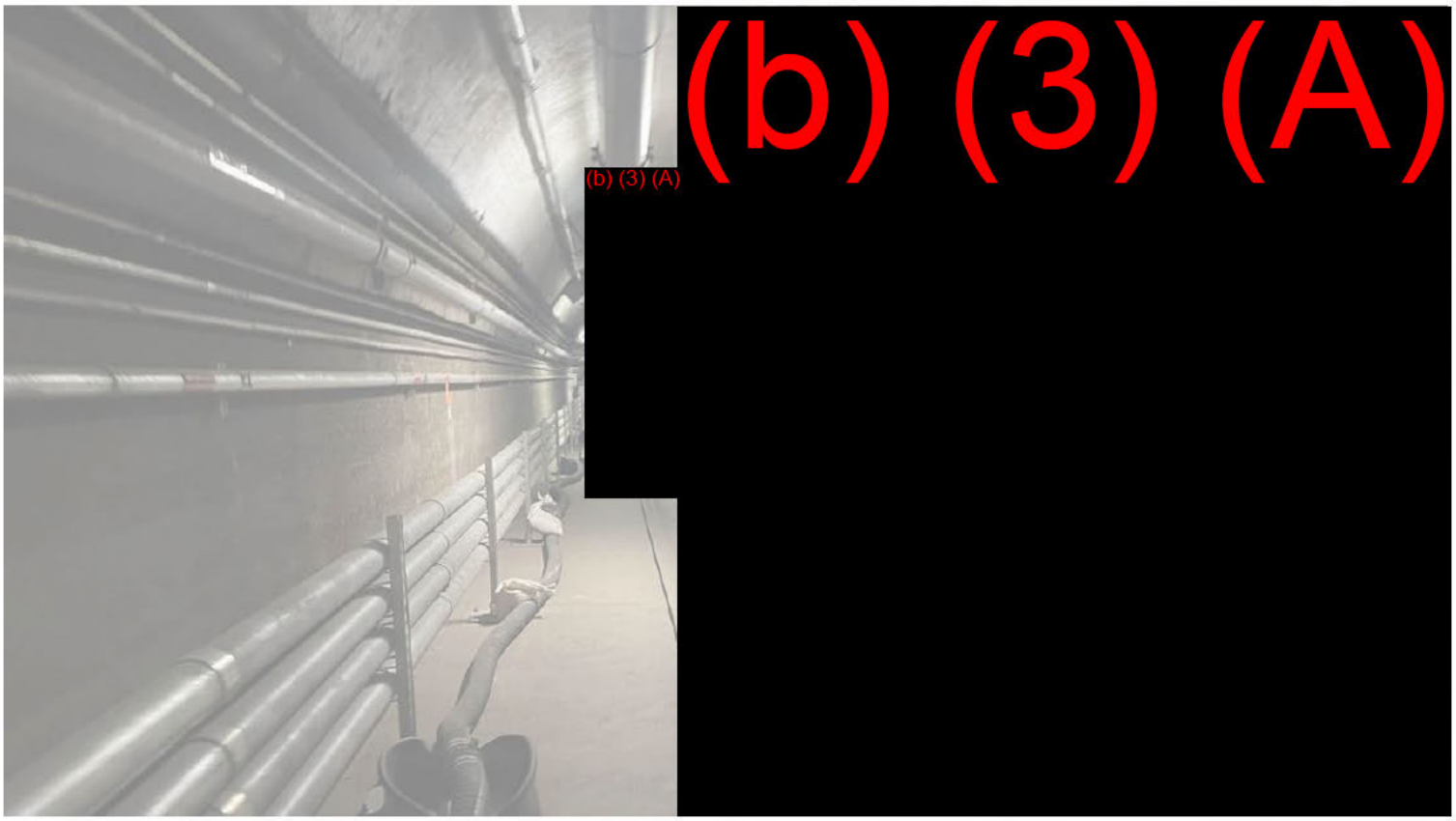
RED HILL FUEL STORAGE FACILITY

Honolulu County



SPILL EXERCISE PLAN

DEPARTMENT OF NAVY

[redacted] THE DOCUMENT FORMAT IS BASED OFF FEDERAL EMERGENCY MANAGEMENT AGENCY MANUALS AND RELIES HEAVILY ON THE INCIDENT COMMAND SYSTEM.

Contents

1 FACILITY DESCRIPTION

1.1 FACIILITY LOCATION

The RHFSF is located in a ridge of volcanic rock known as Red Hill on the western edge (leeward side) of the Koolau Mountains that divides South Halawa Valley and Moanalua Valley. It is approximately 2.5 miles northeast of Joint Base Pearl Harbor Hickam (JBPHH) and occupies approximately 144 acres of land surrounded by Federal, State, and residential property (Figure 1).

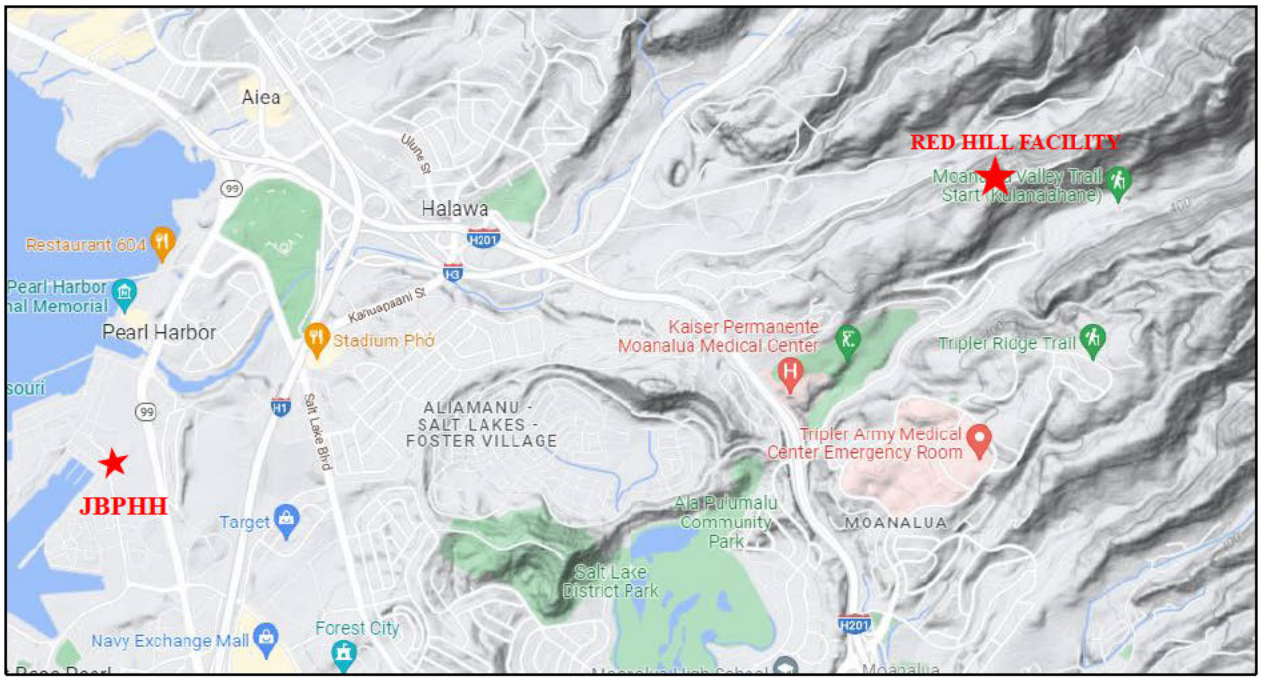


Figure 1: RHFSF Location

Most of the surface topography of the site lies at an elevation of approximately 200 to 500 feet above mean sea level. The Red Hill ridge extends southwesterly toward JBPHH and provides protective cover not only for the underground fuel storage facility, but also for the long tunnel that connects the fuel storage facility with the Underground Pumphouse (UGPH) at Adit 1.

Figure 2 and Figure 3 provide a topographic and three-dimensional view of the facility, respectively, with the RHFSF superimposed on both.

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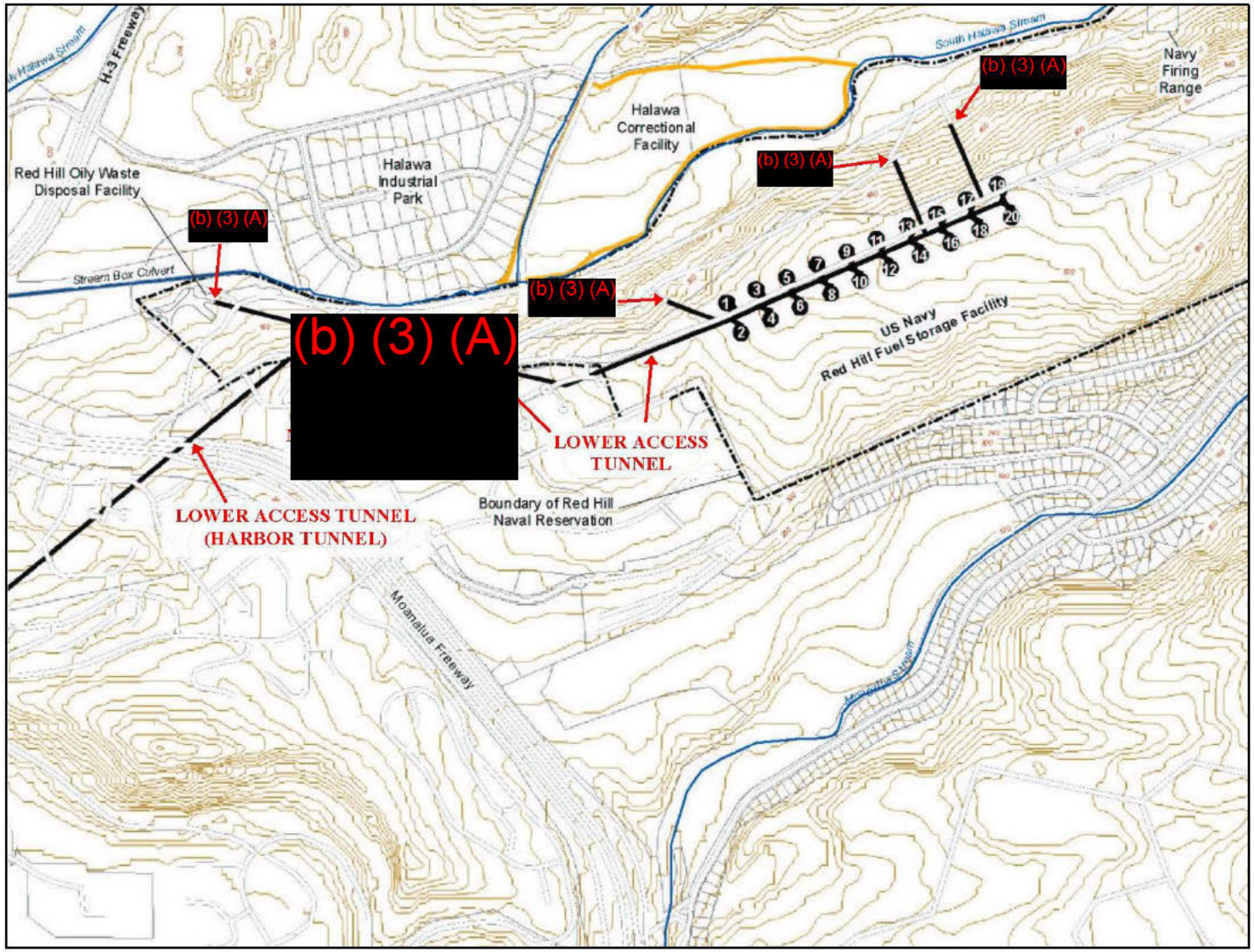

Figure 2: Topographic View of the RHFSF

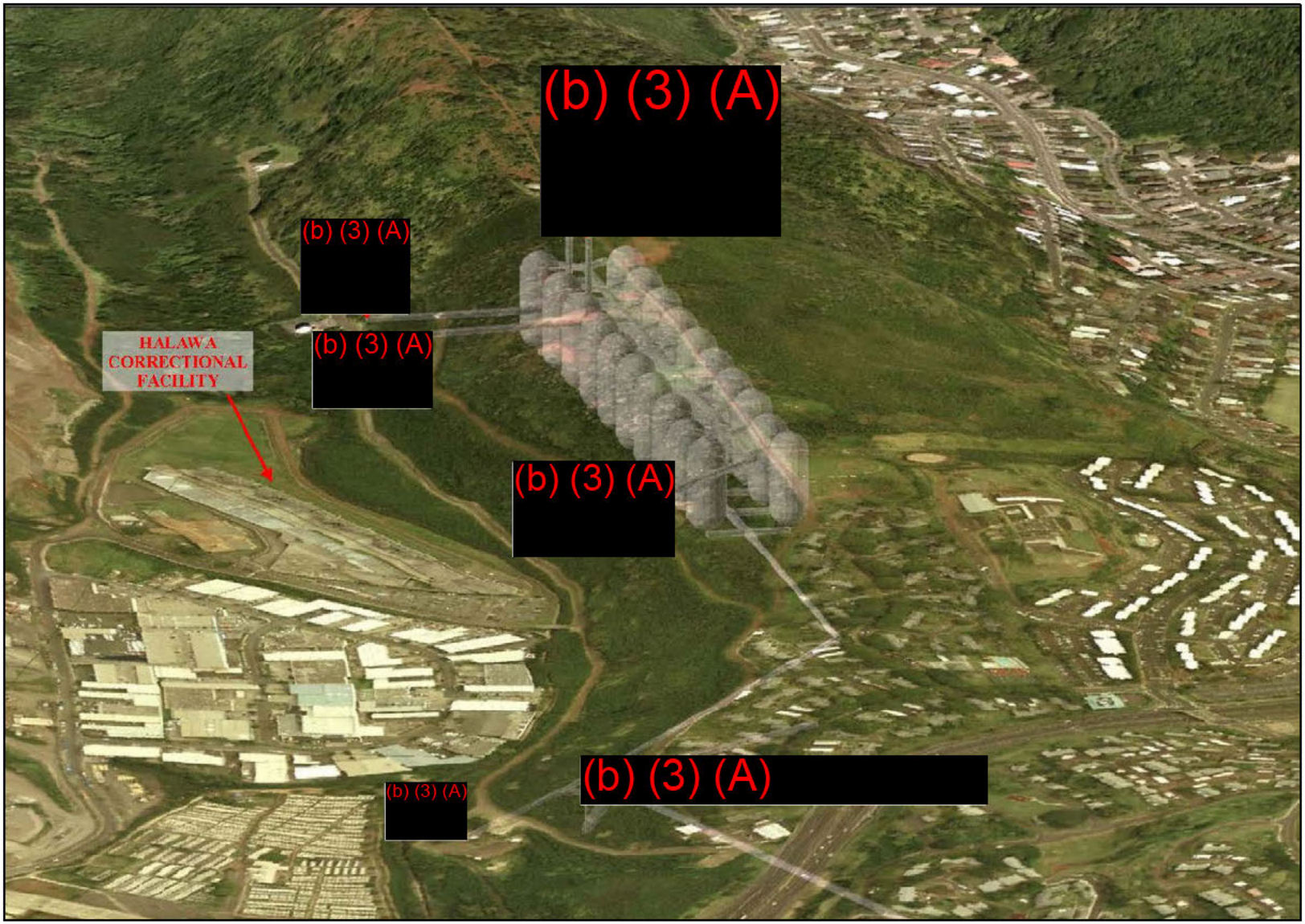

Figure 3: Three-Dimensional View of the RHFSF

1.2 FACILITY DESCRIPTION

Tank Gallery and Pipeline Tunnel

The RHFSF consists of sixteen 302,000-barrel and four 285,500-barrel field-constructed USTs containing Jet Fuel Propellant No. 5 (JP-5), North Atlantic Treaty Organization - grade F-24 jet fuel (F-24), and Diesel Fuel - Marine Grade (DFM/F-76). The tanks are constructed of reinforced concrete and lined with steel. The Primary containment material is steel. The tanks are in subterranean vaults hollowed out of volcanic basaltic rock. Each tank has the form of a vertical cylinder, closed on top and bottom by hemispherical domes. The cylindrical portion of Tanks 1 through 4 has a height of 138 feet. The cylindrical portion of Tanks 5 through 20 has a height of 150 feet. The radius of the cylinder and domes is 50 feet, making the total height 238 (Tanks 1 through 4) and 250 feet (Tanks 5 through 20) and the diameter 100 feet (all tanks). The upper domes of the tanks lie at depths varying between approximately 110 feet and 175 feet below the existing ground surface. Table 1 provides details on the RHFSF storage tanks.

The twenty storage tanks at Red Hill are located 200 feet apart on centers in two straight rows running parallel with the ridge. Two tunnels, the Upper Access Tunnel (UAT) and the Lower Access Tunnel (LAT), centered between the two rows of tanks provide access to the top and bottom of the tanks (Figure 4). The UAT has its floor at the elevation of the spring lines of the upper domes of the tanks. The floor of the LAT is about [redacted] the tank bottoms. Each of the tunnels has branches to the tanks, which are located opposite each other. Adits [redacted] provide access to the UAT and Adit [redacted] provides access to the LAT (Figure 4). Adit [redacted] runs to a service elevator which allows access to both the UAT and LAT. Bulkheads separate Tanks 17 through 20 from the remainder of the tanks in both the UAT and LAT. Both bulkheads have oil and fireproof doors for access through the bulkheads. [redacted] elevators, [redacted], are used for traveling between the UAT and LAT.

The LAT extends from Tank 20 approximately [redacted] to the entrance of the UGPH at grades from [redacted] A typical cross-section of the tunnel is approximately [redacted] by [redacted]. The tunnel walls are lined with gunite (sprayed concrete). A narrow-gauge train track runs the entire length of the LAT on which a battery-powered locomotive operates to haul personnel and supplies.

[redacted] pipelines carry fuel from the storage tanks to the UGPH. The pipeline run down the LAT [redacted]. The F-76 pipeline is [redacted], while the [redacted] JP-5 pipeline is [redacted] the F-76 line and is [redacted], and the [redacted] F-24 pipeline is [redacted] JP-5 pipeline and [redacted]. Along the length of each pipeline are a number of [redacted] Valves [redacted]), which allows the fuel operators [redacted] of the pipeline [redacted] Table 2 provides further details on the RHFSF pipelines and Figure 5 provides a schematic of the pipelines running from the RHFSF to the fueling facilities at JBPHH.

Approximately [redacted] from Tanks 1 and 2, down the LAT (and Adit [redacted] tunnel) is the entrance to Adit [redacted] This entrance [redacted] the lower tank area of the fuel storage facility. At the junction of the Adit [redacted] tunnel and the LAT (the Adit [redacted] resides

U.S. Navy Supply Well [redacted] This well provides [redacted] the potable water used by the JBPHH Water System. In this area, there is also [redacted] for the tunnel. From this junction the LAT (also known as the Harbor Tunnel from this point) continues approximately [redacted] the UGPH. Adits [redacted] provide access to the LAT near JBPHH. Adit [redacted] is the entrance to the UGPH and Adit [redacted] provides access to the [redacted] Tunnel which intersects the LAT. Just inside Adit [redacted] and [redacted] Tunnel, are [redacted]
Access to the [redacted] is restricted by a steel door located at the base of the stairs (in the tunnel) that is [redacted]

An Emergency Oil Pressure Door is located at the end of the tank gallery in the LAT to prevent an accidental release of fuel from flowing down unabated to JBPHH. The door is designed to automatically close when oil is detected in its sump (via a high-level float indicating the sump is full) or a nearby push button is activated. The door can also be closed remotely from the control rooms located in the UGPH and Building [redacted] Closing of the door activates the fire alarm system which sets off audible and visual alarms throughout the facility and alerts the Federal Fire Department (FFD). The door provides a fuel tight seal once closed and is designed to withhold the contents of one of the facility's storage tanks.

Underground Pumphouse

The UGPH is used to transfer the receipt of fuel from Hotel Pier [redacted] into the Red Hill storage tanks. There are four underground surge tanks ([redacted] located at the UGPH, along with associated pump, manifolds, and pipelines. These surge tanks help regulate the flow of fuel into the Red Hill tanks [redacted]

TABLE 1: RED HILL STORAGE TANK DETAILS

Tank ID	Type	Material	Diameter (Ft)	Height (Ft)	[redacted]	Fuel Type	Year Built
Red Hill Storage Tan							
1/0101	UST	RCLWS [1]	100	238		Empty	1943
2/0102	UST	RCLWS	100	238		F-24	1943
3/0103	UST	RCLWS	100	238		F-24	1943
4/0104	UST	RCLWS	100	238		F-24	1943
5/0105	UST	RCLWS	100	250		F-24	1943
6/0106	UST	RCLWS	100	250		F-24	1943
7/0107	UST	RCLWS	100	250		JP-5	1943
8/0108	UST	RCLWS	100	250		JP-5	1943
9/0109	UST	RCLWS	100	250		JP-5	1943
10/0110	UST	RCLWS	100	250		JP-5	1943
11/0111	UST	RCLWS	100	250		JP-5	1943
12/0112	UST	RCLWS	100	250		JP-5	1943
13/0113	UST	RCLWS	100	250		JP-5	1943
14/0114	UST	RCLWS	100	250		JP-5	1943
15/0115	UST	RCLWS	100	250		F-76	1943

TABLE 1: RED HILL STORAGE TANK DETAILS								
Tank ID	Type	Material	Diameter (Ft)	Height (Ft)	Barrels	Gallons	Fuel Type	Year Built
16/0116	UST	RCLWS	100	250	(b) (3) (A)		F-76	1943
17/0117	UST	RCLWS	100	250			JP-5	1943
18/0118	UST	RCLWS	100	250			JP-5	1943
19/0119	UST	RCLWS	100	250			Empty	1943
20/0120	UST	RCLWS	100	250			JP-5	1943
FOR	AST	Steel	21	16			W. Oil	1970
ST1/1224	UST	Steel	60	20			F-24	1942
ST2/1225	UST	Steel	60	20			JP-5	1942
ST3/1226	UST	Steel	60	20			F-76	1942
ST4/1227	UST	Steel	60	20			F-76	1942

Note: RCLWS[1] = Reinforced concrete lined with steel

TABLE 2: RHFSF PIPELINE DETAILS					
Product	Pipeline Material	Diameter (in.)	Length (ft)	Total Volume (gal.)	Containment
F-24	Steel	(b) (3) (A)			Spill kits, Sorbents, and Sump System
JP-5	Steel				Spill kits, Sorbents, and Sump System
F-76	Steel				Spill kits, Sorbents, and Sump System

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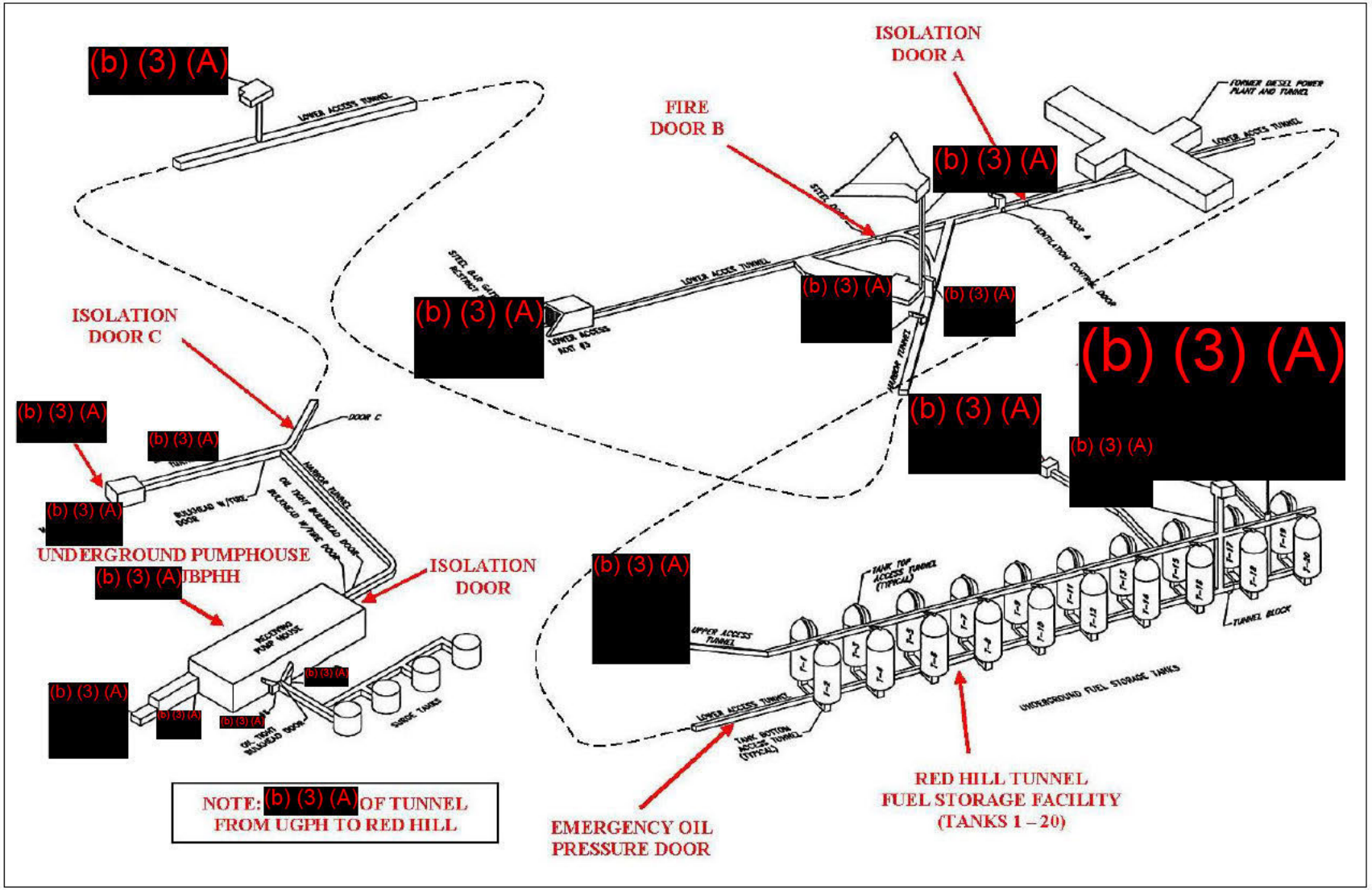

Figure 4: RHFSF Schematic

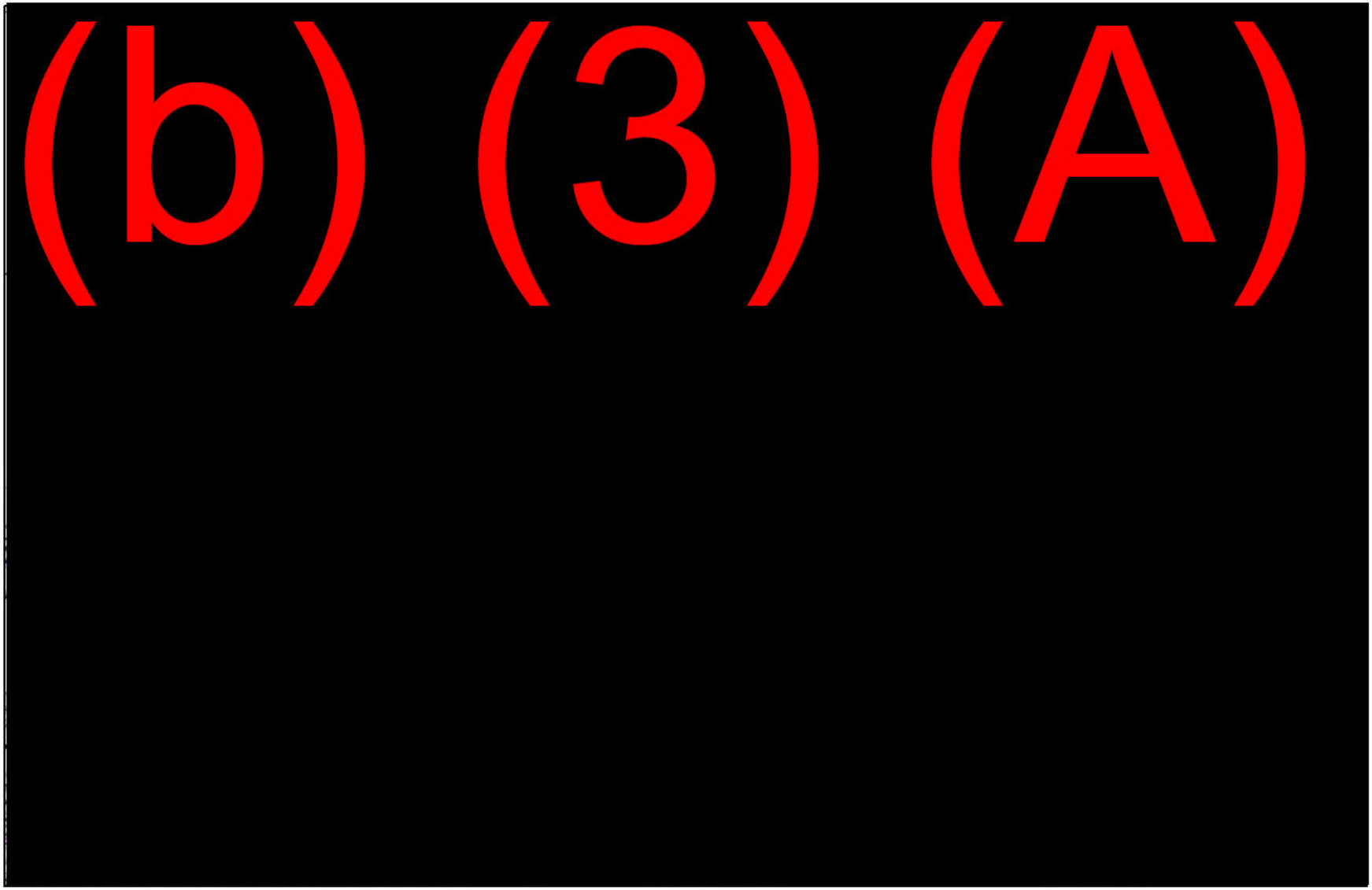

Figure 5: RHFSF Piping Schematic

2 EXERCISE INTRODUCTION

2.1 PURPOSE

The exercise is intended to improve the level of readiness of the Department of Navy (DON) to respond to an oil release at the Red Hill Fuel Storage Facility (RHFSF) by conducting a full-scale exercise involving a large release at the facility that is in full compliance with the Facility Response Plan/Integrated Contingency Plan. The exercise will include representatives from all relevant stakeholders (Hawaii Department of Health [HDOH]; United States Coast Guard [USCG]; United States Environmental Protection Agency [EPA]; DON; and Oil Spill Response Organizations [OSROs]) who will be involved in the planning and execution of the exercise.

This Exercise Plan includes the scenario, purpose, objectives, notification call tree, and other relevant materials related to the exercise to be conducted on 22 September 2022. This is a living document that will be updated based on stakeholder input.

2.2 EXERCISE RESPONSE PLAN CORE COMPONENTS

1. Notifications - During this exercise internal and external (NRC, SERC, LEPC) notifications will be made. *
2. Staff Mobilization – Personnel mobilization will occur. Personnel will be mobilized to: Establish Incident Command Posts (ICPs), Staff the Emergency Operations Center (EOC) and Deploy equipment at a minimum. *
3. Ability to operate within response management system – During the exercise, personnel will demonstrate operating within a response management system. *
4. Source control – The Fuel Control Room, will demonstrate source control by simulating closure of isolation valves (MOVs) within the RHFSF. *
5. Assessment – Site assessment will be simulated during the exercise. A HAZMAT team from Federal Fire Department (FFD) will conduct air monitoring at key areas, including ventilation shafts and adit entrances at the RHFSF. IMT will also assess impacts to lower Halawa Stream and ecologically sensitive areas that support protected species. *
6. Containment – The exercise will demonstrate the ability of the DON to contain the discharge at the source (RHFSF) or at various other locations (Halawa Stream, Pearl Harbor) for recovery operations. *
7. Mitigation – The exercise will demonstrate the ability of the DON to mitigate the discharged fuel through the implementation of countermeasures i.e., diversionary barriers, interrupted preferential pathways, etc. *
8. Protection *
    i. Booming – Active booming will occur during the exercise
    ii. Water intake protection – Protection of the Red Hill drinking water aquifer
    iii. Wildlife recovery and rehabilitation – Protection of ecologically sensitive habitat
    iv. Population protection – FFD will conduct air monitoring at key areas such as ventilation shafts and Adit entrances to assess public health risk.
9. Disposal
10. Communications – The exercise will demonstrate the ability to establish and effective communications system for the response organization by exercising the RHFSF

Notification Call Tree and through the activation of the EOC. *
11. Transportation – The exercise will demonstrate the ability to provide effective multimode transportation (land and waterborne) related to response operations. *
12. Personnel Support -
13. Equipment Maintenance Support -
14. Procurement – The exercise will demonstrate the ability to establish an effective procurement system.
15. Documentation - Demonstrate the ability of the response organization to document all operational and support aspects of the response and provide detailed records of decisions and actions taken. *

*Indicates that this Core Element of the Response Plan will be exercised in some capacity.
Note: Not all Core Elements of the Response Plan listed above need to be demonstrated during each exercise.

2.3 EXERCISE SCOPE

Spill Discover notification through deployment of containment and recovery resources.

2.4 EXERCISE OBJECTIVES

The objectives of the exercise are to:

- Demonstrate capabilities to stand-up response in timely manner that includes the deployment of containment and recovery assets commensurate to the release.
- Demonstrate capacity to institute a Unified Command approach.
- Complete ICS forms 201, 202, 207 in the EOC.

2.5 EXERCISE GOALS

- Evaluate the readiness of the Joint Base Pearl Harbor Hickam (JBPHH) and Commander Navy Region Hawaii (CNRH) to respond to a large fuel release at the RHFSF.
- Evaluate the amount of time it takes to deploy containment and recovery assets.
- Evaluate the capabilities of JBPHH/CNRH to institute the Incident Command System (ICS) and establish a Unified Command (UC).
- Evaluate the amount of time it takes to establish Incident Command Posts (ICP) at the Scene.
- Evaluate the amount of time it takes to stand-up the Emergency Operations Center (EOC).
- Evaluate the amount of time required to make necessary notifications.

At the end of this exercise, participants should be able to:

- Demonstrate the ability to alert, mobilize, and activate personnel for emergency response.
- Demonstrate the ability to mobilize resources in support of emergency operations.
- Demonstrate the ability to operate within an ICS and establish an UC.

2.6 PLANNING CELL/EXERCISE PARTICIPANTS

- CNRH
- Fleet Logistics Command (FLC)
- Hawaii Department of Health (HDOH)
- JBPHH
- Port Operations/Facility Response Team
- United States Coast Guard (USCG)
- United States Environmental Protection Agency (USEPA)

2.7 EXERCISE MATERIALS

This plan includes the information that the Exercise Controller will need to facilitate and track the exercise. The plan includes:

- The overall purpose and scope of the exercise.
- Exercise objectives and goals.
- A description of the pre-exercise activities required to prepare for the exercise.
- Instructions for conducting the exercise.
- Instructions for debriefing the exercise.
- The exercise scenario and supplemental materials.
- Written description of the scenario including figures and maps.
- Facility figure and response maps
- The exercise scenario, all required injects, a description of the expected participant response, and messages to distribute to the exercise participants involved with making notifications.
- Supplemental information that the participants may request to help them make decisions during the exercise (e.g., Safety Data Sheets (SDSs)).
- Participant evaluation worksheets.
- Exercise Evaluator worksheets
- Copy of the RHFSF Notification Call Tree.

2.8 EXERCISE ASSUMPTIONS

The exercise is based on the following assumptions:

1. Jurisdictions have an up-to-date Hazardous Materials Annex (or a Hazardous Materials Plan that conforms to the requirements of the Superfund Amendments and Reauthorization Act (SARA) Title III; and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and the Emergency Planning and Community Right-to Know Act (EPCRA)).
   CERCLA information can be found at:
   http://www.epa.gov/superfund/action/law/cercla.htm
   EPCRA information can be found at: http://es.epa.gov/techinfo/facts/pro-act6.html
2. Exercise participants whose responsibility it is to manage hazardous materials responses are knowledgeable of Department of Transportation (DOT) placarding and labeling requirements and the National Fire Protection Association (NFPA) 704 Diamond.
   DOT placarding and labeling requirements can be found at: www.dot.gov

NFPA 704 Diamond information can be found at www.nfpa.org

3. Exercise participants whose responsibility it is to manage hazardous materials responses are familiar with and able to use the Emergency Response Guidebook (ERG).
4. Exercise participants must be trained to the appropriate level in ICS and hazardous materials response as required by the Occupational Safety and Health Administration (OSHA) and NFPA.
5. The Controller must have specialized knowledge in HazMat, HazMat response, and/or conducting exercises/trainings.
6. Exercise participants whose responsibility it is to manage HazMat responses are familiar with the ICS and the requirements of the National Incident Management System (NIMS) and OSHA regulations, 29 CFR Part 1910.120 to implement ICS on all domestic responses. This information can be found at the following Web addresses:
   ICS courses: http://www.training.fema.gov/EMIWEB/IS/crslist.asp.
   NIMS documents: http://www.fema.gov/emergency/nims/index.shtm.
   29 CFR Part 1910: http://www.access.gpo.gov/nara/cfr/waisidx_03/29cfr1910_02.html

   Note that the participants should assume the resources for the exercises are those that are typically available for HazMat incidents.

