



# JOINT BASE PEARL HARBOR-HICKAM WATER RESPONSE

# RESIDENT RESOURCES



# Introduction

Your Navy leadership remains committed to the safety and well-being of every individual and family on the Joint Base Pearl Harbor-Hickam (JBPHH) drinking water system. We are responsible for and completely committed to ensuring we have and preserve safe drinking water throughout that system.

This JBPHH Water Resident Resources Guide is intended to provide a range of information to address your concerns and is based on the best and most current information that we have available. As new information becomes available, we will provide updates on the digital platforms listed in this guide.



## Oahu Navy Water Response Digital Platforms

Scan the QR codes to stay up to date with the latest information.



**Joint Base Pearl Harbor-Hickam Safe Waters**  
[jbphh-safewaters.org](http://jbphh-safewaters.org)

- Ongoing information on Navy efforts regarding water on the island of Oahu
- Two primary areas: Drinking Water System and Red Hill Environmental Remediation



**Joint Base Pearl Harbor-Hickam Facebook Page**  
[facebook.com/JBPHH](https://facebook.com/JBPHH)

- Features daily joint base water updates
- Imagery and resources related to water response efforts
- Infographics and information



**Navy Region Hawaii Facebook Page**  
[facebook.com/NavyRegionHawaii](https://facebook.com/NavyRegionHawaii)

- Frequent updates and information about Joint Base Pearl Harbor-Hickam drinking water



**Navy Closure Task Force - Red Hill**  
[www.navyclosuretaskforce.navy.mil](http://www.navyclosuretaskforce.navy.mil)

- Document library for defueling and closure of Red Hill Bulk Fuel Storage Facility
- Photos and media gallery related to water response efforts and drinking water testing







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# TOTAL PETROLEUM HYDROCARBONS

MARCH  
2024



## WHAT ARE THEY?

**Total Petroleum Hydrocarbons (TPH) is a term used to describe a large family of many chemical compounds that originally come from crude oil, which is used to make petroleum products.**

These compounds are composed of carbon and hydrogen, which is why they are called “hydrocarbons,” and include various constituents found in gasoline, jet fuels, mineral oils, and other petroleum products used on a daily basis.

Because there are many different chemicals in the hydrocarbon family, they are often grouped into common categories by “carbon range,” meaning the number of carbon elements in the individual compound.

Red Hill drinking water samples are primarily tested for three hydrocarbon categories: Gasoline Range (TPH-g), Diesel Range (TPH-d), and Oil Range (TPH-o). These three categories of hydrocarbons are further described at right.

People could be exposed to TPH from many sources on a daily basis. One of the most common ways people are exposed is by breathing in air while fueling their vehicles at gas stations.

## HOW DOES THIS RELATE TO RED HILL?

It is important to recognize that these drinking water tests are not for gasoline, diesel fuel, or oil specifically, but rather petroleum hydrocarbons that are in the “range” of those found in gasoline, diesel fuel, or oil. Because petroleum hydrocarbons fall into different categories, it is important that testing, analysis, and interpretation of TPH results are taken into careful consideration. **Not all detections of TPH equate to the presence of JP-5 (Jet Propellant-5) in drinking water.**

## TPH-g

### Total Petroleum Hydrocarbons – GASOLINE RANGE

are relatively short hydrocarbons that easily evaporate and are flammable. The TPH-Gasoline Range Organics analysis is used to measure the amount of hydrocarbon compounds with 6 to 10 carbons (C6-C10). These compounds are commonly associated with an unpleasant odor. **These are commonly found in solvents and motor vehicle gasoline fuel.**

## TPH-d

### Total Petroleum Hydrocarbons – DIESEL RANGE

are medium-length hydrocarbons that don’t evaporate as well as the smaller compounds. The TPH-Diesel Range Organics analysis is used to measure the amount of hydrocarbon compounds with 10 to 24 carbons (C10-C24). These compounds are generally flammable and produce a lot of energy when burned. **These are commonly found in many household, biological, and industrial products, such as mothballs, cooking oils, and diesel or kerosene fuels.**

## TPH-o

### Total Petroleum Hydrocarbons – OIL RANGE

are larger hydrocarbons that don’t evaporate. The TPH-Oil Range Organics analysis is used to measure the amount of hydrocarbon compounds with 24 to 40 carbons (C24-C40). **These are commonly found in lotions, lubricants, and greases.**



# TOTAL PETROLEUM HYDROCARBONS



## PROTECTION OF HUMAN HEALTH

Health effects from exposure to TPH depend on many factors, such as the type of compounds in the TPH mixture, how long the exposure lasts, and the amount of TPH exposure. The compounds in each of the TPH ranges affect the body differently.

The federal government develops regulations and guidelines intended to protect human health. These regulations and guidelines often include exposure levels in air, soil, water, or food that may not be exceeded. Exposure levels are developed based on information provided by the U.S. Environmental Protection Agency (EPA), Agency for Toxic Substances and Disease Registry (ATSDR), Centers for Disease Control and Prevention (CDC), and the National Institute for Occupational Safety and Health (NIOSH).

There are currently no federal drinking water regulations or guidelines for TPH in general; however, the EPA has developed regulations, guidelines, and risk-based screening levels for TPH fractions and individual compounds that make up TPH mixtures. These include:

**Maximum Contaminant Levels (MCLs)** established under the Safe Drinking Water Act (SDWA) to limit the amount of contamination in public drinking water.

**Regional Screening Levels (RSLs)** established as part of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) for determining if a chemical poses an unacceptable risk to human health.

Nearly all states, including Hawaii, have developed guidance and standards for TPH, TPH fractions, and/or individual compounds that make up TPH mixtures.

**Environmental Action Levels (EALs)** established by the Hawaii Department of Health for determining if a chemical poses an unacceptable risk to human and ecological health taking into consideration environmental conditions in Hawaii.

## HOW COULD I BE EXPOSED TO TPH?

People could be exposed to TPH from many sources on a daily basis. Potential everyday sources include:

- Air at gasoline stations
- Chemicals at home or work
- Certain pesticides
- Petroleum products, such as those used in manufacturing

While TPH are commonly associated with the fuel and motor oil for your car, petroleum chemicals are used to make over 6,000 everyday products. These products include asphalt, plastic products, cosmetics, clothing, heat and electricity, electronics, paint, and many more.

