



RED HILL BULK FUEL STORAGE FACILITY

Tank Closure Plan

Response to 15 March 2023 DOH Comments

31 May 2023

Office of the Secretary of the Navy

Responses to 15 Mar 2023 DOH comments on the Red Hill Tank Closure Plan Analysis of Alternatives & Concept Design to Close in Place

GENERAL COMMENTS

1. *The Hawai'i Department of Health (DOH) understands this evaluation of alternatives is based on the concepts of closure in place, tank filling, or partial tank removal and filling. However, in order for the DOH to approve the selected closure alternative, more information on the closure design is necessary. The purposes of filling or partially removing and filling the tanks are, in part, to ensure long-term structural stability and prevent future storage of hazardous substances. More information on the closure design, including details on which portions of the facility will be left in place versus removed, post-closure monitoring and maintenance for the remaining underground storage tank (UST) system to ensure structural integrity, and what changes will be made to prevent hazardous substance storage, are needed to address these concerns.*

Response: The Navy provides much of the requested information on closure design in Closure Supplement 2, which contains information on 1) which portions of the facility will be left in place versus removed, 2) an analysis of the long term structural stability of the tanks, including general recommendations for post closure monitoring and maintenance, and 3) what changes will be made to prevent storage of fuel or hazardous substances. Further details concerning any post closure monitoring and maintenance will be provided in a future supplement.

2. *In general, UST system post-closure monitoring and maintenance needs and associated costs of future inspections and repairs for structural integrity are absent from this analysis, which is problematic for purposes of comparison. For instance, we would expect Alternative 1 (“Closure in Place”) and Alternative 2 (“Closure in Place and Preparation for Non-fuel Reuse of Tanks”) to have significantly higher long-term resource needs and costs than Alternative 3 (“Closure with Fill [with inert material]”) and Alternative 4 (“Remove Tank Steel Liner, and Fill”). The omission of long-term costs from the analysis makes it difficult to compare the true costs of the four alternatives.*

Response: Estimation of cost for post closure monitoring and maintenance was beyond the scope of the Analysis of Alternatives; however, the report does provide rough order of magnitude costs associated with each of the four tank closure alternatives, as requested by DOH during the July 14, 2022, Meet and Confer session between DOH and Navy. Most importantly, the Navy did not consider cost as a factor in selecting the preferred alternative of Closure in Place. Instead, Closure in Place was chosen because it provides the safest approach for site workers, the quickest schedule, and the least impact on the environment and local community, while having no significant constraints on engineering feasibility and allowing the potential for beneficial non-fuel reuse of the tanks.

SPECIFIC COMMENTS

3. *Page 5, 2. Evaluation of Alternatives: This section states “[a]ll four closure alternatives will render the tanks incapable of being used for fuel storage and will effectively eliminate any future possibility of the tanks containing fuel.” While this may be true, details regarding the final closure design to prevent future hazardous substance storage have not yet been discussed, especially for Alternatives 1 and 2. Please provide this information. Alternatives 3 and 4, on the other hand, would make it virtually impossible to revert the Red Hill Bulk Fuel Storage Facility (Facility) back to fuel storage.*

Response: Supplement 2 describes the Navy plan to remove the 3 large fuel pipelines under Alternatives 1 and 2, thereby rendering the tanks incapable of being used again for fuel storage.

4. *Page 6, 2.3 Engineering Feasibility Evaluation: The second paragraph states “[r]emoval of the surrounding concrete would create additional safety concerns, including potential destabilization of the rock face and overburden, risk of catastrophic failure, and loss of life during construction.” This statement similarly speaks to the potentially catastrophic effects of concrete failure over time if the tanks are not filled. The cost of mitigating this risk was not factored into the analysis for Alternatives 1 and 2 but should have been (see comment 2). Provide information on the long-term inspection and maintenance program for Alternatives 1 and 2.*

Response: Supplement 2 includes a detailed assessment of the long term structural integrity of the tanks, with general recommendations for long-term inspections and maintenance of the tanks.

