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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

SEP 28 1999

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Paul A. Rakowski, P.E., DEE
Head , Environmental Program Branch
Environmental Division,
Atlantic Division (LANTDIV), Code 182
Naval Facilities Engineering Command
1510 Gilbert Street
Norfolk, VA 23511-2699

Re: Naval Station Roosevelt Roads - EPA ID # PR2170027203

Revised Draft RCRA Facility Investigation (RFI) Report for Operable Units (OUs) 3 & 5 [SWMUs 1 (Army Cremator) and 2 (Langley Drive Disposal Site), and SWMUs 11 & 45 (Interior of Old Power Plant and exterior areas of Old Power Plant)]

Dear Mr. Rakowski:

The United States Environmental Protection Agency (EPA) Region 2 has completed its review of the above three volume document, transmitted on April 1, 1999 by Baker Environmental on behalf of the U.S. Navy. As you are aware, the Draft RFI report for OUs 3 & 5 had originally been submitted in March 1998. The Revised Draft has been extensively revised and resubmitted to address deficiency comments given in EPA's letter of November 24, 1998.

As part of our review of the revised and resubmitted RFI report, EPA requested our consultant, Booz Allen & Hamilton, to review certain portions of the revised report. As discussed in the enclosed Technical Review, Booz Allen raised a number of issues regarding the human health risk assessments submitted as part of the revised RFI report. However, EPA does not consider those issues significant enough to have a major impact on the overall conclusions and recommendations for the SWMUs investigated.

Therefore, EPA conditionally approves the OU 3 & 5 RFI report, subject to the comments in the enclosed Technical Review being addresses as part of the CMS reports for SWMUs 1 and 2, and SWMU 45. As you are aware, my letter of August 11, 1999 commented on the CMS workplans submitted for those three SWMUs on April 1, 1999 (by Baker Environmental on behalf of the

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Navy), and requested that revised workplans be submitted. Following, EPA's review and approval of those revised CMS workplans, implementation shall include submission of revised human health assessments for SWMUs 1, 2, and 45, addressing comments in the enclosed Technical Review.

Please telephone Mr. Tim Gordon, of my staff, at (212) 637- 4167 if you have questions regarding any of the above.

Sincerely yours,

Nicoletta DiForte

Nicoletta DiForte
Chief, Caribbean Section
RCRA Programs Branch

Enclosure

cc: Mr. Israel Torres, Attn. Ms. Luz Muriel-Diaz, PREQB, w/encl.
Ms. Madeline Rivera, NAVSTA Roosevelt Roads, w/encl.
Mr. Christopher Penny, LANTDIV, w/encl.
Mr. Thomas C. Fuller, Baker Environmental, w/encl.
Ms. Connie Crossley, Booz Allen, w/o encl.
Mr. John C. Tomik, CH2M Hill, w/o encl.

**TECHNICAL REVIEW OF THE RCRA FACILITY INVESTIGATION REPORT FOR OPERABLE UNIT 3/5**
**APRIL 1999**
**NAVAL STATION ROOSEVELT ROADS**
**CIEBA, PUERTO RICO**

## GENERAL COMMENTS

1. The Human Health Risk Assessment for Operable Unit 3/5 should include relevant topographic and land use maps, descriptions of site and surrounding land use, and discussions to support the chemical data groupings and exposure assessment assumptions (i.e., site-specific receptors, exposures pathways, or exposure parameters) used in the risk assessment. At a minimum, the risk assessment should provide references to the relevant text, tables, and figures provided in other sections of the RCRA Facility Investigation Report, including Section 2.0 which includes a description of the facility and background history, and Section 5.0 which includes a detailed characterization of the nature and extent of chemical contamination at the site. Based on the information provided in Sections 2.0 and 5.0, the risk assessment should provide rationale for the data groupings and exposure pathways selected for use in the risk assessment. The risk assessment should include a discussion of potential hot spots or plumes of chemical contamination identified in all evaluated media at the site, and should provide rationale for including or excluding hot spot or plume data groupings from evaluation in the risk assessment.