### TPH ARE USED IN EVERYDAY PRODUCTS SUCH AS

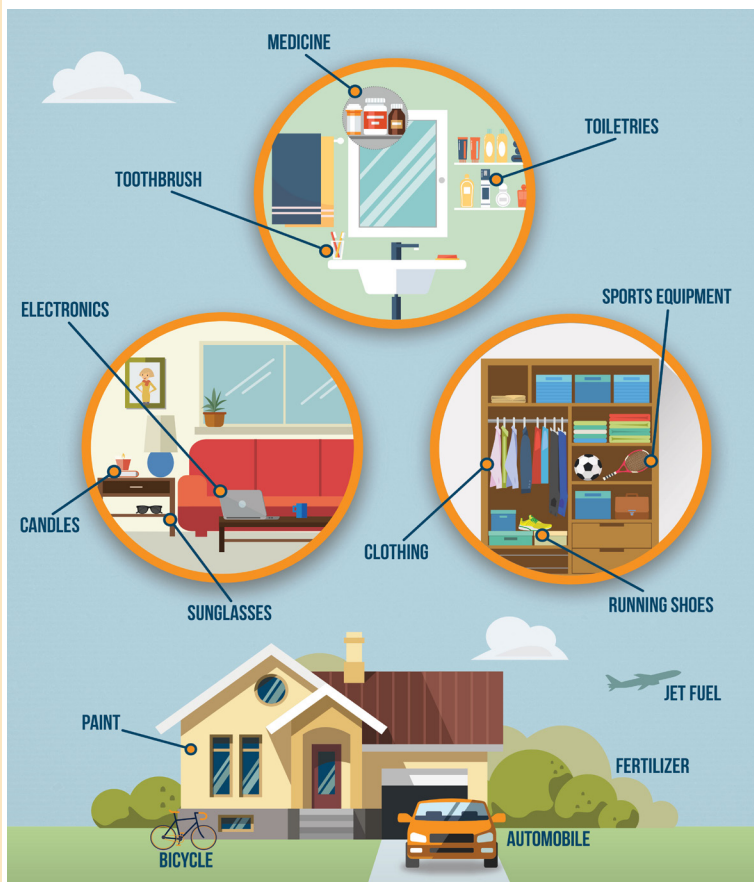


Image Source: <https://iprb.org/wp-content/uploads/2019/04/Petroleum-and-You-Final.jpg>



# JOINT BASE PEARL HARBOR-HICKAM WATER QUALITY ROADMAP

MARCH 2024

Below is a timeline and roadmap of activities with steps the Navy has taken and will take to protect the environment, the aquifer, and our people, their families, and our neighbors.

## 2021

### MAY 6, 2021

RHBFSF operators improperly execute a fuel transfer procedure, resulting in a spill of JP-5 (jet fuel). Not known at the time, a fire suppression system sump pump transfers some of the fuel into a retention line, where it remained until November 20, 2021.

### NOVEMBER 20, 2021

A Red Hill watchstander inadvertently strikes a drain valve, spilling the fuel deposited in the retention line on May 6. A portion of that fuel contaminates the Red Hill drinking water well and the JBPHH drinking water distribution system.

### NOVEMBER 28, 2021

The Navy disconnects the Red Hill well from the JBPHH drinking water distribution system.

### NOVEMBER 29, 2021

DOH issues a Health Advisory for the JBPHH drinking water system.

### DECEMBER 3, 2021

The Navy disconnects the Aiea-Halawa Shaft out of an abundance of caution. The Waiawa well, located more than six miles from Red Hill, is currently the only drinking water source for the JBPHH.

### DECEMBER 17, 2021

The IDWST is formed and is comprised of representatives from the DOH, EPA, FEMA, Navy, and Army. The team develops requirements to restore the drinking water system, to include flushing and sampling plans.

## DECEMBER 2021 – MARCH 2022

The Navy conducts flushing of the complete JBPHH water distribution system (approximately 250 miles of waterlines) and facilities/residences in accordance with the Drinking Water Distribution System Recovery Plan. Flushing and sampling actions are implemented via zones. The Navy implements Rapid Response Teams to address water quality complaints.

## 2022

### MARCH 7, 2022

Secretary of Defense Lloyd J. Austin III announces the decision to defuel and permanently close the RHBFSF.

### MARCH 18, 2022

DOH lifts Health Advisory, declaring JBPHH drinking water fit for human consumption.

### MARCH 2022

In addition to emergency response sampling actions, the Navy begins a two-year Long-Term Monitoring Program, which extends the total sampling effort to all homes, schools, child development centers, facilities, and hydrants throughout the JBPHH drinking water distribution system, to exceed 8,000 samples collected and analyzed.

## 2023

### JANUARY 3, 2023

Red Hill Clinic begins seeing patients.

### OCTOBER 16, 2023

JTF-RH begins draining the 104+ million gallons of fuel from the tanks using gravity to carry the fuel through the pipelines.

### OCTOBER 2023

Reports from residents on the JBPHH water system raise concerns about the quality of the drinking water.

## OCTOBER 2023 – JANUARY 2024

The Navy conducts premise plumbing investigation, in coordination with EPA and DOH, based on October 2023 resident concerns.

### DECEMBER 15, 2023

JTF-RH completes gravity defueling of the RHBFSF. In two months, the Joint Task Force is able to remove over 104 million gallons of fuel.

## 2024

### JANUARY 29, 2024

The Navy surges personnel, resources, and expertise to respond to public concerns about water quality.

### MARCH 2024

Long-term monitoring of the JBPHH drinking water distribution system is complete. The Navy will initiate a follow-on sampling plan to ensure 100% of residences are sampled.

### APRIL 2024 – MARCH 2025

The Navy will voluntarily implement the EDWM for the JBPHH water system and, with the continued Safe Drinking Water Act compliance sampling, will ensure water is safe to drink and meets all state and federal drinking water standards. In addition, the Navy will continue to evaluate and enhance the capabilities of the Water Quality Action teams that are responding to all resident water complaints.

### JUNE 2025

The Navy will issue a Final Report summarizing the results of the EDWM. Based on the results, the EDWM may conclude and the JBPHH system would return to routine drinking water compliance monitoring, or the EDWM may be modified and extended in some or all zones.

**DOH** = Hawaii Department of Health

**EDWM** = Extended Drinking Water Monitoring

**EPA** = U.S. Environmental Protection Agency

**FEMA** = Federal Emergency Management Agency

**IDWST** = Interagency Drinking Water System Team

**JBPHH** = Joint Base Pearl Harbor-Hickam

**JP-5** = Jet Propellant-5

**JTF-RH** = Joint Task Force – Red Hill

**RHBFSF** = Red Hill Bulk Fuel Storage Facility



## PUBLIC INFORMATION AND OUTREACH

The Navy is committed to providing the community with the latest information and being transparent with respect to the safety of JBPHH's drinking water, ongoing water quality monitoring, and test results. The Navy has continued to reach out and keep the community informed by the following measures:

- Establish a JBPHH Safe Waters website
- Establish Water Quality Call Center
- Conduct Town Hall public meetings and open houses
- Post information on social media
- Conduct Facebook Live events to provide important information
- Present and discuss information with Neighborhood Boards
- Conduct community outreach via Drinking Water Information Booth in JBPHH neighborhoods and at malls
- Send letters and messages from the Joint Base Commander
- Issue a Resident Resource Guide
- Establish and maintain an environmental data management system for the public to access drinking water sample results







MARCH 2024

# NAVY WATER QUALITY ACTION TEAM

The Navy's Water Quality Action Team (WQAT) is available to respond to resident drinking water concerns with a holistic response and assessment. Please call **808-210-6968** if you would like to set an appointment.

