

# Reported and Potential Health Concerns from the Red Hill Spills

Presented by  
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March 9, 2024



UNIVERSITY OF HAWAII AT MĀNOA  
OFFICE of PUBLIC HEALTH STUDIES  
THOMPSON SCHOOL  
SOCIAL WORK & PUBLIC HEALTH

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## Media Headlines - Jet Fuel

[Navy says 3 tiny holes found in Oahu fuel tank](#)

News | U.S. Federal; Hawaii | 353 Words | Jun 13, 2014 | AUDREY McAVOY Associated Press | The Associated Press State & Local Wire

[Navy investigating possible Hawaii fuel tank leak](#)

News | U.S. Federal; Hawaii; New York | 282 Words | Jan 16, 2014 | OSKAR GARCIA Associated Press | The Associated Press

[Navy: Fuel found outside steel Hawaii tank](#)

News | U.S. Federal; Hawaii | 422 Words | Jan 17, 2014 | JENNIFER SINCO KELLEHER Associated Press | The Associated Press State & Local Wire

[Leak in Navy Fuel Tank Raises Concerns About Water Contamination](#)

News | U.S. Federal; California | 471 Words | Jan 17, 2014 | Newstex Blogs

[Officials: Threat to Oahu's Water Supply More Serious Than Thought](#)

News | U.S. Federal; Hawaii | 233 Words | Mar 08, 2014 | Newstex Blogs

[EPA and State of Hawaii negotiate historic settlement with U.S. Navy to upgrade Red Hill storage tanks \(HI\)](#)

News | U.S. Federal; Hawaii | 806 Words | Jun 01, 2015 | Government Publications & Documents

## Navy Investigating Fuel Leak At Red Hill

News | U.S. Federal; Hawaii; International | 1018 Words | May 08, 2021 | Kevin Knodell | Newstex Blogs

## Navy says operator error caused Hawaii pipeline leak

News | U.S. Federal; Hawaii | 259 Words | Oct 27, 2021 | The Associated Press State & Local Wire

## Navy Investigating 'Chemical Smell' In Military Housing Drinking Water

News | U.S. Federal | 859 Words | Nov 29, 2021 | Christina Jedra | Newstex Blogs

## Pearl Harbor-area schools report chemical odor in water

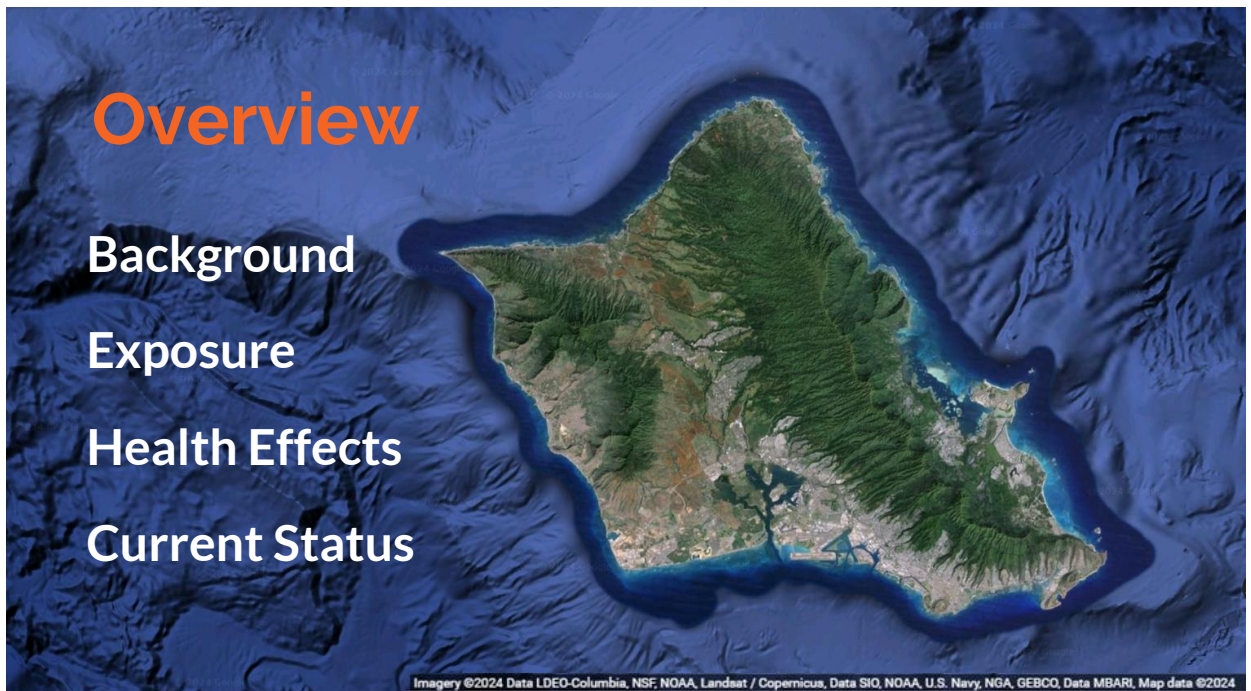
News | U.S. Federal; Hawaii | 290 Words | Nov 30, 2021 | AUDREY McAVOY Associated Press

## Hawaii : Fuel odor in Navy water prompts over 100 complaints

News | U.S. Federal; California; Hawaii | 432 Words | Dec 01, 2021 | AUDREY McAVOY Associated Press

## PRELIMINARY RESULTS DETECT PETROLEUM PRODUCT IN NAVY WATER SYSTEM

News | U.S. Federal; California; Hawaii | 216 Words | Dec 01, 2021 | States News Service | States News Service





**Overview**

**Background**

**Exposure**

**Health Effects**

**Current Status**

Imagery ©2024 Data LDEQ-Columbia, NSF, NOAA, Landsat / Copernicus, Data SIO, NOAA, U.S. Navy, NGA, GEBCO, Data MBARI, Map data ©2024

## Federal Organizations



**United States Navy (Navy)**



**United States Environmental Protection Agency (EPA)**



**Department of Defense, Defense Health Agency (DHA)**



**Agency for Toxic Substances and Disease Registry (ATSDR)**

# Hawai'i Organizations

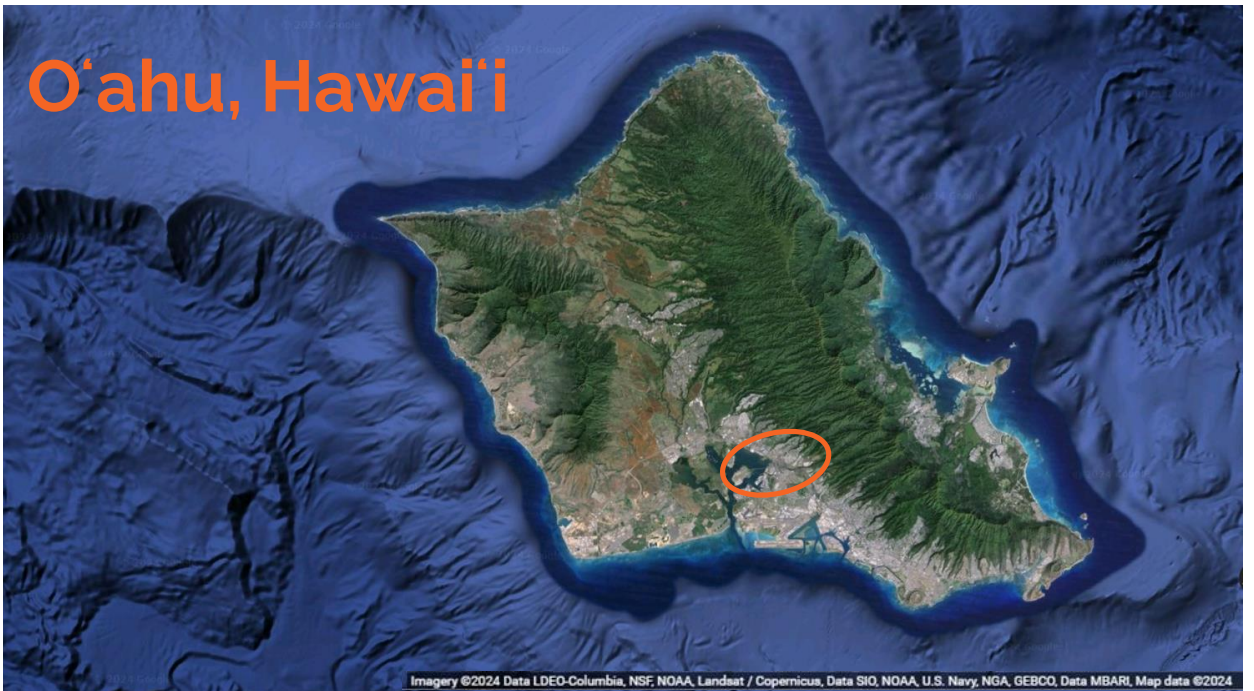


(DOH)



