

## BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU  
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March 5, 2018

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Mr. Omer Shalev  
United States Environmental Protection Agency  
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and

Ms. Roxanne Kwan  
Department of Health  
Solid and Hazardous Waste Branch  
2827 Waimano Home Road  
Pearl City, Hawaii 96782

Dear Mr. Shalev and Ms. Kwan:

Subject: Board of Water Supply (BWS) Comments on the Risk-Based Decision Criteria Development Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility (RHBFSF), Administrative Order on Consent (AOC), Statement of Work (SOW) Sections 6.2 and 7.1.2, 7.2.2, and 7.3.2 dated December 11, 2017

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The Honolulu Board of Water Supply (BWS) offers the following comments on the above referenced Risk-Based Decision Criteria (RBDC) Development Plan. The plan is intended to be "... protective of human health, safety, and the environment specifically considering exposure of human receptors to chemicals of potential concern (COPCs) in the public water supply through ingestion of tap water, dermal contact, and inhalation of volatile chemicals while bathing/showering." Further, Figure 3 in the RBDC Development Plan states that the exposure point for groundwater is the residential tap and that, "Direct exposure to groundwater and inhalation of Volatile Organic Compounds (VOCs) while bathing are considered potentially complete pathways for residents that use groundwater in the area as a drinking water source. Residents could be exposed to chemicals directly by drinking tap water. Residents could be exposed through dermal exposure while washing hands or showering/bathing. Finally, residents could be exposed to volatile chemicals via inhalation while showering/bathing."

Therefore, the recommended screening criteria for each COPC should include water screening levels that incorporate risks from these multiple exposure pathways.

In addition, the contingency action should have more detail and the sampling frequencies necessary to confirm any exceedance of any or SSRBLs should be discussed and defined in the Groundwater Protection Plan (GWPP) update.

The BWS believes the RBDC Development Plan requires significant revision. The Plan does not justify the protectiveness of the assumptions used to derive the proposed Site-Specific Risk-Based Levels (SSRBLs) from the RBDC. How can the Navy be so sure that not exceeding the SSRBLs outlined in the RBDC Development Plan will not result in future exceedance of RBDCs? Because the EPA has stated multiple times that conservative assumptions must be made in the absence of sufficient data in order to be protective of the groundwater resource and the general public and environment, the risk from not degraded total petroleum hydrocarbon (TPH) fractions via multiple exposure pathways must be considered.

### **Specific Comments**

1. Section 1.31, Page 1-8, Lines 5 - 7. RBDC Derivation states that the RBDC for the specific COPCs are the lowest of the available Environmental Protection Agency (EPA) Regional Screening Level (RSL) and State of Hawaii Department of Health (DOH) Environmental Action Level (EAL) values for drinking water. Further, this section (Lines 10 – 12) also states that no EPA RSLs have been established for TPH diesel range organics (TPH-d). This is incorrect. EPA RSL fractions are available for TPH-d and other TPH fractions (aliphatic and aromatics), but were not included by the Navy in the criteria table (Table 5-1).

The screening values listed for TPH fractions in Table 5-1 are the most recent (2017) DOH EALs for drinking water toxicity and gross contamination (odor and taste). The toxicity-based DOH EAL for TPH-d **only** considers ingestion of water as the relevant exposure pathway, and thus, does not incorporate human health risks for inhalation or dermal exposures. Therefore, this is inconsistent with statements regarding the RBDC Development Plan objective of establishing criteria that are protective of the drinking water receptors by multiple pathways as described above. Further, EPA RSLs are available for individual TPH fractions, but these were not included in the criteria table and should be. At least for the TPH-d fractions, the EPA RSLs are lower than the DOH EALs and incorporate multiple exposure pathways (ingestion, inhalation, and in some case, dermal contact). These values are more conservative, and therefore, in accordance with the stated methods of selecting the lowest of the EPA RSL or DOH EAL values,

the RBDC Development Plan should have considered EPA RSLs for TPH screening criteria rather than the DOH EALs.

The DOH EAL for TPH-d does not include the inhalation or dermal pathways of exposure. The rationale for not including the inhalation pathway appears to be based on the DOH assumption that all of the TPH-d would be degraded into non-volatile polar organics by the time it reaches tap water. However, no data were provided or are available to support this assumption for the RHBFSF Site. In fact, the EPA split-sampling data from October 2017 of groundwater samples collected from the RHBFSF groundwater monitoring wells show a variable amount of degradation of TPH-d to polar organics in the samples tested (EPA, 2017). The table below shows the percentage of polar organics in the EPA split samples collected in October 2017:

<b>EPA Sample ID</b>	<b>TPH-d (mg/L)</b>	<b>TPH-d with Silica Gel Cleanup (mg/L)</b>	<b>Percent Polar Organics</b>
<b>1710078-01</b>	3.1	2.5	19%
<b>1710078-02</b>	3.7	2.9	22%
<b>1710078-03</b>	2.4	1.9	21%
<b>1710075-01</b>	3.3	0.5	85%
<b>1710075-02</b>	0.18	<0.15	>17%
<b>1710096-01</b>	0.21	<0.15	>29%
<b>1710102-01</b>	2.3	2.0	13%

Notes: mg/L – milligrams per liter

2. Section 1.3.2 SSRBL Derivation, Page 1-8, Lines 29 - 33. It would be helpful to the user and/or reviewer of the RBDC Development Plan to identify where in the document the attenuation factors (“factor in mass flux”) for the sentinel monitoring wells will be derived and how they will be applied.
3. Section 2.3 Exposure Pathways, Page 2-2., Lines 19 – 23. The Navy identifies that ingestion, dermal contact, and inhalation of groundwater as a drinking water source are complete exposure pathways for offsite residents. However, the EAL for TPH-d recently was increased by DOH in 2017 from 168 micrograms per liter ( $\mu\text{g/L}$ ) to 400  $\mu\text{g/L}$  excludes the inhalation route. The EALs for TPH-gasoline (TPH-g) and TPH-residual range organics (TPH-o) also were increased for the same reason. The RBDC Development Plan should identify that the TPH mixture EALs do not include the inhalation pathway, Figure 3 should indicate that the inhalation exposure pathway is complete but not evaluated for TPH mixtures, and the RBDC Development Plan should identify the uncertainties associated with the exclusion of the inhalation pathway and that the current DOH EALs have

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the potential to underestimate noncancer hazards associated with exposure to the TPH mixtures.

4. Section 4.1.1. Risk Basis of RBDC (Page 4-1, Lines 15 – 17) indicate that the RBDC for TPH mixtures such as TPH-d is the DOH EAL because no EPA RSL is established. This is incorrect. Please see comment No. 1 above.

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

Very truly yours,

  
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Manager and Chief Engineer

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## References

Navy. 2017. Risk-Based Decision Criteria Development Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility. Revision 00. December 11.

EPA, 2017. Split Sampling Data, Analytical Testing Results, EPA Project No. R18U01, Red Hill Tank Farm. November.