BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com

December 15, 2022

Vice Admiral John F. Wade
Commander, Joint Task Force Red Hill
1025 Quincy Avenue Suite 900
JBPHH, Hawaii 96860-5101

Rear Admiral J.J. Kilian, P.E.
Commander, NAVFAC Pacific
258 Makalapa Drive, Suite 100
Pearl Harbor, Hawaii 96860-3134

Rear Admiral Stephen D. Barnett
Commander, Navy Region Hawaii
850 Ticonderoga Street, Suite 110
JBPHH, Hawaii 96860-5101

Subject: Request for Additional Information on Reported Per- and Polyfluoroalkyl Substances (PFAS) Detections and Aqueous Film Forming Foam (AFFF) Systems at the Joint Base Pearl Harbor- Hickam (JBPHH) Water System and the Red Hill Bulk Fuel Storage Facility (RHBFSF)

Dear Vice Admiral Wade, Rear Admiral Kilian, and Rear Admiral Barnett,

The 2021 and 2022 JBPHH Annual Water Quality Reports (attached) show the detection of 5- and 6-carbon PFAS chemicals, respectively, of the 18 PFAS compounds covered in the Navy's sampling method. The Board of Water Supply (BWS) request the following information regarding the reported detections:

- Which well were the detected samples taken from?
- When were the detection samples taken and reported? Please send us a copy of the laboratory reports for these samples.
- What are the types of PFAS detected and their detected concentration?

Considering the recent AFFF spill at the RHBFSF that occurred on November 29, 2022, BWS requests all information on the AFFF systems at the RHBFSF and the JBPHH, including but not limited to:

- The types of AFFF concentrates used and stored at RHBFSF and JBPHH.

- The location and volume of concentrates stored.
- Leak and spill records detailing the date, volume, type, and locations of which the leak/spill occurred and remediation actions that resulted.

In addition, the BWS would like to know if the AFFF systems were activated during the May 6, 2021 and November 20, 2021 spill incidents and if AFFF liquid were present in the AFFF drain line that was damaged during the November 20, 2021 incident.

Please send us your response by January 16, 2023. If you have any questions, please contact me at (808) 748-5061.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

Attachments:

- 2022 Annual Water Quality Report –Joint Base Pearl Harbor-Hickam Water System
- 2021 Annual Water Quality Report –Joint Base Pearl Harbor-Hickam Water System

JL
Cc: E. Kawata
K. Elliott-Pahinui

2022 Annual

Water Quality Report

Joint Base Pearl Harbor-Hickam Water System

(Waiawa, Aiea-Halawa & Red Hill Sources)

This report meets federal and state requirements for Consumer Confidence Reports. This report is updated annually and reflects monitoring data collected from Jan 1 - Dec 31, 2021.

The Navy is pleased to provide you with the 2021 annual Water Quality Report for the Joint Base Pearl Harbor-Hickam (JBPHH) Water System.

This pamphlet provides information about the water delivered to you during the 2021 calendar year. It gives information on where your water comes from, what it contains, and how it compares to established standards for safe drinking water.

Due to the November 20, 2021 release at Red Hill, all drinking water for JBPHH now comes from the Waiawa Shaft (see page 2). This Water Quality Report summarizes data and information that was collected prior to the November 20, 2021 release.

For more information on the Red Hill Release and Response and Restoration efforts, please see: *https://jbphh-safewaters.org/*

Our goal is, and always has been, to provide you safe and dependable drinking water.

Water Provider

Naval Facilities Engineering Systems Command (NAVFAC) Hawaii operates the water system servicing your area. As the Navy water provider in the State of Hawaii (State), we primarily supply water to military installations and housing.

Drinking Water Standards

The Environmental Protection Agency (EPA) and State regulations require us to test your water for contaminants on a regular basis, making sure it is safe to drink, and to report our results accordingly.

To ensure that tap water is safe to drink, EPA regulations limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration does the same for bottled water.

In this latest compliance monitoring period, we conducted tests for over 70 contaminants that have potential for being found in your drinking water. Tables 1-1, 1-2, 1-3, 1-4, and 1-5 show the concentration levels of regulated contaminants found in your water. In all cases, the levels measured were below EPA and State requirements for safe drinking water.

We are continually working to protect your drinking water from contaminants. The State's Department of Health (DOH) completed the Source Water Assessment in 2004 which identifies the susceptibility of your water supply to contamination. The source water assessment is available for review by contacting NAVFAC Hawaii Public Affairs, at 808-457-7497.

Source of Water

Historically, your drinking water comes from the Waimalu and Moanalua groundwater aquifer systems via three supply wells/shafts: Waiawa, Aiea-Halawa, and Red Hill. Groundwater is naturally filtered as it travels from the surface to the aquifers below ground. The water is pumped up from the aquifer, disinfected, fluoridated, and piped into the JBPHH distribution system.