2. Based on the information provided in Section 5.6 (Determination/Demonstration of Statistical Representativeness), the risk assessment should include a discussion of potential data gaps at the site, and the potential effects of data gaps on the conclusions of the risk assessment. The risk assessment should identify additional data needs including the need for further chemical speciation of dioxins and furans at the site.

3. The exposure pathways, exposure parameters, and toxicity values included in the risk assessment, should be modified as detailed in the attached Specific Comments. Associated risk assessment calculations, text, tables, and conclusions and recommendations should be modified to reflect these changes.

4. The statistical representativeness section of the report was reviewed to assess the appropriateness of the statistics used and the conclusions drawn from the statistical analysis of the data. The data were analyzed to determine whether the two solid waste management units met screening criteria for the sites and to determine whether sufficient samples, by media on a per analyte basis, were tested for each data set. Review of the

data showed that the appropriate statistical analyses were performed on the data sets to satisfy the goals of the data analysis. The interpretation of the statistical results appears reasonable. Random testing of the statistical calculations revealed that they were accurate.

5. There are numerous instances in the data sets where the method detection limits of various analytes exceed the regulatory limits. This requires that the affected analytes be classified as contaminants of concern at a hazardous level without the analytes actually being detected in the samples. A more sensitive method of analysis must be used to overcome this situation or approval must be obtained from the regulators to use the method detection limit as the regulatory limit for decision making.

**TECHNICAL REVIEW OF THE RCRA FACILITY INVESTIGATION REPORT FOR OPERABLE UNIT 3/5**
**APRIL 1999**
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**CIEBA, PUERTO RICO**

## SPECIFIC COMMENTS

**Section 5.6.2.1, Determination/Demonstration of Statistical Representativeness, Page 5-56**

1. The second sentence in the second paragraph is in error. Additional samples are required for the two constituents when compared to the "residential RBCs" not to the "industrial RBCs" as indicated in the sentence.

**Tables 5-51 Through 5-72, Page 2 of 2**

2. A number of errors were found in a random sampling of these tables. For example in Table 5-56 the answer to whether the confidence interval is greater than the ERL screening value for mercury and silver should be "No" not "Yes." The answer to whether the confidence interval is greater than the ERL screening value for nickel should be "Yes" not "No." In Table 5-61 the answer to whether the 95% confidence mean sample concentration attains the EPA Region III BTAG screening level for arsenic should be "No" not "Yes." It is recommended that these tables be reviewed for accuracy.

**Table 5-61, Page 1 of 2**

3. The superscripts in this table should be defined.

**Section 6.1 COPC Selection Criteria, page 6-3**

4. The text states that the screening values used in the risk assessment were derived from the risk-based concentration (RBC) values issued by the USEPA Region III in October 1998. More recent USEPA Region III RBC values were issued in April 1999. Because RBC values are frequently updated and therefore continually changing, revising the risk assessment to reflect current RBC values is not necessary. However, the RBC values used in the risk assessment should be

the new tables were posted 4/12 after the report was submitted 4/1

reviewed, and the effects of any updated values on the results of the risk assessment should be addressed in the uncertainty section of the report. For example, based on the April 1999 RBC values, heptachlor would not have been selected as a chemical of potential concern (COPC) in groundwater at SWMU 1.

**Section 6.1 COPC Selection Criteria, page 6-6**

5. The text states that "essential nutrients need not be considered further in the baseline RA if they are present in relatively low concentrations (i.e., slightly elevated above naturally occurring levels), or if the constituent is toxic at doses much higher than those which could be assimilated through exposures at the site." The risk assessment appears to eliminate all detected essential nutrients from further evaluation in the risk assessment without comparing maximum detected nutrient concentrations to health-based screening criteria. Modify the text and associated tables to show comparisons of maximum detected nutrient concentrations in each medium and data grouping to appropriate screening criteria such as dietary Allowable Daily Intake Levels (ADIs). In cases where maximum detected concentrations of essential nutrients exceed screening criteria, qualitatively address the potential adverse health effects associated with the essential nutrient in the uncertainty section.

