# Red Hill Bulk Fuel Storage Facility

# Community Informational Briefing

January 2020

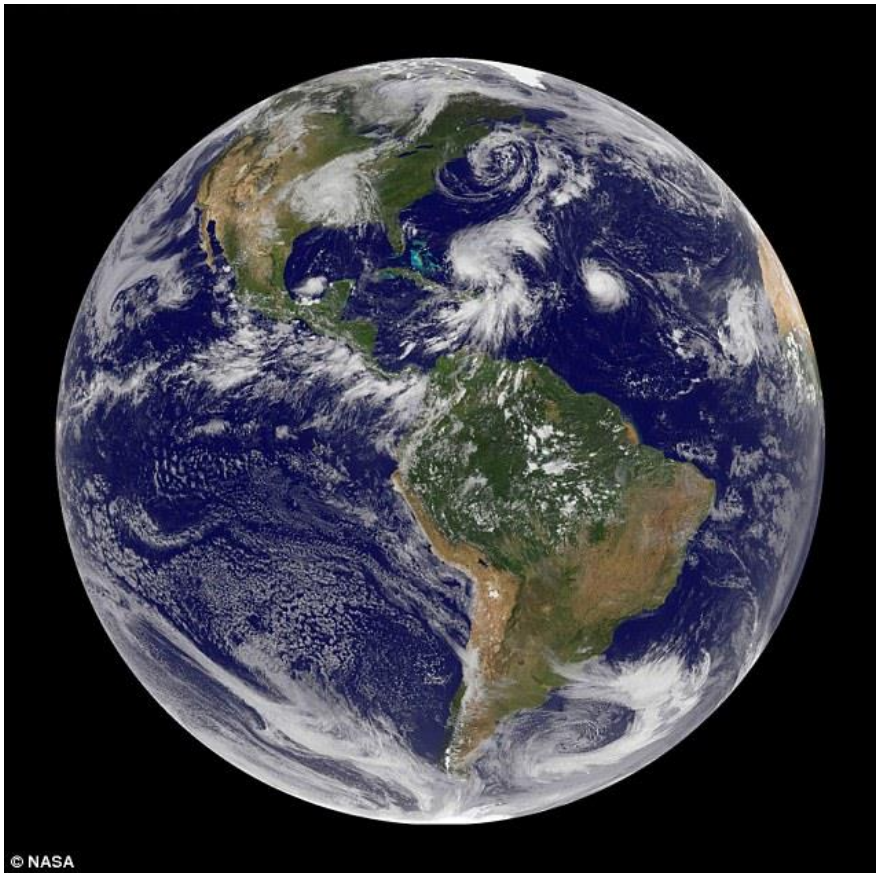
# Today's Discussion

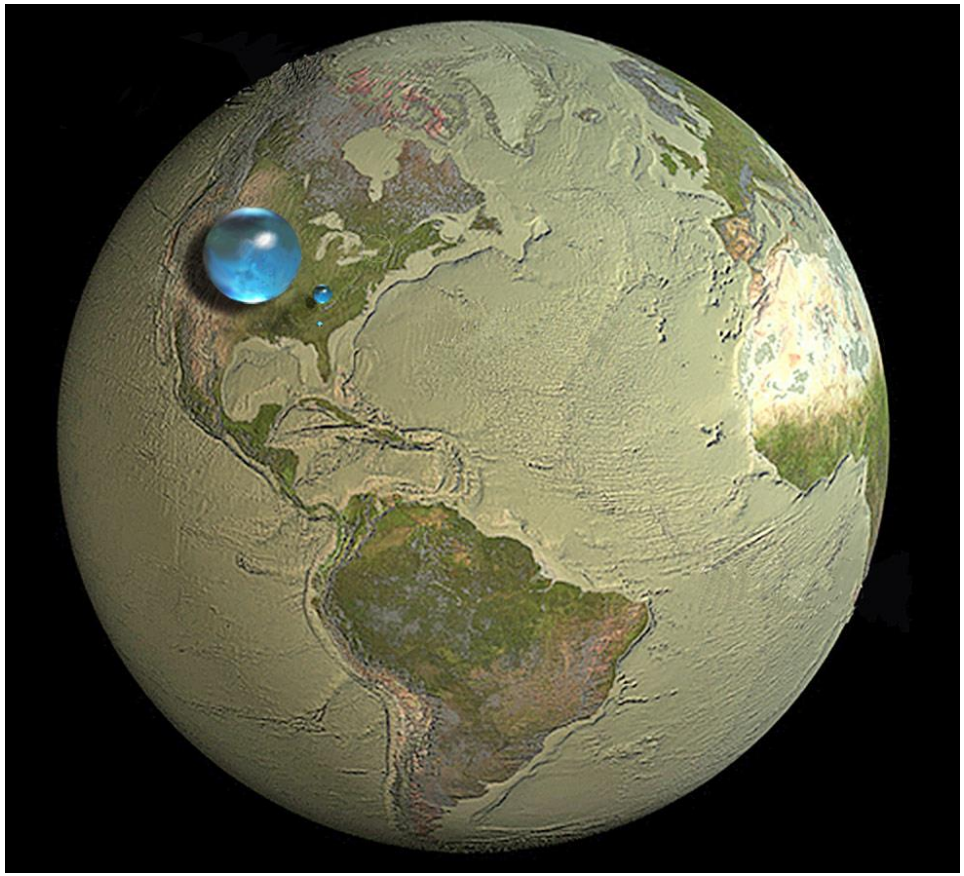
- Water – a precious resource with unique properties
- Red Hill Bulk Fuel Storage Facility
  - Introduction and 2014 fuel leak
  - Past Navy studies and findings
  - Red Hill Administrative Order on Consent (AOC)
  - Tank condition/ destructive testing
  - Tank upgrade alternative (TUA) selection
  - Risk and vulnerability
  - Groundwater flow direction
  - Navy's UST permit application
  - DOH proposed UST rule revisions
- Summary

# WATER FOR LIFE

*Safe, dependable, and affordable water now and into the future*

Board of Water Supply
City and County of Honolulu



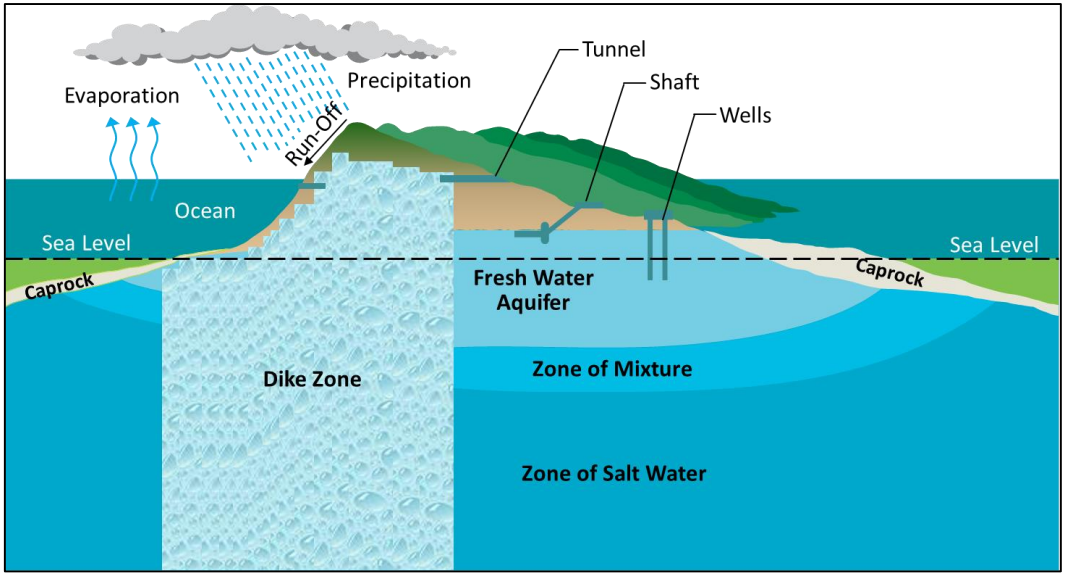
- Nearly 70% of the earth's surface is covered with water.
- Only 2.5 percent of it is freshwater. The rest is saline and ocean-based.
- Of this percentage less than 1% is easily accessible, with much of it trapped in glaciers and snowfields.

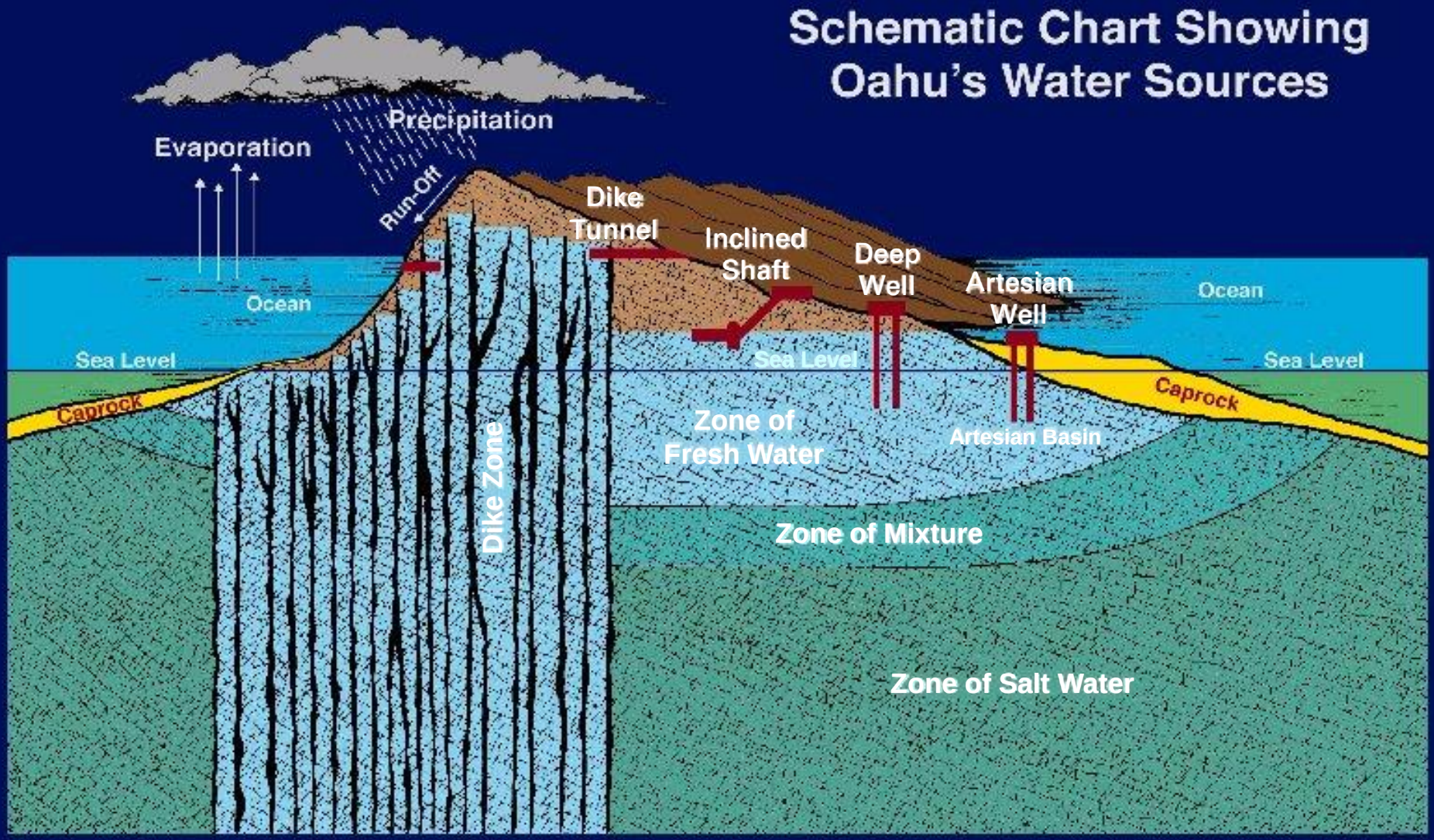
# Water's Unique Properties

- Only substance found on Earth in all three states -- liquid, solid (ice), and gas (steam).
- The solid form, ice, is less dense than the liquid form, which is why ice floats.
- Can absorb a lot of heat before it begins to get hot. Reason water is valuable as a coolant.
- Called the "universal solvent" because it dissolves more substances than any other liquid.

# Water Availability and Use on Oahu

- On average 1.8 billion gallons fall on Oahu as rain.
  - One-third loss to run-off.
  - One-third absorbed by plants or evaporates.
  - One-third recharges the aquifer. Takes 1 - 25 years to reach the aquifer.
- Oahu's aquifer sustainable yield is 393.5 mgd. Of this amount total withdrawn from aquifer is 190 mgd.

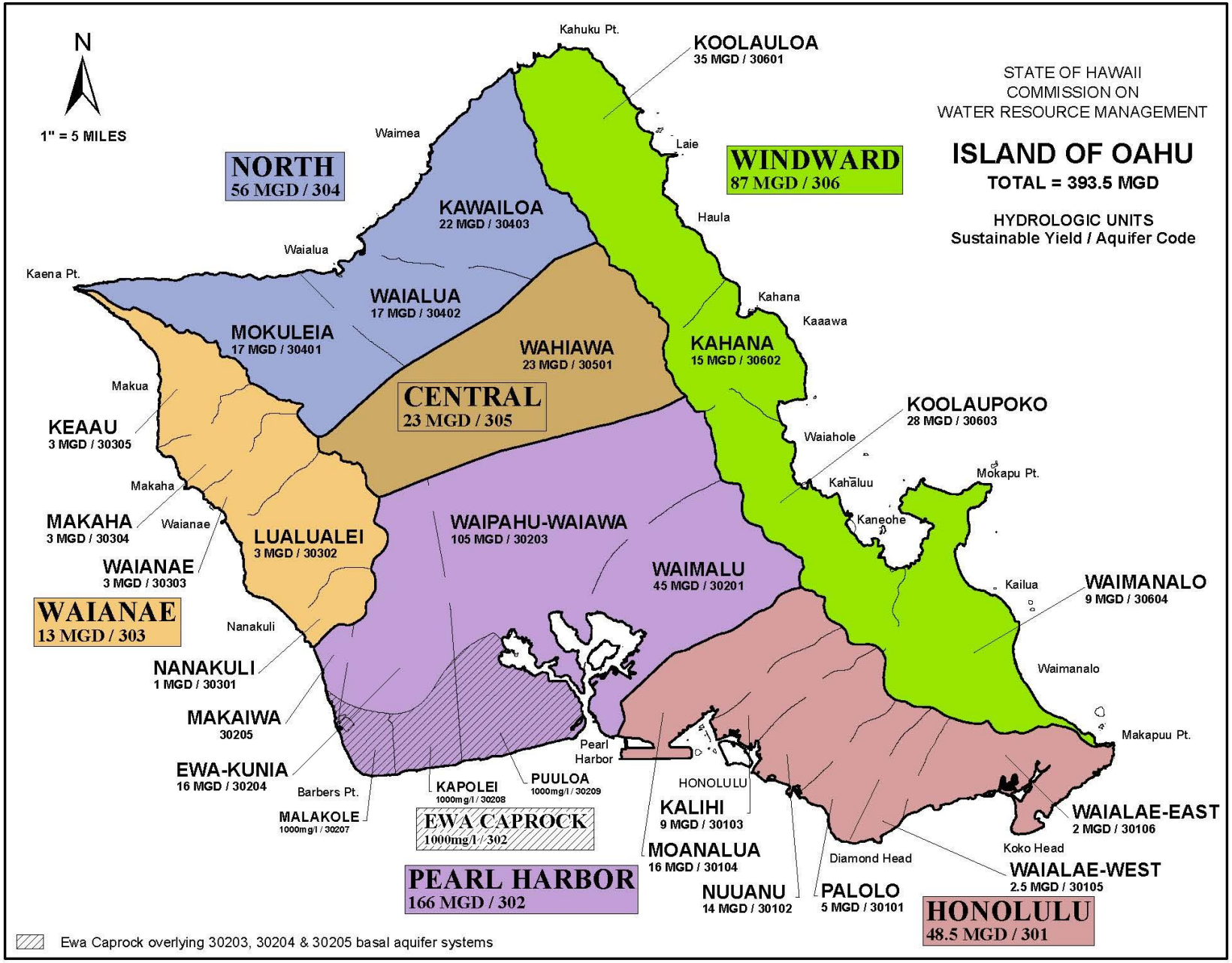



Schematic Chart Showing
Oahu's Water Sources
Precipitation
Evaporation
Run-Off
Dike
Tunnel
Inclined
Shaft
Deep
Well
Artesian
Well
Ocean
Ocean
Sea Level
Sea Level
Sea Level
Caprock
Caprock
Zone of
Fresh Water
Artesian Basin
Dike Zone
Zone of Mixture
Zone of Salt Water

# Oahu's Groundwater Bodies and Caprock

- Oahu is 598 square miles
- About 461 square miles of Oahu (77% of the island) are inland of the caprock
- About 137 square miles (23% of the island) are covered by caprock


Ref. Izuka, Engott, Rotzoll, Bassiouni, Johnson, Miller and Mair, Volcanic aquifers of Hawai'i—Hydrogeology, water budgets, and conceptual models, Scientific Investigations Report 2015-5164, United States Geological Survey, 2015



