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Memo To: Jackie Miller
Environmental Center

From: Frank Peterson

Subject: Comments on Phase I Remedial Investigation Report for Red Hill Oily Waste Disposal Facility Pearl Harbor

My overall impression of the work described by this report is that it is scientifically competent and covers the topics addressed in a thorough manner. The surface and subsurface soil and sediment sampling and analysis looks quite adequate. Furthermore, I strongly agree with the final conclusion that the basal groundwater pathway is of potential concern and requires additional investigation. I do, however, have the following comments and questions regarding details contained in this report:

(1) As stated above I concur that contamination of the basal groundwater is of concern and requires additional investigation. I wonder, however, why more effort was not expended in this study to make a preliminary assessment of basal groundwater contamination, at least to the extent of sampling nearby basal water wells, or at the very least making an inventory of existing basal wells in the immediate vicinity of the site. Was this type of work expressly ruled out in the scope of work for the Phase I study?

(2) No mention is made anywhere in the report of the presence of DNAPLs. If any of the potential groundwater contaminants are DNAPLs this should be pointed out as transport pathways in the basal groundwater for DNAPLs may not follow the expected groundwater flow gradients.

(3) <u>p. 5-22:</u> Attenuation factors of 10 and 100 were used for the groundwater pathway beneath the Stilling Basin. Because borings at this site do not all encounter a low permeability tuff (see comment (4) below) and the low permeability clay layer at the surface is of variable thickness (in boring B04 it is less than 10 ft) I would feel most comfortable using an attenuation factor of 10 throughout. An attenuation factor of 100 may give misleadingly low contaminate concentration values.

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(4) Appendix C, Borings Beneath Stilling Basin: It seems rather curious that tuff is encountered in all borings in the vicinity of the Stilling Basin at about 25-35 ft bgs except B04 which is less than 100 ft from the other borings. I would except wind-laid tuff to be deposited over the entire site. Is it possible these are stream-laid tuffs and hence are restricted in their areal distribution? If so this could enhance the possibility of basal groundwater contamination. I also notice that tuff is not encountered in the Background boring (B01), which is about 25 ft upslope from the other borings which may explain its absence, especially if the tuff is stream-laid.

(5) Section 5.4.11, Stilling Basin Groundwater Pathways: Any compound occurring in concentrations of concern in the perched groundwater (TFH, 11-DCE, B(a)A for example) should also be of concern for basal gorundwater because as indicated in comment (4) above, the tuff which causes the perched groundwater is not areally continuous in all borings at this site. Hence, the concentrations entering the basal water where the tuff is not present could conceivably be the same as those observed in the perched groundwater.

(6) Section 5, Surface Water Pathways: For all sites described in the report the surface water pathway via runoff to Halawa Stream is deemed insignificant because of infrequent heavy rains and flooding. However, no quantitative evidence is given to justify this conclusion. I believe this interpretation probably is correct but I would like to see some quantification to justify this, especially for the Site Runoff Area where surface arsenic values exceed background by a factor of 5 times (Section 5.4.7.2). Can calculations be presented to justify this conclusion? Also what about the potential problem of contaminated sediment from the site being deposited in Halawa Stream? Is this stream channelized all the way to Pearl Harbor or are there potential sediment traps along the way? This needs some clarification/discussion.

(7) Section 5.4.11.4, Coast Guard Parcel Groundwater Pathway: Several compounds (TFH, dieldrin) have calculated concentrations entering basal groundwater at or near HBL yet the report concludes that groundwater pathway is insignificant. I would conclude from this exactly the opposite, that it may be of concern and should be further investigated.

(8) Section 7, Risk Evaluation: My understanding of risk evaluation is rudimentary at best, nonetheless, I am concerned about the risk assessment for the Coast Guard Parcel under proposed residential use. In particular, the soil exposure pathways for onsite residents are all evaluated as insignificant due to low contaminant concentration (Table 7.1-21, p. 7-36). On p. 7-47 it is stated that "according to USEPA (1991b) the Site does not warrant cleanup if: (1) the Site-specific cumulative excess carcinogenic risk is equal to or less than 10^{-6} and (2) the Site-specific cumulative HI is equal to or less than 1. Remedial action must be justified if: (1) the Site-specific cumulative excess carcinogenic risk is between 10^{-6} and 10^{-4} (2) the Site-specific cumulative HI is equal to or less than 1. The Site may pose a significant risk to human health and warrant cleanup if: (1) the Site-specific cumulative excess carcinogenic risk is greater than 10^{-4}; or (2) the Site-specific cumulative HI is much greater than 1." On p. 7-65 and 7-70 the report indicates that the cumulative health risks for a residential setting for the Coast Guard Parcel are

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in excess cancer risk of 8×10^{-5} and have a noncancer HI of 1.3. These numbers are right at the borderline for remedial action as described on p. 7-47 above. I recognize that background arsenic and thallium are partially responsible for the high HI, however, this still looks borderline to me and perhaps requires further investigation or at least a stronger justification for requiring no further action.

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