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August 31, 2023

Rear Admiral Stephen Barnett
Commander, Navy Region Hawaiʻi
850 Ticonderoga St., Ste. 110
Joint Base Pearl Harbor Hickam, HI 96860-5101
(Sent via Electronic Mail)

Subject: Comments on the *Groundwater Protection Plan Update – Defueling Revision, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, Oʻahu, Hawaiʻi*, dated June 26, 2023.

Dear Rear Admiral Barnett:

The Hawaiʻi Department of Health (DOH) and U.S. Environmental Protection Agency (EPA), collectively the Regulatory Agencies (RAs), have reviewed the *Groundwater Protection Plan Update – Defueling Revision* (GWPP), dated June 26, 2023, submitted by the U.S. Department of the Navy (Navy). Overall, the GWPP lacks significant details regarding the identification of potential releases, as well as planned courses of action, should a release be identified under various scenarios. The GWPP should also work in conjunction with the *Phase I – Source Water Protection Plan* to provide details regarding the protection of groundwater, Red Hill Shaft, and other water sources during defueling operations.

The Enclosure contains our comments on the GWPP, which are categorized as either "critical" or "additional," as requested by the Navy, to aid the Navy in its review and revision of the document. It should be noted, that "additional" comments are important and do need to be addressed, so the Navy can better detect and respond to releases and/or understand risk to receptors. The critical comments are more directly related to the actions the Navy shall take to prevent or adequately respond to a release during defueling.

This GWPP update was submitted as a deliverable under Section 7.0 of the 2015 Administrative Order on Consent Statement of Work for the Red Hill Bulk Fuel Storage Facility located in Oʻahu, Hawaiʻi. Submit a revised document for RA approval, and please contact Grant Scavello, EPA Red Hill Project Coordinator, at Scavello.Grant@epa.gov or (415) 972-3556; or Kelly Ann

Lee, DOH Red Hill Project Coordinator, at KellyAnn.Lee@doh.hawaii.gov or (808) 586-4226 if you have questions regarding this letter.

Sincerely,

GRANT SCAVELLO
Digitally signed by GRANT SCAVELLO
Date: 2023.08.31 10:03:49 -07'00'

Grant Scavello
Red Hill Project Coordinator
U.S. Environmental Protection Agency, Region 9

Kelly Ann Lee
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Kelly Ann Lee
Red Hill Project Coordinator
State of Hawai‘i, Department of Health

Enclosure

cc: VADM John Wade, Commander, Joint Task Force – Red Hill
Sherri Eng, Environmental Director, Navy Region Hawai‘i
Joshua Stout, Red Hill PMO Deputy Director, Navy Region Hawai‘i
RDML Jeffrey Kilian, Commander, NAVFAC Hawai‘i
CAPT James Sullivan, Commanding Officer, NAVFAC Hawai‘i
LCDR Travis Myers, Aquifer Recovery Team Lead, NAVFAC Hawai‘i

CRITICAL COMMENTS

General Comments

1. We understand from a meeting with the Joint Task Force – Red Hill (JTF-RH), Fleet Logistic Center (FLC), and U.S. Department of the Navy (Navy) on August 4, 2023, that environmental monitoring during defueling will require coordination between the Navy, JTF-RH, and FLC to determine in advance where and when samples can safely be collected at locations where the Navy will not use automated sampling and data reporting systems. From our meeting, it appears that sampling during the initiation and completion of fuel movement evolutions should be avoided, based on the potentially higher risk of spills and increased activity in the lower access tunnel at these times. The *Groundwater Protection Plan Update – Defueling Revision* (GWPP) should discuss this coordination and include specific protocols for spill mitigation measures during and after sampling, including potential diversion and overhead protection and re-sealing sampling points after samples are collected. Quality assurance of re-installation actions, such as inspecting seals to ensure they are intact during defueling, should also be discussed.