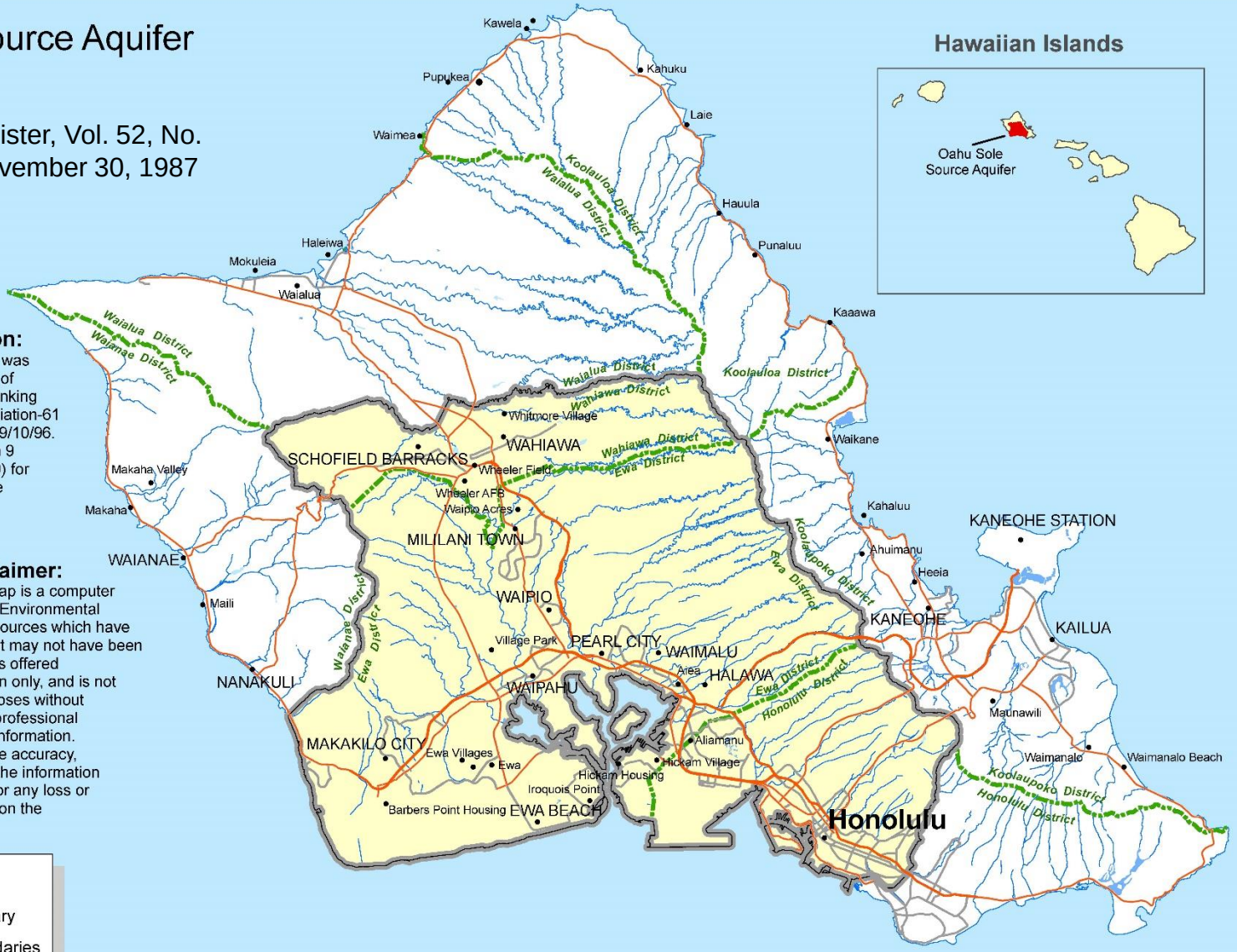

06/20/2018

Map Projection: Universal Transverse Mercator

# Oahu Sole Source Aquifer

Designated Area

Ref. Federal Register, Vol. 52, No. 229, Monday, November 30, 1987




## Notes and Explanation:

The Oahu Sole Source Aquifer was designated under the authority of Section 1424(e) of the Safe Drinking Water Act, Federal Register Citiation-61 FR 47752, Publication Date - 09/10/96. Please contact US EPA Region 9 (Jamelya Curtis, 415-972-3529) for assistance in determining place locations with respect to the project review area.

## Map Status and Disclaimer:

Please note that this working map is a computer representation compiled by the Environmental Protection Agency (EPA) from sources which have supplied data or information that may not have been verified by the EPA. This data is offered here as a general representation only, and is not to be used for commercial purposes without verification by an independent professional qualified to verify such data or information. The EPA does not guarantee the accuracy, completeness, or timeliness of the information shown, and shall not be liable for any loss or injury resulting from reliance upon the information shown.

**Legend**

- Designation Boundary
- Water District Boundaries
- Highways
- Major Roads
- Streams
- Cities & Towns

# Hawaii State Constitution

- Article XI, Section 1
  - For the benefit of present and future generations, the State and its political subdivisions shall conserve and protect Hawaii's natural beauty and all natural resources, including land, water, air, minerals and energy sources, and shall promote the development and utilization of these resources in a manner consistent with their conservation and in furtherance of the self-sufficiency of the State.
  - All public natural resources are held in trust by the State for the benefit of the people.

# Hawaii State Constitution – cont.

- Article XI - Section 7
  - The State has an obligation to protect, control and regulate the use of Hawaii's water resources for the benefit of its people. The legislature shall provide for a water resources agency which, as provided by law, shall set overall water conservation, quality and use policies; define beneficial and reasonable uses; protect ground and surface water resources, watersheds and natural stream environments; establish criteria for water use priorities while assuring appurtenant rights and existing correlative and riparian uses and establish procedures for regulating all uses of Hawaii's water resources.

# City Charter

- The Revised Charter of the City and County of Honolulu Article II, § 2-102:
- "All city powers shall be used to serve and advance the general welfare, safety and aspirations of its inhabitants in a sustainable manner and promote stewardship of natural resources for present and future generations."

# State Water Code

- §174C-2 Declaration of Policy
  - (d) The state water code shall be liberally interpreted to protect and improve the quality of waters of the State and to provide that no substance be discharged into such waters without first receiving the necessary treatment or other corrective action. The people of Hawaii have a substantial interest in the prevention, abatement, and control of both new and existing water pollution and in the maintenance of high standards of water quality.

# Today's Discussion

- ✓ Water – a precious resource with unique properties
- Red Hill Bulk Fuel Storage Facility
  - Introduction and 2014 fuel leak
  - Past Navy studies and findings
  - Red Hill Administrative Order on Consent (AOC)
  - Tank condition/ destructive testing
  - Tank upgrade alternative (TUA) selection
  - Risk and vulnerability
  - Groundwater flow direction
  - Navy's UST permit application
  - DOH proposed UST rule revisions
- Summary

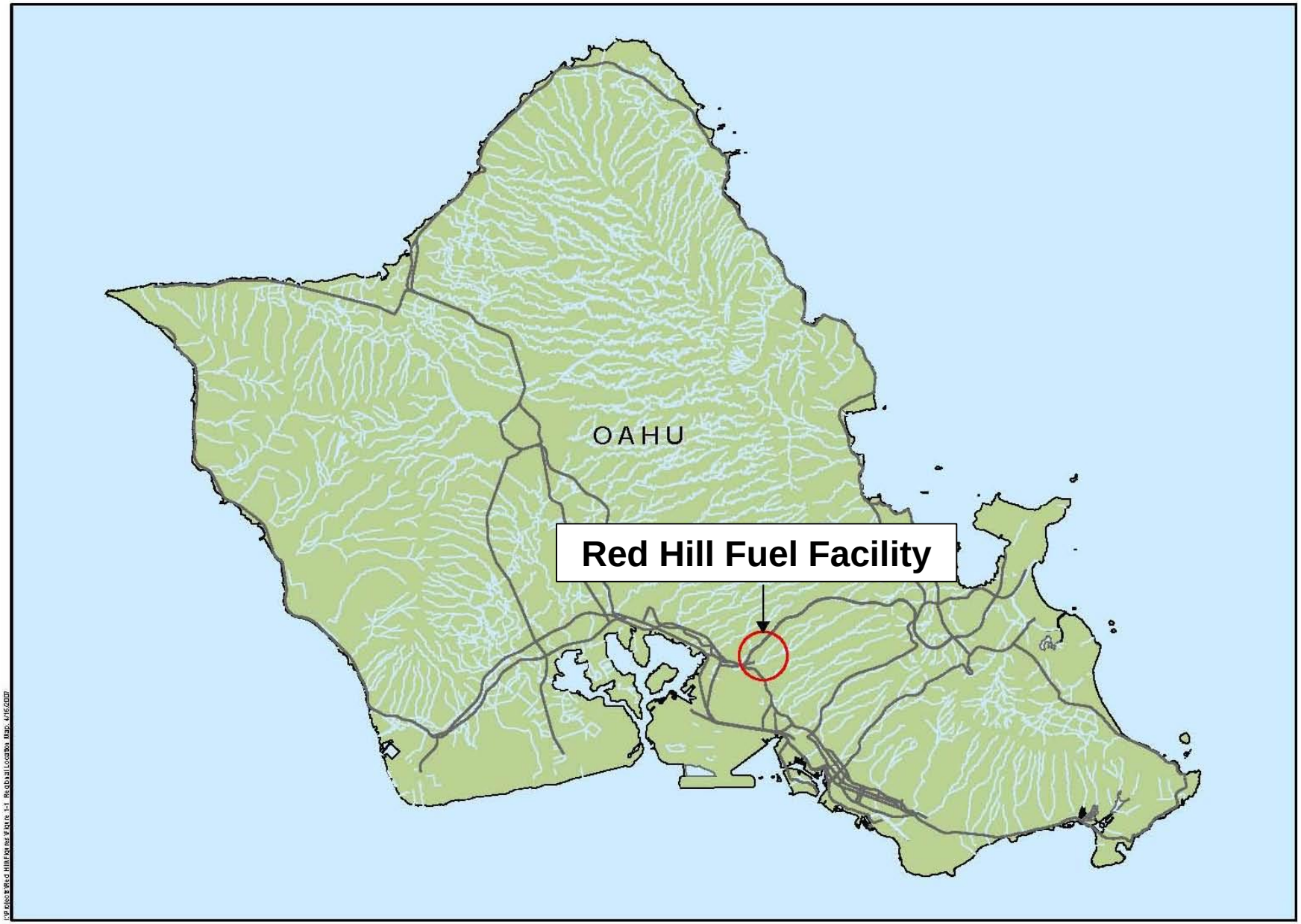


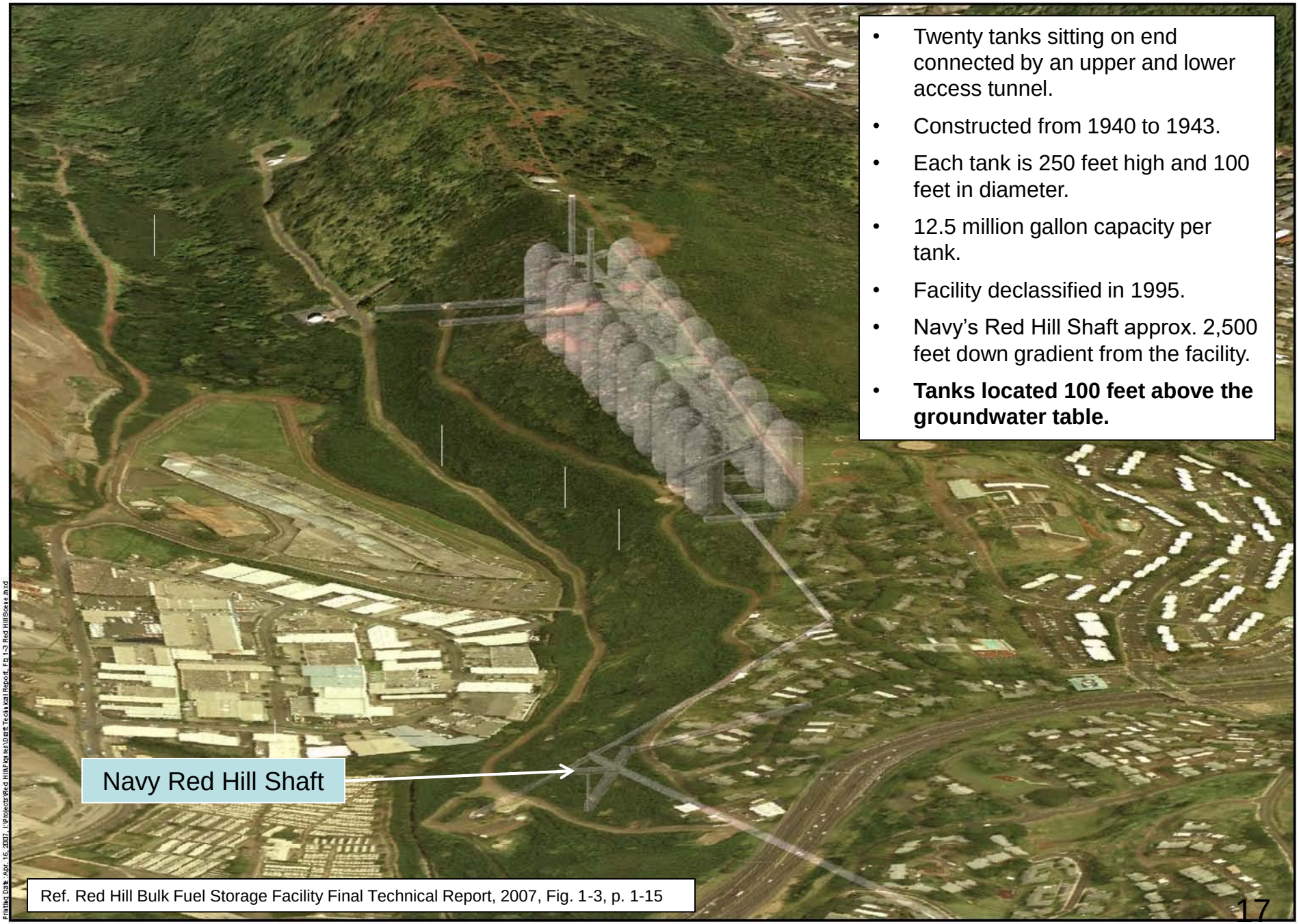

**Figure 1-1**
**Regional Location Map**
Red Hill Fuel Storage Facility
Oahu, Hawaii

Meters
0 7,000 14,000
0 14,000 28,000 56,000
Feet

N

# Hawaii UST Statutes and Regulations

- Hawaii Revised Statutes §342L Underground Storage Tanks
  - HRS §342L-32 (b) (1) The tank and tank system shall be designed, constructed, installed, upgraded, maintained, repaired, and operated to prevent releases of the stored regulated substances for the operational life of the tank or tank system.
- DOH Hawaii Administrative Rules (HAR) Chapter 11-280.1, Underground Storage Tanks rules



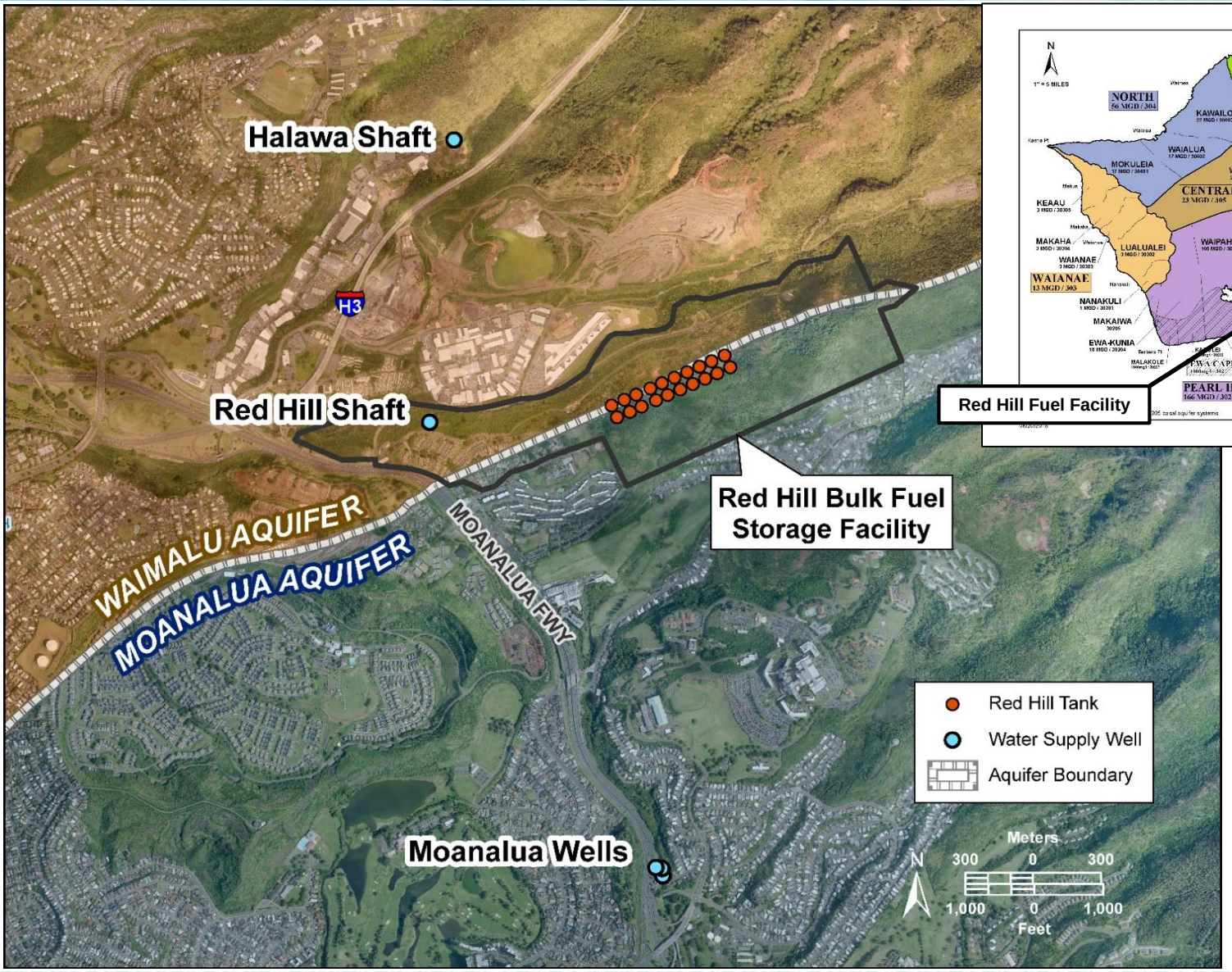

- Twenty tanks sitting on end connected by an upper and lower access tunnel.
- Constructed from 1940 to 1943.
- Each tank is 250 feet high and 100 feet in diameter.
- 12.5 million gallon capacity per tank.
- Facility declassified in 1995.
- Navy's Red Hill Shaft approx. 2,500 feet down gradient from the facility.
- **Tanks located 100 feet above the groundwater table.**

