UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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9 July 1999

Ms. Darlene Ige
Department of the Navy
Pacific Division
Naval Facilities Engineering Command
(Makalapa, Hawaii)
Pearl Harbor, Hawaii 96860-7300

Dear Darlene:

Enclosed are the comments of the U.S. Environmental Protection Agency (EPA) to the Draft Phase II Report Remedial Investigation Report for Red Hill Oily Waste Disposal Facility.

If you have any questions please contact me at (415) 744-2412.

Sincerely,

Lewis Mitani
Remedial Project Manager

enclosure

cc: Mike Miyasaka, DOH
Adam Klein, TLI

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REVIEW COMMENTS
DRAFT PHASE II REMEDIAL INVESTIGATION REPORT
FOR RED HILL OILY WASTE DISPOSAL FACILITY
DATED JANUARY 1999

Specific Comments - Executive Summary

1. Page ES-3, third complete paragraph (Groundwater). A reference to existing data indicating the absence of COPCs and TPH in the basal aquifer would also help to support the conclusion that the potentially complete groundwater transport pathway from the OWDF to this potable water source is insignificant. Estimating the potential leachate concentrations for representative PAHs (pyrene and benzo(a)pyrene) in the potable aquifer is appropriate in the absence of sufficient data, but there are other contaminants present in the OWDF, such as TPH that could enter the basal aquifer causing the water to be unpalatable (i.e., taste and odor) and essentially unuseable as a potable source of drinking water without appropriate treatment. Although the presence of TPH at low concentrations in a drinking water source may not necessarily constitute a quantifiable human health hazard, a drinking water source in the area would be impacted. Impacts to groundwater are commonly determined based on the potential for human exposure to carcinogens and other toxicants known to cause adverse human health effects. However, contaminants not considered toxicants at low concentrations can introduce unpleasant odors or taste and make an existing drinking water source virtually unusable, usually at levels above the TPH taste and odor threshold of 100 ppb. The issue of taste and odor requires further evaluation.

2. Page ES-3, seventh paragraph, second sentence. The "EPA fixed levels of allowable risk" for residential and industrial land use should be identified in the summary. The document should reflect the cumulative risks are within, or below the risk range for the different land uses.

Comments Section 4.0 - Nature and Extent of Contamination

3. Section 4.6. Suggest the date or time of year each sampling round took place so the reader will have a sense of the anticipated seasonal water level.

4. Section 4.6.3.3, last Paragraph. All the detected chemicals can easily carried through the risk assessment. Include the VOC data in total. Overall, this will not drastically increase the risk values, however, if this is laboratory contamination, why is it only a problem in the basal aquifer sampling and not the others? This may raise a question of adequate characterization.

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Specific Comments - Section 5.0 - ARARS and TBCS

5. Page 5-4, second paragraph, second sentence. The text states the perched groundwater is of limited extent and is not classified as a current or potential source of drinking water. As such, the federal drinking water standards are not applicable or relevant and appropriate requirements (ARARs).

   Current groundwater monitoring data indicates no communication between the perched aquifer and the basal aquifer. While the perched aquifer may not be a current or future source of potable water, leakage from the perched zone to the basal aquifer has not been completely demonstrated. However, quarterly groundwater monitoring is continuing to validate this information. Until sufficient

   monitoring data is available to validate no communication between these two aquifers, the drinking water standard should be evaluated for its relevance or appropriateness for the perched aquifer. Consequently, the application of federal drinking water standards would appear to be both relevant and appropriate to the perched aquifer. The federal drinking water standards may be an ARAR for the perched aquifer. Page 5-4, fourth paragraph, fourth sentence. The text states the Hawaii Department of Health (DOH) recommended soil action levels do not supersede the underground injection control (UIC) criteria. The comparison of the DOH guidance with the UIC regulations implies that the UIC regulations are applicable or relevant and appropriate to this site. Since the recommended soil action levels do not supercede the UIC criteria, it would appear that this sentence is stating the UIC requirements are also ARARs. Please explain if this sentence is meant to indicate that the UIC standards are also ARARs. If this is not the purpose for this statement, please clarify.