In addition to the WQAT, the Navy also has its Extended Drinking Water Monitoring (EDWM) program. The EDWM program also collects samples from the Joint Base Pearl Harbor-Hickam (JBPHH) drinking water system to determine whether water meets state and federal drinking water standards.

## WATER QUALITY ACTION PROCESS

- STEP 1:** The resident contacts the call center with a drinking water concern. The call center offers an appointment for the WQAT based on the resident's concerns.
- STEP 2:** The appointment includes sample collection from the Drinking Water Quality Investigation monitoring team and 24-hour rapid response total petroleum hydrocarbons (TPH) sampling. The resident will be offered bottled water for use while waiting on sample results.
- STEP 3:** On the scheduled date, the WQAT visits the home to inspect the drinking water, answer questions and concerns, and collect drinking water samples. WQAT conducts a baseline sampling of the drinking water, assesses, and continues to investigate based off the resident's input on-site. If the resident accepted alternate water, the Navy confirms bottled water is provided.
- STEP 4:** Rapid response samples are sent to the Navy lab on island, which typically returns results within 24 hours. Drinking Water Quality Investigation monitoring samples are sent to a lab certified by the U.S. Environmental Protection Agency off island the same day samples are collected, with a typical turnaround time of 10-14 days.
- STEP 5:** The Navy lab on island processes water quality samples and, once results are received, a member of the Water Quality Action Team informs the resident.
- STEP 6:** The Navy continues to offer bottled water until the Drinking Water Quality Investigation monitoring sample results are available from the mainland lab and provided to the resident. Once results are provided, and results demonstrate the water meets all federal and state safe drinking water standards, bottled water is discontinued.



Our highest priority is the health of our people, families, neighbors, and the island of Oahu.





# JOINT BASE PEARL HARBOR-HICKAM SAFE WATERS WEBSITE

MARCH 2024

## HOW DO I FIND MY RESULTS?

### SEARCH WITH INTERACTIVE MAP

#### Step 1

Welcome to the JBPHH Safe Waters website. This site has been created to provide ongoing information on all the Navy's efforts regarding water on the island of Oahu. These efforts are divided into two primary areas of focus, Drinking Water System and Red Hill Environmental. Choose from the options below to find detailed information on each of these efforts.

[Drinking Water System](#)

[Red Hill Environmental](#)

Click here for information on the Drinking Water System program.

Click here for information on the Red Hill Environmental program.

[View Drinking Water System Site](#)

[Community Outreach Events](#)

[View Red Hill Environmental Site](#)

#### Step 2

Welcome to the JBPHH Drinking Water System information page. Here you can find up-to-date information regarding the ongoing quality of the Navy's drinking water system. All results from water sampling that has occurred throughout the system are posted to each zone's page once it has been reviewed by the Hawaii Department of Health.

[System Map and Zones](#)

This map of the JBPHH water system zones allows you to click on a zone to view flushing, sampling, and long-term monitoring data. Each zone page is updated as validated data becomes available.

[View Interactive Drinking Water Results Map](#)

[View Water System Zone Map](#)

[Public Notices](#)

Documents released to the public to provide information on the fuel release and ongoing response efforts.

[View Public Notices](#)

[How to Access Sampling Results](#)

[Complaint Log for January](#)

Total Calls: **28**

Calls with Water Quality Questions: **28**

Water Testing Requested: **24**

Water Testing Completed: **21**

RRT TPH Detections: **0**

Total Concerns Addressed: **28**

Visit [www.jbphh-safewaters.org](http://www.jbphh-safewaters.org);  
click View Drinking Water System Site

Click View Interactive Drinking Water Results Map

#### Step 3

**Location Sampled by Zone**

Zone	Locations
Enery Point to Distribution System - Site Required Samples (FAS)	1
LTM A1 Zone Residential DW	40
LTM A1 Zone Residential DW	74
LTM A1 Zone Residential DW	74
LTM A1 Zone Residential DW	41
<b>Total</b>	<b>5775</b>

**Location**

**Zone**

**Find Address**

**Analyte Name**

**Screening**

**Location**

**Address**

**Sampling Date**

**Client Sample ID**

**Analyte Name**

**Screening Level**

**Reported Results**

**Units**

**Screening**

Analyte Name	Screening Level	Reported Results	Units	Screening
1,1,1-Trichloroethane	200	ND	UG/L	Not Detected
1,1,1-Trichloroethane	200	ND	UG/L	Not Detected
1,1,2-Trichloroethane	5	ND	UG/L	Not Detected
1,1,2-Trichloroethane	5	ND	UG/L	Not Detected
1,1-Dichloroethane	7	ND	UG/L	Not Detected
1,1-Dichloroethane	7	ND	UG/L	Not Detected
1,2-Dichloroethane	70	ND	UG/L	Not Detected
1,2-Dichloroethane	70	ND	UG/L	Not Detected
1,2-Dichloroethane	600	ND	UG/L	Not Detected
1,2-Dichloroethane	600	ND	UG/L	Not Detected

[View Filters](#)

[More Info](#)

[Detection](#) Analyte found at concentration below the lowest regulatory screening level

[Exceedance](#) Analyte concentration exceeds lowest regulatory screening level

Use drop-down bars on the left of the screen to search by zone, address, analyte name, screening, and dates

### OR SEARCH CROSSTABS

#### Step 1

Visit [www.jbphh-safewaters.org](http://www.jbphh-safewaters.org);  
click View Drinking Water System Site

#### Step 2

Click View Water System Zone Map

#### Step 3

Select your zone

#### Step 4

For each Period, click on Sampling Results for Zone

#### Step 5

Press Ctrl+F and enter your address



Joint Base Pearl Harbor-Hickam  
Safe Waters  
[jbphh-safewaters.org](http://jbphh-safewaters.org)



# HOW TO READ DRINKING WATER RESULTS FROM ANALYTICAL LABORATORIES



From sample collection to lab analysis and reporting – We are committed to providing reliable and readable information.

## ANALYTICAL RESULTS

The analytical results section (often called the Report of Analysis) contains test results for all chemicals analyzed by the lab. The Report of Analysis provides useful information such as when the sample was collected, when the lab received the sample, and when the lab tested the sample. For each chemical, the lab reports if the chemical was detected or not detected in the sample. If a chemical was detected, the lab reports the concentration (or amount) present in the sample. If a chemical was not detected, the lab reports the method reporting limit (MRL) indicating the lab was not able to identify and report a measurable amount of that chemical.

Often the lab assigns a qualifier to analytical results. The qualifier gives additional information about the results. Qualifiers are typically letters. The most common qualifiers are defined in Table 1. Labs may assign unique qualifiers that are lab-specific. These qualifiers are defined in the lab report.

## INTRODUCTION

After a drinking water sample is collected, the sample is sent to the analytical laboratory (lab) for testing. When the test results are available, the lab creates a lab report. Analytical results show the amount of a chemical present in a specific drinking water sample at the time of collection. The purpose of the lab report is to summarize the following:

- Test results for all chemicals analyzed
- Key observations made during the testing phase
- Procedures and methods used
- Results of quality control samples
- Potential interferences that could impact or skew the results

Lab reports typically include a transmittal or cover letter, a case narrative, analytical results, results of the quality control samples, and a copy of the Chain-of-Custody (COC).