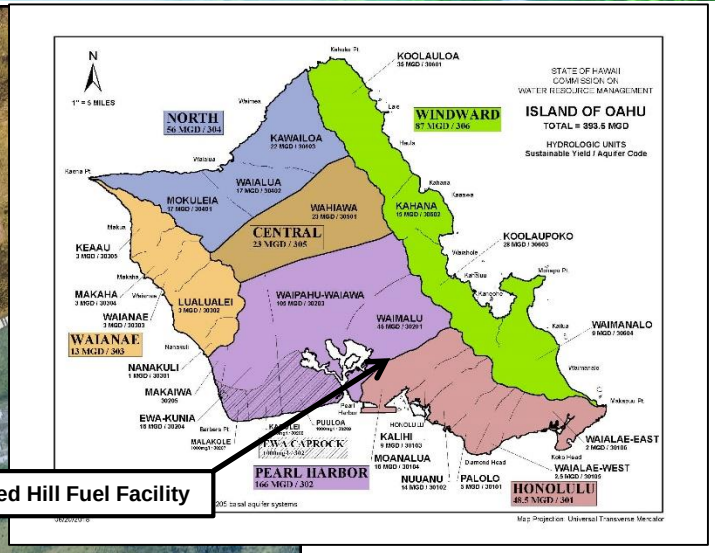
Ref. Red Hill Bulk Fuel Storage Facility Final Technical Report, 2007, Fig. 1-3, p. 1-15

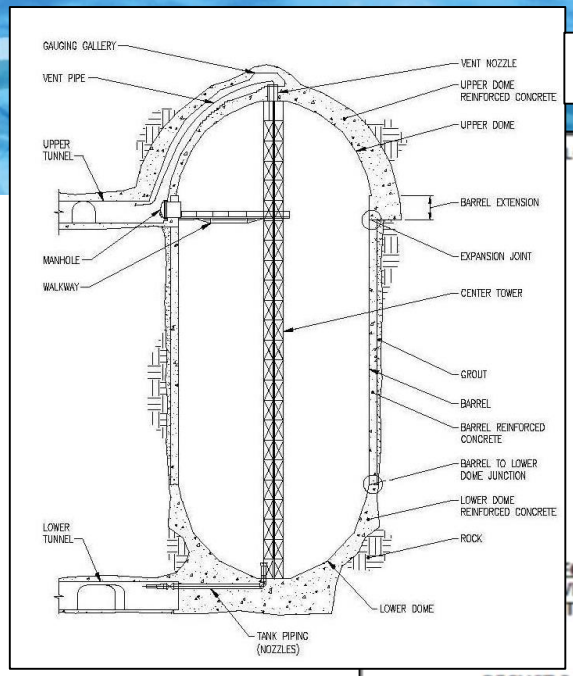
# WATER FOR LIFE

*Safe, dependable, and affordable water now and into the future*

Board of Water Supply
City and County of Honolulu






Ref: Red Hill Tank Upgrade Alternatives Report, Red Hill Bulk Fuel Storage Facility, Final Report December 2017, Figure B-1.0-2

LOCATIONS AND ROUTING ARE DIAGRAMMATIC ONLY.

## Red Hill System Layout

BFCUST 17
OUT OF SERVICE

BFCUST 19
REMOVED FROM SERVICE

BFCUST 20 / JP-5
HIGH LEVEL PRODUCT
@ TEST - 211.45 Feet

BFCUST 15 / F76
HIGH LEVEL PRODUCT
@ TEST - 210.82 Feet

BFCUST 13 / F76
HIGH LEVEL PRODUCT
@ TEST - 212.45 Feet

BFCUST 11 / JP-5
HIGH LEVEL PRODUCT
@ TEST - 211.9 Feet

CUST 9 / JP-5
EL PRODUCT
T - 211.78 Feet

BFCUST 7 / JP-5
HIGH LEVEL PRODUCT
@ TEST - 212.25 Feet

BFCUST 18 / JP-5
OUT OF SERVICE

BFCUST 5
OUT OF SERVICE

BFCUST 14
OUT OF SERVICE

BFCUST 16 / F76
HIGH LEVEL PRODUCT
@ TEST - 58.59 Feet

BFCUST 3/ JP-8
HIGH LEVEL PRODUCT
@ TEST - 201.2 Feet

BFCUST 1
REMOVED FROM SERVICE

BFCUST 10 / JP-5
HIGH LEVEL PRODUCT
@ TEST - 211.43 Feet

BFCUST 12 / JP-5
HIGH LEVEL PRODUCT
@ TEST - 212.39 Feet

BFCUST 6 / JP-8
HIGH LEVEL PRODUCT
@ TEST - 211.9 Feet

BFCUST 8 / JP-5
HIGH LEVEL PRODUCT
@ TEST - 211.08 Feet

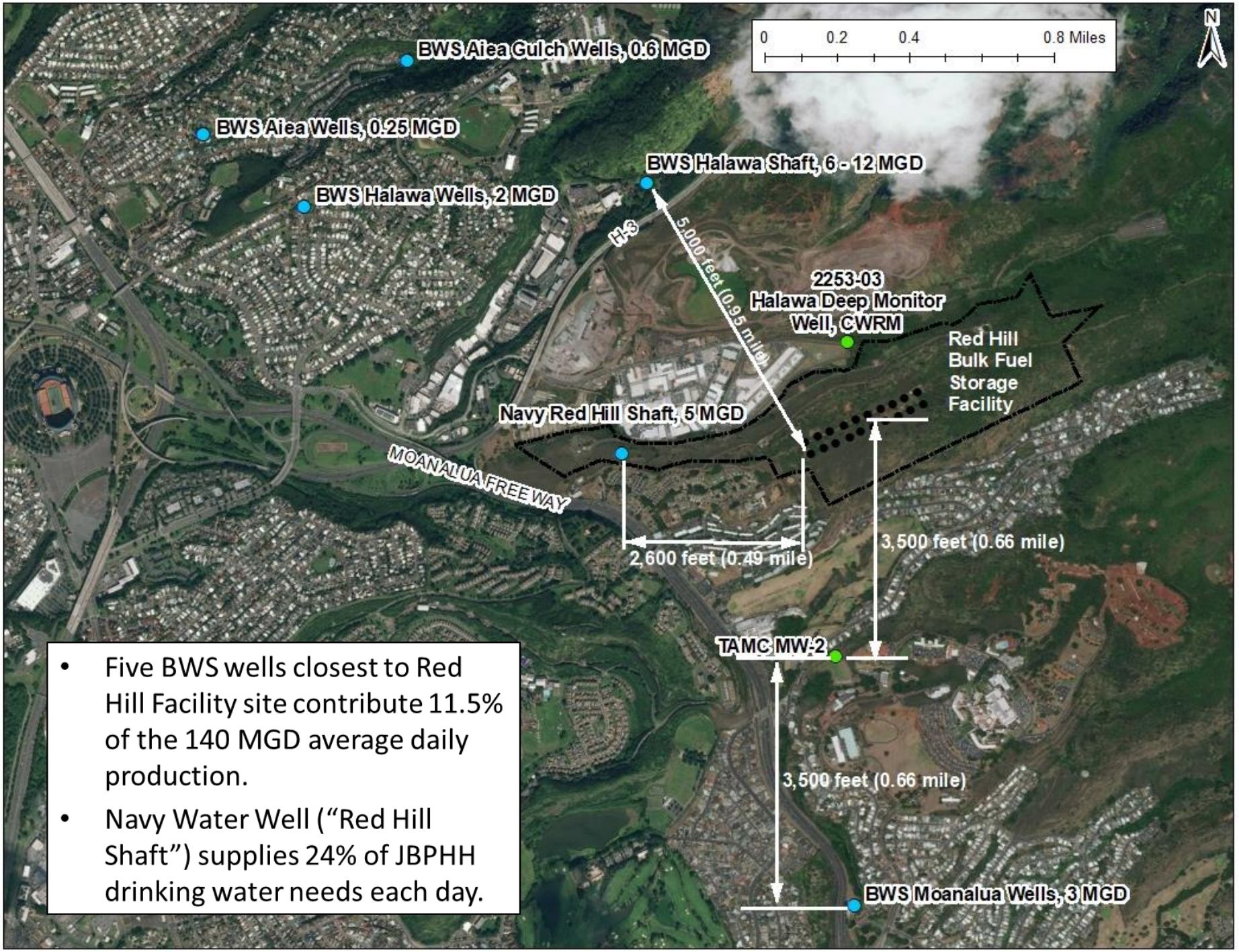
BFCUST 2 / JP-8
HIGH LEVEL PRODUCT
@ TEST - 208.2 Feet

BFCUST 15 / JP-8
HIGH LEVEL PRODUCT
@ TEST - 211.01 Feet

| | | |
|---|---|---|
| DATE: 15 MAY 2015<br>SCALE: NTS<br>DGN / DWN / CHK BY:<br>AKK / AKK / MC | PRJ / TASK NO.:<br>140296 / 4.1.89<br>FILE NAME:<br>140296_RH.DWG | Michael Baker INTERNATIONAL<br>MICHAEL BAKER INTERNATIONAL<br>VIRGINIA BEACH, VIRGINIA |

RED HILL SYSTEM LAYOUT
ANNUAL RED HILL BFCUST LEAK DETECTION TEST REPORT
JOINT BASE PEARL HARBOR- HICKAM, HAWAII

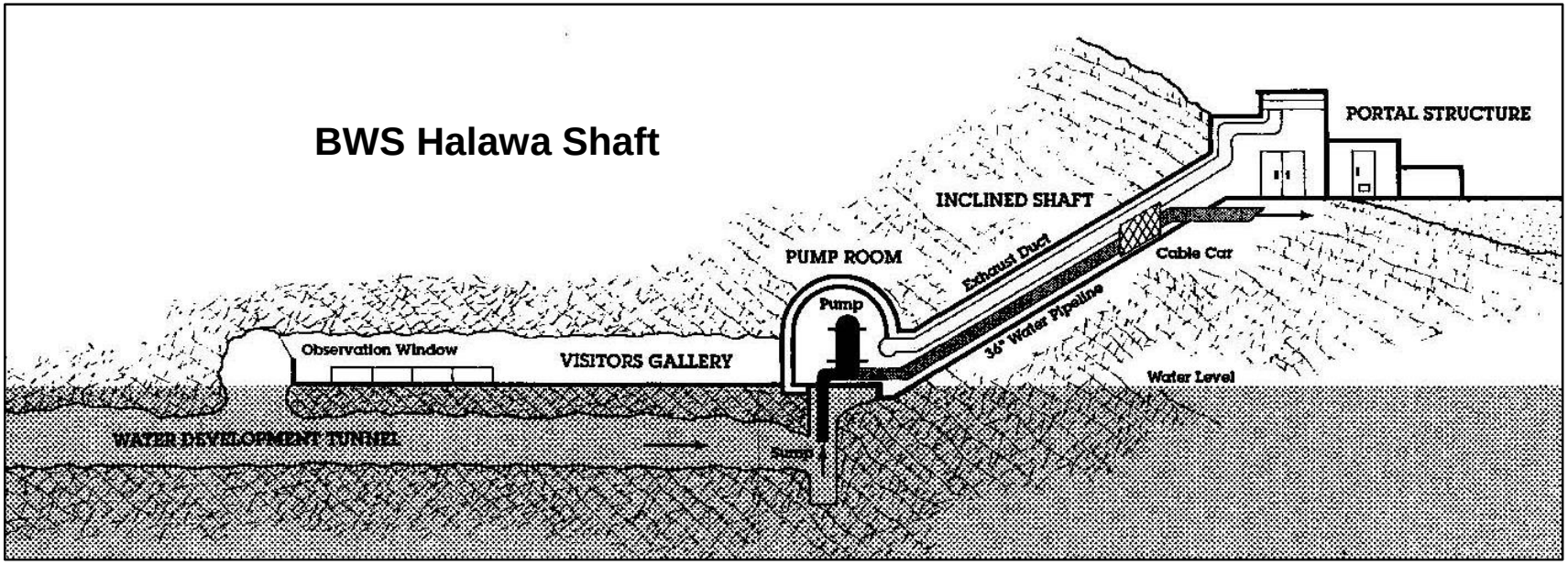
Ref: Underground Storage Tank System Evaluation Final Report, Red Hill Bulk Fuel Storage Facility Joint Base Pearl Harbor-Hickam, Submitted by: Atlas Geotechnical, Eastern Research Group, Inc., PEMY Consulting and Powers Engineering and Inspection, Inc., June 2017, Figure 1-2.




- Five BWS wells closest to Red Hill Facility site contribute 11.5% of the 140 MGD average daily production.
- Navy Water Well ("Red Hill Shaft") supplies 24% of JBPHH drinking water needs each day.