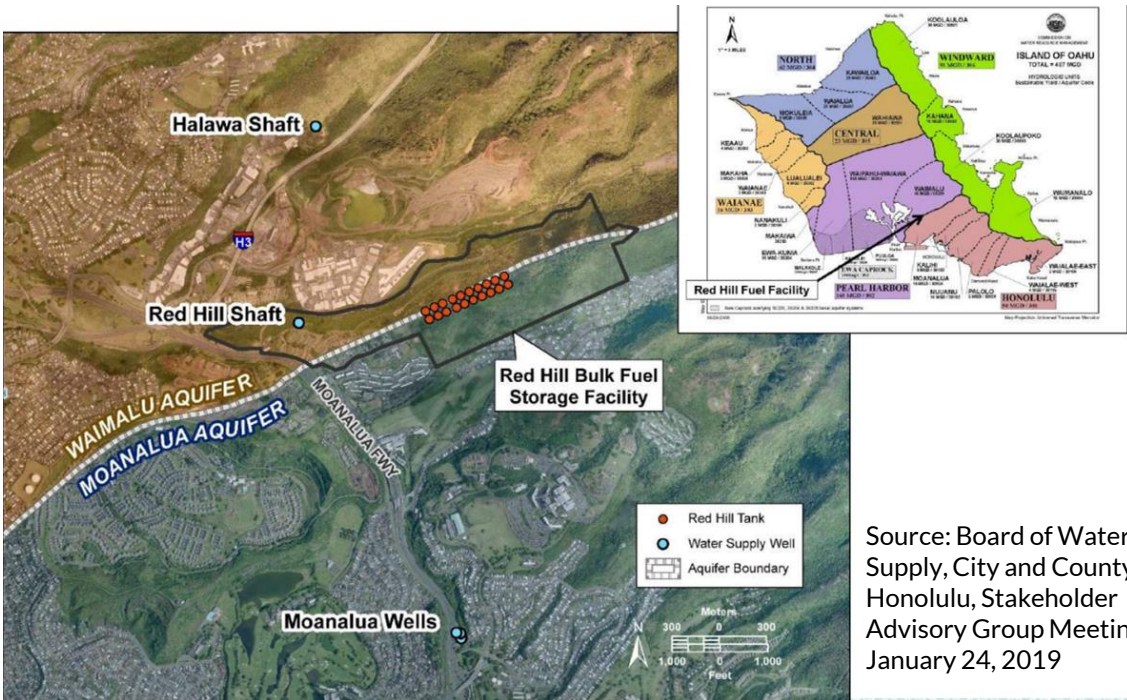
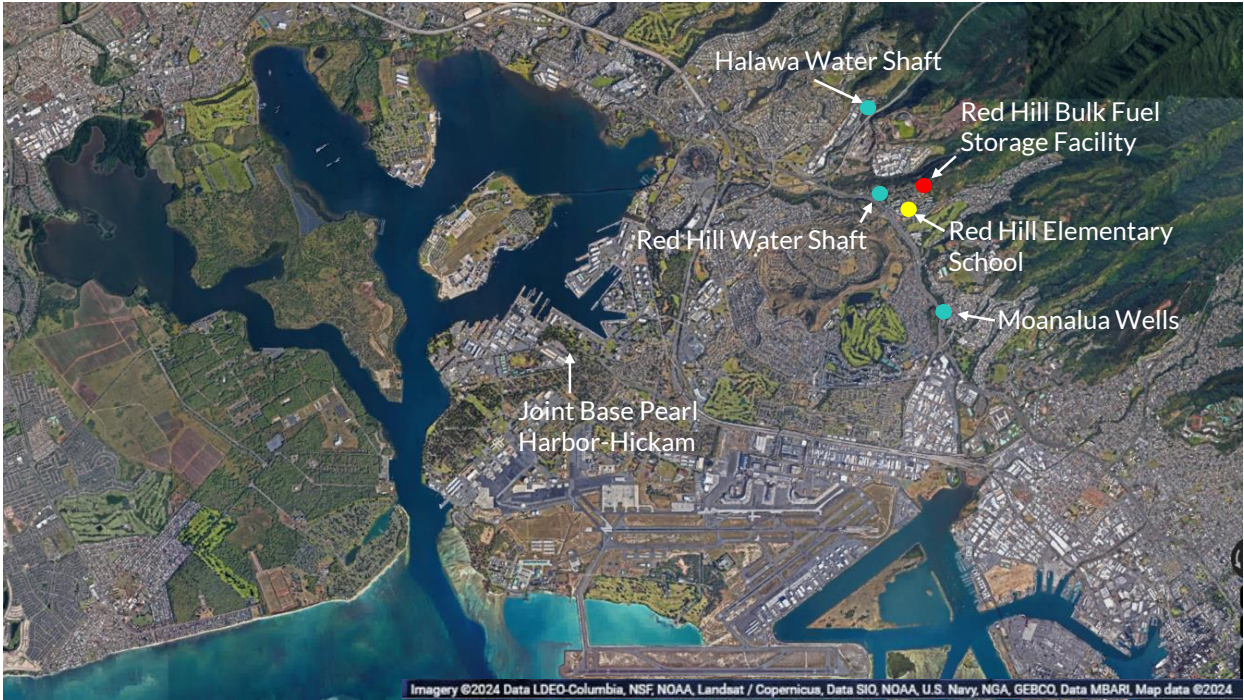
(WRRC)

## O'ahu, Hawai'i



Imagery ©2024 Data LDEO-Columbia, NSF, NOAA, Landsat / Copernicus, Data SIO, NOAA, U.S. Navy, NGA, GEBCO, Data MBARI, Map data ©2024

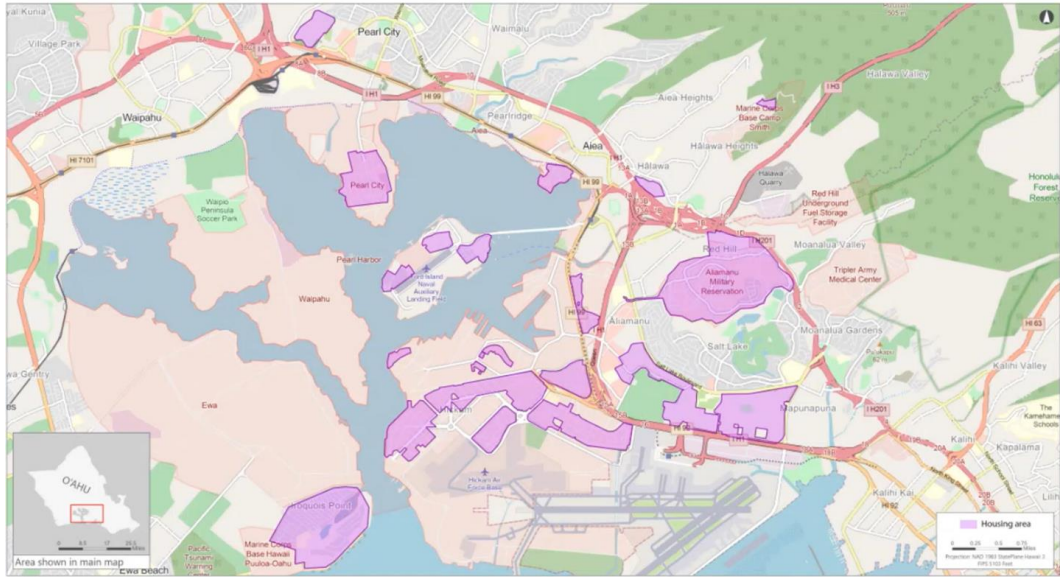




Source: Board of Water Supply, City and County of Honolulu, Stakeholder Advisory Group Meeting, January 24, 2019



**Housing areas served by the Joint Base Pearl Harbor-Hickam Water System**



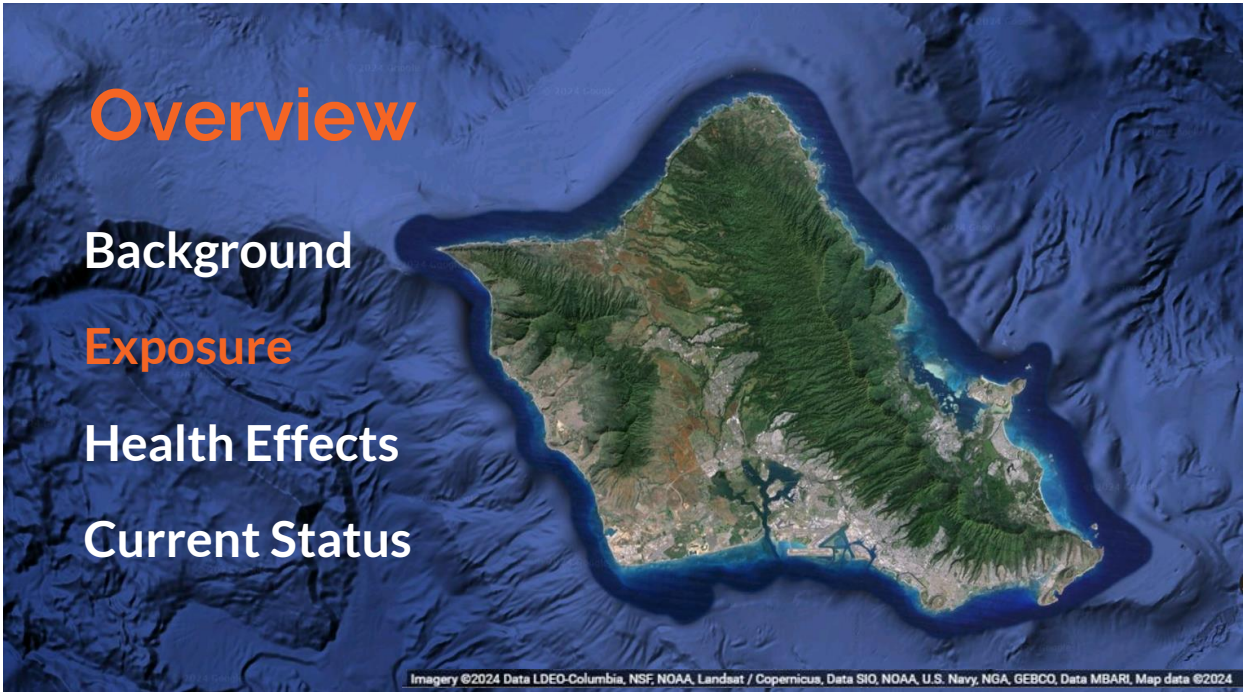
**CDC ATSDR** Centers for Disease Control and Prevention  
Agency for Toxic Substances and Disease Registry