2. Recognizing that releases may be identified visually (from watch standers) and via operator equipment (pressure transducers, tank gauging system), and not just from soil vapor monitoring points (SVMPs) or groundwater monitoring wells (MWs), the GWPP should identify actions that would be taken (with confirmation from the Incident Command and U.S. Environmental Protection Agency [EPA] and Hawai‘i Department of Health [DOH], collectively the Regulatory Agencies [RAs]) under these scenarios. For example, if a release occurs from a pipeline, the watch stander will observe the spill and the response team will respond to contain the spill and remove it from the tunnel as soon as possible. This type of release identification is described in other plans but should also be tied to the GWPP. The GWPP currently describes actions taken to prevent releases during unpacking and other completed events but fails to demonstrate how these actions will be enhanced during pending large volume movements (repacking, main tank defueling, and final unpacking/pipeline removal).

   Revise the GWPP globally to include communication protocols between the JTF-RH's defueling team and the Navy's environmental team and actions that the Navy's environmental team would take following a release identified at the surface. These actions should include the resources needed to respond to an identified release that has reached or may reach the subsurface and the means (e.g., contracts with sampling contractors and laboratories) to promptly provide these resources. The objective should be to determine if the spill reached or has the potential to reach the subsurface environment and to what degree. If the release impacts the subsurface environment, regulations require site assessment and remediation, if needed.

3. In a letter dated April 17, 2023, the EPA requested that the Navy "include (in the GWPP) other relevant information that will help inform how to protect groundwater resources and human health in the event of a release." In meetings with the Navy, the RAs clarified

the need for contingency plans to protect drinking water shafts from releases. The contingency plans should address Red Hill Shaft, Navy Aiea-Hālawa Shaft, and the Honolulu Board of Water Supply's (BWS') Hālawa Shaft. However, the GWPP does not contain such contingency plans. Update the GWPP to inform the user how to protect the drinking water shafts, should there be a release.

4. The soil vapor and groundwater "trigger" action levels proposed are too high and will likely delay recognition of potential releases. Instead, the action levels should be based on more recent data (e.g., within the last six months), and due to varying maximum concentrations detected at each SVMP and groundwater MW, should be specific to each individual sampling location.

   Calculate a trigger concentration for each SVMP and groundwater MW. For each SVMP or MW, calculate the average of the photoionization detector (PID) data over the past six months, and determine the standard deviation (SD). Triggers for PID readings should be the average value for that SVMP plus the SD, not to exceed 10,000 parts per billion per volume (ppbv). Additionally, any free product detected in groundwater by interface probe and/or visually is a trigger for immediate action. PID readings from MWs should not exceed 8,000 ppbv. Trigger exceedances and/or increasing concentrations of contaminants of potential concern (COPCs) over time should trigger specific actions that are defined in the GWPP. Please update the report globally to refer to trigger levels based on trends.

Specific Comments

1. **Section 1.3.1 Subsurface Conditions, PDF Pages 9 and 10:** Please update the text to consider the following:
   a) Clarify the first and second sentences of the first paragraph to state the vadose zone beneath the Red Hill Bulk Fuel Storage Facility's (Facility's) bulk fuel tanks consists primarily of basalt materials in a series of stacked lava flows resulting in a heterogeneous sequence ranging from very high to very low permeability.
   b) The RAs recognize that, as light nonaqueous-phase liquid (NAPL) moves through larger pore spaces, some could be trapped in fractures. However, it should also be noted that some NAPL may migrate rapidly through large cracks and fractures. Areas where the vadose zone is saturated from previous releases could also convey NAPL more rapidly.
   c) It should be noted that the spatial distribution of soil water infiltration is presumed to generally mimic the pattern of orographic rainfall – i.e., recharge is highest on windward slopes and mountain peaks below the top of the trade wind inversion – however, the role that the receiving geologic units (saprolite, alluvium, basalt, volcanics, and so on) play in determining the specific patterns and rates of net groundwater recharge resulting from this precipitation is not well understood.