2.9 PRE-EXERCISE ACTIVITIES

The Controller (or other exercise coordinator) must complete several pre-exercise activities to ensure that the exercises run as smoothly as possible. These activities involve:

- Establishing a date for the exercise: Select a date far enough in advance of the exercise to allow the participants enough time to arrange their schedules. Allow at least 1 month's lead time between the time the participants are notified and the scheduled exercise date. – 22 September 2022
- Exercise Development & Determination of Resource Needs: Form a planning committee with representatives from the different stakeholder groups expected to participate in the exercise. Hold regular meetings to facilitate exercise development and foster stakeholder buy-in. Reserve a meeting room that is large enough to accommodate the planning committee. Determine a scope for the exercise that establishes a clear starting point and end point. Once the scenario, goals, objectives, and response/exercise actions are established determine resources needed for the exercise. Be sure to include resources needed to effectively track the drill. Procure necessary equipment.
- Invite the participants: After setting a date and reserving a working space, prepare a written invitation to all potential exercise participants.
  The invitation should include:
  - The date and location of the meeting.
  - Starting and ending times.
  - Directions to the site, if necessary.
  - Future meeting dates and locations.
  - Contact information for the meeting organizer.
- Resource Inventory and Equipment Check: An inventory of resources needed to conduct and track the exercise should be re-visited a day or two ahead of the exercise. An

equipment check should occur to ensure all equipment is in good working order ahead of the exercise.

- Pre-Exercise Briefing: A pre-exercise briefing should be held to re-visit the exercise objectives, scenario including maps and figures, notification call tree, expectations, roles and responsibilities, and anticipated actions. Safety concerns should be discussed. Pre-scripted messages and exercise equipment should be distributed as appropriate. Exercise radio frequency established and communicated to participants and a communications check should also take place. Controller identifies exercise locations and assigns an evaluator for each location to be assessed. Distributes Evaluator Assessment Forms based on locality and/or objectives. **Note: Encourage participants to write down information during notification calls so information is not lost. Communicate that all notifications and radio use should start with Exercise, Exercise then message and complete with Over.**

2.10 REVIEWING THE EXERCISE MATERIALS

Before conducting any exercise, be sure to review the exercise background information, the timeframes for conducting the exercise, and all other exercise materials thoroughly. To make the exercise more realistic, feel free to tailor the exercise description, maps, and other materials to the jurisdiction.

Supplemental exercise materials are included. These materials include information such as Safety Data Sheets (SDSs). Be sure to make at least one copy of all supplemental materials for the exercise so that they can be provided to the participants, if requested. Encourage the participants to ask questions and request supplemental information throughout the exercise.

Because the Controller is critical to exercise success, he or she should also review and become familiar with the RHFSF FRP and Red Plan as well as local policies and procedures required for an OHS response.

2.11 CONDUCTING THE EXERCISE

Individuals should plan to be at their respective locations an hour ahead of time on the exercise day. A final communications check should be conducted 15 minutes prior to the commencement of the exercise. An Athoc notification to base personnel will be sent to notify personnel that the JBPHH is in an exercise environment prior to exercise commencement.

Follow the steps below to conduct the exercises:

1. Pre-exercise communications check.
2. Initiate and track exercise via Exercise Control.
3. Upon completion of the exercise, the Exercise Controller should, with the assistance of Evaluator's, debrief the group. Debriefing instructions are included in this Manual.

The Controller's primary responsibility is to facilitate the exercise, keep the exercise on track, and answer questions intended to clarify information contained in the scenario or message. The

Controller is also responsible for maintaining the official exercise clock. If necessary, the Controller can direct corrective actions and make decisions regarding any significant deviations in the scenario caused by unexpected developments during the exercise.

The success of the exercise depends on the involvement of all participants.

2.12 EXERCISE SAFETY

During the exercise briefing safety concerns of exercise participants should be discussed and addressed. Safety of personnel should never be compromised for the sake of the exercise. Every participant has the capability and responsibility to halt the exercise if a safety concern arises. When commuting between one location and another care should be taken to obey laws. Vehicle operators must drive the speed limit and use hand-free devices for communications.

2.13 DEBRIEFING THE EXERCISE

At the conclusion of the exercise, the Controller will debrief exercise participants, with the assistance of Exercise Evaluator(s). The purpose of the debriefing is to provide immediate feedback to the exercise participants on:

- Whether the exercise objectives were met.
- Areas that worked well during the exercise as well as those that require attention by way of revision to the plan, policies, or procedures, potential training needs, etc.

The debriefing should also serve to solicit feedback, suggestions, and strategies from exercise participants.

Make the debriefing as interactive as possible. Obtain the participants' input before providing feedback from the Evaluator. For example, ask the participants for their impressions of the exercise and what they learned by participating. Then, follow the steps below to debrief the exercise:

1. Read the exercise objective.
2. Ask the participants whether they achieved the objective. Ask for additional comments, suggestions, and strategies for lessons learned, mitigation strategies, and areas of improvement, if appropriate.
3. Ask the Evaluator to provide his or her rating of whether the objective was achieved, together with the feedback about why he or she rated the objective that way.
4. Provide constructive feedback about how to make improvements in the areas related to the objective. Be sure to keep the discussion positive.
5. Allow the participants to comment on the evaluation and your suggestions.

Repeat this procedure until all the objectives have been covered.

Finally, distribute the evaluation forms. These forms are designed to collect information from all exercise participants, the Controller, and the Evaluator to gain their general impressions on and

feedback from the exercise. Ask the participants to complete the form and complete a form yourself. Be sure to collect the forms before the participants leave the debriefing. Use the feedback to improve the conduct of future exercises.

Note: Do not try to resolve every issue during the debriefing. It is more important that the participants understand and record areas where improvement is required and identify a basic strategy for making the improvements after the exercise.

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PHASE II FULL SCALE EXERCISE: RHFSF TANK GALLERY

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3 UNPACKING INFORMATION AND INCIDENT SCENARIO

3.1 UNPACKING INFORMATION

For repairs to take place at the RHFSF, existing fuel in the JP-5, F-24, and F-76 pipelines need to be remove or unpacked. The estimated volume of fuel in the JP-5 pipeline (b) (3) (A) (b) (3) (A). Approximately (b) (3) (A) JP-5 will be (b) (3) (A) yard oiler navy (YON) (b) (3) (A) Pearl Harbor. The remaining (b) (3) (A) will be removed from the pipeline using (b) (3) (A) and transferred to Tank (b) (3) (A). Concept of Operations (CONOPS) for the transfer of JP-5 to (b) (3) (A) Pier are provided on (b) (3) (A) with CONOPS for transfer of JP-5 to Tank (b) (3) (A) via (b) (3) (A) provided on Figure

The estimated volume of fuel in the F-24 pipeline (b) (3) (A) (b) (3) (A). Approximately (b) (3) (A) F-24 will be transferred to Tank (b) (3) (A) at Hickam Airfield using the existing F-24 pipeline. The remaining (b) (3) (A) will be removed from the pipeline using (b) (3) (A) and transferred to Tank (b) (3) (A) CONOPS for the transfer of F-24 to Hickam Airfield is provided on Figure (b) (3) (A) with CONOPS for transfer of F-24 to Tank (b) (3) (A) via (b) (3) (A) provided on Figure

The estimated volume of fuel in the F-76 pipeline (b) (3) (A) (b) (3) (A). Approximately (b) (3) (A) F-76 will be (b) (3) (A) YON (b) (3) (A) The remaining (b) (3) (A) will be removed from the pipeline using (b) (3) (A) over (b) (3) (A) and transferred to Tank (b) (3) (A) CONOPS for the transfer of fuel to the YON (b) (3) (A) is provided on (b) (3) (A), with CONOPS for transfer of F-76 to Tank (b) (3) (A) via (b) (3) (A) provided on (b) (3) (A) (b) (3) (A)

(b) (3) (A) be stationary and used as a passthrough to transfer fuel from one pipeline to another. (b) (3) (A) be positioned on secondary containment with a capacity (b) (3) (A) of the capacity of (b) (3) (A). (b) (3) (A) and the (b) (3) (A) and recently developed standard operating procedures for (b) (3) (A) will be implemented.

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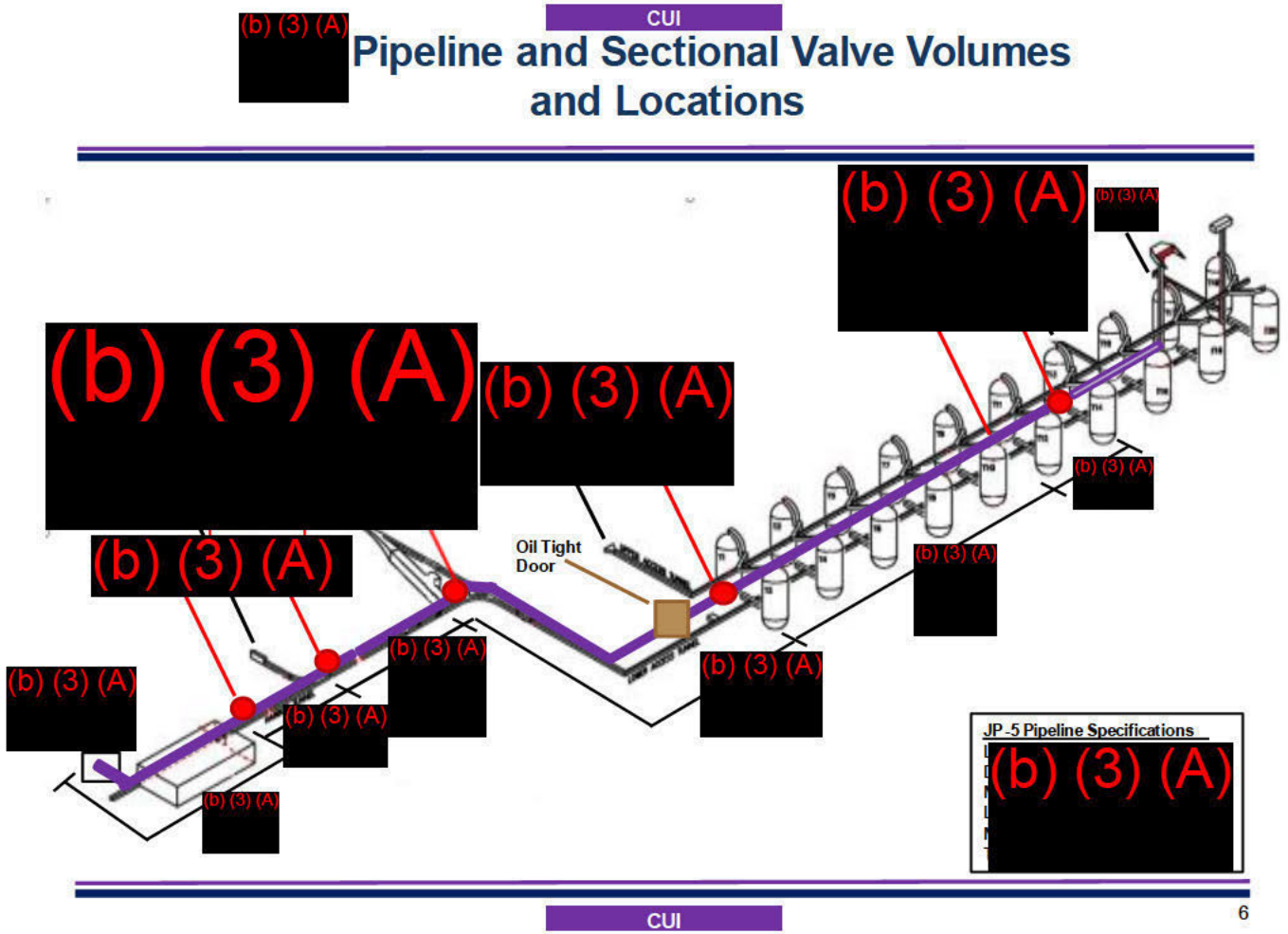

Figure 6: (b) (3) (A) Pipeline and Sectional Valve Volumes

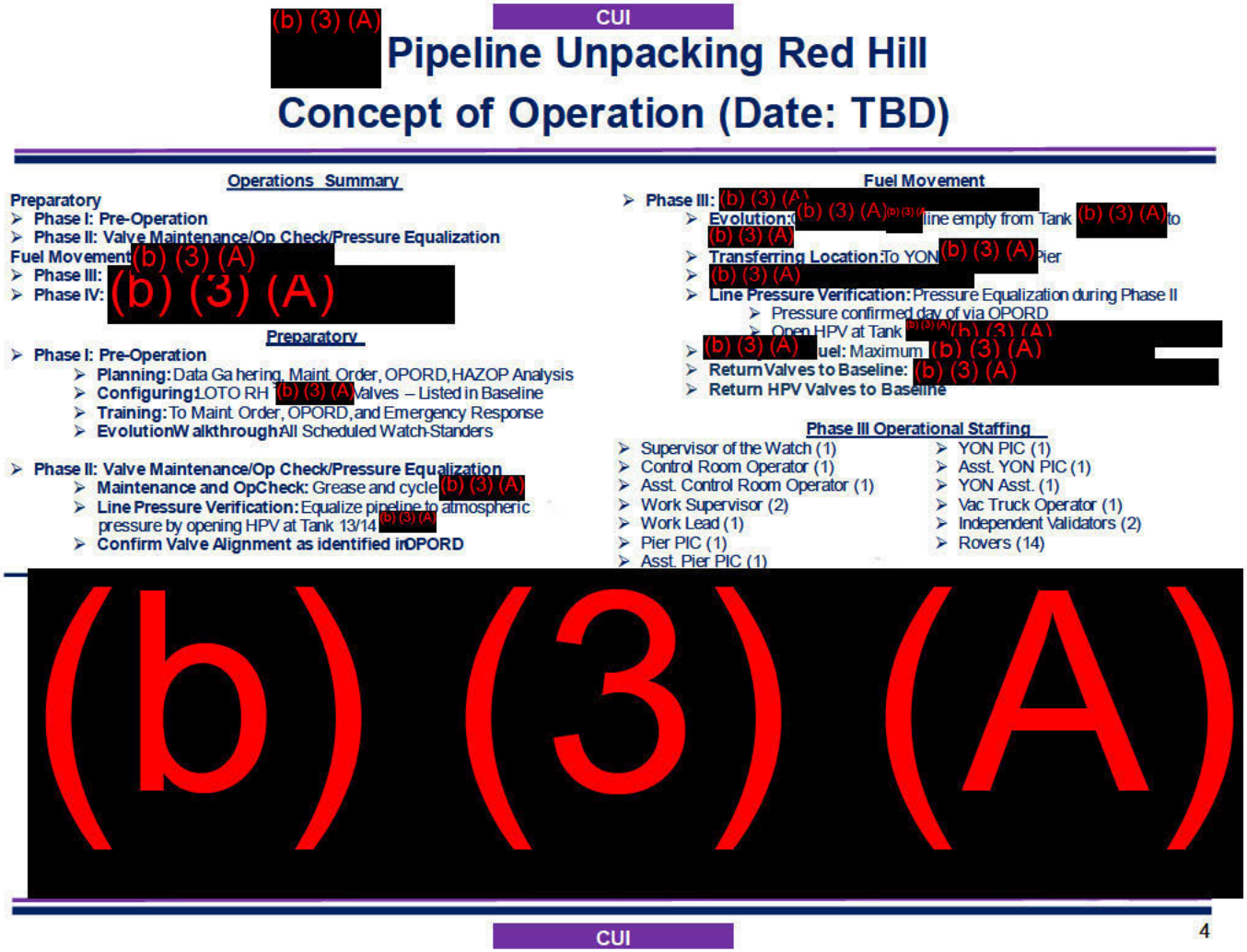

Figure 7: (b) (3) (A) CONOPS for Transfer of Fuel to YON (b) (3) (A)

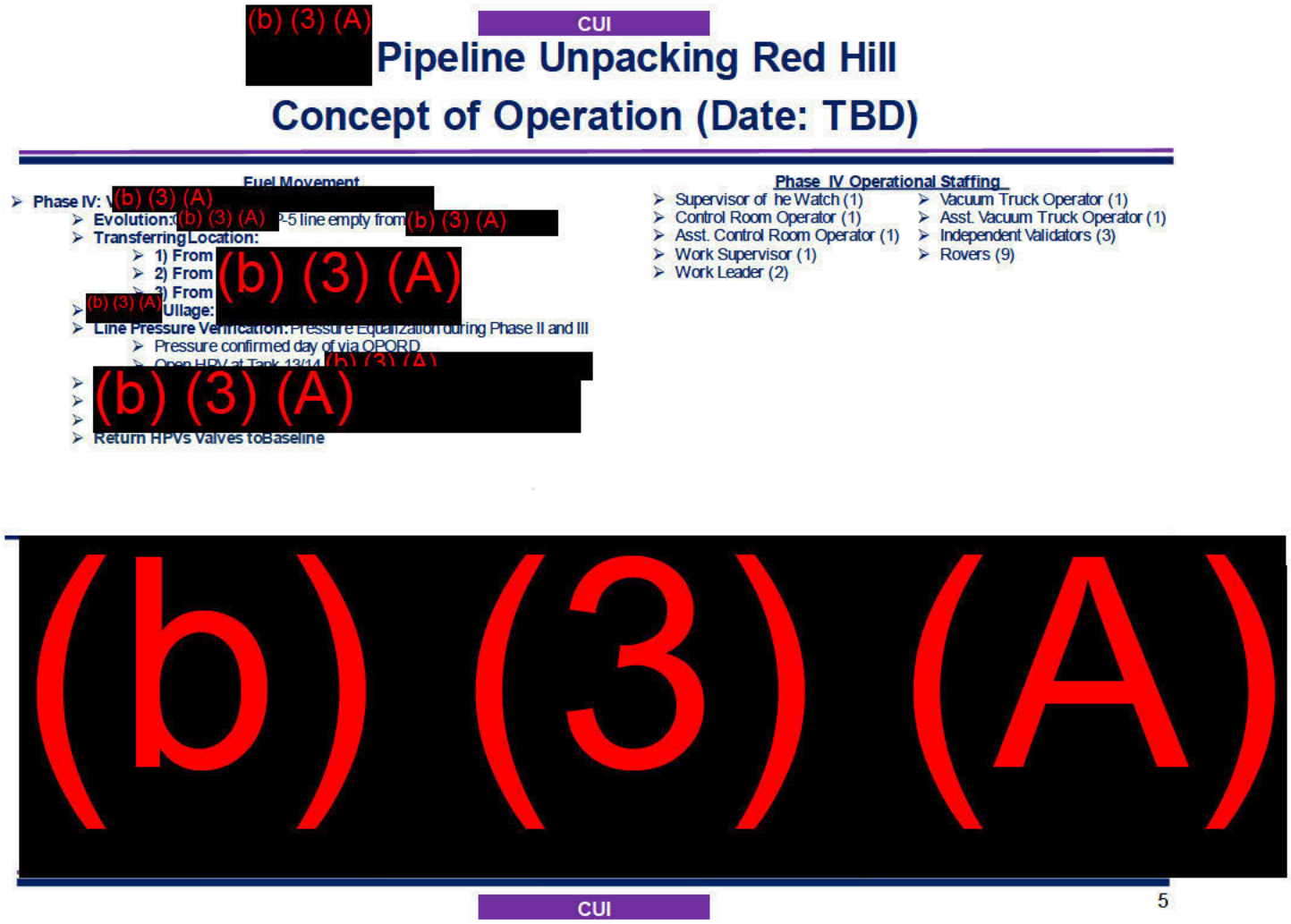

Figure 8: CONOPS for Transfer of (b) (3) (A) to Tank (b) (3) (A)

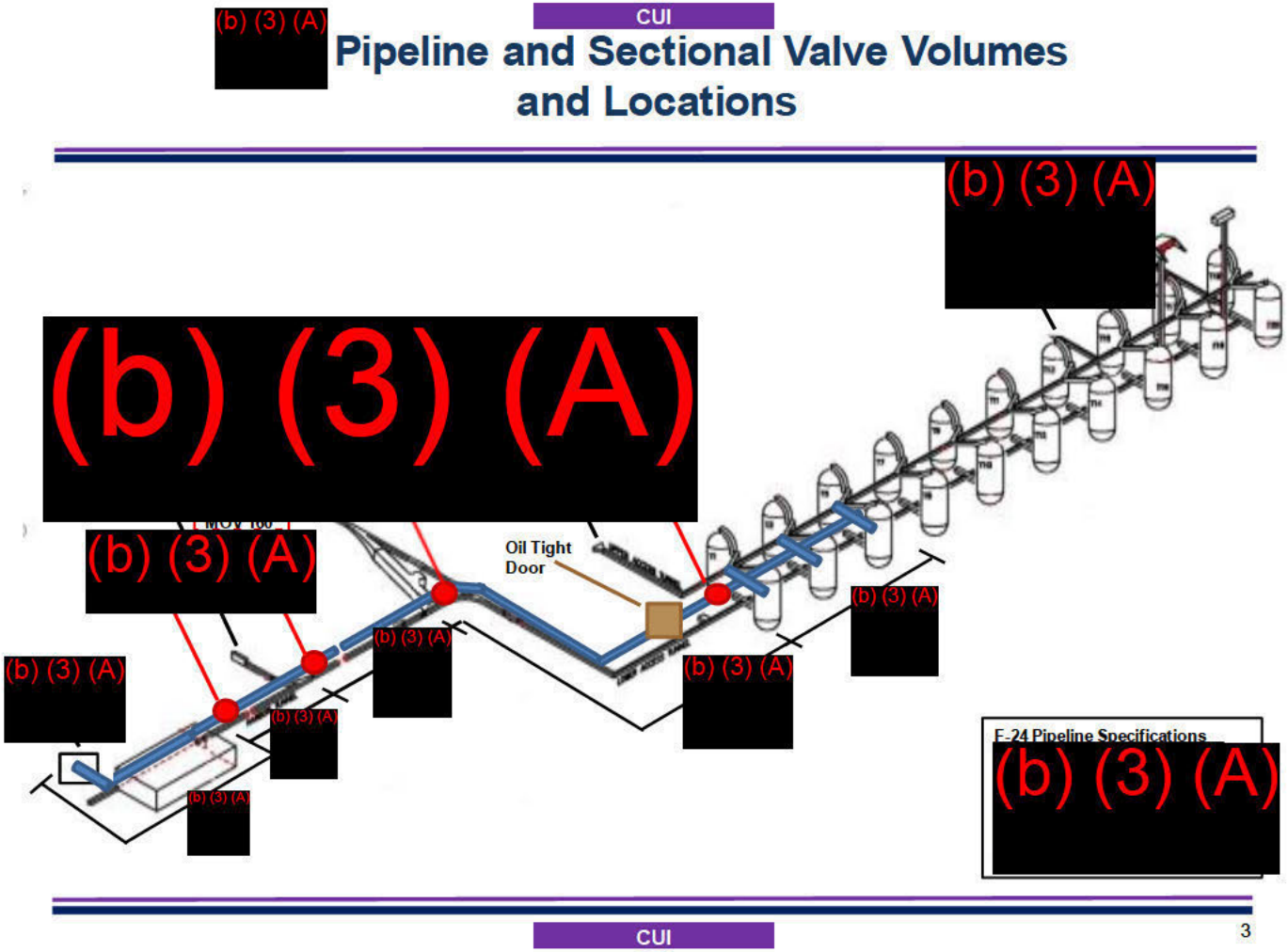

Figure 9: (b) (3) (A) Pipeline and Sectional Valve Volumes

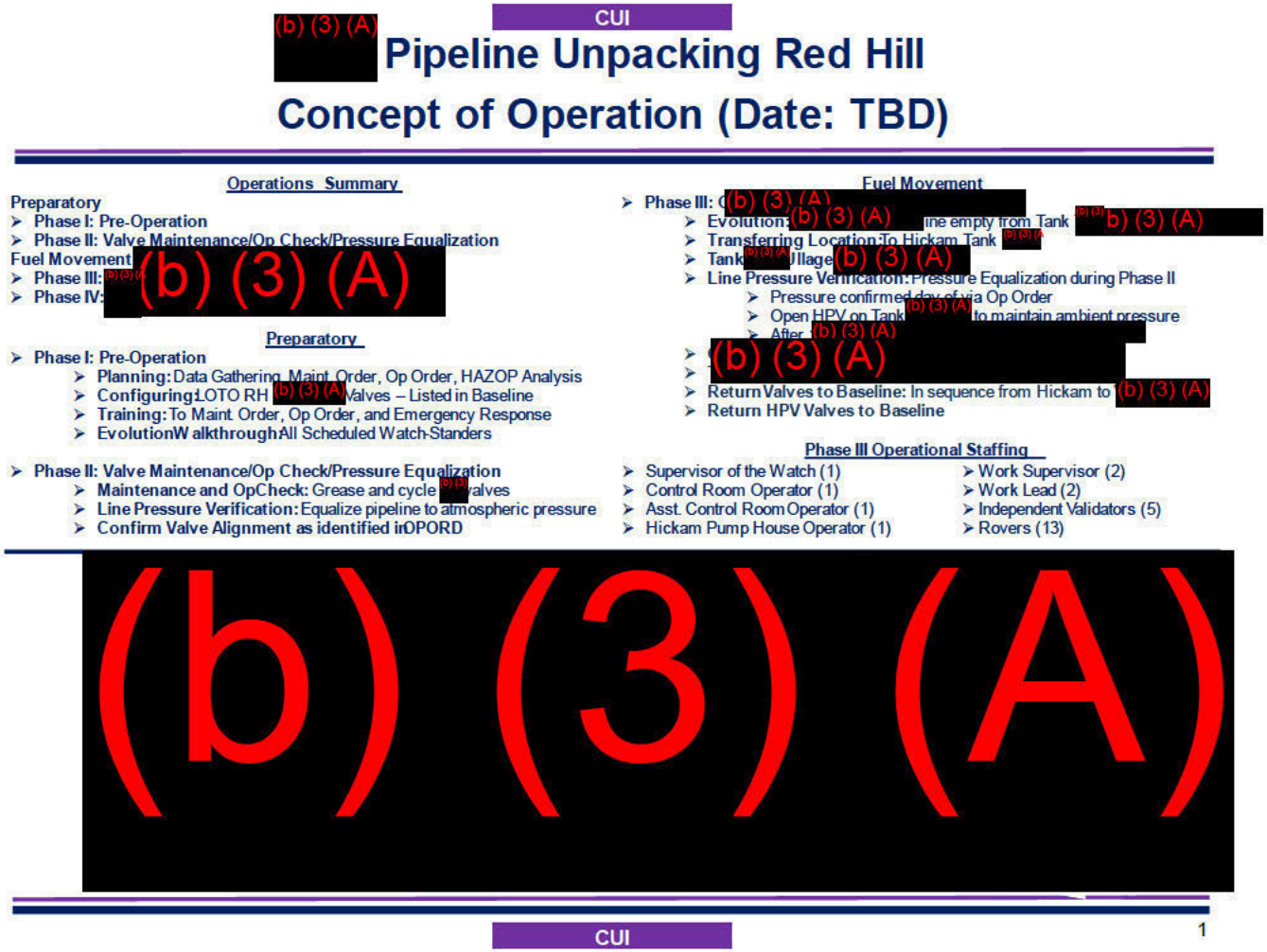

Figure 10: (b) (3) (A) CONOPS for Transfer of Fuel to Tank (b) (3) (A) at Hickam Airfield

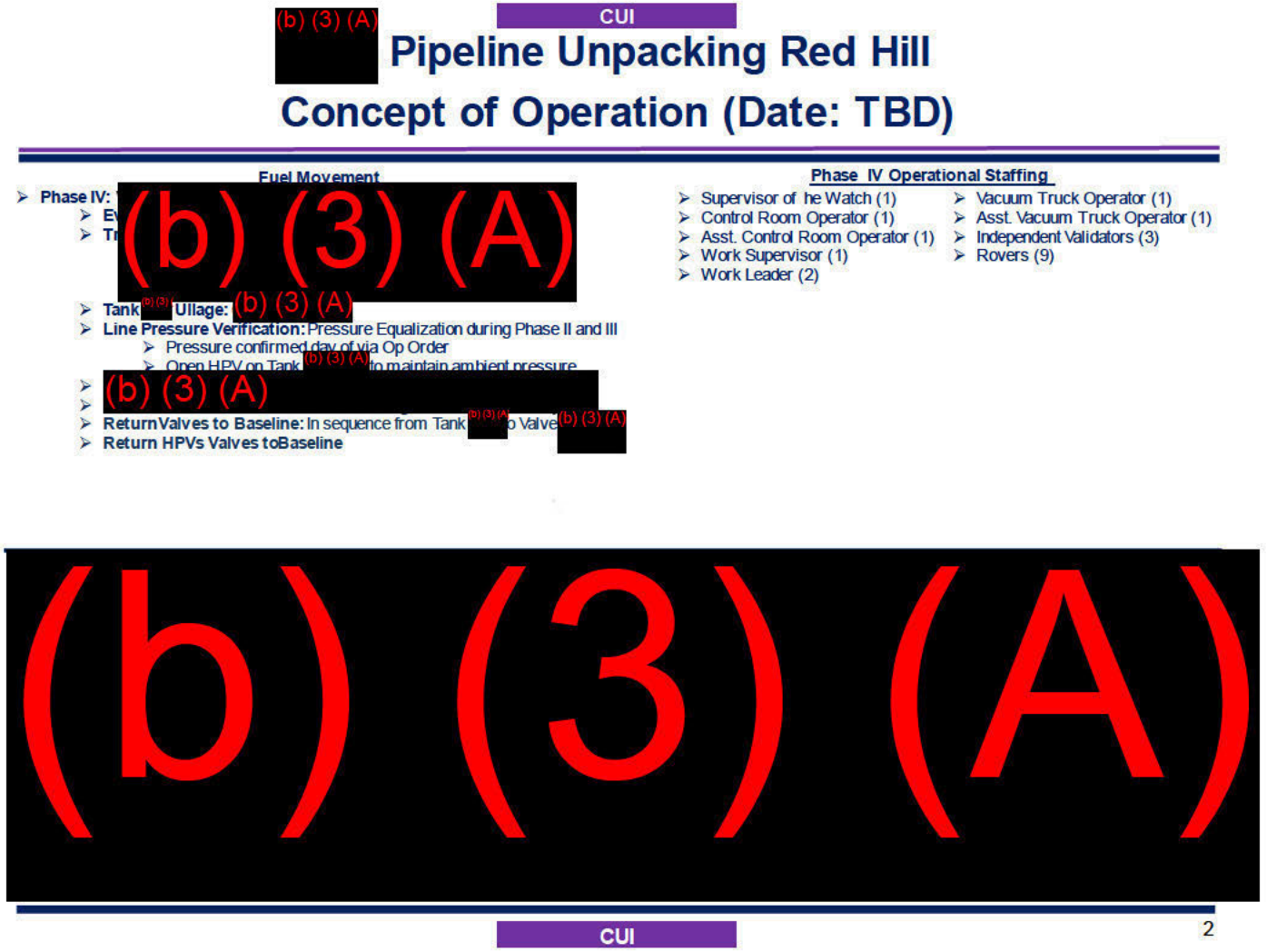

Figure 11: CONOPS for Transfer of (b) (3) (A) to Tank (b) (3) (A)

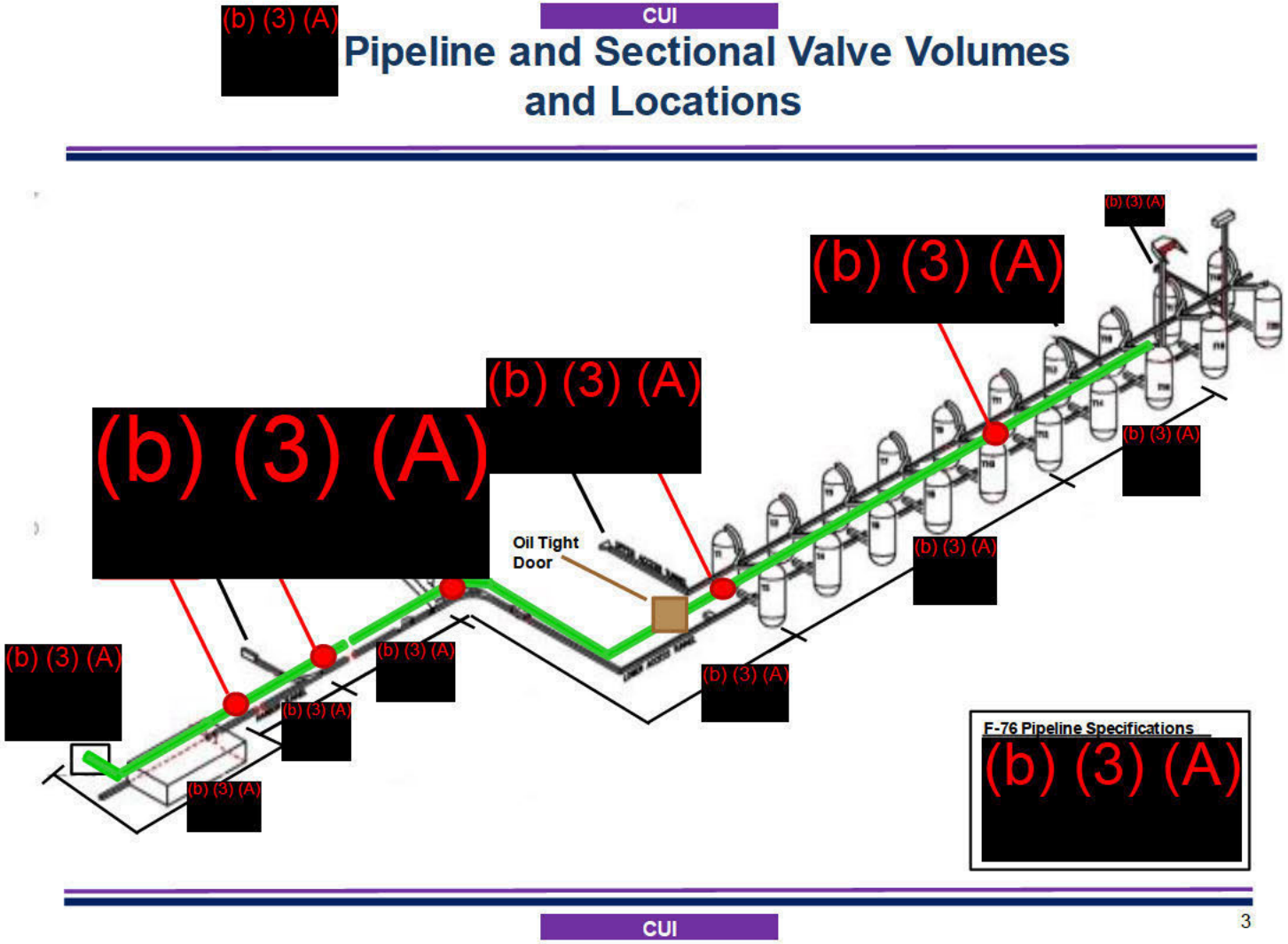

Figure 12: (b) (3) (A) Pipeline and Sectional Valve Volumes

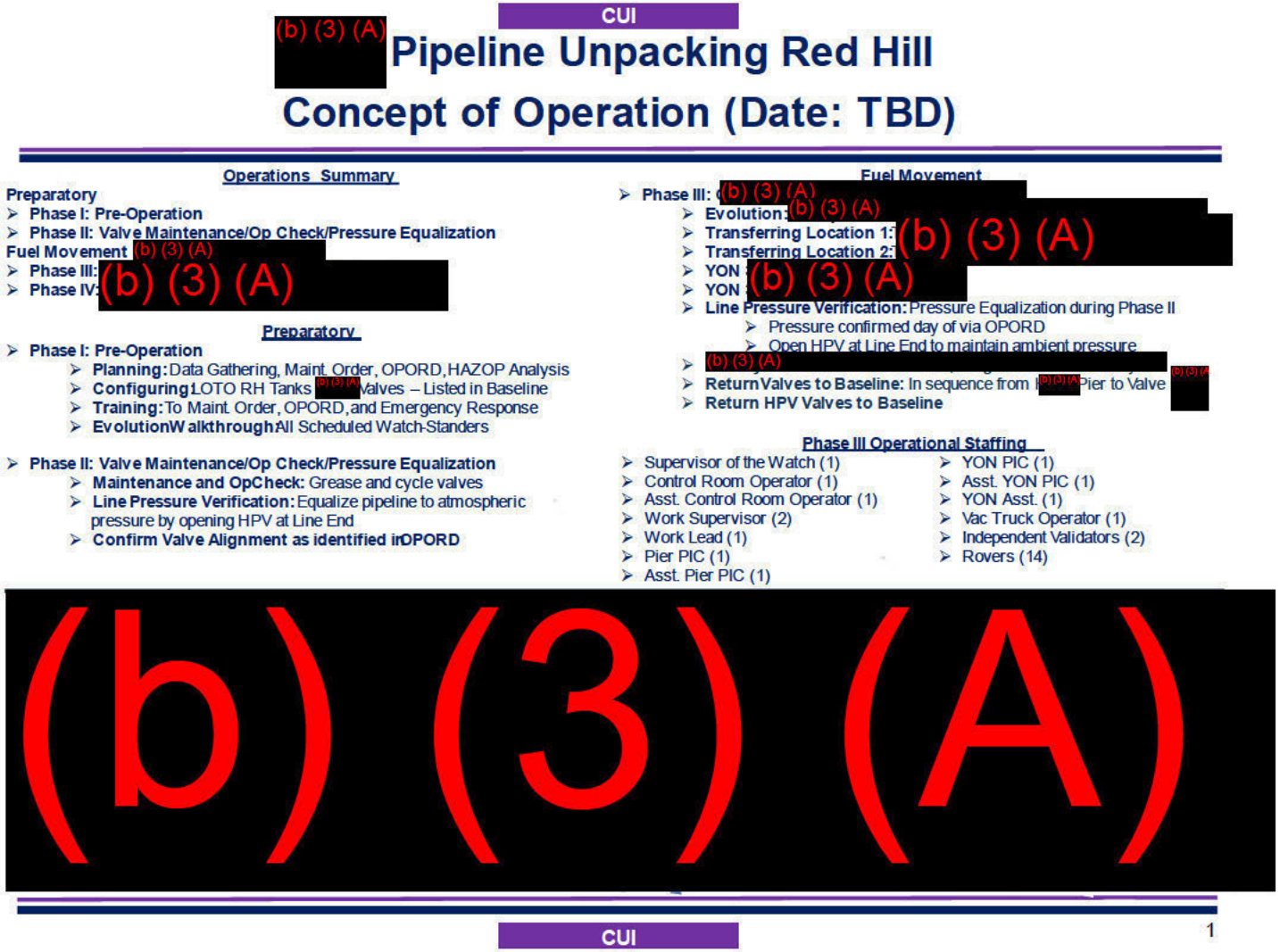

Figure 13: (b) (3) (A) CONOPS for Transfer of Fuel to YON (b) (3) (A)

CUI

(b) (3) (A) Pipeline Unpacking Red Hill

Concept of Operation (Date: TBD)

Fuel Movement

- **Phase IV:** (b) (3) (A)
  - **E**
  - **Transferring Location:**
    - **1)**
    - **2)** (b) (3) (A)
    - **3)**
  - **Tank (b)(3)(A) Ullage:** (b) (3) (A)
  - **Line Pressure Verification:** Pressure Equalization during Phase II and III
    - Pressure confirmed day of via OPORD
    - Open HPV at Line End to maintain ambient pressure
  - (b) (3) (A)
  - **Return Valves to Baseline:** In sequence from Tank (b) (3) (A) to Valve (b) (3) (A)
  - **Return HPVs Valves to Baseline**

Phase IV Operational Staffing

- Supervisor of the Watch (1)
- Control Room Operator (1)
- Asst. Control Room Operator (1)
- Work Supervisor (1)
- Work Leader (2)
- Vacuum Truck Operator (1)
- Asst. Vacuum Truck Operator (1)
- Independent Validators (3)
- Rovers (9)

(b) (3) (A)

CUI

2

Figure 14: CONOPS for Transfer of (b) (3) (A) to Tank (b) (3) (A)

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3.2 PHASE II SPILL SCENARIO

3.2.1 SCENARIO INTRODUCTION

Discussion

The scenario involves a release from the (b) (3) (A) F-76 pipeline between valves (b) (3) (A) within the LAT. This section of pipeline is (b) (3) (A) and contains (b) (3) (A) of fuel. The resulting release, which occurs (b) (2) (b) (3) (A) tunnel, threatens both the (b) (3) (A) unnel, the Red Hill drinking water aquifer, and Harbor Tunnel (HT).