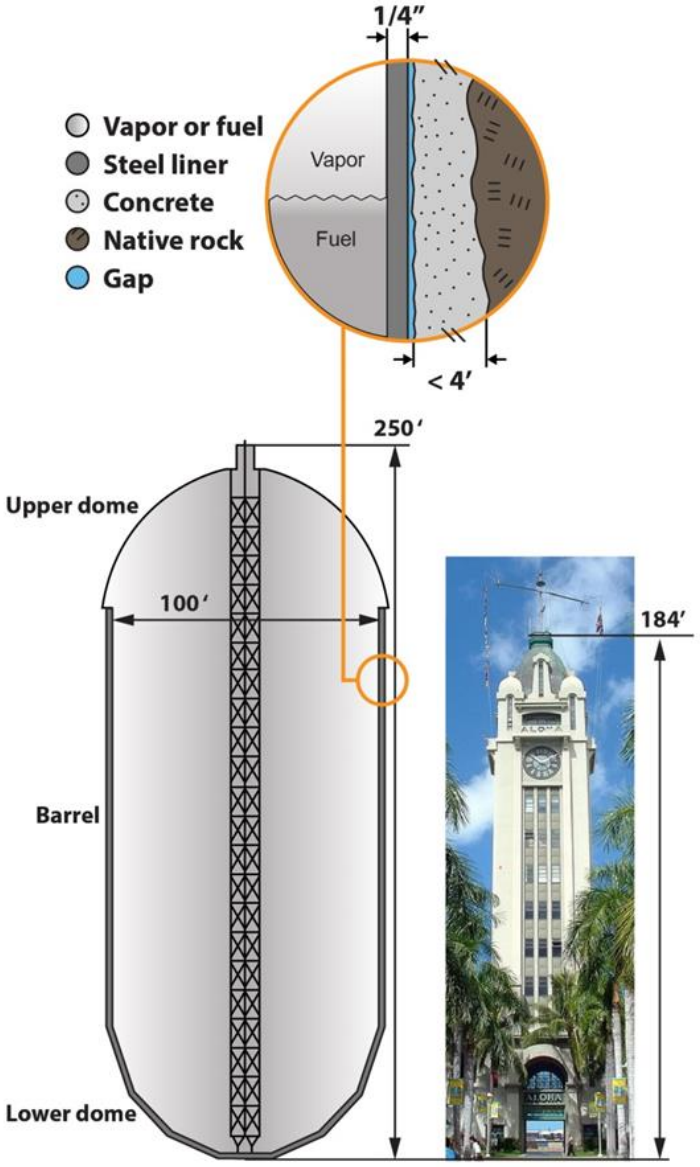
# BWS Halawa Shaft

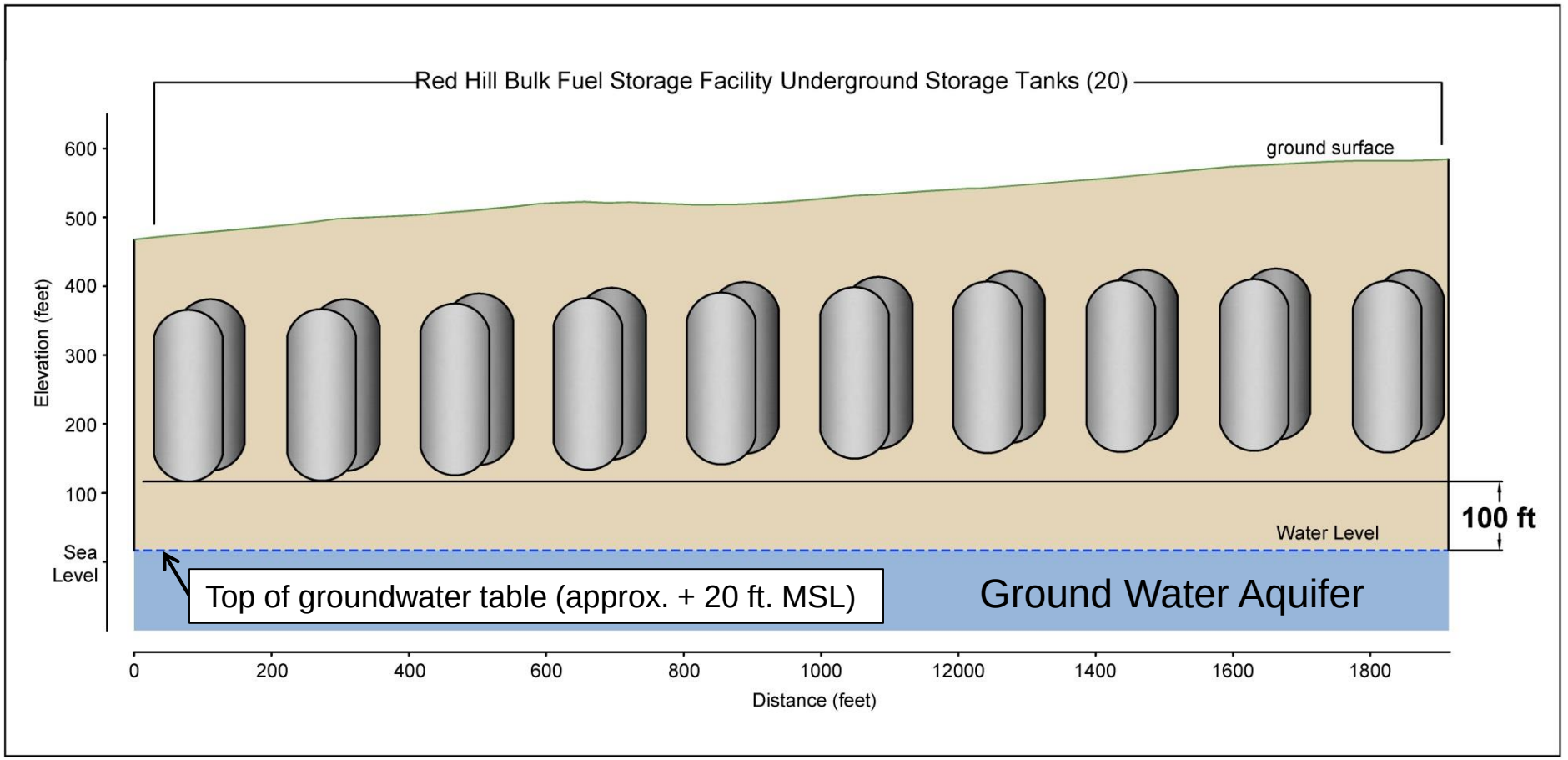
The BWS Halawa Shaft pumps water from the top of the groundwater table just like the Navy's Red Hill Shaft. A contaminant plume on the water table surface or dissolved in the water can quickly impact these types of sources.



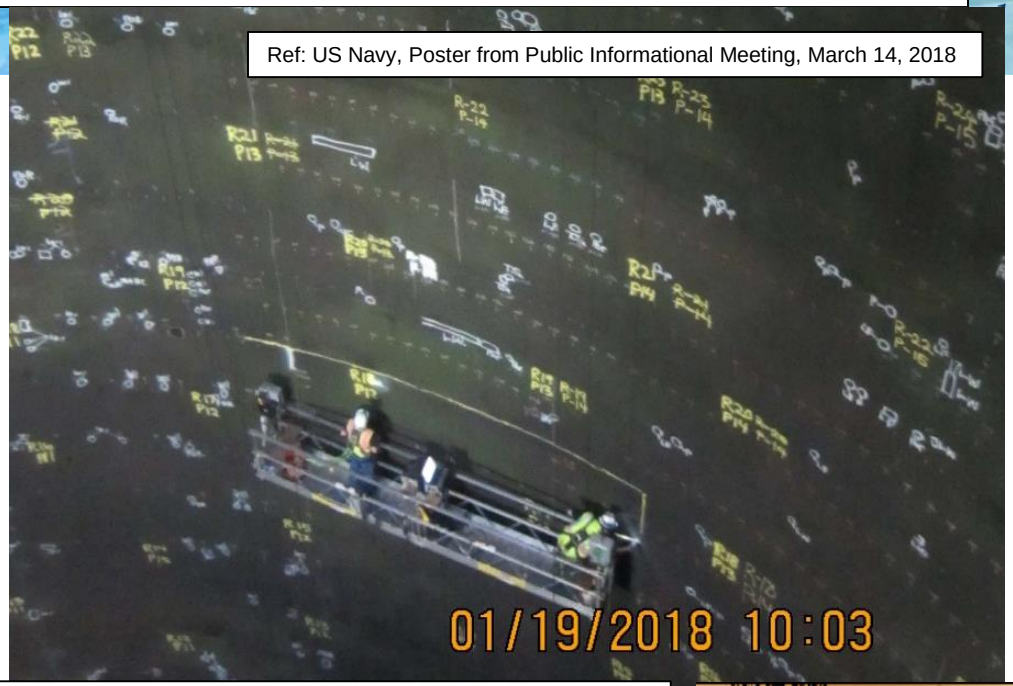
# Red Hill Tanks

- Concrete with ¼ inch steel liner. (Lower dome base is ½ inch)
- Red Hill Tank large enough to hold Aloha Tower.
- Fuel storage
  - Currently JP-5, JP-8 and F-76 (marine diesel).
- 15 active tanks together store 187 million gallons of fuel.
- Rainwater seeping between ¼ inch steel liner and concrete and corroding steel liner.



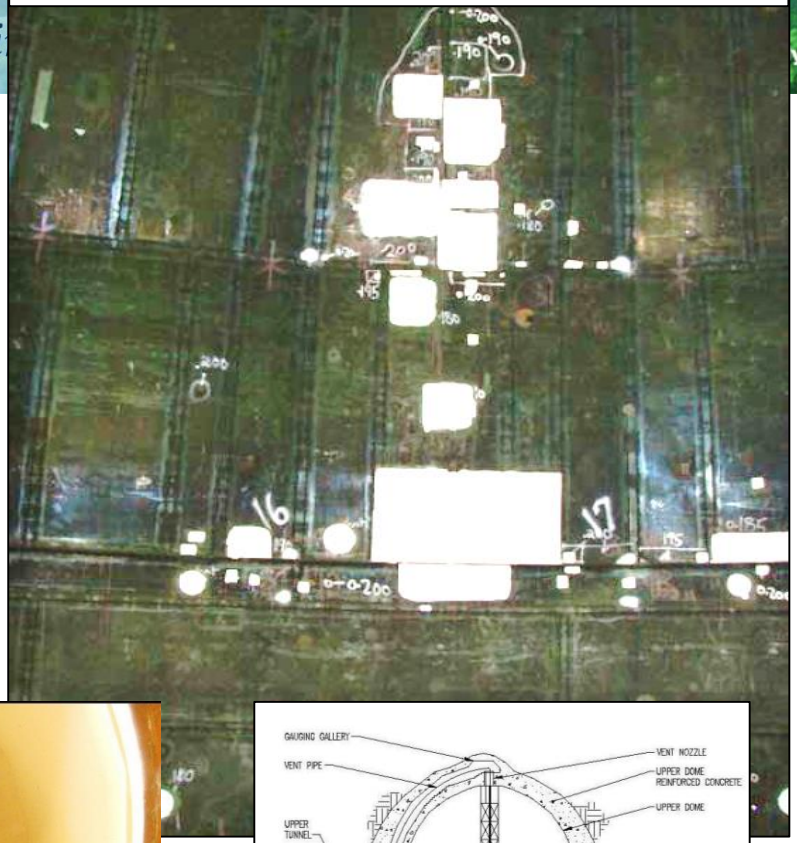

Red Hill Bulk Fuel Storage Facility Underground Storage Tanks (20)
ground surface
600
500
400
300
200
100
Sea Level
Elevation (feet)
Water Level
100 ft
Top of groundwater table (approx. + 20 ft. MSL)
Ground Water Aquifer
0
200
400
600
800
1000
12000
1400
1600
1800
Distance (feet)

# Inside Red Hill Tank

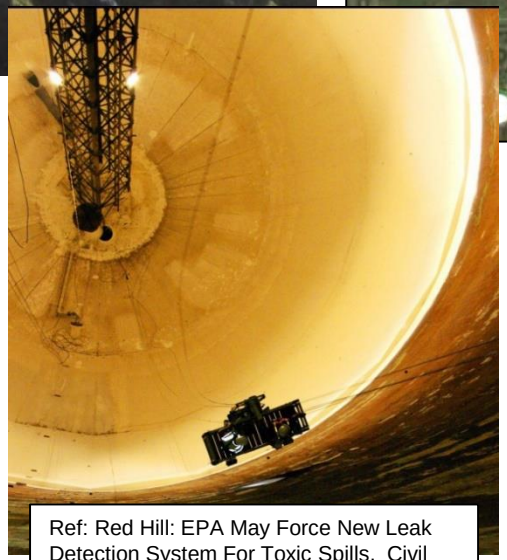



Ref: US Navy, Poster from Public Informational Meeting, March 14, 2018

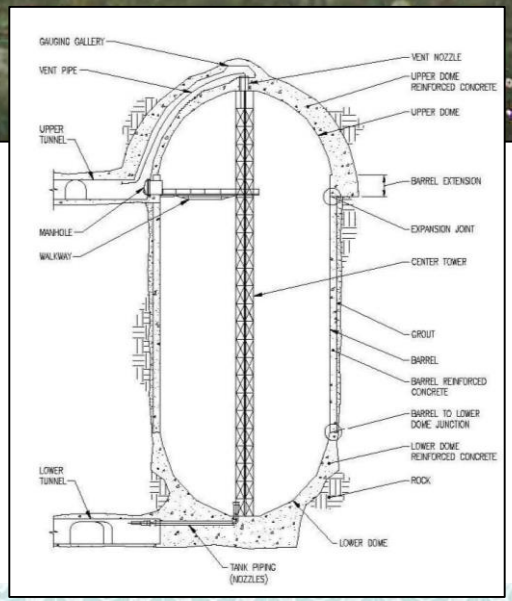
Typical Patch Plate Repairs on Tank 6, Dunkin & Bush, Inc. Report on Tank 6 As Built Repairs, Contract Number N62742-03-C-1402. June 2007 (Navy, 2016).



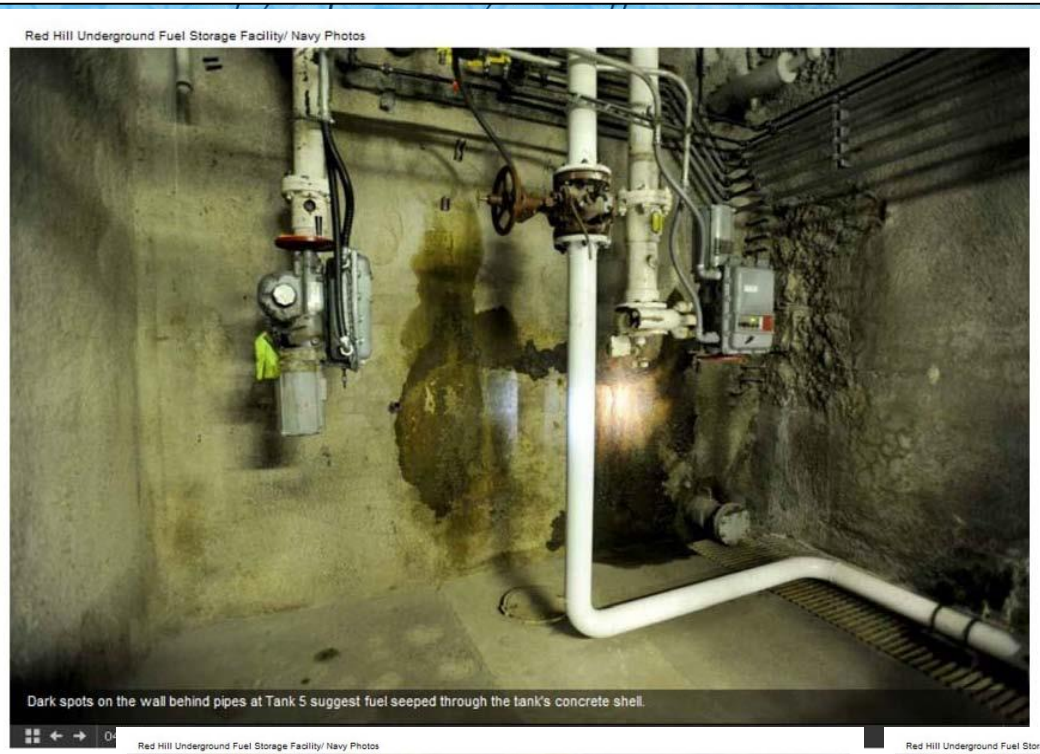
Catwalk and Small Access Platform from Tank Manhole. Note boom on right hand side. Photo was taken from basket on boom.

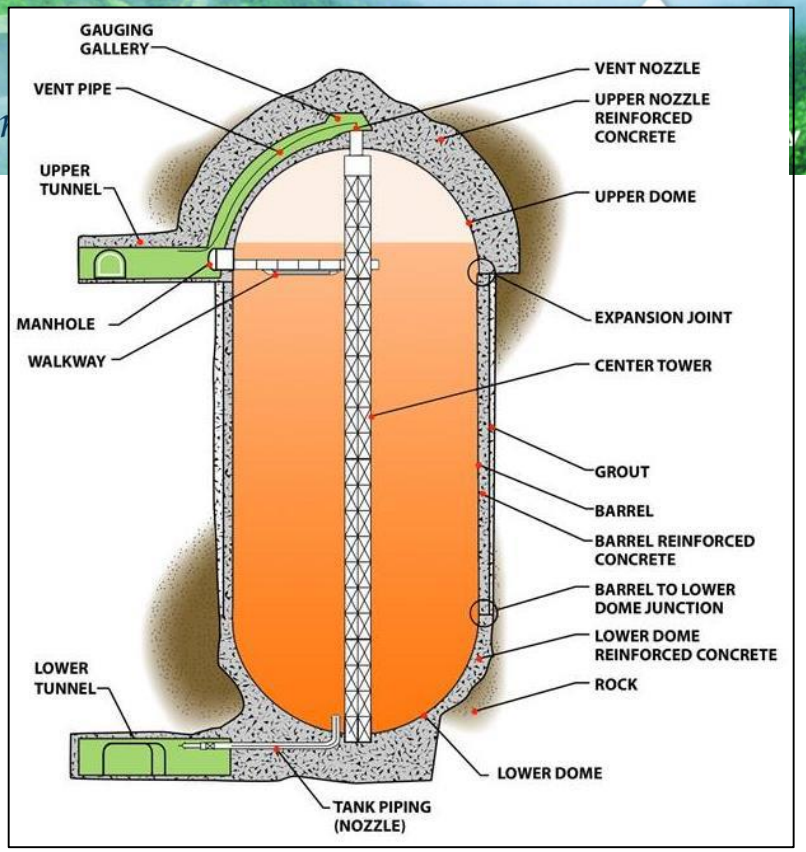


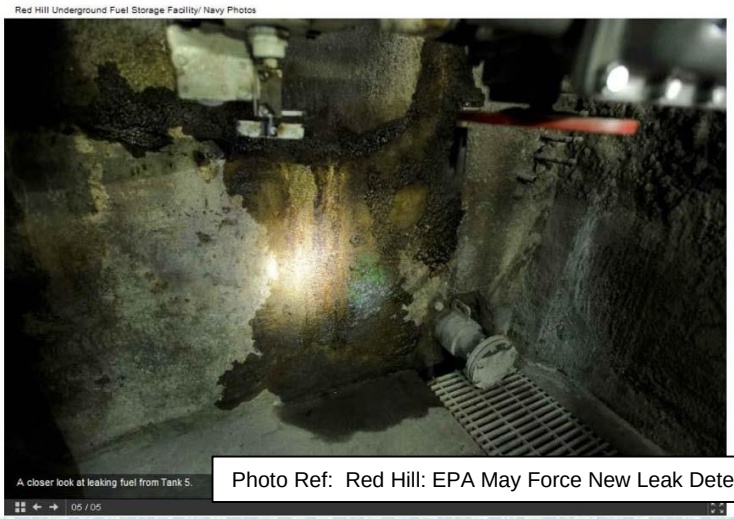
Ref: Red Hill: EPA May Force New Leak Detection System For Toxic Spills, Civil Beat, S. Cocke, 2/14/14



# 2014 Tank 5 Leak



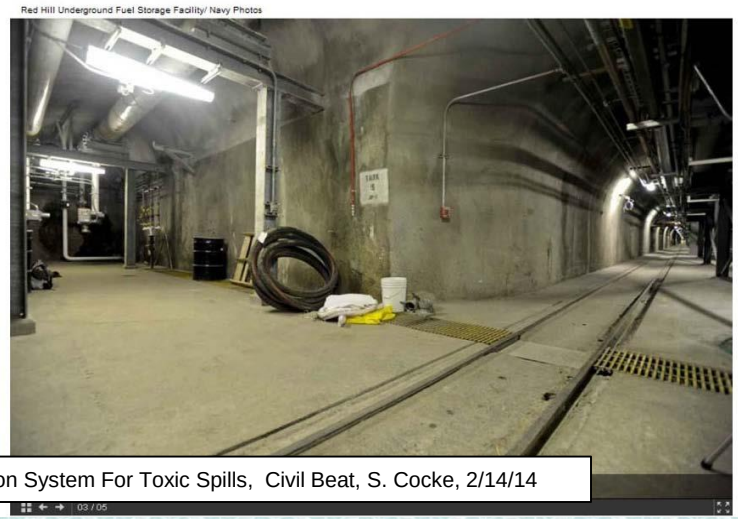




Photo Ref: Red Hill: EPA May Force New Leak Detection System For Toxic Spills, Civil Beat, S. Cocke, 2/14/14

# Navy Study and Fuel Record Findings

- Navy commissioned studies
  - Petroleum hydrocarbons present in groundwater and rock beneath facility.
  - Warn of increasing facility age and potential catastrophic large volume release.
  - Documented fuel releases (1947 – 1999)

# Fuel Contamination Under Red Hill Tanks

- 1998-2002 Investigations.