Starting on 16 November 2021 and through the end of 2021, due to pump issues, the United States Marine Corps Manana housing area was supplied with water from the Honolulu Board of Water Supply's (BWS) Pearl City Shaft and Well 1.

The Red Hill and Aiea-Halawa shafts were taken offline on November 28, 2021 and December 3, 2021, respectively, due to the Red Hill Shaft Incident (see page 2). Since December 3rd, drinking water for the JBPHH Water System has been supplied solely by the water from the Waiawa Shaft and will continue to be for the foreseeable future.

Possible Source of Contaminants

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. It can also pick up other substances resulting from the presence of animals 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 the 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 at 1-800-426-4791.

Potential Contaminants

Contaminants that may be present in your source water include:

Microbial contaminants – such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic contaminants – such as 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 – which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.

Organic chemical contaminants – including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

Radionuclide contaminants – which can be naturally-occurring or be the result of oil and gas production and mining activities.

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. NAVFAC Hawaii 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 two minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may request to have the Navy test your water. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available at: ***www. epa.gov/safewater/lead***

Navy Water Requirements

In accordance with Navy policy, chlorine and fluoride are added to your water supply after the water is pumped from the ground. The Navy's goal is to maintain concentrations of approximately 0.7 parts per million (ppm) for fluoride and 0.2 ppm for chlorine throughout the distribution system.

2021 Red Hill Shaft Incident

On November 20, 2021, a mixture of JP-5 (jet fuel) and water was released from a fire suppression drain line contaminating the drinking water in the Red Hill Shaft. The Red Hill Shaft has been isolated and offline since November 28, 2021. On November 29, 2021, DOH issued a Health Advisory for the JBPHH Public Water System recommending Navy water system consumers to avoid using the water for drinking, cooking, dishwashing, laundry, or oral hygiene.

As a result of the fuel contamination, the Navy, in cooperation with DOH, EPA, and the U.S. Army, has implemented a set of plans and corrective actions to ensure safe drinking water and restore/recover the aquifer and drinking water system. The plans include: Red Hill Shaft Recovery and Monitoring Plan; Drinking Water Distribution System Recovery Plan; and Drinking Water Sampling Plan. PDFs of these documents are available at:

www.cpf.navy.mil/JBPHH-Water-Updates

The Drinking Water Distribution System Recovery Plan divided the JBPHH Water System and Aliamanu Military Reservation Water System into 19 zones and detailed standard operating procedures for the flushing and sampling of each of the zones. High-volume flushing of the Navy drinking water distribution system (all water mains/laterals/buildings) with 3 to 5 volumes of clean water from the Waiawa Shaft was conducted to restore safe drinking water to all Navy Water System users. Other corrective measures, such as fixture replacement, were also implemented where appropriate. Extensive testing was also conducted to confirm that system flushing was effective. Table **1-6** shows the levels of contaminants detected in samples collected while the DOH Health Advisory was still in effect, as well as the level of contaminants after flushing and other corrective actions.

On March 18, 2022, after verification of recovery efforts and a thorough review of sample results, the DOH amended the health advisory and declared the drinking water safe for all 19 zones. In order to ensure a continuous supply of safe drinking water, the Navy has implemented a long-term monitoring plan and will continue to conduct testing in all zones over a two-year period. All drinking water sampling results are compiled and published on our Safe Waters website designed to provide the public access to the most recent data reports. Sampling results will also be included in future Water Quality Reports. Drinking water sampling results and updates to the ongoing efforts to maintain safe drinking water are available at:

https://jbphh-safewaters.org

Tier 1 Public Notification Rule Violation

Per Hawaii Administrative Rules (HAR) 11-20-18(b)(1)(G) a public water system must provide Tier 1 public notice within 24-hour for all national primary drinking water regulation violations and other situations as determined by the State. JBPHH was required to publish a Tier 1 public notification within 24 hours of confirmation of a fuel contamination in the drinking water system. The Navy conducted ongoing pubic outreach to JBPHH water users throughout the incident notifying them of the contamination and recovery efforts. However, the Navy initially failed to provide a Tier 1 public notification with all required specific components to JBPHH water users and was issued a Notice of Violation by DOH on May 12, 2022. On June 30, 2022, the Navy posted an administrative notice on the Public Notice page at: ***https://jbphh-safewaters.org***. This notice includes an explanation of the drinking water contamination, actions taken by the Navy to remediate the situation and identifies the point of contact for more information. The PDF notification is available at:

https://jbphh-safewaters.org/public/administrative_notice_noo_amended_june_30.pdf

Concerns/Additional Copies

NAVFAC Hawaii does not have routine meetings about the water system. For questions and/or information, please contact NAVFAC Hawaii Public Affairs at 808-457-7497. For additional copies of this and other Navy water reports, go to:

- ***https://cnrh.cnic.navy.mil/Operations-and-Management/Environmental/Water-Quality-Information/***
- ***https://pacific.navfac.navy.mil/Facilities-Engineering-Commands/NAVFAC-Hawaii/About-Us/***

Please share this information with all other people who drink this water, especially those who may not have received this notice.