5. *Page 7, 3. Closure Alternatives: The first sentence assumes closure according to American Petroleum Institute (API) Recommended Practice 1604. However, the Tank Closure Plan references several other standards, for example, for tank cleaning. Please clarify.*

Response: As noted in the comment, in addition to referencing API 1604, the Tank Closure Plan says, “The tank cleaning will be performed by contract and all work will comply with EM 385-1-1, API Std 2015, ANSI Z117.1, API RP 575, API RP 2219, API STD 2217A, HAR 11-280.1 subchapter 7, Federal, State and local laws, ordinances, criteria, rules and regulations. Where requirements differ among applicable laws, criteria, ordinances, and regulations, the most stringent requirements shall apply.” The Tank Closure Plan also says, “Tank and pipeline cleaning will be part of a contract for tank closure that will conform to Unified Facilities Guide Specifications (UFGS) 33 01 50.55, “Cleaning of Petroleum Storage Tanks,” and applicable industry and government standards specified therein.” Even though these other standards are not referenced in the Analysis of Alternatives, they will be followed during cleaning, as stated in the Tank Closure Plan.

6. *Page 7, 3. Closure Alternatives, item 1: This item states the U.S. Department of the Navy (Navy) must determine if any significant restrictions will remain after defueling. When will this determination be made? How will it affect the Tank Closure Plan’s discussion of potentially opening the Facility to the public, for example, as a museum, or a different beneficial reuse?*

Response: In the section on General Overarching Considerations, the Analysis of Alternatives says, “Past Red Hill tank repair projects have been subject to extensive security requirements and facility access restrictions, to the point that a labor force is difficult to obtain and maintain. Once the fuel is removed from Red Hill, the Navy needs to determine if any significant restrictions will remain.” After defueling, it is possible that some of these security and access requirements may be lifted, and if so, this will have a positive effect on closure activities. The Navy is currently working to determine access requirements for the closure workforce. After closure is complete, many of the current access restrictions (which are in place to protect fuel resources) will no longer apply. At that point, restrictions would remain to protect the Red Hill well, and any new access restrictions would depend on the selected non-fuel reuse.

7. *Page 7, 3. Closure Alternatives, item 3: Has the Navy considered filling the surge tanks with sand, UST foam, or a similar substance as an alternative to concrete? We note that, while foam may minimize air and water intrusion, it will not provide structural support, as sand or concrete would. Please note, the DOH has not fully evaluated these alternatives or the suitability of these alternatives but is only asking if they have been considered, and if not, why.*

Response: The Navy acknowledges this suggestion, and we believe an alternative to concrete, such as UST foam, may be acceptable. Nevertheless, we note that there may not be sufficient supplies of UST foam available on island, and purchase and transport to the island in that quantity would extend the projected timelines. The actual substance to be used will be presented in the contractor work plan, which will be submitted to the Navy for review and approval, and to DOH and EPA for review and comment.

8. *Page 8, 3. Closure Alternatives, item 4: How will piping with asbestos insulation or piping supports with lead-based paint be closed in place? This is not described in the Tank Closure Plan or Red Hill Tank Closure Plan Analysis of Alternatives & Concept Design to Close in Place. However, from the cost estimates, it appears the Navy intends to demolish these portions of piping. Please confirm. How will the pipes be cleaned and verified as clean? Unless beneficial reuse of the site would use the three fuel pipelines, the DOH recommends all fuel pipelines located in the lower access tunnel and harbor access tunnel be removed. Without long term maintenance, these overhead pipelines may eventually become a safety issue.*

Response: The Navy concurs with the recommendation, and Supplement 2 describes the Navy plan to remove the fuel pipelines from the lower access tunnel and harbor access tunnel. The details of pipeline removal, including potential lead-based paint and asbestos insulation, will be described in the contractor work plan and Environmental Protection Plan, which will be provided to DOH and EPA for review and comment prior to beginning the work. The Navy expects the piping supports will be left in place, and the paint will be maintained by re-painting and sealing in accordance with EPA regulations for lead paint management. Because pipelines must be designed for their intended purpose, the Navy does not expect the existing fuel pipelines to be adequate for any beneficial non-fuel reuse. Instead, new pipelines would need to be installed if required by the selected reuse option.

9. *Page 8, 3. Closure Alternatives, item 5: This item states the Navy will use cleaning solution with the pressure washer. Identify the proposed cleaning solution and provide its material composition and safety data sheet. The Navy has also indicated during a meeting that cleaning could be done without surfactants. Is this option still available or realistic?*

Response: As discussed during the ongoing technical meetings among DOH, EPA, and Navy, the cleaning contractor will choose the specific cleaning solution, and its material composition and safety data sheet will be described in the contractor work plan, which will be provided to DOH and EPA for review and comment prior to beginning the work. As an alternative, the contractor will evaluate the option to use water only for pressure washing, with no cleaning solution added.

