

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com



July 14, 2017

KIRK CALDWELL, MAYOR

BRYAN P. ANDAYA, Chair
DAVID C. HULIHEE
KAPUA SPROAT
KAY C. MATSUI

ROSS S. SASAMURA, Ex-Officio
FORD N. FUCHIGAMI, Ex-Officio

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

ELLEN E. KITAMURA, P.E.
Deputy Manager and Chief Engineer *EW*

Mr. Bob Pallarino
EPA Red Hill Project Coordinator
United States Environmental Protection Agency
Region IX
75 Hawthorne Street (LND-4-3)
San Francisco, California 94105

And

Mr. Steven Chang, P.E.
DOH Red Hill Project Coordinator
State of Hawaii
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801-3378

Dear Messrs. Pallarino and Chang:

Subject: Board of Water Supply (BWS) Comments to the Underground Storage Tank System Evaluation Final Report, Red Hill Bulk Fuel Storage Facility Joint Base Pearl Harbor-Hickam, dated June 13, 2017

The BWS has reviewed the subject report and offers the following comments.

We understand that this document, herein referred to as the Underground Storage Tank (UST) Evaluation Report, was prepared by Atlas Geotechnical, Eastern Research Group (ERG), PEMY Consulting, and Powers Engineering and Inspection (PEI) for the United States Environmental Protection Agency (EPA). The UST Evaluation Report discusses this team's baseline evaluation of the UST system and peripheral equipment at Red Hill Bulk Fuel Storage Facility (RHBFSF). Their field assessment occurred from May 9 through 12, 2016 and thus the BWS notes that it took approximately one year for this report to be released (report is dated June 13, 2017).

The BWS notes an important disconnect between the stated objective of the evaluation and its fundamental finding. On Page 1 the report states that the purpose of the evaluation was to "...provide an overall assessment of the Facility's ability to be operated in a manner that prevents release of fuel into the environment." However, the fundamental finding (also Page 1) is that the "...systems and management practices in

place at the Red Hill Facility meet or exceed best practices for petroleum terminals and bulk fuel storage facilities.” It has been the BWS’s position, from our earliest involvement, that because of its storage volume, proximity to the aquifer, and aging infrastructure, the Red Hill facility represents a serious risk to a critical water resource. Whether or not systems and management at Red Hill are found to meet industry standards intended for facilities that pose significantly less risk does not necessarily guarantee the “Facility’s ability to be operated in a manner that prevents release of fuel into the environment”, an environment that is our Sole Source Aquifer and drinking water supply. As such, the stated finding does not satisfy the report’s more broadly stated objective of evaluating whether the facility is or can be operated in a manner that prevents release of fuel into the environment and contamination of the aquifer.

Furthermore, regardless of whether or not the systems and management practices are found to meet or exceed best practices, these same Red Hill practices resulted in a significant fuel release from Tank 5 in January 2014. This demonstrates why the Red Hill facility must clearly exceed current best practices and standards. The UST Evaluation Report acknowledges that “The evaluation team did not identify areas of noncompliance with current state or federal regulations; however, most of the regulations for UST systems were not yet in effect at the Red Hill Facility, due to EPA’s deferral of regulations for field constructed tanks.” (Page 1).

Refer to Section III – Regulatory Background and Industry Standards, Page 2; the UST Evaluation Report states that:

“For field constructed UST systems in use as of October 13, 2015, owners and operators must meet corrosion protection requirements for their tanks and piping in contact with the ground that routinely contain regulated substances. Tank and piping materials must be constructed either of fiberglass-reinforced plastic, cathodically protected and coated steel, steel jacketed with a noncorrodible material, or metal without corrosion protection if the tank is determined to not cause a release due to corrosion. All cathodic protection systems must be tested within 6 months of installation and at least every 3 years thereafter.”

With respect to the phrase “in contact with the ground”, the Red Hill steel liners are not in contact with the ground but with a concrete shell cast against shotcrete and native rock. The BWS has previously stated in letters to the EPA and Hawaii Department of Health (DOH) that through-wall corrosion has initiated at the exterior surfaces of tank steel liners (steel-to-concrete interface), and therefore is encompassed by the intent of regulations for tanks in ground contact to have some form of corrosion protection.