Official Address

Naval Facilities Engineering Systems Command, Hawaii
400 Marshall Road, JBPHH, HI 96860-3139

Printed June 2022

Water Quality Data Table

The following tables list contaminants that were detected during the latest round of sampling required by EPA and State regulations. The water samples were collected from either the source water or distribution system and analyzed by the State, BWS and/or NAVFAC Hawaii. The presence of contaminants does not necessarily indicate that the water poses a health risk. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. You may obtain more information about contaminants and potential health effects by calling the EPA's Safe Drinking Water Hotline 1-800-426-4791 or the State's Department of Health at 808-586-4258.

Contaminants in the Navy's Source Water **Table 1-1**

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	Highest Level Detected	Range of Detection	Year of Sample	Typical Sources of Contaminants	Violation
Inorganic Contaminants							
Barium (ppm)	2	2	0.02	nd – 0.02	2017[1]	Erosion of natural deposits	No
Chromium (total) (ppb)	100	100	2.1	nd – 2.1	2017[1]	Naturally-occurring	No
Fluoride (ppm)	4	4	0.58	0.23 – 0.58	2021	Erosion of natural deposits; Water additive which promotes strong teeth	No
Lead (ppb)	AL = 15	0	10.1	nd – 10.1	2019[1]	Residue from man-made pollution such as auto emissions and paint; lead pipe, casing, and solder	No
Nitrate (ppm)	10	10	2.1	0.51 – 2.1	2021	Runoff from fertilizer use; Erosion of natural deposits	No
Organic Contaminants							
Chlordane (ppb)	2	0	0.36	nd – 0.36	2017[1]	Residue of banned termiticide	No
Heptachlor epoxide (ppt)	200	0	20	nd – 20	2017[1]	Breakdown of heptachlor (banned pesticide)	No
Unregulated Contaminants[2,7,8]							
Bromide[7] (ppb)	n/a	n/a	765	124 – 765	2018[1]	Naturally-occurring	n/a
Chloride[8] (ppm)	250[3]	n/a	225	30 – 225	2021	Naturally-occurring	n/a
Dieldrin (ppb)	n/a	n/a	0.05	nd – 0.05	2017[1]	Residue of banned insecticide	n/a
Manganese[8] (ppb)	n/a	n/a	nd	nd	2020[1]	Naturally-occurring	n/a
Sodium (ppm)	n/a	n/a	124	26 – 124	2017[1]	Naturally-occurring	n/a
Sulfate[8] (ppm)	250[3]	n/a	47	nd – 47	2021	Naturally-occurring	n/a

NOTE: Table 1-1 presents data from samples collected prior to November 29, 2021

Contaminants in the BWS Source Water (Serving Manana Housing) **Table 1-2**

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	Highest Average Level Detected	Range of Detection	Year of Sample	Typical Sources of Contaminants	Violation
Regulated Contaminants							
1,2,3-Trichloropropane (ppb)	0.6	0	0.048	0.045 – 0.053	2021	Fumigant previously used in agriculture	No
Barium (ppm)	2	2	0.004	0.003 – 0.004	2021	Erosion of natural deposits	No
Chromium (ppb)	100	100	0.445	nd – 0.890	2021	Naturally-occurring	No
Fluoride (ppm)	4	4	0.069	0.054 – 0.069	2021	Erosion of natural deposits; Water additive which promotes strong teeth	No
Nitrate (ppm)	10	10	0.880	0.700 – 0.880	2021	Runoff from fertilizer use; Erosion of natural deposits	No
Unregulated Contaminants[2,6,7]							
Chlorate[7] (ppb)	n/a	n/a	17	17	2021	Byproduct of the disinfection process	n/a
Chloride[8] (ppm)	250[3]	n/a	64	40 – 64	2021	Naturally-occurring	n/a
Chromium, hexavalent[7] (ppb)	n/a	n/a	1.4	1.3 – 1.4	2021	Naturally-occurring	n/a
Dieldrin (ppb)	n/a	n/a	0.007	nd – 0.012	2021	Residue of banned pesticide	n/a
Sodium (ppm)	n/a	n/a	36	29 – 36	2021	Naturally-occurring	n/a
Strontium[7] (ppb)	n/a	n/a	84	60 – 84	2021	Naturally-occurring	n/a
Sulfate[8] (ppm)	250[3]	n/a	14	9.7 – 14	2021	Naturally-occurring	n/a
Vanadium[7] (ppb)	n/a	n/a	12	10 – 12	2021	Naturally-occurring	n/a

Contaminants in the Distribution System **Table 1-3**

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	Highest Level Detected	Range of Detection	Year of Sample	Typical Sources of Contaminants	Violation
Copper (ppm)	AL = 1.3	1.3	0.09[4]	0 – 0.09	2019[1]	Corrosion of household plumbing systems; Erosion of natural deposits	No
Fluoride (ppm)	4	4	1.00	nd – 1.00	2021	Erosion of natural deposits; Water additive which promotes strong teeth	No