**ESRI** Geospatial Research, Analysis, and Services Program

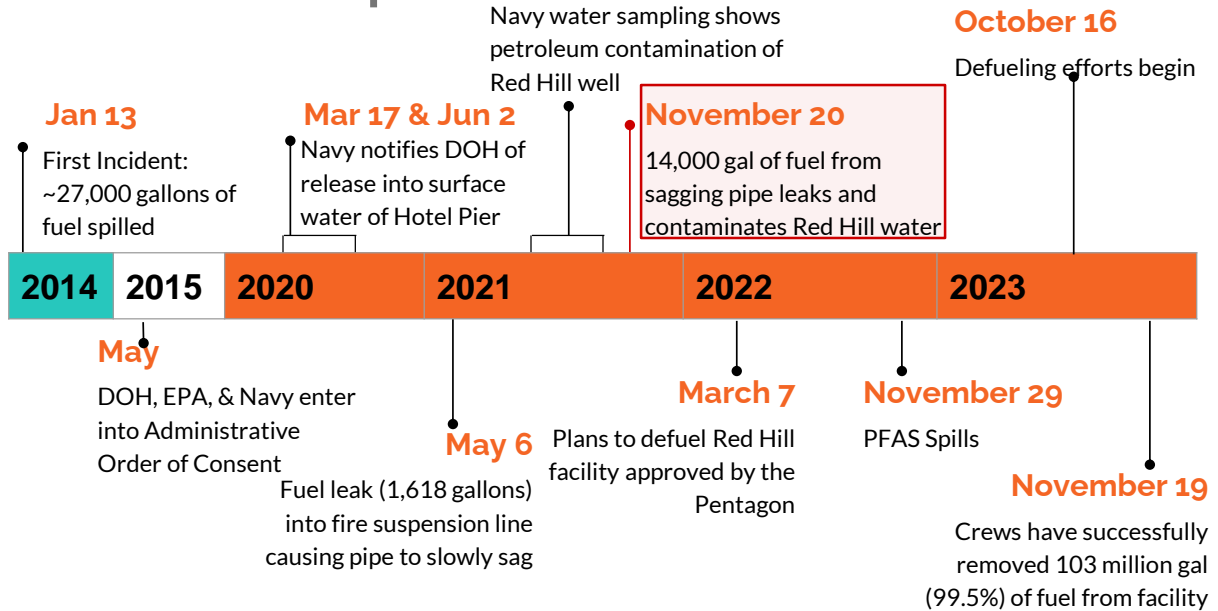
PRJ ID: 04195 | AUTHOR: Nina Burdon | 10/13/2023

**FINAL - FOR INTERNAL AND EXTERNAL RELEASE**

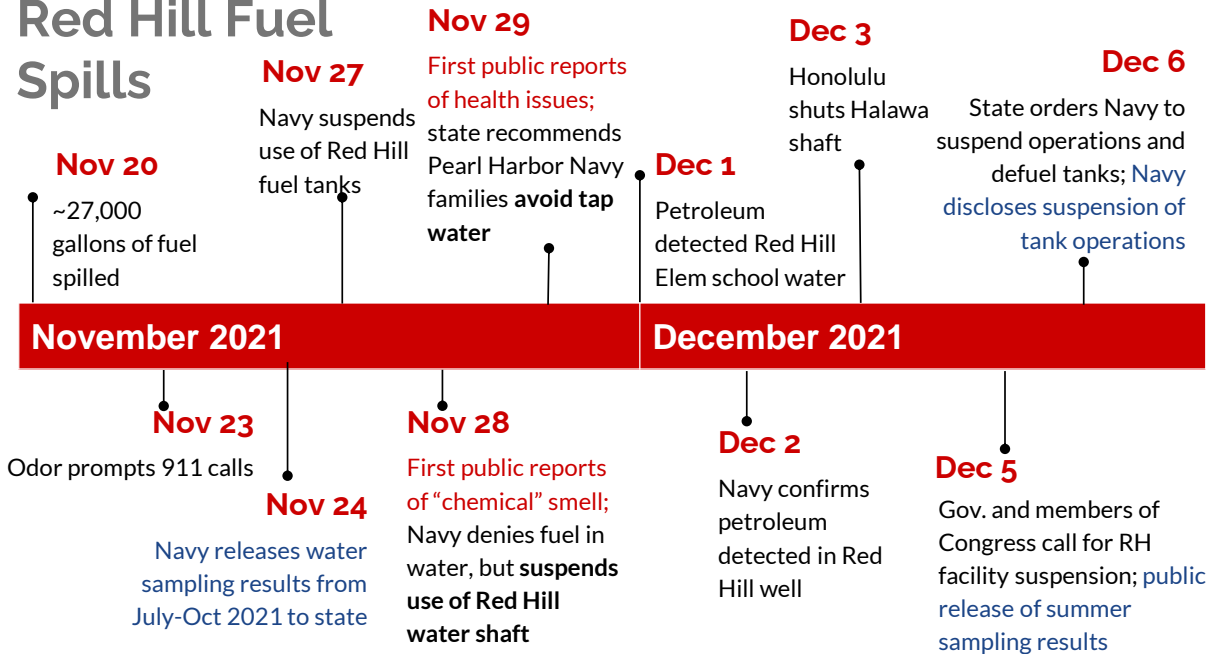
**DATA SOURCE:** Housing areas: Naval Facilities Engineering Systems Command; Pearl Harbor: USACE/USACE/USACE; I-15, I-90, I-80: Daily, using data with Water System for Joint Base Pearl Harbor-Hickam - 10/15/21; Basecamp: OpenStreetMap, Inc.



# Red Hill Fuel Spills Jul 8-Sep 29

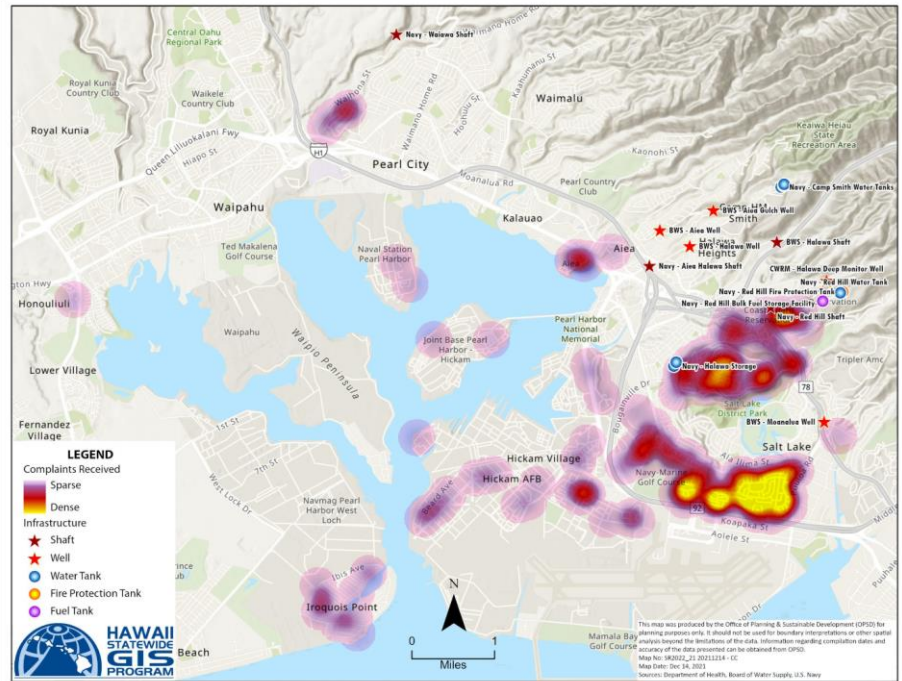


# Red Hill Fuel Spills



# Complaints Received Nov 28-29, 2021

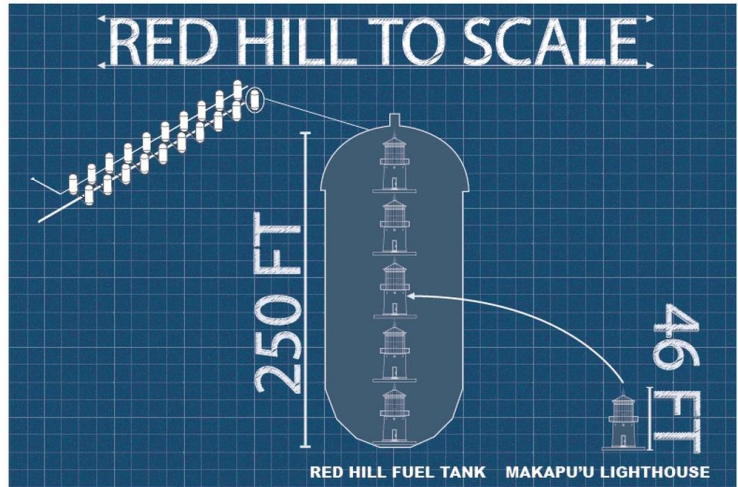
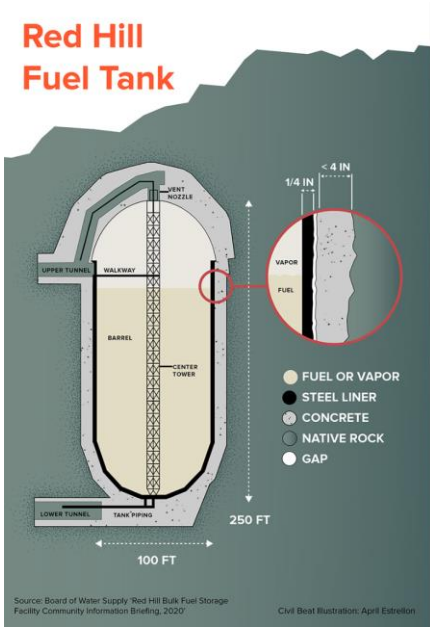
Source: Hawai'i DOH  
<https://health.hawaii.gov/about/files/2021/12/Water-Infrastructure-DOH-Complaints-Heatmap-Topo-20211214--scaled.png>