Furthermore, the statement

“Tank and piping materials must be constructed either of fiberglass-reinforced plastic, cathodically protected and coated steel, steel jacketed with a noncorrodible material, **or metal without corrosion protection if the tank is determined to not cause a release due to corrosion**”
[emphasis added]

implies that the tank steel liner must be cathodically protected and coated, or jacketed with a noncorrodible material since tanks have had releases due to corrosion. The BWS has previously stated, and we understand that both the EPA and Navy agree, that the exterior surface of the steel liner that is corroding cannot be effectively cathodically protected and/or coated.

Furthermore, refer to Section IV.b. – Piping, Pages 6-7; the UST Evaluation Report discusses the rather concerning issue of poor maintenance of the cathodic protection system that is currently in use at Red Hill for the piping system that is in contact with soil.

Refer to Section IV.a.1 – Tanks Findings, Page 3; the UST Evaluation Report states:

“The implemented inspection technologies and methods meet or exceed industry standard.”

However, these inspection procedures missed the weld defects that caused the January 2014 release. The BWS has been told that the leaks were a result of not adequately inspecting or vacuum testing the repair welds. The release demonstrates that construction and quality control that meets industry standards can nevertheless allow substantial releases at Red Hill due to inevitable limitations with the tools and the possibility of human error.

The UST Evaluation Report on Page 3 states that:

“Based on the observation that the gauges used to generate the UFM’s [unscheduled fuel movement] are only accurate to within 3/16 of an inch, however, it can detect inventory losses during operation almost continuously”

This statement is unclear and misleading as it seems to indicate fuel loss can be detected continuously. It is the BWS’s understanding that it takes many hours and fuel loss with quantities of fuel significantly greater than 3/16 inch level loss (greater than 900 gallons), before any action would be taken to rapidly lower the fuel level in the tank. In fact, on Page 5 the UST Evaluation Report states that during scheduled fuel transfers, the Automatic Fuel Handling Equipment (AFHE) generates a warning alarm for more than 1 inch level change and a critical alarm for more than 1.5 inches. Presumably, action would not be taken to rapidly lower the fuel until the critical alarm initiates which would correspond to a loss of 7,344 gallons or more. Therefore, before any action would be taken, additional fuel would be released until the level is lowered below the leak location.

Refer to Section IV.a.2 – Tanks Observations, Page 4; the UST Evaluation Report states it is:

“...most likely that if potential leak paths are present under the steel liner, the product would likely stay between the steel liner and the concrete outer shell.”

At present, the BWS is not aware of any engineering analysis, testing or physical observation to support this statement. In fact, there is ample evidence to the contrary based on information from the January 2014 release, early testing of the tell-tale system, and the numerous observations of fuel and fuel-stained rock samples extracted from beneath the tanks about 15 years ago. In fact, the UST Evaluation Report states on Page 4, just two sentences below the statement that fuel would stay between the steel liner and the concrete shell, that

“PEI suggests that besides cracks in the concrete outer shell, groundwater may have found its way under/behind the steel plates through the path dug to the roof vent or air shaft.”

This clearly points to communication between the steel-to-concrete interface and surrounding groundwater.

The UST Evaluation Report on Page 4 further states that the:

“Red Hill Facility previously employed the use of a tell-tale system comprising a series of steel pipes that penetrated the walls of the USTs near the tank bottom to observe fluid outside the steel shell of each tank; however, this system was decommissioned at all of the tanks and is no longer used due to concerns regarding corrosion and vulnerability of the tell-tale piping to leakage.”


In recent AOC meetings, it appears that the Navy is reconsidering the merits of the tell-tale piping. As previously stated, the BWS believes that performance of the original tell-tale systems was questionable at best, and that the likelihood of restoring a robust, well-behaved tell-tale system is low.

Refer to Section IV.b.1 – Piping Findings, Page 6; the UST Evaluation Report states that any potential leak paths in these areas would likely be contained by the tunnel system and the oil-tight doors. However, there is no indication that the doors are “oil-tight doors”; the BWS has seen no engineering analysis to indicate the tunnels themselves are fuel/oil tight. Further, the BWS has no confidence that the tunnels, which were not designed to be fuel/oil tight, will reliably prevent leaked fuel from escaping into the environment and leading to contamination of the aquifer

Messrs. Pallarino and Chang
July 14, 2017
Page 5

If you have any questions, please contact Erwin Kawata at 748-5080.

Very truly yours,



ERNEST Y.W. LAU, P.E.
for Manager and Chief Engineer

CC: Mr. Steve Linder
United States Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, California 94105

Mr. Mark Manfredi
Red Hill Regional Program Director
NAVFAC Hawaii
850 Ticonderoga Street, Suite 110
JBPHH, HI 96860