NOTE: Table 1-3 presents data from samples collected prior to November 29, 2021

Disinfection Agent **Table 1-4**

Contaminants (units)	MRDL (Allowed)	MRDLG (Goal)	Highest Average Level Detected	Range of Detection	Year of Sample	Typical Sources of Contaminants	Violation
Residual Chlorine (ppm)	4	4	0.51[5]	0.3 – 0.7	2021	Water additive used to control microbes	No

Disinfection Byproducts **Table 1-5**

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	Highest Level Detected	Range of Detection	Year of Sample	Typical Sources of Contaminants	Violation
Total Trihalomethanes (ppb)	80	n/a	2.8	2.8	2021	Byproduct of drinking water disinfection	No

NOTE: Table 1-5 presents data from samples collected prior to November 29, 2021

As previously described on page 2, after the November 20 fuel release and issuance of the DOH Health Advisory, extensive testing was conducted to initially determine the level of contamination present, and later to confirm that system flushing was effective. Table **1-6** shows the levels of contaminants detected in samples collected after the release, as well as the level of contaminants after flushing and other corrective actions.

Contaminant Detections in Distribution System/Residences During DOH Health Advisory **Table 1-6**

Table Contaminants (units)	MCL (Allowed)	Highest Contaminant Level Detected Prior to Flushing (Dec 30 - Feb 22 2022)	Contaminant Level After Flushing/Corrective Actions (Jan 23 - Mar 16 2022)
Beryllium (ppb)	4	8.4	nd
Cadmium (ppb)	5	23.1	nd
Dichloromethane / Methylene Chloride (ppb)	5	186	nd
Di(n-butyl)phthalate (ppb)	n/a	0.45	nd
Lead (ppb)	AL = 15	49	nd
Total Organic Carbon (ppm)	EAL = 2	14.5	nd
Total Petroleum Hydrocarbons (gasoline) (ppb)	EAL = 300	nd	nd
Total Petroleum Hydrocarbons (diesel) (ppb)	EAL = 400	268	nd
Total Petroleum Hydrocarbons (oil) (ppb)	EAL = 500	650	nd

NOTE: Table 1-6 presents data from samples collected after November 28, 2021

Potential health effects from long-term exposure above the MCL, EAL, or AL

- **Beryllium**: Intestinal lesions
- **Cadmium**: Kidney damage
- **Dichloromethane**: Liver problems; increased risk of cancer
- **Di(n-butyl)phthalate:** This chemical appears to have relatively low acute (short-term) and chronic (long-term) toxicity. No information is available regarding the effects in humans from inhalation or oral exposure to di(n-butyl)phthalate, and only minimal effects have been noted in animals exposed by inhalation. No studies are available on the reproductive, developmental, or carcinogenic effects of di(n-butyl)phthalate in humans. Animal studies have reported developmental and reproductive effects from oral exposure. EPA has classified di(n-butyl)phthalate as not classifiable as to human carcinogenicity.
- **Lead**: Delays in physical or mental development in infants and children; children could show slight deficits in attention span and learning abilities; Adults can develop kidney problems and/or high blood pressure.
- **Total Organic Carbon**: A form of disinfection byproduct precursors and has no health effects.
- **Total Petroleum Hydrocarbons (gasoline, diesel, oil)**: Consumption can cause upset stomach, stomach cramping, nausea, vomiting, and diarrhea. Your throat and mouth may also get irritated. Petroleum hydrocarbons can irritate the skin (dermal exposure). Continuous exposure can cause itchy rash with red and peeling skin. Breathing petroleum vapors (also called inhalational exposure) can cause headaches, dizziness, tiredness and respiratory problems like cough and difficulty breathing. Nosebleeds are possible. Evaluation of the possibility of long-term health effects is ongoing. Based on current information, people exposed to contaminated drinking water from the Joint Base Pearl Harbor-Hickam Drinking Water System in this incident are not expected to experience long-term health effects.

Table Definitions:

AL **Action Level.** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

DOH **Department of Health.**

EAL **Environmental Action Level (EAL).** Environmental Action Levels are concentrations of contaminants in drinking water and other media (e.g., soil, soil gas, and groundwater) below which the contaminants are assumed to not pose a significant threat to human health or the environment. Exceeding the EAL does not necessarily indicate that contamination at the site poses environmental hazards but generally warrants additional investigation.

J Estimated Value

MCL **Maximum Contaminant Level.** 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.

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 allow for a margin of safety.

MRDL **Maximum Residual Disinfectant Level**. 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.

MRDLG **Maximum Residual Disinfectant Level Goal**. 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 contamination.

Table Abbreviations:

n/a not applicable.

nd not detectable at testing limits.

ppb parts per billion or micrograms per liter.

ppm parts per million or milligrams per liter.

ppt parts per trillion or nanograms per liter.