# How did the fuel enter the drinking water?



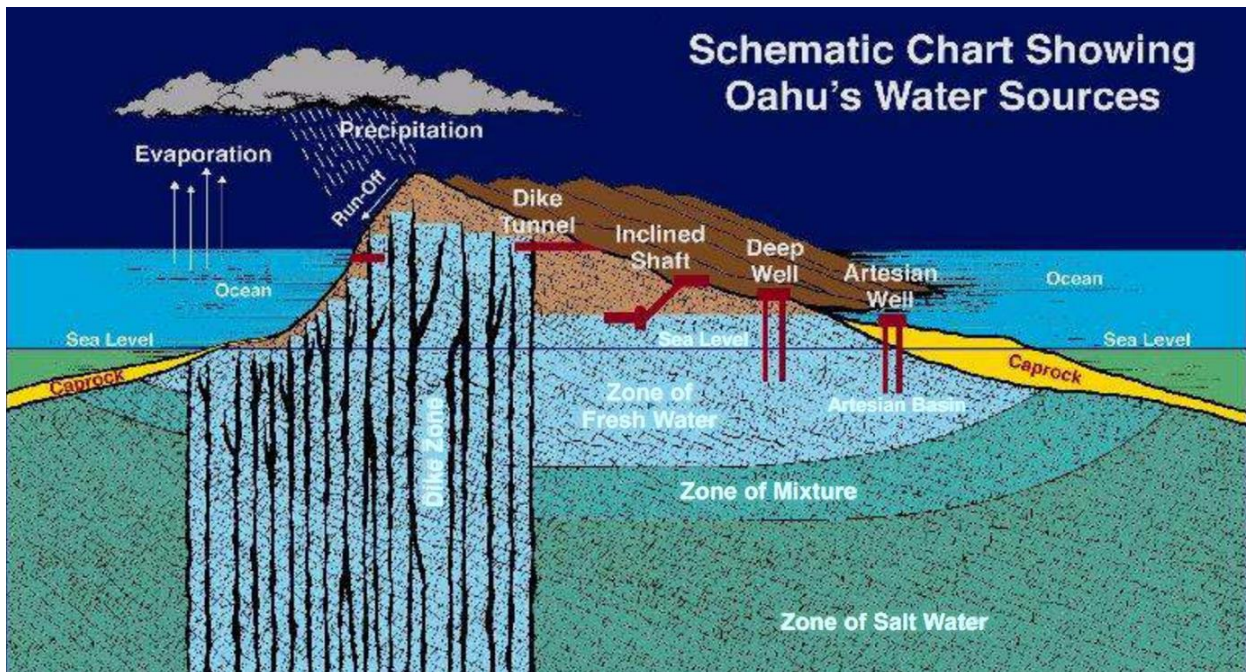
## Red Hill Fuel Tank



The tanks are large enough to fit five of the Makapu'u Point lighthouses stacked on top of each other. Each of the 20 tanks can hold up to 12.5 million gallons of fuel.

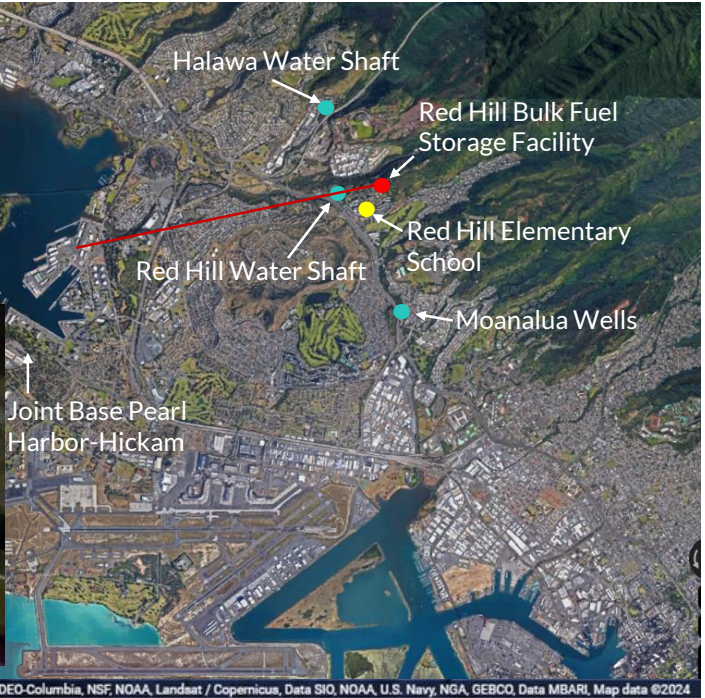
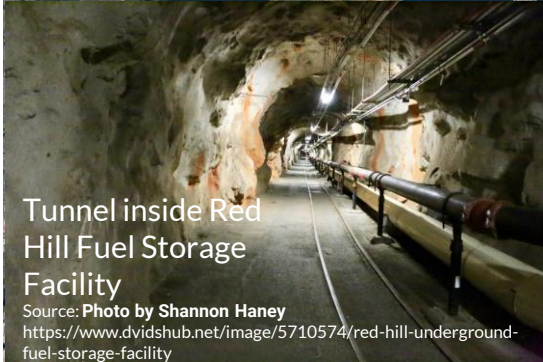
Source: Graphics by Sgt. Luke Cohen  
<https://www.dvidshub.net/graphic/23052/red-hill-scale>

Source: <https://www.civilbeat.org/2021/12/how-the-red-hill-fuel-system-has-threatened-oahus-drinking-water-for-decades/>



Source: Board of Water Supply, City and County of Honolulu, Stakeholder Advisory Group Meeting, January 24, 2019

# How did the fuel spill happen?



# Chemicals of Concern

**JP-5**  
**Additives**  
**PFAS**



# JP-5 (jet propellant-5)- A Total Petroleum Hydrocarbon (TPH)


- Used as military aircraft fuel
- Colorless liquid is flammable and smells like kerosene
- Made in oil refineries from hydrocarbons
- Additives
- Thousands of components

TPH Component	Estimated % of TPH
Benzene	0.2%
Toluene	0.1%
Xylenes	3.5%
Methylnaphthalenes	4.6%
Naphthalene	3.0%
C5-C8 Aliphatics	12%
>C8-C18 Aliphatics	68%
>C18-C32 Aliphatics	0.0%
>C8 Aromatics	9%

## Total Petroleum Hydrocarbons (TPH)

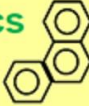
**Aliphatics**

nC<sub>6</sub>  
 >nC<sub>6</sub>-nC<sub>8</sub>  
 >nC<sub>8</sub>-nC<sub>10</sub>  
 >nC<sub>10</sub>-nC<sub>12</sub>  
 >nC<sub>12</sub>-nC<sub>16</sub>  
 >nC<sub>16</sub>-nC<sub>21</sub>  
 >nC<sub>21</sub>-nC<sub>35</sub>



**Aromatics**

>nC<sub>7</sub>-nC<sub>8</sub>  
 >nC<sub>8</sub>-nC<sub>10</sub>  
 >nC<sub>10</sub>-nC<sub>12</sub>  
 >nC<sub>12</sub>-nC<sub>16</sub>  
 >nC<sub>16</sub>-nC<sub>21</sub>  
 >nC<sub>21</sub>-nC<sub>35</sub>



- Chemical compounds from crude oil
- Not a lot of information in the medical literature on health effects in humans
- Some cause harm at low concentrations

Source: Adapted from Rhodes (2006)  
[https://www.enviro.wiki/index.php?title=Petroleum\\_Hydrocarbons\\_%28PHCs%29](https://www.enviro.wiki/index.php?title=Petroleum_Hydrocarbons_%28PHCs%29)

# Additives

Diethylene glycol monomethyl ether (DiEGME) is a Fuel System Icing Inhibitor (FSII) additive

- Acute health effects (mostly from animal studies)
  - **headache, dizziness, tiredness, nausea, vomiting and eye irritation**
- Long term-exposure impacts
  - **gastrointestinal tract, skin, kidneys, and developmental and reproductive systems.**

Source: <https://health.hawaii.gov/about/files/2023/10/JP-5-Exposure-Assessment-June-2023-updated-Oct-2-2023.pdf>

## Media Headlines: Per & Poly Fluoroalkyl Substances (PFAS)

**HONOLULU CIVIL BEAT** Hawaii News Ideas Special Projects

**Red Hill**  
**A New Leak At Red Hill Dumps Hundreds Of Gallons Of Firefighting Foam**  
A health department official called the incident "egregious." 25

**HONOLULU CIVIL BEAT** Hawaii News Ideas Special Projects

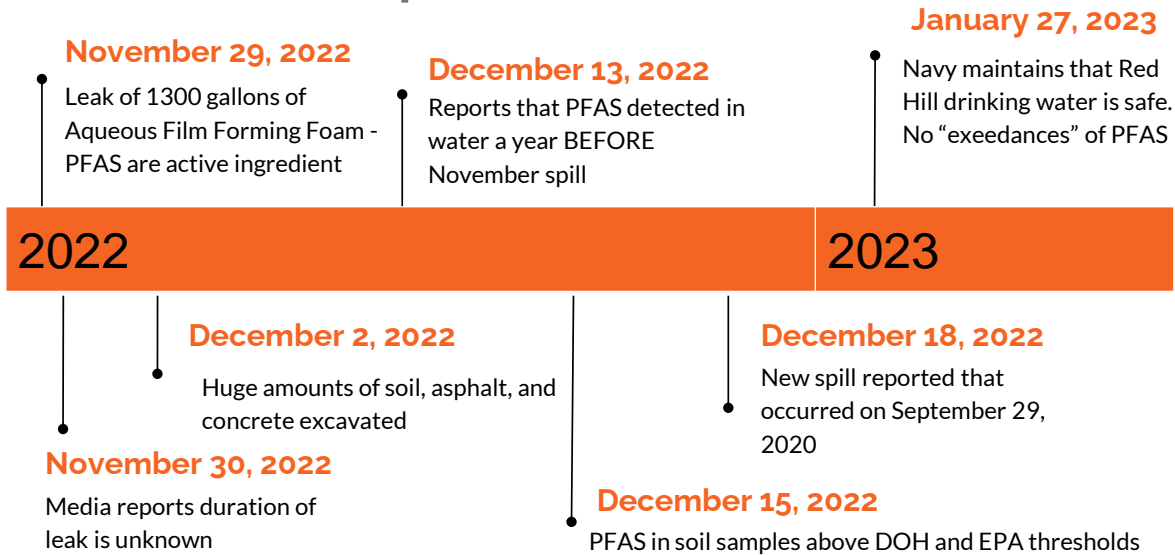
**Red Hill**  
**Delayed Notification Of Toxic Chemicals In Red Hill Water Draws Criticism**  
The disclosure raises questions about whether Pearl Harbor area residents consumed the chemicals known as PFAS. 5