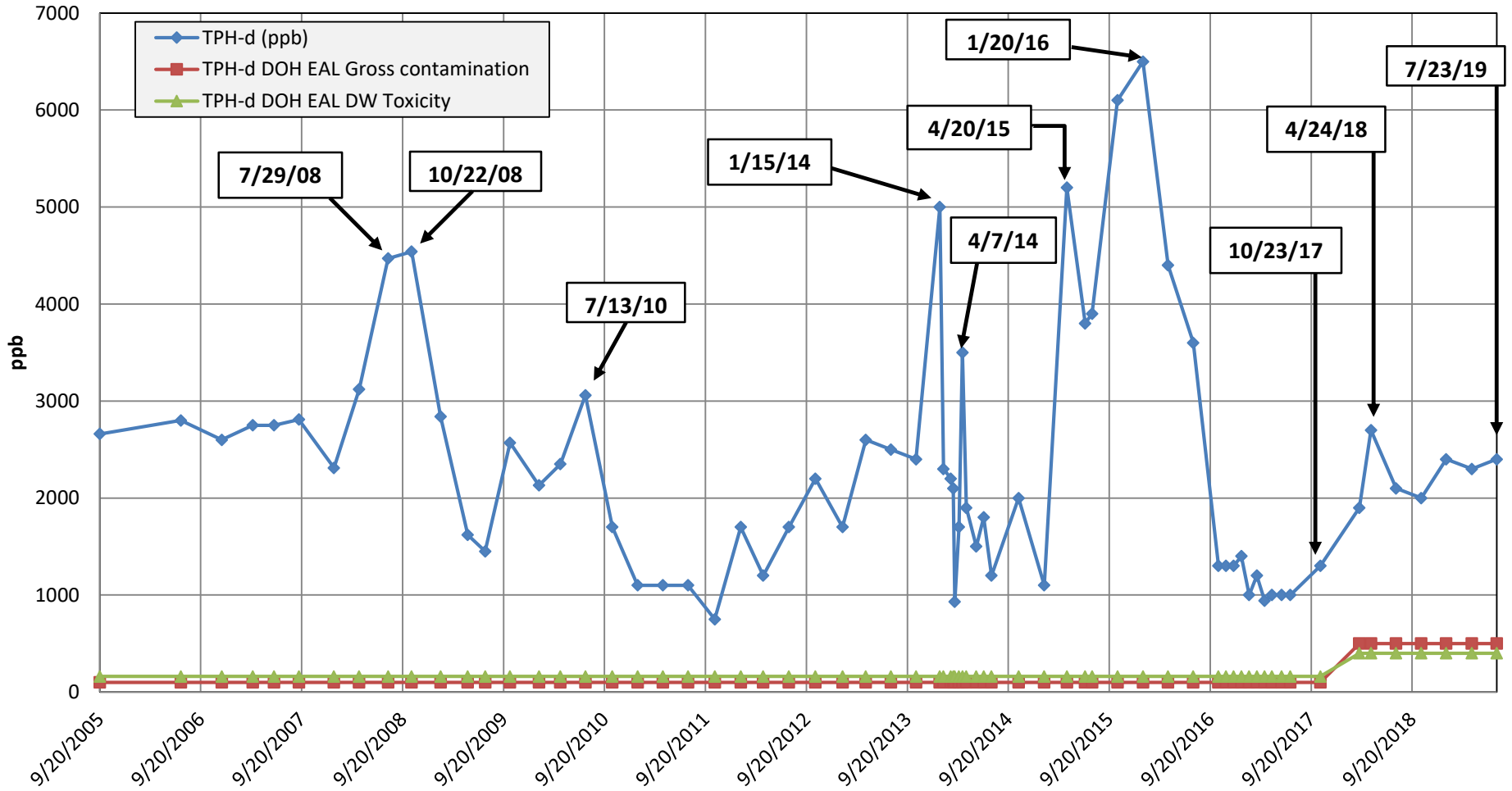
- Basalt rock core samples taken from underneath **19 out of 20 tanks show petroleum stains**.

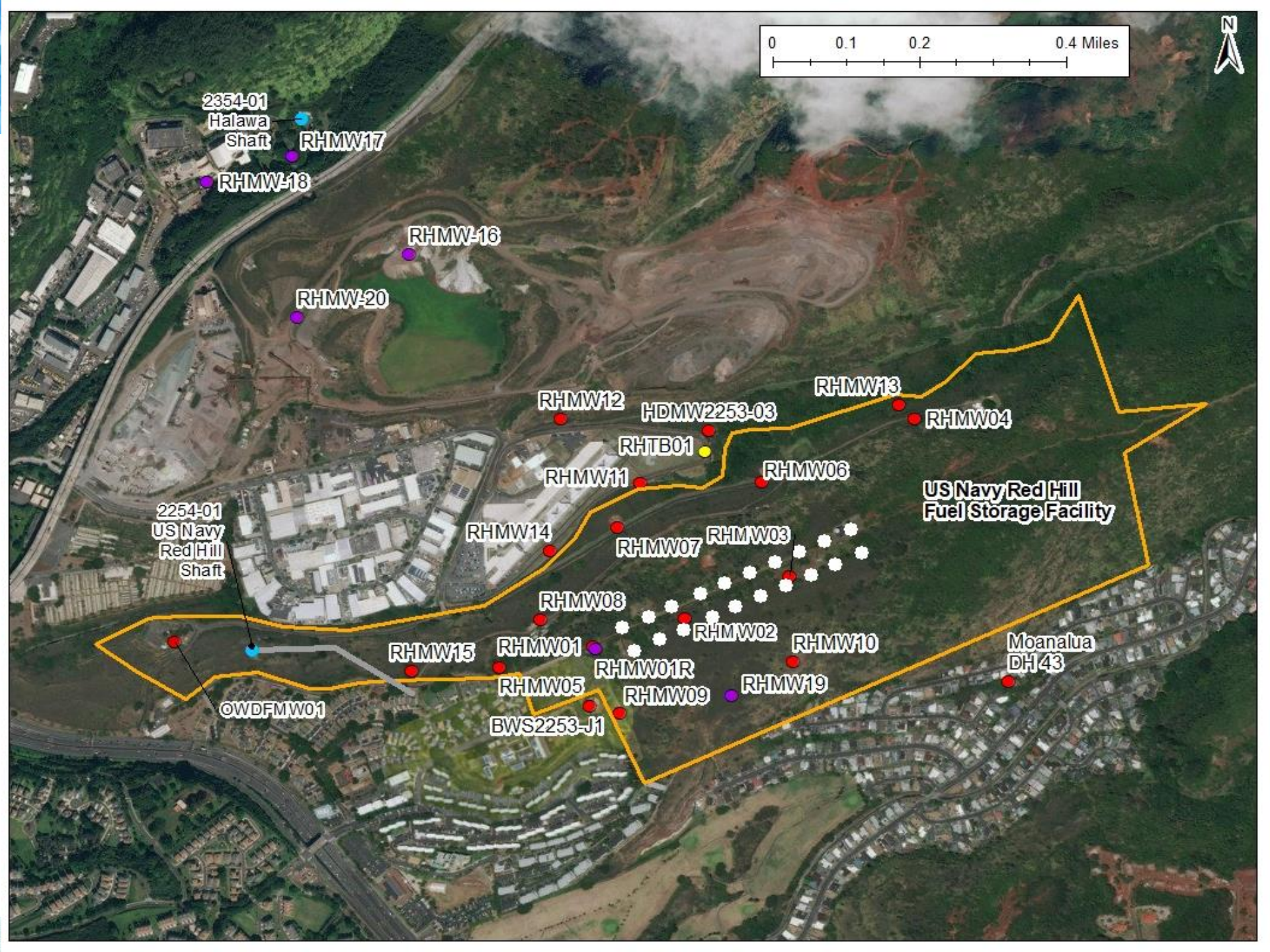


Figure 4-7 Petroleum Stained Core – B16C, 49' to 60'

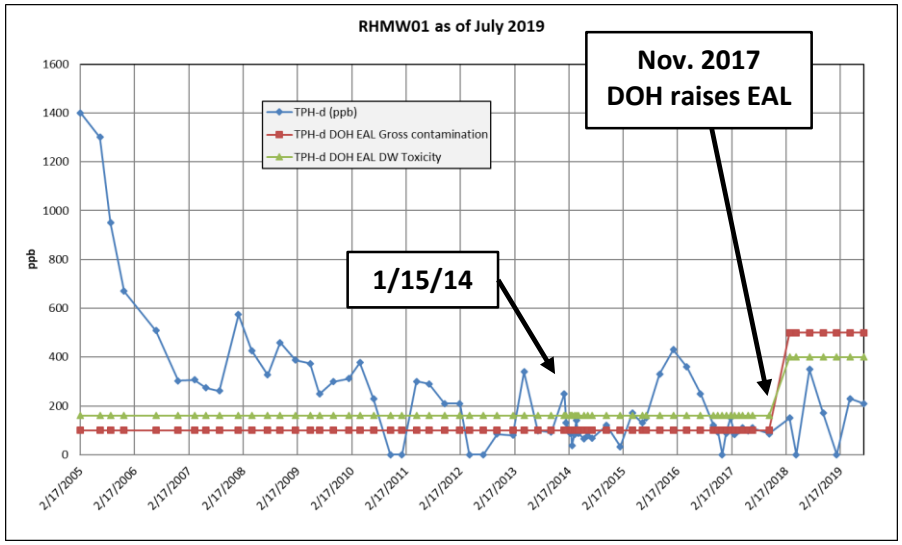
Figure 4-8 Petroleum Stained Core – B16C, 60' to 69'

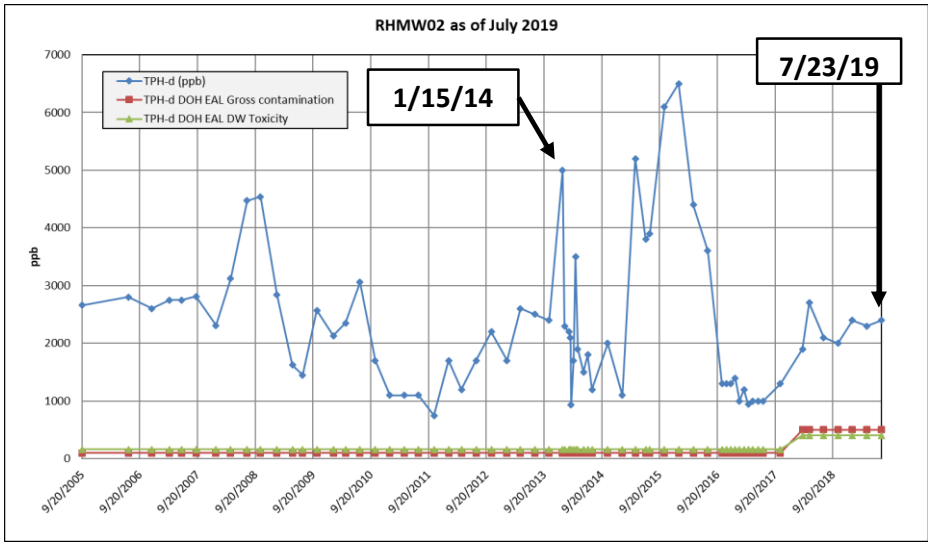
## Groundwater Contamination underneath Red Hill Tank at RHMW02 as of **July 2019** (2019 Q3)

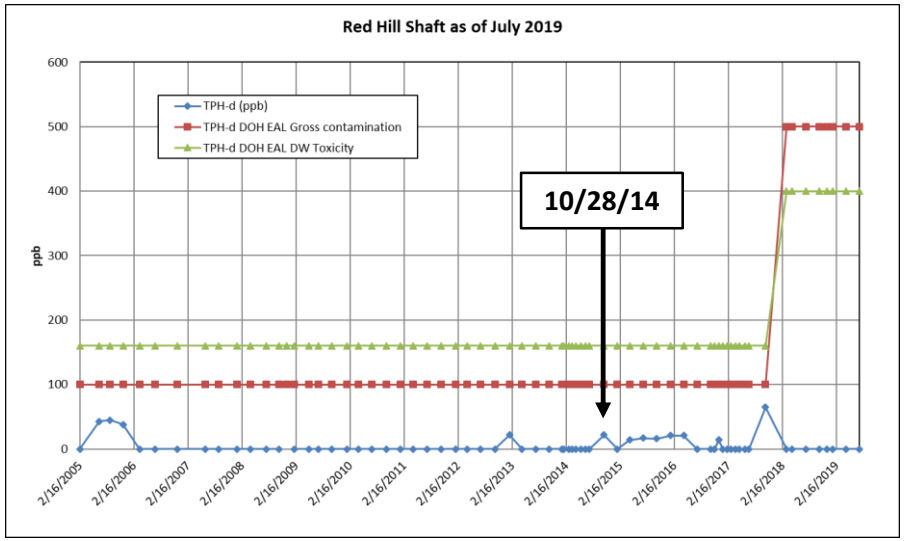


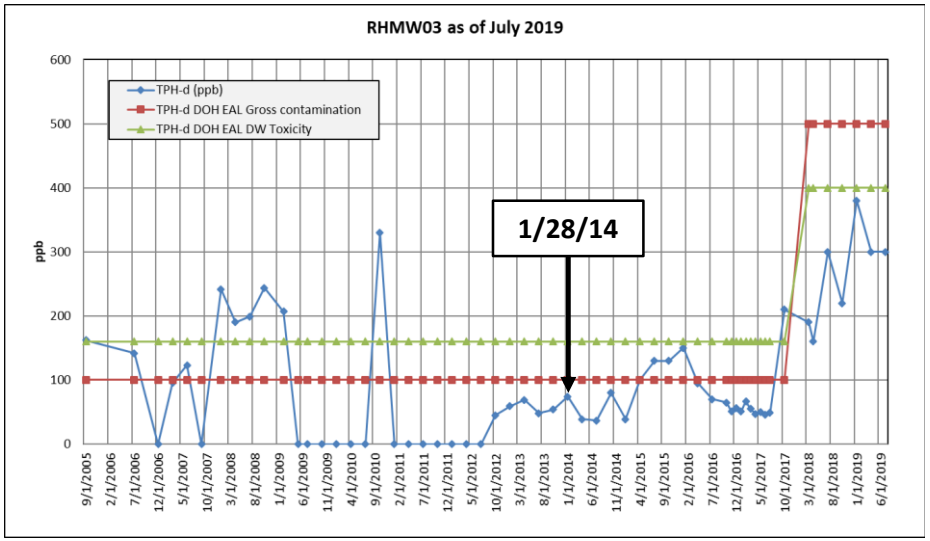

0
0.1
0.2
0.4 Miles
N
2354-01
Halawa
Shaft
RHMW17
RHMW-18
RHMW-16
RHMW-20
RHMW12
HDMW2253-03
RHMW13
RHMW04
RHTB01
RHMW11
RHMW06
US Navy Red Hill
Fuel Storage Facility
2254-01
US Navy
Red Hill
Shaft
RHMW14
RHMW07
RHMW03
RHMW08
RHMW02
RHMW10
Moanalua
DH 43
RHMW15
RHMW01
RHMW01R
RHMW05
RHMW09
RHMW19
OWDFMW01
BWS2253-J1

# Groundwater Aquifer Contamination underneath Red Hill Tanks as of **July 2019** (2019 Q3)



# 2010 Navy Audit

~~FOR OFFICIAL USE ONLY~~

**Naval Audit Service**

**Audit Report**

**Department of the Navy Red Hill and Upper Tank Farm Fuel Storage Facilities**

This report contains information exempt from release under the Freedom of Information Act. Exemptions (b)(2) high and (b)(6) apply.