Lab reports contain a lot of information. This information can be confusing and hard to understand. The purpose of this fact sheet is to define common terms used in lab reports and summarize how to read the key components included in the results section of a lab report.

**Table 1. Common Qualifiers to Analytical Results**

Qualifier	Definition
Blank	If the qualifier column is blank, the chemical was detected and the lab did not assign a qualifier to that sample. No qualifier indicates the lab did not find anything notable with the sample.
B	The chemical was detected in a blank sample. A blank sample is a quality control sample used to ensure drinking water samples have not been contaminated during the lab testing process. A result assigned a “B” qualifier is likely biased high, meaning the chemical was not detected at a level greater than the method detection limit (MDL).
J	Sample results with a “J” qualifier means the lab detected the chemical, but the reported concentration (amount) is an estimate.
Q	One or more quality control criteria failed.
U	The chemical was not detected at a concentration greater than the lab MDL.



## SAMPLE REPORT OF ANALYSIS

### 1. General Information

Lab reports include generic information such as the sample identification number, the matrix or media that indicates the type of sample (e.g., drinking water, groundwater, soil), the date the sample was collected in the field, the date the lab received the same, and the date the lab analyzed or tested the sample. This information is provided for each sample sent to the lab.

### 2. Analytical method

Analytical methods are procedures used to measure the concentration (or amount) of a chemical in a drinking water sample. These methods are developed by the U.S. Environmental Protection Agency (EPA) and other organizations for the purposes of standardizing how drinking water samples are analyzed.

### 3. CAS No. and Chemical

All chemicals are assigned a unique identification number, referred to as a CAS No. This helps decision makers identify specific chemicals present in the sample.

### 4. Result and Units

Chemicals are either detected or not detected. If a chemical is detected, the lab reports a concentration (or amount) present in the sample and the units of measurement. If the sample was not detected, the lab was not able to identify and report a measurable amount. For non-detects, the lab typically reports the reporting limit along with a 'U' qualifier.

<b>Client Sample ID:</b>	A2-TW-220315-22060-N	<b>Date Sampled:</b>	02/02/2022
<b>Lab Sample ID:</b>	DA42928-3A	<b>Date Received:</b>	02/03/2022
<b>Matrix:</b>	Drinking Water	<b>Date Analyzed:</b>	02/15/2022
<b>Project:</b>	JBPHH DW Sampling		

2  
3

<b>Analytical Method:</b>	<b>EPA 524.2</b>					
<b>CAS No.</b>	<b>Chemical</b>	<b>Result</b>	<b>Units</b>	<b>MCL</b>	<b>MRL</b>	<b>MDL</b>
71-43-2	Benzene	0.50 U	ug/L	5.0	5.0	5.0
100-41-4	Ethylbenzene	0.50 U	ug/L	700	5.0	5.0
108-88-3	Toluene	0.50 U	ug/L	1000	5.0	5.0
1330-20-7	Xylenes (Total)	0.50 U	ug/L	10000	5.0	5.0
<b>Analytical Method:</b>	<b>SW846 8260B</b>					
<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>Units</b>	<b>MCL</b>	<b>MRL</b>	<b>MDL</b>
	TPH-GRO	88.5	ug/L		100	50

### 5. Maximum Contaminant Levels (MCL)

MCL are the maximum level a chemical can be present in drinking water and be considered protective of human health. Many chemicals are found at detectable levels in drinking water. A detection does not mean there is cause for concern. Results are compared to MCLs to determine if action is needed to ensure drinking water is safe for consumption.

### 6. Method Reporting Limit (MRL) and Method Detection Limit (MDL)

For each chemical the lab reports a MRL and MDL. The MRL is the lowest concentration the lab can reliably report while the MDL is the lowest concentration that can be reported using the analytical method. The MRL should be greater than or equal to the MDL.

## GLOSSARY OF TERMS

**Analytical Method:** Refers to the standardized methods and procedures used to analyze the sample; most analytical methods are developed by and/or approved by the United States Environmental Protection Agency.

**Chemical:** (also referred to as analyte, contaminant, or compound): Any physical, chemical, biological, or radiological substance or matter in water.

**Detect:** If a chemical is detected, the lab will report a concentration (or amount) that is present in the sample.

**Method Detection Limit (MDL):** The lowest concentration or amount of a chemical that

can be detected in a sample using a specific analytical method with 99 percent confidence; MDLs may vary by laboratory, equipment, and/or lab personnel.

**Method Reporting Limit (MRL):** The lowest concentration or amount of a chemical that can reliably be reported by the lab; the MRL is equal to or greater than the MDL.

**Non-Detect:** If a chemical is identified as non-detect, the lab was not able to identify and report a measurable amount of that chemical in the sample.

**Quality Assurance/Quality Control (QA/QC):** Represents the systematic process of verifying

samples were collected correctly and the lab analyzed the samples in accordance with the methods and procedures identified in the analytical method; QA/QC is an important step for ensuring the usability of results.

**Trace:** A chemical was detected but not at a concentration or amount that can be quantified.

**Units:** Describes the concentration or amount of a chemical found in water; results are typically reported in kg/L, mg/L, and ug/L.

**kg/L:** kilograms per liter

**mg/L:** milligrams per liter, also known as parts per million (ppm)

**ug/L:** micrograms per liter, also known as parts per billion (ppb)



# CAUSES OF SKIN RASH RELATED TO WATER USE

MARCH 2024

On November 20, 2021, JP-5 fuel was released to the Joint Base Pearl Harbor-Hickam (JBPHH) drinking water system. The Red Hill Shaft and Navy Aiea-Halawa Shaft were taken offline November 28 and December 3, 2021, respectively, in conjunction with a Health Advisory issued by the Hawaii Department of Health (DOH) on November 29, 2021. The Interagency Drinking Water System Team (IDWST) — composed of experts from the Department of Defense, DOH, and the U.S. Environmental Protection Agency (EPA) — created a flushing plan to clean/restore the drinking water system. Samples were taken to verify water in the drinking water system was safe for consumption, and the DOH amended the Health Advisory for all parts of the drinking water system by March 2022 to allow full use of the water.

## Common Types of Skin Rashes

### Urticaria - Allergic Reaction (Hives)

A rash that is caused by contact with something you are allergic to.

### Dermatitis - Skin Irritation

Skin irritation that is caused by contact (contact dermatitis) with an irritant.



## Stress

Stress plays a big part in your health. When you go through a traumatic event, your body can have higher levels of stress than normal, which can affect your health.

High stress can cause or worsen skin conditions. You can develop a "stress rash," which while usually short term, can last a long time.

Stress weakens your immune system, so you may react to environmental triggers that you could normally fight off.

## Common Water Contaminants that Cause Skin Rashes

Since the November 2021 release, some residents have expressed concern about symptoms related to exposure to contaminated water. Included in these symptoms are skin rashes. Skin rashes can be caused by a number of factors, including:

**Chlorine:** Used in drinking water for disinfection; it can remove good bacteria from your skin and strip oils, leading to dry skin.