Consider revising the last sentence of the third paragraph to reflect this information.

d) The last sentence of Section 1.3.1 correctly states that many factors influence groundwater movement but should be updated with additional information. Very low hydraulic gradients, geologic conditions (e.g., the strike and dip and geologic heterogeneity), potential saltwater buoyancy effects, and the variability in local pumping stresses from water development shafts and wells all complicate the understanding of the actual directions and rates of groundwater flow (and hence, contaminant migration).

2. **Section 2.1, Visual Inspections, PDF Page 12:** Visual inspections should include confirming lock-out tag-out, closed/sealed monitoring well heads, and proper spill mat placement over SVMP and wellheads. Specify who will perform each visual inspection, how frequently the inspections will occur, and how the inspections will be documented. Include a figure showing the well and SVMP locations that need to be checked and a schedule for those checks.

3. **Section 2.2.1, Soil Vapor Monitoring Network, PDF Page 13:**

   a) It is stated that sampling the SVMPs underneath the Facility's fuel storage tanks with a photoionization detector will occur two times per week. Ideally, a continuous soil vapor monitoring system (CSVM) with telemetric data logging/reporting should be employed in advance of defueling to detect releases in real-time and allow for quick response. If the Navy is unable to implement the CSVM system prior to defueling, as was previously indicated during an April 2023 special purpose meeting, daily sampling and reporting is recommended (except during the start-up and wind-down of each fuel evolution when the potential for a pressure surge is greatest) with sampling occurring a minimum of two times per week. Daily sampling should focus on locations with active fuel movement.

   b) It is our understanding that main tank defueling activities will be conducted Monday through Saturday each week, on a 24-hour basis, and tank bottom defueling activities will be conducted Monday through Friday, during daytime hours. We also understand the monitoring locations in the tunnel will be protected to ensure all preferential pathways are sealed in the event of a potential release. If the Navy does not implement CSVM with automatic data logging/transmission, specify which day(s) sampling at the SVMPs will occur and what assurance can be provided to demonstrate spill mitigation measures will be reinstalled after sampling events.

   c) Include a discussion of which SVMPs are currently operating correctly and which inoperable SVMPs will be repaired or replaced before defueling. If not all the SVMPs will be repaired or replaced, specify which SVMPs will be sampled and which will be out of service during defueling. Remove the SVMPs that will not be sampled from Figure 1.

4. **Section 2.2.2, Soil Vapor Action Levels, PDF Page 13:** It is stated that, if a PID reading is above the applicable soil vapor action levels, a passivated (Summa) canister soil vapor sample for laboratory analysis will be collected. Include details surrounding the collection of the Summa canister soil vapor sample (e.g., sample collection methodology, analytes, laboratory analytical methods, laboratory turn-around time, etc.). This is one action that should be considered when trigger levels are exceeded, but the field crews should take additional actions, which should be summarized in this section and detailed in Section 3. Recommended actions include but are not limited to:
    a) The field crew should immediately retest the SVMP with the PID.
    b) If the second test exceeds the trigger:
        1. The field crews should immediately notify specific personnel within the Navy and JTF-RH. Identify the staff in the report. The Navy should notify Lynn Brockway with EPA and the Emergency Preparedness and Response (EP&R) Section in the DOH Hazard Evaluation and Emergency Response (HEER) Office within two hours.
            a. Lynn Brockway – (808) 539-0541
            b. DOH HEER EP&R – (808) 586-4249 (business hours) or (808) 236-8200 (after hours)
        2. The environmental team should follow up with the JTF-RH and FLC to perform inventory reconciliation. If there is no unscheduled fuel system movement and inventory reconciliation does not identify a release, then:
            a. Collect passive (Summa) samples. The laboratory analytical methods should include, at a minimum, TO-15, including Paraffins, Isoparaffins, Aromatics, Naphthalenes, and Olefins (PIANO) forensics method and EPA Method 3C for fixed gases. In addition, the Navy should request that the laboratory report tentatively identify compounds.
            b. Field crews should continue to monitor the vapor point and nearby vapor points for increasing trends and report the results to the RAs.
        3. If there is an unscheduled fuel movement or inventory loss exceeds the estimated volume of fuel moved, the Navy should work with the JTF-RH to immediately implement spill response actions identified in existing spill response reports. Update the GWPP to point the reader to specific actions in the Facility Response Plan (FRP) and Spill Prevention, Control, and Countermeasure Plan (SPCC). If effective actions are not in the FRP or SPCC, add the actions to the GWPP.
5. **Section 2.2.1, Soil Vapor Monitoring Network, PDF Page 13:** A soil vapor trend analysis should be conducted immediately after taking a round of samples. Criteria should be developed to list trend levels that would initiate a response action and what