**Red Hill**  
**Navy Doesn't Know When — Or How — Latest Red Hill Leak Started**  
The health department is calling on the Navy to disclose more information about how the leak happened. 31

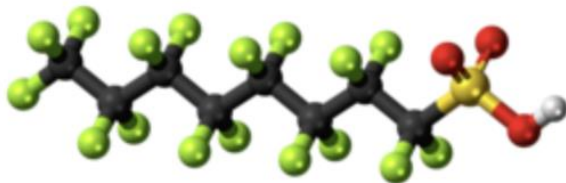
**Red Hill**  
**Firefighting Foam Spilled At Red Hill Before. The Navy Didn't Notify Anyone**  
Military officials requested emergency funding to respond to an AFFF spill in 2020, but told health inspectors later that no foam had been released. 18



# Red Hill PFAS Spills



## PFAS



- Man made
- Thousands of related compounds
- Environmentally persistent

PFOS compound. Attribution: Jynto, CC0, via Wikimedia Commons

## Typical human exposure to PFAS

- Food and water ingestion
- Dust ingestion
- Hand-to-mouth transfer from treated carpets
- Consumer products such as transfer from treated food wrapping
- **Human umbilical cord blood and breast milk**
  - Exposure route to fetus and young child
  - Concentrations of PFAS higher in children than adults

## PFAS Summary

- **Important spill of concentrated fire-fighting foam on November 29, 2022. Known** contamination of soil near site of spill. To date, assurances that drinking water is not affected.
- Two weeks later, media reports that **PFAS were detected in Red Hill drinking water a year before** the 2022 spill. Levels below Hawaii State Environmental Action level but above EPA interim health advisory level.
- Three weeks later, media reports a **previous spill of 5000 gallons** of liquid through a pipeline that previously contained fire-fighting foam. Likely that the spill contained PFAS.
- **PFAS in soil at Red Hill and possibly in water. PFAS detected in water not reported from 2022 spill, as samples that detected PFAS from a year earlier.**



Home Data News Events Participate Education FAQs About Us

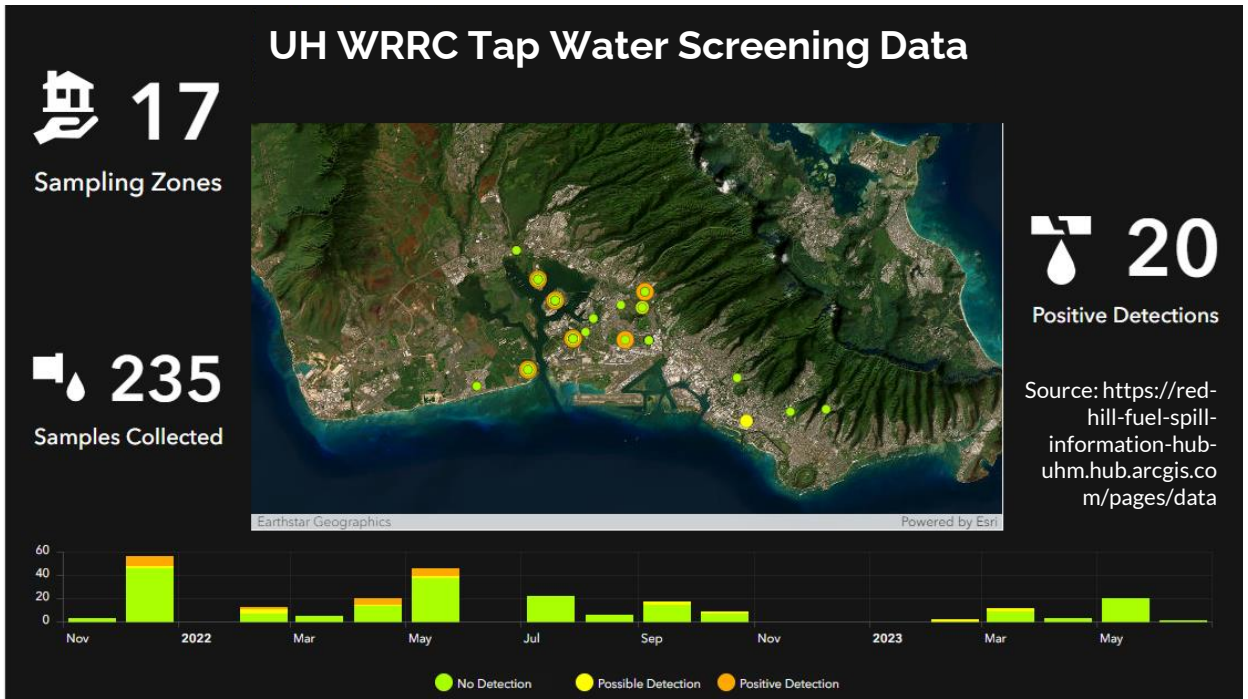
# Red Hill Information Hub

Click [here](#) for defueling updates!

Click [here](#) to view the Maui Post-Fire Community Drinking Water Hub!



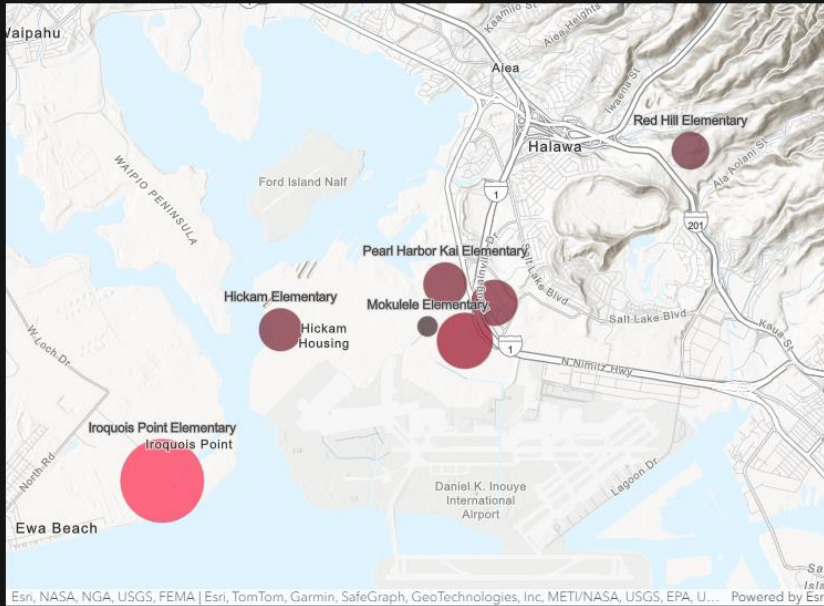
The University of Hawai'i Red Hill Task Force was formed in December 2021 and is coordinated through the Water Resources Research Center.



## Public Schools on Navy Water System


 **7**  
Schools

 **3.3k**  
Students



Esri, NASA, NGA, USGS, FEMA | Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc. METI/NASA, USGS, EPA, U... Powered by Esri

Source: <https://red-hill-fuel-spill-information-hub-uhm.hub.arcgis.com/pages/data>




**Joint Base Pearl Harbor-Hickam (JBPHH)**  
**Drinking Water Long Term Monitoring Dashboard**

Locations Sampled	Total Samples	Analytes Tested	Detected Above Screening Level
<b>5775</b>	<b>8071</b>	<b>444.0K</b>	<b>32</b>

**Location Sampled by Zone**

Zone	Locations
Entry Point to Distribution System – EPA Required Samples PFAS	1
LTM A1 Zone Residential DW Sampling Month 1 of 3	40
LTM A1 Zone Residential DW Sampling Month 10 through 15	74
LTM A1 Zone Residential DW Sampling Month 16 through 21	74
LTM A1 Zone Residential DW Sampling Month 2 of 3	41
<b>Total</b>	<b>5775</b>





**Analytes Exceeding Screening Level**

Analyte Name	Screening Level	Min Exceedance	Max Exceedance	Count of Exceedances
Bis(2-ethylhexyl)phthalate	6	6.90	20.30	4
Lead	15	15.30	82.70	26
Mercury	2	3.90	3.90	1
Total Organic Carbon	2	130.00	130.00	1

**All Analytes Tested**

Location	Address	Sampling Date	Client Sample ID	Analyte Name	Screening Level	Reported Results	Units	Screening
A1-ALOH1600	1600 Aloha Avenue	10/17/2023	A1-TW-0001561-23139-N	1,1,1-Trichloroethane	200	ND	UG/L	Not Detected
A1-ALOH1600	1600 Aloha Avenue	10/17/2023	A1-TW-0001561-23139-3-N	1,1,1-Trichloroethane	200	ND	UG/L	Not Detected
A1-ALOH1600	1600 Aloha Avenue	10/17/2023	A1-TW-0001561-23139-N	1,1,2-Trichloroethane	5	ND	UG/L	Not Detected
A1-ALOH1600	1600 Aloha Avenue	10/17/2023	A1-TW-0001561-23139-3-N	1,1,2-Trichloroethane	5	ND	UG/L	Not Detected
A1-ALOH1600	1600 Aloha Avenue	10/17/2023	A1-TW-0001561-23139-N	1,1-Dichloroethane	7	ND	UG/L	Not Detected
A1-ALOH1600	1600 Aloha Avenue	10/17/2023	A1-TW-0001561-23139-3-N	1,1-Dichloroethane	7	ND	UG/L	Not Detected
A1-ALOH1600	1600 Aloha Avenue	10/17/2023	A1-TW-0001561-23139-N	1,2,4-Trichlorobenzene	70	ND	UG/L	Not Detected
A1-ALOH1600	1600 Aloha Avenue	10/17/2023	A1-TW-0001561-23139-3-N	1,2,4-Trichlorobenzene	70	ND	UG/L	Not Detected
A1-ALOH1600	1600 Aloha Avenue	10/17/2023	A1-TW-0001561-23139-N	1,2-Dichlorobenzene	600	ND	UG/L	Not Detected
A1-ALOH1600	1600 Aloha Avenue	10/17/2023	A1-TW-0001561-23139-3-N	1,2-Dichlorobenzene	600	ND	UG/L	Not Detected