**Petroleum:** Exposure to petroleum products, such as gasoline, home heating oil, and JP-5 jet fuel, can cause short-term inflammation.

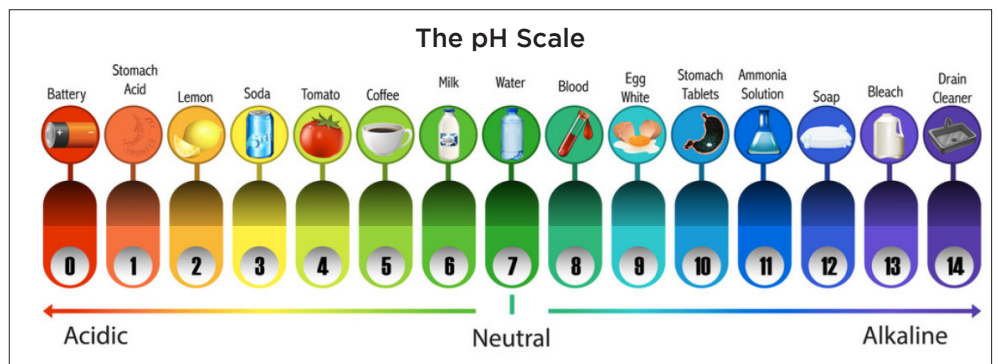
**Bacteria:** Typically associated with coming into contact with outdoor water, bacteria can cause skin infections (small bumps that get larger over time).

**Hard Water:** High amounts of calcium and magnesium in water can cause dry skin and redness and make other skin conditions worse.

**Pesticides:** If pesticides from farm runoff enter drinking water, they can cause skin irritation or trigger allergic reactions.

**pH:** pH measures the acidity or alkalinity of water. The pH of drinking water is typically around 7.5 and the EPA recommends drinking water be kept at a pH between 6.5 and 8.5. Drinking water can cause rashes and dry skin if the water becomes more acidic (typically a pH < 6.5) or more alkaline (typically a pH > 8.5). See the pH Scale figure below for more examples.

**Arsenic:** Naturally occurs in water; high amounts of arsenic consumption over a long period of time can cause skin lesions.







## YOU SHOULD:

- **keep the rash clean**, and wash with a gentle cleanser
- **apply anti-itch cream or ointment** to the rash (1% hydrocortisone)
- **try antihistamines** if itching prevents a good night's sleep
- **consider colloidal oatmeal products** for bathing and as a moisturizer
- **wear breathable or loose-fitting clothing**

## YOU SHOULD AVOID:

- **scratching** your rash, which can make the rash more severe and lead to infection
- **using hot water to wash** your rash, which can dry out your skin
- **using hydrogen peroxide, rubbing alcohol, or bleach**, which can further dry and irritate your skin
- **using light lotions**, which don't provide a lot of moisture compared to creams and ointments
- **using perfumed or scented products** (e.g., soaps, detergents, fabric softeners)

### What should I do if I have a rash?

Getting a rash can be concerning, especially if you don't know what is causing it. See your doctor if you have a rash. Be sure to discuss with your doctor your bathing and showering habits, and make note of any change in your tap water (e.g., a new sheen or odor, or it feels different) or in your daily routine, including showering/bathing, new products (e.g., lotions, laundry detergents), or eating habits. If needed, your doctor can refer you to a specialist.

### What can I do at home if I have a rash?

Taking care of a rash can help prevent it from getting worse or becoming infected. To the left is a list of things that you should do and things you should avoid doing to care for your rash until you can seek medical care. Always follow your doctor's recommendations.

### If you or a loved one is experiencing a rash that is not resolved with at-home care, seek medical attention.

- Make an appointment with your **primary care physician**
- Call the **Red Hill Clinic** at **833-415-3024**, Monday-Friday, 8 a.m.-4 p.m., to schedule an appointment
- Call the health screening appointment line at **(888) 683-2778**
- Contact the Nurse Advice Line at **(800) 874-2273 (800-TRICARE)**
- If your rash is severe, go to **Tripler Army Medical Center** or call **911**

Water hardness, pH, bacteria, and other chemicals are regularly tested for by the Naval Facilities Engineering Systems Command. Petroleum products, arsenic, and chlorine are among the chemicals tested for as part of the JBPHH drinking water system Long-Term Monitoring Plan and Extended Drinking Water Monitoring. Levels are well below the safety standards developed by the IDWST.

Source: Penn Medicine [www.pennmedicine.org/for-patients-and-visitors/patient-information/conditions-treated-a-to-z/rash](http://www.pennmedicine.org/for-patients-and-visitors/patient-information/conditions-treated-a-to-z/rash)





# JOINT BASE PEARL HARBOR-HICKAM

## ROUTINE DRINKING WATER QUALITY COMPLIANCE MONITORING

MARCH 2024

The Joint Base Pearl Harbor-Hickam (JBPHH) Water System complies with all applicable Federal, State, and local safe drinking water regulations, Executive Orders, and Navy Policy by performing routine water quality monitoring including bacteria, lead, copper, disinfection by-products, and other chemicals and providing customers an annual Consumer Confidence Report as well as investigating and resolving customer complaints. This fact sheet summarizes the routine water quality compliance monitoring requirements applicable to the JBPHH Water System.

### Drinking Water Standards

The U.S. Environmental Protection Agency (EPA) and State of Hawaii regulations require the Navy test your water for contaminants regularly to ensure it is safe to drink and report the results. 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.

### National Primary Drinking Water Regulations:

The National Primary Drinking Water Regulations (NPDWR) are legally enforceable primary standards and treatment techniques that apply to public water systems. Primary standards and treatment techniques protect public health by limiting the levels of contaminants in drinking water. These are called Maximum Contaminant Levels (MCLs), which are the highest level of a contaminant allowed in drinking water. MCLs are set as close to Maximum Contaminant Level Goals (MCLG) as feasible using the best available treatment technology and taking cost into consideration. MCLs are legally enforceable standards.

### 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.

### Lead in Priority Area (LIPA) Sampling:

The Navy has adopted the EPA policy to sample for lead in drinking water at schools and day care centers in the interest of the health and welfare of children. The Navy extended that policy to all high-risk priority areas, including child development centers, child development group homes, youth centers, and schools on the JBPHH Water System.

### Other JBPHH Water System Programs:

Navy drinking water policy requirements include JBPHH System Sanitary Survey reviews and programs for cross-connection control, backflow prevention, operation and maintenance, asset management, valve exercising, and flushing (i.e., unidirectional, routine maintenance, and hydrant flushing). All of these programs are designed to ensure that safe drinking water is delivered to every consumer on the JBPHH Water System.

The Navy also conducts additional sampling that is not required for the system, but provides information regarding water quality. This sampling includes analyzing water at the Waiawa Shaft twice per year for 1,2-dichloropropane, as recommended by the State of Hawaii Department of Health (DOH) and analyzing one water sample in accordance with the National Secondary Contaminant Monitoring Rule every five years.

