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October 18, 2017

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and

Mr. Steven Chang, P.E.
DOH Red Hill Project Coordinator
State of Hawaii
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P.O. Box 3378
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Dear Messrs. Pallarino and Chang:

Subject: Approval of Red Hill Administrative Order on Consent ("AOC") Statement of Work ("SOW") Section 2.4- Tank Inspection, Repair and Maintenance ("TIRM") Procedures Decision Document and Clarifications dated September 5, 2017

The Honolulu Board of Water Supply (BWS) offers the following comments to the subject letter from the United States Environmental Protection Agency (EPA) and Department of Health (DOH) (EPA/DOH, 2017). The subject letter states that the Regulatory Agencies (EPA and DOH) have reviewed the TIRM decision document dated April 24, 2017 and subsequent clarifications received in a Navy and Defense Logistics Agency (DLA) letter on August 15, 2017 (Navy/DLA, 2017), and issued an approval "in whole" based on these two documents. The BWS provided comments to the TIRM decision document dated April 24, 2017 in our letter dated June 1, 2017 (Lau, 2017). This BWS letter provides comments to the subject letter and also the Navy/DLA clarification letter dated August 15, 2017.

The Navy/DLA clarification letter to the EPA and DOH (Navy/DLA, 2017) has two enclosures, A and B, in which the Navy/DLA address various issues raised by the EPA or BWS. Enclosure B itemizes the BWS comments made in the BWS comment letter

dated June 1, 2017 (Lau, 2017) and provides the corresponding Navy/DLA responses. Specifically, in Item 5 of Enclosure B the Navy/DLA claims that our June 1, 2017 letter to the regulators misstated facts regarding the contemplated visual and hydrostatic testing, citing Attachment BD as support (Navy, 2016).

The BWS has not misstated facts, but believes the Navy/DLA misinterpreted our concerns that visual surface examination and hydrostatic testing alone are not reliable methods for determining whether piping is likely to survive in a leak-free condition during the intervals between inspections. The BWS has reviewed the referenced paragraphs along with other sections of Attachment BD pertaining to the inspection and testing methodology, and the BWS remains concerned that the Navy will not demonstrate reliability and safety of operation based on their proposed non-destructive evaluation (NDE) plan. This includes both the ultrasonic and electromagnetic NDE methods proposed for the tank liner and welds, as well as for the visual and hydrostatic testing methods for piping that cannot be otherwise inspected.

A more general concern is that Attachment BD states that the reliability of the NDE methods will be assessed in accordance with ASTM E2862-12. The cited standard applies when the response from an NDE system is binary in nature (i.e., metal loss or not). The description of acceptance criteria for general metal loss (Paragraph 2.2.2.1.1) does not address whether all detections would be repaired or, if not, the rationale for determining which require corrective action. According to Attachment BD (Paragraph 2.2.4), NDE examiners must demonstrate the capability to detect flaw sizes at the limits of dimensional uncertainty. But the acceptance criteria allow for the NDE system and operator to fail to detect metal loss at as many as 5 percent of locations with wall thickness less than 0.05 inches and at as many as 40 percent of locations that have lost 30 to 50 percent of their original wall thickness. Thus, consistent with our previous comments, it remains unclear whether this requirement is sufficient to ensure the NDE method will provide reliable indication of the depth of cracks, pitting, or corrosion-induced wall thinning.

In Section 1.8 of Attachment BD "Suitability for Service" it is stated that mandatory repairs are required if the tank wall thickness would be less than 0.100 inch at the time of the next inspection, with the inspection interval being 20 years. Given the statements that reliability will be assessed in accordance with ASTM D2862-12, it is not clear how the Navy will be able to demonstrate that they can reliably repair all defects such that no areas will be thinner than 0.100 inch in 20 years. In addition, BWS would like to know if the Navy will apply the same criteria for the piping and, if not, why. Beyond the statement that hydrostatic testing of tank piping will be designed in accordance with API-RP1110 (Paragraph 1.6.7.5), Attachment BD provides few details about the planned implementation of such testing at Red Hill. Obviously, the size of defects found

by hydrostatic testing is a function of test pressure, pipe inner diameter and wall thickness; however, BWS is concerned that, at a test pressure of 162.5 psig specified for the hydrostatic testing of the receipt, steam piping, drain line carrier pipe, and drain line piping; only defects that are either completely through wall or almost completely through wall will be found. If other significant wall defects are allowed to exist without repair, the likelihood of leaks within the 20-year inspection interval may remain unacceptably high.

Therefore, the BWS remains concerned that areas only visually examined or pressure-tested could contain defects deep enough to leak prior to the next scheduled inspection. BWS would like more detail on how the API inspection, repair, and re-inspection methodology will be implemented on these difficult-to-inspect areas.

The focus in this letter on rebutting the response to only one of our previous comments should not be interpreted as concurrence that other prior BWS comments on the TIRM decision document have been satisfactorily addressed. The BWS feels that the regulatory approval of the TIRM Decision Document and associated clarifications lack the specificity and rigor necessary to ensure that the Navy/DLA will develop a suitably conservative approach to NDE and a correspondingly defensible inspection interval based on observable tank conditions and not simply dictated by operational efficiency.

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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Messrs. Pallarino and Chang
October 18, 2017
Page 4

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References Cited

EPA/DOH. 2017. Letter regarding: Approval of Red Hill Administrative Order on Consent ("AOC") Statement of Work ("SOW") Section 2.4 – Tank Inspection, Repair and Maintenance ("TIRM") Procedures Decision Document and Clarifications. Letter from Mr. Bob Pallarino, United States Environmental Protection Agency (EPA) and Mr. Steven Y.K. Chang, State of Hawaii, Department of Health (DOH), to: Captain Richard D. Hayes III, Naval Facilities Hawaii, dated September 5, 2017.

Navy/DLA. 2017. Letter regarding: Clarifications on Administrative Order on Consent Statement of Work (AOC/SOW) Section 2.4 Tank Inspection, Repair and Maintenance (TIRM) Procedure Decision document, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, Oahu, Hawaii. Letter from R. D. Hayes, U.S. Navy, to: Mr. Bob Pallarino, United States Environmental Protection Agency (EPA) and Mr. Steven Y.K. Chang, State of Hawaii, Department of Health (DOH), dated August 15, 2017.

Lau, E. Y. W. (Lau). 2017. Letter to Mr. Bob Pallarino, United States Environmental Protection Agency (EPA) and Mr. Steven Y.K. Chang, State of Hawaii, Department of Health (DOH) on June 1, 2017, regarding: Board of Water Supply (BWS) Comments to the Red Hill Administrative Order on Consent (AOC) Statement of Work (SOW) Tank Inspection, Repair and Maintenance (TIRM) Procedure Decision Document Section 2.4, dated April 24, 2017.

Navy. 2016. Attachment BD, Inspection of Fuel Storage Tanks, Section 33 56 17.00 20, dated September 9, 2016.