10. *Page 8, 3. Closure Alternatives, item 5: The Facility may be opened to the public in the future, depending on the proposed beneficial reuse. This should be considered when determining the “level of repair” needed to provide safe access. Due to the historical significance of the site, after closure would the Facility be transferred to another Federal Agency, such as, the National Park Services?*

Response: References to ‘level of repair’ are those necessary to effect the closure of the facility as opposed to an unknown future reuse. Decisions regarding further actions to support reuse will be made outside of the closure process once such future use(s) have been determined. The potential transfer of the facility to another federal agency would be resolved during the process of developing any non-fuel reuse. At present, the Navy does not anticipate transferring the Red Hill Bulk Fuel Storage Facility to another federal agency.

11. *Page 9, 3. Closure Alternatives, item 14: Please explain why it is necessary to weld the 750 two-inch diameter openings in the steel liner of Tank 18.*

Response: During the previous Clean, Inspect, Repair (CIR) effort, the tell-tale leak detection system was removed, leaving behind these two inch diameter openings that were proposed to be welded shut during closure. Further review has determined that it is not necessary to weld these openings under closure requirements and will therefore be left in their current state.

12. Page 9, 3. Closure Alternatives, item 17: This item states, “[f]or Alternative 4, removal of the tank steel liner would likely meet DOH requirements for permanent tank closure.” The DOH disagrees with this statement. Simply removing the steel tank liner without filling the remaining void with inert material would not meet the tank closure requirements. We understand Alternative 4 also proposes to fill the tank cavity with inert material, so it is only the quoted statement we disagree with.

Response: The Navy agrees with this clarification. Alternative 4 involves filling the tank cavity with inert material, and item 17 was not intended to imply otherwise.

13. Page 10, 3.1 Alternative 1: Closure in Place, item 1: Explain why the vent to the tanks will be capped if ventilation is needed to prevent condensation and organic growth from forming inside the tanks? Tanks 1 and 19 have been out of use for years – has condensation been an issue in those tanks? Were the vent lines to those Tanks capped?

Response: While the analysis of alternatives does recommend closing off the vents to the outside, the ultimate status of the vents will be determined by condition of the empty tanks and the beneficial non-fuel reuse. Tank 19 has been constantly ventilated, and the tank has remained dry for many years, so condensation has not been an issue. Tank 1 has not been ventilated, and it contained water in the bottom when it was last opened. Further investigation would be needed to determine the source of the water in Tank 1.

14. Page 10, 3.1 Alternative 1: Closure in Place, item 2: This item states the access manhole “must be secured to prevent unauthorized access or use.” Explain how it will be secured.

Response: Depending upon the final disposition of each tank, the Navy would either reinstall the existing manway cover or construct an access door that could be locked similar to the one installed on Tank 19.

15. Page 10, 3.1 Alternative 1: Closure in Place, item 4: This item states “[t]he existing gauging provision, including nozzles and gauge tube, can be left in place since the structural stability of these items is not a concern to the overall integrity of the concrete tanks and liner.” All parts of the tank system that are not necessary to ensure structural stability for closure should be removed. Metal components have greater recycling value when recycled prior to being rusted out.

Response: The Navy will further evaluate the removal of specific metal components when the beneficial non-fuel reuse is selected.

16. Page 11, 3.1 Alternative 1: Closure in Place: The estimate of fifty to one hundred years in the first paragraph is highly speculative. If the tanks are emptied and water intrudes into the tank in the presence of oxygen, the steel liners could corrode more rapidly, exposing the concrete and rebar to more rapid failure. It appears structural integrity is an important aspect of selecting the appropriate alternative, meaning seismic analysis should be performed and a plan for long-term monitoring and maintenance of the tanks provided.

Response: The Navy agrees that these numbers are merely rough estimates. Supplement 2 includes a detailed assessment of the long term structural integrity of the tanks, with supporting seismic analysis and general recommendations for long-term inspections and maintenance of the tanks. Specific maintenance requirements may also depend on the beneficial non-fuel reuse, so the Navy will submit a plan for monitoring and maintenance of the tanks in a future supplement.