Calculated Discharge Rate, Flow Velocity, & Containment

Worst Case Pipe Discharge

Assumptions:

1. Pipe Break → Full open release
2. Hazen-Williams equation is applicable
3. Length of F-76 Pipe = (b) (3) (A)
4. Elevation change upper F-76 to break is (b) (3) (A)
5. Pipe is flowing full
6. Pipe diameter = (b) (3) (A)

Velocity (V) = $(k)(C)(R)^{0.63}(S)^{0.54}$

k = conversion factor = 1.318

C = roughness coefficient = 120 (for steel)

R_h=hydraulic radius = Area (A)/Wetted Perimeter (P) = $\pi r^2/2\pi r = r/2$; r=(b) (3) (A);

R_h=(b) (3) (A)

S = slope = rise/run =(b) (3) (A)

Q = flow rate

[redacted]

Worst Case Open Channel Flow

Assumptions:

1. Tunnel slope is constant 0(b) (3) (A)
2. $Q_{pipe}=Q_{tunnel}$ = [redacted] (b) (3) (A)
3. Tunnel width =(b) (3) (A)

R = Hydraulic Radius = width (w) x height (h)=wh/w+2h

n = Manning coefficient = 0.013 (concrete)

S = slope = rise/run =(b) (3) (A)

A= area = width (w) x height (h)

V = (b) (3) (A)/n ($R^{0.66}$ square root slope)

[redacted]

[redacted]

Flow Velocity

[redacted]

Time to Reach Underground Pumphouse (UGPH)

Assumptions:

1. Flow rate is constant
2. Slope is constant [redacted]
3. No ponding or pooling
4. Distance from break to Underground Pumphouse is [redacted]
5. V=[redacted]

Time (T) = Distance (D)/Velocity (V)

=[redacted] ft/second

=[redacted] =[redacted]

UGPH Vault Containment Capacity

The size of the Underground Pumphouse (UGPH) vault is approximately [redacted] feet = [redacted]. A gallon is equivalent to 0.134 ft^3. The UGPH vault capacity is [redacted]. Assuming void space is at a [redacted], the UGPH has a storage capacity of [redacted] which would be sufficient to contain the entire volume of the release in the scenario. The released product would immediately start to be recovered before reaching the UGPH as the 5-plex vault and their associated sump pumps have the capability of directing flow to Tank [redacted] (capacity [redacted]) located at the Fuel Oil Reclamation Facility (FORFAC). The 5-plex presently has [redacted] active pumps, [redacted] which have a [redacted] capacity and [redacted] which have a [redacted] capacity. [redacted] pump in the UGPH has [redacted] capacity. Some of the released product would inherently flow down [redacted] which has a [redacted] slab. Product retained in [redacted] would need to be removed using [redacted]

Impact to Navigable Waters

For unpacking and the presented scenario, fuel would never reach the level where it would escape [redacted] However, for preparedness purposes, strategies for Halawa Stream containment and recovery are provided in Section 6.2.1 of this plan.

For [redacted], CONOPS calls for unpacked fuel to be transferred to YON [redacted] at [redacted] Pier. The transfer of fuel from the pier to the YON [redacted] presents a risk to navigable waters of the United States. [redacted] will be double boomed, however a faulty riser or another mishap could lead to a release.

Scenario

After completing the diversionary barrier at the [redacted] An operator of a forklift being used to transport sandbags becomes unconscious and the forklift accidentally hits a pressure release valve on a pipeline causing the valve assembly to break. Fuel starts to immediately flow out of the pipeline. Fuel quickly flows down the tunnel towards the [redacted] tunnel and Harbor Tunnel (HT). Another worker assists the forklift operator who regains consciousness within 1-2 minutes, and they evacuate the tunnel to [redacted] and notify the Fuel Control Room Operator.

Note: Notification to fuel room indicated diversionary barrier seems to be operational and functioning as intended. Fuel being diverted down HT. No containment barrier in place in HT. Fuel flowing down to UGPH unabated.

TABLE 3: UNPACKING WORST-CASE DISCHARGE INFORMATION	
Calculated WCD	[redacted] F-76
Oil Group	Group 2 – Persistent Oil
Operating Area	Inland, Nearshore

Figure 15 presents [redacted] Pipeline Release Location.

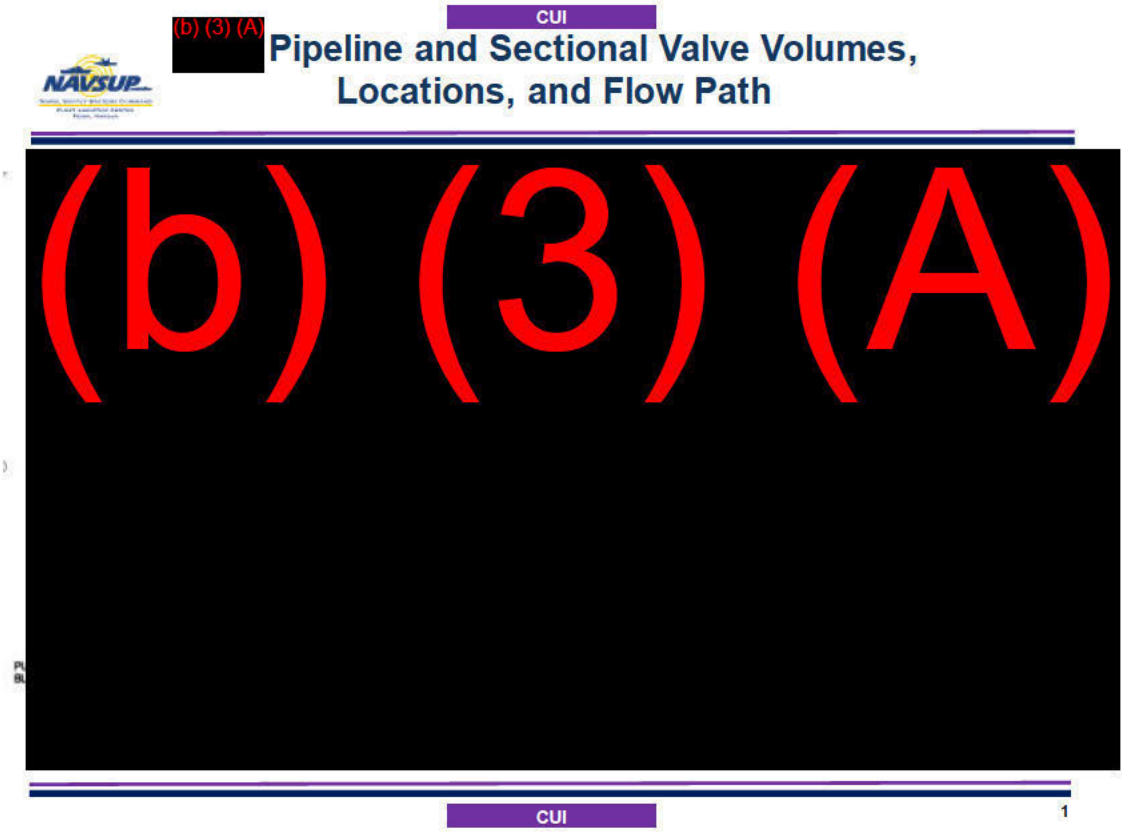

Figure 15 – [redacted] Pipeline Release Location

4 IMMEDIATE RESPONSE ACTIONS

Fuel Department Personnel

1. Immediately alert nearby personnel who may be exposed to the effects of the discharge.
2. Activate nearest fire alarm.
3. Evacuate the facility, tunnels, and adits – Refer to Figure 16 for the appropriate evacuation location.

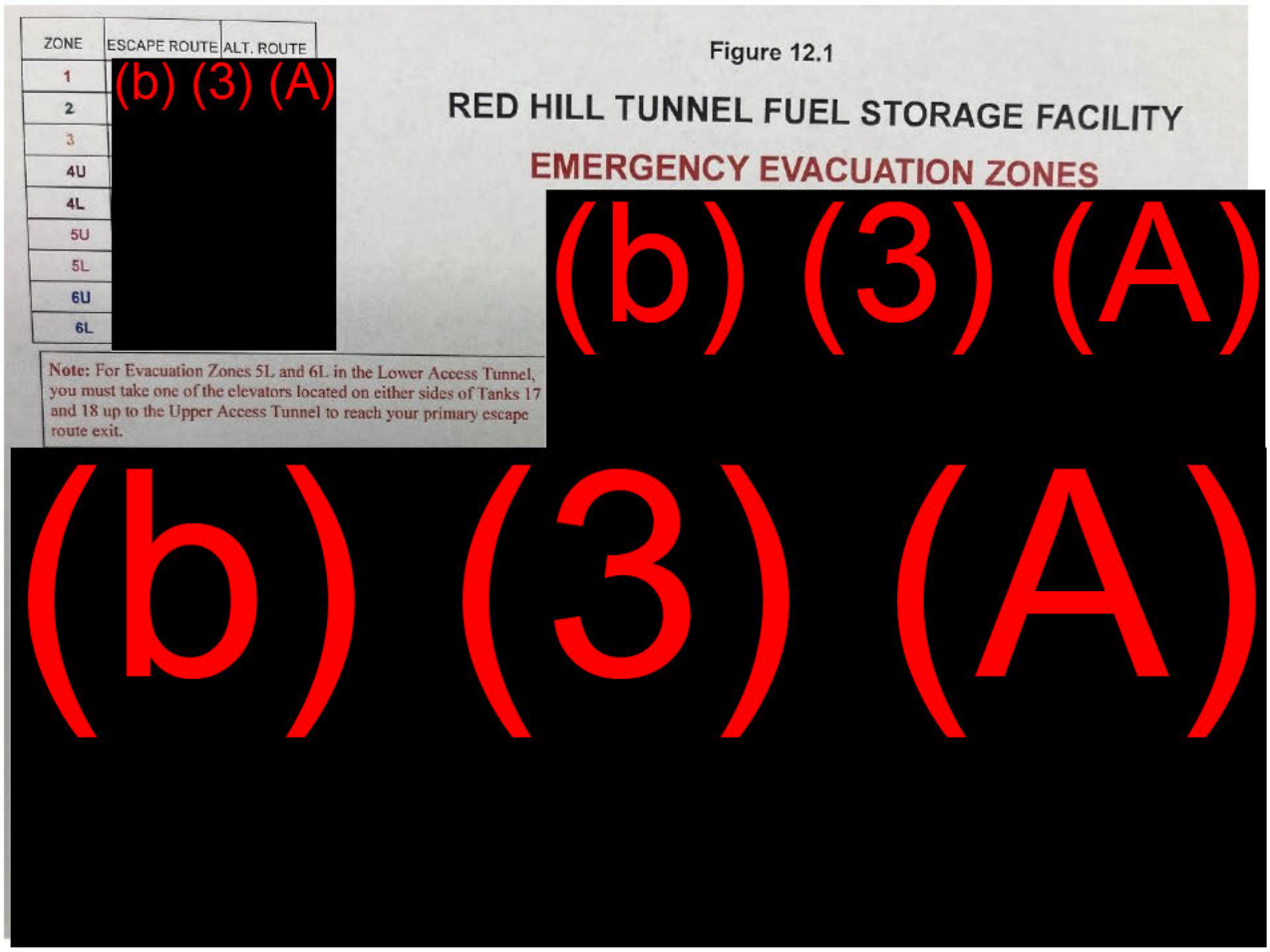

Figure 16 – RHFSF Emergency Evacuation Routes

4. Notify the Control Room Operator.
5. If properly trained, authorized, and it is safe to do so, initiate available on-site countermeasures (if applicable).

Control Room Operator

1. Stop all fueling operations.
2. Activate emergency shutdown procedures if safe to do so
3. Close all MOVs on pipelines.
4. Ensure that the bulkhead door between the UGPH and Lower HT is shut and secured.
5. Report the spill immediately to Regional Dispatch Center at 911 or 808-471-7117.
6. Notify the Fuel Operations Director at 808-780-3703 who will in turn notify the Fuel Director at 808-977-2294.
7. Notify the COMPACFLT CDO at 808-471-3201 to initiate immediate evacuation of Buildings (b) (3) (A) [redacted] (if necessary)
8. Move fueling operations to the alternate control room in Building 1757 (if necessary)
9. Account for the number of personnel (workers and contractors) evacuated.
10. Assess the situation, including:
    - Source and extent of release
    - Status of operation shutdown
    - Number of injured and their conditions
    - Probable direction of vapors
    - Estimate quantity of release
    - Direction of movement of release
    - Status of ignition sources
11. Follow all emergency standard operating procedures.
12. See the Core Plan of the ICP for additional action.
13. Document all actions.

Fuel Director/Emergency Coordinator

1. Immediately Notify:
    - JBPHH CDO at 808-864-2460
    - NAVSUP FLCPH CDO at 808-216-1339 who will in turn notify the NAVFAC CDO at 808-347-8289.
    - Deputy Fuel Director at 808-690-0115.
2. Submit Operation Report (OPREP-3) Navy Blue Message followed by an Oil or Hazardous Substance Spill/Release Message if directed by the JBPHH QI, NOSC, or IC (see Appendix A of ICP)
3. Refer to Core Plan of the ICP (see Appendix B) for additional action.

JBPHH CDO

1. Immediately Notify
    - JBC/CSO at 808-499-8963
    - CNRH ROC at 808-473-3215 or 808-473-3216 who will in turn notify REGCOM at 808-472-2200
    - JBPHH QI at (b) (6) [redacted]
    - PAO at 808-371-5189

JBPHH QI

1. Immediately Notify
    - CNRH NOSC-R at (b) (6) [redacted] (as needed)
    - NAVFAC/JBPHH Service Desk at 808-449-3100
    - National Response Center at 800-424-8802 or 202-267-2675
    - State Emergency Response Commission at 808-586-4249 (0745-1630) or 808-236-8200 (after hours).
    - Local Emergency Response Committee at 808-723-8960 or 911 (24-hours).

TABLE 4 NOTIFICATION INFORMATION
Name, location, organization, & telephone number
Name, address and contact information of responsible party
Substance released
Approximate quantity released
Incident location
Spill date & time
Source & cause of the release
Medium affected by release (i.e., land or water)
Danger or threat posed by release
Number and types of injuries or fatalities (if any)
Whether an evacuation has occurred
Weather conditions at the incident location
Measures taken or proposed to be taken to clean-up the spill
Other county, state, or federal officials notified
Other information that may help emergency personnel respond to the incident

2. Provide all necessary resources for spill response.
3. Recall the JBPHH Spill Management Team.
4. Activate the Emergency Operations Center (EOC).
5. Notify the Honolulu Board of Water Supply at 808-748-5000 Ext. 1.

Navy On-Scene Coordinator

1. Ensure that all proper notifications were made
1. Activate Navy SUPSALV to assist Port Operations Facility Response Team (if applicable)
2. Recall CNRH Spill Management Team.
3. Activate Regional Operations Center (ROC).
4. Establish command center and staging area.
5. Establish a Unified Command with State and Federal Agencies (see Appendix B of ICP).
6. Activate OSROs (see Appendix E of ICP).
7. Engage NAVFAC PAC KO at 808-474-4551

TABLE 5 NAVY SUPSALV SPILL RESPONSE CONTRACTORS				
Name	*Day Phone*	*Other Phone*	*Response Time*	*Capability*
Navy SUPSALV	202-781-1731 Ext. 2	202-781-3889 (24-hours)	< 12 hours	On-water containment and recovery
Pacific Environmental Company (PENCO)	808-545-5195		< 12 hours	On-water containment and recovery; and on-land cleanup capabilities.
National Response Corporation[1]	631-224-9141		< 12 hours	On-water containment and recovery; on-land cleanup capabilities; and dispersant coverage (including dispersant aircraft)
[1]The CNRH NOSC Rep can also access the services of the NRC by going through US Navy SUPSALV				

Safety Officer

1. Evaluate immediate public health and safety risks.
2. Recommend site control measures to isolate public from possible exposure (such as recommending evacuation or shelter in place).
3. Assess environmental conditions (such as air and water monitoring).
4. Conduct site safety evaluation and develop site safety plan.

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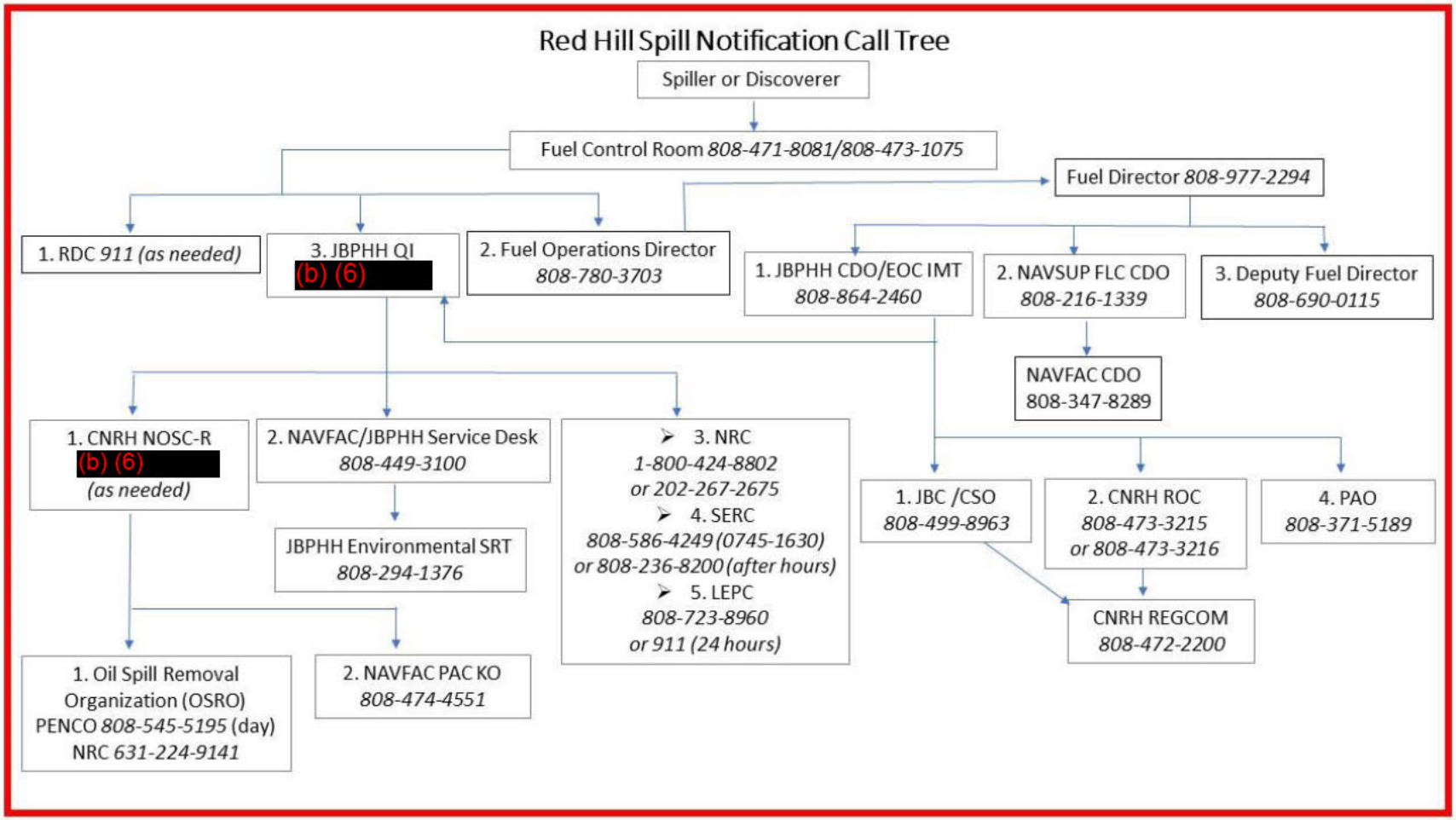
Red Hill Spill Notification Call Tree
Spiller or Discoverer
Fuel Control Room 808-471-8081/808-473-1075
Fuel Director 808-977-2294
1. RDC 911 (as needed)
3. JBPHH QI
(b) (6)
2. Fuel Operations Director
808-780-3703
1. JBPHH CDO/EOC IMT
808-864-2460
2. NAVSUP FLC CDO
808-216-1339
3. Deputy Fuel Director
808-690-0115
NAVFAC CDO
808-347-8289
1. CNRH NOSC-R
(b) (6)
(as needed)
2. NAVFAC/JBPHH Service Desk
808-449-3100
➢ 3. NRC
1-800-424-8802
or 202-267-2675
➢ 4. SERC
808-586-4249 (0745-1630)
or 808-236-8200 (after hours)
➢ 5. LEPC
808-723-8960
or 911 (24 hours)
1. JBC /CSO
808-499-8963
2. CNRH ROC
808-473-3215
or 808-473-3216
4. PAO
808-371-5189
JBPHH Environmental SRT
808-294-1376
CNRH REGCOM
808-472-2200
1. Oil Spill Removal Organization (OSRO)
PENCO 808-545-5195 (day)
NRC 631-224-9141
2. NAVFAC PAC KO
808-474-4551

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5 INITIAL RESPONSE

The Federal Fire Chief, or senior fire official, will assume the duties of the IC and take control of the spill during the emergency phase. The FFD will attempt to control the release, rescue the injured, monitor site safety, and guard against the possibility of fire. A major priority for the FFD will be to ensure the safety of the residents in the surrounding area, and to the responders and other emergency personnel.

Due to the nature and volume of the spill, the USCG housing near the Red Hill facility may need to be evacuated due to the risks from vapor, fire, and explosions. The IC, in consultation with the NOSC and Safety Officer, will decide if evacuations will be needed.

- If facility personnel and base residents need to be evacuated, the IC will initiate the evacuation in accordance with the CNRH Emergency Management Plan (EMP).
- If communities off base need to be evacuated the IC will coordinate with the Hawaii Emergency Management Agency (HIEMA) at 808-733-4300 and the Honolulu Fire Department at 808-831-7771 in implementing community evacuation plans.

Concurrent with public safety evacuations, the FFD will conduct air monitoring at key areas, including the Red Hill facility, ventilation shafts, and adit entrances. Once the initial emergency actions are implemented, the QI will assume direct control of the spill response and cleanup until and if replaced by the NOSC.

6 RESPONSE STRATEGIES

6.1 PROTECTING THE RED HILL DRINKING WATER AQUIFER

Assets will be prepositioned ahead of unpacking and defueling operations with the sole purpose of protecting the wellhead at the Red Hill drinking water aquifer pumping station. An engineered diversionary barrier will be constructed at the Adit (b) (3) (A) with the objective of directing flow down the HT. Waterfilled flood control tubes reinforced with sandbags will be positioned in a tiered approach along Adit (b) (3) (A) add extra protection in the event of breakthrough. Vacuum pumps, hoses, collection totes and spill kits will also be staged at various locations within Adit (b) (3) Preferential pathways will be sealed with epoxy or interrupted using flood control mats. Mitigation measures are discussed in more detail in Section 8 of this plan.

6.2 REMOVAL OF OIL FROM THE LOWER HT & ADIT (b) (3)

The UGPH has a sump drainage system to remove water and oil out of the pumphouse. A sump pump with capacity of 280 gpm will move any fuel that makes it into the UGPH sump into Tanks B-1 (capacity 378,000 gallons) and B-2 (capacity 378,000 gallons) at the FORFAC. The 5-plex sump system in lower HT has the capability of directing flow to Tanks B-1 and B-2 at FORFAC as well. As previously stated, the 5-plex presently has (b) (3) (A) active pumps, (b) (3) (A) which have a (b) (3) (A) capacity and (b) (3) (A) which have a (b) (3) (A) capacity. Pumps feed into a (b) (3) (A) line that has a capacity to move approximately (b) (3) (A) . From these tanks, oil can be moved to a Ship Waste Off-Loading Barge (SWOB) or a Yard Oiler Navy (YON) (b) (3) (A) at (b) (3) (A) Pier. See the

Fuel Department's Operation, Maintenance, Environmental, and Safety (OMES) Plan, dated August 2018 for valve line-up details. If the UGPH sump pump was removing product at a rate of 280-gpm, and the 5-plex sump in lower HT was moving 1,000-gpm it would take approximately [redacted] minutes to clear [redacted] gallons of fuel from the lower HT. If the UGPH sump was solely used to remove product it would take approximately [redacted] to remove [redacted] fuel from the lower HT.

Outside Adit [redacted] (Figure 17) [redacted] could start pumping [redacted] fuel out of the Adit [redacted] tunnel using hose and weir skimmers. Each [redacted] would take approximately an hour to setup and fill its tank. [redacted] could be used to continuously remove fuel from the Adit. Once full, the [redacted] can offload at the FORFAC facility.

Note: For this exercise we are assuming release is flowing unabated to HT. Adit [redacted] would be impacted as no containment barrier constructed. As a result, deployment of vac truck, hoses and weir skimmer needed.

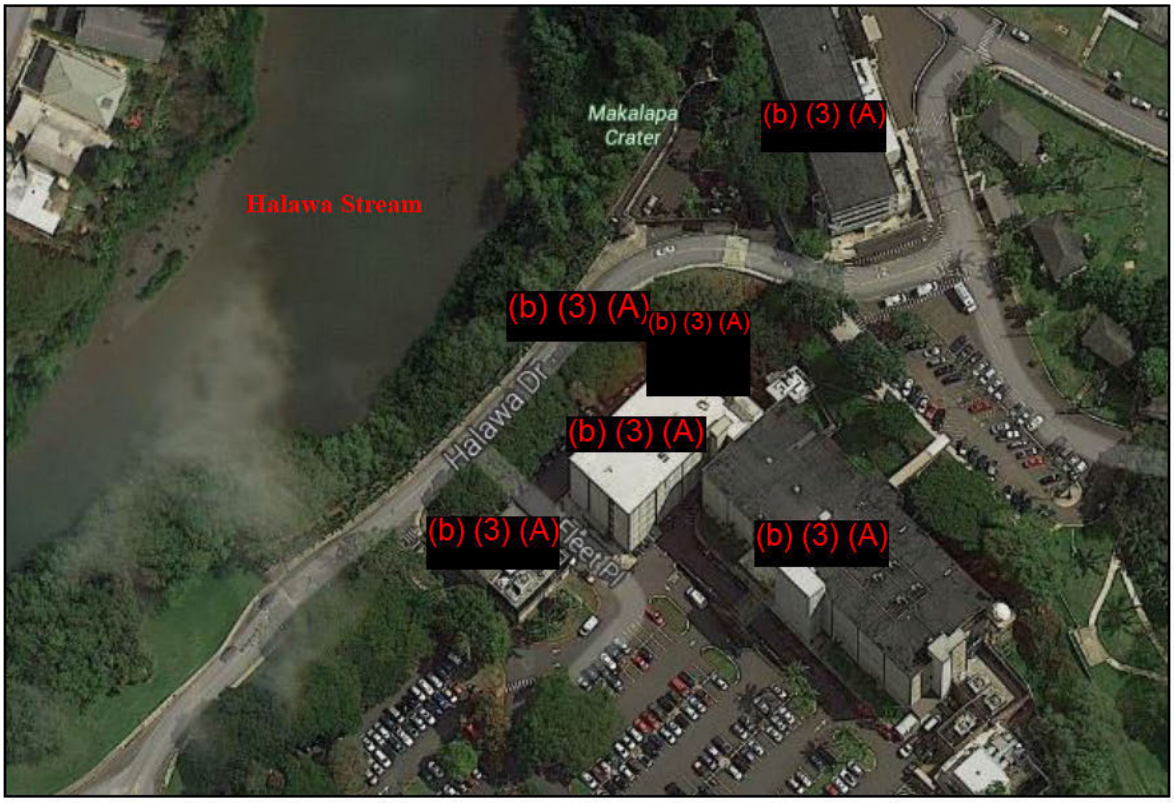

Figure 17: Aerial Photo Showing Location of Adit [redacted]

To be better prepared for a major spill event that could flood the HT, such as a release in the HT from the [redacted] main between valves [redacted] that contains [redacted] fuel, equipment could be pre-staged at the lower HT. Navy SUPSALV has hydraulic submersible pumps that could be pre-staged next to the existing sump in the lower HT, just opposite the bulkhead door to the UGPH. A flexible hose could be run to the sump drainage system in the

UGPH sump and connected to an oily waste pipeline that runs to the FORFAC facility. A tie-in for the flexible hose has been identified at a (b) (3) (A) pipeline (ID# GI1RA) in the UGPH sump. Currently, the tie-in is flanged. If configured for a flexible hose, a Gate Valve (ID# GI1RB) would have to be closed. Figure 18 provides a picture of the possible tie-in point. Note that SUPSALV needs to be activated by the CNRH NOSC before equipment can be staged. See Appendix E for further information on using Navy SUPSALV. With a pre-staged hydraulic submersible pump rated at (b) (3) (A) the tunnel could be pumped dry in approximately (b) (3) (A) With the added capacity of pumps in the 5-plex and UGPH sump (b) (3) (A) could be removed in (b) (3) (A)

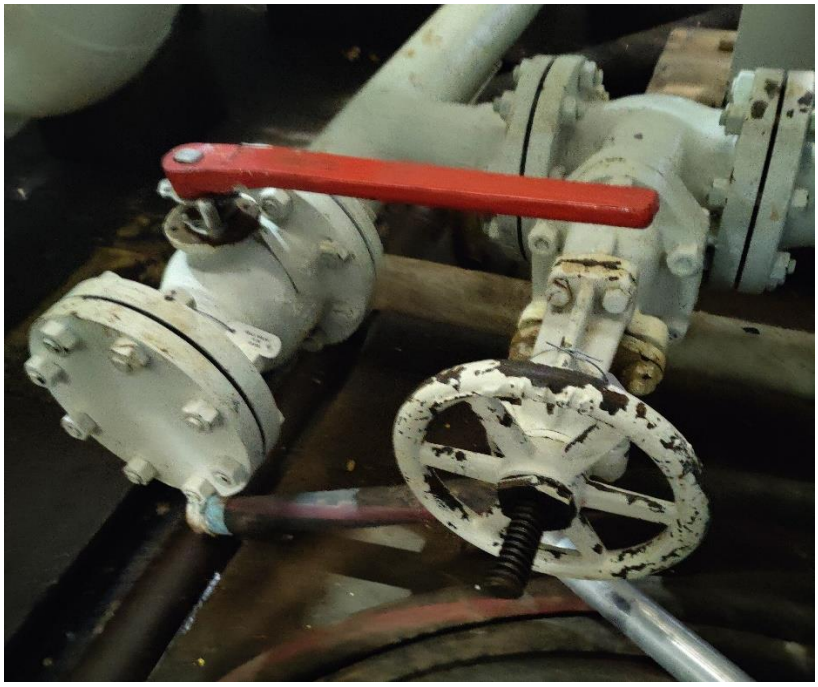

Figure 18 – UGPH Sump Area – (b) (3) (A) [redacted]

6.2 PROTECTING HALAWA STREAM AND PEARL HARBOR – ON-WATER SPILL CONTAINMENT AND RECOVERY STRATEGIES

6.2.1 CONTAINMENT & RECOVERY STRATEGY FOR HALAWA STREAM

Discussion

For fuel released from the RHFSF that impacts Halawa Stream, the strategy will be to contain and recover as much fuel as possible before it enters Pearl Harbor and to protect sensitive shorelines and historical resources in Pearl Harbor (Figure 19).

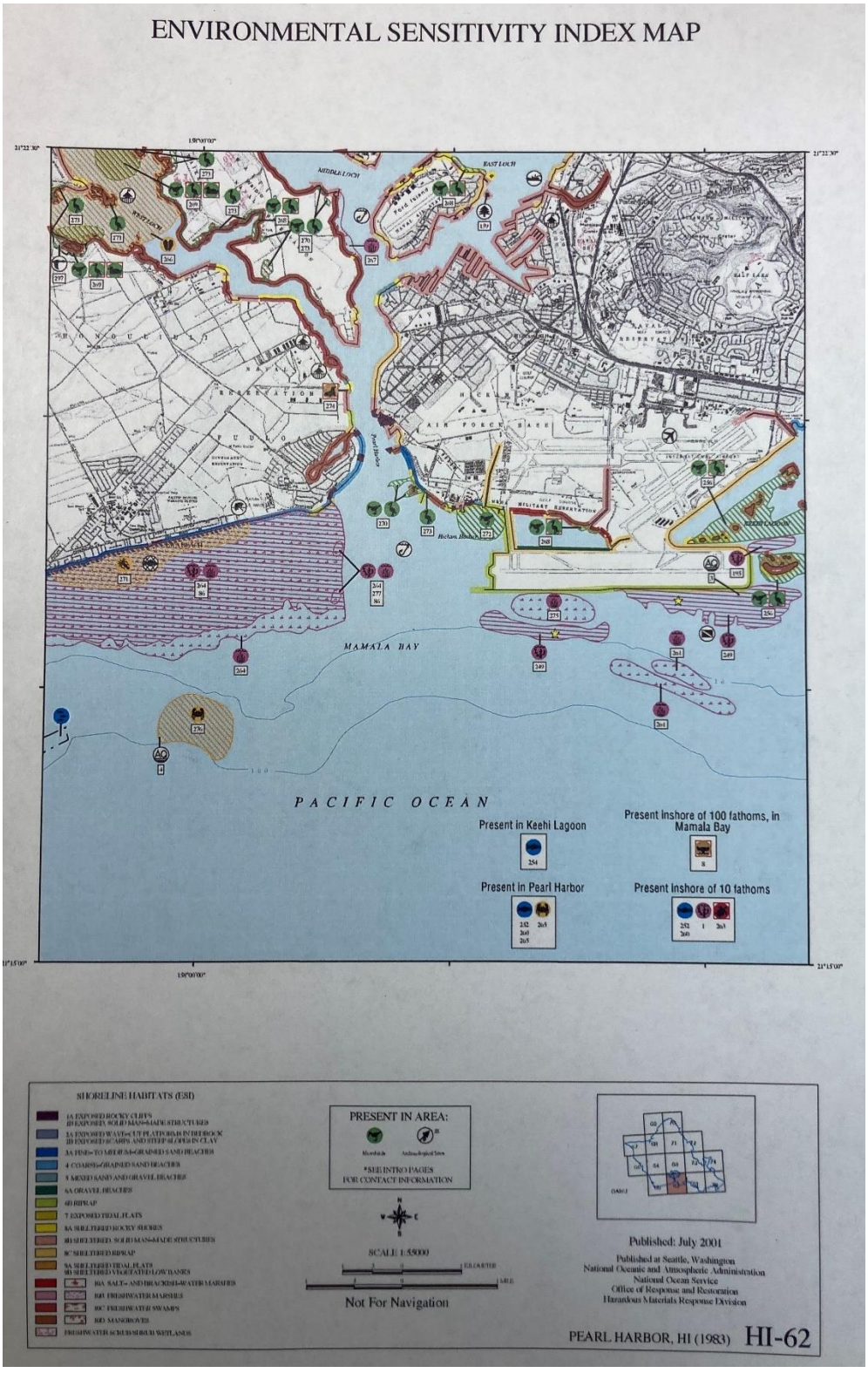

Figure 19 – Environmental Sensitivity Map of Pearl Harbor

The ideal strategy is to contain and recover oil before the stream reaches Pearl Harbor. Currently, a 24" harbor boom has been pre-staged in Halawa Stream just opposite Adit [redacted] at the RHFSF. At this location the stream runs along a concrete lined culvert. While this boom may slow down a release in the stream the velocity of the stream at this location may be too fast to contain oil effectively. A precautionary boom is also in place at the mouth of lower Halawa Stream where it meets Pearl Harbor (Figure 20).