### Consumer Confidence Reports (CCR)

As required by EPA, JBPHH provides an annual CCR, also referred to as the Water Quality Report, for its drinking water system. The CCR provides information about the water delivered to you during each 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. In this latest compliance monitoring period (Jan. 1 – Dec. 31, 2022), the Navy conducted tests for over 70 contaminants that have the potential to be found in your drinking water. In all cases, the levels measured were below EPA and State of Hawaii requirements for safe drinking water (see link in the Additional Resources section).

### Additional Resources

- EPA National Primary Drinking Water Standards: <https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations>
- EPA Fifth Unregulated Contaminant Monitoring Rule (UCMR5): <https://www.epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule>
- EPA Safe Drinking Water Act: <https://www.epa.gov/sdwa>
- EPA Safe Drinking Water Act: Consumer Confidence Reports (CCR): <https://www.epa.gov/ccr>
- Safe Waters JBPHH: <https://jbphh-safewaters.org/>
- Water Quality Information, Consumer Confidence Reports: <https://cnrh.cnic.navy.mil/Operations-and-Management/Environmental/Water-Quality-Information/>
- Lead in Priority Area Sampling Program/Hawaii: <https://cnrh.cnic.navy.mil/Operations-and-Management/Environmental/Water-Quality-Information/Lead-in-Priority-Area-Sampling-Program/>
- CNIC Lead in Priority Sampling Program: <https://www.cnic.navy.mil/Operations-and-Management/Base-Support/Environmental/Water-Quality-Information/Lead-in-Priority-Area-Sampling-Program/>
- General Information and Facts: <https://www.cnic.navy.mil/Operations-and-Management/Base-Support/Environmental/Water-Quality-Information/General-Information-and-Facts/>



## Current JBPHH Monitoring Programs

### ● LONG-TERM MONITORING (LTM) PROGRAM

The two-year LTM sampling period ends March 2024. LTM sampling was conducted in accordance with the Drinking Water Long-Term Monitoring Plan dated June 2022. The Navy has agreed to extend monitoring for one year (see Extended Drinking Water Monitoring [EDWM]). Contaminant detections in the distribution system and/or residences during LTM are reported in the annual CCR and posted at the [www.jbphh-safewaters.org](http://www.jbphh-safewaters.org) website.

### ● PER- AND POLYFLUOROALKYL SUBSTANCE (PFAS)

Sampling for PFAS is being conducted in accordance with Department of Defense (DoD) policy and the UCMR5 (see Additional Resources). PFAS results are reported in the annual CCR.

### ● FIFTH UNREGULATED CONTAMINANT MONITORING RULE (UCMR5)

EPA uses UCMR5 to collect data for contaminants that are suspected to be present in drinking water and do not have health-based standards (e.g., MCLs) established under the Safe Drinking Water Act (SDWA). EPA uses this data to help determine where certain contaminants occur and whether EPA needs to regulate these contaminants. The results are for informational purposes and are reported in the annual CCR.

### ● EXTENDED DRINKING WATER MONITORING (EDWM)

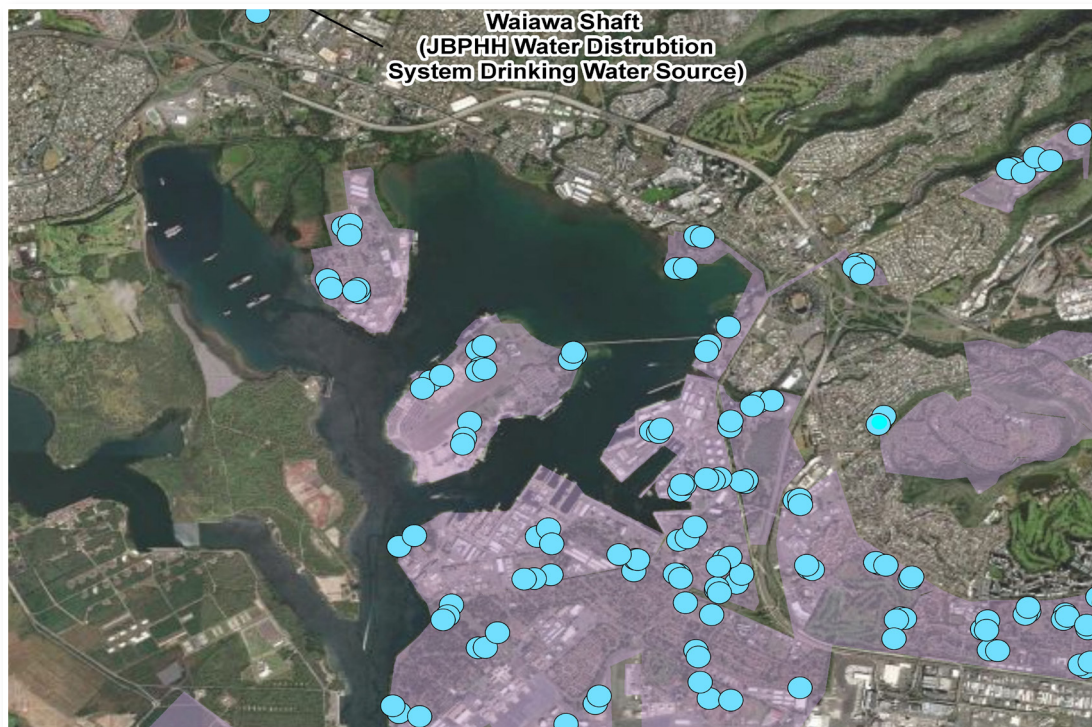
The Navy is voluntarily extending drinking water monitoring efforts for one year after the completion of the LTM Program. The goal is to sample all remaining residences that were not sampled as part of the LTM Program. Contaminant detections in the distribution system and/or residences during the EDWM period will be reported in the annual CCR and posted at [www.jbphh-safewaters.org](http://www.jbphh-safewaters.org).

## Sampling Locations

As required by EPA and DOH, routine sampling occurs at the entry point of the JBPHH distribution system (EPTDS) and at specific locations throughout the distribution system. The EPTDS is a post-chlorination point at the Waiawa Shaft. Routine sampling locations are presented on Figure 1. A summary of the sampling requirements, including contaminant, number of samples, and sampling frequency are summarized in Table 1.