those actions would be. Note that data collected during defueling activities should not be included in the background data set when conducting trend analyses.

6. **Section 2.3, Groundwater Monitoring, PDF Page 14:**
    a) The basis of the groundwater monitoring portion of the GWPP is to be conducted in accordance with the *Consolidation and Optimization of the Groundwater Sampling Programs*, hereinafter the "Consolidation Plan," dated May 2023. However, the RAs have not approved this program. Additionally, the RAs recommend increased sampling frequency and data reporting during defueling. Therefore, specific details regarding the sample collection methodology, specific analytes, and analytical methods are to be included in the GWPP.

    b) The frequency of groundwater monitoring will increase to at least once per week in primary leak detection wells. Analytes should include all chemicals that have been identified with the fuel currently and historically stored within the tanks, as well as any cleaning agents and/or lead scavengers. Please see EPA letter, *Request for Analysis of Fuel in Tanks at Red Hil Bulk Fuel Storage Facility*, dated June 28, 2023, for more information. In addition, the laboratory turn-around time should be expedited (five-day turn-around time), and the preliminary results provided to RAs as soon as the Navy receives them. Additionally, the Navy should provide immediate written notification if analytical results exceed the trigger level for that MW.

7. **Section 2.3.1, Groundwater Monitoring Network, and Table 2-1, PDF Pages 14 through 16:**
    a) Page 16 divides MWs into three categories. For this Defueling Revision of the GWPP, consider revising the well categories as follows:
        i. Change "Release Detection Wells" to "Primary Release Detection Wells."
        ii. Change compliance wells to "Secondary Release Detection Wells."
        iii. Move the following wells from "Secondary Release Detection Wells" to "Primary Release Detection Wells":
            - RHMW05[1],
            - RHP01[2],
            - RHP02[2],
            - RHP03[2],
            - RHP04A, 04B, 04C[2],
            - RHP05[2],
            - RHP06[2],
            - RHP08[2].

            Notes: These changes should be reflected throughout Section 2.3.2.
            [1] Well RHMW05 is located within the Red Hill tunnel and would be more appropriate to detect a release during defueling.

[2] The original objective of this well was to define the extent of groundwater contamination around Red Hill Shaft after the November 2021 release.

b) Note that sampling frequency at specific wells may increase if triggers are exceeded in nearby wells or a release is observed.

c) In the first bullet on PDF page 16, clarify that "Primary Release Detection Wells" will be sampled at least weekly during defueling, which includes the emptying of the tank bottoms. It should be noted that based upon the data collected during defueling, the RAs may require extension of sampling conducted under the GWPP. More frequent sampling may also be recommended during tank cleaning.

d) In the first bullet after the table on PDF page 16, clarify which of the "Secondary Release Detection Wells" will be installed before defueling and will be sampled as part of this plan.

e) It is stated that during defueling, compliance wells ("Secondary Release Detection Wells") will be sampled monthly. Biweekly (once every two weeks) sampling of the secondary release detection wells is recommended during defueling activities and until tank bottoms are emptied.

f) It is stated that during defueling, sentinel wells will be sampled monthly. While this may be appropriate for long term monitoring, more frequent sampling is warranted if increasing trends or Environmental Action Level (EAL) exceedances are observed in the plume delineation or compliance wells.

g) It is stated that release detection well RHMW21(II) is proposed for future installation. If the planned installation date is after defueling activities are estimated to be completed, this well should be removed from the table as a primary release detection well.