6. Page 5-2, second paragraph. As required by the federal Clean Water Act, the State of Hawaii has a general policy of water quality antidegradation (11 HAR §54-01.1). This policy states that water "...whose quality are higher than established water quality standards shall not be lowered in quality unless it has been affirmatively demonstrated to the director that the change is justifiable as a result of important economic or social development and will not interfere with or become injurious to any assigned uses made of, or presently in, those waters." This would appear to be applicable to this action and attainment of the requirement should be documented.

General Comment - Section 6.0 - Contaminant Fate and Transport

7. It appears that soil analytical data collected from the bottom of the excavation during the Removal Action were not included in the data set used to evaluate contaminant fate and transport. These data represent levels of contaminants left in place after completion of the RA. It is recommended that these data be included

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in this section.

Specific Comments - Section 6.0 - Contaminant Fate and Transport

8. Page 6-2, first paragraph, second bullet item. Transport of soil contaminants through storm water runoff is dismissed due to low measured rainfall, dilution, and low flow in a receiving waterway, Halawa Stream. However, measured annual rainfall of 20 to 24 inches on Oahu, Honolulu and Waikiki respectively, appears to be sufficient to result in some heavy runoff from the OWDF and a potentially significant transport pathway. Information on storm water discharge (quality and quantity) and outfall(s) would help to support the conclusion that transport by surface water is insignificant.

9. Page 6-2, second paragraph. It is unclear what constitutes an "insufficient concentration" to allow transport. This rationale for dismissing VOCs, metals, PCBs, pesticides and herbicides from further consideration should be clarified.

10. Page 6-4, third complete paragraph, last sentence. It is unclear why benzo(a)pyrene and pyrene are considered surrogates or indicator compounds (ICs) for TPH as diesel fuel. The PAHs are toxicants that represent potential health risks to exposed populations, but are they representative of straight run middle distillates in the 10 to 20 carbon chain range which are commonly composed of 21 percent aromatic hydrocarbons? Perhaps napthalene, or one or more of the straight- or branched-chain aliphatics (decane, dodecane, tridecane, heptadecane, etc.) would provide a more representative surrogate for TPH-diesel. Further discussion supporting the use of the two PAHs as ICs for TPH appears warranted.

11. Page 6-8, next to last paragraph, first sentence. As discussed above (see Comment 9), the appropriateness of benzo(a)pyrene and pyrene as surrogates for the fate and transport of TPH should be discussed further.

12. Page 6-9, Table 6-2. The calculated leachate concentrations for pyrene at the UPD appear to be incorrect. Assuming the maximum soil concentration of 2.4 mg/kg, the leachate concentrations for the average and minimum TOC content should be 4.21 and 12.63 µg/L, respectively. Please correct.

13. Page 6-12, fifth paragraph, second sentence. The leachate concentration for benzo(a)pyrene was calculated using the single detected concentration of 0.085 mg/kg, not 0.22 mg/kg, which was the UDA concentration. Please correct.

14. Page 6-12, sixth paragraph, second sentence. The discussion in Subsection 6.4.3.1 (p. 6-11) indicates that the highest pyrene concentrations detected in UDA soil during the Phase I and Phase II RI were 0.5 and 0.38 mg/kg, respectively. Furthermore, as discussed above, the average and maximum calculated leachate concentrations presented in Table 6-2 do not reflect a soil concentration of 2.4

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mg/kg.

15. Page 6-13, fifth paragraph (Phase I RI Samples), second sentence. It is assumed that TPH was detected in soil borings at concentrations ranging from 200 to 8,400 mg/kg. If these are groundwater data, the units should be µg/L or mg/L.

16. Page 6-15, second paragraph. It should be noted that the two monitoring wells, MW04 and MW05, which had elevated VOC and PAH concentrations during Phase I sampling, were not sampled during one or both rounds of Phase II sampling due to insufficient water. In addition, the detection limits for the VOCs during the Phase II sampling were elevated and in some cases above TBCs.

