

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
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January 31, 2022

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Dr. Elizabeth A. Char, MD
Director of Health
State of Hawaii
Department of Health
1250 Punchbowl Street
Honolulu, Hawaii 96813

Dear Dr. Char:

Subject: Honolulu Board of Water Supply (BWS) Request the Hawaii Department of Health (DOH) Revisit its Environmental Action Levels (EALs) for Total Petroleum Hydrocarbon Middle Distillate Fraction (TPH-d)

The BWS requests the DOH lower its current 400 µg/L EAL for TPH-d to its previous level that we believe are more protective of human health, the environment, and our critical drinking water resources.

In November 2017, the DOH increased its TPH-d drinking water health-based EAL from 160 micrograms per liter (µg/L) to 400 µg/L and increased its TPH-d taste and odor EAL from 100 µg/L to 500 µg/L (DOH 2016, 2017). At that time, DOH determined that TPH-d in tap water will change into a form that will stay in water and not be released into the air or absorbed through the skin, and therefore the EAL could be increased and not pose a significant threat to human health and the environment. The BWS disagrees and has consistently raised concerns about the DOH's rationale for the change (Lau et al. 2018a,b; 2019). Since TPH-d does not have an applicable drinking water standard, the BWS considers these EALs an important tool to assist water purveyors in ensuring that the water provided to customers is safe and free of objectionable qualities. The ongoing fuel releases from the Red Hill Bulk Fuel Storage Facility (Red Hill) and the contamination of the U.S. Navy's water distribution system, heighten our concerns and underscore the need to revise these EALs to their prior levels.

We were surprised both by the DOH's decision to raise its TPH-d EALs as well as its proffered rationale for doing so. The DOH (2017) justified its decision to increase the drinking water health-based EAL based in part on the following finding:

[P]etroleum-related compounds reported in this range will be dominated by non-volatile, degradation compounds or "metabolites" of biogenic

origin. The resulting action level is therefore based on ingestion only and does not incorporate an inhalation pathway.

In other words, the DOH effectively assumed that exposures to TPH-d do not occur via inhalation or skin absorption while showering, bathing, or washing dishes. As we have made clear in the past, this justification for the current drinking water toxicity EAL for TPH-d is incorrect (Lau 2018 a,b).

The studies relied upon by the DOH to raise its EALs are not sufficiently protective because they assess historical TPH release sites on the mainland (Lau 2018a). TPH-d in local groundwater may travel faster from a release site to drinking water wells through Hawaii's more hydraulically conductive volcanic soils and rock. Moreover, the Red Hill fuel facility equipment and operations can more directly contaminate drinking water wells, as demonstrated by releases in 2021 affecting the aquifer and the Joint Base Pearl Harbor Hickam (JBPHH) water system. Consequently, there may be less time for TPH-d to degrade to forms that remain in water, particularly for sites with recent or ongoing fuel releases like Red Hill. The DOH's assumption that TPH-d will degrade such that it does not result in inhalation or absorption exposures does not apply here as sampling results from the Navy's Red Hill Shaft clearly show that undegraded fuel product can travel and has travelled through the subsurface into the Navy's Red Hill Shaft drinking water source.

State Toxicologist Dr. Diana Felton recently testified that people can be exposed in the following ways: by ingestion, dermal exposure (absorption), and inhalation. Exposures to a petroleum-based product via the inhalation and skin absorption pathways are consistent with the recent reports from users of the U.S. Navy water distribution system of strong fuel odors from their tap water as well as documented symptoms, including skin irritation and rash, from individuals using the water. It is clear from the experiences of the service members and their families actually affected by exposure to petroleum constituents in their water that both the inhalation and skin absorption pathways should be considered when establishing DOH's health-based TPH-d EAL.

The DOH's explanation that its increased taste and odor EAL of 500 µg/L for TPH-d is based on more contemporary studies and is on the low side of published thresholds is equally unavailing. There is considerable uncertainty inherent in the studies referenced by the DOH in support of its decision to raise the TPH-d EAL (DOH, 2017; Lau 2018b, 2019). More importantly, this new EAL has not been verified to apply to a situation in which an actively used source of drinking water has been impacted by fuel releases and its validity has been directly refuted by recent experience. The Navy has reported taking hundreds of samples from its water distribution system and has generally maintained that none have indicted the presence of petroleum-related constituents at or above the DOH's current EALs. Despite these reported results, the water contamination crisis was discovered when Navy servicemembers and their families reported strong

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fuel odors emanating from the water served from their taps. Given these reports, the DOH's current taste and odor EAL of 500 µg/L is simply too high.

The BWS understands that the DOH may now be using a more conservative EAL of 200 µg/L to assess the sufficiency of the Navy's efforts to flush the petroleum contamination from its water distribution system. While we support the application of a more protective standard to such efforts, we believe that a prompt revision of the TPH-d EALs is necessary to safeguard the public and our critical drinking water resources. The DOH indicated in February 2020 (Anderson, 2020) that Dr. Roger Brewer had initiated a laboratory study to investigate the chemistry and toxicity of dissolved TPH in groundwater from different types of fuel, and that the DOH intended to incorporate the results of this research to develop EALs for TPH in groundwater from a fresh petroleum release. The BWS continues to have great interest in the progress of such work and would appreciate an update on this laboratory study as well as the status of the DOH's further revision of the TPH EALs.

In the meantime, it is clear that use of DOH's current TPH-d EALs as a screening tool is not sufficiently protective of human health, the environment, or drinking water. EALs should err on the side of being conservative. Recent experience shows that the existing EALs are not. Accordingly, the BWS urges the DOH to act now to lower the TPH-d EALs at least back to previous levels that were more protective.

If you have any questions, please contact Mr. Erwin Kawata, Program Administrator of the Water Quality Division at (808) 748-5080.

Very truly yours,



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

cc: Ms. Gabriela Carvalho, EPA Region 9
Dr. Diana Felton, DOH

References

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