Table Notes:

1. The State and EPA require us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. The date of the oldest sample collected is as indicated.
2. These results are for informational purposes. There are no set standards. EPA will use this data to help determine where certain contaminants occur and whether it needs to regulate these contaminants. At this time, these contaminants do not have MCLs or MCLGs.
3. These are Secondary Maximum Contaminant Levels not enforced by EPA.
4. 90th percentile value of the samples collected.
5. After each quarter, a running average is calculated using the preceding 12 months of data. This value is the highest running average for the year.
6. The 1996 Safe Drinking Water Act (SDWA) amendments require that once every five years the EPA issue a new list of no more than 30 unregulated contaminants to be monitored by public water systems (PWSs). EPA uses the Unregulated Contaminant Monitoring Rule (UCMR) to collect data for contaminants that are suspected to be present in drinking water and do not have health-based standards set under the SDWA.
7. National Secondary Drinking Water Regulations (NSDWRs), or secondary standards, are non-enforceable guidelines regulating contaminants that may cause cosmetic or aesthetic effects in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply with the standard.

Note: 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 EPA's Safe Drinking Water Hotline 1-800-426-4791.

Additional Testing - PFAS

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 United States, 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 (aqueous film-forming foam or AFFF) used for fighting petroleum fires at airfields and in industrial fire suppression processes because they rapidly extinguish fires, saving lives and protecting property. PFAS chemicals 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?

There is currently no established federal water quality regulation for any PFAS compounds. In May 2016, the EPA established a health advisory (HA) level at 70 parts per trillion (ppt) for individual or combined concentrations of perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). Both chemicals are types of PFAS.

Out of an abundance of caution for your safety, the Department of Defense's (DoD) PFAS testing and response actions go beyond EPA Safe Drinking Water Act requirements. In 2020 the DoD promulgated a policy to monitor drinking water for PFAS at all service owned and operated water systems at a minimum of every three years.

The EPA's health advisory states that if water sampling results confirm that drinking water contains PFOA and PFOS at individual or combined concentrations greater than 70 parts per trillion, water systems should quickly undertake additional sampling to assess the level, scope, and localized source of contamination to inform next steps.

Has JBPHH tested its water for PFAS?

Yes. In 2021, three samples were collected from Aiea-Halawa Shaft Chlorinator. Results from the sampling events are presented in Table **1-7**.

We are informing you that 6 of the 18 PFAS compounds covered by the sampling method were detected above the method reporting limit (MRL). PFOA and PFOS were below the EPA HA level. As PFOA and PFOS were below the EPA HA level, there is no immediate cause for concern, but we will continue to monitor the drinking water closely to ensure that remains the case. In accordance with DoD policy, JBPHH will collect samples for PFAS once every two years (2023, 2025) until the results are below the MRL. When PFAS results are below the MRL, sampling will be conducted once every three years. As mentioned previously, the Aiea-Halawa Shaft was temporarily taken offline on December 3, 2021.

2021 PFAS Sampling Results at Aiea-Halawa Shaft Chlorinator **Table 1-7**

Contaminants (ppt)	MCL (Allowed)	Health Advisory (ppt)	Highest Level Detected	Range of Detection	Year of Sample	Violation
Perfluorooctanoic acid (PFOA)	n/a[2]	70	3.6	nd – 3.6	2021	n/a
Perfluorooctanesulfonic acid (PFOS)	n/a[2]	70	5.6	nd – 5.6	2021	n/a
Perfluorobutanesulfonic acid (PFBS)	n/a[2]	n/a	2.6	nd – 2.6	2021	n/a
Perfluoroheptanoic acid (PFHpA)	n/a[2]	n/a	1.7	nd – 1.7	2021	n/a
Perfluorohexanesulfonic acid (PFHxS)	n/a[2]	n/a	4.6	nd – 4.6	2021	n/a
Perfluorononanoic acid (PFNA)	n/a[2]	n/a	nd	nd	2021	n/a
Perfluorodecanoic acid (PFDA)	n/a[2]	n/a	nd	nd	2021	n/a
Perfluorohexanoic acid (PFHxA)	n/a[2]	n/a	2.9	nd – 2.9	2021	n/a
Perfluorododecanoic acid (PFDoA)	n/a[2]	n/a	nd	nd	2021	n/a
Perfluorotridecanoic acid (PFTrDA)	n/a[2]	n/a	nd	nd	2021	n/a
Perfluoroundecanoic acid (PFUnA)	n/a[2]	n/a	nd	nd	2021	n/a
N-ethyl perfluorooctanesulfonamidoacetic acid	n/a[2]	n/a	nd	nd	2021	n/a
N-methyl perfluorooctanesulfonamidoacetic acid	n/a[2]	n/a	nd	nd	2021	n/a
Hexafluoropropylene oxide dimer acid (HFPO-DA)	n/a[2]	n/a	nd	nd	2021	n/a
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	n/a[2]	n/a	nd	nd	2021	n/a
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	n/a[2]	n/a	nd	nd	2021	n/a
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	n/a[2]	n/a	nd	nd	2021	n/a
Perfluorotetradecanoic acid (PFTA)	n/a[2]	n/a	nd	nd	2021	n/a

2021 Annual

Water Quality Report

Joint Base Pearl Harbor-Hickam Water System

(Waiawa, Halawa & Red Hill Sources)

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Drinking Water Standards

The Environmental Protection Agency (EPA) and State regulations require us to test your water for contaminants on a regular basis, making sure it is safe to drink, and to report our results accordingly.