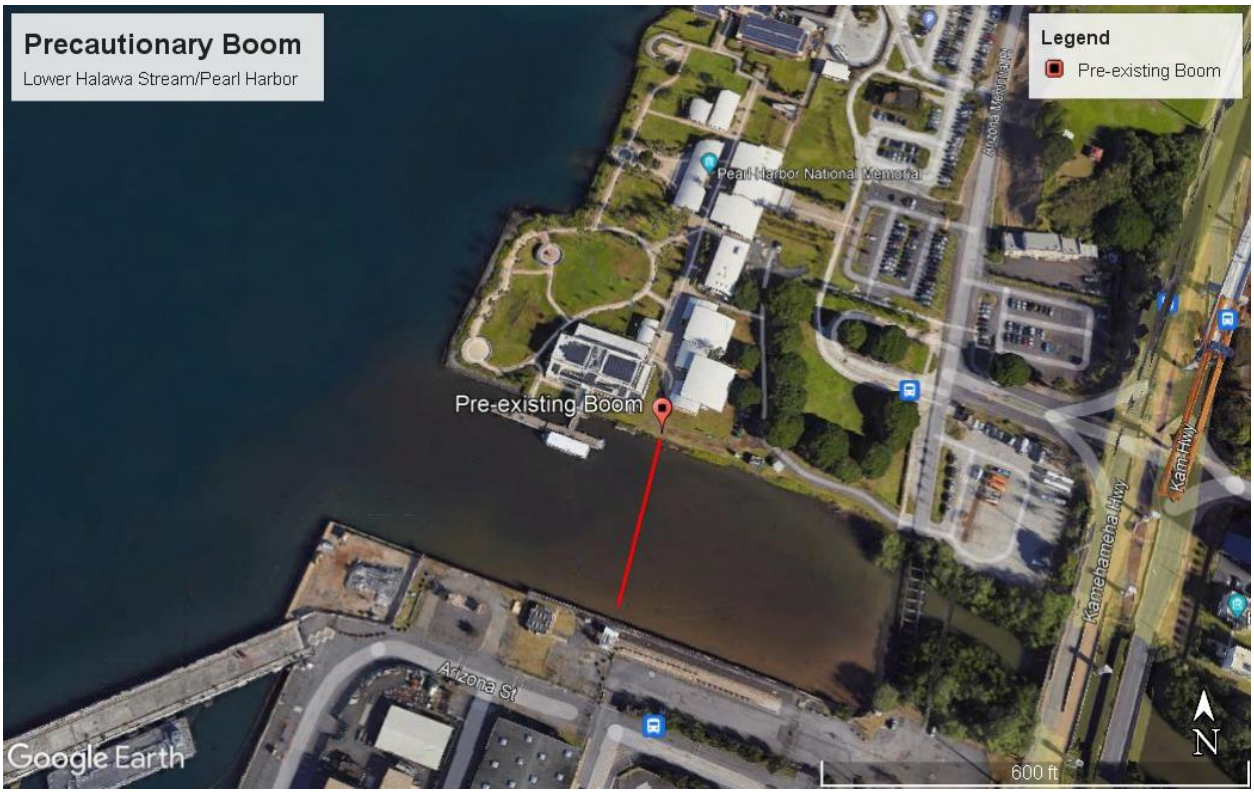

Figure 20: Precautionary Pre-existing Boom at Pearl Harbor/Lower Halawa Stream

If a fuel release at the RHFSF is reported, the NOSC will assume impacts to Halawa Stream are possible and will immediately call the JBPHH Port Operations Control Tower at 808-474-6262 to deploy additional precautionary booms and other assets including boats, rapid response skimmer and vacuum truck to lower Halawa Stream. Port Operations will activate the Facility Response Team (FRT) who will respond to deploy the requested assets. The FRT will remain on-site to observe and actively patrol the area for impacts to navigable waters. Port Operations will also request that the National Park Service closes the Arizona Memorial and clear the area of vessel traffic (if necessary).

Note: This booming strategy is for guidance only. All booming strategies may need to be adjusted depending on the tides, current, wind, availability of equipment, and movement of oil.

Booming Strategy

A 600-foot length of boom will be placed for containment purposes and two 600-foot lengths of deflection boom will be place diagonally across the mouth of the stream to deflect oil to the Navy side of Halawa Stream where vacuum trucks will use hoses and portable skimmers to collect oil

(Figure 21).

Staging Areas

The staging area for vacuum trucks and other response equipment/supplies will be the parking lot at the corner of (b) (3) (A) (b) (3) (A) The staging area for the waterborne response equipment will be the (b) (3) (A)

Booming Strategy Map

Figure 21 shows an aerial photo depicting the booming strategy for Halawa Stream with the suggested oil recovery site and staging areas shown.

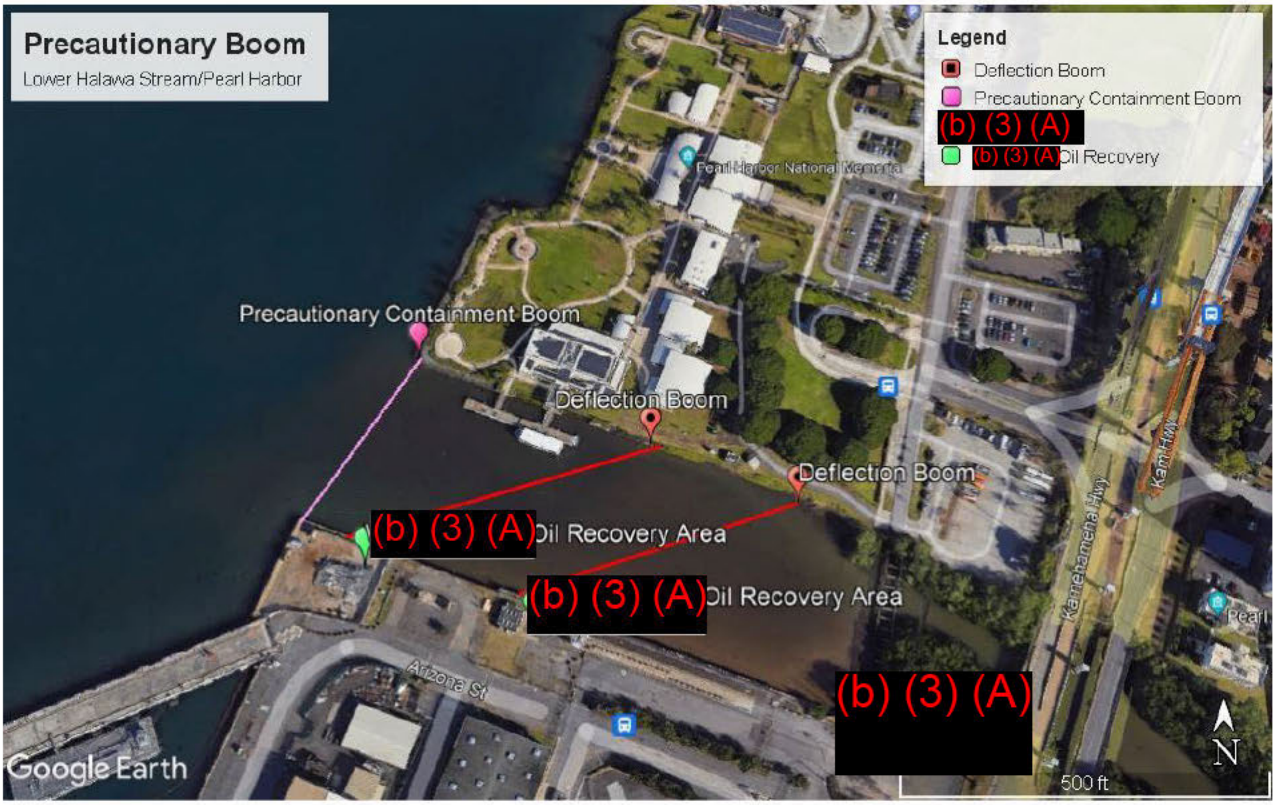

Figure 21: Booming Strategy, Oil Recovery Site (b) (3) (A)

Figure 22: (b) (3) (A) [redacted]

Site Conditions

Near the mouth of Halawa Stream, the water depth ranges from 3 to 7 feet per nautical charts. This is sufficiently deep for platform and utility boats until approaching the shoreline. Booming site is tidal and may be affected by prevailing Trade/Kona winds.

Initial Response Equipment

Boom* - Approximately 1800 feet of 24" harbor boom depending on water current and weather conditions.

Vessels: Two platform boats and four utility boats

(b) (3) (A) [redacted] @ Port Operations [808-474-6262])

Personnel: 2 to 3 crew per vessel; 1 to 2 personnel per vacuum truck

Boom Attachments: Connect to fixed objects on both sides of Halawa Stream

Initial Response Time: <1 hour

Oil Recovery:

This response strategy requires a minimum of (b) (3) (A) [redacted] will use hoses with portable skimmers attached to recover oil at the oil recovery locations identified in Figure 21. (b) (3) (A) [redacted] once full will wait 30 minutes for the oil and water to separate before decanting water back into the boomed area of the stream. During this process additional (b) (3) (A) [redacted] provide by the Fuels Logistic Center (FLC) and Naval Facilities (NAVFAC) will be continuing oil

recovery operations. (b) (3) (A) will eventually offload recovered oil at the FORFAC facility.

Spill Trajectories

The National Oceanic and Atmospheric Administration (NOAA) oil spill trajectory model GNOME (General NOAA Operational Modeling Environment) can be used to develop spill trajectories. A spill trajectory was developed for a million-gallon release and modelled under a variety of conditions. Spill trajectories are included in Attachment A.

Other Potential Booming Locations

Two additional sites along Halawa Stream have been identified where boom (b) (3) (A) could be deployed to contain and recover oil from the stream. Boom and sorbents could also be pre-staged at these locations to enable quick response in the case of a release.

The first site is the "Freeway Interchange Fuel Recovery Point" where a service road can be accessed from the (b) (3) (A) off the H-3 Highway. Figure 23 shows the entrance to the service road and location of (b) (3) (A) and recovery point.

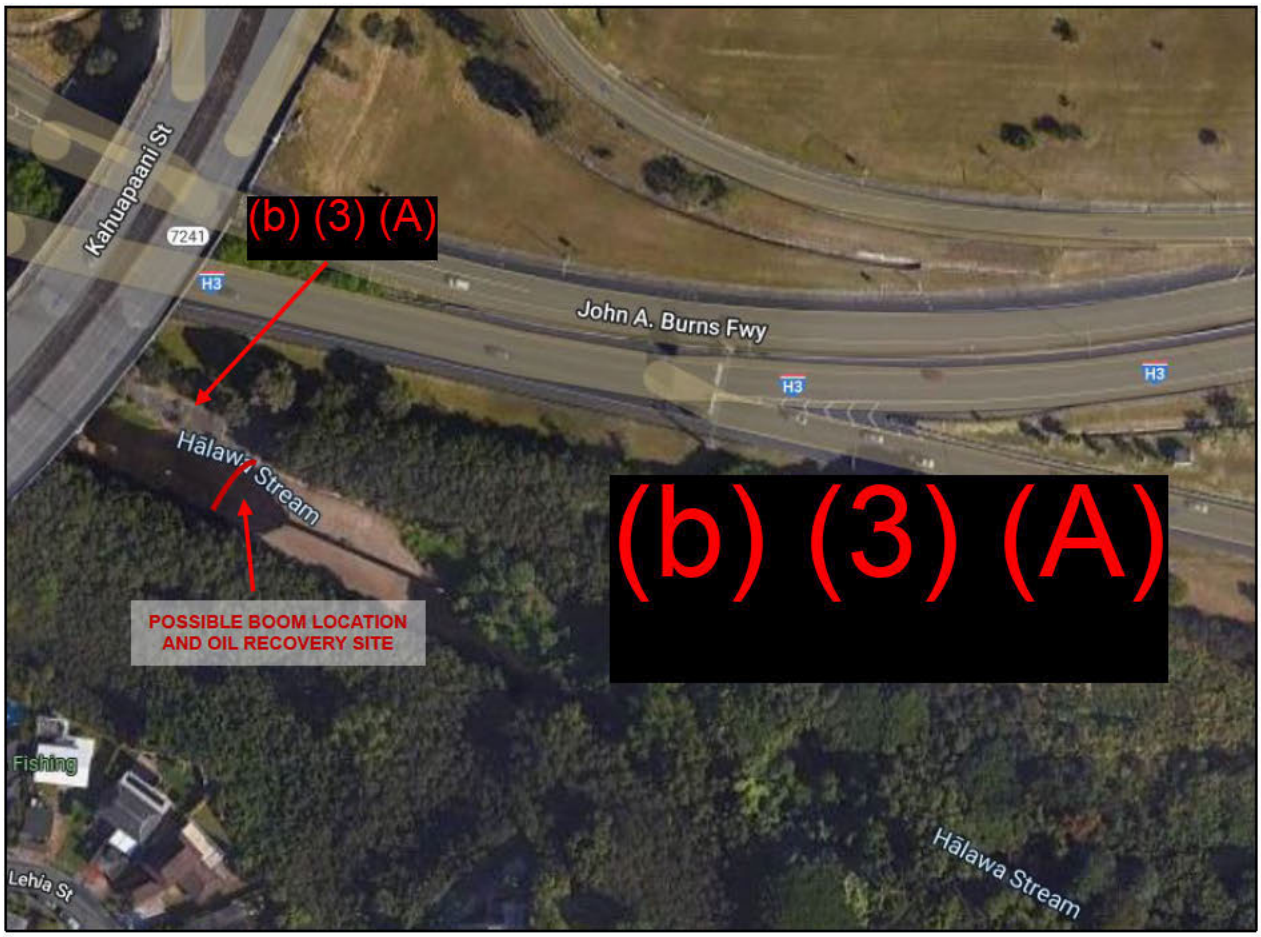

Figure 23: (b) (3) (A) Oil Recovery Point

The second site is in the (b) (3) (A) at Aloha Stadium. This site provides direct access to Halawa Stream and has plenty of space to conduct booming and oil recovery operations. There is plenty of area to (b) (3) (A) Note that permission needs to be provided by the Hawaii Stadium Authority (808-483-2500) before (b) (3) (A) or conducting recovery operations. Figure 24 shows the location of the (b) (3) (A) covery point.

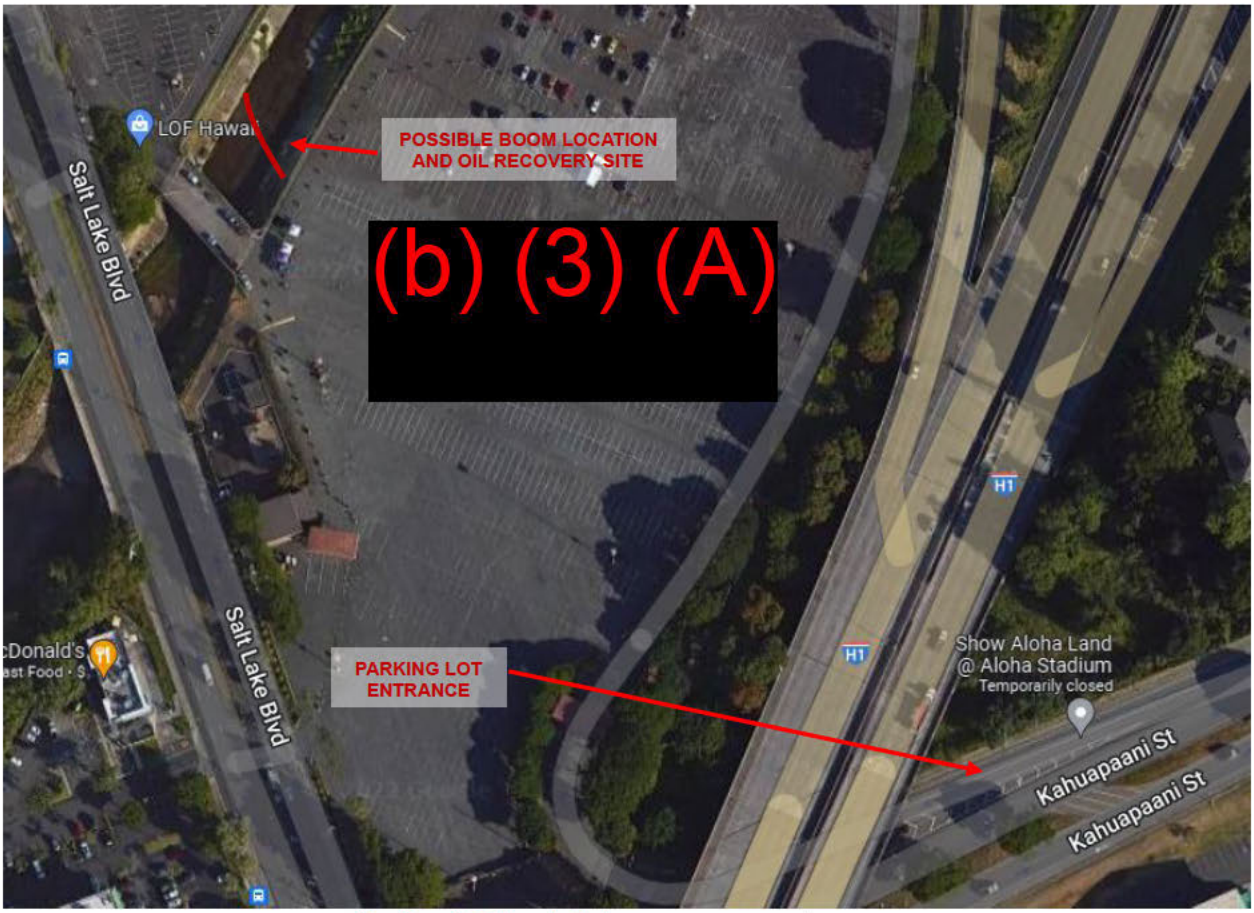

Figure 24: (b) (3) (A) Oil Recovery Point

Note: Neither of these two alternative locations will have (b) (3) (A) this exercise as the exercise assumes no impact to Adit (b) (3) and subsequently upper Halawa Stream.

The exercise assumes a release outside of the facility to the swale that has a direct connection with lower Halawa Stream. (b) (3) (A) oses and weir skimmer will also be mobilized to this location. The location is marked as Impacted Area on Figure 2.5

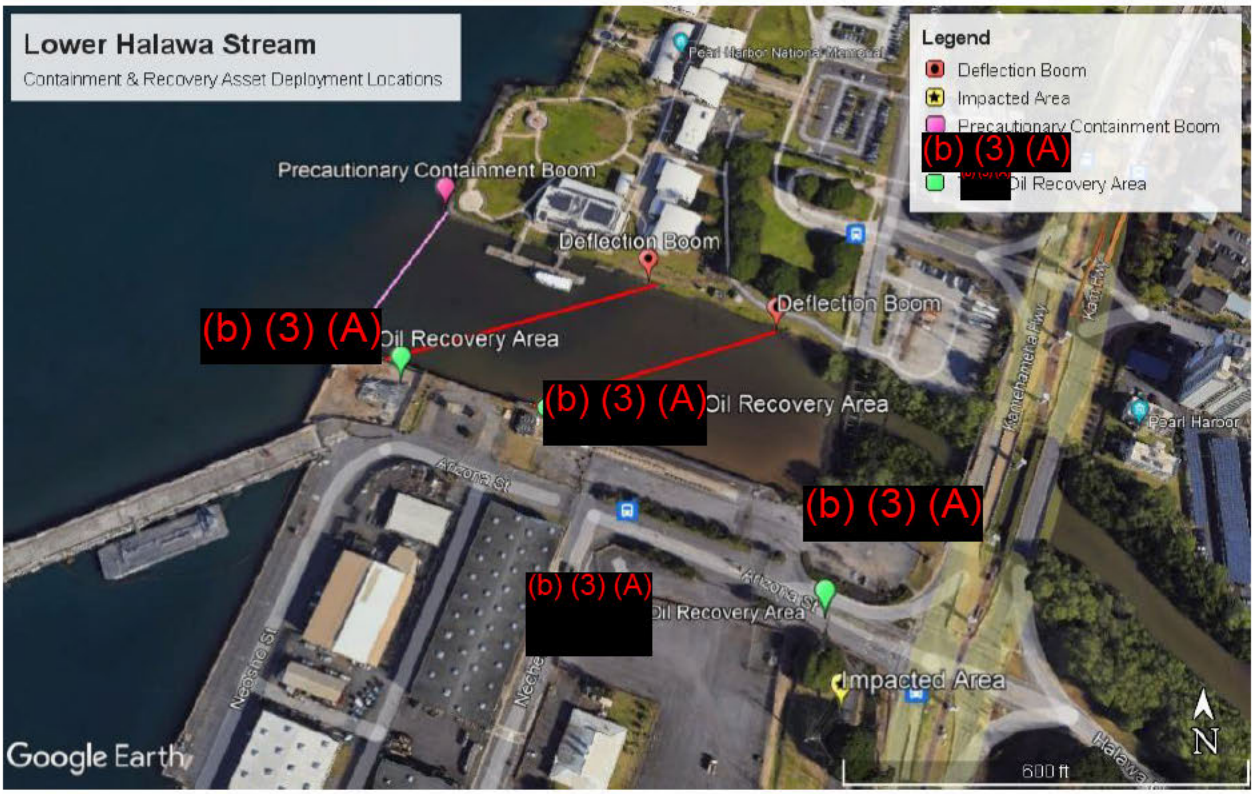

Figure 25: Impacted Area Leading to Lower Halawa Stream

7 EQUIPMENT SOURCES

Table 6 below identifies Navy vacuum trucks resources that can be used to recover oil from the Adit (b) (3) (A) and Lower Halawa Stream. Table 7 below identifies Navy owned Ship Waste Offload Barges (SWOB) and Yard Oiler, Non-Self Propelled (YON) (b) (3) (A) that can be used for the temporary storage of recovered fuel.

TABLE 6: (b) (3) (A) TRUCKS			
Topic		**Truck Type**	**Truck Type**
NUMBER	ON HAND	(b) (3) (A) [redacted]	
MANUFACTURER	BRAND		
	MODEL	Unk	Unk
	YEAR	Unk	Unk
PICK-UP HEAD TYPE (Manta, weir, etc.)		Weir/Hose Nozzles	Weir/Hose Nozzles
RECOVERY RATES	NOMINAL (gals/min)	(b) (3) (A) [redacted]	
	DE-RATED DAILY (gals/day)		
	" " (bbls/day)		

TABLE 6: (b) (3) (A) TRUCKS			
Topic		Truck Type	Truck Type
	TANK SIZE (gals)	(b) (3) (A) [redacted]	
MOBILIZATION	POINT OF CONTACT	NAVSUP FLCPH 473-7801	NAVFAC HI Emerg. Service Desk 449-3100
	STORAGE LOCATION	Fuel Department, Bldg 1757	BOWTS Facility Bldg 1910
	CREW NEEDED	1	1
	TIME (hrs) (Request on the road)	(b) (3) (A) [redacted]	

TABLE 7: TEMPORARY STORAGE		
Equipment	Capacity	Location / POC / Telephone
Bulk Storage Equipment For Recovered Oil		
SWOB Barge (b) (3) (A)	(b) (3) (A) [redacted]	Waterfront Operations Officer 474-6262
YON Barge (b) (3) (A)		Fuel Department 473-7833 or 690-0115 (24 hours)
YON Barge (b) (3) (A)		Waterfront Operations Officer 474-6262

8 MITIGATION MEASURES

Mitigation measures designed to protect the Red Hill Drinking Water Aquifer will be implemented prior to unpacking and will remain until completion of defueling operations.

8.1 RELEASE DIVERSION

A 50 foot (ft.) long by 24-inch diameter water-filled flood control tube will be positioned in the LAT at the entrance to the Adit (b) (3) (A) as depicted in Figure 26. The flood control tube has a capacity of 2,350 gallons and weighs 19,600 pounds (lbs.) when filled. The flood control tube is made of woven PVC vinyl fabric which makes it resistant to flame (has ignition temperatures as high as 455 degrees Fahrenheit), is resistant to oil and chemicals (hard to dissolve in most organic solvents), is mechanically stable (show little change in molecular structure) and is processable and moldable (strong exterior surface and embossing performance). Additionally, PVC vinyl fabric offers good flexibility, elasticity, impact resistance, anti-fouling, and resistance to microbial growth. The flood control tube will be reinforced with sandbags to prevent rolling and can withstand the release velocity as calculated based on maximum discharge from a 32-inch diameter steel pipe using slope and volume. Calculations are presented below. The anticipated height of the release is 3.912 inches which will be adequately contained by a 24-inch diameter tube. For safety and access stairs or a ramp will be constructed so personnel can access either side of the berm.

Pressure of Channel Flow Against Wall

A 25 ft. x 12-inch diameter flood control tube will be positioned and reinforced with sandbags at the [redacted] spur and HT. The flood control tube has a capacity of 587 gallons and weighs 4,900 pounds (lbs.) when filled. A series of 25 ft. x 12-inch diameter flood control tubes will similarly be positioned in Adit [redacted] in the event of breakthrough should it occur. Spill Kits containing large absorbents will be stationed downstream of water-filled flood control tubes for absorption of breakthrough if needed. Empty and lined 55-gallon drums will be staged alongside spill kits for containerization of soiled absorbents. As a precautionary contingency, vacuum pumps will also be pre-positioned throughout Adit [redacted] with hoses to pump fuel away from the Red Hill Drinking Water Aquifer into a staged (b) (3) (A) [redacted] tote.

Red Hill Fuel Storage Facility Spill Mitigation and Oil Removal Measures

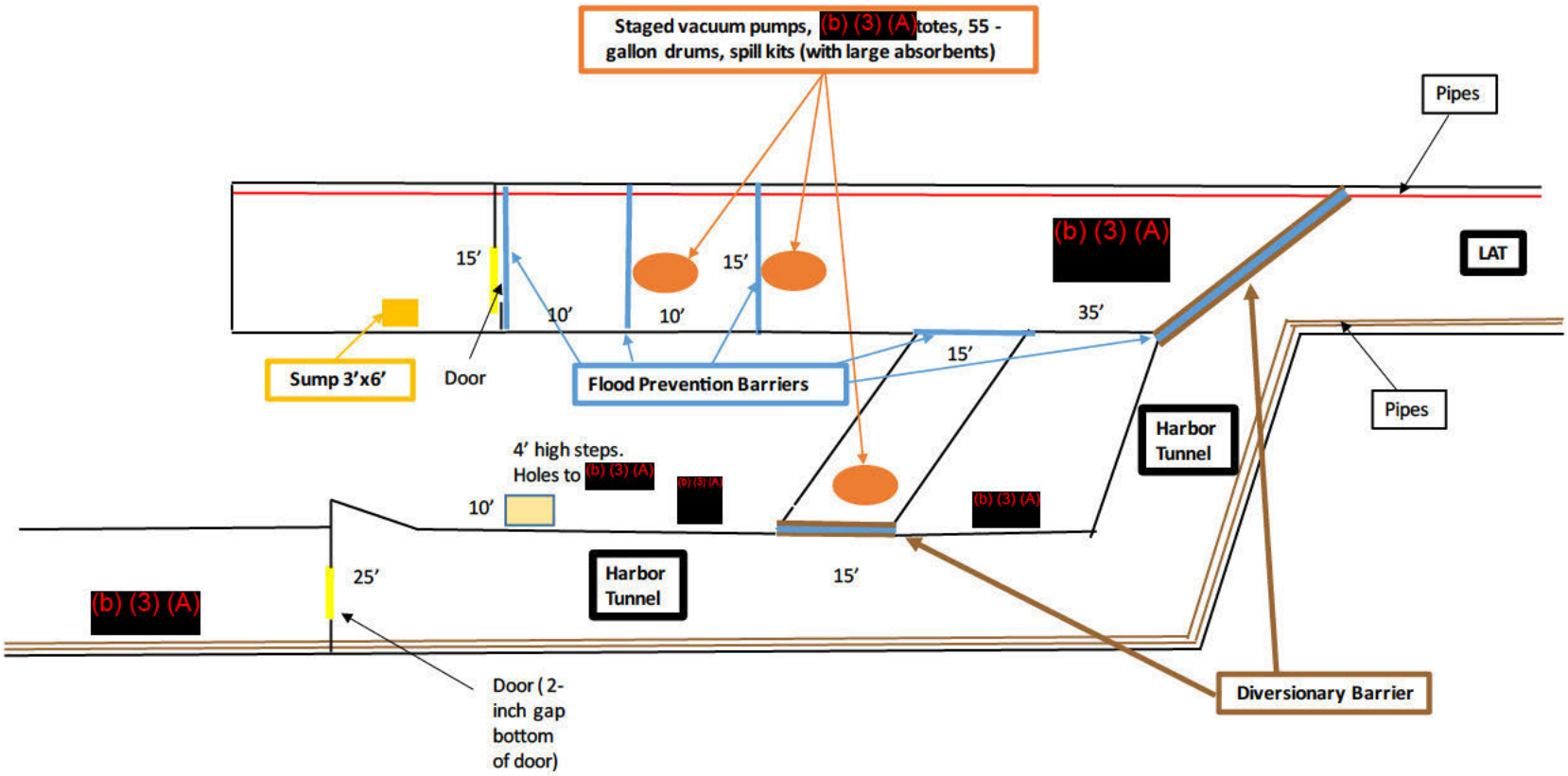

Figure 26: (b) (3) (A) Spill Mitigation Measures

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8.2 PROTECTION OF PREFERENTIAL PATHWAYS

8.2.1 SEALING OF CRACKS AND HOLES IN THE LAT

A comprehensive visual inspection of the LAT floor was completed 15-24 August 2022 that identified any suspected or probable penetrable areas allowing vertical migration of fuel to ground water. Structurally the concrete floor is stable. Minimal flaking and cracking is evident. Five categories of damaged and compromised concrete were identified:

a. Stress Release Cracks. These occur symmetrically from (b) (3) (A) [redacted] (b) (3) (A) [redacted]. Ranging from (b) (3) (A) [redacted] deep, they are positioned transversely from the steel column and concrete piers to the track. The majority are [redacted]. Risk: LOW. None of the cracks appear to penetrate more than (b) (3) (A) through the top-level slab. No mitigations recommended. If action is required, use QUIKRETE Gray Vinyl Patch and trowel over cracks.

b. Mechanical Puncture:

   i. Holes and Blunt Force Damage. A few puncture holes and some damaged areas are evident. Testing the depth with a screwdriver identified soft fill with little resistance allowing the screwdriver to be driven down to the hilt. Initial Risk: MEDIUM. The greatest risk for fuel migration vertically is likely the holes in which the screwdriver was able to penetrate without resistance. These should be vacuumed cleaned and filled with QUIKRETE Anchoring Fast Setting Cement. Mitigated Risk: LOW.

   ii. Bore Samples. These are one inch diameter holes and are sealed. They are located on both sides of Adi [redacted] access door and from (b) (3) (A) [redacted]. Risk: NONE. All the bore samples are sealed tight.

   iii. Soil Vapor Points. These are 2-inch access holes for monitoring sensors and gauging shallow subsurface water/oil transmission and contamination. They vary in depth from 8 inches to 6 feet. Some have water, some not. The contractor on site is using these. They are located on both sides of Adi [redacted] access door and from (b) (3) (A) [redacted]. Initial Risk: HIGH. These are high risk because not all are sealed. Once soil vapor points are sealed with a rubber membrane that should prevent fuel migration. Final solution to be determined by contractor on site. Mitigated Risk: LOW. All soil vapor points will be sealed using epoxy prior to unpacking operations. Necessary soil vapor points for facility closure will be re-opened once defueling of the facility has occurred.

c. Track Repair. Multiple areas of track are under repair exposing the lower layer of the concrete and/or footer. Along these repairs exist multiple sections with parallel saw cut lines along the tracks. These cut lines are no more than 2 inches in depth. Where the ties are removed, some screwdriver penetration occurs. Initial Risk: MEDIUM. There are two items of concern with the tracks that are prepped for removal and replacement from previous repair efforts:

   1. The locations where the ties were removed appear susceptible to leakage. Some of them can be penetrated by a screwdriver, others not. Recommended all tie holes be filled with QUIKRETE Anchoring Fast Setting Cement. Mitigated Risk: LOW.
   2. Second issue is the blunt force damage near and around the track repairs. Recommend they be patched with QUIKRETE Gray Vinyl Patch. Mitigated Risk: LOW.

3. All other damage along the track rails appears cosmetic and unsightly, but no leak issues suspected. These include saw cuts from a concrete saw blade parallel to the tracks and the cutout concrete sections.

d. Vibration Damage and Spalling. Some spalling and/or vibration damage exist along the rail tracks and tie downs. Initial Risk: LOW. There are minimal locations of this damage. These involve surface flaking less than one inch deep. Recommendation: Trowel QUIKRETE Gray Vinyl Patch over the area. Mitigated Risk: LOW.

e. Abrasion/Wear and Tear. Normal wear and tear have occurred to the concrete. Where excessive, abrasion and pitting has occurred. Minimal flaking exists in the tunnel floor. Initial Risk: LOW. Recommend no action.

8.2.2 GROUNDWATER MONITORING & SOIL VAPOR WELLS

Groundwater monitoring and soil vapor wells will be protected through the deployment of flood control/drain mats made of polyurethane. The flexible gel-like material delivers a durable seal. Mats resist oil, water and most aggressive chemicals and are a valuable addition to any emergency response plan, spill kit or stormwater management program.

8.2.3 LEAK DIVERTERS

Diverters that channel overhead leaks away from property, machinery and inventory will be placed around high-pressure valves (HPVs). The diverter will capture any released product and gravity feed the product to a staged 55-gallon drum below via tubing.

8.2.4 ELEVATOR SHAFTS

Temporary spill berms will be constructed in front of the elevator shafts to divert fuel away while at the same time not impeding their operation.

8.3 STAGING OF ROVERS IN THE LAT

Rovers/Gaugers will be staged throughout the RHFSF under MOVs during unpacking and defueling operations and actively observing and listening as valves are opened. The Rovers/Gaugers will be in constant communication with the Fuel Control Room and ready to respond to a release immediately should one occur.

8.4 ADDITIONAL RESOURCES AT THE READY

Additional resources will be staged at the RHFSF ahead of unpacking and defueling operations. Responders including the CNRH NOSC-R and the Facility Spill Response Team will be activated and on-site. Tanks that could potentially be used for the recovery of released product such as Tank [redacted], [redacted] will be drawn-down to provide extra ullage. Secondary storage will also be positioned at the facility. Federal Fire Department will also be on notice and will be at the ready should their services be needed.

EXERCISE BREAKDOWN

The exercise simplifies the sequences of events during a period that would be characterized by a series of complex issues occurring near simultaneously. All incidents are presented as unfolding events with the initial incident scenarios introducing the emergency and new information being introduced by means of injected messages throughout the exercise.