17. Page 11, 3.1 Alternative 1: Closure in Place: The first paragraph states, “[i]n addition, during normal operations the tanks are never filled to the top of the upper dome, so portions of the upper dome of all tanks have been exposed to air/vapor mixtures for the past 80 years.” Please note, it is the DOH’s understanding the tanks were not recently filled within the upper dome, due to the increased prevalence of identified metal thinness (likely due to backside corrosion).

Response: The Navy acknowledges the fact that the tanks have not recently been filled within the upper dome. This approach was due to a reduced requirement for fuel inventory and the presence of an occasional through hole in the upper domes, identified during prior CIR projects.

18. Page 11, 3.1 Alternative 1: Closure in Place: The third paragraph states “Alternative 1 would require ongoing site access and continued maintenance of roads, tunnels, ventilation systems, water-based fire protection system, electrical service, and systems for collection, processing, and disposal of water that may enter the tanks or tunnels.” We understand additional structural integrity evaluation will be performed, and a determination of which UST system features will be removed or remain in place will be made. Until the final closure design and proposed post-closure monitoring and maintenance program are provided, the DOH is unable to complete our review of the Closure in Place option.

Response: In Supplement 2, the Navy provides additional information on structural integrity and the UST system features to be removed. Post-closure monitoring and maintenance plans will be provided in a future supplement. As additional information on the non-fuel reuse becomes available, the Navy will update the closure design and the post-closure monitoring and maintenance program.

19. Page 12, 3.1.1 Alternative 1: Cost: The cost estimate does not appear to include costs associated with long-term maintenance of the Facility, which will likely not be the same for all Alternatives (see comment 2).

Response: Estimation of cost for post closure monitoring and maintenance was beyond the scope of the Analysis of Alternatives; however, the report does provide rough order of magnitude costs associated with each of the four tank closure alternatives, as requested by DOH during the July 14, 2022, Meet and Confer session. Most importantly, the Navy did not consider cost as a factor in selecting the preferred alternative of Closure in Place. Instead, Closure in Place was chosen because it provides the safest approach for site workers, the quickest schedule, and the least impact on the environment and local community, while having no significant constraints on engineering feasibility and allowing the potential for beneficial non-fuel reuse of the tanks.

20. Page 12, 3.1 Alternative 1: Closure in Place, Table 1: One of the “pros” listed is that “[t]ank closure tasks are well defined, with minimal uncertainty.” However, the Navy has yet to define how the tanks will be closed in place (e.g., which portion of the system will be removed, what will remain, how future hazardous substance storage will be prevented, and the final design). Additionally, methods of tank closure other than removal or filling with inert material require approval from the DOH, which is uncertain.

Response: In Supplement 2, the Navy provides information on structural integrity and the portions of the system that will be removed in order to prevent future storage of fuel or hazardous substances. Future supplement(s) will provide further information necessary to support the closure in place alternative.

21. Page 12, 3.1 Alternative 1: Closure in Place, Table 1: Another “pro” listed is “[t]he estimated schedule is significantly shorter than any other alternative.” While this may be true, the schedule for Alternative 1 is only one year shorter than Alternative 2, which could be significantly reduced if the beneficial nonfuel reuse is identified and proposed to the DOH during defueling, rather than waiting until after defueling.

Response: The Navy is currently soliciting public input. A beneficial reuse report for the RHBFSF is due to Congress on February 1, 2024 as required by the National Defense Authorization Act for Fiscal Year 2023

(FY23 NDAA). The Navy will need to conduct National Environmental Policy Act analysis of beneficial non-fuel reuse, which will require several years to complete. The Navy's preference is to close the facility in place while working toward beneficial non-fuel reuse.

22. *Page 12, 3.2 Alternative 2 Closure in Place and Preparation for Non-Fuel Reuse of Tanks: This section assumes "the tanks will be used to store products other than fuel." However, if the tanks are reused as a public education center or something similar, this would change the alternatives analysis. For example, the cost of Alternative 2 would be similar to Alternative 1.*

Response: The Navy agrees that the evaluation of Alternative 2 would change if the tanks were to be used as a public education center or something similar. In order to create an approach that could be analyzed under Alternative 2, we assumed the tanks would be used to store products other than fuel. The report notes, "If a different reuse is ultimately selected, the coating proposed under this alternative may not be needed. As a result, there is significant uncertainty in the schedule and level of effort for this alternative."