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. The Food and Drug Administration does the same for bottled water.

In the latest compliance monitoring period, we conducted tests for over 70 contaminants that have potential for being found in your drinking water. Tables 1-1, 1-2, 1-3, 1-4, 1-5, and 1-6 show the levels of concentrations of regulated contaminants found in your water. In all cases, the levels measured met both EPA and State requirements for safe drinking water.

We are continually working to protect your drinking water from contaminants. The State's Department of Health completed the Source Water Assessment in 2004. This document identifies the susceptibility of your water supply to contamination. The source water assessment is available for review by contacting NAVFAC Hawaii Public Affairs, at 808-471-7300.

Source of Water

Your drinking water comes from three ground water sources: Waiawa, Halawa, and Red Hill. Ground water is naturally filtered as it travels from the surface to the aquifer below ground. The water is pumped up from the aquifer, disinfected, fluoridated, and piped into the distribution system.

For a limited time during 2020:

- **The Manana housing area was supplemented with water from the Honolulu Board of Water Supply's (BWS) Pearl City Shaft and Well 1.**

Possible Source of Contaminants

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. It can also pick up other substances resulting from the presence of animals 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 the 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 at 1-800-426-4791.

Potential Contaminants

Contaminants that may be present in your source water include:

Microbial contaminants – such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic contaminants – such as 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 – which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.

Organic chemical contaminants – including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

Radionuclide contaminants – which can be naturally-occurring or be the result of oil and gas production and mining activities.

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. NAVFAC Hawaii 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 two 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 at ***www.epa.gov/safewater/lead.***

Navy Water Requirements

In accordance with Navy policy, chlorine and fluoride are added to your water supply after the water is pumped from the ground. We try to maintain the Navy's recommended concentration of approximately 0.7 ppm for fluoride and 0.2 ppm for chlorine throughout the distribution system.

2020 Testing at Red Hill Shaft

In January 2014, a fuel release from Tank #5 at the Red Hill Underground Fuel Storage Facility was reported. As a proactive measure and in accordance with the 2014 Transition Plan executed between the Navy and the State Department of Health, we have been conducting testing at the Red Hill Drinking Water Shaft above what is required by drinking water regulation for several years which includes volatile organic compound (VOC), semi-volatile organic compound (SVOC), lead, and total petroleum hydrocarbon-diesel (TPH-d). Table 1-6 shows the levels of contaminants detected at the Red Hill Drinking Water Shaft in 2020. We will continue to conduct this testing and include the test results in the future Water Quality Reports.

Concerns / Additional Copies

NAVFAC Hawaii does not have routine meetings about the water system. For questions and/or information, please contact NAVFAC Hawaii Public Affairs at 808-471-7300. For additional copies of this and other Navy water reports, go to:

- ***www.cnic.navy.mil/regions/cnrh/om/environmental/water_quality_information.html***
- ***www.navfac.navy.mil/navfac_worldwide/pacific/fecs/hawaii/about_us/hawaii_documents/Reports.html***

Please share this information with all other people who drink this water, especially those who may not have received this notice.

Official Address

Naval Facilities Engineering Systems Command, Hawaii
400 Marshall Road, JBPHH, HI 96860-3139

Printed June 2021

Water Quality Data Table

The following tables list contaminants which were detected during the latest round of sampling required by EPA and State regulations. The water samples were collected from either the source water or distribution system and analyzed by the State, BWS and/or NAVFAC Hawaii. The presence of contaminants does not necessarily indicate that the water poses a health risk. You may obtain more information about contaminants and potential health effects by calling the EPA's Safe Drinking Water Hotline 1-800-426-4791 or the State's Department of Health at 808-586-4258.