Individual or Entity	Participant	Location	Equipment Needed	Actions	Observer Needed
Forklift Operator & Facility Worker		RHFSF – LAT & Evacuate to Adit (b) (3) (A) [redacted]	➢ FLC Radio to communicate with PAPA ➢ Exercise Control Radio	➢ Notify other workers in general vicinity of LAT ➢ Evacuate to A(b) (3) (A) [redacted] ➢ Make notification to Fuel Control Room ➢ Communicate notification made to Exercise Control ➢ Standby for FFD & EMS ➢ Forklift operator evaluated by EMS upon arrival on-scene ➢ Notify Exercise Control of EMS & FFD arrival on-scene	Yes Location: (b) (3) (A) [redacted]
Fuel Control Room		RHFSF – PAPA	➢ FLC Radio ➢ Exercise Control Radio	➢ Source Control (close MOVs/Isolation valves) ➢ Initiate Emergency Notification to Evacuate Facility Workers ➢ Contact RDC and Dispatch Fed Fire Department (FFD), FFD HAZMAT Teams & EMS ➢ Contact the QI ➢ Secure Isolation Door @ UGPH/HT & (b) (3) (A) [redacted] if safe to do so	Yes Location: Fuel Control Room

				➢ Contact Fuel Operations Director ➢ Notify COMPACFLT CDO for immediate evacuation of BLDGS (b) (3) (A) [redacted] if necessary ➢ Move operations to alternate fuel control room (BLDG (b) (3) (A) [redacted]) if necessary ➢ Account for Evacuated Personnel ➢ Deploy Fuel Operator to ADIT [redacted] to assist FFD with identification of key areas for screening (ventilation shafts & ADIT entrances) & evaluation of ADIT [redacted] sump for fuel ➢ Deploy Fuel Operator to ADIT [redacted] to assist FFD with access for air monitoring ➢ Upon request of NOSC deploy Vac Truck to impacted swale area. ➢ Update Exercise Control as appropriate.	
FLC Fuel Operator #1		RHFSF – ADIT [redacted]	➢ FLC Radio ➢ Exercise Control Radio	➢ Mobilize to ADIT [redacted] ➢ Meet FFD HAZMAT team at ADIT [redacted] and provide facility map. ➢ Facilitate FFD with identifying key areas for	Yes Location: ADIT [redacted]

				screening i.e., Ventilation Shafts/ADIT (b) (3) (A) Entrances ➢ Once ADIT [redacted] cleared by HAZMAT Team simulate de-energization of ADIT [redacted] sump pump and check outlet for fuel. ➢ Report back to PAPA/Exercise Control that no fuel observed in sump outlet.	
FLC Fuel Operator #2		[redacted]	➢ Exercise Control Radio	➢ Mobilize to [redacted] to meet FFD HAZMAT Team #2 to facilitate access and to meet Recovery Team (Vac Truck). ➢ Report Vac Truck arrival to Exercise Control.	Yes Location: ADIT [redacted] Observer
RDC		RDC	➢ None	➢ Notify & Mobilize FFD to establish Incident Command Post (ICP) @ [redacted] Deploy FFD HAZMAT Teams to [redacted] for air monitoring & assessment of risk to public health ➢ Notify & Deploy EMS to [redacted]	No
EMS		EMS	➢ None	➢ Mobilize to [redacted] ➢ Evaluate Forklift Operator	Yes Location: [redacted] Observer

Fed Fire Department (FFD)		Fed Fire	➢ Can use same Exercise Control Radio as Spill Discoverer	➢ Establish ICP @ [redacted] ➢ Deploy HAZMAT Team # 1 to [redacted] to meet FLC Fuel Operator #1 ➢ Screen Ventilation Shafts/ADIT (b) (3) (A) Entrances using Air Monitoring Instruments. ➢ HAZMAT Team #1 confirms no IDLH environment, escorts Fuel Operator #1 to [redacted] Sump. ➢ HAZMAT Team #1 continues to monitor environment using air monitoring instruments at key locations ADIT (b) (3) (A) Ventilation Shafts ➢ HAZMAT Team #2 mobilizes to [redacted] to meet FLC Fuel Operator #2 and clears of IDLH Environment. ➢ Continues to monitor environment using air monitoring instruments and awaits Recovery Team (Vac truck). ➢ Mobilize representatives to EOC & ROC ➢ FFD acting IC briefs NOSC & QI on their arrival to ICP @ [redacted] ➢ Assist with ICP set-up when	Yes Location: [redacted] Observer [redacted] Observer [redacted] Observer

				resources arrive (simulated) ➢ Support NOSC ➢ Communicate Actions to Exercise Control	
Fuel Operations Director		Normal Post	➢ Exercise Control Radio	➢ Make Notification to Fuel Director ➢ Communicate Notification Made to Exercise Control	No
Fuel Director		Normal Post	➢ Exercise Control Radio	➢ Make Notification to JBPHH CDO ➢ Make Notification to NAVSUP FLC CDO ➢ Make Notification to Deputy Fuel Director ➢ Communicate Notifications Made to Exercise Control	No
JBPHH CDO		Normal Post	➢ Exercise Control Radio	➢ Make Notification to JBC/CSO. Activate EOC ➢ Make Notification to CNRH ROC ➢ Make Notification to JBPHH QI ➢ Make Notification to PAO ➢ Communicate Notifications Made to Exercise Control	No
JBC/CSO	(b) (6) [redacted]	Normal Post	➢ Exercise Control Radio	➢ Activate EOC ➢ Communicate Actions to Exercise Control	Yes Location: EOC Observer
Emergency Operations Center		EOC	➢ Exercise Control Radio	➢ Stand up EOC ➢ Establish communications	Yes Observer

(EOC)				bridge with ROC & ICP ➢ Send out internal Navy notifications as appropriate ➢ Deploy resources to ICP to support QI/NOSC response ➢ Fill out ICS Forms 201, 202, & 207 with NOSC, SOSC and other Federal Partners ➢ Installation PAO contact CNRH PAO and HDOH PIO ➢ Communicate actions to Exercise Control	needed for EOC
Regional Operations Center (ROC)		ROC	➢ Exercise Control Radio	➢ Make Notification to REGCOM ➢ Personnel report to ROC ➢ Deploy resources to ICP to support QI/NOSC response ➢ ROC notify NOSC reported sheen lower Halawa Stream ➢ Regional PAO contact Installation PAO & HDOH PIO. ➢ Communicate Notification of REGCOM and Actions to Exercise Control ➢ Send out internal Navy notifications as appropriate.	Yes ROC Observer
JBPHH QI	(b) (6) [redacted]	JBPHH/ [redacted] ICP	➢ Exercise Control Radio ➢ Spill Phone (cell)	➢ Notify NOSC ➢ NOSC instructs QI to mobilize recovery resources to [redacted] (3) (A) have them standby for further instruction	Yes [redacted] Observer

				➢ Mobilize to ICP @ [redacted] ➢ Receive Briefing from IC/FFD ➢ Assist NOSC with mobilization of resources through NAVFAC Service Desk & EOC ➢ Assess Sheen with NOSC & SOSC ➢ Further assist NOSC with mobilization of resources through NAVFAC Service Desk & EOC ➢ Communicate Actions to Exercise Control	
PAO		EOC ROC	➢ No special equipment needed	➢ Communicate with each other & Engage HDOH PIO ➢ Generate Press Release.	EOC Observer ROC Observer
REGCOM	RDML Barnett	Normal Post/ROC	➢ No special equipment needed	➢ No actions	ROC Observer
CNRH NOSC-R	(b) (6) [redacted]	JBPHH/RHFSF ICP	➢ Exercise Control Radio ➢ NOSC Cell	➢ Instruct QI to mobilize resources to [redacted] and have them standby (FFD HAZMAT Team #2, FLC Fuel Operator #2, & (b) (3) (A) ➢ Notify Port Ops & Deploy Boom, Boats, Skimmer, Vac Truck to Halawa Stream via FRT. FRT to remain on-scene and actively patrol. Report	Yes [redacted] Observer

				any observations. Request Port Ops notify NPS and have Arizona Memorial Operations suspended. ➢ Notify NRC, SERC, LEPC ➢ Notify Exercise Control after each step ➢ Mobilize to ICP @ [redacted] and announce yourself. ➢ Receive briefing from IC/FFD and assume role of IC. ➢ Assess Scene ➢ Assess Release ➢ Request EOC begin filling out ICS forms 201, 202, 207. Assist as required ➢ Task QI with Requesting Resources from EOC ➢ Brief SOSC upon arrival @ [redacted] & integrate into UC/Org. Chart ➢ NOSC, QI, SOSC investigate Swale/Halawa Stream ➢ Directs QI to contact NAVFAC Service Desk to Deploy Vac Truck and Skimmer to Swale for recovery ➢ Contact Port Ops to confirm deployment of assets. Confirm notification to NPS, closure of Arizona Memorial,	

				and area cleared of vessel traffic. ➢ Contact USCG – Updates on impacts to navigable waters of the US. ➢ Contact Environmental Division - Deploy team to assess shoreline/lower Halawa Stream for wildlife/ecologically sensitive area Impacts. Contact FWS/NOAA if impacts discovered. ➢ Update Exercise Control as appropriate	
Engineer		[redacted] ICP	➢ No special Equipment Needed	➢ Receives Notification to Report to [redacted] ICP with Facility Maps. ➢ Briefs with NOSC/IMT upon arrival. ➢ Conducts requested calculations and reviews maps. ➢ Calls 5-Plex to attention of NOSC/IMT and conducts calculations to determine volume potentially released from Facility. ➢ Briefs NOSC	Yes [redacted] Observer
Port Operations		Normal Post	➢ Exercise Control Radio	➢ Notify Bowhead to deploy precautionary containment boom, deflection boom, boats,	Yes [redacted] Observer

				rapid response skimmer, vacuum truck to lower Halawa Stream. ➢ Request that NPS close Arizona Memorial (simulated) ➢ Update Exercise Control as appropriate on Port Operations Actions and Actions of Bowhead. ➢ Once notified of sheen by Bowhead convey that to the ROC so that they can notify NOSC	
BOWHEAD		Normal Post	➢ Coms with Port Operations	➢ Deploy Boom (Containment, Deflection), Skimmer, Vac Truck. ➢ Notify Port Ops of actions so that Port Ops can notify Exercise Control ➢ Actively patrol area (lower Halawa Stream) and periodically report observations to Port Ops. ➢ Notify Port Ops of sheen @ lower Halawa Stream	Yes Harbor Observer
NAVFAC/JBPHH Service Desk		Normal Post	➢ No special equipment needed	➢ Make Notification to JBPHH Environmental SRT to dispatch vacuum truck to [redacted]	No
NRC/SERC/ LEPC			➢ No special equipment needed	➢ Provide Report #'s ➢ SOSC Mobilize to [redacted] ICP & ROC	Yes [redacted] Observer

				➢ Receive Incident Brief ➢ Integrate into UC ➢ Evaluate Sheen Lower Halawa Stream with NOSC ➢ Assist with ICS Forms ➢ PAOs & PIOs connect	
JBPHH Environmental SRT		Normal Post	➢ No special equipment needed	➢ Mobilize (b) (3) (A) [redacted] ➢ Exercise Participants at Collection Points need to notify Exercise Control on asset arrival.	Yes [redacted] & Field Observers.

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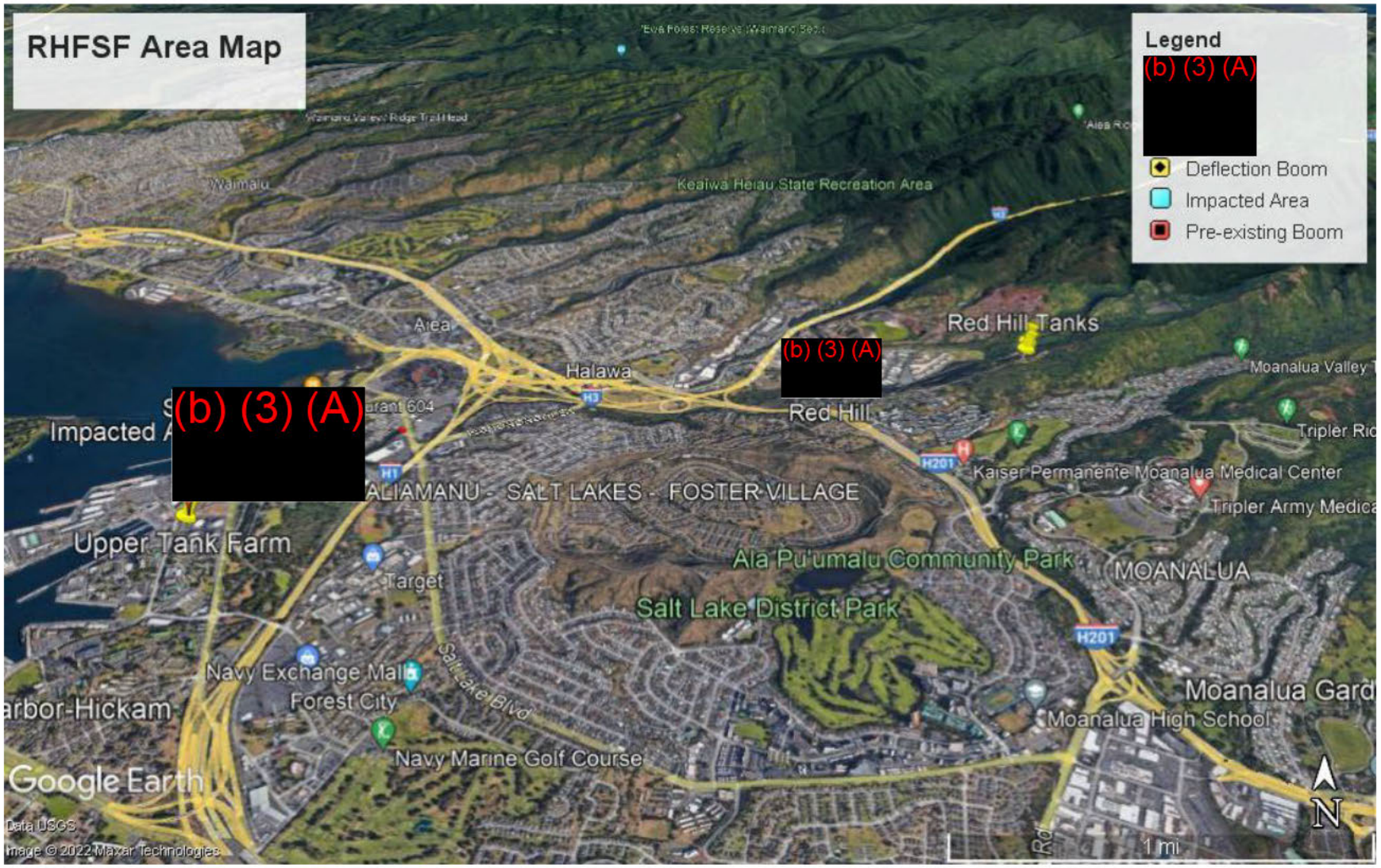

Figure 27: Facility Map Illustrating Distance

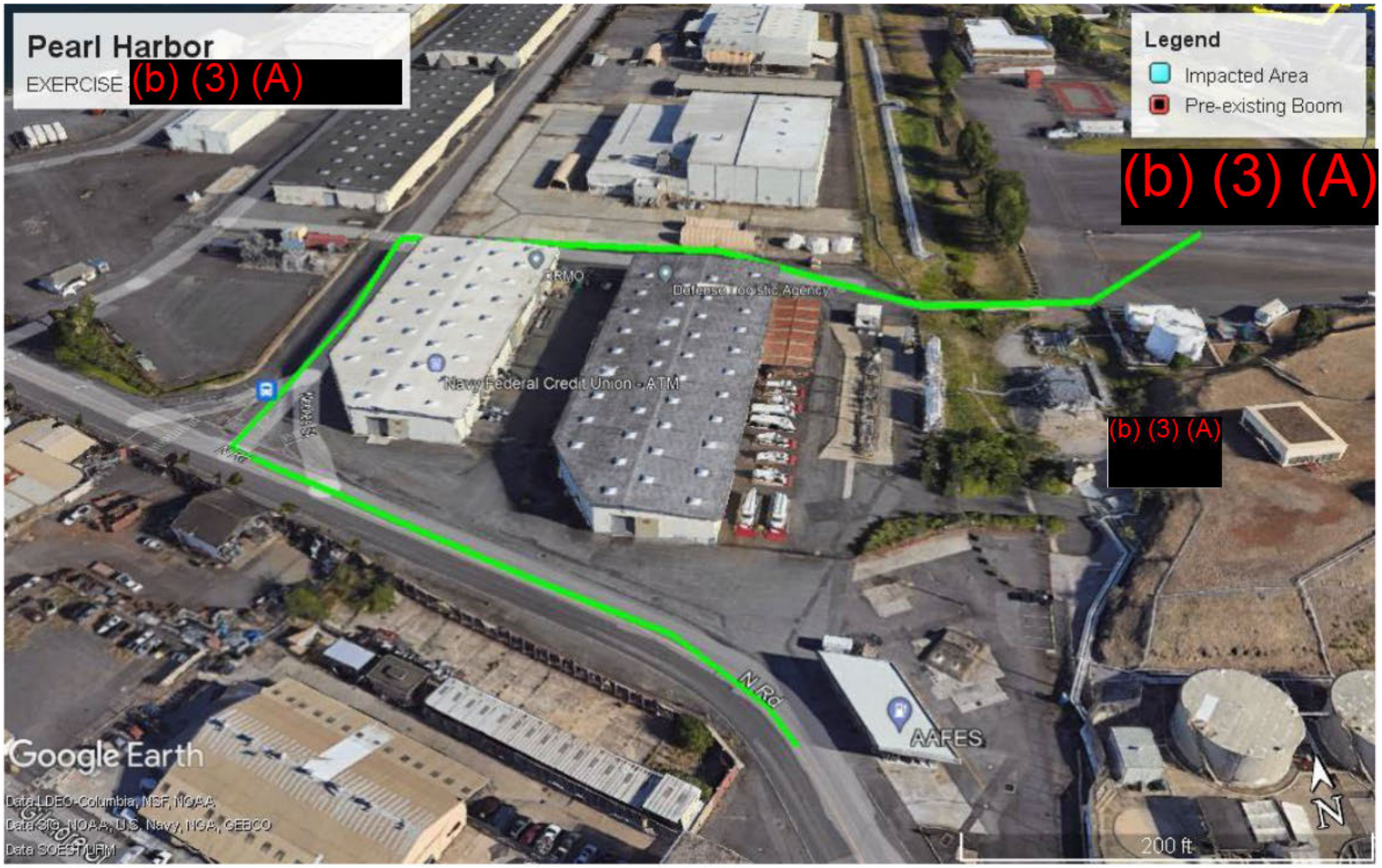

Figure 28: Exercise (b) (3) (A) [redacted] MAP

Figure 29: [redacted](b) MAP/NAVFAC (b) (3) (A) [redacted] Location

Figure 30: [redacted] MAP

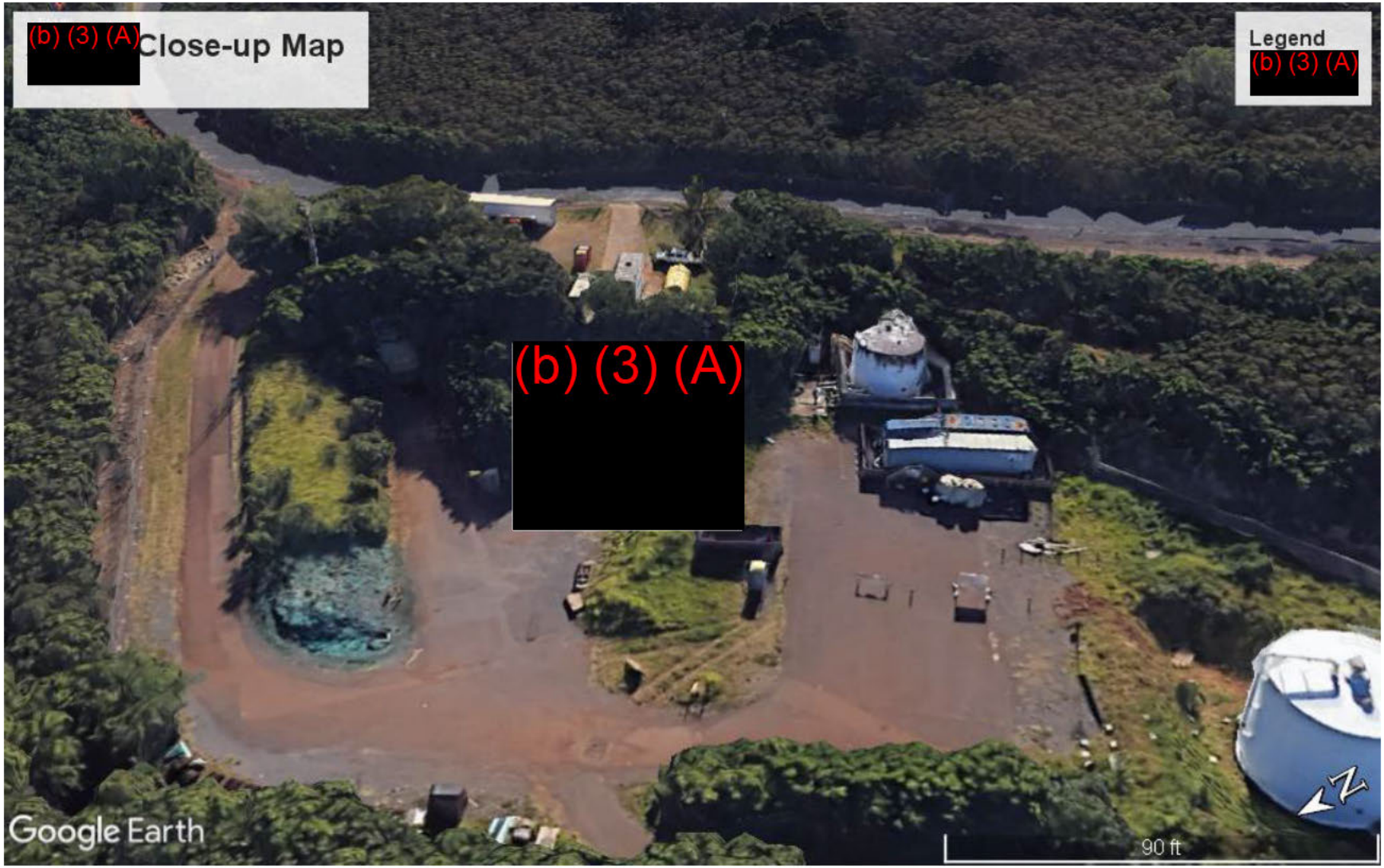

Figure 31: Close-up (b) (3) (A)

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SCENARIO MESSAGES

Message Number	Exercise Participant	Exercise Message	Expected Actions
1	Forklift Operator	Exercise, Exercise. Sir or Madame, this is _____ (insert name) and I'm calling to report an emergency in the Lower Access Tunnel. Upon completion of the diversionary barrier at the A(b) (3) (A)our forklift operator fell unconscious and crashed the forklift into a fuel pipeline just upgradient of the A(b) (3) (A)in the Lower Access Tunnel (LAT). The pipeline ruptured and is actively releasing fuel. The forklift operator regained consciousness almost immediately after the crash and I assisted him with evacuating to outside the A(b) (3) (A) entrance. We notified other workers in the general vicinity who have also evacuated and are mustered at the assembly point outside A(b) (3) (A) The forklift operator seems okay and wasn't doused in fuel. There are no other injuries to report. The diversionary barrier seemed to be intact and operating as intended. Awaiting further instructions. If you need additional information I can be reach at _____ (provide phone #). Over."	➢ Notify other workers in general vicinity of LAT ➢ Evacuate to A(b) (3) (A) ➢ Make notification to Fuel Control Room ➢ Communicate notification made to Exercise Control ➢ Standby for FFD & EMS ➢ Forklift operator evaluated by EMS upon arrival on-scene ➢ Notify Exercise Control of EMS & FFD arrival on-scene

Message 2 Controller's Note:
The Control Room Operator initiates the emergency alarm/notification system to notify all workers at the facility using the "giant voice" system. Motorized block valves are immediately closed using the Automatic Fuel Handling Equipment (AFHE) Emergency Shutdown Graphical User Interface (GUI). Maintenance and hot work are halted. The Control Room Operator confirms the leak is coming from the [redacted] pipeline between valves [redacted] The Fuel Control Room Operator confirms that valves at those [redacted] locations are closed, effectively isolating that section of pipeline which contains [redacted] fuel. Fuel Control Room Operators secure isolation doors at the UGPH and at [redacted] Evacuated personnel are accounted for. Fuel Operator #1 is dispatched to meet FFD HAZMAT Team #1outside of [redacted] to facilitate access. Fuel Operator #2 is dispatched to meet FFD HAZMAT Team #2 outside of [redacted] to facilitate access. Once the HAZMAT Team clears [redacted] of an IDLH using air monitoring instruments, FFD will escort Fuel Operator #1 to de-energize the [redacted] sump pump and check the outlet for fuel. EMS is dispatched to [redacted] to evaluate the forklift operator. PAPA makes the necessary notifications.

Message Number	Exercise Participant	Exercise Message	Expected Actions
2	Fuel Control Room/PAPA	"Exercise, Exercise. Sir or Madame, this is the Fuel Control Room at the Red Hill Fuel Storage Facility. At 1000 a forklift operator fell unconscious and crashed his forklift into the [redacted] pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the [redacted] Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains [redacted] fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered. The forklift operator is being given fluids to keep him hydrated and is being treated for shock. Fuel seems to be flowing down the Harbor Tunnel towards the Underground Pumphouse (UGPH). Isolation doors at the UGPH and ADIT [redacted] are closed. Could you please dispatch the Federal Fire Department (FFD) to establish an incident command post outside of ADIT [redacted] We would also like to	➢ Source Control (close MOVs/Isolation valves) ➢ Initiate Emergency Notification to Evacuate Facility Workers ➢ Contact RDC and Dispatch Fed Fire Department (FFD), FFD HAZMAT Teams & EMS ➢ Contact the QI ➢ Secure Isolation Door @ UGPH/HT & ADIT [redacted] f safe to do so ➢ Contact Fuel Operations Director ➢ Notify COMPACFLT CDO for immediate evacuation of BLDGS

		request that the FFD dispatch a HAZMAT Team to [redacted] to evaluate the hazard to public health. We would like them to screen key areas such as ventilation shafts and ADIT entrances using air monitoring instruments. We will be dispatching a FLC operator to meet the HAZMAT team and provide maps of the facility. We would also like to request the assistance of EMS at [redacted] to evaluate the forklift operator. Finally, we request a second HAZMAT team be deployed to [redacted] to conduct air monitoring. Another Fuel Operator will be at [redacted] to meet the second HAZMAT Team. Over."	[redacted] if necessary ➢ Move operations to alternate fuel control room (BLDG [redacted]) if necessary ➢ Account for Evacuated Personnel ➢ Deploy Fuel Operator to [redacted] to assist FFD with identification of key areas for screening (ventilation shafts & ADIT entrances) & evaluation of [redacted] sump for fuel ➢ Deploy Fuel Operator to [redacted] to assist FFD with access for air monitoring ➢ Upon request of NOSC deploy Vac Truck to impacted swale area. ➢ Update Exercise Control as appropriate.

Message 3 Controller's Note:
Fuel Operator #1 is dispatched to ADIT [redacted] to meet FFD HAZMAT Team, provide them a facility map and facilitate access. FLC Fuel Operator #1 will direct FFD to screen key areas with air monitoring instruments including ventilation shafts and ADIT entrances. Once FFD HAZMAT Team #1 has cleared ADIT [redacted] of IDLH they will escort Fuel Operator #1 to the ADIT [redacted] pump. Fuel Operator #1 will de-energize the pump (simulated) and check outlet for fuel. No fuel to report which adds to body of evidence that diversionary barrier is functioning as intended and diverting fuel down the Harbor Tunnel. Actions will be communicated to Exercise Control. HAZMAT Team #1 continuously air monitor at ADIT [redacted] FFD HAZMAT Team #2 deployed to ADIT [redacted] to meet Fuel Operator #2 and conduct air monitoring in that location. Regional Dispatch Center Notify Fed Fire and request: Establishment of ICP at ADIT [redacted] HAZMAT Team #1 mobilize to ADIT [redacted] to conduct air monitoring; EMS mobilize to ADIT [redacted] to evaluate forklift operator; HAZMAT Team #2 mobilize to ADIT [redacted]

Message Number	Exercise Participant	Exercise Message	Expected Actions
3	Fuel Operations Director	"Exercise, Exercise. Sir or Madame, this is the Fuel Operations Director at the Red Hill Fuel Storage Facility. At 1000 a forklift operator fell unconscious and crashed his forklift into the [redacted] pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the [redacted] Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains [redacted] fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered but is waiting outside ADIT [redacted] for further evaluation by EMS. Fuel is flowing down the Harbor Tunnel towards the UGPH. Isolation doors at the UGPH and ADIT [redacted] are closed. RDC has dispatched FFD to establish an incident command post outside of ADIT [redacted] HAZMAT Teams have been dispatched to both ADIT [redacted] and ADIT [redacted] to assess the risk to public health. Fuel operators have been dispatched to both locations to meet and assist HAZMAT Teams with	➢ Make Notification to Fuel Director ➢ Communicate Notification Made to Exercise Control

		identifying key areas such as ventilation shafts and ADIT entrances to screen using air monitoring instruments. Once cleared of hazards the fuel operator at [redacted] will de-energize the pump at the [redacted] sump and check the outlet for fuel. EMS have been mobilized to [redacted] to evaluate the forklift operator. Will keep you informed as the situation develops. Over."	

Message 4 Controller's Note:
Fuel Operator #1 is dispatched to (b) (3) (A) to meet FFD HAZMAT Team, provide them a facility map and facilitate access. FLC Fuel Operator #1 will direct FFD to screen key areas with air monitoring instruments including ventilation shafts and ADIT entrances. Once FFD HAZMAT Team #1 has cleared (b) (3) (A) of IDLH they will escort Fuel Operator #1 to the (b) (3) (A) ump. Fuel Operator #1 will de-energize the pump (simulated) and check outlet for fuel. No fuel to report which adds to body of evidence that diversionary barrier is functioning as intended and diverting fuel down the Harbor Tunnel. Actions will be communicated to Exercise Control. HAZMAT Team #1 continuously air monitor at (b) (3) (A) FFD HAZMAT Team #2 deployed to (b) (3) (A) to meet Fuel Operator #2 and conduct air monitoring in that location. Regional Dispatch Center Notify Fed Fire and request: Establishment of ICP at (b) (3) (A) HAZMAT Team #1 mobilize to (b) (3) (A) to conduct air monitoring; EMS mobilize to (b) (3) (A) to evaluate forklift operator; HAZMAT Team #2 mobilize to (b) (3) (A)

Message Number	Exercise Participant	Exercise Message	Expected Actions
4	Fuel Director	"Exercise, Exercise. Sir or Madame, this is the Fuel Director at the Red Hill Fuel Storage Facility. At 1000 a forklift operator fell unconscious and crashed his forklift into the (b) (3) (A) pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the (b) (3) (A) Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains (b) (3) (A) fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered but is waiting outside (b) (3) (A) for further evaluation by EMS. Fuel is flowing down the Harbor Tunnel towards the UGPH. Isolation doors at the UGPH and (b) (3) (A) are closed. RDC has dispatched FFD to establish an incident command post outside of (b) (3) (A) HAZMAT Teams have been dispatched to both (b) (3) (A) o assess the risk to public health. Fuel operators have been dispatched to both locations to meet and assist HAZMAT Teams with identifying key	➢ Make Notification to JBPHH CDO ➢ Make Notification to NAVSUP FLC CDO ➢ Make Notification to Deputy Fuel Director ➢ Communicate Notifications Made to Exercise Control

		areas such as ventilation shafts and ADIT entrances to screen using air monitoring instruments. Once cleared of hazards the fuel operator at [redacted] will de-energize the pump at the [redacted] sump and check the outlet for fuel. EMS have been mobilized to [redacted] to evaluate the forklift operator. Will keep you informed as the situation develops. Please continue with the notification process and request the assistance of the QI/NOSC. Over."	

Message 5 Controller's Note:

- Upon notification JBC/CSO activates the Emergency Operations Center (EOC).
- Once the JBPHH CDO reaches the QI, they will request that the QI mobilize to the ICP at (b) (3) (A) to integrate with FFD, further assess the situation, and initiate clean-up operations. The JBPHH CDO should request that the QI provide an estimated time of arrival at the (b) (3) (A) ICP and communicate this.

Message Number	Exercise Participant	Exercise Message	Expected Actions
5	JBPHH CDO	"Exercise, Exercise. Sir or Madame, this is the JBPHH CDO. At 1000 a forklift operator fell unconscious and crashed his forklift into the [redacted] pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the (b) (3) (A) Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains (b) (3) (A) fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered but is waiting outside (b) (3) (A) for further evaluation by EMS. Fuel is flowing down the Harbor Tunnel towards the UGPH. Isolation doors at the UGPH and (b) (3) (A) re closed. RDC has dispatched FFD to establish an incident command post outside of (b) (3) (A) HAZMAT Teams have been dispatched to both (b) (3) (A) nd [redacted] o assess the risk to public health. Fuel operators have been dispatched to both locations to meet and assist HAZMAT Teams with identifying key areas such as ventilation shafts and ADIT entrances to screen using air monitoring instruments. Once cleared of hazards the fuel operator at (b) (3) (A) will de-energize the pump at the (b) (3) (A) mp and check the outlet for fuel. EMS have been mobilized t [redacted] o evaluate the forklift operator. The assistance of the QI is being requested at the ICP at (b) (3) (A) Over."	➢ Make Notification to JBC/CSO ➢ Make Notification to CNRH ROC ➢ Make Notification to JBPHH QI ➢ Make Notification to PAO ➢ Communicate Notifications Made to Exercise Control

Message 6 Controller's Note:			
Message Number	**Exercise Participant**	**Exercise Message**	**Expected Actions**
6	NAVSUP FLC CDO	"Exercise, Exercise. Sir or Madame, this is the NAVSUP FLC CDO. At 1000 a forklift operator fell unconscious and crashed his forklift into the [redacted] pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the [redacted] Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains [redacted] fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered but is waiting outside [redacted] for further evaluation by EMS. Fuel is flowing down the Harbor Tunnel towards the UGPH. Isolation doors at the UGPH and [redacted] are closed. RDC has dispatched FFD to establish an incident command post outside of [redacted] HAZMAT Teams have been dispatched to both [redacted] and [redacted] to assess the risk to public health. Fuel operators have been dispatched to both locations to meet and assist HAZMAT Teams with identifying key areas such as ventilation shafts and ADIT entrances to screen using air monitoring instruments. Once cleared of hazards the fuel operator at [redacted] will de-energize the pump at the [redacted] and check the outlet for fuel. EMS have been mobilized to [redacted] to evaluate the forklift operator. The assistance of the QI is being requested at the ICP at [redacted] Over."	➢ Make Notification to NAVFAC CDO ➢ Communicate Notification Made to Exercise Control

Message 7 Controller's Note:

Message Number	Exercise Participant	Exercise Message	Expected Actions
7	ROC	"Exercise, Exercise. Sir or Madame, this is the ROC. At 1000 a forklift operator fell unconscious and crashed his forklift into the (b) (3) (A) pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the (b) (3) (A) Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains (b) (3) (A) fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered but is waiting outside A (b) (3) (A) for further evaluation by EMS. Fuel is flowing down the Harbor Tunnel towards the UGPH. Isolation doors at the UGPH and (b) (3) (A) are closed. RDC has dispatched FFD to establish an incident command post outside of (b) (3) (A) HAZMAT Teams have been dispatched to both (b) (3) (A) and to assess the risk to public health. Fuel operators have been dispatched to both locations to meet and assist HAZMAT Teams with identifying key areas such as ventilation shafts and ADIT entrances to screen using air monitoring instruments. Once cleared of hazards the fuel operator at ADIT 3 will de-energize the pump at the (b) (3) (A) mp and check the outlet for fuel. EMS have been mobilized t to evaluate the forklift operator. The assistance of the QI/NOSC is being requested at the ICP at (b) (3) (A) JBC has activated the EOC. Over."	➢ Make Notification to REGCOM ➢ Personnel report to ROC ➢ Deploy resources to ICP to support QI/NOSC response ➢ ROC notify NOSC reported sheen lower Halawa Stream ➢ Regional PAO contact Installation PAO & HDOH PIO. ➢ Communicate Notification of REGCOM and Actions to Exercise Control ➢ Send out internal Navy notifications as appropriate.

Message 8 Controller's Note:
QI provides ETA and confirms (b) (3) (A) as the ICP location. Notifies NOSC and receives direction to mobilize Vac Truck with hoses and portable skimmer to (b) (3) (A) QI then mobilizes to the ICP @ (b) (3) (A) Receives briefing from IC/FFD and assists NOSC with mobilization of resources and release assessment.

Message Number	Exercise Participant	Exercise Message	Expected Actions
8	QI	"Exercise, Exercise. Sir or Madame, this is the QI. At 1000 a forklift operator fell unconscious and crashed his forklift into the (b) (3) (A) pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the (b) (3) (A) Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains (b) (3) (A) fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered but is waiting outside (b) (3) (A) for further evaluation by EMS. Fuel is flowing down the Harbor Tunnel towards the UGPH. Isolation doors at the UGPH and (b) (3) (A) are closed. RDC has dispatched FFD to establish an incident command post outside of (b) (3) (A) HAZMAT Teams have been dispatched to both (b) (3) (A) and to assess the risk to public health. Fuel operators have been dispatched to both locations to meet and assist HAZMAT Teams with identifying key areas such as ventilation shafts and ADIT entrances to screen using air monitoring instruments. Once cleared of hazards the fuel operator at (b) (3) (A) will de-energize the pump at the (b) (3) (A) sump and check the outlet for fuel. EMS have been mobilized to (b) (3) (A) to evaluate the forklift operator. Your assistance is being requested at the ICP at (b) (3) (A) JBC has activated the EOC. Over."	➢ Notify NOSC ➢ NOSC instructs QI to mobilize recovery resources to (b) (3) (A) and have them standby for further instruction ➢ Mobilize to ICP @ ADIT (b) (3) (A) ➢ Receive Briefing from IC/FFD ➢ Assist NOSC with mobilization of resources through NAVFAC Service Desk & EOC ➢ Assess Sheen with NOSC & SOSC ➢ Further assist NOSC with mobilization of resources through NAVFAC Service Desk & EOC ➢ Communicate Actions to Exercise Control

Message 9 Controller's Note:
NOSC provides ETA and confirms [redacted] as the ICP location. NOSC requests through the QI that a [redacted] hoses, skimmer, and large absorbents be deployed to [redacted] Requests deployment of booms, skimmer, [redacted] to lower Halawa Stream through Control Tower. Requests NPS be notified to suspend Arizona Memorial Operations. NOSC makes notifications to NRC and SERC and mobilizes to the ICP @ [redacted] LEPC notified via online form. Obtains briefing from FFD including updates on deployed resources and their present locations, risks to public health – air monitoring results, information known surrounding release. Resource request to EOC through QI and requests EOC begin filling out ICS forms 201, 202, and 207. Updates the ROC. Investigates sheen in harbor and swale. Deploys vac truck to impacted area through QI. Deploys wildlife observer to lower Halawa Stream to conduct shoreline survey of impacts to ecologically sensitive areas and potentially impacted listed species.

