

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
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September 12, 2017

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and

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Dear Messrs. Pallarino and Chang:

Subject: Red Hill Bulk Fuel Facility Administrative Order on Consent (AOC) - Board of Water Supply (BWS) Comments Regarding the 31 August 2017 AOC Meeting Regarding Tank Upgrade Alternatives, and Quantitative Risk and Vulnerability Assessment

Thank you again for the opportunity to attend the subject meeting with the United States Environmental Protection Agency (EPA), Hawaii Department of Health (DOH), Navy, and Defense Logistics Agency (DLA) on August 31, 2017. This meeting was held at the EPA Region IX office in San Francisco, California to discuss the work being conducted under the Administrative Order on Consent (AOC) Statement of Work (SOW) Tank Upgrade Alternatives (TUA) AOC Section 3, and Quantitative Risk and Vulnerability Assessment (QRVA) AOC Section 8. We appreciated the opportunity to share our comments and perspectives and hope you found them helpful.

Please send us a copy of the meeting minutes and attendance list. We also request copies of the written materials presented at the meeting. In the meantime, the BWS offers the enclosed comments that restate our most important points made during the meeting.

Tank Upgrade Alternatives (TUA) –Attributes, Category Definitions, and Rankings

With respect to the discussion regarding TUA (AOC Section 3), we have the following comments:

1. Although the combined table of attributes, category definitions, and rankings provides a summary of many factors that should be considered in the tank upgrade decision, we are concerned that the table understates or omits some important aspects of those attributes:
 - a. The reliability associated with any of the upgrades is a complicated issue that is intrinsically related to the risk assessment (Section 8). In the current table, all of the TUAs are ranked as being equally reliable (using a simple binary reliable/not reliable rating scheme). Such a coarse rating of equal reliability completely obscures the fact that composite-walled and double-walled tanks are clearly a more reliable solution than single-walled tanks. Likewise, the significant challenges associated with reliably monitoring the grouted interstitial space in each of the composite-wall alternatives make these TUAs less reliable compared to the double-wall tank-in-tank TUA. These differences in reliability among TUAs are not captured by ratings in the current table.
 - b. In the current table, all of the TUAs are ranked as being "testable" (using a simple binary testable/not testable rating scheme). This equal rating of all alternatives does not accurately reflect significant differences in the test requirements associated with each alternative. The testing required for a true double-wall tank-in-tank alternative with a fully open interstitial space that can be easily inspected or monitored is operationally less challenging than the testing required for the other TUAs. Verifying the integrity of a single-wall alternative requires deployment of level monitoring devices with adequate sensitivity for timely detection of and response to leaks exceeding a minimum threshold rate. And, to our knowledge, no protocol has been defined yet for the testing required to demonstrate the functionality and reliability of drainage paths in the grouted interstitial space of a composite-wall alternative.
 - c. Discussions during the meeting demonstrated how subjective these rating systems can be. Evaluators using the same vaguely defined rating scheme for an attribute, but with different perspectives, could assign different rankings to a TUA. For instance, someone more cognizant of operational requirements than risk mitigation goals may not fully consider the risks associated with a certain TUA.
2. The current summary table includes no acknowledgment of the relocation option and its transformative reduction in aquifer risk. Relocation is the only tank "upgrade" that essentially eliminates the contamination hazard associated with the fuels stored at Red Hill.
3. The current summary table also includes no explanation of how each attribute will be weighted in the decision-making process and thus provides little insight on how this tool will ultimately be used by the decision makers. The BWS is concerned that disproportionate weighting of one or more attributes can essentially render the others moot.

4. Except for a brief mention in one of the attribute definitions (#6 – Attainment of Goals), the table fails to address the fundamental objective of the upgrade: minimizing the risk to the aquifer. The BWS is concerned that this overriding objective may be lost in the details of the table attributes and rankings.