8. **Section 2.3.2.1, Release Detection Wells, Table 2-2, PDF Page 18:** Delete this table and the plots provided in Appendix A, and replace them with documentation of appropriate trigger levels for each sampling location (see Critical General Comment 4).
   a) Additional analytes would be expected to be associated with a release of either JP-5, JP-8, or F-76 fuels, and subsequently should be included in the GWPP as COPCs for action at release detection wells. Although the Consolidation Plan has not been approved by the RAs, tri- and tera-methylbenzenes, 2-(2-methoxyethoxy) ethanol, 2(2-butoxyethoxy) ethanol, and other constituents associated with fuel additives, lead scavengers, and cleaning agents are to be considered potential COPCs requiring action at release detection wells under the GWPP—in addition to the analytes listed in Table 1 of the May 2023 version of the Consolidation Plan. This comment should be reflected throughout the document, where appropriate.
      i. The Navy may have identified additional analytes when it analyzed the fuel remaining in all tanks in June 2023. We expect the Navy to use all

information available to monitor for relevant COPCs in the environment under and around Red Hill. Update the COPC tables accordingly.

b) Trigger levels should not be based on data collected immediately following the May 6, 2021, release. They should be based on more recent data collected, as there has been a decreasing trend in the detected concentrations of COPCs in groundwater. The Navy has weekly groundwater monitoring data, so there are sufficient data points collected more recently (e.g., within six months) to determine the most appropriate trigger levels. See Critical General Comment 4 for additional groundwater triggers that require action.

c) In addition to the use of trigger levels to aid in determining when a potential release may have occurred, trends analysis should be evaluated immediately after each sampling event. The GWPP should detail who will monitor for and identify increasing trends, and the flow of communication from the person who identifies the increase through the Navy's point of contacts to the RAs within 48 hours. The increasing trends should trigger specific actions that will be included in the GWPP. Recommendations include ties to the FRP and SPCC, sampling of all adjacent wells, etc.

d) Field measurements and observations should also be triggers for action. Add text to this section describing how observations of any NAPL, well PID results that exceed trends, etc. can be real-time indicators of releases. See Critical General Comment 4 for details.

9. **Section 2.3.2.2, Compliance Wells, PDF Page 18:** Reframe this section to discuss leak detection during defueling and closure. Link the leak detection efforts to specific actions/notifications. Delete Table 2-3 and the plots provided in Appendix A, and replace them with documentation of appropriate trigger levels for each sampling location (see Critical General Comment 4).

   Being that many of the "compliance wells" ("Secondary Release Detection Wells") are positioned near the Facility boundary, waiting until concentrations of COPCs in these wells reach the DOH EALs before taking action, when action involves notifying the JTF-RH, FLC, and RAs of an increasing groundwater plume, may be too late to prevent a release from extending beyond the property boundary. The RAs recognize some COPCs may have been detected at concentrations slightly below the DOH EALs within the last six months, for example, total petroleum hydrocarbons as diesel fuel in RHMW17. However, groundwater data collected over the past six months should be used to generate statistics and identify current trends so that appropriate action levels are developed for each well.

10. **Section 3, Groundwater Protection Responses for Releases and Action Level Exceedances, PDF Page 21:**
    a) Include actions identified for SVMP/MW trigger level exceedances and NAPL observations, as well as COPC detections in sentinel wells.

b) Be specific about the notification chains, actions that will be taken, and the time frames for those actions. Where relevant, refer to specific actions in the FRP and/or SPCC.

c) Listing these actions on the Navy's website is insufficient. Include instructions in the GWPP that will be followed by all parties the Navy deems responsible for conducting the release identification and response actions identified in the GWPP. Ensure the personnel who are responsible for detecting releases, notifying key personnel, and conducting the actions in the plan have read the plan and are knowledgeable of their role in its implementation.