For agency notifications NOSC should be prepared to take down report #'s and provide the following information:

- *Your name, location, organization, and telephone number*
- *Name and address of the party responsible for the incident; or name of the carrier or vessel, the railcar/truck number, or other identifying information*
- *Date and time of the incident*
- *Location of the incident*
- *Source and cause of the release or spill*
- *Types of material(s) released or spilled*
- *Quantity of materials released or spilled*
- *Medium (e.g., land, water) affected by release or spill*
- *Danger or threat posed by the release or spill*
- *Number and types of injuries or fatalities (if any)*
- *Weather conditions at the incident location*
- *Whether an evacuation has occurred*
- *Other agencies notified or about to be notified*
- *Any other information that may help emergency personnel respond to the incident*

Message Number	Exercise Participant	Exercise Message	Expected Actions
9	NOSC	"Exercise, Exercise. Sir or Madame, this is the NOSC. At 1000 a forklift operator fell unconscious and crashed his forklift into the (b) (3) (A) pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the (b) (3) (A) Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains (b) (3) (A) gallons of fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered but is waiting outside (b) (3) (A) for further evaluation by EMS. Fuel is flowing down the Harbor Tunnel towards the UGPH. Isolation doors at the UGPH and (b) (3) (A) are closed. RDC has dispatched FFD to establish an incident command post outside of (b) (3) (A) HAZMAT Teams have been dispatched to both (b) (3) (A) and (b) (3) (A) to assess the risk to public health. Fuel operators have been dispatched to both locations to meet and assist HAZMAT Teams with identifying key areas to screen including ventilation shafts and ADIT entrances. Once cleared of hazards the fuel operator at (b) (3) (A) will de-energize the pump at the (b) (3) (A) sump and check the outlet for fuel. EMS have been mobilized to (b) (3) (A) to evaluate the forklift operator. Recovery assets have been deployed to key locations and a containment boom is in the process of being deployed at the mouth of lower Halawa Stream and Pearl Harbor. Over."	➢ Instruct QI to mobilize vac truck, hoses, skimmer, and large absorbents through NAVFAC Service Desk to (b) (3) (A) and have them standby. ➢ Notify Control Tower to deploy boom, skimmer, vac truck to Halawa Stream. Request NPS be notified to suspend operations at Arizona Memorial. FRT to actively patrol area and observe for sheen. ➢ Notify ROC/EOC ➢ Notify NRC, SERC (LEPC notified online) ➢ Mobilize to ICP @ (b) (3) (A) ➢ Receive briefing from IC/FFD including updates on deployed resources and their present locations/status; risks to public health – air monitoring results; information surrounding release and assume role of IC. ➢ Notify ROC/EOC ➢ Task QI with Requesting Resources from EOC (Safety Officer, Security Officer, Engineer with maps and figures to help with flow calculations to help guide response, shade canopy, table, chairs, chart paper/white boards, markers, etc. Requests EOC begin to fill out ICS

			forms 201, 202, and 207 and once complete to send me the forms via text. ➢ Ask QI for updates on asset deployment (booms, skimmers, trucks) and confirm NPS suspended operations at Arizona. QI communicates updates to the EOC. ➢ Update ROC/EOC ➢ Brief SOSC upon arrival @ [redacted] & integrate into UC/Org. Chart. Ask who will be the representative from the STATE to be included on form 207 and communicate that to the EOC. ➢ Exercise Insert – Impacts to the Harbor. Notify ROC. Going to investigate ➢ NOSC, QI, SOSC investigate Hotel Pier & Swale/Halawa Stream ➢ Calls PAPA to deploy vac truck, skimmer and large absorbents to swale for recovery. ➢ Call PAPA to report impacts to swale area, and deploy vac truck, hoses, skimmer, and large absorbents. Confirm isolation valves are closed, impacts to UGPH, pumps @ UGPH sump and 5-Plex are recovering product to Tank B-1 @ FORFAC. ➢ Contact USCG – Updates on impacts to navigable waters of the

			US. ➢ Contact Environmental Division - Deploy wildlife observer to conduct shoreline assessment of ecologically sensitive areas and protected wildlife for impacts. Contact FWS/NOAA if impacts discovered. ➢ Update ROC/EOC – Impacts to swale. Deployed resources. Confirmed with PAPA that isolation valves to swale are closed. They are seeing impacts at UGPH and actively recovering product from 5-plex and UGPH sump to FORFAC. USCG notified. Wildlife Observer deployed. ➢ Update Exercise Control after each action taken.

Message 10 Controller's Note:
No hazardous environment at [redacted] as determined by air monitoring instruments/HAZMAT Team #1. Fuel Operator #1 reports no fuel in [redacted] lending support that diversionary barrier is operating as intended and directing flow down the Harbor Tunnel.

Message Number	Exercise Participant	Exercise Message	Expected Actions
10	Fuel Operator #1	"Exercise, Exercise. PAPA, this is the Fuel Operator at [redacted] Presently no hazardous environment to report at [redacted] according to FFD HAZMAT Team who are continuously screening the environment with air monitoring instruments. I've been escorted to the [redacted] sump, deenergized it and checked the outlet for fuel. No fuel to report. Over".	➢ Mobilize to [redacted] and meet FFD HAZMAT Team #1 and assist with identifying key areas (ventilation shafts, adit entrances [redacted] to screen. ➢ Once cleared of hazardous environment by HAZMAT Team #1, be escorted to [redacted] sump, deenergize pump (simulate) and check outlet for fuel. ➢ Report back to PAPA/Exercise Control that no fuel observed in sump outlet.

Message 11 Controller's Note:			
Message Number	**Exercise Participant**	**Exercise Message**	**Expected Actions**
11	Fuel Operator #2	"Exercise, Exercise. PAPA, this is the Fuel Operator at [redacted] FFD HAZMAT TEAM has arrived on-site and are presently reporting no hazardous environment. The HAZMAT Team will remain on-site to continuously screen the environment using air monitoring instruments. The recovery team have arrived on site with a vac truck, skimmer, and large absorbents and are standing by for further direction. Over".	➢ Mobilize to [redacted] to meet HAZMAT Team #2 to facilitate access and to meet Recovery Team (Vac Truck). ➢ Report Vac Truck arrival to Exercise Control.

Message 12 Controller's Note:
Bowhead is actively patrolling the Harbor in the vicinity of lower Halawa Stream and observing for sheen. Operations at the Arizona Memorial have been halted and vessel traffic has been cleared from the area. Between 60-90 minutes after the spill was reported, Bowhead observe a sheen where lower Halawa Stream empties into Pearl Harbor. They report the sheen to Port Ops who in turn report the sheen to the ROC and EOC. The ROC and EOC in turn report the sheen to the NOSC and QI.

Message Number	Exercise Participant	Exercise Message	Expected Actions
12	Sheen Discoverer/Bowhead	"Exercise, Exercise. Control Tower, this is _____ from the FRT. I'm calling to let you know that we have observed sheen at the mouth of Halawa Stream where it enters Pearl Harbor. As you're already aware, containment and recovery assets are in place, and we are going into active recovery mode. Over".	➢ Make Notification to Control Tower that impacts to mouth of lower Halawa Stream and Pearl Harbor have occurred.

Message 13 Controller's Note:
Bowhead reports impacts to Pearl Harbor at lower Halawa Stream and transitions from actively patrolling to actively recovering. The Control Tower makes appropriate notifications which includes notifying the NOSC. Unified Command (NOSC, QI, SOSC) mobilize to Hotel Pier and assess lower Halawa Stream. Assess swale and deploy recovery assets (vac truck, hoses, skimmers, and large absorbents). NOSC also follows up with USCG and deploys wildlife observer to conduct shoreline assessment of lower Halawa Stream for impacts to ecologically sensitive areas and protected species.

Message Number	Exercise Participant	Exercise Message	Expected Actions
13	Control Tower/Port Ops	"Exercise, Exercise. Sir or Madame, this is the Control Tower at Joint Base Pearl Harbor Hickam. I'm calling to notify you that a sheen has been reported at the mouth of lower Halawa Stream and Pearl Harbor. Containment and deflection booms are in place along with recovery assets including a vac truck and skimmer. Product is being actively recovered. We have informed the NOSC and an assessment to determine source location is underway. Over".	➢ Make Notifications that impacts to Pearl Harbor/lower Halawa Stream reported. Ensure you call the NOSC at (b) (6)

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SUPPLEMENTAL EXERCISE MATERIAL

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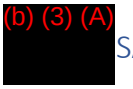

SAFETY DATA SHEET

EVALUATOR WORKSHEETS

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Objective #1: Demonstrate capabilities to stand-up response in timely manner that includes the deployment of containment and recovery assets commensurate to the release.

1. How long did it take to establish an ICP at [redacted]

2. How long did it take for FFD to assess the environment at [redacted]

3. How long did it take for EMS to mobilize to [redacted]

4. How long did it take for the FLC Operator to check the [redacted] sump for fuel?

5. How long did it take to notify the NRC? SERC? LEPC?

6. How long did it take FFD to assess the environment at [redacted]

7. How long did it take for a boom to be deployed at lower Halawa Stream?

8. How long did it take for a vac truck to be deployed to [redacted]

9. Were vac trucks equipped with the hoses and portable skimmer?

10. How long did it take to mobilize vac trucks, portable skimmer and hoses to Hotel Pier?

11. How long did it take to mobilize vac truck, portable skimmer and hose to the Swale?

12. How long did it take for the QI to report to the ICP @[redacted]

13. How long did it take for the NOSC to report to the ICP @[redacted]

14. Were resources deployed commensurate with release scenario?

15. How long did it take to stand-up the EOC?

16. How long did it take to make regulatory notifications?

Objective #2: Demonstrate capacity to institute a Unified Command approach

1. Was the ICS instituted effectively and did the establishment of a Unified Command occur?

   _____
   _____
   _____

2. Were State and other Federal Agencies integrated into a UC?

   _____
   _____
   _____

3. Were personnel identified to occupy key roles i.e., Deputy IC; Operations Section Chief; Planning Section Chief; Logistics Section Chief; Finance Section Chief; Public Affairs Officer (PAO).

   _____
   _____
   _____

4. Was an Incident Action Plan (IAP) prepared?

   _____
   _____
   _____

Objective #3: Complete ICS forms 201, 202, and 207 on-site.

1. Did the IMT begin to populate ICS forms 201, 202 and 207 on-scene at the ICP?

   _____
   _____
   _____

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EXERCISE PARTICIPANT WORKSHEET

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Exercise Participant Evaluation

Read Exercise Objectives

1. Were the objectives of the exercise achieved?

2. What facets of the exercise went well?

3. What facets of the exercise could be improved?

4. What lessons were learned?

5. Additional comments?

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PARTICIPANT COPIES OF MESSAGES

This section includes copies of exercise messages that you can copy and distribute to the exercise participants.

BACKGROUND INFORMATION AND INCIDENT SCENARIO

BACKGROUND INFORMATION

The RHFSF supports military operations in the Pacific and is a bulk fuel storage facility with a capacity of 250 million gallons. It consists of 20 steel lined tanks, encased in concrete, and built into cavities that were mined inside of Red Hill. Each tank has a storage capacity of approximately 12.5 million gallons. The tanks are connected to [redacted] pipelines that run [redacted] through a tunnel to fueling piers at Pearl Harbor. The RHFSF is located under a volcanic mountain ridge near Honolulu. Entrance to the facility is through a single controlled access point.

INCIDENT SCENARIO

After completing the diversionary barrier at the [redacted] An operator of a forklift being used to transport sandbags becomes unconscious and the forklift accidentally hits a pressure release valve on a pipeline causing the valve assembly to break. Fuel starts to immediately flow out of the pipeline. Fuel quickly flows down the tunnel towards the [redacted] spur tunnel and Harbor Tunnel (HT). Another worker assists the forklift operator who regains consciousness within 1-2 minutes, and they evacuate the tunnel to [redacted] and notify the Fuel Control Room Operator.

Note: Notification to fuel room indicated diversionary barrier seems to be operational and functioning as intended. Fuel being diverted down HT. No containment barrier in place in HT. Fuel flowing down to UGPH unabated.

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MESSAGE 1

Exercise, Exercise. Sir or Madame, this is _____ (insert name) and I'm calling to report an emergency in the Lower Access Tunnel. Upon completion of the diversionary barrier at the [redacted] our forklift operator fell unconscious and crashed the forklift into a fuel pipeline just upgradient of the [redacted] in the Lower Access Tunnel (LAT). The pipeline ruptured and is actively releasing fuel. The forklift operator regained consciousness almost immediately after the crash and I assisted him with evacuating to outside the [redacted] entrance. We notified other workers in the general vicinity who have also evacuated and are mustered at the assembly point outside [redacted] The forklift operator seems okay and wasn't doused in fuel. There are no other injuries to report. The diversionary barrier seemed to be intact and operating as intended. Awaiting further instructions. If you need additional information I can be reach at _____ (provide phone #). Over."

Fuel Control Room Phone # 808-471-8081 or 808-473-1075

MESSAGE 2

"Exercise, Exercise. Sir or Madame, this is the Fuel Control Room at the Red Hill Fuel Storage Facility. At 1000 a forklift operator fell unconscious and crashed his forklift into the [redacted] pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the [redacted] Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains [redacted] fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered. The forklift operator is being given fluids to keep him hydrated and is being treated for shock. Fuel seems to be flowing down the Harbor Tunnel towards the Underground Pumphouse (UGPH). Isolation doors at the UGPH and [redacted] are closed. Could you please dispatch the Federal Fire Department (FFD) to establish an incident command post outside of [redacted] We would also like to request that the FFD dispatch a HAZMAT Team to [redacted] to evaluate the hazard to public health. We would like them to screen key areas such as ventilation shafts and ADIT entrances using air monitoring instruments. We will be dispatching a FLC operator to meet the HAZMAT team and provide maps of the facility. We would also like to request the assistance of EMS at [redacted] to evaluate the forklift operator. Finally, we request a second HAZMAT team be deployed to [redacted] to conduct air monitoring. Another Fuel Operator will be at [redacted] to meet the second HAZMAT Team. Over."

RDC Phone # 911

Fuel Operations Director Phone # 808-780-3703

QI Phone # [redacted]

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MESSAGE 3

"Exercise, Exercise. Sir or Madame, this is the Fuel Operations Director at the Red Hill Fuel Storage Facility. At 1000 a forklift operator fell unconscious and crashed his forklift into the [redacted] pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the [redacted] Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains [redacted] fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered but is waiting outside [redacted] for further evaluation by EMS. Fuel is flowing down the Harbor Tunnel towards the UGPH. Isolation doors at the UGPH and [redacted] are closed. RDC has dispatched FFD to establish an incident command post outside of [redacted] HAZMAT Teams have been dispatched to both [redacted] and [redacted] to assess the risk to public health. Fuel operators have been dispatched to both locations to meet and assist HAZMAT Teams with identifying key areas such as ventilation shafts and ADIT entrances to screen using air monitoring instruments. Once cleared of hazards the fuel operator at [redacted] will de-energize the pump at the [redacted] sump and check the outlet for fuel. EMS have been mobilized to [redacted] to evaluate the forklift operator. Will keep you informed as the situation develops. Over."
Fuel Director Phone # 808-977-2294

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MESSAGE 4

"Exercise, Exercise. Sir or Madame, this is the Fuel Director at the Red Hill Fuel Storage Facility. At 1000 a forklift operator fell unconscious and crashed his forklift into the [redacted] pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the [redacted] Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains [redacted] fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered but is waiting outside [redacted] for further evaluation by EMS. Fuel is flowing down the Harbor Tunnel towards the UGPH. Isolation doors at the UGPH and [redacted] are closed. RDC has dispatched FFD to establish an incident command post outside of [redacted] HAZMAT Teams have been dispatched to both [redacted] and [redacted] to assess the risk to public health. Fuel operators have been dispatched to both locations to meet and assist HAZMAT Teams with identifying key areas such as ventilation shafts and ADIT entrances to screen using air monitoring instruments. Once cleared of hazards the fuel operator at [redacted] will de-energize the pump at the [redacted] sump and check the outlet for fuel. EMS have been mobilized to [redacted] to evaluate the forklift operator. Will keep you informed as the situation develops. Please continue with the notification process and request the assistance of the QI/NOSC. Over."

JBPHH CDO Phone # 808-864-2460
NAVSUP FLC CDO Phone # 808-216-1339
Deputy Fuel Director Phone # 808-690-0115

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MESSAGE 5

"Exercise, Exercise. Sir or Madame, this is the JBPHH CDO. At 1000 a forklift operator fell unconscious and crashed his forklift into the [redacted] pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the [redacted] Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains [redacted] fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered but is waiting outside [redacted] for further evaluation by EMS. Fuel is flowing down the Harbor Tunnel towards the UGPH. Isolation doors at the UGPH and [redacted] are closed. RDC has dispatched FFD to establish an incident command post outside of [redacted] HAZMAT Teams have been dispatched to both [redacted] and [redacted] to assess the risk to public health. Fuel operators have been dispatched to both locations to meet and assist HAZMAT Teams with identifying key areas such as ventilation shafts and ADIT entrances to screen using air monitoring instruments. Once cleared of hazards the fuel operator at [redacted] will de-energize the pump at the [redacted] sump and check the outlet for fuel. EMS have been mobilized to [redacted] to evaluate the forklift operator. The assistance of the QI is being requested at the ICP at [redacted] Over."

JBC/CSO Phone # 808-499-8963
ROC Phone # 808-473-3215 or 808-473-3216
JBPHH QI Phone # [redacted]
PAO Phone # 808-371-5189

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MESSAGE 6

"Exercise, Exercise. Sir or Madame, this is the NAVSUP FLC CDO. At 1000 a forklift operator fell unconscious and crashed his forklift into the (b) (3) (A) pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the [redacted] Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains [redacted] fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered but is waiting outside [redacted] for further evaluation by EMS. Fuel is flowing down the Harbor Tunnel towards the UGPH. Isolation doors at the UGPH and [redacted] are closed. RDC has dispatched FFD to establish an incident command post outside of [redacted] HAZMAT Teams have been dispatched to both [redacted] and [redacted] to assess the risk to public health. Fuel operators have been dispatched to both locations to meet and assist HAZMAT Teams with identifying key areas such as ventilation shafts and ADIT entrances to screen using air monitoring instruments. Once cleared of hazards the fuel operator at [redacted] will de-energize the pump at the [redacted] sump and check the outlet for fuel. EMS have been mobilized to [redacted] to evaluate the forklift operator. The assistance of the QI is being requested at the ICP at [redacted] Over."

NAVFAC CDO Phone # 808-347-8289

MESSAGE 7

"Exercise, Exercise. Sir or Madame, this is the ROC. At 1000 a forklift operator fell unconscious and crashed his forklift into the (b) (3) (A) pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the [redacted] Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains [redacted] fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered but is waiting outside [redacted] for further evaluation by EMS. Fuel is flowing down the Harbor Tunnel towards the UGPH. Isolation doors at the UGPH and [redacted] are closed. RDC has dispatched FFD to establish an incident command post outside of [redacted] HAZMAT Teams have been dispatched to both [redacted] and [redacted] to assess the risk to public health. Fuel operators have been dispatched to both locations to meet and assist HAZMAT Teams with identifying key areas such as ventilation shafts and ADIT entrances to screen using air monitoring instruments. Once cleared of hazards the fuel operator at [redacted] will de-energize the pump at the [redacted] sump and check the outlet for fuel. EMS have been mobilized to [redacted] to evaluate the forklift operator. The assistance of the QI/NOSC is being requested at the ICP at [redacted] JBC has activated the EOC. Over."

REGCOM Phone # 473-2200

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MESSAGE 8

"Exercise, Exercise. Sir or Madame, this is the QI. At 1000 a forklift operator fell unconscious and crashed his forklift into the [redacted] pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the [redacted] Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains [redacted] fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered but is waiting outside [redacted] for further evaluation by EMS. Fuel is flowing down the Harbor Tunnel towards the UGPH. Isolation doors at the UGPH and [redacted] are closed. RDC has dispatched FFD to establish an incident command post outside of [redacted] HAZMAT Teams have been dispatched to both [redacted] and [redacted] to assess the risk to public health. Fuel operators have been dispatched to both locations to meet and assist HAZMAT Teams with identifying key areas such as ventilation shafts and ADIT entrances to screen using air monitoring instruments. Once cleared of hazards the fuel operator at [redacted] will de-energize the pump at the [redacted] sump and check the outlet for fuel. EMS have been mobilized to [redacted] to evaluate the forklift operator. Your assistance is being requested at the ICP at [redacted] JBC has activated the EOC. Over."
NOSC Phone # [redacted]
NAVFAC/JBPHH Service Desk 808-449-3100

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MESSAGE 9

"Exercise, Exercise. Sir or Madame, this is the NOSC. At 1000 a forklift operator fell unconscious and crashed his forklift into the (b) (6) pipeline causing it to rupture. It is actively releasing fuel from a section of pipe in the lower access tunnel (LAT) just upgradient of the [redacted] Valves on either side of the rupture have been closed isolating the ruptured section of pipe that contains (b) (3) (A) [redacted] fuel. Fuel pumps have been shut down and all open valves have been closed. Emergency alarms have been activated and facility personnel have evacuated and are mustered at assembly areas outside of ADIT entrances. All personnel are accounted for and there are no further injuries to report outside of the forklift operator who seems to have recovered but is waiting outside [redacted] for further evaluation by EMS. Fuel is flowing down the Harbor Tunnel towards the UGPH. Isolation doors at the UGPH and [redacted] are closed. RDC has dispatched FFD to establish an incident command post outside of [redacted] HAZMAT Teams have been dispatched to both [redacted] and [redacted] to assess the risk to public health. Fuel operators have been dispatched to both locations to meet and assist HAZMAT Teams with identifying key areas to screen including ventilation shafts and ADIT entrances. Once cleared of hazards the fuel operator at [redacted] will de-energize the pump at the [redacted] sump and check the outlet for fuel. EMS have been mobilized to [redacted] to evaluate the forklift operator. Recovery assets have been deployed to key locations and a containment boom is in the process of being deployed at the mouth of lower Halawa Stream and Pearl Harbor. Over."

Control Tower Phone # 808-474-6262
ROC 808-473-3238
EOC 808-448-2570 or 808-448-2744
NRC 1-800-424-8802
SERC 808-586-4249
PAPA 808-471-8081 or 808-473-1075
USCG 808-517-8848 or 808-842-2600
NAVFAC Environmental 808-722-7285

MESSAGE 10

"Exercise, Exercise. PAPA, this is the Fuel Operator at [redacted] Presently no hazardous environment to report at [redacted] according to FFD HAZMAT Team who are continuously screening the environment with air monitoring instruments. I've been escorted to the [redacted] sump, deenergized it and checked the outlet for fuel. No fuel to report. Over".

PAPA phone # 808-471-8081 or 808-473-1075.

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MESSAGE 11

"Exercise, Exercise. PAPA, this is the Fuel Operator at [redacted] FFD HAZMAT TEAM has arrived on-site and are presently reporting no hazardous environment. The HAZMAT Team will remain on-site to continuously screen the environment using air monitoring instruments. The recovery team have arrived on site with a vac truck, skimmer, and large absorbents and are standing by for further direction. Over".
PAPA phone # 808-471-8081 or 808-473-1075.

MESSAGE 12

"Exercise, Exercise. Control Tower, this is _____ from the FRT. I'm calling to let you know that we have observed sheen at the mouth of Halawa Stream where it enters Pearl Harbor. As you're already aware, containment and recovery assets are in place, and we are going into active recovery mode. Over".
Control Tower phone # 808-474-6262

MESSAGE 13

"Exercise, Exercise. Sir or Madame, this is the Control Tower at Joint Base Pearl Harbor Hickam. I'm calling to notify you that a sheen has been reported at the mouth of lower Halawa Stream and Pearl Harbor. Containment and deflection booms are in place along with recovery assets including a vac truck and skimmer. Product is being actively recovered. We have informed the NOSC and an assessment to determine source location is underway. Over".
NOSC phone (b) (6) [redacted]

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RED PLAN OHS SPILL CHECKLIST

Spiller

☐ If trained and safe to do so, stop the spill

☐ Discontinue operations
- Activate emergency shutdown procedures if safe to do (if applicable)

☐ Warn people in the area of hazards
- Direct personnel to move well clear of the release in an upwind direction

☐ Prevent ignition
- Exclude ignition sources from the area
- Do not start electrical equipment or other engines in area

☐ Call:
- Call JBPHH Command Duty Officer (CDO):
  - The time and location of the incident
  - Whether there are any injuries to personnel
  - The type and amount of oil or hazardous substance spilled
  - The status of the source

The CDO will initiate internal Navy notifications to JBC, JBPHH QI, CNRH ROC.

NOSC Representative / JBPHH QI

☐ Receive report of the spill
- Ascertain nature and severity of spill
- Ensure safety of onsite personnel
- Ensure regulatory notifications were made. If not, assist Spiller
- NOSC-R assume role as incident commander (if requested)

☐ Recalls CNRH Spill Management Team if applicable
- NOSC-R briefs Spill Management Team on the status of the incident

☐ Establish command center and staging area

☐ Document actions

- Submit reports as required
-

SPILL INFORMATION LOG		
SECTION 1 – INITIAL RELEASE INFORMATION (Initial notifications must not be delayed pending collection of data)		
Spiller:	**Discoverer:**	
POC:	Command/Vessel/Company:	
Command/Vessel/Company:		
Phone # (duty & non-duty):	Phone # (duty & non-duty):	
Incident Description:		
Date of Spill:	Time of Spill:	
Spill Location (bldg. no./pier/tank no./etc.):		
Spilled Product:		
Capacity of Container:		
Total Amount Spilled (specify units-gals, lbs., etc.):		
How Much On Land:	How Much in Water:	How Much Entering Storm Drain:
Spill Description (size/color/fumes/slick in water/puddle on pavement/etc.):		
Spill Environment: Weather (clear, overcast, partly-cloudy): _____ Prevailing wind at scene: Direction_____Speed _____ Air Temperature: _____ Tide (high, low, ebb, flood): _____		
SECTION 2 – RELEASE INFORMATION DETAILS		
Source and Cause of Incident:		
Spill Source/Cause:		
Operations(s) Under Way When Spill Occurred:		

SPILL INFORMATION LOG	
Response Actions:	
Actions Taken to Stop Release:	
Containment Method Planned/Used:	
Clean-Up Method Planned/Used:	
Parties Performing Spill Containment/Clean-Up: Samples Taken: Yes_____No_____ Volume of Product Recovered (in gallons):	
Impact/Health Threats:	
Number of Injuries:	Number of Deaths:
Describe Any Evacuations Including Number Evacuated:	
Describe Any Property Damaged:	
Description of Environmental and Health Threats Including Areas Threatened:	

Notifications:

NOSC Rep: Yes____ No____Date:_____Time: _____

NRC: Yes ____ No ____ Date:_____Time:_____Report No._____

SERC: Yes ____ No ____ Date:_____Time:_____Report No._____

LEPC: Yes ____ No ____ Date:_____Time:_____

Other Notification:

Department/Command/Agency	Date	Time	Phone	POC

ATTACHMENT A – RELEASE MODEL

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Ruth Yender

Scientific Support Coordinator
Pacific Islands

NOS/HIHWNMS
NOAA/DKIRC
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Telephone : 206-849-9926
24/7 Emergency: 206-526-4911
Ruth.Yender@noaa.gov

Pearl Harbor, HI

Exercise, Exercise, Exercise

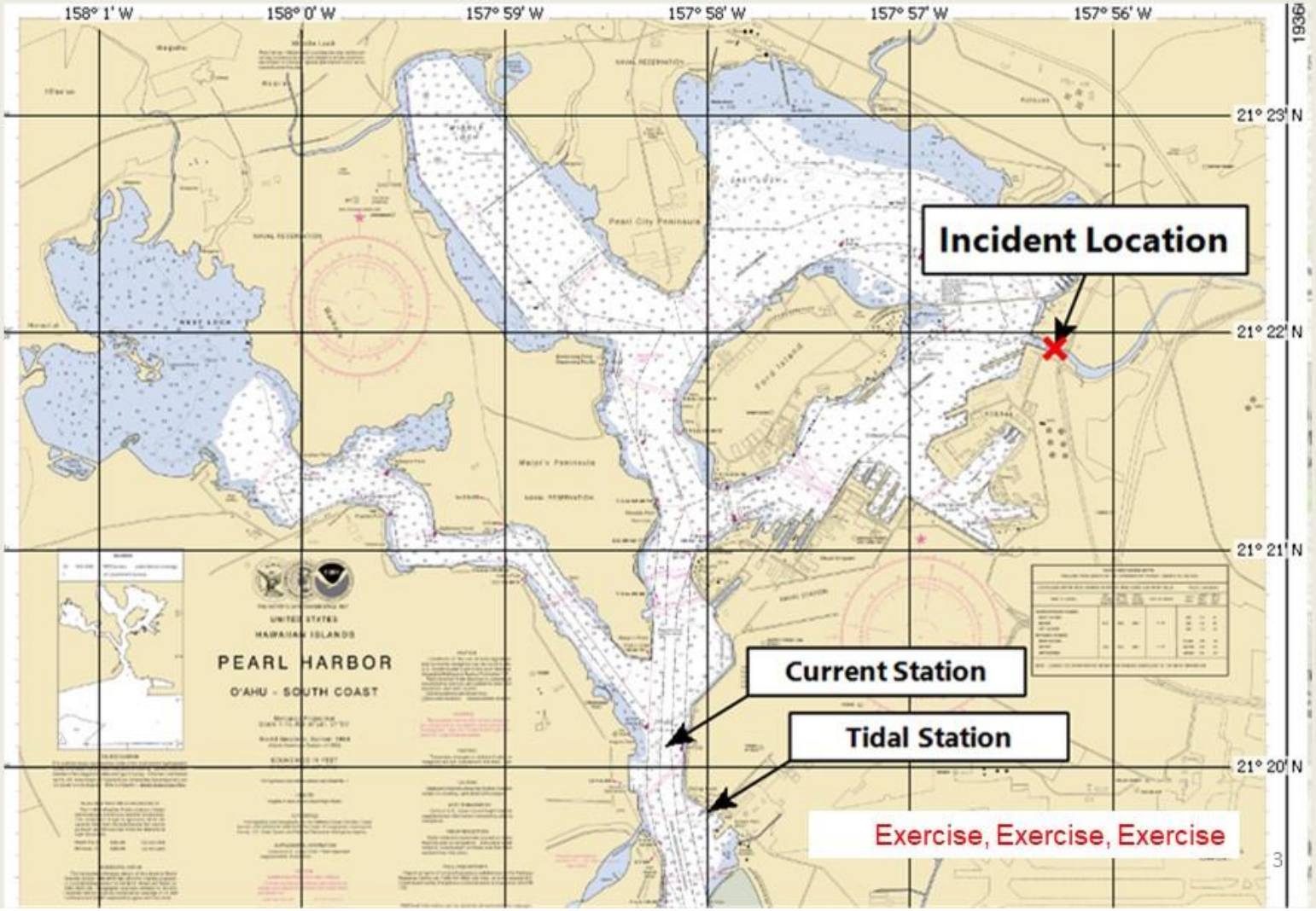
Incident Information

On October 15, 2022 at 0900 HST, 1,000,000 gallons of Marine Diesel #2 got into the Halawa stream from Red Hill tunnels during the de-fueling operation. It flows down the stream to where the Halawa stream enters Pearl Harbor near the Arizona Memorial boat shuttle docks. Trajectory and fate analysis is requested.

Incident location reported as 29° 21.933′ N, 157° 56.285′ W

Exercise, Exercise, Exercise

Map


158° 1' W
158° 0' W
157° 59' W
157° 58' W
157° 57' W
157° 56' W
21° 23' N
21° 22' N
21° 21' N
21° 20' N
Incident Location
Current Station
Tidal Station
PEARL HARBOR
O'AHU - SOUTH COAST
Exercise, Exercise, Exercise

NOAA/NWS Marine Forecast

Forecast

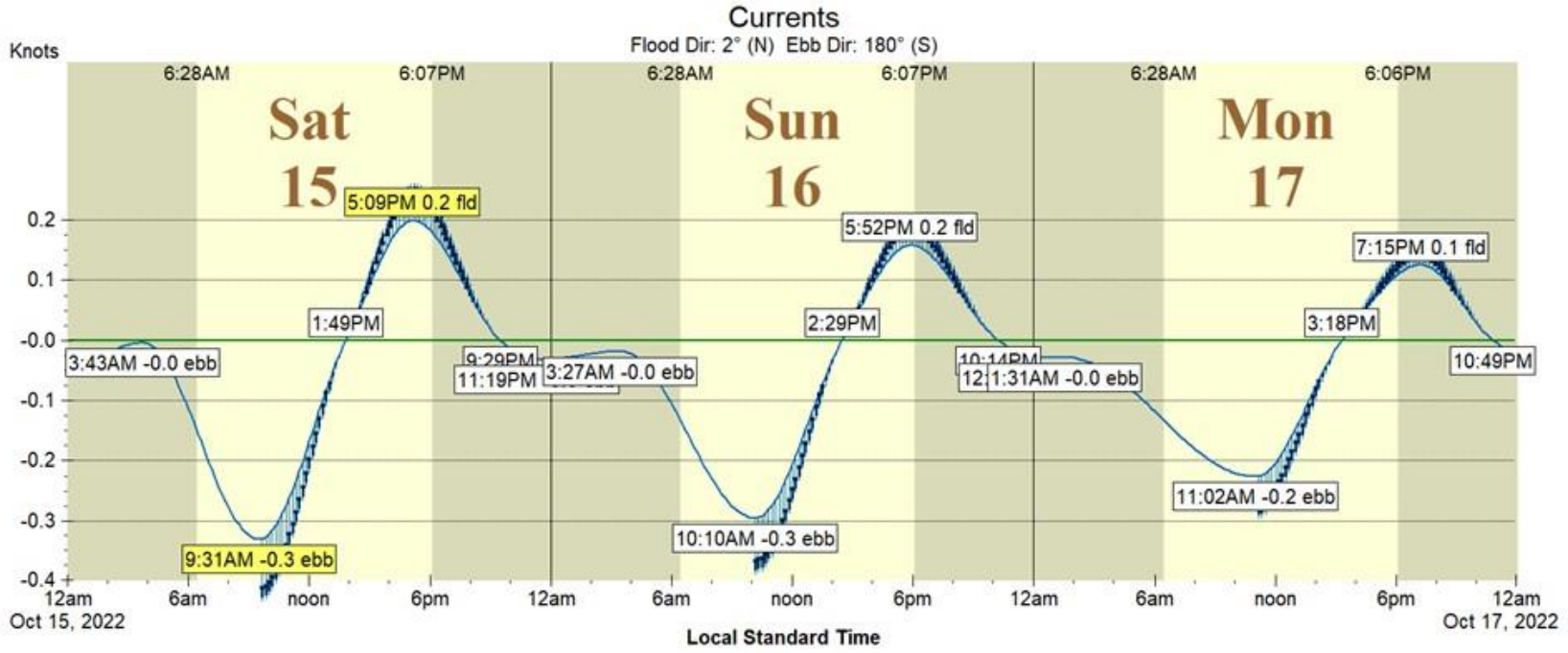
Today and night (Saturday): the winds are forecast to be from the NE at 10-15 knots.
Sunday: the winds are predicted from the NE at 15 knots.
Sunday night: winds are expected from the NE at 10-15 knots with gusts to 20 knots.
Monday: the winds are forecast to be from the NE at 10-15 knots.
Tuesday: the winds are forecast to be from the NE at 10 knots.