**Table 1. Sampling Requirements**

Contaminant	Sampling Requirements
<b>EPTDS Sample Requirements (Waiawa Shaft)</b>	
Carbamate Pesticides	2 Samples every 3 Years
Synthetic Organic Compounds	2 Samples every 3 Years
Endothal	2 Samples every 3 Years
Dioxins	2 Samples every 3 Years
Diquat	2 Samples every 3 Years
Cyanide	1 Sample every 3 Years
Herbicides and Chlorinated Acids	2 Samples every 3 Years
Inorganic Anions (Nitrates and Anions)	1 Sample every 1 Year
Inorganic Regular Metals	1 Sample every 3 Years
Volatile Organic Compounds	2 Samples every 3 Years
EDB/DBCP/TCP	2 Samples every 3 Years
Glyphosate	2 Samples every 3 Years
Semivolatile Organic Compounds	2 Samples every 3 Years
Radionuclides	1 Sample every 9 Years
<b>Distribution System Sample Requirements</b>	
Total Coliform	70 Samples every 1 Month
Residual Chlorine	70 Samples every 1 Month
Lead and Copper	30 Samples every 1 Year
Haloacetic Acids/Trihalomethanes	2 Samples every 1 Year
Asbestos	1 Sample every 9 Years



**Figure 1. JBPHH Compliance Monitoring Sampling Locations**

## Resources and Contacts

### Water Quality Concerns

**Water Quality Call Center: 808-210-6968**

**Hawaii Department of Health Safe Drinking Water**

**Branch: 808-586-4258**

Email: [SDWB@doh.hawaii.gov](mailto:SDWB@doh.hawaii.gov)

**Environmental Protection Agency Desk Line:  
415-947-4406**

### Housing

**Housing Assistance Call Center: 808-474-1820/1821**

**Hickam Housing Communities: 888-329-4758**

**Island Palms Housing Communities: 877-487-4323**

**Ohana Hunt Military Communities: 855-413-8805**

### Other Contacts

**Airman and Family Readiness Center: 808-449-0301**

**Red Hill Community Liaison: 808-321-7692**

**Navy/Marine Corps Relief Society: 808-473-0282 /  
808-257-1972/1973**

Email: [pearlharbor@nmcrs.org](mailto:pearlharbor@nmcrs.org)

**Army Emergency Relief (AER): 808-787-4227**  
(request to be transferred to AER)



## Medical Resources



**FOR MEDICAL EMERGENCIES:  
GO TO TRIPLER EMERGENCY ROOM  
OR CALL 911.**

**Families are Encouraged to Contact  
Their Primary Care Provider for  
Health-Related Concerns.**

**Tripler Army Medical Center: 888-683-2778, opt. 3**

**Red Hill Clinic:** Provides medical assessments for all TRICARE-eligible beneficiaries and individuals granted Secretarial Designee status, endorsing symptoms that may be related to the Red Hill fuel spill.

For current eligibility criteria, visit [nhchawaii.tricare.mil/Clinics/BHC-Makalapa/Red-Hill-Clinic](http://nhchawaii.tricare.mil/Clinics/BHC-Makalapa/Red-Hill-Clinic). Individuals continuing to experience symptoms are encouraged to call **833-415-3024**, Monday-Friday, 8 a.m.-4 p.m., to schedule an appointment.

**15th Medical Group, Hickam Clinic: 888-683-2778, opt. 4**

**Naval Health Clinic Hawaii: 808-473-1880**

Monday-Friday, 7:30 a.m. - 4 p.m.

1253 Makalapa Road

Joint Base Pearl Harbor-Hickam

**Military Health System Nurse Advice Line:  
800-TRICARE**

[www.mhsnurseadvice.com](http://www.mhsnurseadvice.com)

**Hawaii Poison Center: 800-222-1222**





# Red Hill Registry and Incident Report

## Independent Red Hill Registry

We are in the early stages of setting up a separate independent Red Hill Registry. A third party will operate the registry. The purpose of this registry is to:

- a. Track your health over time,
- b. Investigate any health effects, and
- c. Provide information and support to those potentially exposed during the Red Hill fuel release.

### 1. Who will be able to join the independent Red Hill Registry?

Everyone who was potentially exposed may join the registry: local populations as well as those associated with the Department of Defense (DoD).

### 2. How to participate?

When the registry is ready, you will receive information on the advantages of enrolling and how to enroll. Sign-up is voluntary.

### 3. What to expect in the future?

We are fully committed to making this registry a valuable resource for all those affected. We will provide more information on the specifics and enrollment procedures.

### 4. Your involvement matters!

Your active participation in the independent Red Hill Registry will be vital to our efforts to understand and address the impacts of JP-5 exposure. Together, we can make a significant difference in public health and contribute to evidence-based decision making for health care options.

## Red Hill Defense Occupational and Environmental Health Readiness System (DOEHRS) Incident Report

This report was also referred to as the Red Hill Registry during the fuel release response.

### • What is DOEHRS?

The Defense Occupational and Environmental Health Readiness System, or DOEHRS, is the DoD information system for known and potential occupational and environmental hazardous exposures.

### • What is a DOEHRS Incident Report?

This report is a record of people potentially exposed to an occupational or environmental hazard related to a specific event.

### • What is the Red Hill DOEHRS Incident Report?

Shortly after the Red Hill fuel release, the U.S. Navy established the Red Hill DOEHRS Incident Report and populated it with the names of people (including family members) living in a military family housing area exposed to the fuel release. The Defense Health Agency (DHA) recently added rosters of DoD workers served by the JBPHH water system.

### • Who is eligible for the Red Hill DOEHRS Incident Report?

DoD-affiliated individuals (military members, their families, DoD civilian employees, and DoD contractors) potentially exposed to JP-5 in the JBPHH water system through their residence or workplace anytime between November 20, 2021, and March 18, 2022, are eligible for listing in the Red Hill DOEHRS Incident Report.

### • What is the difference between the Red Hill DOEHRS Incident Report and the independent Red Hill Registry?

You can think of the Red Hill DOEHRS Incident Report as a limited “Registry 1.0” without the functionality to send, receive, and store individual health questionnaires. The Red Hill DOEHRS Incident Report also does not include potentially exposed people that are not DoD-affiliated. The independent Red Hill Registry will be open to all persons exposed or at risk of exposure to the fuel release and will monitor the health and quality of life of participants over the long term, mainly through ongoing surveys. DHA is committed to supporting both the Red Hill DOEHRS Incident Report and the independent Red Hill Registry.

### • How do I know if I am included in the Red Hill DOEHRS Incident Report?

In early 2022, sponsors of families in military family housing areas served by the JBPHH water system received a letter notifying them that they were listed in the Red Hill DOEHRS Incident Report. If you would like to confirm that you and your family are listed, please email us at [dha.redhill@health.mil](mailto:dha.redhill@health.mil) and include your full name. Do not include any protected health information (PHI) or personally identifiable information (PII). Please provide a phone number in case we need to contact you about your request.

# The Agency for Toxic Substances and Disease Registry (ATSDR) will evaluate exposures to chemical releases in communities near the Red Hill Bulk Fuel Storage Facility in Oahu, Hawaii.



In late 2021, a large amount of jet fuel leaked from the Red Hill Bulk Fuel Storage Facility (Red Hill). The facility is owned by the U.S. Navy. The leak contaminated the Joint Base Pearl Harbor-Hickam public drinking water system used by residences, businesses, and schools on- and off-base. The Hawai'i Department of Health (HDOH) asked ATSDR to conduct a public health assessment to understand the health effects of the releases from Red Hill.

ATSDR will use environmental data and health information collected since 2005 to evaluate the potential health risks.

ATSDR will identify data and information gaps that stand in the way of better addressing people's questions about exposures and health risks.