Specific Comments - Section 7.0 - Health Risk Assessment

17. Page 7-4, second paragraph. As discussed above in Comment 15, VOCs (1,1,1-TCA, 1,1-DCA, 1,1-DCE, chloromethane) were detected in MW05 (and duplicate sample), and PAHs (benzo[a]pyrene, chrysene, fluoranthene, fluorene) in MW04 during Phase I RI sampling. It should be noted that during Phase II RI sampling the detection limits for VOCs were elevated, and no samples were collected in MW04 during either of the two subsequent sampling events or in MW05 during October 1998 sampling due to insufficient water. Consequently, the list of perched groundwater COPCs presented in Table 7-1 may be incomplete due to missing or inadequate data for the two monitoring wells. Please address this issue in the text and present recommendations for subsequent sampling to confirm the absence of these COPCs in the perched groundwater.

18. Page 7-5, first paragraph (EPCs). It should be noted for future reference that although the use of the H-statistic to estimate the 95% UCL on the arithmetic mean is recommended in EPA guidance, some recent issue papers have cast doubt on this approach, particularly when the data appear to be highly skewed. Recent studies by EPA's Technology Support Center (TSC) at numerous hazardous waste sites concluded that while the H-statistic UCL is theoretically sound, it is questionable in environmental applications (EPA/600/R-97/006). The TSC found that other procedures, including jackknife, bootstrap and Central Limit Theorem (CLT), were more accurate and recommended that the following steps be used instead of the H-statistic to compute a UCL of the mean of COPCs:

    1. Plot histograms and perform a statistical test. Don't assume the distribution to be normal if the coefficient of variation (CV) is less than 1 (i.e., the CV-test).

    2. If a normal distribution provides an adequate fit, use the Student t approach

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to calculate the UCL of the mean.

3. If a lognormal distribution provides an adequate fit, use the lognormal theory-based formulas for computing the Minimum Variance Unbiased Estimate (MVUE) of the mean and standard deviation; then either use these MVUEs with the jackknife or bootstrap methods to calculate a UCL of the mean, or use the Chebychev approach. Do not use the H-statistic, especially when sample numbers are less than 30.

4. If the distribution is neither normal or lognormal, use the nonparametric versions of the jackknife or bootstrap methods to calculate the UCL of the mean. The nonparametric methods are recommended even when the lognormal distribution seems to provide a reasonable fit, and if there maybe evidence of a mixture of two or more subpopulations, or if outliers are suspected.

Nevertheless, the key is that the data be representative of the site and the potential exposure pathways being considered in a risk assessment. If this is questionable, then it is preferable to over- rather than under-estimate actual exposure point concentrations (EPCs). This is commonly the case with the H-statistic, which is designed to protect against the error of not capturing the true mean within a given UCL interval. Consequently, use of the H-statistic for a conservative or screening level risk assessment that would tend to avoid a Type 1 decision error, such as is the case for this PRE, does not appear to be inappropriate but should be discussed in the uncertainty analysis.

19. Page 7-7, fourth complete paragraph, last sentence. Since there are no industrial groundwater PRGs to compare to the groundwater COPC EPCs, it is unclear how it will be determined when an OWDF-specific PRE is necessary. It is assumed that the perched groundwater COPC EPCs will be compared to tap water PRGs, not industrial PRGs, as indicated in the text. Please revise or clarify.

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20. Page 7-7, last paragraph, third sentence. The authors are referred to a document prepared by the TPH Criteria Working Group (TPHCWG)[1], a consortium of state and federal agencies, industry (petroleum, power, transportation), and consulting firms. The TPHCWG document presents a technical basis for the development of TPH fraction-specific reference doses and concentrations (RfDs, RfCs) to assess the potential health effects of petroleum hydrocarbons. The methodology uses a combination of data on individual compounds (e.g., carcinogenic indicators) to which the receptor is exposed individually, and, if the indicators are not present or below levels of concern, the remaining TPH mass is evaluated using fraction-specific surrogates. Does this contradict the reviewed doc?

21. Page 7-10, Table 7-4. The PRG for chrysene is 5.60E+01, not 5.60E+00, and the risk for both the maximum and RME EPC should be 7.14E-09. Please correct the table accordingly.