Contaminants in the Navy's Source Water **Table 1-1**

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	Highest Level Detected	Range of Detection	Year of Sample	Typical Sources of Contaminants	Violation
Inorganic Contaminants							
Barium (ppm)	2	2	0.02	nd – 0.02	2017[1]	Erosion of natural deposits	No
Chromium (total) (ppb)	100	100	2.1	nd – 2.1	2017[1]	Naturally-occurring	No
Fluoride (ppm)	4	4	0.77	nd – 0.77	2020	Erosion of natural deposits; Water additive which promotes strong teeth	No
Lead (ppb)	15	0	10.1	nd – 10.1	2019[1]	Residue from man-made pollution such as auto emissions and paint; lead pipe, casing, and solder	No
Nitrate (ppm)	10	10	2.0	0.52 – 2.0	2020	Runoff from fertilizer use; Erosion of natural deposits	No
Organic Contaminants							
Chlordane (ppb)	2	0	0.36	nd – 0.36	2017[1]	Residue of banned termiticide	No
Heptachlor epoxide (ppt)	200	0	20	nd – 20	2017[1]	Breakdown of heptachlor (banned pesticide)	No
Unregulated Contaminants[2]							
Bromide (ppb)	n/a	n/a	765	124 - 765	2018[1]	Naturally-occurring	n/a
Chloride (ppm)	250[3]	n/a	235	34 - 235	2020	Naturally-occurring	n/a
Dieldrin (ppb)	n/a	n/a	0.05	nd – 0.05	2017[1]	Residue of banned insecticide	n/a
Manganese (ppb)	n/a	n/a	1.20	nd – 1.20	2018[1]	Naturally-occurring	n/a
Sodium (ppm)	n/a	n/a	124	26 – 124	2017[1]	Naturally-occurring	n/a
Sulfate (ppm)	250[3]	n/a	46	nd - 46	2020	Naturally-occurring	n/a

Contaminants in the BWS Source Water (Serving Manana Housing) **Table 1-2**

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	Highest Average Level Detected	Range of Detection	Year of Sample	Typical Sources of Contaminants	Violation
Regulated Contaminants							
1,2,3-Trichloropropane (ppb)	0.6	0	0.050	0.047 – 0.052	2020	Fumigant previously used in agriculture	No
Barium (ppm)	2	2	0.004	0.003 – 0.004	2020	Erosion of natural deposits	No
Chromium (ppb)	100	100	1.3	1.3	2020	Naturally-occurring	No
Fluoride (ppm)	4	4	0.068	0.058 – 0.068	2020	Erosion of natural deposits; Water additive which promotes strong teeth	No
Nitrate (ppm)	10	10	0.970	0.690 – 0.970	2020	Runoff from fertilizer use; Erosion of natural deposits	No
Unregulated Contaminants[2]							
Chlorate (ppb)	n/a	n/a	26	22 – 26	2020	Byproduct of the disinfection process	n/a
Chloride (ppm)	250[3]	n/a	61	37 – 61	2020	Naturally-occurring	n/a
Chromium, hexavalent (ppb)	n/a	n/a	1.4	1.3 – 1.4	2020	Naturally-occurring	n/a
Dieldrin (ppb)	n/a	n/a	0.008	nd - 0.016	2020	Residue of banned pesticide	n/a
Sodium (ppm)	n/a	n/a	37	30-37	2020	Naturally-occurring	n/a
Strontium (ppb)	n/a	n/a	79	54-79	2020	Naturally-occurring	n/a
Sulfate (ppm)	250[3]	n/a	14	9.4 – 14	2020	Naturally-occurring	n/a
Vanadium (ppb)	n/a	n/a	11	11	2020	Naturally-occurring	n/a

Contaminants in the Distribution System **Table 1-3**

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	Highest Level Detected	Range of Detection	Year of Sample	Typical Sources of Contaminants	Violation
Copper (ppm)	AL = 1.3	1.3	0.09[4]	0[5]	2019[1]	Corrosion of household plumbing systems; Erosion of natural deposits	No
Fluoride (ppm)	4	4	1.16	nd – 1.16	2020	Erosion of natural deposits; Water additive which promotes strong teeth	No

Disinfection Agent **Table 1-4**

Contaminants (units)	MRDL (Allowed)	MRDLG (Goal)	Highest Average	Range of Detection	Year of Sample	Typical Sources of Contaminants	Violation
Residual Chlorine (ppm)	4	4	0.5[6]	0.2 – 1.0	2020	Water additive used to control microbes	No

Disinfection Byproducts **Table 1-5**

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	Highest Level Detected	Range of Detection	Year of Sample	Typical Sources of Contaminants	Violation
Total Trihalomethanes (ppb)	80	n/a	3.7	3.7	2020	Byproduct of drinking water disinfection	No

2020 Testing – Red Hill Shaft **Table 1-6**

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	DOH EAL	Highest Level Detected	Range of Detection	Violation
TPH-d, C8-C18 (ppb)	n/a	n/a	400	490[7]	nd – 490	n/a
Lead (ppb)	AL = 15	0	15	0.66	nd – 0.66	No
DOC (ppm)	n/a	n/a	n/a	1.4	nd – 1.4	n/a

Table Definitions:

AL **Action Level.** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

DOH EAL **Department of Health Environmental Action Level.** Risk-based levels published by DOH for compounds that do not have promulgated MCL values.

MCL **Maximum Contaminant Level.** 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.

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 allow for a margin of safety.

MRDL **Maximum Residual Disinfectant Level**. 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.

MRDLG **Maximum Residual Disinfectant Level Goal**. 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 contamination.

TPH-d Total Petroleum Hydrocarbons as diesel fuel.