Currents

Iroquois Point, Pearl Harbor Shio 2.12.5.2021

Tidal currents at Iroquois Point, Pearl Harbor, Oahu Island, HAWAIIAN ISLANDS
Station No. 2475 Meter Depth: 9 feet Latitude: 21° 20.10' N Longitude: 157° 58.21' W
Based on KALOHI CHANNEL

From Sat Oct 15, 2022 to Mon Oct 17, 2022 (3 days) Local Standard Time



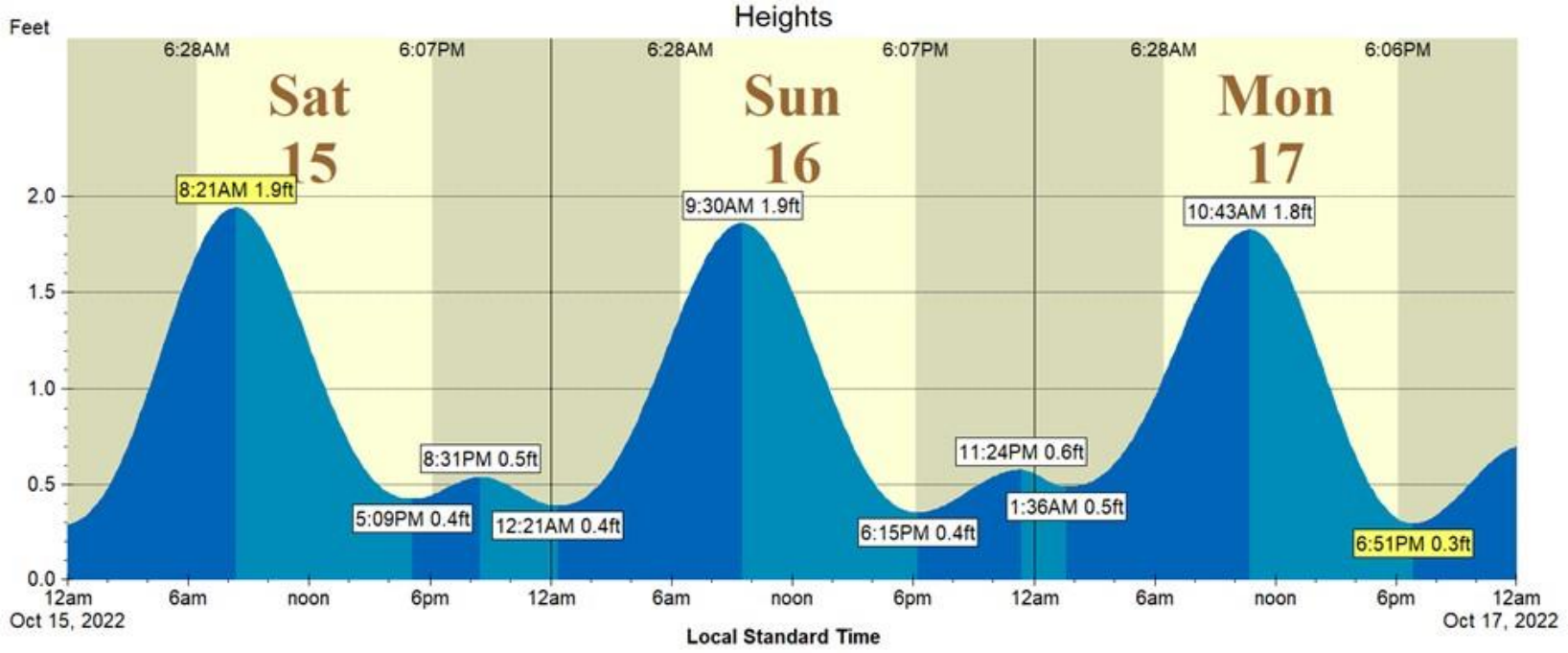
Exercise, Exercise, Exercise

Tide Heights

Pearl Harbor Entrance, Bishop Point Shio 2.12.5.2021

Tidal heights at Pearl Harbor Entrance, Bishop Point, Oahu Island, HAWAIIAN ISLANDS
Station No. 2757 Latitude: 21° 19.80' N Longitude: 157° 58.00' W
Based on HONOLULU

From Sat Oct 15, 2022 to Mon Oct 17, 2022 (3 days) Local Standard Time



Exercise, Exercise, Exercise 6

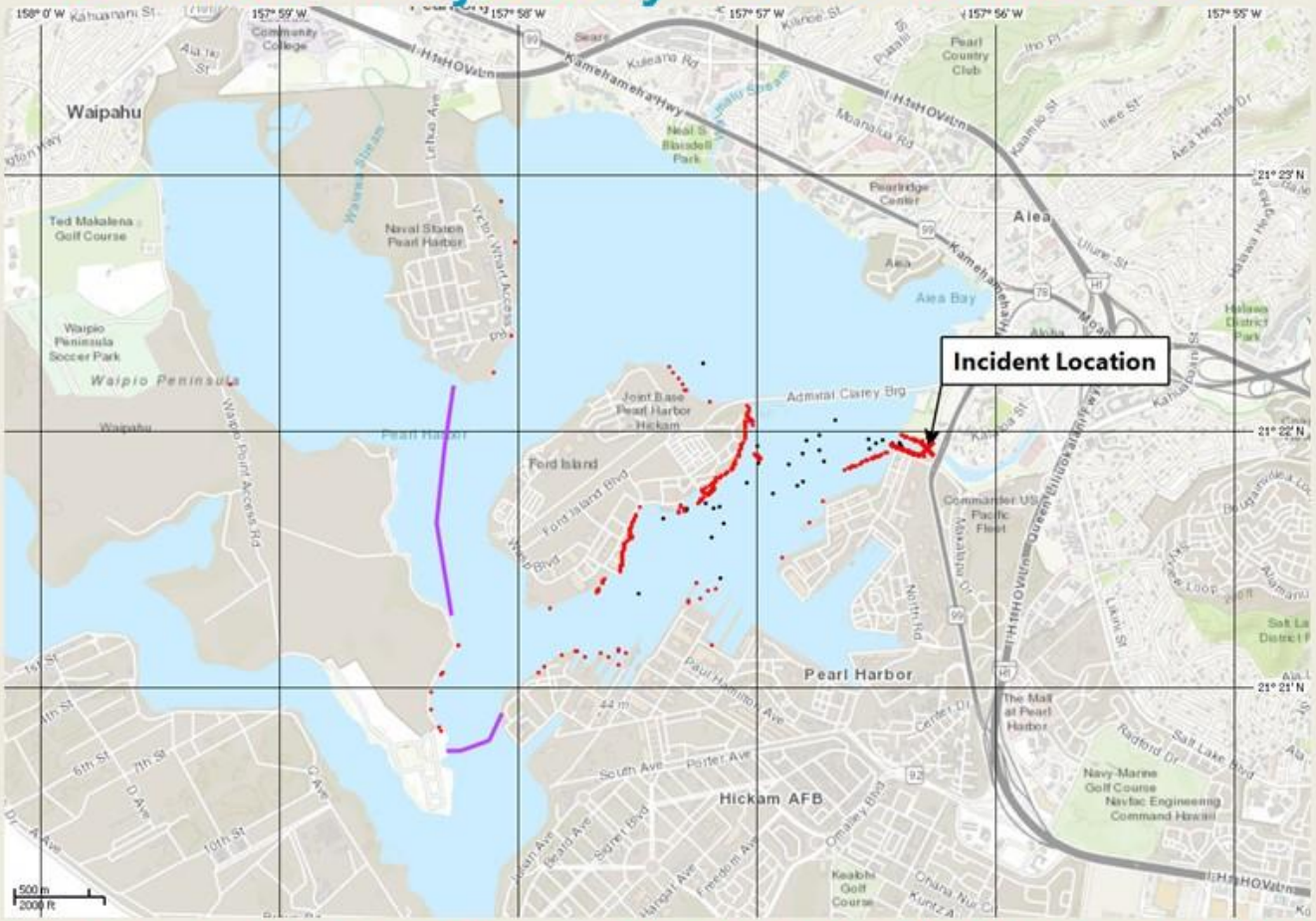
Trajectory Analysis

Winds at the time of the incident (October 15) were from the northeast at ~10 knots. They are forecast to continue to be from the northeast at ~10-15 knots with gusts to 20 knots for the next three days (October 15 - 18).

During the release period, the tidal currents are weak around Ford Island with maximum velocity of ~0.2 knots at ebbs. Thus, the movement of oil will be dominated by winds. With easterly winds forecast to near 10-15 knots we would expect the oil to move westward, causing potential shoreline impacts on east-facing shorelines in Pearl Harbor and East Loch (e.g., east shorelines of Ford Island and Pearl City). After the oil enters Pearl Harbor, relatively stronger ebb tides will likely move the oil to as far south as Waipi'O Point after 3 days. Potential impacted regions are reported on the following slides. Additional scenarios using different wind speeds which are representative for that region are also tested and shown on the following slides.

Exercise, Exercise, Exercise

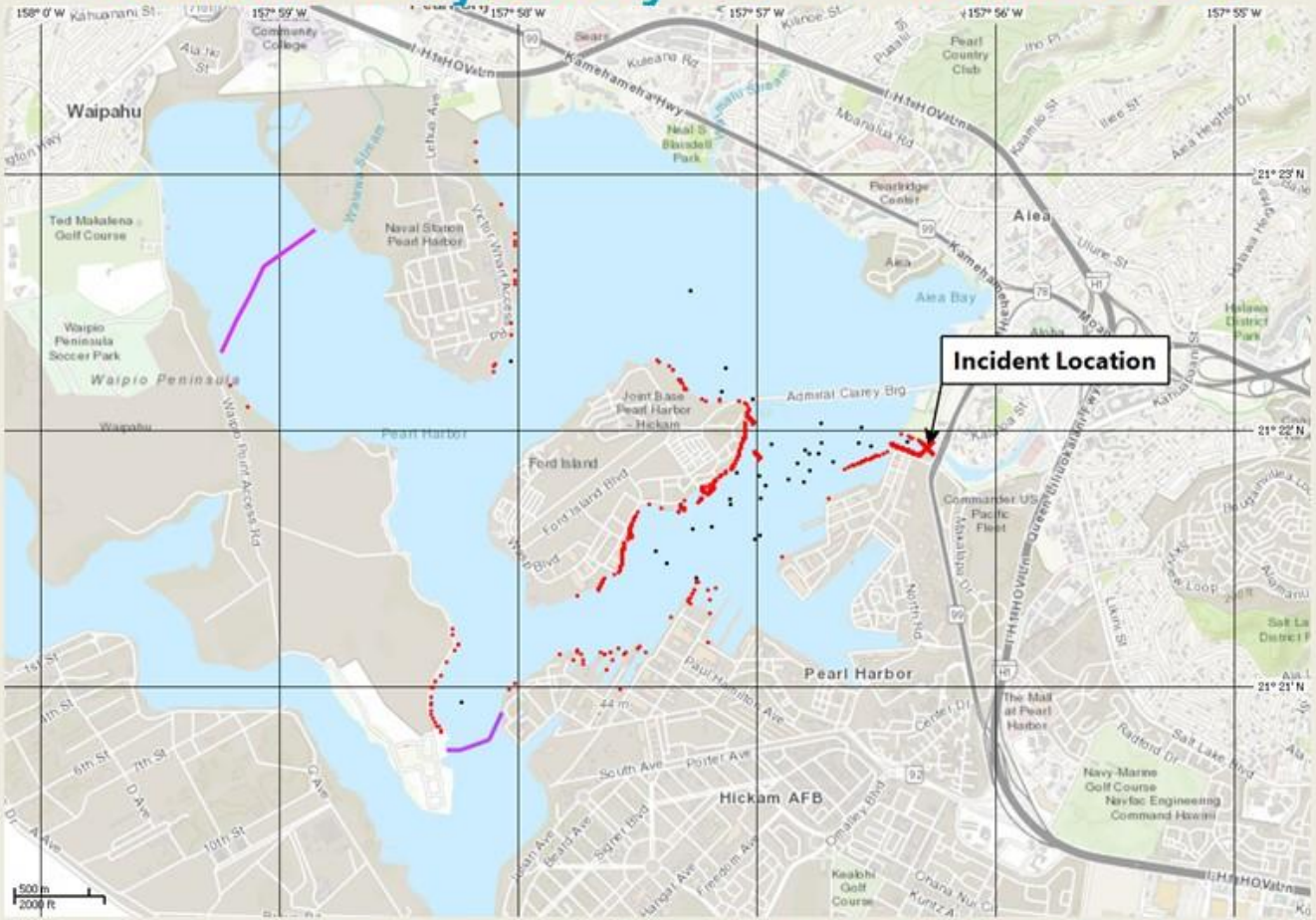
24 Hour Trajectory 10-16-2022 0900



Trajectory results showing predicted transport from a continuous 4-h release. Red particles represent shoreline impacts, black particles are floating on the water surface, and purple lines designate the most west and south extents of potential impacted regions.

Exercise, Exercise, Exercise

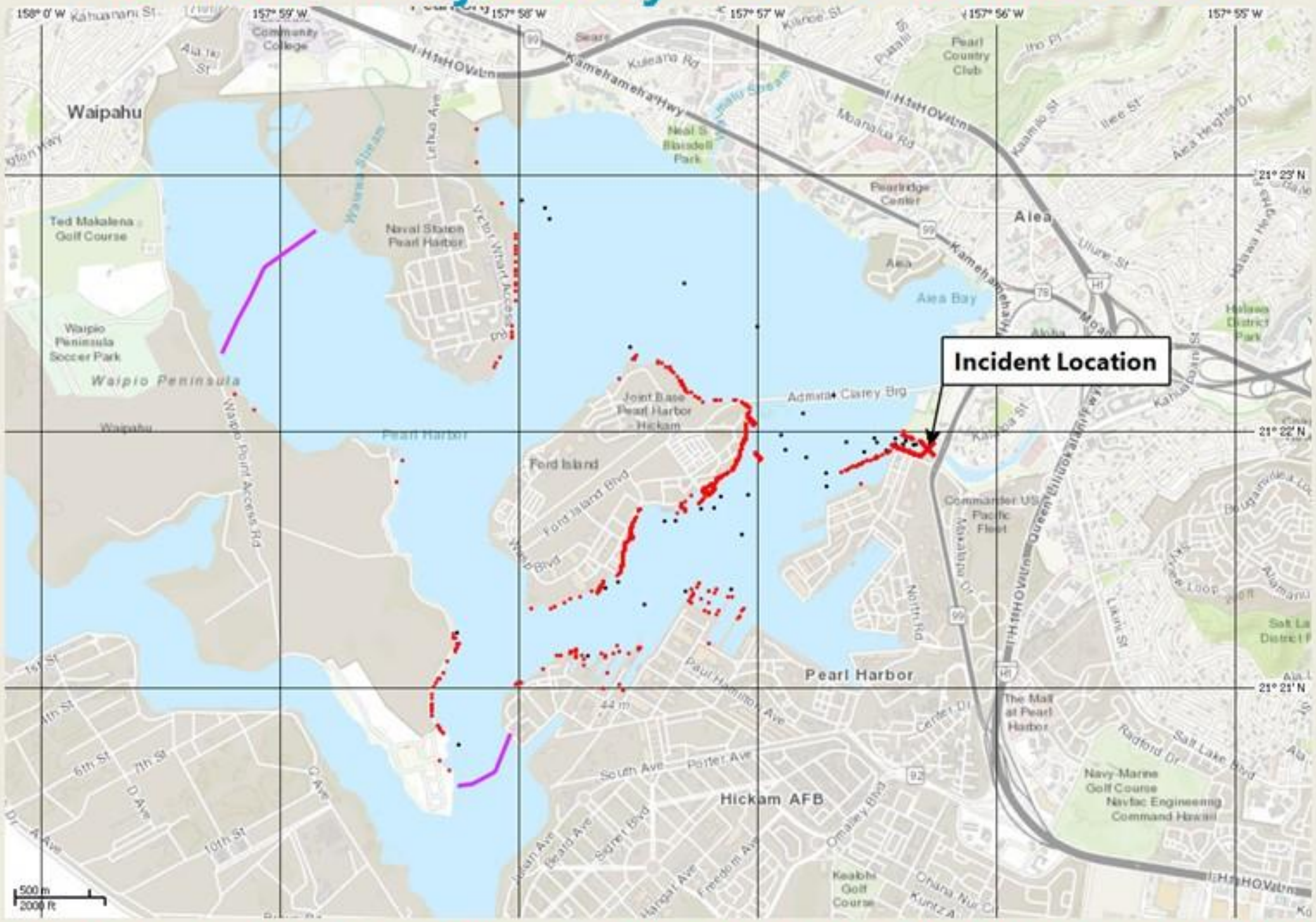
48 Hour Trajectory 10-17-2022 0900



Trajectory results showing predicted transport from a continuous 4-h release. Red particles represent shoreline impacts, black particles are floating on the water surface, and purple lines designate the most west and south extents of potential impacted regions.

Exercise, Exercise, Exercise

72 Hour Trajectory 10-18-2022 0900



Trajectory results showing predicted transport from a continuous 4-h release. Red particles represent shoreline impacts, black particles are floating on the water surface, and purple lines designate the most west and south extents of potential impacted regions.

10

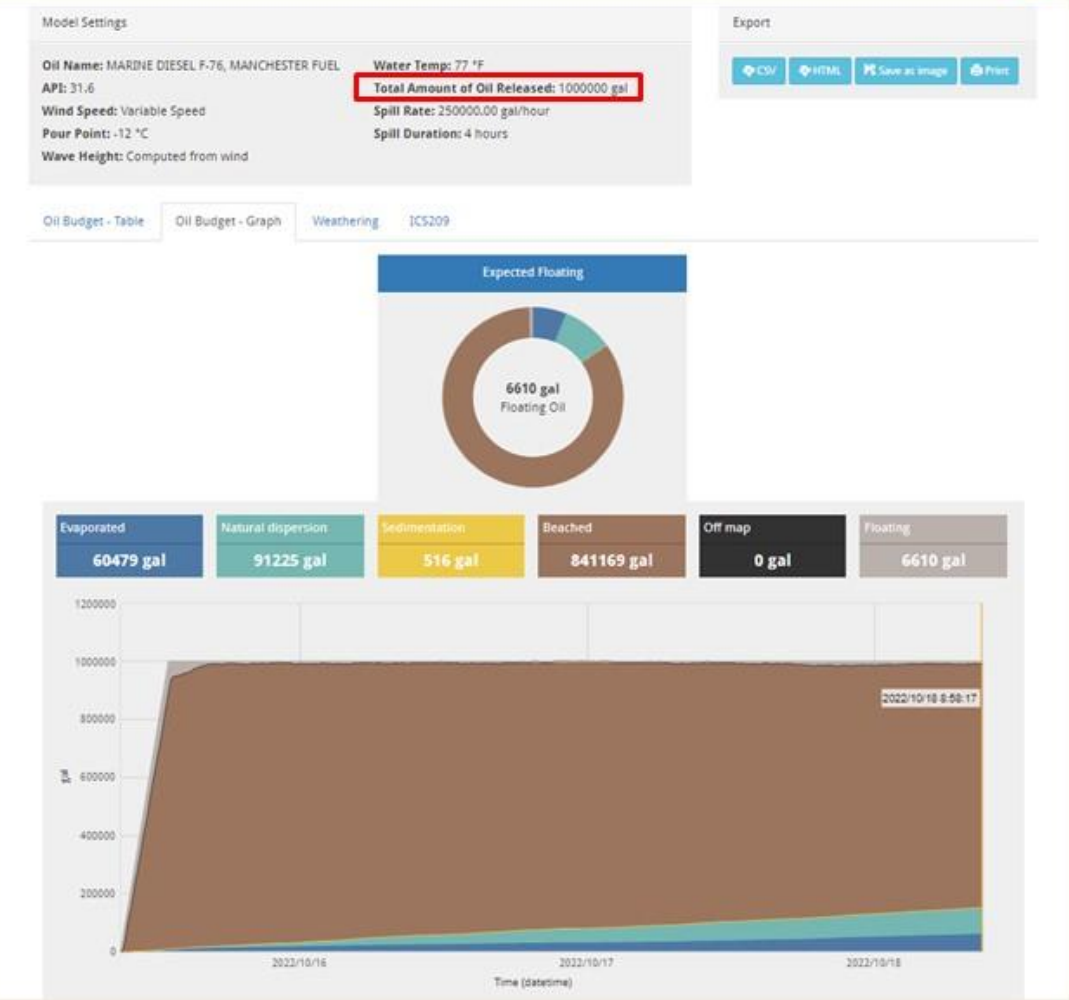
Exercise, Exercise, Exercise

Important Note Regarding the Following Oil Fate Discussion Slides

- The oil type used to generate the ADIOS graphics and Oil Fate Discussion in the following slides, Marine Diesel F-76, Manchester Fuel Oil, is not the oil type stored in the Red Hill facility. This oil type was selected from the current database of oils in ADIOS as likely having similar physical properties and behavior to the oil in the Red Hill tanks presumed to spill in this exercise scenario.

- Note that if the required physical properties for the Red Hill oil become available, we can add the oil to the ADIOS fate model database and rerun the model. Required physical properties include density and viscosity, ideally at more than one environmentally relevant temperature, such as 0C and 15C, Distillation cuts, including fraction recovered, terminal boiling point, and mass or volume fraction. Also helpful are Pour Point, Flash Point, Interfacial Tension with seawater and SARA fractions.

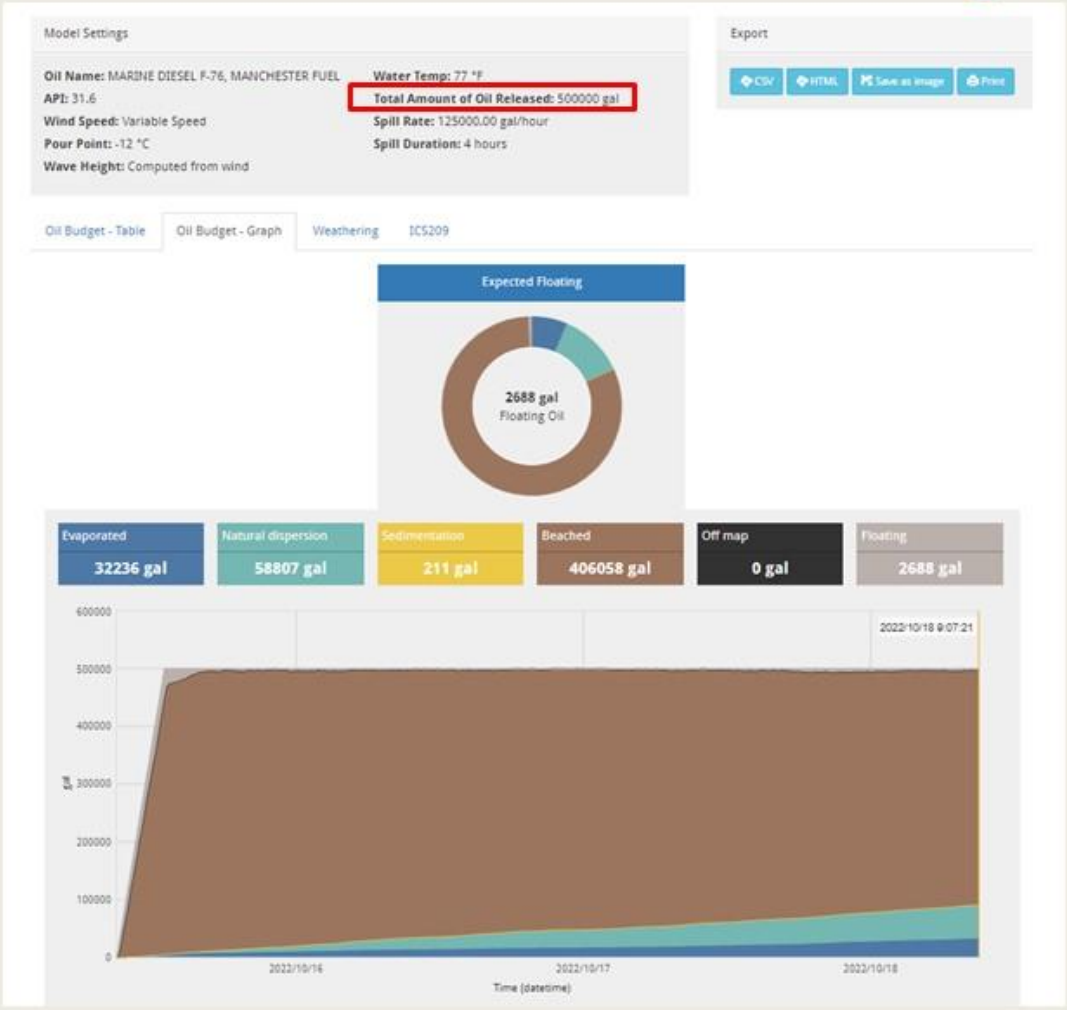
Fate Discussion – 1,000,000 gallon scenario



Due to moderate NE winds and weak tidal currents forecast, a significant amount of the released oil (~85%) will beach along the east-facing shorelines in Pearl Harbor and East Loch (Ford Island and Pearl City). The rest of the oil (~15%) will likely evaporate and disperse into water column within a couple of days.

Exercise, Exercise, Exercise

Fate Discussion – 500,000 gallon scenario

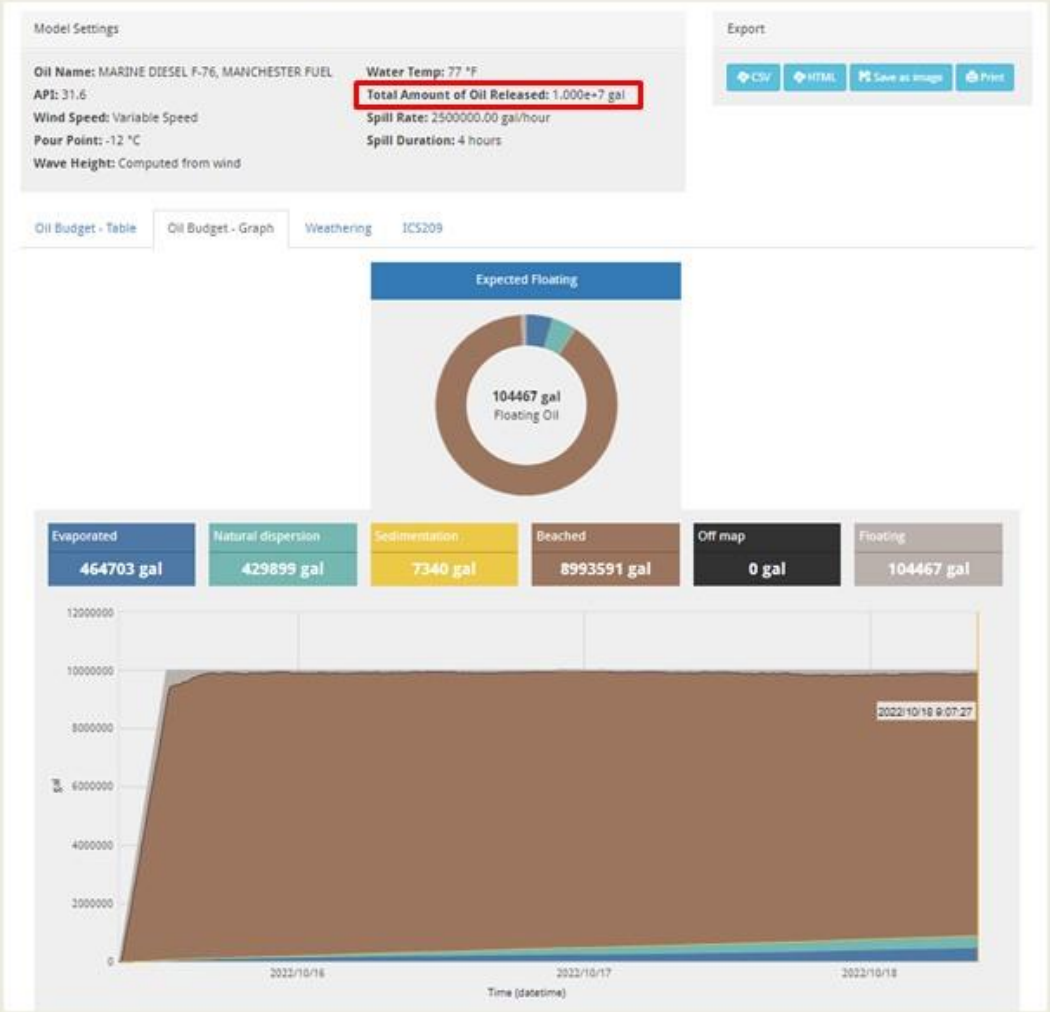


Due to moderate easterly winds and weak tidal currents forecast, a significant amount of the released oil (~80%) will beach along the east-facing shorelines in Pearl Harbor and East Loch (Ford Island and Pearl City). The rest of the oil (~20%) will likely evaporate and disperse into water column within a couple of days.

13

Exercise, Exercise, Exercise

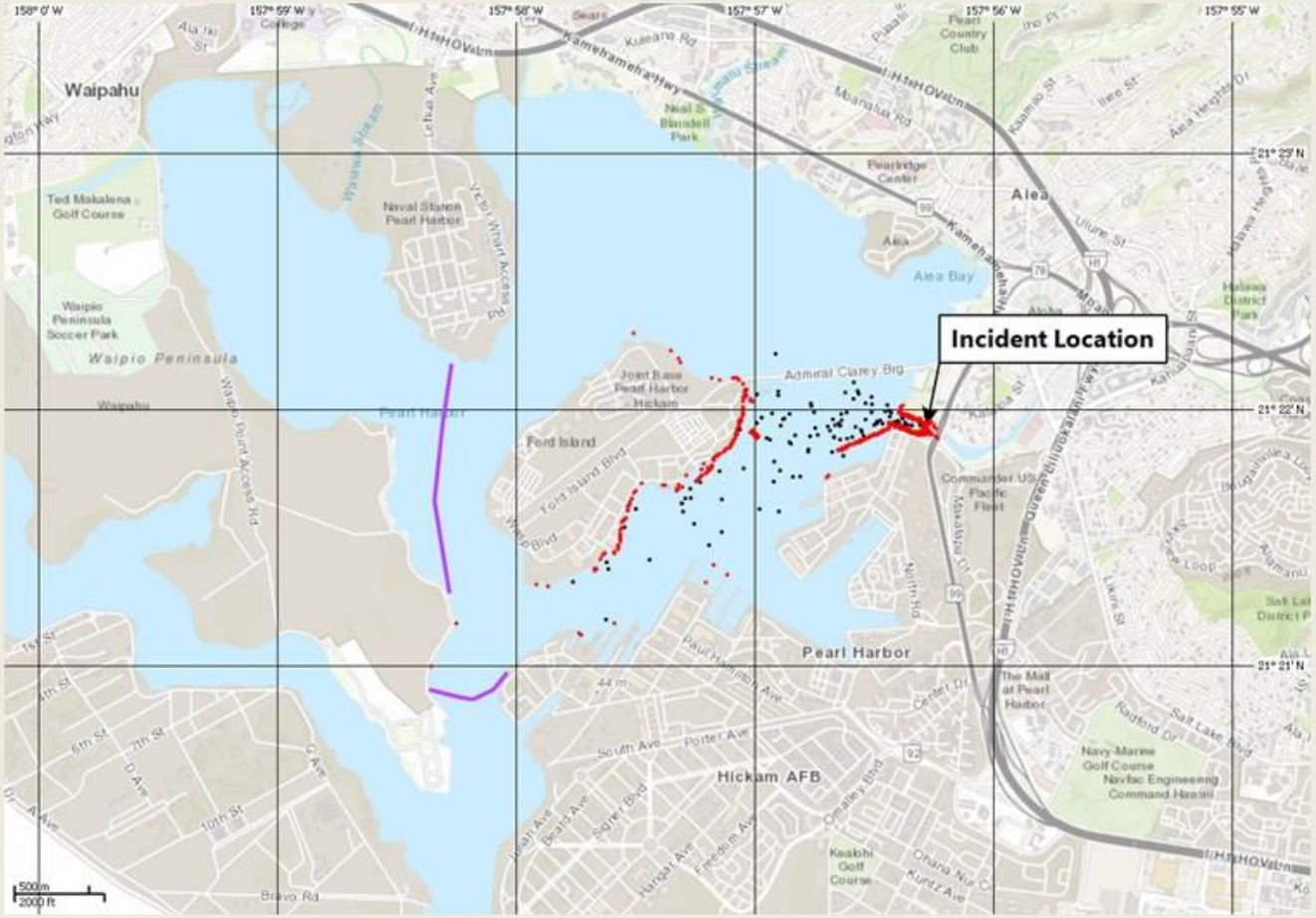
Fate Discussion – 10,000,000 gallon scenario



Due to moderate easterly winds and weak tidal currents forecast, a significant amount of the released oil (~90%) will beach along the east-facing shorelines in Pearl Harbor and East Loch (Ford Island and Pearl City). The rest of the oil (~10%) will likely evaporate and disperse into water column within a couple of days.