22. Page 7-14, Table 7-8. As discussed above (see comments for pp. 7-4 and 6-15), VOCs (1,1,1-TCA, 1,1-DCA, 1,1-DCE, chloromethane) were detected in MW05 and PAHs (benzo[a]pyrene, chrysene, fluoranthene, fluorene) in MW04 during Phase I RI sampling. The detection limits for VOCs during subsequent Phase II sampling were elevated and no samples were collected in the two wells during one or both sampling events. Consequently, the perched groundwater COPCs presented in the table may be incomplete due to missing or inadequate data for the two monitoring wells. This should be noted. In addition, the tap water PRG for pyrene is 180 µg/L, not 1,500 µg/L. Please correct.

23. Page 7-21, first paragraph, second sentence. Actually, there are PRGs for acenapthene. The correct PRG values for acenaphthene (2.6E+03 mg/kg for residential soils and 2.8E+04 mg/kg for industrial soils), not naphthalene, were used in Tables 7-3, 7-4, 7-10, and 7-11 to estimate cancer and HQ values. Please correct the text.

24. Page 7-21, fourth paragraph (ASTs), first sentence. Table 7-2 accurately indicates that the RME excess cancer risk for AST surface soils is 5.0E-06, not 5.6E-06. Please correct the text.

    In addition, the reference to, and use of, an excess cancer risk of 1E-04 as a trigger level for remediation is an issue that has been raised in previous comments. The impression that this gives is that estimated risks less than 1E-04 are of no concern, which may or may not be the case. EPA Guidance, as per the Don R. Clay memorandum (OSWER Directive 9355.0-30), notes that the upper boundary of the

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[1] *Development of Fraction Specific Reference Doses (RfDs) and Reference Concentrations (RfCs) for Total Petroleum Hydrocarbons (TPH).* 1996. Toxicology Technical Action Group, TPHCWG. Amherst Scientific Publishing.

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risk range is not a discreet line at 1E-04, although risks around 1E-04 may be considered acceptable if justified based on site-specific conditions. However, a risk manager may ultimately decide that a risk less than 1E-04 is unacceptable due to site-specific conditions and that remediation may, in fact, be warranted. Site-specific conditions and weight-of-evidence classifications (e.g., Class A, B-1, B-2, C) for carcinogenic COPCs are more important considerations in a risk assessment than a "remedial action trigger" which may trivialize estimated risks less than the "trigger" value. It is preferable to simply define the risks and allow the risk manager(s) to determine the need for remedial actions based on COPC- and site-specific considerations presented in the RI, CSM, and risk assessment.

25. Page 7-21, next to last paragraph (UDA), last sentence. It is unclear how the areal extent and thickness of impacted soil is considered in the DOH Tier 1 Risk-Based Corrective Action (RBCA) process for the assessment and remediation of TPH-contaminated sites. Although no RME TPH concentrations in UDA soils exceeded the Tier 1 Action Level of 5,000 mg/kg, maximum concentrations did, including 8,300 mg/kg of TPH-residual fuels in surface soils and 18,000 mg/kg of TPH-middle distillates in subsurface soils. Is it appropriate to apply the Tier 1 Soil Action Level on an average (i.e., RME) site-wide basis at the UDA, or should it be applied to each "hot spot" or maximum TPH concentration detected in UDA surface or subsurface soils? Please clarify whether the use of the RME rather than maximum TPH soil concentrations is consistent with the use of a DOH Soil Action Level.

26. Page 7-22, first complete paragraph (Perched Groundwater). As discussed above (see Comment 21), 1,1,1-TCA, 1,1-DCA, 1,1-DCE, and chloromethane were detected in MW05, and PAHs (benzo[a]pyrene, chrysene, fluoranthene, fluorene) were detected in MW04 during Phase I RI sampling. The detection limits for VOCs during subsequent Phase II sampling were elevated, and no samples were collected in the two wells during one or both sampling events. This should be noted.

    Perhaps the threshold odor concentrations (TOCs) or taste thresholds for TPH should be considered as TBCs for groundwater (at least groundwater used as a potable drinking water source) since they provide criteria to define the acceptability of a domestic water supply. The TOCs, based on McKee and Wolf (1963)[2], although somewhat qualitative, would include 100 µg/L for TPH-diesel, and 10 µg/L for commercial or TPH-gasoline.

27. Page 7-23, first paragraph (top of page), second sentence. It should be noted in the text that the data for the perched groundwater, as noted above (see Comment 25), may be incomplete. There may still be carcinogenic COPCs (1,1-DCE, chloromethane), albeit at low concentrations, in the perched groundwater.