23. *Page 12, 3.2 Alternative 2 Closure in Place and Preparation for Non-Fuel Reuse of Tanks: This section states "there is significant uncertainty in the schedule and level of effort for this alternative." For these reasons, the DOH is unable to evaluate this option until the closure design, structural analysis and corresponding plan for structural maintenance are provided.*

Response: The Navy agrees that additional information is needed, and we will submit the requested information in future supplements.

24. *Pages 13 and 14, 3.2 Alternative 2 Closure in Place and Preparation for Non-Fuel Reuse of Tanks, Table 2: The "pros" for Alternatives 1 and 2 appear to be the same. However, an additional "pro" for Alternative 2 should be that, if the beneficial non-fuel reuse option is determined before defueling is complete, preparations for reuse can be completed concurrently with tank closure, saving time and possibly money.*

Response: The Navy is presently involved in collecting concepts for beneficial non-fuel reuse and has hired RAND Corporation to conduct cost-benefit and engineering feasibility analyses on the final list of concepts to meet the requirements of Section 336 of the FY23 NDAA. The report of those analyses is due to Congress on February 1, 2024. Implementation of tank closure will be considered as a separate effort as to not delay actions based on an unknown future use.

25. *Page 13, 3.2 Alternative 2 Closure in Place and Preparation for Non-fuel Reuse of Tanks, Table 2: The primary "con" listed focuses on uncertainty, which will be resolved once the Navy identifies a beneficial reuse option.*

Response: The Navy acknowledges this comment, but the uncertainty exists at present and will remain until the non-fuel reuse option is selected.

26. *Page 14, 3.2.1 Alternative 2: Cost: This section states one of the two driving factors of cost for Alternative 2 is re-coating the tank liners. This means, the capital cost may be significantly lower, if the non-fuel reuse is a public education center or something similar that does not require an epoxy coat. However, it is difficult to determine true cost without knowing what the reuse is, as there may also be an economic benefit from the reuse.*

Response: The Navy agrees with this comment. The Navy is presently involved in collecting concepts for

beneficial non-fuel reuse and has hired RAND Corporation to conduct cost-benefit and engineering feasibility analyses on the final list of concepts to meet the requirements of Section 336 of the FY23 NDAA. The report of those analyses is due to Congress on February 1, 2024.

27. *Page 14, 3.3 Alternative 3: Closure with Fill (with inert material): Has the Navy considered using UST foam (or something similar) to fill the tanks? This type of material could be pumped into the tanks and would be more lightweight and potentially more cost effective than sand (but maybe not dredge sand). UST foam could provide approximately 40 psi (pounds per square inch) compressive strength, adding some dome support, although not as much as sand. It may also prevent water or air intrusion, which would help to preserve the tank liner and eliminate condensation concerns for the insides. Please note, the DOH has not evaluated this alternative or its suitability but is only asking if it has been considered, and if not, why.*

Response: The Navy acknowledges this suggestion. If the fill alternative is ultimately selected, UST foam will be considered and evaluated during the design phase of the contractor work plan. We note that there may not be sufficient supplies of UST foam available on island, and purchase and transport to the island in that quantity would extend the projected timelines.

28. *Page 15, 3.3 Alternative 3: Closure with Fill (with inert material): Could sand be hydraulically dredged in (i.e., as “flowable fill”) and pumped into the tanks, possibly using water drained from the tank bottoms? This could reduce the traffic issues associated with Alternative 3 and provide long-term structural stability. Please note, the DOH has not evaluated this alternative or its suitability but is only asking if it has been considered, and if not, why.*

Response: The Navy acknowledges this suggestion. If the fill alternative is ultimately selected, the pumping of hydraulically dredged sand can be considered and evaluated during the design phase of the contractor work plan. We note that the sand would likely need to be washed, as the residual salt in unwashed dredge spoils would be corrosive to the steel tank linings.

29. *Page 17, 3.3 Alternative 3: Closure with Fill (with inert material), Table 3: The first “con” listed states Alternative 3 would eliminate the possibility of a beneficial non-fuel reuse. However, this may not be true if one or more of the tanks is left unfilled. For example, if the Navy proposes to build a museum, one tank could be saved for public access, while the rest are filled with inert material. This would also help to mitigate the other “cons” associated with Alternative 3. In other words, consideration should also be given to the possibility of a combination of alternatives.*

Response: The Navy acknowledges this suggestion and will consider such a possibility during the evaluation of beneficial non-fuel reuse options.