11. **Section 3.1, Visual Observation Response Actions, PDF Page 21:**

a) Control room operators themselves may identify a release based on system information. In addition to spill response planning and activities, release response actions associated with groundwater and soil vapor monitoring should be included in the GWPP.

b) Visual inspections should also include routine inspections, corrections, and documentations of the seals on SVMPs and MWs. Include these details.

12. **Section 3.3, Groundwater Response Actions, Figures 3A-3C, PDF Pages 22-24:**

a) This section lacks sufficient granularity to address a subsurface release in a timely manner. Advise surveillance and response as separate Lines of Operations. Within these operational lines, Course of Actions (COAs) should be detailed explaining logistical lines, posturing of resources and effort, and the identification of clear objectives and metrics to determine the effectiveness and the need to continue with the COA. For example, the use of Red Hill Shaft as a pump and treat operation should consider logistical requirements including, but not limited to, backup power, adsorption site breakthrough, available carbon in reserve, and the timing to activate (also known as "charge") and replace spent carbon to maintain operational continuity. Consideration should be made to conscript monitoring wells as potential pump and treat options. This maneuvering may be required to contain the release from migrating to other drinking water sources.

b) Pumping the Red Hill Shaft as the primary COA for all potential releases during defueling may not be effective in all cases. The radius of influence when Red Hill Shaft is pumped is not fully known and may not extend much outside the Red Hill Shaft area. Other COAs should be identified depending on the location of a release, such as a mobile pump and treat system (if proven capable of creating a hydraulic containment at other monitoring well locations).

There should be consideration for the need to have a prior agreement with stakeholders including the BWS and U.S. Army, to keep them actively engaged with the unified command should a significant release occur ("significant" should also be defined). All agreements and positioning of contracts and resources should be identified and executed prior to the start of defueling.

c) Link PID trigger exceedances/free product observances to specific actions. Specific actions include notifications, evaluation of unscheduled fuel movements, and additional screening/analytical sample collection.

d) Please update figures to address the following questions:

i. Figure 3A:

1. It is unclear who will determine whether defueling activity will continue or be suspended and at what point this would occur.
2. COA1 and COA2 – Consider a statistically significant increasing trend as a trigger, not just an action level exceedance, so response actions can be implemented quickly if a release is suspected.
3. COA1 – Revise the "Monitor soil vapor probes" box to "Monitor soil vapor probes…at least once per day for 7 days."

ii. Figure 3B:

1. If additional exceedances occur during the seven consecutive days, and the action specified is only to notify everyone of the exceedance, at what point will groundwater monitoring increase from monthly samplings?
2. Why is only NAPL monitoring being conducted, and how often?
3. When will all collective data be reviewed to consider overall action?

iii. Figure 3C:

1. Why is only Waiawa Shaft to be sampled if NAPL is detected during the sampling period?
2. Include Navy Aiea-Hālawa Shaft and Red Hill Shaft.

13. **Appendix A: COPC Action Levels for Release Detection Wells, Figures APPA-1 thru APPA12, PDF Pages 28-39:** The groundwater trigger action levels identified in the graphs incorporate peak concentrations following the May and November 2021 releases, which statistically bias the action levels high. The RAs recommend using the data within the last six months that represent more current groundwater conditions to develop action levels.

ADDITIONAL COMMENTS

General Comments:

1. Use the correct State Well Identifications (WID) throughout the document, as various formats, including the old format, are used. The correct format is "3-####-###." An example is located on PDF page 7, first bullet on the list. The Red Hill Shaft is listed as 2254-01; however, the correct WID is 3-2254-001.