ATSDR will make recommendations to agencies and community members to help protect public health. ATSDR will release the findings in a written report on our website, (<https://www.atsdr.cdc.gov/>).

ATSDR will communicate regularly with the community.

ATSDR is committed to regularly communicating and sharing information with the community and other organizations about our public health assessment process, findings, and recommendations.

We do this by talking with residents and organizational leaders, responding to questions and concerns from the community, and participating in community meetings.

The public health assessment process can take several years. Time is needed to gather and analyze data, develop health recommendations, write and review a final report, and share the final report with the community and other organizations.

ATSDR team members are available throughout the public health assessment process.

Contact ATSDR's Office of Community Health Hazard Assessment (Region 9) with questions about ATSDR's Red Hill public health assessment activities.

- **Jamie Rayman**, Health Educator and Community Involvement Specialist, [jrayman@cdc.gov](mailto:jrayman@cdc.gov)
- **Ben Gerhardstein**, Environmental Health Scientist, [bgerhardstein@cdc.gov](mailto:bgerhardstein@cdc.gov)



U.S. Department of  
Health and Human Services  
Agency for Toxic Substances  
and Disease Registry

CS 346331 December 22, 2023



## The public health assessment activities will build on these previous ATSDR activities:

- Pearl Harbor Naval Complex public health assessment—In the 2005 Public Health Assessment on the Pearl Harbor Naval Complex, ATSDR identified two locations where contaminants were detected in the shallow groundwater: the Ewa Junction Fuel Drumming Facility and the Red Hill Oily Waste Disposal Facility. ATSDR concluded that contaminants from those sources had not reached and were unlikely to reach the deeper aquifer used to supply drinking water. A copy of the report is available at <https://www.atsdr.cdc.gov/HAC/pha/PearlHarborNavalComplex/PearlHarborNavalComplexPHA122805.pdf>
- Assessment of Chemical Exposures (ACE) online health survey—In 2022, Centers for Disease Control and Prevention, ATSDR, and HDOH invited users of the Joint Base Pearl Harbor-Hickam water system to participate in an online health survey and a follow-up health survey. The surveys gathered information about the symptoms and experiences of people who were affected by the November 2021 fuel leak. Findings of the two health surveys are available on the HDOH website at <https://health.hawaii.gov/about/red-hill-water-information/#survey>.
- Medical records review—In 2023, at the request of the Department of Defense's Defense Health Agency, ATSDR reviewed Department of Defense medical records for over 650 service members and their family members, to look for patterns of symptoms and diagnoses among individuals affected by the 2021 leak.

## About ATSDR

ATSDR is a federal public health agency of the U.S. Department of Health and Human Services. ATSDR protects communities from harmful health effects related to exposure to natural and man-made hazardous substances.

We do this by responding to environmental health emergencies; investigating emerging environmental health threats; conducting research on the health impacts of hazardous waste sites; and building capabilities of and providing actionable guidance to state and local health partners.

**For more information about ATSDR, visit our website at <https://www.atsdr.cdc.gov/>.**

## Additional websites with Red Hill information

Agency for Toxic Substances and Disease Registry  
<https://www.atsdr.cdc.gov/sites/red-hill/index.html>

Hawai'i Department of Health  
<https://health.hawaii.gov/about/red-hill-water-information/>

Joint Base Pearl-Harbor Hickam Water Updates  
<https://www.cpf.navy.mil/JBPHH-Water-Updates/>

US Environmental Protection Agency  
<https://www.epa.gov/red-hill>



CDC and ATSDR's ACE team conducts a survey about health effects from the water contamination. Image source: Photo taken by ATSDR. All people in photo are CDC/ATSDR staff.

# Definitions

**DOH** – (Hawaii Department of Health) is organized into three administrations: Health Resources, Behavioral Health, and Environmental Health. The environmental health administration ensures environmental safety regulations are satisfied and manages cases that pose threats to environmental safety.

**EAL** – (Environmental Action Level) are concentrations of contaminants in soil, soil gas, and groundwater that are used in decision making throughout the Environmental Hazard Evaluation (EHE) process.

**EDWM** – (Extended Drinking Water Monitoring) the Navy's voluntary drinking water monitoring program, initiated in April 2024, which ensures water is safe to drink and meets all state and federal drinking water standards.

**EFAC** – (Emergency Family Assistance Center) serves as a location for service members and family members impacted by crisis to get timely and accurate information. All military installations are required to create and maintain an emergency family assistance plan, which helps protect military families and other Department of Defense personnel. This plan helps ensure your environment is safe and mission-ready after a disaster.

**EHE** – (Environmental Hazard Evaluation) is the link between site investigation activities and response actions carried out to address hazards posed by the presence of contaminated soil and groundwater.

**EPA** – (Environmental Protection Agency) is an independent executive agency of the United States federal government tasked with environmental protection matters.

**EOC** – (Emergency Operations Center) serves as EPA's emergency response operational focal point. It is a communication and coordination hub designed to increase data management and coordination capabilities.

**GAC** – (Granular Activated Carbon) is an organic carbon filtration media — wood, coconut shells, coal, or peat — used for water purification, typically applied in a fixed bed application.

**JP-5** – (Jet Propellant-5) is one type of fuel used by the military. The Red Hill storage tanks store this type of fuel.

**LTM** – (Long-Term Monitoring) a plan developed jointly by the DOH, EPA, Navy, and Army to monitor drinking water at JBPHH. The LTM effort began June 2022 and concluded March 2024.

**MCL** – (Maximum Contaminant Level) the highest level of a contaminant that is allowed in drinking water according to the Environmental Protection Agency. The MCL standards are monitored by the EPA to protect human health.

**Qg/L** – (Microgram Per Liter) the unit that is used to report the amount of chemical in a specific volume. The data from water samples are reported using this unit.

**PPB** – (Parts Per billion) is the number of units of mass of a contaminant per 1000 million units of total mass. PPB is used when there are very small amounts of a contaminant in the water.

**TPH** – (Total Petroleum Hydrocarbons) comprise a large class of compounds composed of carbon and hydrogen. These compounds are generally categorized into three ranges based on the hydrocarbon chain length, including Diesel Range, Gasoline Range, and Oil Range and are the primary compounds found in many petroleum-based materials, including gasoline, jet fuels, mineral oils, lubricants, and other household and industrial materials.

**TPH-d** – (Total Petroleum Hydrocarbons-Diesel Range) are a type of Total Petroleum Hydrocarbons that do not evaporate but do produce a lot of energy when burned.

**TPH-g** – (Total Petroleum Hydrocarbons-Gasoline Range) are a type of Total Petroleum Hydrocarbons that easily evaporate and are flammable. These are most commonly associated with an unpleasant odor.

**TPH-o** – (Total Petroleum Hydrocarbons-Oil Range) are a type of Total Petroleum Hydrocarbons that do not evaporate and don't burn very well. They are commonly used to make lubricants and greases.





**Joint Base Pearl Harbor-Hickam Safe Waters Website**

**Scan the QR code to stay up to date with the latest information.**

**JBPHH-SAFEWATERS.ORG**