 Clear Filters

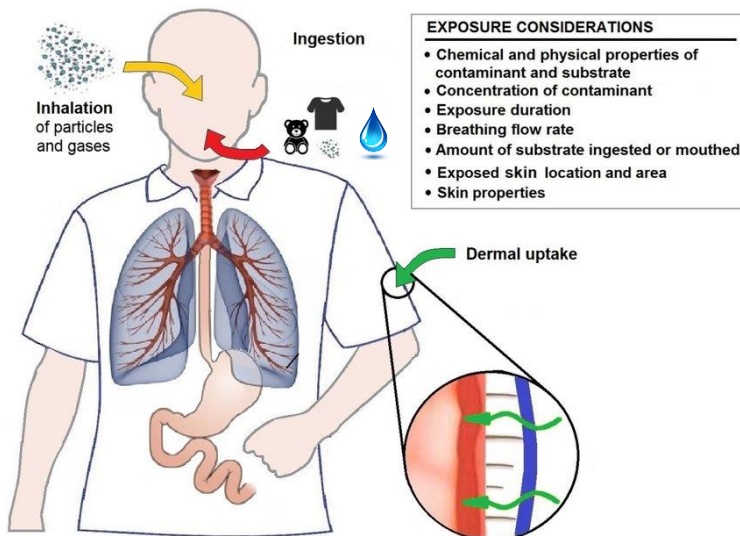
 More Info

■ **Detection** Analyte found at concentration below the lowest regulatory screening level

■ **Exceedance** Analyte concentration exceeds lowest regulatory screening level

## Routes of exposure

- Inhalation
- Ingestion
- Dermal contact
- Injection



Licina, D., Morrison, G. C., Bekö, G., Weschler, C. J., & Nazaroff, W. W. (2019). Clothing-mediated exposures to chemicals and particles. *Environmental science & technology*, 53(10), 5559-5575.

33

## TOXICOLOGICAL PROFILE FOR JP-5, JP-8, AND JET A FUELS



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Public Health Service  
Agency for Toxic Substances and Disease Registry



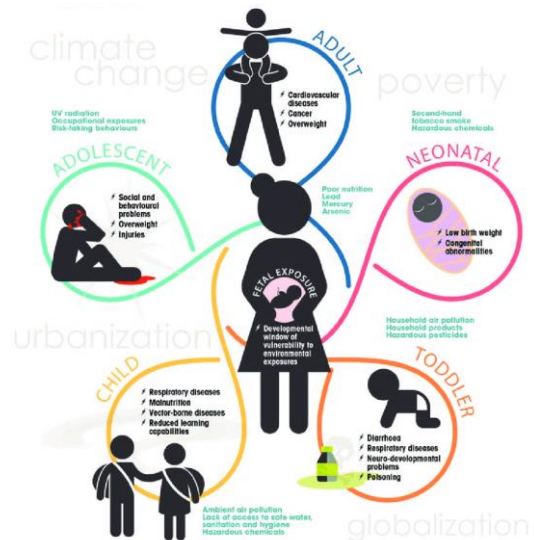
- Human exposures mostly of young men
- Typically occupational exposures
- Exposure route of humans: inhalation and some dermal
- Animal studies have some dermal exposure
- Almost NO studies of oral exposure (ingestion)
- Almost NO studies of people in different age groups

March 2017



## Pregnant women and children are more vulnerable

- Maternal transfer to fetus/infant
- Childhood rapid growth and development
  - “critical windows of exposure”
- Children eat, drink and breathe more air per unit of body weight compared to adults
- Hand-to-mouth behavior, time outdoors
- Exposure at different life stages can lead to different health effects e.g. lead



ATSDR Agency for Toxic Substances and Disease Registry (2023). Why Are Children Often Especially Susceptible to the Adverse Effects of Environmental Toxicants? [https://www.atsdr.cdc.gov/csem/pediatric-environmental-health/why\\_children.html](https://www.atsdr.cdc.gov/csem/pediatric-environmental-health/why_children.html)

Rother, H., Wijesekera, S. & Ward, F. (2019). The impact of the environment on South Africa's child and adolescent health: An overlooked health risk. In book: South African ChildGauge 2019: Child and adolescent health - leave no one behind (pp.264). Publisher: Children's Institute, University of Cape Town 35

## How much JP-5 were people exposed to?

- Predicting an individual's exposure is impossible.
- Difficult to predict which symptoms are related to exposure or long-term health effects.



March 11, 2022

**MEDICAL ADVISORY:**

**CHEMICAL SCREENING (AKA BIOLOGICAL MONITORING) FOR EXPOSURES TO PETROLEUM HYDROCARBONS IN DRINKING WATER**

- CHEMICAL SCREENING FOR EXPOSURES TO PETROLEUM HYDROCARBONS IN DRINKING WATER IS NOT RECOMMENDED
- PATIENTS PRESENTING WITH SYMPTOMS POSSIBLY RELATED TO EXPOSURE TO CONTAMINATED WATER SHOULD BE EVALUATED WITH A THOROUGH HISTORY AND PHYSICAL
- DIAGNOSTIC TESTING SHOULD BE DRIVEN BY THE CLINICAL EVALUATION



**AVAILABLE BLOOD AND URINE TESTING CANNOT:**

- Reliably indicate exposure to JP-5 jet fuel in drinking water
- Determine if presenting symptoms are from exposure to petroleum hydrocarbons in drinking water
- Predict potential future health effects
- Help direct management of patient's symptoms or clinical condition

Special thanks:  
Diana Felton, MD,  
DOH



# PFAS

## What are Forever Chemicals?

### Per- and polyfluoroalkyl substances (PFAS)

are manmade chemicals used in many industries to make things water proof, non-stick, and stain resistant. Some examples of materials that may contain PFAS include firefighting foam, carpet,

## How might I be exposed to PFAS?



### Food

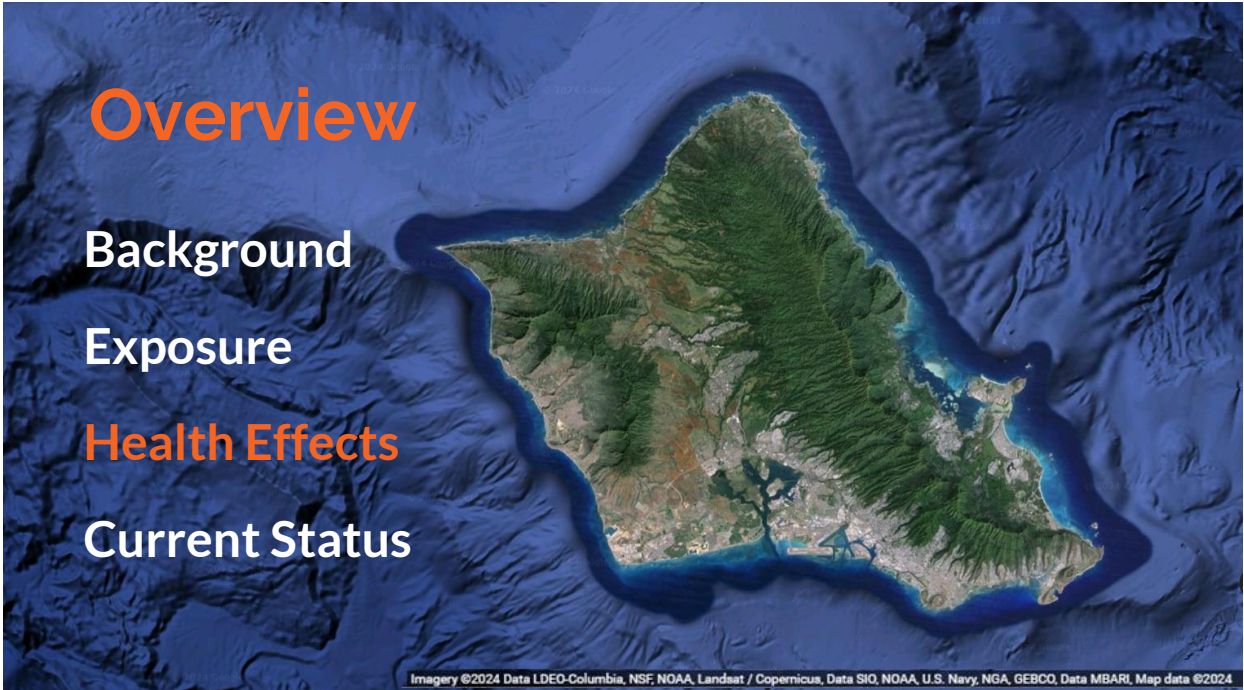
PFAS can get into food via contact with certain types of food packaging and deteriorated PFAS containing cookware. PFAS can accumulate in fish and shellfish living in contaminated waters and in fruits or vegetables grown in contaminated water.



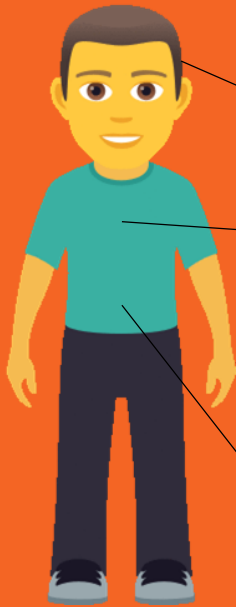
### Contaminated Drinking Water

Drinking water contaminated with PFAS is a common source of PFAS exposure. Most cases of contaminated drinking water in the U.S. are the result of contamination from fire-fighting training sites, military installations, or manufacturing facilities.