Specific Comments

1. **Acronyms and Abbreviations, PDF Page 5:** Include the acronym definition for soil vapor monitoring point (SVMP) and semi-volatile organic compound (SVOC) in the list. In addition, for consistency between documents, revise the definition for the acronym "PAH" to polycyclic aromatic hydrocarbon.
2. **Section 1, Introduction/Objectives, PDF Page 6:** It is stated that the groundwater protection measures currently implemented at the Facility include contingency planning for response actions, such as actions that would be required to remediate the basal drinking water aquifer if a large release of fuel were to migrate to the water table. Include a description of these planned remediation actions.
2. **Section 1.1, Description of the Facility, PDF Page 7:** It appears a radius of 5.5 miles was used to identify the nearest active or inactive drinking water supply wells. If this is the criterion, many drinking water wells are missing, such as:
    - BWS Aiea Gulch Wells 1 and 2
    - BWS Aiea Wells 1 and 2
    - BWS Hālawa Wells 1, 2, and 3
    - U.S. Army Tripler Medical Center Wells 1 and 2

    All BWS wells listed above, including Hālawa Shaft, contribute to the Public Water System (PWS) 331, which services metropolitan Honolulu. The U.S. Army wells contribute to PWS 346, which services Tripler Army Medical Center.

3. **Section 1.2, Description of the Problem, PDF Pages 7 through 9:**
    a) This section discusses historical releases prior to 1980, the 2014 release, and the May and November 2021 fuel releases. The section also states these releases impacted the vadose zone and groundwater underneath the Facility (DON 2023b). Other releases at the Facility should also be reflected in this section and considered when evaluating risk, such as the documented November 2022 aqueous film forming foam release and anecdotal release of approximately 1.3 million gallons of fuel in the 1940's that was discussed in the *Work Plan (WP), Red Hill Oily Waste Disposal Pit, Remedial Investigation/Feasibility Study (RI/FS), Naval Supply Center Pearl Harbor*, dated March 1992.

    b) It is stated that drinking water at Red Hill Shaft was contaminated with fuel from the November 2021 release. While it is true that Red Hill Shaft was contaminated after the November 2021 fuel release, Red Hill Shaft saw exceedances of TPH-o

above the DOH EAL before that, in the summer of 2021, which was shortly after the May 2021 fuel release.

c) The last sentence of the first full paragraph after the bullets on PDF Page 8 states, "Treated water is permitted by DOH to be discharged to Hālawa Stream, and Red Hill Shaft and remains disconnected from the JBPHH [Joint Base Pearl Harbor Hickam] Drinking Water Distribution System." This statement is correct, but it omits two facts. Please update this paragraph with the following information:

i. The Navy is currently pursuing a contract to install a water treatment system that will allow it to resume providing drinking water from this location, and

ii. The RAs have consistently requested that the Navy identify beneficial use for the water they continue to discharge to Hālawa Stream. Include the omitted information in the discussions on Page 8. Note: Comment c) also applies to the last paragraph of Section 1.3.2.

4. Section 1.3.2, Exposure Model, PDF Page 10:

a) The assumptions made in the first paragraph are incomplete.

i. When evaluating exposure pathways, include pathways to groundwater, incidental ingestion, dermal contact with/direct exposure to contaminated groundwater, and exposure to contaminated groundwater that discharges via seeps or artesian wells.

ii. The last sentence of the first paragraph should be revised to, "Additional work is required to evaluate risk to ecological receptors."

b) The last paragraph of Section 1.3.2 discusses the "capture and treatment of the groundwater potentially impacted by the November 2021 release." Clarify that the system captures and treats water from Red Hill Shaft but is not an approved remedy for the aquifer.

c) The last sentence of Section 1.3.2 claims that untreated water from Red Hill Shaft no longer offers a complete pathway for human exposure. To support this statement, consider comparing the granular activated carbon effluent concentrations to drinking water screening levels. A discussion should be added regarding the Navy's pending project to install a drinking water treatment system and whether the Red Hill Shaft will be used to supply drinking water while fuel remains in the Facility.