~~*Do not release outside of the Department of the Navy, or post on non-Naval Audit Websites or in Navy Taskers, without approval from the Auditor General of the Navy*~~

**N2010-0049**
**16 August 2010**

~~FOR OFFICIAL USE ONLY~~

- Findings
  - Groundwater contamination resulting from irregular maintenance and insufficient inspection.
  - Delays in completion of the maintenance cycle due to operational and time constraints.
  - Inability of current leak detection methods in detecting slow, chronic fuel leaks.
  - Non-compliance with terms of the State DOH approved Navy Groundwater Protection Plan (GPP).

# Today's Discussion

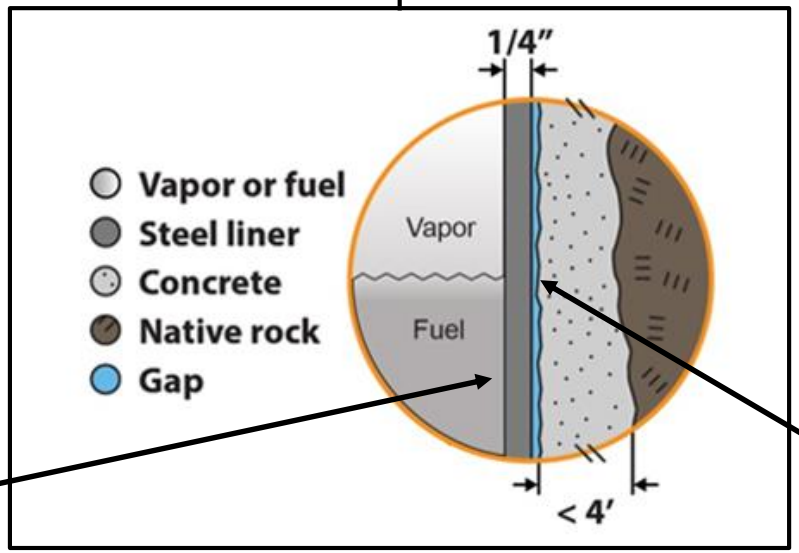
- ✓ Water – a precious resource with unique properties
- ✓ Red Hill Bulk Fuel Storage Facility
  - ✓ Introduction and 2014 fuel leak
  - ✓ Past Navy studies and findings
  - • Red Hill Administrative Order on Consent (AOC)
  - • Tank condition/ destructive testing
  - • Tank upgrade alternative (TUA) selection
  - • Risk and vulnerability
  - • Groundwater flow direction
  - • Navy's UST permit application
  - • DOH proposed UST rule revisions
- • Summary

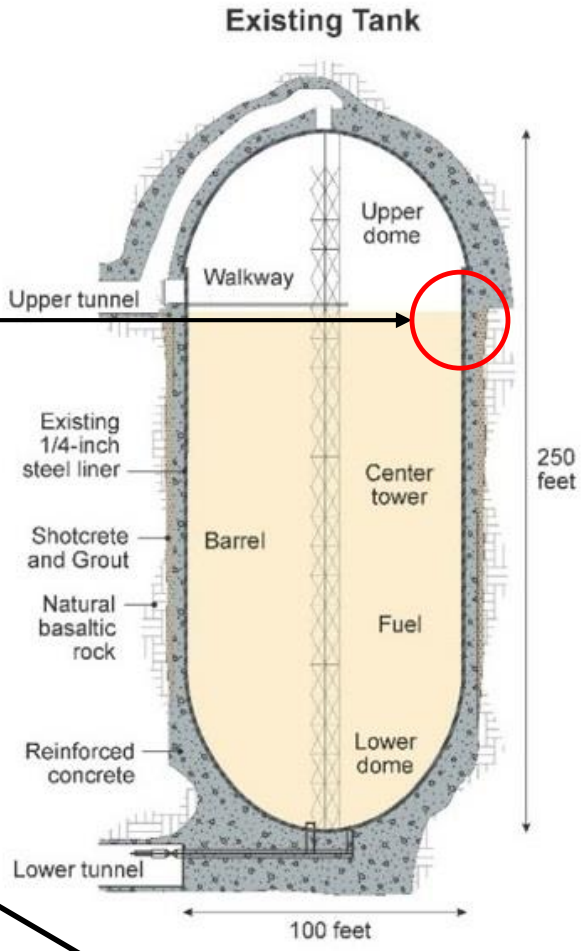
# Red Hill Administrative Order on Consent (AOC)

- Sec 1 – Overall project management, SME, community involvement, meetings, written responses.
- Sec 2 – Tank inspection, repair & maintenance
- Sec 3 – Tank upgrade alternatives
- Sec 4 – Release (leak) detection and tightness
- Sec 5 – Corrosion and metal fatigue
- Sec 6 – Investigation & Remediation
- Sec 7 – Groundwater Protection and Evaluation
- Sec 8 – Risk / vulnerability assessment

# Study Condition of Existing Tank

- Examine fuel side and back side of tanks.

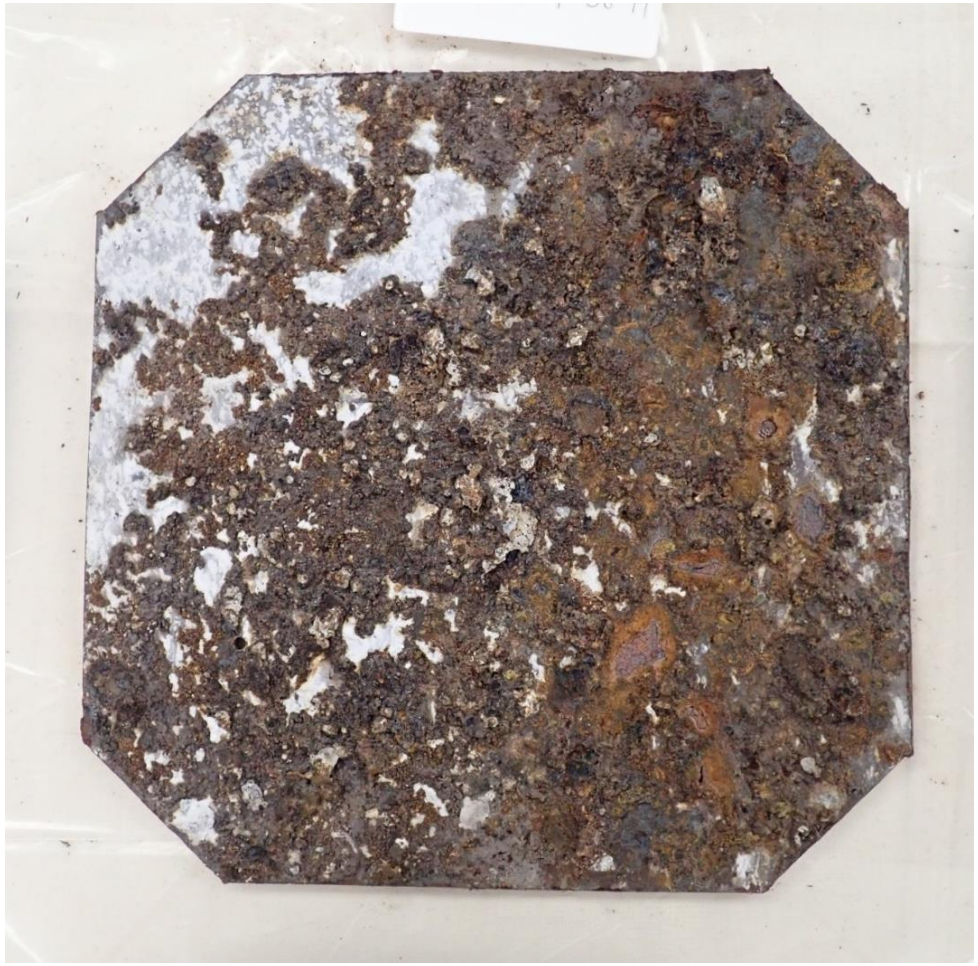



Fuel side of liner

Back side of liner

# (Coupon #7) Barrel – back side

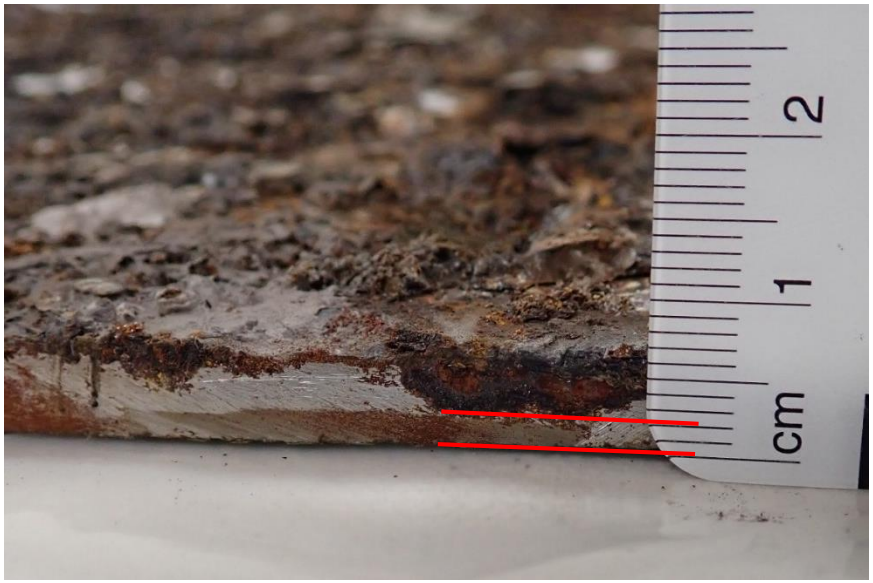


NDE Predictions:

- Minimum remaining thickness: 0.135” to 0.187”

June 25th Observations:

- Apparent remaining thickness: 2mm = 0.079”

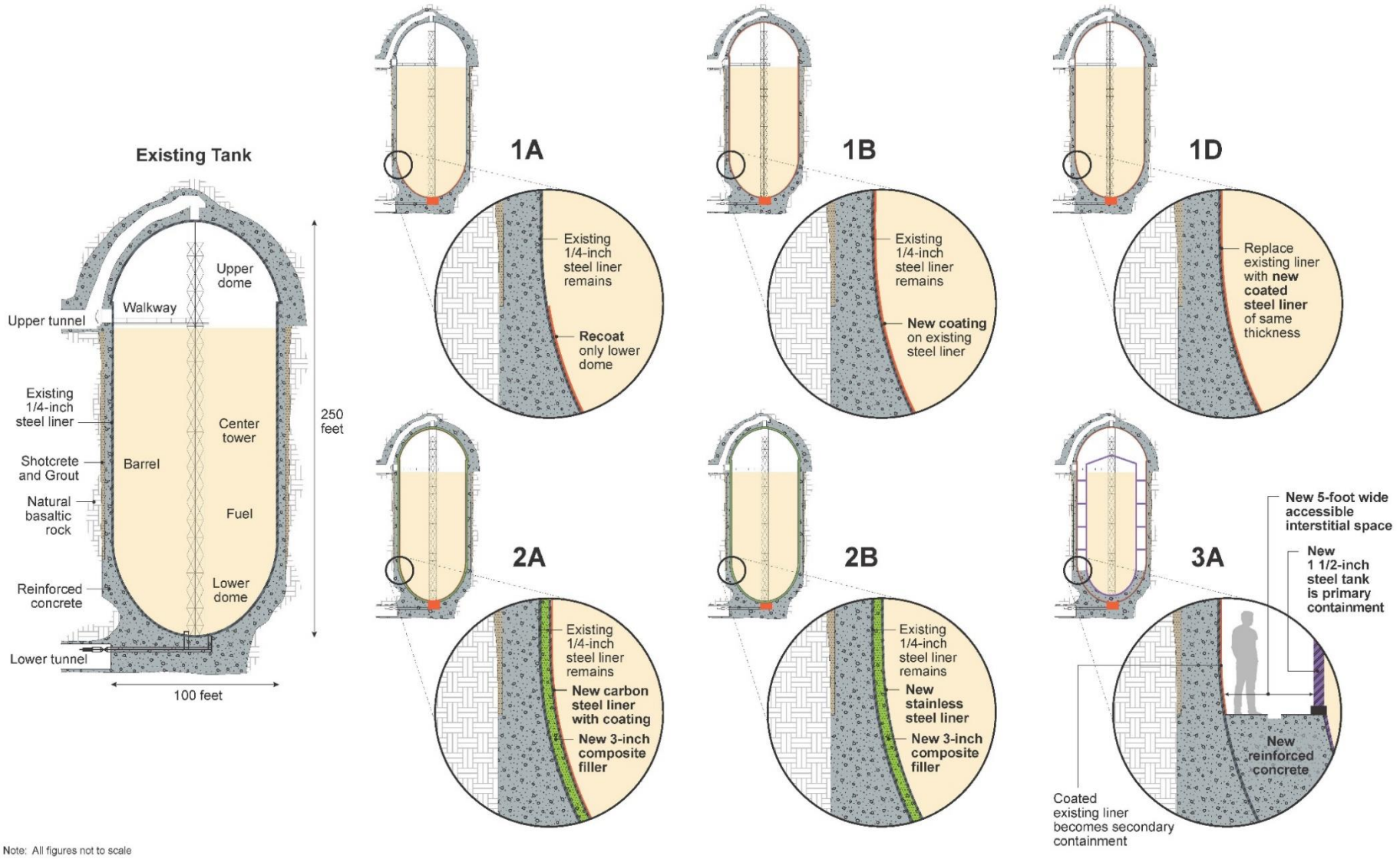


# Destructive Testing Results

- Steel liner samples collected from Tank 14 prove rusting (that leads to through-wall holes) is taking place on the side of the liner that cannot be inspected or maintained
  - Coating the interior surface of a tank does not stop corrosion from occurring on the back side of the liner
- Navy destructive testing report confirms:
  - Navy's nondestructive evaluation (NDE) method cannot accurately and reliably identify areas of the liner in need of repair before the next inspection
  - Navy's NDE both significantly overestimated (Samples 3 & 6) and underestimated (Samples 1 & 5) liner thickness
  - Navy's NDE only found 50% of the coupons in need of repair

# Tank Upgrade Alternatives

Adapted from: Navy, Red Hill AOC SOW Section 3.0 Tank Upgrade Alternatives (TUA), Red Hill Fuel Storage Facility, NAVSUP FLC Pearl Harbor (PRL), Hawaii, Final Report, December 2017; https://www.epa.gov/red-hill/tank-upgrade-alternatives-red-hill

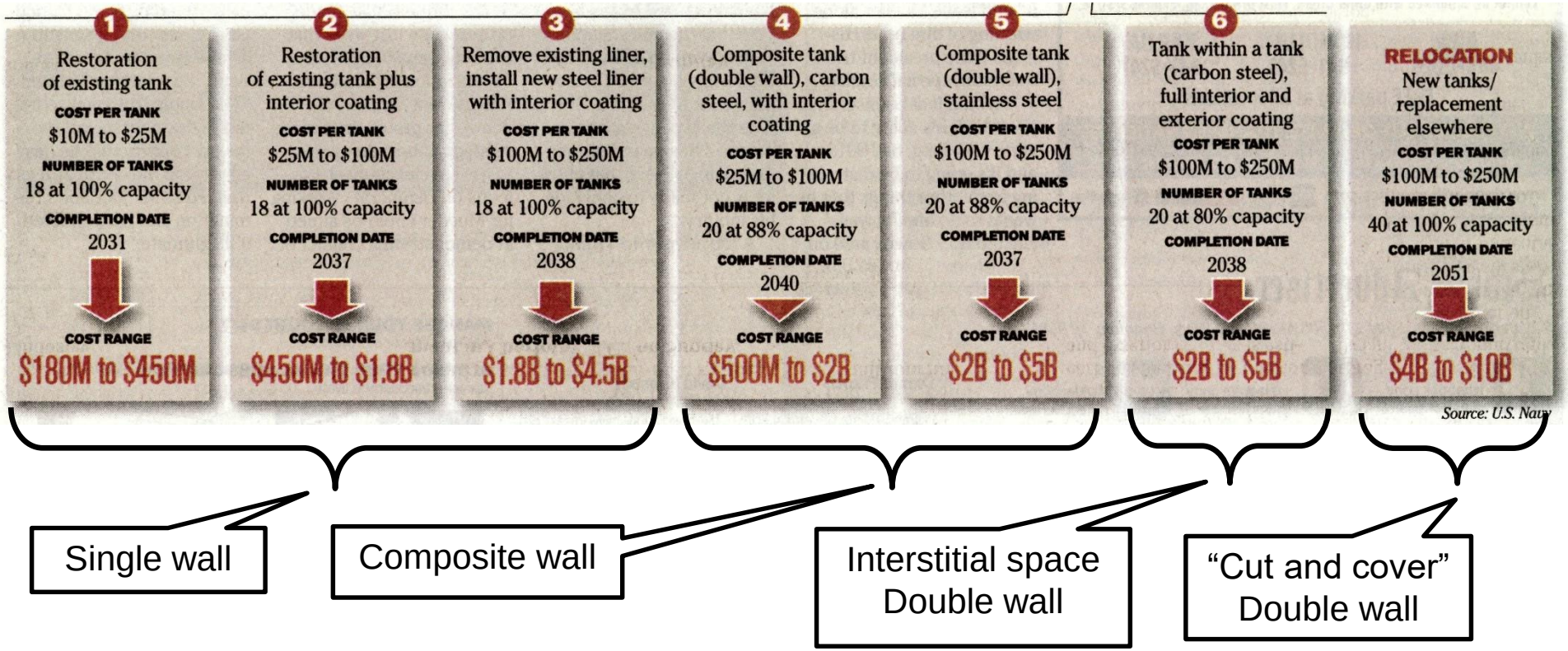



**"Alternative 3A can be constructed in the field at Red Hill using practicable construction means and methods."** Ref. Navy Red Hill Tank Alternatives (TUA) Report, December 2017.