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[2] McKee, J.E. and H.W. Wolf. 1963. Water Quality Criteria. Publication 3-A (Reprinted July 1978). California State Water Resources Control Board. Sacramento CA

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28. Page 7-23, sixth paragraph (Subsection 7.2.2.3). As discussed above (see Comment 19), there are toxicological data available to estimate potential health risks associated with TPH. The Massachusetts Department of Environmental Protection (MADEP 1994)[3] and the British Columbia Environment (BCE 1995)[4] have also developed methods to evaluate the health risks of TPH.

29. Page 7-25, first paragraph, last bullet item (Perched Groundwater). As discussed above (see Comment 25), the list of perched groundwater COPCs may be incomplete due to missing or inadequate data. VOCs (1,1,1-TCA, 1,1-DCA, 1,1-DCE, chloromethane) and PAHs (benzo[a]pyrene, chrysene, fluoranthene, fluorene) were detected in samples collected from MW04 and MW05 during earlier sampling. Data from the two wells during subsequent Phase II RI sampling are limited or totally absent. The issue of the potential presence of these COPCs in the groundwater or vadose zone at the OWDF must be addressed.

30. Page 7-26, second paragraph. As discussed above (see Comment 23), it is unclear whether it is appropriate to compare RME TPH concentrations to DOH Soil Action Levels or to use "hot spot" or maximum TPH concentrations in this initial screening. Maximum TPH concentrations in surface and subsurface soils at the UDA exceed the DOH Soil Action Level. In any event, it appears that the concentration of TPH in surface and subsurface soils at the OWDF EAOCs warrants a Tier 2 or comparable assessment of soil contamination to determine the need for further action. Please address this issue.

Specific Comments - Section 9.0 - Conclusions and Recommendations

31. Page 9-1, second paragraph (9.1.1 Soil), last sentence. It should be noted that TPH-middle distillate was detected at a concentration of 19,000 mg/kg in surface soils during Phase I UPD area sampling. This significantly exceeds the DOH Tier 1 Action Level of 5,000 mg/kg and is considered elevated based on this criterion.

32. Page 9-1, fourth and fifth paragraphs (9.1.2 Perched Groundwater). Phase I data indicated the presence of various contaminants in MW04, including TPH-diesel (3,400 µg/L), benzo(a)anthracene (0.11 µg/L), and other PAHs. There were also several VOCs detected in MW05, including 1,1-DCE (0.44 µg/L). During the Phase

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[3] Massachusetts Department of Environmental Protection. 1994. Interim Final Petroleum Policy: Development of Health-Based Alternative to the Total Petroleum Hydrocarbon (TPH) Parameter. Boston MA

[4] British Columbia Environment. 1995. Recommendations to B.C. Environment for Development of Remediation Criteria for Petroleum Hydrocarbons in Soil and Groundwater. Victoria B.C.

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II sampling, MW04 was not sampled, and MW05 was sampled only during the first round (March 1998), when the VOC detection limits were elevated. Consequently, the data presented in the Phase II RI may not fully characterize the extent of the TPH, PAH or VOC contaminants present in the perched groundwater.

33. Page 9-2, fourth paragraph, third sentence. The method for estimating leachate concentrations used benzo(a)pyrene and pyrene as surrogates or ICs for TPH as diesel fuel. Although the estimates are calculated using a conservative screening method and assumptions, it is unclear why these two PAHs, which represent potential health risks to exposed populations, are representative of straight-run middle distillates in the 10 to 20 carbon chain range, which are commonly composed of only 21 percent aromatic hydrocarbons. Alternative ICs with lower K_{oc} values that could be used as surrogates include napthalene and the straight- and branched-chain aliphatics. Further discussion supporting the use of the two PAHs as ICs for TPH appears warranted.

34. Page 9-2, sixth paragraph, third sentence. As discussed above (Comment 31), virtually all of the contaminants detected during the Phase I RI were in samples collected from MW04 and MW05. Since there were no samples collected from MW04 during Phase II sampling, and only one sample was collected from MW05, the conclusion that contaminants were significantly reduced after the RA is clearly premature in the absence of a complete set of data from MW04 and MW05.