Plan for Quantitative Risk and Vulnerability Assessment (QRVA)

With regard to the QRVA portion of the meeting (AOC Section 8), the BWS expands upon some of our comments regarding the QRVA discussion. Please refer to the recent BWS letters dated May 26 and August 1, 2017 for additional information (Lau, 2017a and Lau, 2017b). At this time, we provide the following comments from the August 31, 2017 meeting:

1. The BWS continues to be concerned that little or no quantitative risk data will be available to inform the TUA decision. As mentioned above, we believe that the risk to the aquifer should be the overriding consideration in the TUA decision. Making a TUA decision in the absence of any quantification of risk reduction associated with each TUA alternative (including relocation) is a clear error in judgement.
2. We appreciate the information provided by Mr. Liming (ABS) regarding the upcoming risk assessment, as well as the anticipated opportunity this December 2017 to review the data and initiating event frequencies upon which Mr. Liming's risk assessment will be based. However, based on the discussion during the meeting, the BWS is concerned that there appears to be no current plan to incorporate into the risk assessment the analysis of Red Hill tank API inspection data regarding the corrosion and weld defects that currently exist or were previously repaired.
 - a. BWS believes such information needs to be considered in the QRVA as the API inspection interval (intended to ensure safe operation of the tanks over the next 20 years) is predicated on having an accurate understanding of the current distribution and growth rate of defects, as well as the associated uncertainties.
 - b. The BWS understands from Mr. Liming that he would consider such data, but analyzing the inspection reports to estimate the future frequency of through-wall-related tank wall leaks is outside his scope of work and will have to be provided to him by others.
 - c. The BWS is not convinced that generic data related to tank leak rates will be representative of future conditions at Red Hill and may seriously underestimate tank wall leaks. Using generic tank leak rates as part of the QRVA could be quite misleading, because almost all underground storage tanks (USTs) from which the generic data are obtained have different designs than the Red Hill tanks. Specifically, most USTs are coated, cathodically protected, and double-walled—not to mention that most have much smaller capacity and are not as old.
 - d. We understand that, as currently proposed in the QRVA, the tank wall leak will be considered an initiating event, and we look forward to reviewing the underlying assumptions and calculations used to define the leak frequency distribution(s) used in the risk assessment.

3. AOC Section 7 is the preparation of an updated groundwater model that will attempt to define the flow and transport of contamination in the immediate vicinity of Red Hill. Because the results of this model is not expected for several months, groundwater flow direction and velocity are unlikely to be included in the TUA decision and any preliminary QRVA documents developed. The absence of this information will severely limit the utility of the QRVA and will be limited in the support of any TUA decision. The BWS encourages the AOC parties to make note of this fact and to accelerate all AOC Section 7 work.

Finally, we would like to strongly urge that the final decisions on TUA and QRVA (and all work performed under the AOC) be made based on the results of thorough defensible investigative studies and sound science rather than the political approach expressed in the EPA closing remarks.

Thank you for the opportunity to comment. If you have any questions, please feel free to call Erwin Kawata, Program Administrator of our Water Quality Division at 808-748-5080.

Very truly yours,



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References Cited

Lau, E. Y. W. 2017a. Letter to Mr. Bob Pallarino, United States Environmental Protection Agency (EPA) and Mr. Steven Y.K. Chang, State of Hawaii, Department of Health (DOH) regarding: Board of Water Supply (BWS) Comments to the Red Hill Administrative Order on Consent (AOC) Statement of Work (SOW) Section 8.2: Risk/Vulnerability Assessment and the Navy Transmittal Letter Dated April 13, 2017. May 26.

Lau, E. Y. W. 2017b. Letter to Mr. Bob Pallarino, United States Environmental Protection Agency (EPA) and Mr. Steven Y.K. Chang, State of Hawaii, Department of Health regarding: Board of Water Supply (BWS) Comments to the EPA and DOH Letter Conditionally Approving the United States Navy's Section 8.2 Scope of Work ("SOW") – Risk/Vulnerability Assessment, Dated May 16, 2017. August 1.