**Section 6.1 COPC Selection Criteria, Tables 6-2, 6-5, 6-6, 6-7, 6-15**

6. The RBC value for beta-BHC was used to screen concentrations of delta-BHC in the risk assessment. In addition, delta-BHC was selected as a COPC in sediment at SWMU 1. Although oral toxicity criteria exist for other BHC congeners (e.g., alpha-, beta-, and gamma-BHC), none has the same Class D weight-of-evidence as delta-BHC (i.e., the other BHC congeners are Class B2 and C carcinogens). Therefore, no other BHC congener should be used as a surrogate to evaluate delta-BHC. Modify the tables listed above to indicate that screening criteria do not exist for delta-BHC. Address the uncertainty associated with the evaluation of delta-BHC in the uncertainty section. Include a discussion of the potential effects of delta-BHC concentrations on the estimated risks at the site.

**Section 6.1 COPC Selection Criteria, page 6-3 and Tables 6-3, 6-8**

7. The text on page 6-3 indicates that non-carcinogenic RBC values used in the risk assessment are based on a hazard quotient (HQ) of 0.1, rather than 1.0. Tables 6-3 and 6-8 show a RBC value of 0.15 ug/L for chloroform in groundwater (calculated based on carcinogenic toxicity criteria). It should be noted that the non-carcinogenic RBC value for chloroform in groundwater based on a HQ of 0.1 is equal to 0.063 ug/L. According to guidance provided in USEPA's RBC Table, RBCs are based on standard exposure scenarios and either carcinogenic or non-carcinogenic toxicity criteria, whichever results in a lower value. Since the noncarcinogenic RBC value for chloroform (0.063 ug/L) is lower than the

carcinogenic RBC value (0.15 ug/L), the noncarcinogenic RBC value should be used in the risk assessment.

**Section 6.1 COPC Selection Criteria, page 6-4**

8. The second paragraph on page 6-4 states "Therefore, the most conservative TEFs for the 2,3,7,8-congeners (cited in Section 6.2.3.5) corresponding to detected total PCDDs and PCDFs were applied to the Region III industrial and residential soil RBCs for 2,3,7,8-TCDD to give the following toxic equivalent dioxin/furan RBCs (ug/kg): total hexachlorodibenzo-p-dioxin (HxCDD) - 0.38/0.043; ..."

   Modify this sentence to clarify that the values "0.038/0.043" correspond to the "industrial/residential" soil RBCs. In addition, please note that Section 6.2.3.5 does not exist in the risk assessment document. Modify the text to include the most conservative Toxicity Equivalence Factors (TEFs) for the 2,3,7,8-congeners.

**Section 6.1 COPC Selection Criteria, Tables 6-13**

9. Modify the ninth column of Table 6-13 to indicate that mercury was selected as a COPC in groundwater at SWMU 45.

**Section 6.1 COPC Selection Criteria, Tables 6-15**

10. Modify Table 6-15 "Summary of Chemicals of Potential Concern" to reflect the following:

    a) Phenol, chromium, copper, selenium, and silver were not selected as COPCs in sediment at SWMU 1.
    b) Cadmium, copper, and silver were not selected as COPCs in surface water at SWMU 2.
    c) Benzo(a)anthracene, benzo(a)pyrene, and chrysene were selected as COPCs in groundwater at SWMU 45.
    d) Both chromium and chromium VI were analyzed for and selected as COPCs in groundwater at SWMU 1.

**Section 6.2.3 Potential Human Receptors and Exposure Pathways, page 6-28**

11. The risk assessment (page 6-28 and Table 6-17) indicates that on-site workers were assumed to ingest 0.05 L/hr of surface water per hour for 8 hr/day. According to USEPA's Risk Assessment Guidance for Superfund, Volume I (RAGS) (USEPA, 1989), a surface water ingestion rate of 0.05 L/hr is typically associated with a swimming scenario. Revise the text on page 6-28 to identify and describe the specific water surface water bodies to which on-site workers may be exposed at each of the evaluated SWMUs. This discussion should include the

type of the water body being evaluated (e.g., pond, stream, creek), the depth of the water body, and the accessibility of the water body. Provide rationale for the on-site worker surface water exposure pathways and parameters selected for use in the risk assessment. Provide further discussion of the uncertainty associated with these assumptions in the uncertainty section.