Table Abbreviations:

n/a not applicable.

nd not detectable at testing limits.

ppb parts per billion or micrograms per liter.

ppm parts per million or milligrams per liter.

ppt parts per trillion or nanograms per liter.

Table Notes:

1. The State and EPA require us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. The date of the oldest sample collected is as indicated.
2. These results are for informational purposes. There are no set standards. EPA will use this data to help determine where certain contaminants occur and whether it needs to regulate these contaminants. At this time, these contaminants do not have MCLs or MCLGs.
3. These are Secondary Maximum Contaminant Levels not enforced by EPA.
4. 90th percentile value of the samples collected.
5. Number of samples above the action level.
6. After each quarter, a running average is calculated using the preceding 12 months of data. The posted amount is the highest running average for the year.
7. One TPH-d (C8-C18) EAL exceedance occurred during 2020 testing on a post-chlorination sample. Pre-chlorination samples are believed to be more representative of any potential contact with fuels stored at the Red Hill Bulk Fuel Storage Facility and TPH-d (C8-C18) was not detectable at testing limits for all 2020 pre-chlorination samples. Hawaii Department of Health (HDOH) and the Navy will continue to conduct testing and include results in future Water Quality Reports.

Note: 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 EPA's Safe Drinking Water Hotline 1-800-426-4791.

Additional Testing - PFAS

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 United States, 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 (aqueous film-forming foam or AFFF) used for fighting petroleum fires at airfields and in industrial fire suppression processes because they rapidly extinguish fires, saving lives and protecting property. PFAS chemicals 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?

There is currently no established federal water quality regulation for any PFAS compounds. In May 2016, the EPA established a health advisory (HA) level at 70 parts per trillion (ppt) for individual or combined concentrations of perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). Both chemicals are types of PFAS.

Out of an abundance of caution for your safety, the Department of Defense's (DoD) PFAS testing and response actions go beyond EPA Safe Drinking Water Act requirements. In 2020 the DoD promulgated a policy to monitor drinking water for PFAS at all service owned and operated water systems at a minimum of every three years.

The EPA's health advisory states that if water sampling results confirm that drinking water contains PFOA and PFOS at individual or combined concentrations greater than 70 parts per trillion, water systems should quickly undertake additional sampling to assess the level, scope, and localized source of contamination to inform next steps.

Has JBPHH tested its water for PFAS?

Yes. In November 2020 samples were collected from Halawa Shaft Chlorinator, Waiawa Shaft Chlorinator, and Red Hill Shaft Chlorinator.

We are informing you that 5 of the 18 PFAS compounds covered by the sampling method were detected above the method reporting limit (MRL). PFOA and PFOS were below the EPA HA level. The results are provided in Table 1-7. As PFOA and PFOS were below the EPA HA, there is no immediate cause for concern, but we will continue to monitor the drinking water closely to ensure that remains the case. In accordance with DoD policy, JBPHH will collect quarterly samples for PFAS for one year and then every two years thereafter as long as the results are below the MRL.

2020 PFAS Sampling Results at JBPHH **Table 1-7**

Contaminants (ppt)	MCL (Allowed)	Health Advisory (ppt)	Highest Level Detected	Range of Detection	Year of Sample	Violation
Perfluorooctanoic acid (PFOA)	n/a	70	3.2	nd – 3.2	2020	n/a
Perfluorooctanesulfonic acid (PFOS)	n/a	70	5.5	nd – 5.5	2020	n/a
Perfluorobutanesulfonic acid (PFBS)	n/a	n/a	2.4	nd – 2.4	2020	n/a
Perfluoroheptanoic acid (PFHpA)	n/a	n/a	nd	nd	2020	n/a
Perfluorohexanesulfonic acid (PFHxS)	n/a	n/a	4.0	nd – 4.0	2020	n/a
Perfluorononanoic acid (PFNA)	n/a	n/a	nd	nd	2020	n/a
Perfluorodecanoic acid (PFDA)	n/a	n/a	nd	nd	2020	n/a
Perfluorohexanoic acid (PFHxA)	n/a	n/a	2.9	nd – 2.9	2020	n/a
Perfluorododecanoic acid (PFDoA)	n/a	n/a	nd	nd	2020	n/a
Perfluorotridecanoic acid (PFTrDA)	n/a	n/a	nd	nd	2020	n/a
Perfluoroundecanoic acid (PFUnA)	n/a	n/a	nd	nd	2020	n/a
N-ethyl perfluorooctanesulfonamidoacetic acid	n/a	n/a	nd	nd	2020	n/a
N-methyl perfluorooctanesulfonamidoacetic acid	n/a	n/a	nd	nd	2020	n/a
Hexafluoropropylene oxide dimer acid (HFPO-DA)	n/a	n/a	nd	nd	2020	n/a
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	n/a	n/a	nd	nd	2020	n/a
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	n/a	n/a	nd	nd	2020	n/a
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	n/a	n/a	nd	nd	2020	n/a
Perfluorotetradecanoic acid (PFTA)	n/a	n/a	nd	nd	2020	n/a