# Tank Upgrade Alternatives

Source: Star Advertiser, March 19, 2018

Alternate Location




**"Alternative 3A can be constructed in the field at Red Hill using practicable construction means and methods."**

Ref. Navy Red Hill Tank Alternatives (TUA) Report, December 2017.

# Alternate Tank Location

- Navy studied 12 potential locations along southern Oahu.
- Navy determined best site was Kapūkaki located mauka of existing Red Hill facility.
- Navy's cut and cover tank artist rendering and tank design.

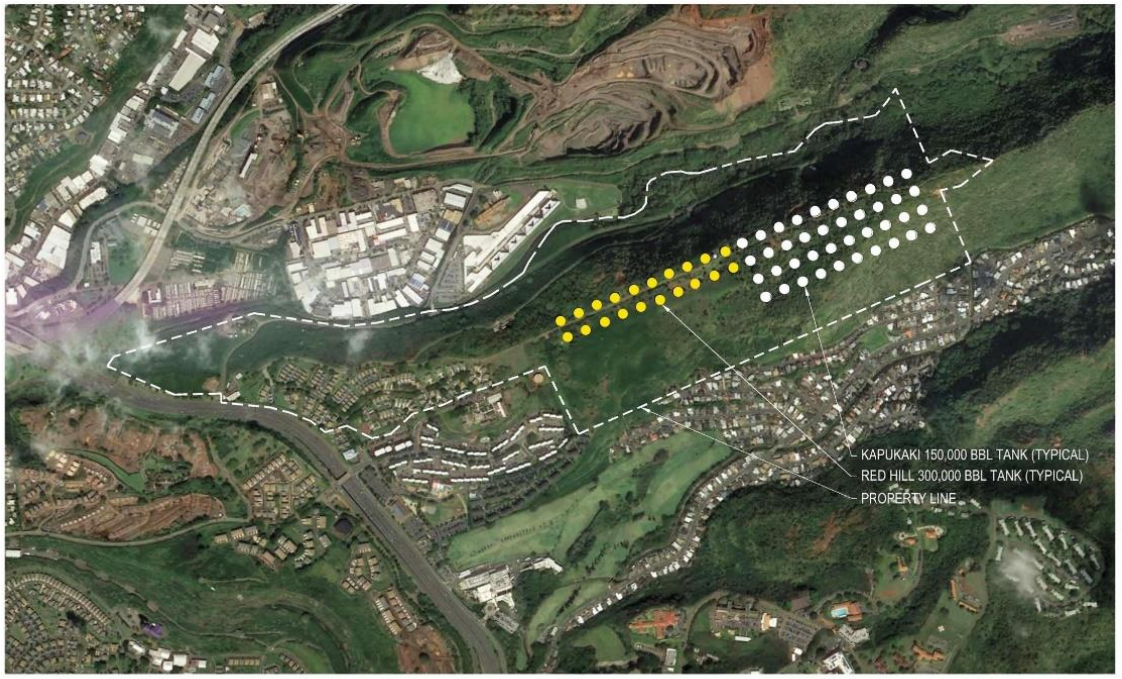
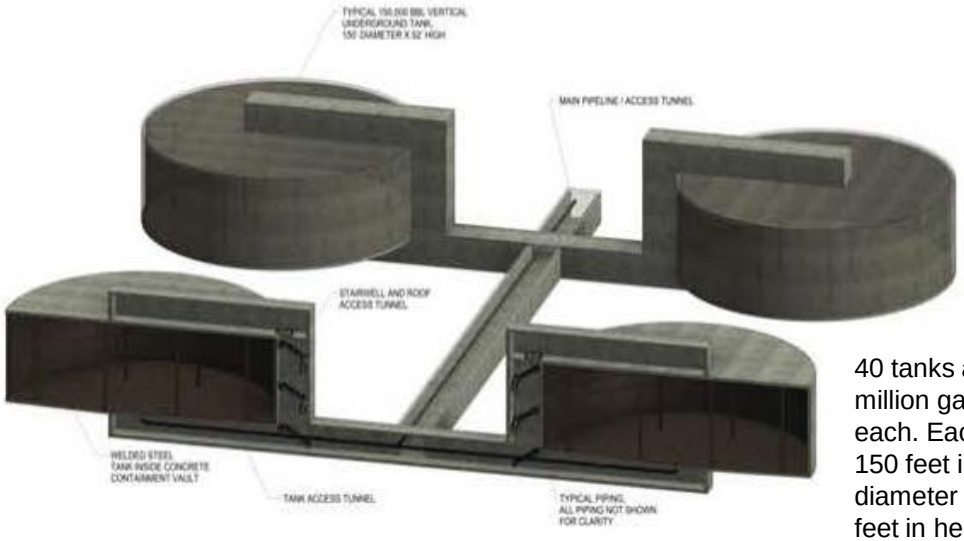
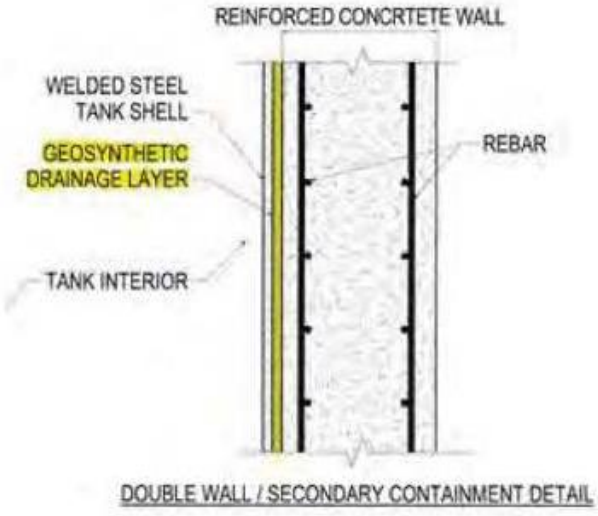



Figure 7.1-1 Kapūkaki Tank Layout

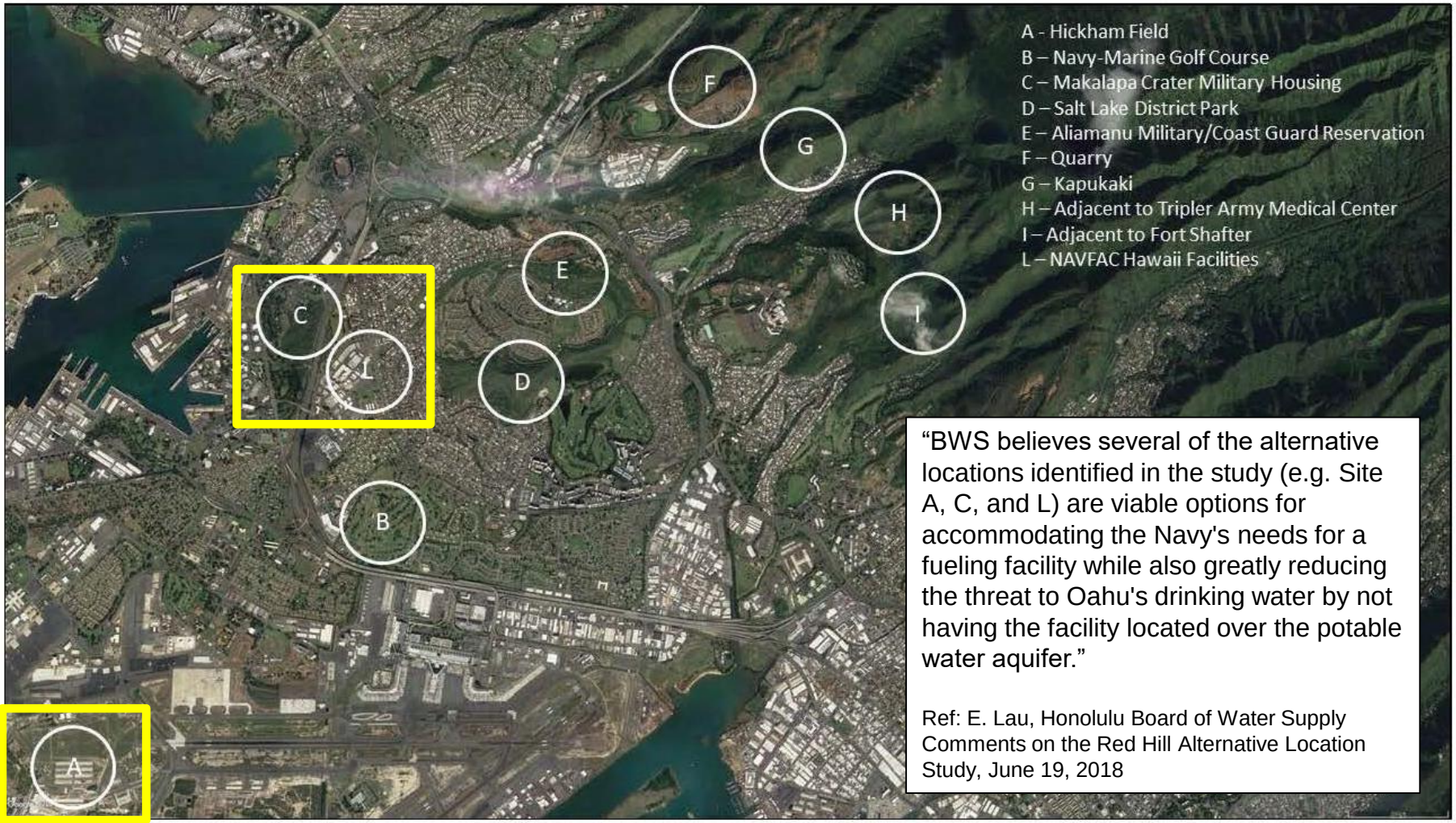
Ref: Red Hill Alternative Locations Study, Revision 3, Austin Brockenbrough Engineering and Consulting, February 5, 2018.




40 tanks at 6.3 million gallons each. Each tank 150 feet in diameter by 52 feet in height.



# Alternate Tank Location – cont.




"BWS believes several of the alternative locations identified in the study (e.g. Site A, C, and L) are viable options for accommodating the Navy's needs for a fueling facility while also greatly reducing the threat to Oahu's drinking water by not having the facility located over the potable water aquifer."

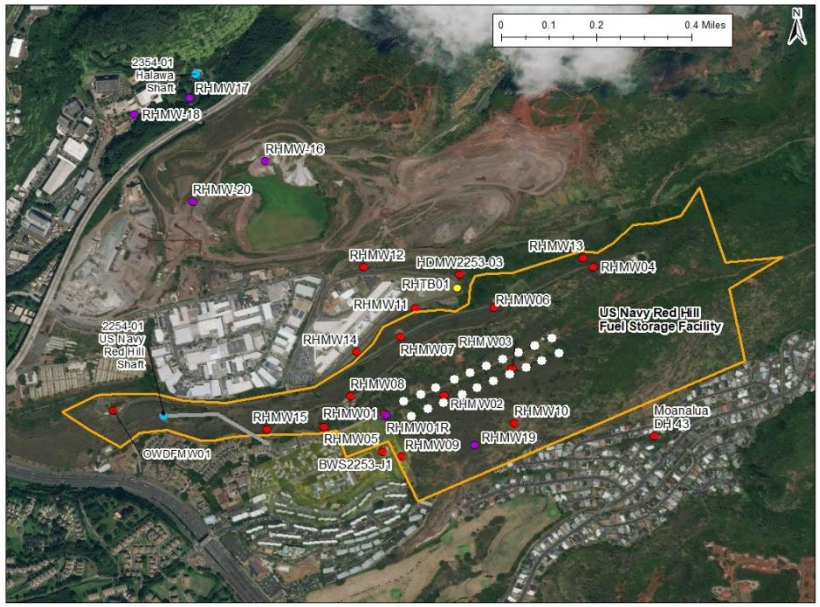
Ref: E. Lau, Honolulu Board of Water Supply Comments on the Red Hill Alternative Location Study, June 19, 2018

Figure 3.3-2 Joint Base Pearl Harbor-Hickam Map

# Alternate Tank Location – cont.

- Red Hill Facility site occupies approx. 144 acres of land.
- Oahu is 598 square miles
- About 137 square miles (23%) of Oahu is covered by caprock.
- 137 square miles is equal to 87,680 acres.

Ref. 1 square mile = 640 acres




# Requirements for a TUA Selection

- The Red Hill AOC requires the Navy to identify, evaluate TUA options and select a TUA "to prevent releases into the environment" (AOC SOW § 3).
- In a August 2019 letter, EPA and DOH made clear the TUA decision selected must "compare the relative environmental performance of each TUA alternative" and "demonstrate to the Regulatory Agencies' satisfaction that groundwater and drinking water resources will be protected".
- Hawaii Revised Statutes (HRS) § 342L-32(b)(1) also expressly provides that underground (fuel) storage tank (UST) systems "shall be … upgraded … and operated to prevent releases … for the operational life of the tank or tank system."

# Navy's TUA Selection

- Retain the existing single-walled tanks and current practices (TUA Option 1A)
- "Implement "double-wall equivalency" or removal of fuel in the 2045 timeframe"
- "Determine feasibility for the potential construction of a water treatment plant or equivalent engineering controls"
- Implement other improvements including among others installing permanent leak detection equipment, conduct soil vapor monitoring, apply epoxy coating to the tank lower domes, install eight additional monitoring wells and conduct a pilot project to consider fully coating tank barrels

# What is "Double-Wall Equivalency"?

- According to the Navy:
  - "Double wall equivalency" is its current work with enhanced leak detection, tank tightness testing, groundwater monitoring, soil vapor monitoring, and measuring the height of the fuel in each tank as layers of protection working together to *"provide redundant elements of detection and capture, equivalent to typical provisions of a 'double wall' solution."*
  - The Navy would also use a water treatment plant to create a "capture zone" around the Red Hill tank facility to prevent the spread of contamination to drinking water sources.

# Concern with "Double Wall Equivalency"

- The objective is to prevent releases from the tanks to the environment by keeping the fuel in the tanks as required by Hawaii law and the AOC
- Leak detection, tank tightness testing, and soil vapor monitoring merely detect and/or measure what is already released to the environment
- Navy's "double wall equivalency" relies upon a water treatment plant that does not exist and that the Navy has not committed to constructing nor proven that it works
- The Navy's reliance on a potential water treatment plant assumes the plant can treat for any amount of fuel released

# Today's Discussion

- ✓ Water – a precious resource with unique properties
- ✓ Red Hill Bulk Fuel Storage Facility
  - ✓ Introduction and 2014 fuel leak
  - ✓ Past Navy studies and findings
  - ✓ Red Hill Administrative Order on Consent (AOC)
  - ✓ Tank condition/ destructive testing
  - ✓ Tank upgrade alternative (TUA) selection
  - Risk and vulnerability
  - Groundwater flow direction
  - Navy's UST permit application
  - DOH proposed UST rule revisions
- Summary