12. Modify the second complete paragraph of page 6-28 to indicate that exposures to transient naval personnel who temporarily reside next to SWMU 1 would be lower than exposures to trespassers already evaluated in the risk assessment, and therefore the associated risks to transient naval personnel would likely also be lower.

**Section 6.2.5 Quantitation of Exposures, page 6-29**

13. Page 6-32 indicates that the exposure point concentrations (EPCs) used in the risk assessment were calculated based on the normal 95% upper confidence limit (UCL) of the arithmetic mean of the data, even when statistical analyses showed that the data were log normally distributed. According to US EPA's *Supplemental Guidance to RAGS: Calculating the Concentration Term* (OSWER Publication 9285.7-08I, May 1992), most soil data sets are lognormally distributed rather than normally distributed, and it is reasonable to assume that Superfund sampling data are log normally distributed. The EPA guidance states that a normal 95% UCL should be used only when a statistical test supports the assumption that the data are normally distributed. Since the risk assessment already includes statistical analyses to determine the distributions of the data for each chemical (presented in Appendix H of the report), the risk assessment should be revised to include EPCs that are based on the appropriate distribution. Furthermore, Section 6.2.5 should be revised to include a table summarizing the EPC selection process for each COPC. This table should show 1) whether the data for each COPC were determined to be normally or log normally distributed, 2) the normal or log-normal 95% upper confidence limit (UCL) on the arithmetic mean concentration, 3) the maximum detected concentration, and 4) the selected EPC value.

**Section 6.2.5.2.1 Soil and Sediment, page 6-36**

14. Page 6-36 indicates that air concentrations of chemicals in fugitive dust emissions were estimated using a particulate emission factor (PEF) of $1.32 \times 10^9$ $m^3/kg$. This PEF value is a default value provided in USEPA's Soil Screening Guidance: User's Guide (USEPA, 1996). It should be noted that the PEF value is intended to be a site-specific value, and is easily calculated for each site using source area, city, climatic zone, percent vegetative cover, and mean annual windspeed. Since the risks associated with inhalation of COPCs in fugitive dust for Operable Unit 3/5 are low, it is not necessary to recalculate risks using the site-specific PEF. However, the uncertainty associated with using the default PEF should be addressed in the uncertainty section.

**Section 6.2.5.2 Calculation of Chronic Daily Intakes, page 6-33**

15. Modify Section 6.2.5.2 to include a subsection presenting the equations and input parameters used in the calculation of CDIs/DADs for the surface water exposure pathways evaluated in the risk assessment.

**Section 6.2.5.3 Exposure Factors Used to Derive Chronic Daily Intakes, page 6-39**

16. Section 6.2.5.3 provides an inadequate level of site-specific information to support the selection of site-specific exposure parameters for use in the risk assessment. According to Tables 6-17 through 6-20, the following exposure parameters were selected based on "best professional judgement": on-site worker exposure frequencies; trespasser exposure frequency, duration and time, and fraction of soil ingested; construction worker fraction of soil ingested; and residential exposure frequency and time. In addition, the skin surface area available for trespasser and residential exposures was based on a percent of the total skin surface area, without a rationale for the percent value selected. Modify the text to identify the site-specific features or special considerations that were used to select site-specific parameters.

    For example, on Table 6-18, best professional judgement was used to select an adult exposure frequency of 15 days/year for exposures to surface soil, surface water, and sediment at each SWMU. Revise the text to indicate how the value of "15 days" was derived based on the number of days of exposure assumed per month, the number of months per year, etc. Indicate whether there are similarities or differences between the various SWMUs that would influence the frequency of exposure at each SWMU. Identity special features such as vegetative cover, fencing, or seasonal changes (e.g., snow cover) that would influence exposure frequencies. Identify the specific surface water bodies to which receptors may be exposed at each SWMU and discuss the manner in which exposures to surface water would occur (e.g., while wading or swimming).