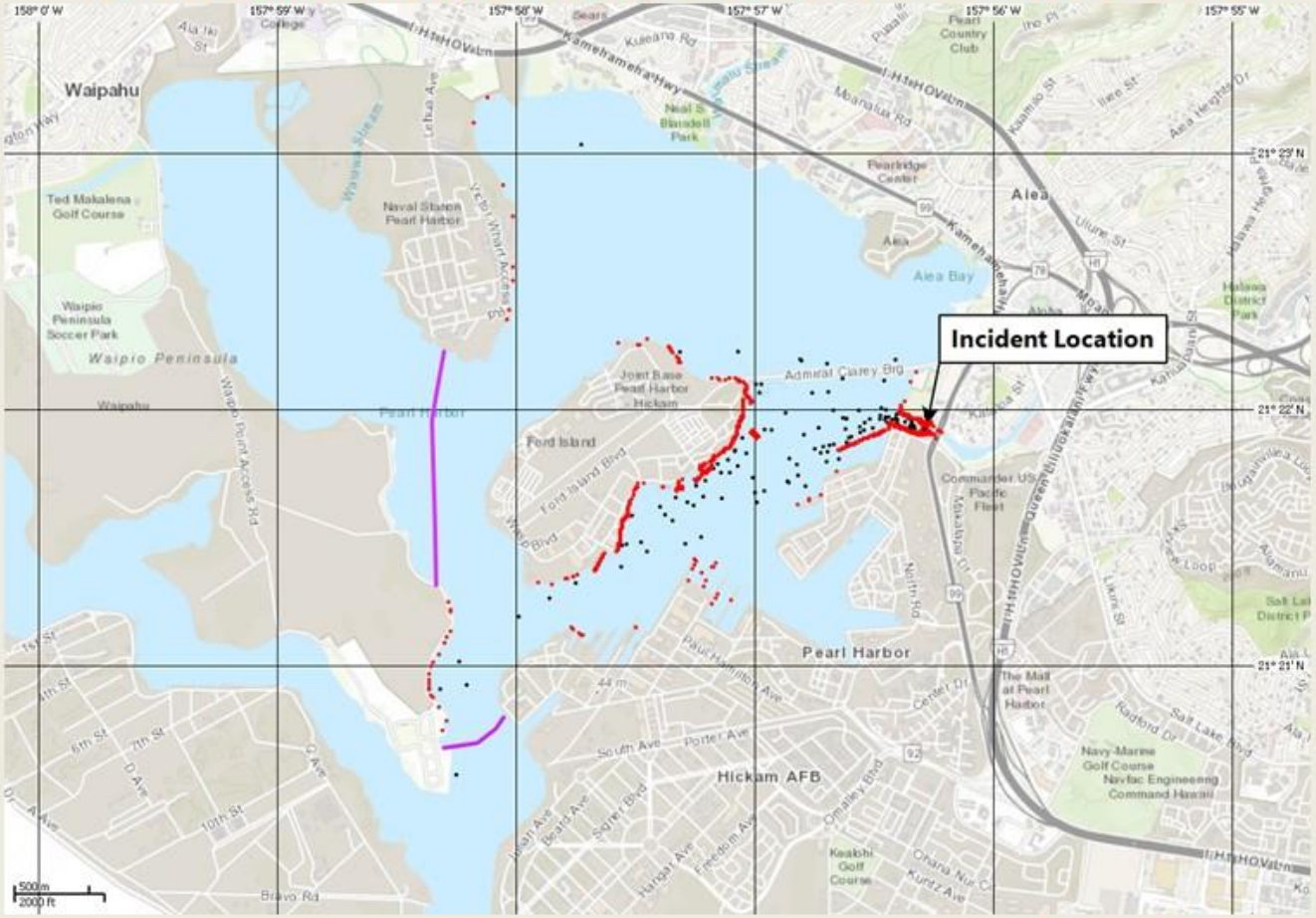
Exercise, Exercise, Exercise

Scenario – NE winds at 3-5 knots
24 Hour Trajectory 10-16-2022 0900



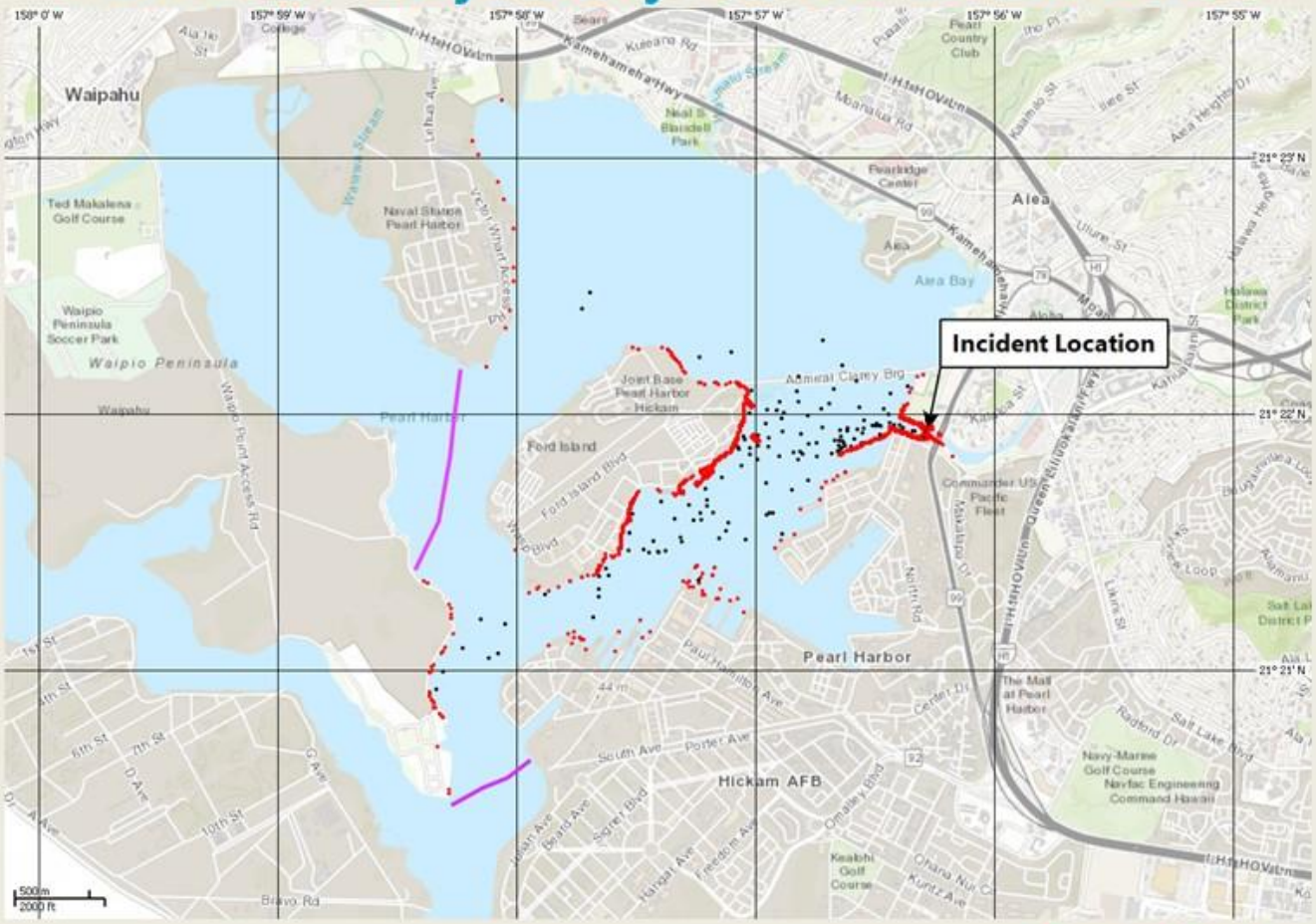
Exercise, Exercise, Exercise

Scenario – NE winds at 3-5 knots
48 Hour Trajectory 10-17-2022 0900



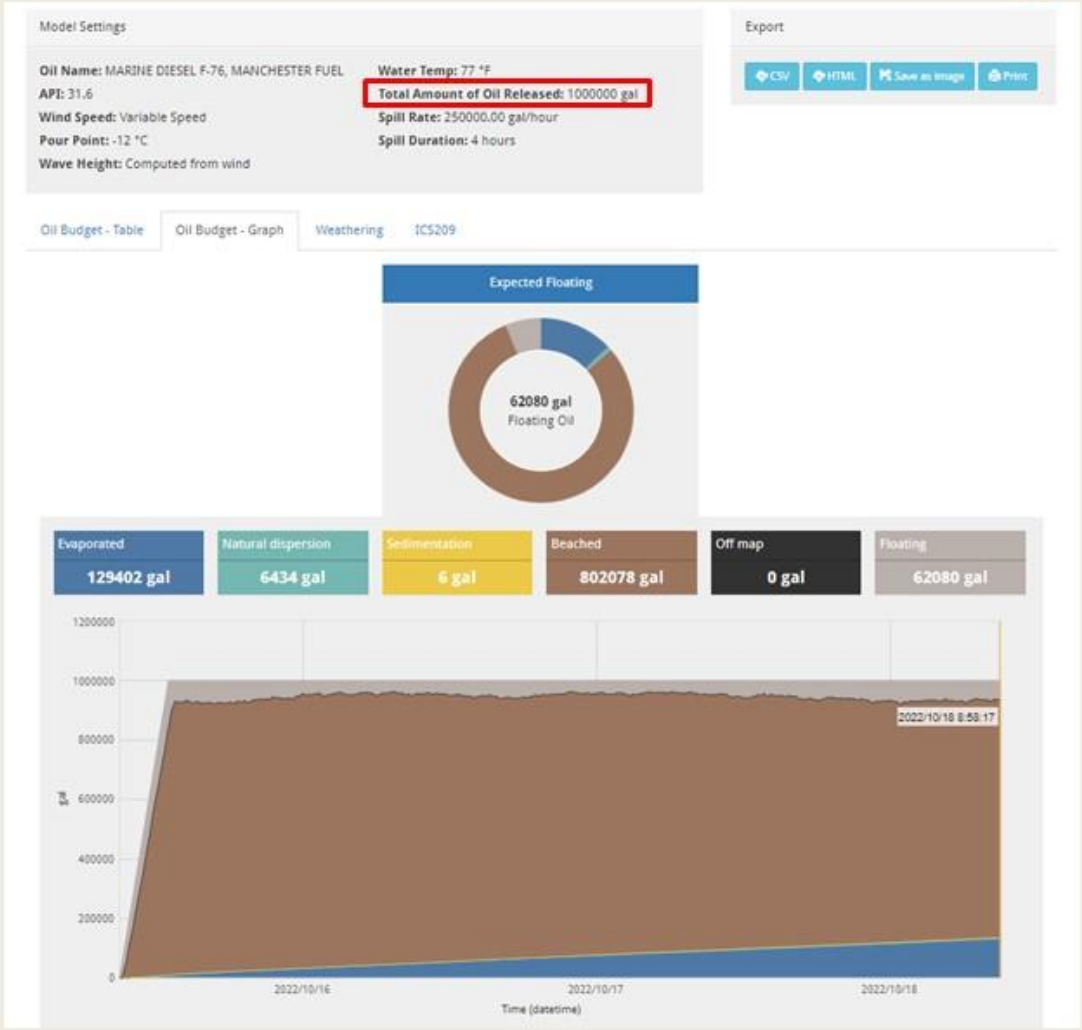
Exercise, Exercise, Exercise

Scenario – NE winds at 3-5 knots
72 Hour Trajectory 10-18-2022 0900



Exercise, Exercise, Exercise

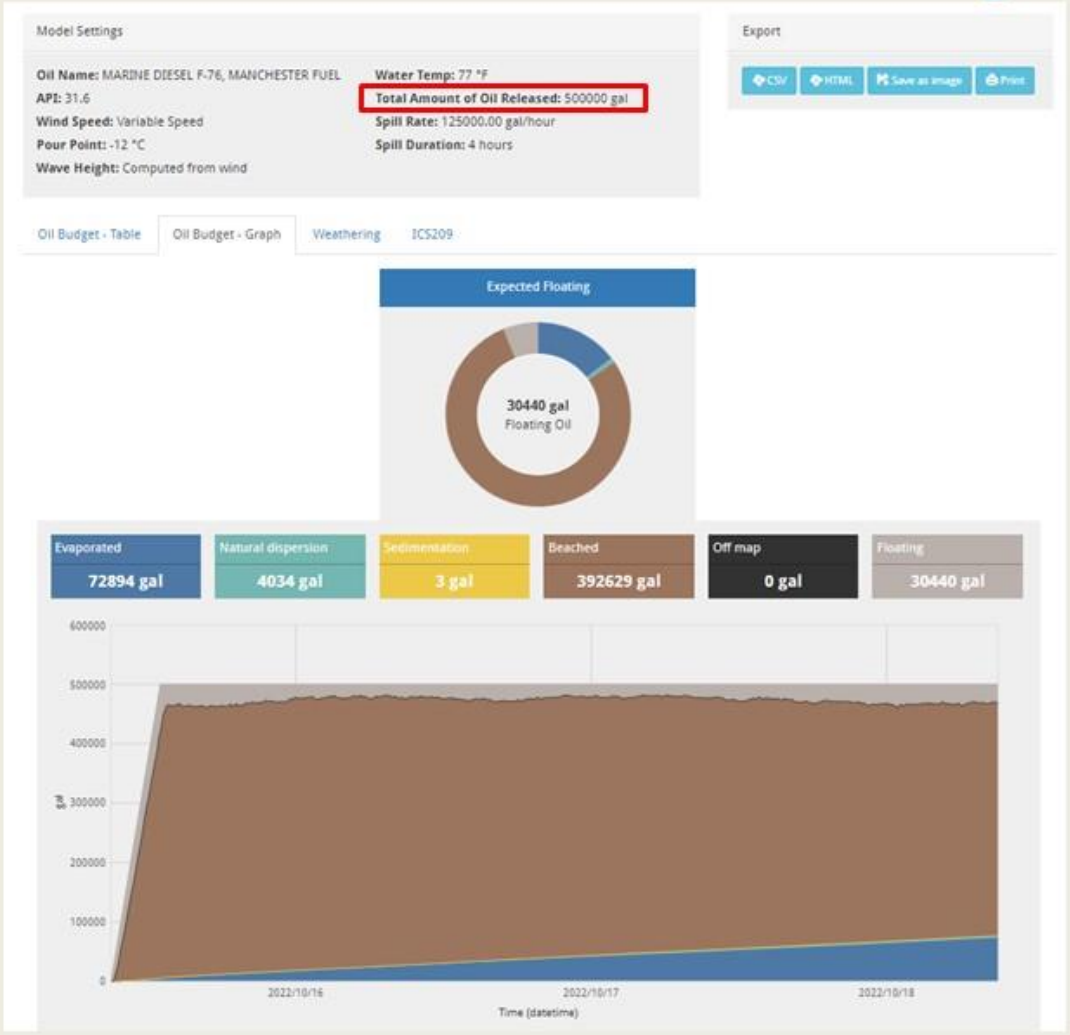
Fate Discussion – 1,000,000 gallon scenario



Due to moderate NE winds and weak tidal currents forecast, a significant amount of the released oil (~80%) will beach along the east-facing shorelines in Pearl Harbor and East Loch (Ford Island and Pearl City). The rest of the oil (~20%) will likely evaporate and disperse into water column within a couple of days.

Exercise, Exercise, Exercise

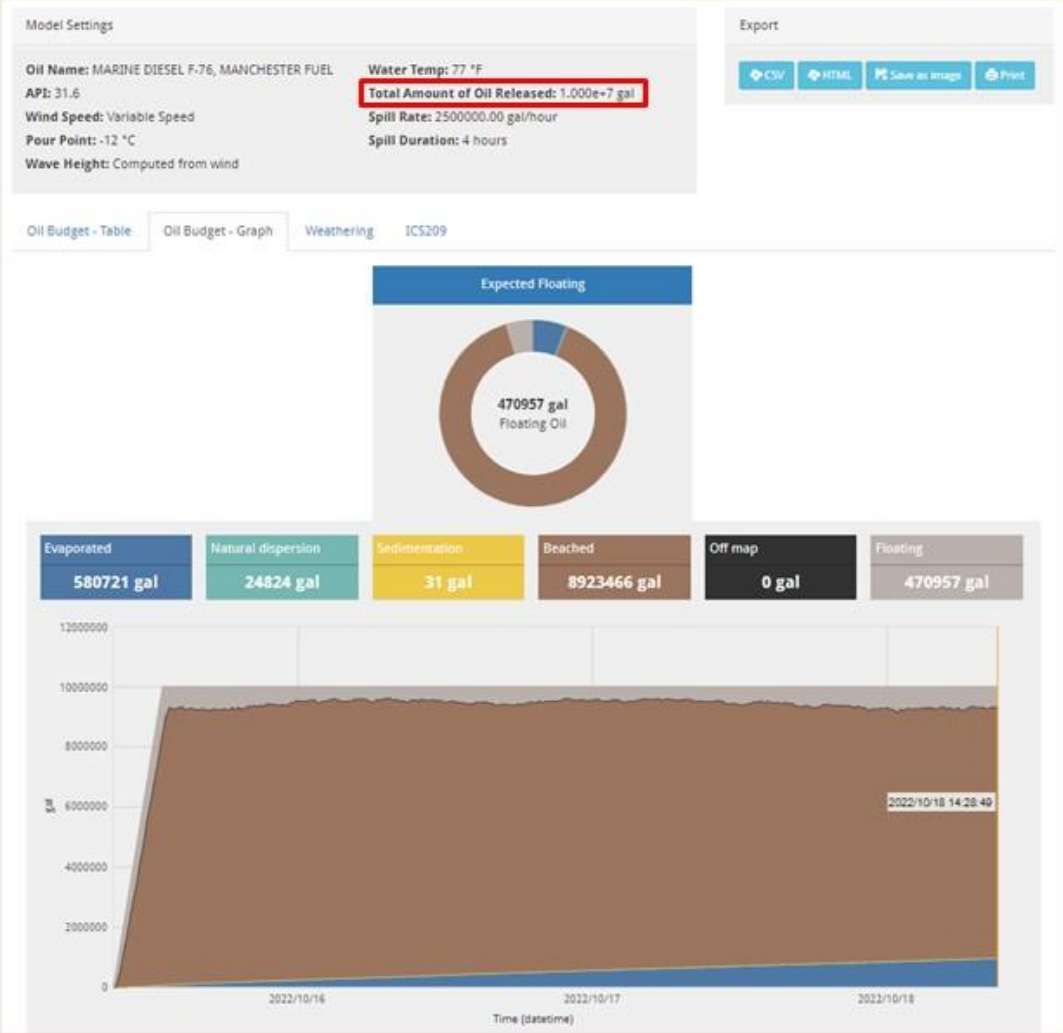
Fate Discussion – 500,000 gallon scenario



Due to moderate NE winds and weak tidal currents forecast, a significant amount of the released oil (~78%) will beach along the east-facing shorelines in Pearl Harbor and East Loch (Ford Island and Pearl City). The rest of the oil (~22%) will likely evaporate and disperse into water column within a couple of days.

Exercise, Exercise, Exercise

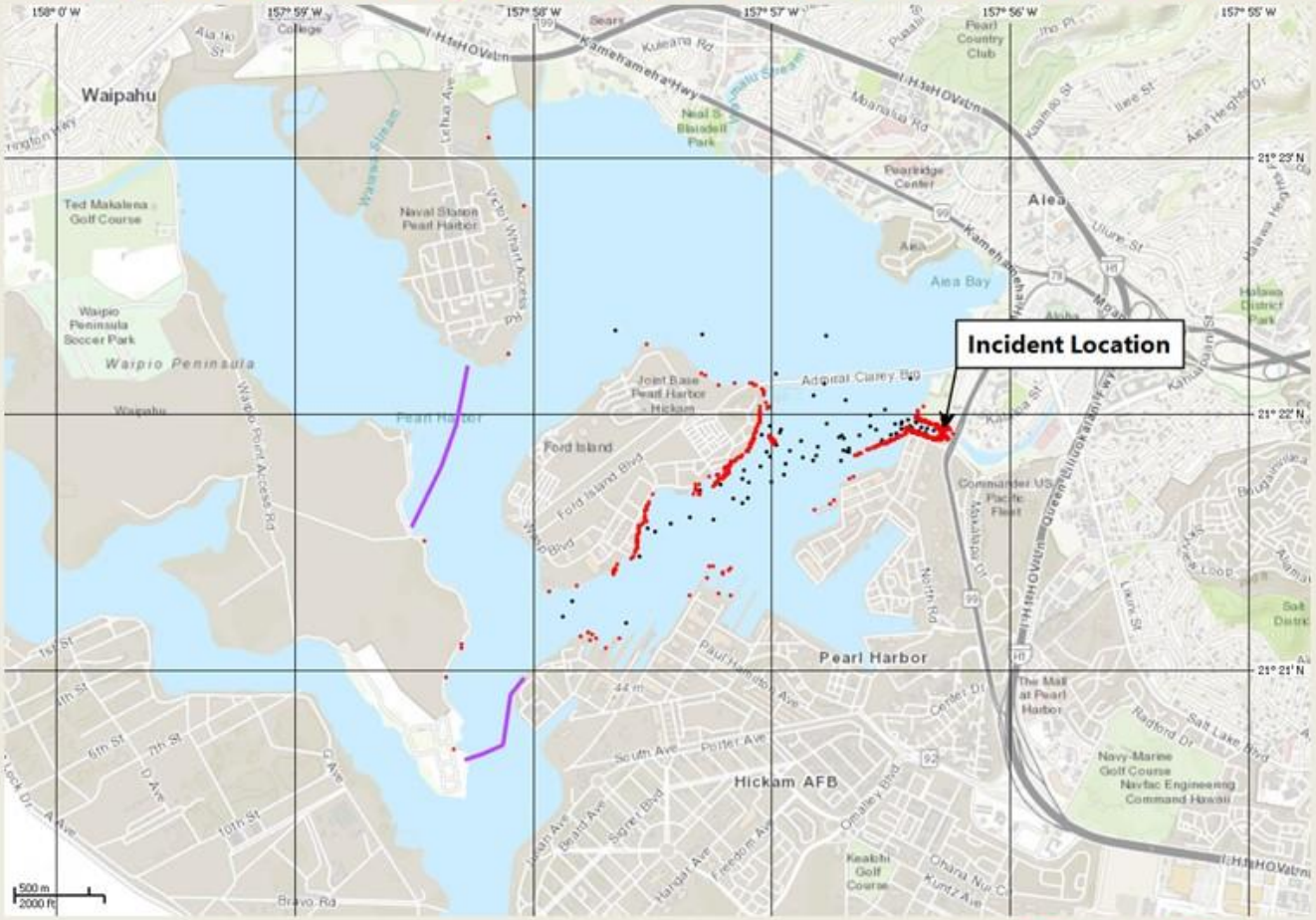
Fate Discussion – 10,000,000 gallon scenario



Due to moderate NE winds and weak tidal currents forecast, a significant amount of the released oil (~83%) will beach along the east-facing shorelines in Pearl Harbor and East Loch (Ford Island and Pearl City). The rest of the oil (~17%) will likely evaporate and disperse into water column within a couple of days.

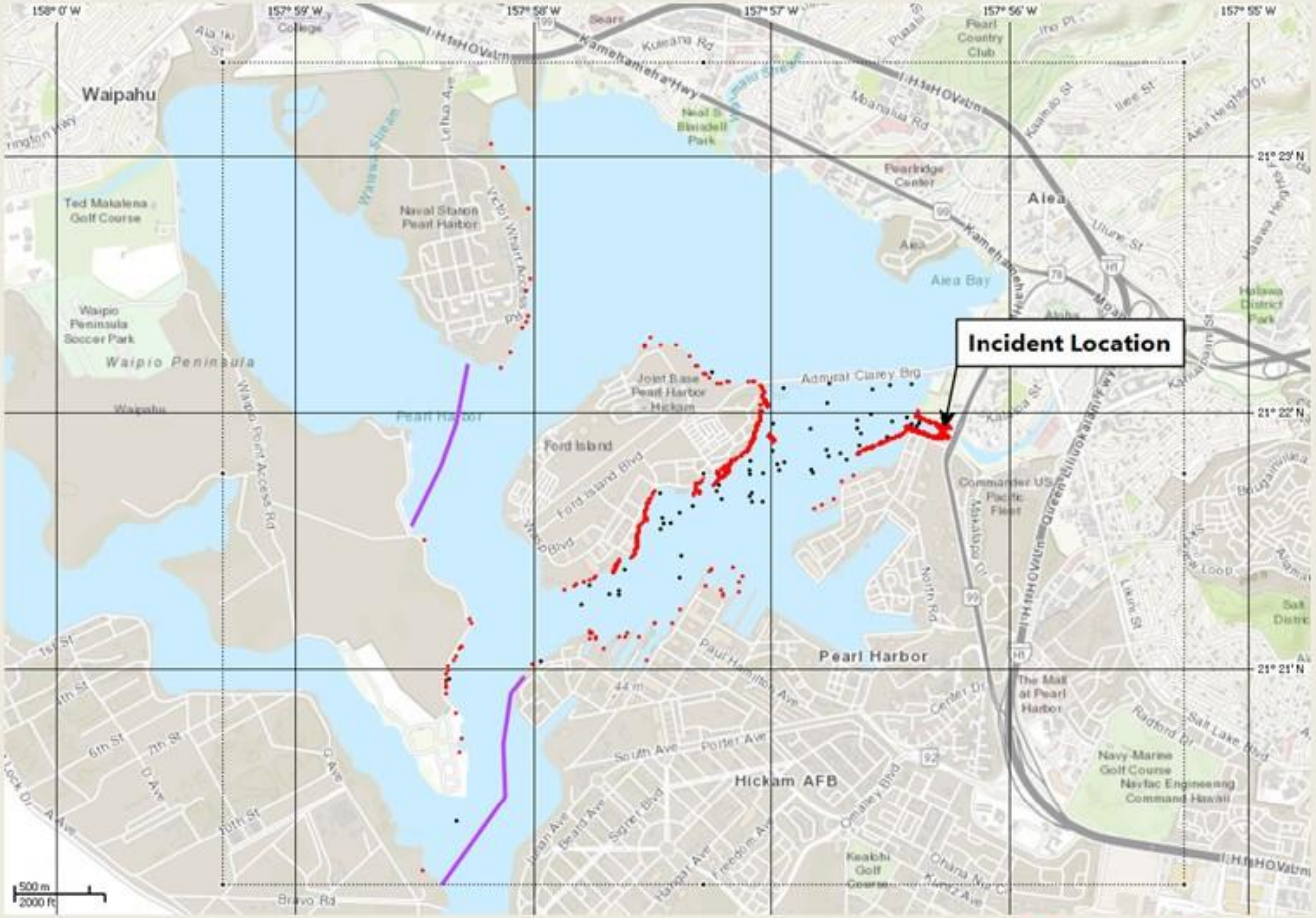
Exercise, Exercise, Exercise

Scenario – NE winds at 5-10 knots
24 Hour Trajectory 10-16-2022 0900



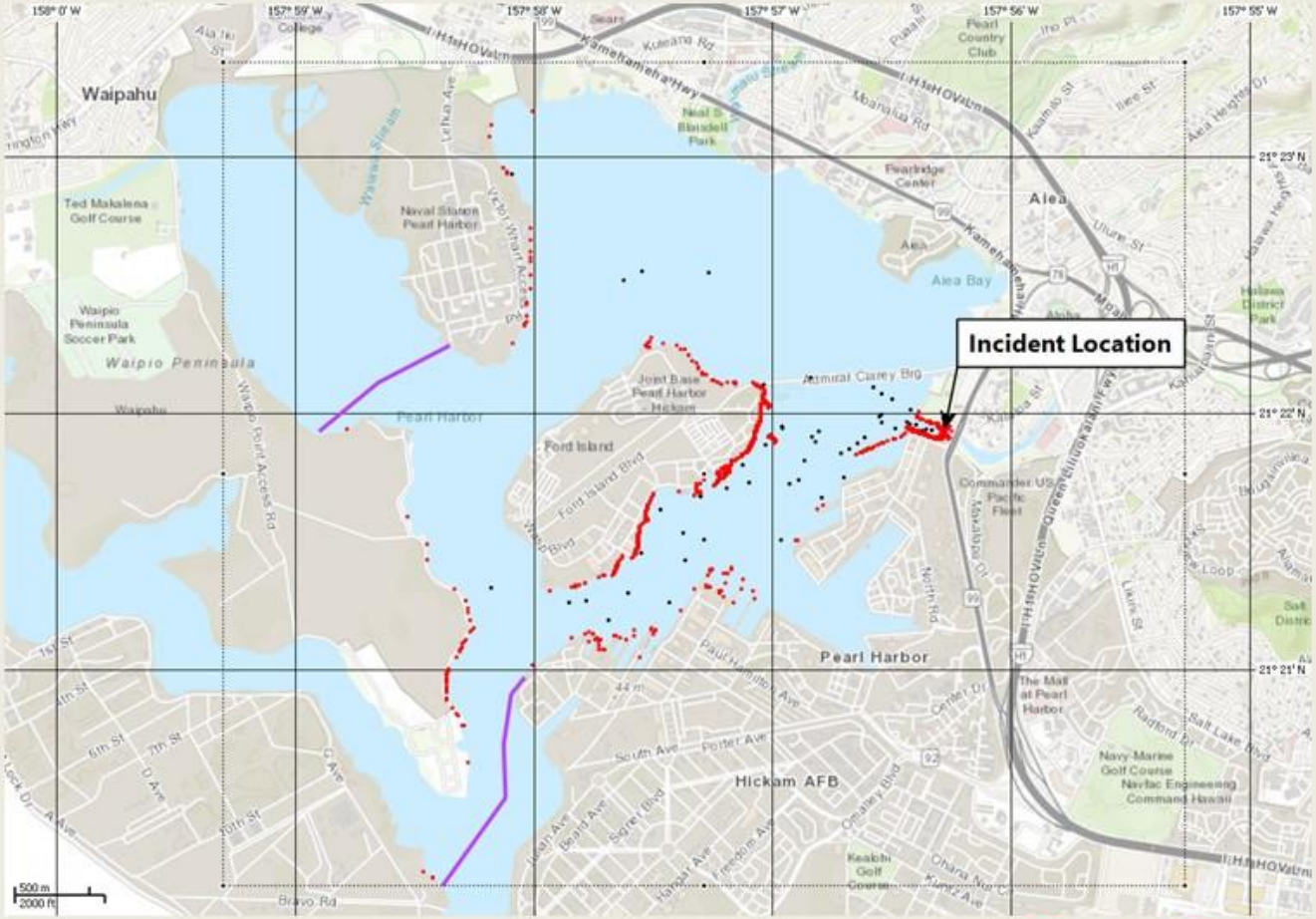
Exercise, Exercise, Exercise

Scenario – NE winds at 5-10 knots
48 Hour Trajectory 10-17-2022 0900



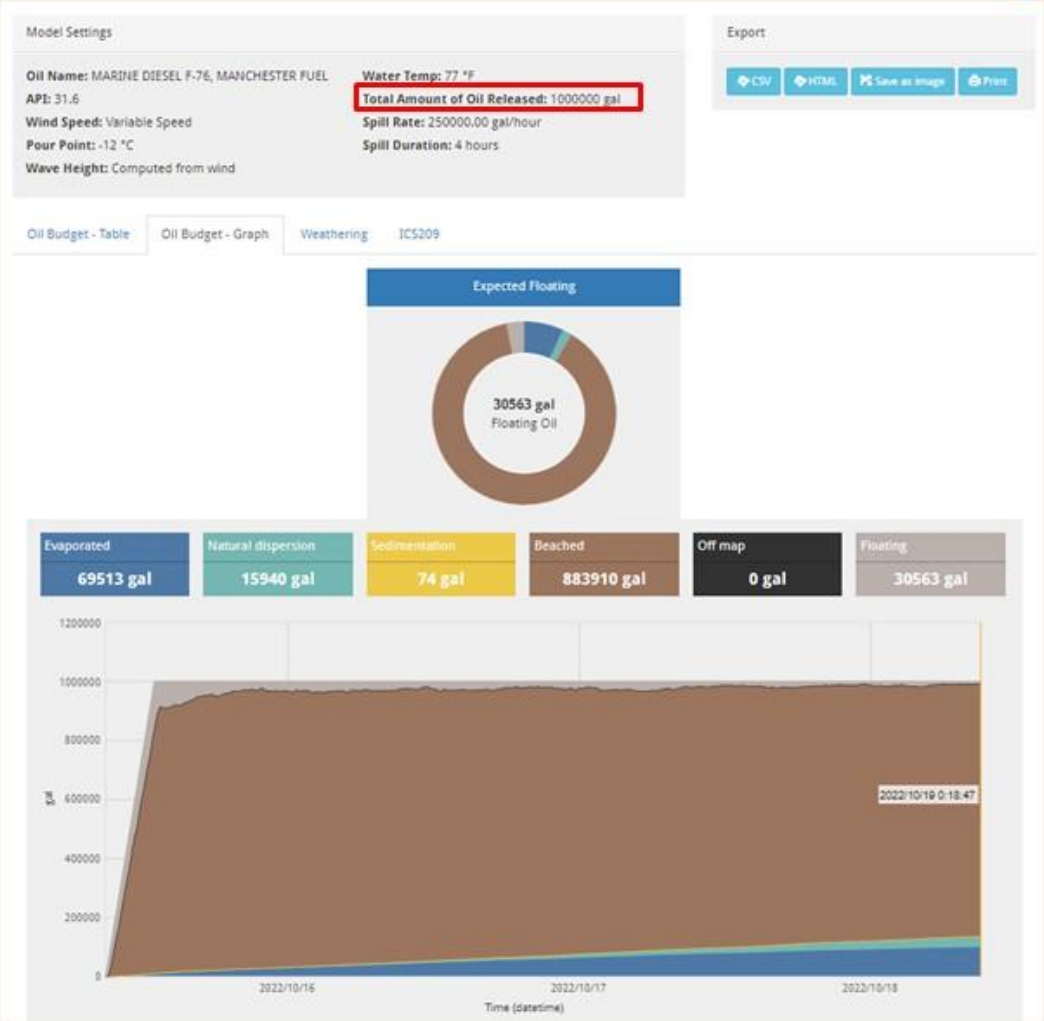
Exercise, Exercise, Exercise

Scenario – NE winds at 5-10 knots
72 Hour Trajectory 10-18-2022 0900



Exercise, Exercise, Exercise

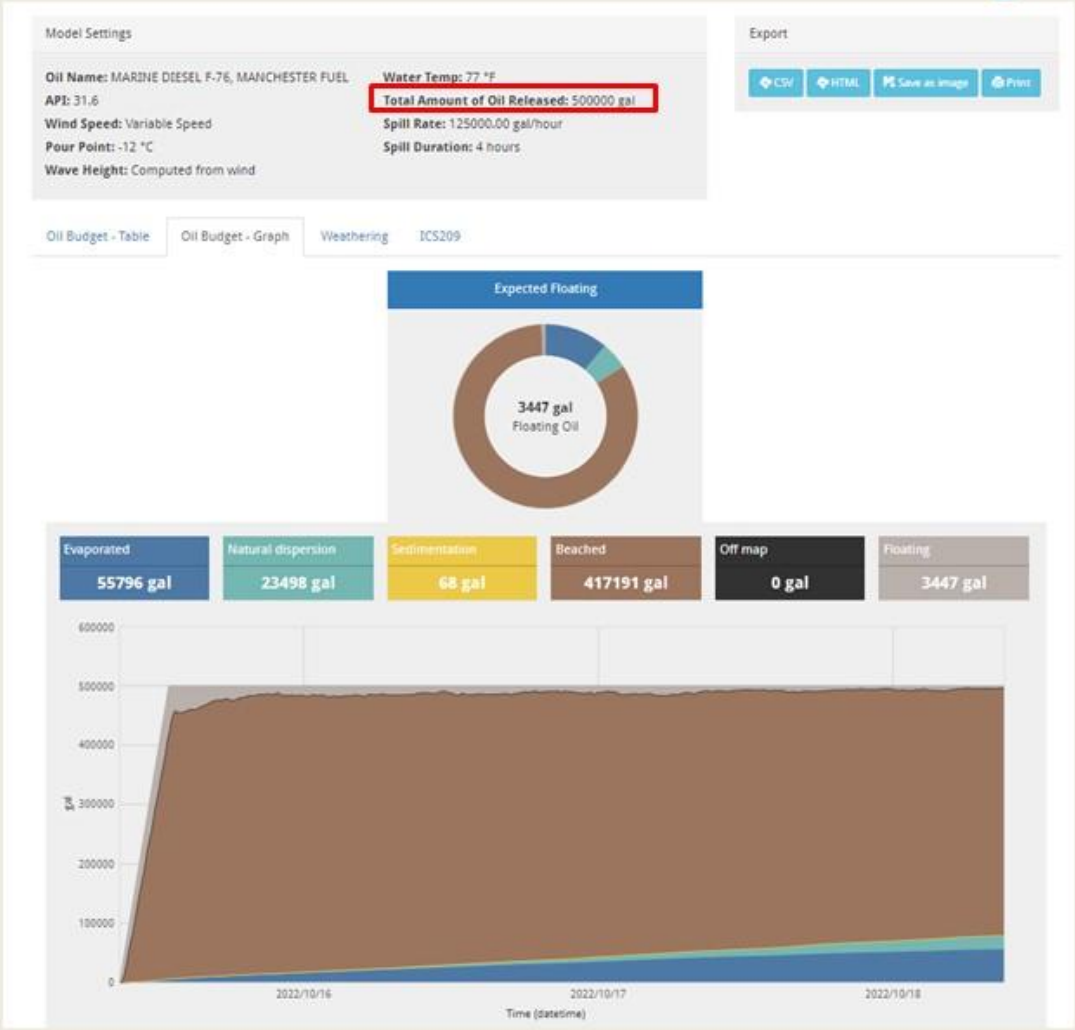
Fate Discussion – 1,000,000 gallon scenario



Due to moderate NE winds and weak tidal currents forecast, a significant amount of the released oil (~86%) will beach along the east-facing shorelines in Pearl Harbor and East Loch (Ford Island and Pearl City). The rest of the oil (~14%) will likely evaporate and disperse into water column within a couple of days.

Exercise, Exercise, Exercise

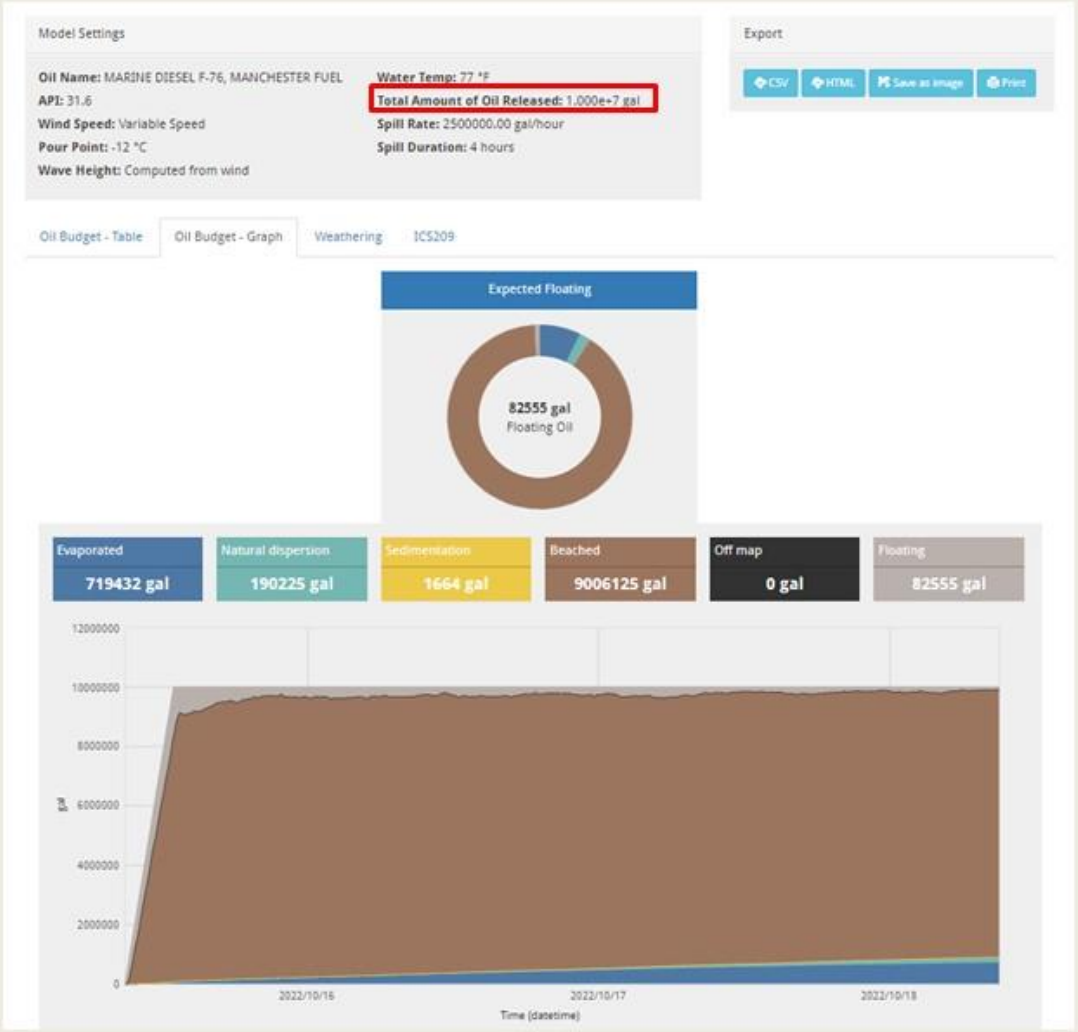
Fate Discussion – 500,000 gallon scenario



Due to moderate NE winds and weak tidal currents forecast, a significant amount of the released oil (~83%) will beach along the east-facing shorelines in Pearl Harbor and East Loch (Ford Island and Pearl City). The rest of the oil (~17%) will likely evaporate and disperse into water column within a couple of days.

Exercise, Exercise, Exercise

Fate Discussion – 10,000,000 gallon scenario



Due to moderate NE winds and weak tidal currents forecast, a significant amount of the released oil (~90%) will beach along the east-facing shorelines in Pearl Harbor and East Loch (Ford Island and Pearl City). The rest of the oil (~10%) will likely evaporate and disperse into water column within a couple of days.

Exercise, Exercise, Exercise

ATTACHMENT B- DIRECTIONS