35. Page 9-4, first paragraph, first bullet item. The recommendation should include implementation of future land use restrictions and the awareness that subsequent excavation of contaminated soils for disposal or re-use may be subject to federal and/or state regulatory requirements.

36. Page 9-4, first paragraph, second bullet item. The recommendation should provide for another round of sampling to determine whether the PAHs and VOCs previously detected in the perched groundwater are still present in monitoring wells MW04 and MW05.

General Comments - Section 4.7, Appendices H, I, and J - Quality Control Samples, Analytical Data Validation Reports, Performance Evaluation Sample Results, PARCC Summary Report

37. The analytical procedures for both on-site and fixed laboratory analyses differ greatly from those described in the Sampling and Analysis Plan, yet full explanations of the variances are not provided. One variance and a brief rationale were provided - that for the onsite laboratory analyses in place of the immunoassay screening. Description of the modified SW8270 analysis using selective ion monitoring was not provided in the text, nor did any of the validation reports or the PARCC sections mention this modification to the method. All deviations from the

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SAP should be discussed fully within this document.

38. The rationale for the new onsite methods is that they would "provide more defensible data"; however, no discussion of the quality of that data in any form was provided in the document. Data review was apparently not performed, no field QC samples were collected, and no comparison to the associated fixed laboratory results was supplied. Therefore, these data are currently not defensible and may have not contained enough quality controls to ever be considered defensible. The use of these results for "evaluating extent of COPCs at the Phase II RI EAOCs" requires some way of determining the quality of the data. Data are not considered defensible unless the quality of the data is known. Please provide sufficient information regarding the quality of this screening data and why it is sufficient for "evaluating extent of COPCs at the Phase II RI EAOCs."

39. The validation reports and PARCC summary reports were clearly taken from a template. This is acceptable IF all template language is reviewed relative to the data being validated. This does not appear to be the case for these reports. Statements such as the following bring up concerns regarding the accuracy of the reports for issues other than those that can be clearly identified.

    "All target compound identifications were within validation criteria." "All compound quantitation were within validation criteria."
    These statements are found in validation reports where no identifications were reported.

    "The application of the blank qualification rule does have implications on the comparability of the analytical data, which is discussed below."
    This statement is found in many of the PARCC sections following discussion of blanks, all of which have no detections.

    "The laboratory used standard analytical methods for all of the analyses."
    Method 8270-SIM is NOT a standard method.

    "Some samples were qualified due to low-level blank contamination (as discussed in Section 3.3), which raised the effective detection limits for the suspected blank contaminants in those samples."
    This is found in the PARCC sections for VOCs and PAHs by GC/MS. The blank sections state that no qualifiers were applied to sample results.

The above examples call into question the other statements made regarding to quality control sample results. It is recommended that an independent party validate 10% of this data to verify the validation results.

Specific Comments - Section 4.7, Appendices H, I, and J - Quality Control Samples, Analytical Data Validation Reports, Performance Evaluation Sample Results, PARCC

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Summary Report

40. Numerous statements in Appendix J are made without any rationale. One of these statements is "The result associated with the above listed exceedances ... is considered to have minimal imprecision." Another is "The %D exceedances may create a bias in the data relative to the other quality control information generated, but it is not evident that an absolute quantifiable bias exists in the data." Statements like these have no basis. Rationale should be presented to support these conclusions.

41. Page 4-3, second bullet at the top of the page. The text states that PAHs were analyzed using Method 8270. However, Method 8270 is unable to attain detection limits of 0.023 mg/kg, as listed in Tables 4-4 and 4-5. Further explanation of this method is required. Also, Appendix J (PAHs by GC/MS section) states that the methods used were SW 846 8270C and SW 846 8270-SIM. The first method is not able to reach these limits but the second may be. Section 4 should specify which samples were analyzed appropriately to achieve the low detection limits listed in these tables and which were not.

42. Table 4-9. There appears to be an error in the entries for benzo(a)pyrene. There are only two detections, yet the number above criteria is 3. Please correct.