**Section 6.2.5.3 Exposure Factors Used to Derive Chronic Daily Intakes, Tables 6-17 through 6-20**

17. Several values for skin surface area selected for use in the risk assessment were obtained from USEPA's 1992 guidance document *Dermal Exposure Assessment: Principles and Applications*. All skin surface values should be reviewed in light on more recent guidance provided in USEPA's August 1997 *Exposure Factors Handbook*. Since modifications to skin surface area values are not likely to alter the conclusions of the risk assessment, it is not necessary to revise the quantitative risk calculations. However, the potential effects of using more current skin surface values on the risk estimations should be qualitatively addressed in the uncertainty section.

**Section 6.2.5.3 Exposure Factors Used to Derive Chronic Daily Intakes, Table 6-17**

18. Table 6-17 indicates that the ingestion rate of 0.05 L/hour used to evaluate on-site worker ingestion of surface water was obtained from RAGS (USEPA, 1989). Please note that Section 6.6.1, page 6-34, of this USEPA guidance recommends using an ingestion rate of 0.05 L/hour to evaluate residential exposures to surface water while swimming, and states that workers are not expected to be exposed via this pathway. Either eliminate on-site worker ingestion exposures to surface water from evaluation in the risk assessment, or modify the reference on Table 6-17 to indicate the ingestion rate is based on best professional judgement and provide supporting rationale.

**Section 6.2.5.3 Exposure Factors Used to Derive Chronic Daily Intakes, Table 6-18**

19. Table 6-18 indicates that the ingestion rate of 0.5 L/hour used to evaluate trespasser ingestion of surface water was obtained from RAGS (USEPA,1989). This appears to be a typo in the risk assessment. The risk assessment calculation tables in Appendix I show an assumed value of 0.05 L/hour.

20. Table 6-18 indicates that the body weight of 37 kg used to evaluate trespasser exposures was obtained from RAGS (USEPA, 1989). Please cite the RAGS page reference for this value, or modify the reference on Table 6-18 to indicate the body weight is based on best professional judgement and provide supporting rationale.

**Section 6.2.5.3 Exposure Factors Used to Derive Chronic Daily Intakes, Table 6-20**

21. Table 6-20 indicates that an exposure duration of four years used to evaluate adult and child residential exposures was obtained from USEPA's 1991 guidance document *Risk Assessment Guidance for Superfund Volume I. Human Health Evaluation Manual Supplemental Guidance. "Standard Default Exposure Factors." Interim Final.* Please note that Section 2.1, page 5, of this USEPA guidance states "In terms of exposure duration, the resident is assumed to live in the same home for 30 years. In the EFH [Exposure Factors Hanbook], this value is presented as the 90$^{th}$-percentile for time spent at one residence. (Please note that in the intake equation, averaging time (AT) for exposure to non-carcinogenic compounds is always equal to ED; whereas, for carcinogens a 70 year AT is still used in order to compare to Agency slope factors typically based on that value)." Modify Table 6-20 to indicate that an exposure duration of 30 years and averaging time of 10,950 days will be used for adult residents, and an exposure duration of 6 years and averaging time of 2,190 days will be used for child residents. Modify all associated risk assessment calculations, data summary tables, text, and conclusions to reflect these required changes.

22. Table 6-20 indicates that the exposure time of 2.6 hours/day used to evaluate

residential exposures to surface water was obtained from RAGS (USEPA, 1989). Please cite RAGS page reference for this value, or modify the reference on Table 6-20 to indicate the exposure time is based on best professional judgement and provide supporting rationale.

23. Table 6-20 indicates that the inhalation rate of 0.83 m3/hr used to evaluate child resident exposures to fugitive dusts was obtained from USEPA's 1991 guidance document *Risk Assessment Guidance for Superfund Volume I. Human Health Evaluation Manual Supplemental Guidance. "Standard Default Exposure Factors." Interim Final.* Please note that Section 2.3, page 6, of this USEPA guidance indicates that this inhalation rate is representative of adult resident exposures. Modify Table 6-20 to indicate that the adult inhalation rate was conservatively used to evaluate child resident inhalation exposures. Discuss the related uncertainties in the uncertainty section.

**Section 6.3 Toxicity Assessment, page 6-39, Table 6-21**

24. Section 6.3.2 (page 6-40) indicates that toxicity criteria were obtained from IRIS, HEAST, or NCEA. Modify the text and/or Table 6-21 to cite the source and date of the toxicity criteria used for each COPC. Since the IRIS database is frequently updated, indicate the date (day and month) on which the toxicity criteria used in the risk assessment were obtained from the IRIS database.