5. Sections 1.4.1 Fuel Line Unpacking, and Section 1.4.3 Training, PDF Pages 10 and 11:

a) These sections discuss actions taken during the unpacking that occurred last year, rather than discussing actions planned to prevent releases during future large-scale fuel movement activities. Consider moving discussions of the work that is not part of the scope of future protectiveness measures to "Background" to avoid confusion. In addition, specific, protective measures the Navy will implement to

prevent, identify, and quickly respond to above- and below-ground releases during pipeline repacking, system/main tank defueling, future pipeline unpacking, and closure activities should be included in this section.

b) The last sentence of the next-to-last paragraph of Section 1.4.1 discusses "controls to minimize the risk of release." It should be noted that these controls are associated with the risk of observed release from facility infrastructure.

c) It should be specified in the second sentence of the last paragraph of Section 1.4.1 that the spill mitigation actions were taken to minimize observed, aboveground spills from impacting the aquifer.

d) Update the last paragraph of Section 1.4.3 to discuss what enhancements the Navy will implement during future large fuel movements (current planned number of spill response positions, trained spill response individuals, etc.).

6. **Section 2.3, Groundwater Monitoring, PDF Page 14:** During defueling activities, the Navy should tentatively suspend the use of bailers in the two-inch wells and use oil-water interface probes for free product gauging. However, if the monitoring wells' headspaces exceed the photoionization detector screening value of 8,000 ppbv, the Navy should verify the presence of free product using the bailer method and photo document the observations.

7. **Section 2.3.1, Groundwater Monitoring Network, and Table 2-1, PDF Pages 14 through 16:**
   a) Evaluate whether the existing monitoring wells at Tripler Army Medical Center or Fort Shafter provide potential value for monitoring during defueling. Establish a pre-defueling analyte baseline if historical monitoring results are insufficient.

   b) Add a footnote to Figure 2 stating that not all the wells agreed upon in 2022 are depicted on the Figure. The Navy will continue to work with the RAs and key stakeholders to ensure the well network is sufficient to meet previously proposed objectives.

8. **Section 2.3.2, Groundwater Action Levels, PDF Page 17:** This section states that Red Hill Shaft is the nearest downgradient water supply well located near the Facility. Efforts are underway to better understand the direction and rates of groundwater flow and have been studied since 2007. While regional groundwater flow is generally from the mountains to the harbor, localized groundwater flow directions are still uncertain and being studied.

9. **Section 2.3.2.3 Sentinel Wells, PDF Page 19:**
   a) Delete the second paragraph of this section. Replace it with text describing how sentinel wells will aid in release detection and what notifications/actions the Navy will take to determine whether the COPC detections are related to a release from the Facility.

   b) The last paragraph on PDF Page 19 states if COPCs are detected in sentinel wells, the DOH will be notified, and the data will be evaluated for verification purposes.

This sentence shall be updated to include the EPA in notifications. The GWPP should also specify who will make the notifications, that the notifications will be made within 24 hours of identifying the COPC detections in preliminary data, and what actions the Navy may take when the COPCs are detected. Example actions may include immediate follow-up sampling of the well with exceedances and all adjacent wells.

10. **Section 2.4, Contingency PFAS Monitoring, PDF Page 20:**
    a) While "PFAS [per- and polyfluorinated substances] are not chemicals of concern for the defueling process" a baseline of PFAS data in all the groundwater monitoring wells shall be obtained as soon as possible to establish a baseline, as discussed in the RAs' July 31, 2023, disapproval of the Consolidation Plan. A release during defueling (e.g., fuel, cleaning products, PFAS) also has the potential to mobilize existing PFAS contamination. The GWPP should include PFAS sampling at the following frequencies: Weekly for "Primary," biweekly for "Secondary Release Detection Wells," and monthly for sentinel wells. More frequent sampling may be warranted if a fuel release occurs or if increasing trends or EAL exceedances are observed.
    b) Include the EPA's tap water regional screening levels and proposed maximum contaminant levels in Table 2-4.

11. **Section 3, Groundwater Protection Responses for Releases and Action Level Exceedances, PDF Page 21:** Consider updating the heading to reflect all information to be presented in this section, such as releases, trigger exceedances, and increasing data trends.