## Symptoms of TPH Exposure



### Neurological

Lightheadedness, headache, difficulty concentrating

### Respiratory

Coughing, difficulty breathing, pneumonia-like illness

### Dermal

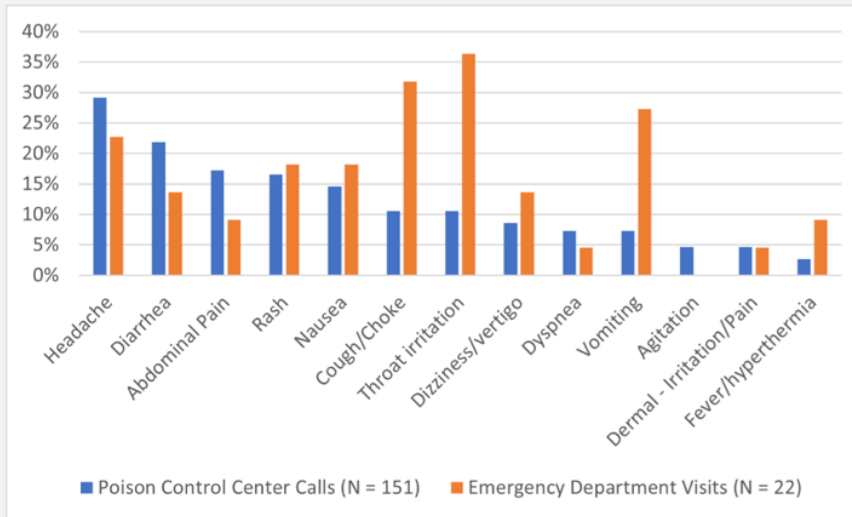
Skin irritation, redness, peeling skin

### Gastrointestinal

Stomach upset, nausea, vomiting, diarrhea



## SYMPTOMS REPORTED IN POISON CONTROL CALLS AND EMERGENCY DEPARTMENT VISITS



Special thanks:  
Diana Felton, MD,  
DOH



### Self-Reported Health Symptoms Following Petroleum Contamination of a Drinking Water System — Oahu, Hawaii, November 2021–February 2022

Alyssa N. Troeschel, PhD<sup>1</sup>; Ben Gerhardstein, MPH<sup>2</sup>; Alex Poniatowski, MS<sup>3</sup>; Diana Felton, MD<sup>4</sup>; Amanda Smith, PhD<sup>1</sup>; Krishna Surasi, MD<sup>1</sup>; Alyson M. Cavanaugh, DPT, PhD<sup>1</sup>; Shanna Miko, DNP<sup>1</sup>; Michele Bolduc, PhD<sup>1</sup>; Vidisha Parasram, DrPH<sup>1</sup>; Charles Edge, MSN, MS<sup>5</sup>; Renée Funk, DVM<sup>3</sup>; Maureen Orr, MS<sup>5</sup>

MMWR / May 27, 2022 / Vol. 71 / No. 21

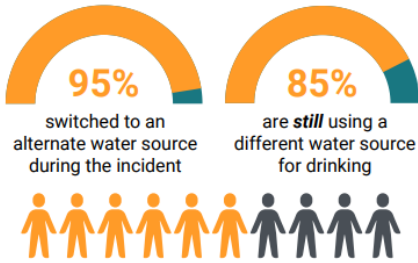
- ATSDR Assessment of Chemical Exposures (ACE)
- Self-administered online survey
- January 7–February 10, 2022
- Questions about potential exposure to contaminated water, health symptoms experienced, and medical care sought

- 2,289 participants
- 1,115 (52%) at least one indication that their water was contaminated (i.e., petroleum smell or taste, or visible oily sheen)
- ingested the potentially contaminated water through oral hygiene (1,821; 80%), drinking (1,650; 72%), and cooking (1,629; 71%)
- One or more new or worsened symptoms after the incident (1,980; 87%)
- Symptoms lasting ≥30 days (1,493; 75%).
- Symptoms reported:
  - nervous system (62%)
  - gastrointestinal system (58%)
  - skin (58%)
  - ear, nose, and throat (47%)
  - mental health (46%)
  - eyes (42%)
  - respiratory system (31%)

# Follow-Up Survey Results

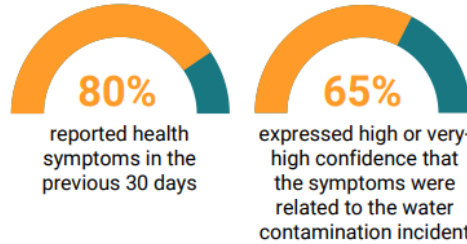
September 2022

- 986 people submitted surveys
- 61% returning participants
- 90% affiliated with the Department of



61% have changed their behavior due to exposure concerns, citing changes to water use, household budgeting, social interactions, or mental health.

Survey respondents overwhelmingly expressed concern and frustration with communication, transparency, and trust.



The most commonly reported symptoms were:

- Headache
- Anxiety
- Dry or Itchy Skin
- Fatigue
- Difficulty Sleeping

55% reported worse physical health & 50% reported worse mental health after the incident compared to before.

Source: <https://health.hawaii.gov/about/files/2022/11/ATSDR-Follow-Up-Survey-One-Pager.pdf>

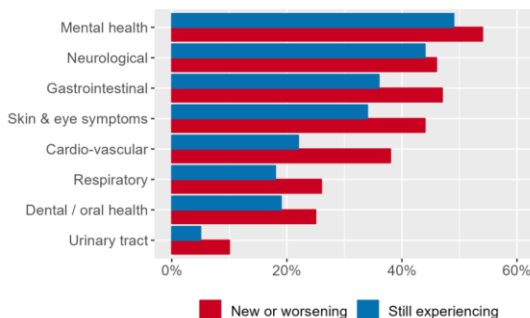
## Social, economic, and health impacts of the Red Hill fuel spill: preliminary survey results

January 18, 2024 Leah Bremer, Nathan DeMaagd, Water Resources, Ruben Juarez, Blogs, Environment, Health

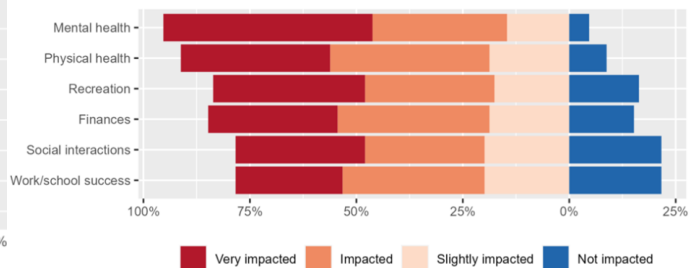
\*University of Hawai'i Economic Research Organization (UHERO), Water Resources Research Center (WRRC), Department of Geography and Environment, University of Hawai'i at Mānoa.

Survey in July 2023 with Navy water users who had participated in the 2021 and 2022 surveys

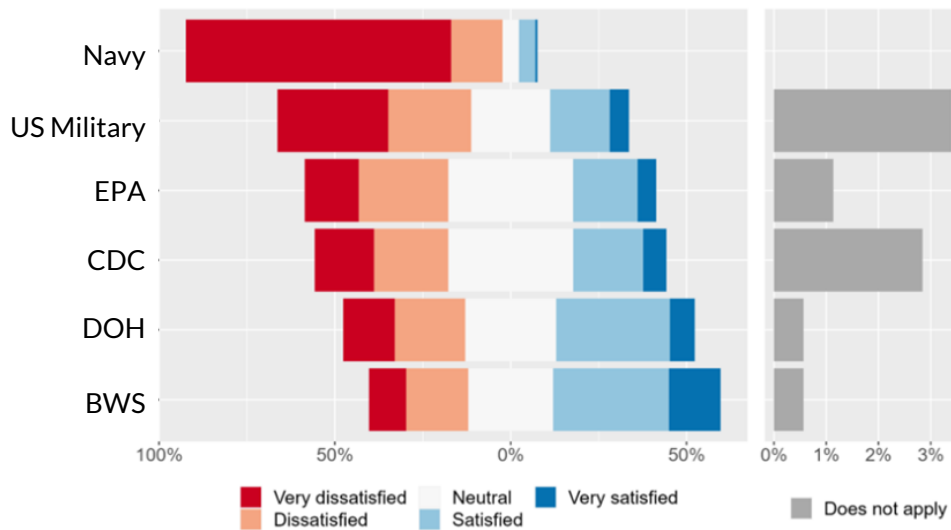
### Self-reported on-going physical and mental health symptoms



### Self-reported household level well-being impacts



## Satisfaction with response to the crisis and trust in institutions



## Known health effects associated with PFAS

### • Cancer

- Reasonable evidence - kidney and testicular cancer
- Also linked to prostate cancer, ovarian cancer, and non-Hodgkin lymphoma

### • Immunotoxic

- Strongest evidence for harm
- Lower antibody responses to routine childhood vaccines
  - Diphtheria, Rubella, and Tetanus vaccines



*“These results suggest that elevated PFAS may impede potential immune response to SARS-CoV-2 infection by blunting peak antibody levels following infection; the same finding was not observed for immune response to vaccination.”*



## Serum per- and polyfluoroalkyl substance concentrations and longitudinal change in post-infection and post-vaccination SARS-CoV-2 antibodies

James Hollister<sup>a</sup>, Alberto J. Caban-Martinez<sup>b</sup>, Katherine D. Ellingson<sup>a</sup>, Shawn Beitel<sup>a</sup>, Ashley L. Fowlkes<sup>c</sup>, Karen Lutrick<sup>d</sup>, Harmony L. Tyner<sup>e</sup>, Allison L. Naleway<sup>f</sup>, Sarang K. Yoon<sup>g</sup>, Manjusha Gaglani<sup>h</sup>, Danielle Hunt<sup>i</sup>, Jennifer Meece<sup>k</sup>, Julie Mayo Lamberte<sup>c</sup>, Natasha Schaefer Solle<sup>b</sup>, Spencer Rose<sup>h</sup>, Kayan Dunnigan<sup>h</sup>, Sana M. Khan<sup>a</sup>, Jennifer L. Kuntz<sup>f</sup>, Julia M. Fisher<sup>l</sup>, Alissa Coleman<sup>a</sup>, Jefferey L. Burgess<sup>a</sup>