43. Page 4-63, Section 4.7.2.1, first paragraph, last sentence. The explanation for low benzo(a)pyrene and anthracene results is flawed. If the acceptable surrogate recoveries are low and other samples exhibit similar recoveries, then this event may not be isolated, but due to the difference in expected accuracy between method requirements and the vendor PALs. The heterogeneity issue would also be evident in the results from the laboratories that were used to develop the PALs. A low bias factor of 3 is significant in determining risk. Please address the effect of this low bias on the conclusions of this investigation.

44. Page 4-63, Sections 4.7.2.2 and 4.7.2.3. The second-round water PE sample results were not all within the PALs. 1,1,2,2-Tetrachloroethane and fluoranthene were recovered below the PALs. Please revise these sections and discuss the effect on the data.

45. Section 4.7. Please provide the field audit results specified in the SAP and discuss the effect of any findings on the data quality.

46. Page 4-64, Section 4.8. This section should also address the comparability of the onsite laboratory results and the associated fixed laboratory results.

47 Page 4-64, Section 4.8, Representativeness and Comparability. This text is inaccurate. Quality control sample frequency (method blanks, field duplicates and field blanks) defines contract compliance not representativeness and comparability.

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This section must be clearly thought out, researched, and rewritten.

48. Appendix H. Please provide a table in Section 4.8 that lists the total number of samples for each method and matrix, the number fully validated, and the percent validated. This table should verify the 10% Level D validation specified in the SAP. Based upon a cursory review, 10% Level D has not been reached for some methods and matrices.

49. Appendix H. Validated Volatiles Soil Data, SDG 803039. Although it is ideal to fully validate the first SDG of the field effort as was done here, a full validation of this SDG does not provide an assessment of the analytical data quality of any environmental samples collected at this location. All samples in this SDG are quality control samples where there are no detections (because they are field blanks). Many issues such as analyte identification cannot be verified when no environmental samples are validated. These should not be used when plan compliance frequency is determined. Please provide full validation frequency for all methods and matrices.

50. Appendix H, TPH-D Soil Data, SDG 804004. The Form Is are stamped U.S. Navy PACDIV IRP Validated Level. In fact, they are Level E validated. Please revise.

51. Appendix I, page 5, PAH table. Please verify that the upper PAL for pyrene is actually 11.4 µg/kg.

52. Appendix J, page 6, Section 2.1.1. Please verify that 30 sets of MS/MSDs were analyzed for a total of 30 VOC samples.

53. Appendix J, page 7, Section 2.2. Please correct the error in the sentence. As previously stated, MS/MSDs were analyzed in all 7 SDGs." Section 2.1 states there were 10 SDGs.

54. Appendix J, page 7, Section 2.2.1. Please present the QC limits in this section as they are presented in the sections for other analyses.

55. Appendix J, page 11, Section 3.1.2. An assessment of field duplicate sample differences should also include those with a detection in one sample and no detection in the field duplicate. A field duplicate pair in SDG 803059 shows a hit of 200 µg/kg of acenaphthene in one sample and a non-detect at 23 µg/kg in the other. Data associated with this sample should be qualified for imprecision.

56. Appendix J, page 16, Section 4.2.1. Table VI shows 10 %R exceedances for the LCS/LCSD samples. Please correct appropriately.

57. Appendix J, page 20, Section 5.2.2. Please explain the initial calibration procedure

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for Method 6010. Generally, a single calibration point and a blank are used to calibrate for metals.

58. Appendix J, page 22, Section 6.1.1. Please explain why a RPD of 200 does not constitute rejection of associated data.

59. Appendix J, page 23, first paragraph. Please explain why imprecision is considered minimal when the RPDs are so high. Also, qualify data associated with the field duplicates in SDG 803059. One sample was 340 mg/kg for TPH-D and the other was non-detect at 13 mg/kg.

60. Appendix J, pages 31 and 33, Sections 8.3 and 10.3. Representativeness of the analytical results is affected also by holding time exceedance. Please include a discussion in this section.

61. Appendix J. All holding time exceedances listed in Table IV should be discussed in the text of Appendix J.

62. Appendix J. The wet chemistry section should include nitrogen qualifications.

63. Appendix J, page 32, Section 9.0. The laboratory did not use standard analytical methods for 8270-SIM. Please present the variances to the method or the laboratory SOP.

64. Appendix J, page 34. The two TPH-gasoline rejected data points are not included in Table II. Please correct.

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