# Past Fuel Releases

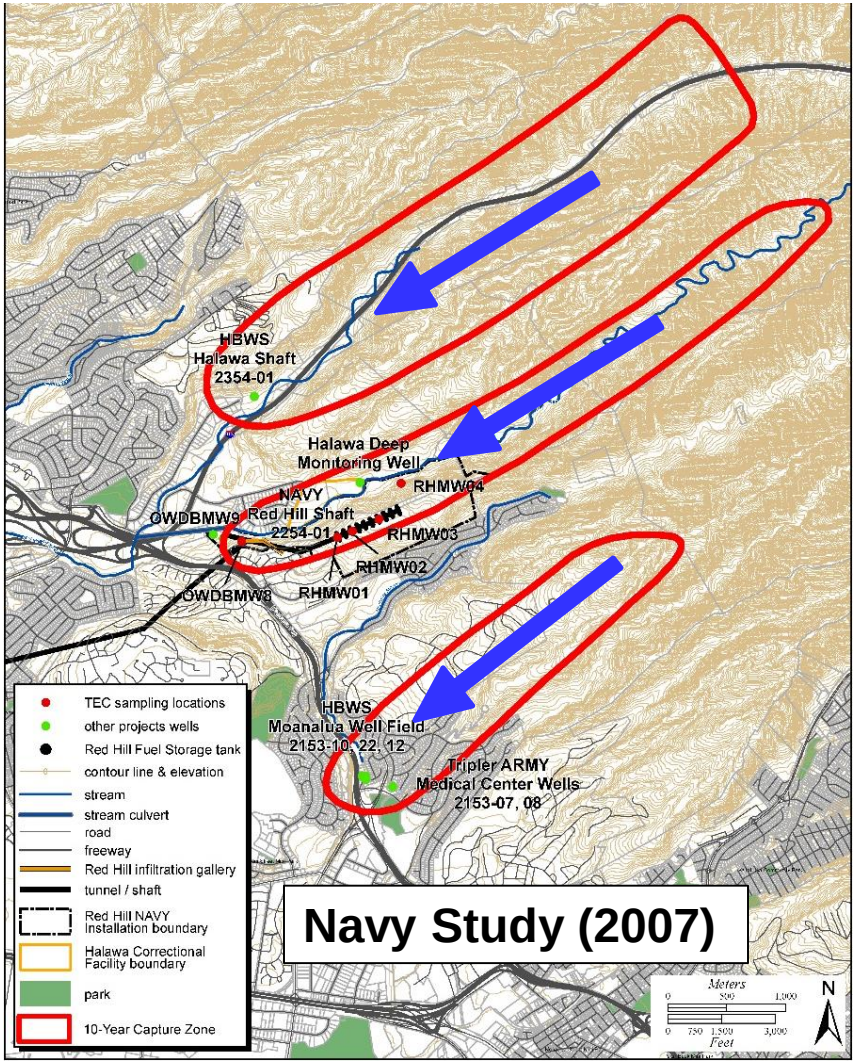
- 2014 Release is **NOT** the Only Release
  - Tank 6 in 2002 (Navy, 2002)
  - Tanks 15 and 16 after 1988 (Navy, 2014)
  - The groundwater data from 2005 to present show petroleum chemical contaminants in groundwater samples
  - 1988 Inspections on Tank 5, Tank 10, Tank 17, Tank 19, Tank 20 identified through-wall corrosion and therefore possibly leaks below the detection limit (Navy, 2016)
  - Petroleum staining found in cores taken before 2014 beneath 19 of 20 tanks (AMEC, 2002)
  - Navy's Red Hill Facility Groundwater Protection Plan (GWPP) report documents leaks from various tanks from 1940s – 1980s (Navy, 2008)

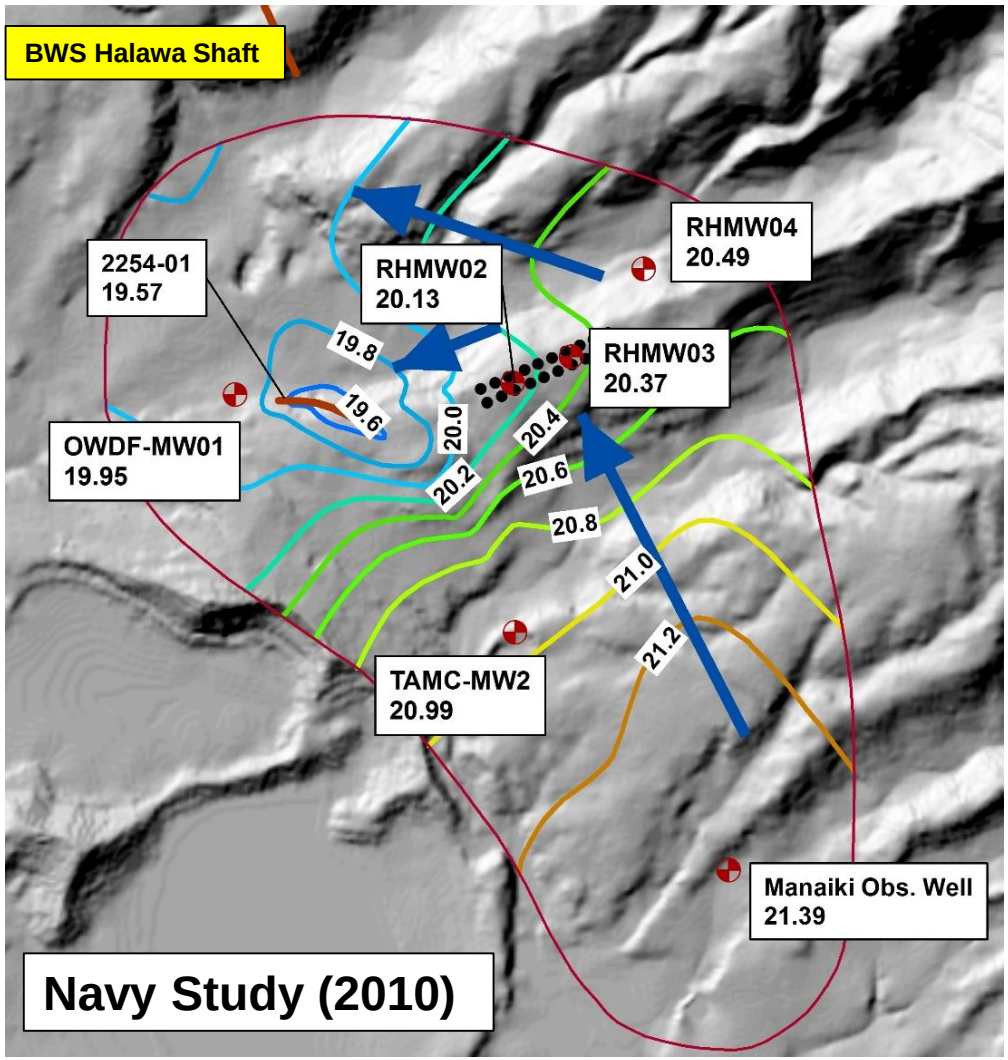
# Risk Assessment Report

- Navy risk assessment prepared by ABS Consulting calculated:
  - Greater than 27% probability of a sudden release of between 1,000 and 30,000 gallons of fuel each year
  - Greater than 34% chance of a sudden release of more than 120,000 gallons of fuel in the next 100 years
  - Greater than 5% probability of a sudden release of more than 1 million gallons of fuel in the next 100 years
  - For chronic, undetected releases, the expected fuel release is 5,803 gallons per year (facility-wide)

    [For example: 25 years x 5,803 gallons/year = 145,075 gallons released]

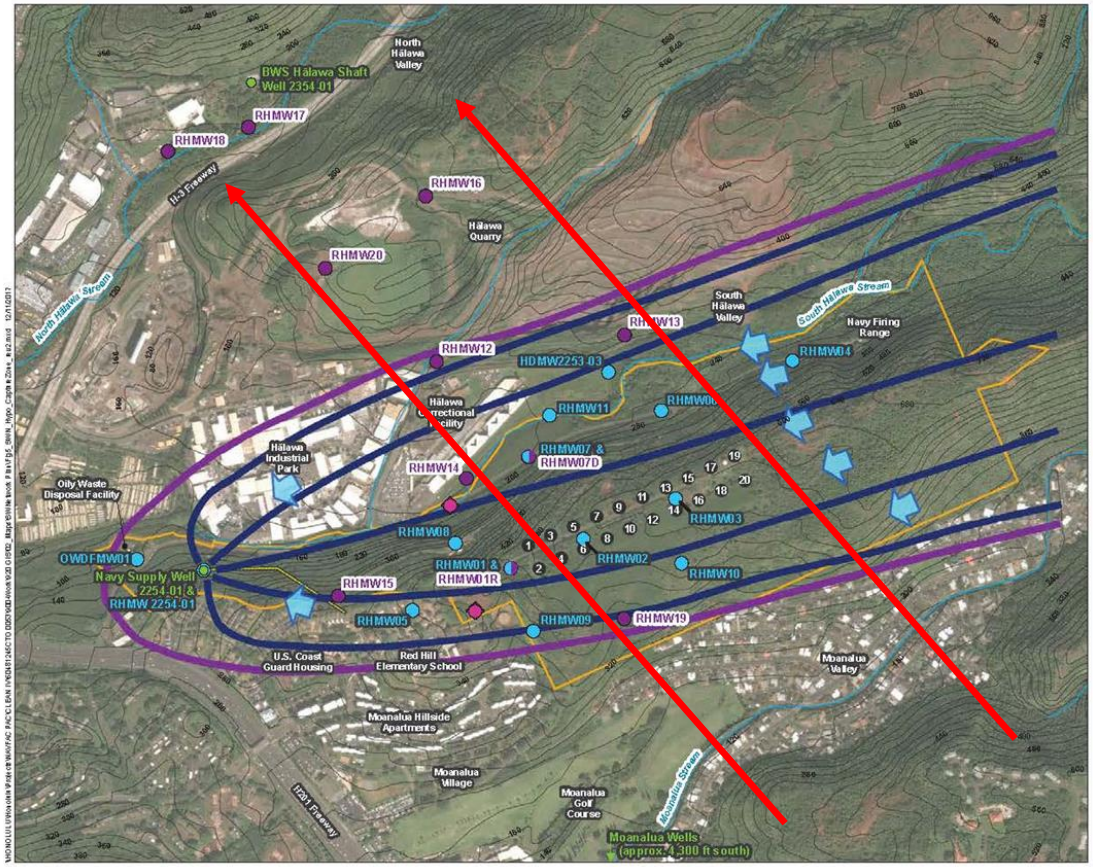
# Navy Study Show Groundwater Flow from Red Hill toward BWS Halawa Shaft



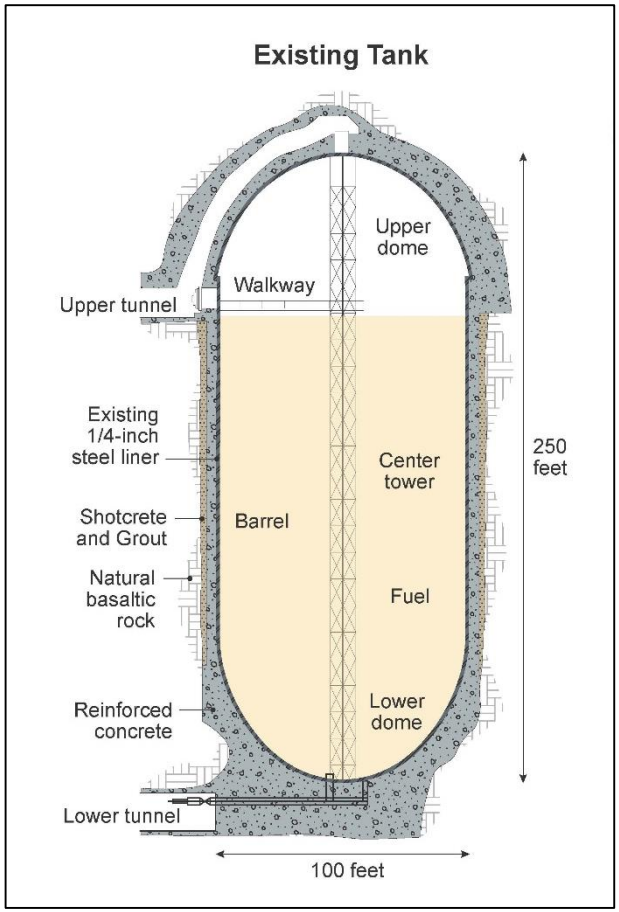



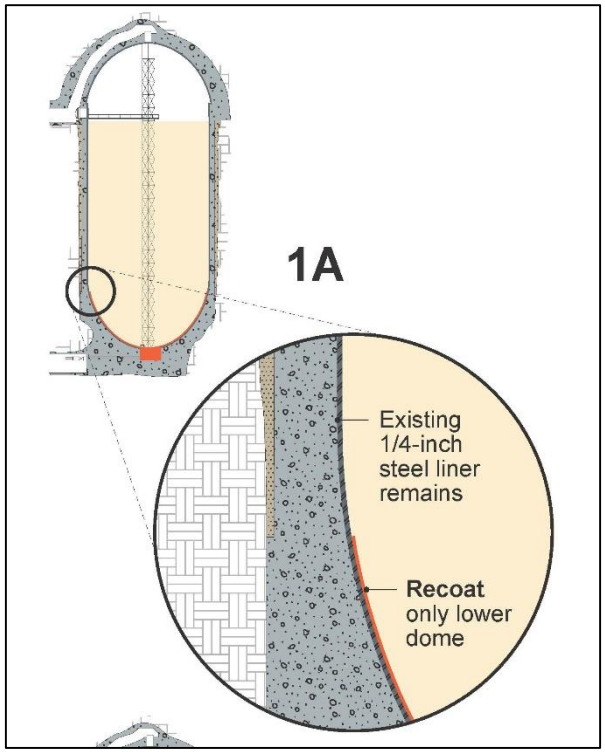
# Groundwater Flow At Red Hill

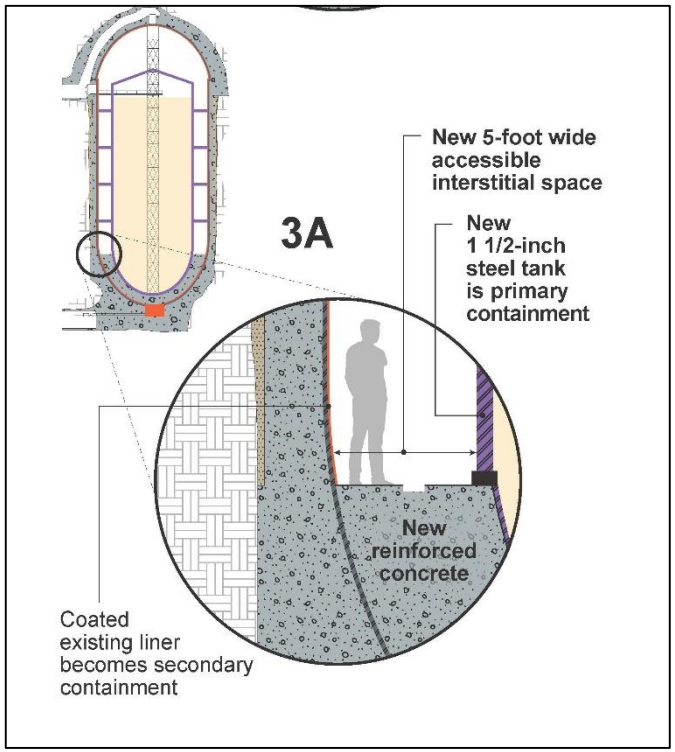
- DOH report says the Navy's groundwater model unable to reproduce measurements recorded in the field.
- Field data shows groundwater can flow from the facility to the northwest toward the BWS Halawa Shaft.
- Claims of subsurface geologic features that isolate Halawa Shaft from the tanks is unsupported.



# Single wall v. Secondary containment



# Navy Permit Application

| | | |
|---|---|---|
| 2018 | July 15 (effective) | DOH revises Hawaii UST rules requiring Navy to obtain a permit to operate Red Hill tanks by July 15, 2019. |
| 2019 | May 23 | DOH accepts Navy permit application. |
| | May 29 | DOH requests public comments until June 29. |
| | June 6 | Sierra Club submits request for contested case. |
| | July 16* | DOH issues letter allowing Navy to operate Red Hill until its decision on the permit application is rendered. |
| | August 14 | BWS requests DOH send written notice of decision regarding Sierra Club's contested case hearing request. |
| | Oct. 15* | BWS first learns of July 16 DOH letter at Navy's public informational meeting. |
| | Oct. 17 | Navy discusses DOH July 16 letter at 4th annual Fuel Tank Advisory Committee meeting. |

# Navy Permit Application – cont.

| | | |
|---|---|---|
| 2019 | Oct. 18 | BWS sends DOH notice of intervenor status concerning the Sierra Club's contested case hearing request. |
| | Oct. 23 | AG sends letter to BWS and Sierra Club that Red Hill to remain operational until completion of contested case. |
| | Oct. 24 | Sierra Club sends letter to DOH demanding contested case commence immediately. |
| | Oct. 29 | BWS sends DOH request for contested case hearing. |
| | Nov. 5 | DOH provides notice initiating process for proceeding with contested case. |
| | Dec. 3 | Pre-conference meeting held. Additional meetings to set schedule and establish parties pending. |

# DOH Proposed UST Rule Revisions

- DOH proposed rule changes
  - Field constructed tanks installed before July 15, 2018 must be provided with secondary containment not later than July 15, 2045
  - Field-constructed tanks not in compliance shall be immediately emptied of all liquids and accumulated sludges and permanently closed
  - Remove the 180 day automatic approval of a complete permit application
- DOH held public hearings on December 2 and 30, 2019

# DOH Proposed UST Rule Revisions – cont.

- BWS comments/concerns
  - The 2045 deadline is too long for installing secondary containment.
  - The deadline imposed by the current UST rules for secondary containment upgrades is July 15, 2038. The proposed 2045 date extends the deadline by seven years without any explanation or technical justification.
  - BWS urged DOH to change the deadline to 2028.

# DOH Proposed UST Rule Revisions – cont.

- Definition of secondary containment should include interstitial space of sufficient size to facilitate the inspection, maintenance, testing, and physical repair of the tank walls.
- BWS supports removing the 180 day automatic approval of a complete permit application if DOH is unable to act within that time.
- All permit applications should be reviewed and include the opportunity for public review and comment to address any community concerns and interest on permits that allow the operations of very large USTs.

# Summary

- Red Hill single wall tanks are not protective of aquifer and environment.
- Facility is over 75 years old and continues to age.
- Fuel contamination already present in groundwater and rocks underneath facility.
- Large volume of fuel stored 100 ft. above aquifer poses risk to sole drinking water resource.
- Facility must satisfy HRS §342L-32 (b)(1)
- Relocate the tanks away from the aquifer if tank-within-a-tank secondary containment is not feasible.

# Questions/Discussion