## Suspected health effects associated with PFAS

- **Reproductive**
  - Exposure while in utero associated with low birth weight and preterm birth
  - May affect fertility
- **Other health effects**
  - Liver toxicity
  - Increased serum lipid levels
  - **Greater risk of thyroid disease**
  - Possible neurotoxicity


*PFAS exposure may have thyroid-disrupting effects in older adults*

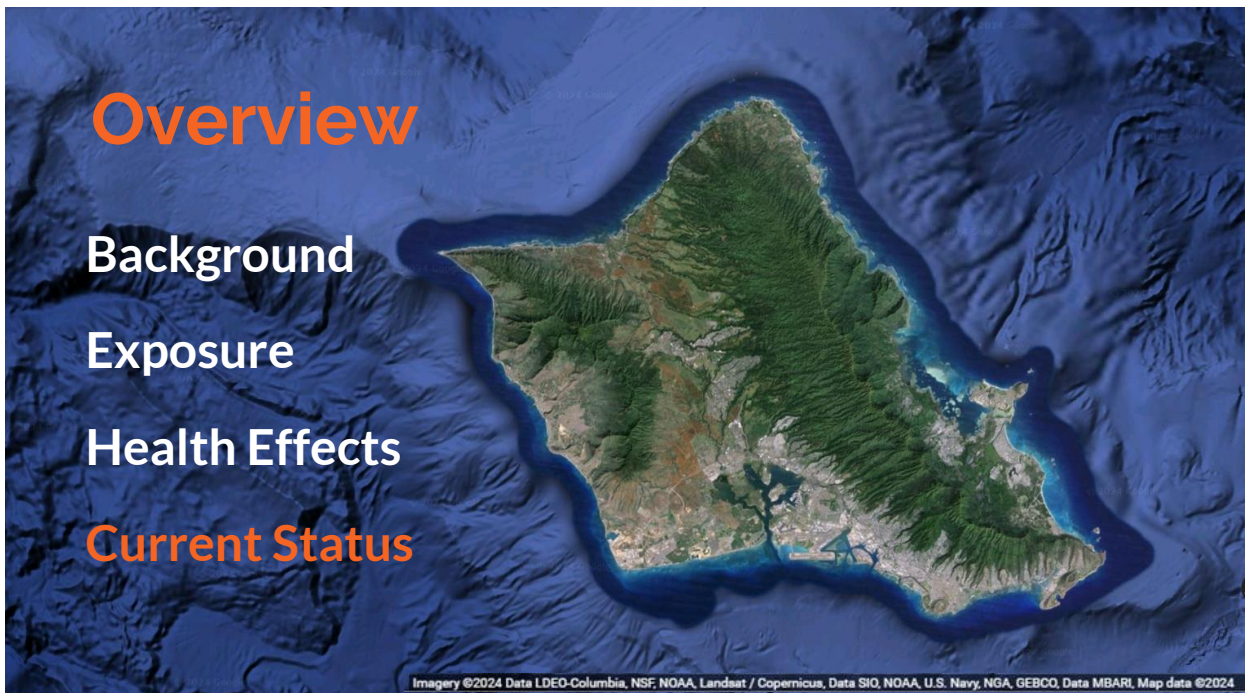


Science of The Total Environment  
Volume 920, 10 April 2024, 170761

ELSEVIER

Review  
**Associations between *per*- and polyfluoroalkyl substances exposure and thyroid hormone levels in the elderly**

Kai Tan <sup>a</sup>, QingQuan Zhang <sup>a</sup>, Yanjun Wang <sup>b</sup>, Chunfang Wang <sup>c</sup>, Chongfang Hu <sup>d</sup>, Lin Wang <sup>e</sup>, Hualin Liu <sup>f</sup>, Zhigiang Tian <sup>g</sup>  



**Overview**

Background

Exposure

Health Effects

**Current Status**

Imagery ©2024 Data LDEO-Columbia, NSF NOAA, Landsat / Copernicus, Data SIO, NOAA, U.S. Navy, NGA, GEBCO, Data MBARI, Map data ©2024

# Community Action



Sources: <https://oahuwaterprotectors.org/>  
<https://www.civilbeat.org/2022/03/how-hawaii-activists-helped-force-the-militarys-hand-on-red-hill/>



## Red Hill Community Representation Initiative

Elected by community participants on September 16, 2023

### Impacted Residents Category

- Mandy Feindt
- Lacey Quintero

### Oahu Residents Category

- Walter Chun
- 'Ilima DeCosta
- Susan Gorman-Chang
- Marti Townsend

### Community Based Organizations Category

- Melodie Aduja, Environmental Caucus of the Democratic Party of Hawai'i
- David Kimo Frankel, Sierra Club

### Native Hawaiian Interests Category

- Alfred Keaka Hiona Medeiros
- Healani Sonoda-Pale



## RED HILL WATER ALLIANCE INITIATIVE REPORT

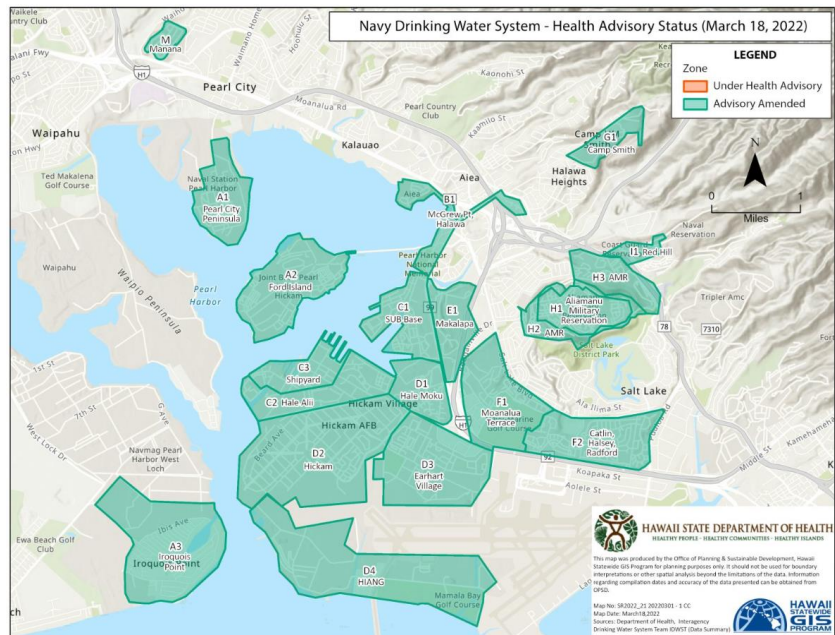
November 2023

### A. Red Hill Water Alliance Initiative (WAI): Origin and Mandate, Goals, Focus, and Stance

On May 9, 2023, State and City and County of Honolulu officials signed a Unified Statement on Red Hill, recognizing the stewardship responsibility to ensure that there is clean water for future generations. “We seek a proactive approach, plan, and operational integration... We understand that this will require new ways of thinking and acting, locally and nationally.”

## Is the water safe?

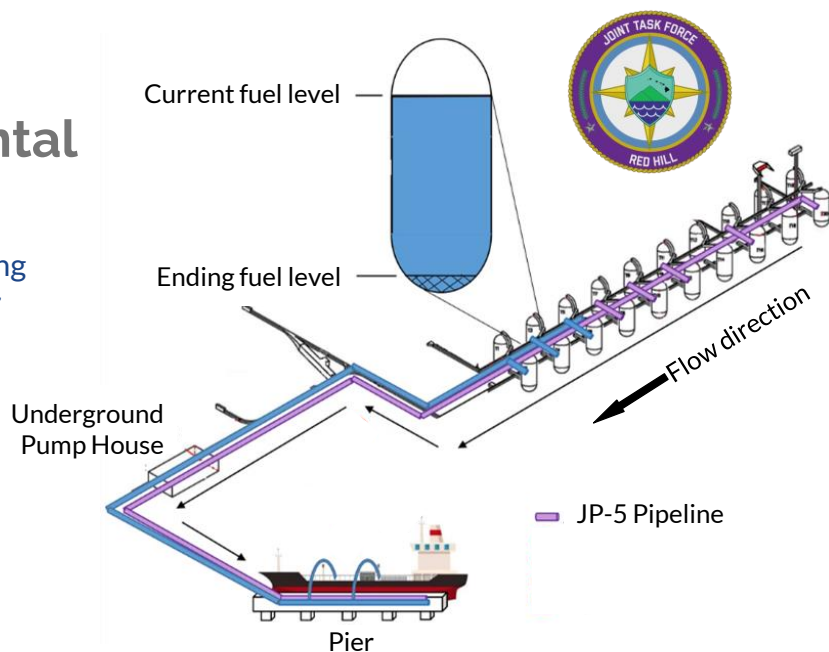
- 20 zones
- Mains flushed through granulated activated carbon filters
- Each residence and building was flushed by military members
- Water samples tested after flushing
- Zone cleared if tests ok



Source: Hawaii DOH <https://health.hawaii.gov/about/navy-water-amendments/>

# Ongoing Environmental Activities

- Long-term monitoring of the drinking water system
- Defueling
- Facility closure
- Aquifer recovery
- Environmental remediation



Source: Photo by Chief Petty Officer Kenneth Takada <https://www.dvidshub.net/image/7839635/tank-mains>

## — Long-term Health Effects

- Mostly unknown
- Generally unexpected
- Many people experiencing symptoms two years after the incident
- Seem to be parallels with other complex health problems such as long COVID or chronic fatigue syndrome

## Actions Due to Health Study Results

- Red Hill Clinic established
- DOD established a roster of exposed people
- ATSDR medical record review
- Additional support for medical providers
- DHA and ATSDR working to establish a 3rd party Registry



## Plans for a Red Hill Registry announced January 9, 2024

### Independent Red Hill Registry

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- What is an *exposure registry*?
  - A system of ongoing follow-up of people who have had documented environmental exposures
- Must enroll voluntarily to be included
- Grant to independent organization, such as university
- Long term
- Best means to study long-term health impacts from fuel release

—  
**Thank you!**

**We would like to acknowledge the Red Hill community who recognized a problem and fought for answers.**



Questions?