25. Table 6-21 lists the target organs and critical effects associate with oral noncarcinogenic toxicity criteria for each COPC. IRIS provides critical effect data for both oral and inhalation noncarcinogenic toxicity criteria. Modify Table 6-21 to include the target organs and critical effects associate with inhalation noncarcinogenic toxicity criteria for each COPC

26. Delete the toxicity criteria for delta-BHC from Table 6-21. (See Specific Comment 6). Modify all associated risk assessment calculations, data summary tables, text, and conclusions to reflect this required change.

27. Revise the text in Section 6.3 to identify the COPCs, including delta-BHC, isodrin, lead, and mercury, that can not be quantitatively evaluated in the risk assessment due to a lack of toxicity criteria.

28. Include a footnote on Table 6-21 indicating that the toxicity criteria for hexavalent chromium were conservatively used to assess chromium exposures, although not all chromium at the site is expected to be in this form.

**Section 6.3.3 Dermal Absorption Efficiency, page 6-41, Table 6-21**

30. Section 6.3.3 (page 6-41) states "The oral absorption efficiencies were obtained from sources such as the NCEA, IRIS, Agency for Toxic Substances and Disease

Registry (ATSDR) toxicological profiles, toxicity publications, toxicology references, and USEPA Regional Offices." The text also indicates that USEPA Region IV default oral absorption efficiencies were used where published information was not available.

a) Modify the text and/or Table 6-21 to cite the source of the oral absorption factors used to adjust the oral toxicity criteria for each COPC.

b) In cases where oral absorption factors were obtained from sources other than ATSDR, indicate why preference was given to the selected source.

c) For the following COPCs, replace the USEPA Region IV default oral absorption factors with the indicated ATSDR values. Modify all associated risk assessment calculations, data summary tables, text, and conclusions to reflect these required changes.

1,1,2,2- Tetrachloroethane – ATSDR 1994; Absorption factor = 100%
Trichloroethane – ATSDR 1991; Absorption factor = 100%
Bis(2-ethylhexyl)phthalate – ATSDR 1993; Absorption factor = 25%
Phenol – ATSDR 1989; Absorption factor = 95%
4,4-DDE – ATSDR 1994; Absorption factor = 70%
4,4-DDT – ATSDR 1994; Absorption factor = 70%
total HxCDD – ATSDR 1992; Absorption factor = 60%
total HxCDFD – ATSDR 1992; Absorption factor = 60%
total TCDF – ATSDR 1992; Absorption factor = 60%
total PeCDF – ATSDR 1992; Absorption factor = 60%
Aluminum – ATSDR 1992; Absorption factor = 27%
Antimony – ATSDR 1992; Absorption factor = 10%
Beryllium – ATSDR 1993; Absorption factor = 0.9%
Cobalt – ATSDR 1992; Absorption factor = 40%
Selenium – ATSDR 1989; Absorption factor = 97%
Silver – ATSDR 1990; Absorption factor = 50%
Thallium – ATSDR 1992; Absorption factor = 100%
Vanadium – ATSDR 1992; Absorption factor = 3%

Table 6-21 presents an oral absorption factor of 50 percent for the carcinogenic polycyclic aromatic hydrocarbons (PAHs). In addition, the risk assessment provides a quantitative evaluation of exposures to carcinogenic PAHs through the dermal exposure pathway. According to RAGS (USEPA, 1989) (page 7-16), "It is inappropriate to use the oral slope factor to evaluate the risks associated with dermal exposure to carcinogens such as benzo(a)pyrene, which cause skin cancer through a direct action at the point of application. These types of skin carcinogens and other locally active compounds must be evaluated separately from the above method. Generally only a qualitative assessment of risks from dermal exposure to

these chemicals is possible." Revise Table 6-21 to indicate that toxicity criteria are not available to evaluate dermal exposures to carcinogenic PAHs. Modify all associated risk assessment calculations, data summary tables, text, and conclusions to reflect this required change.

**Section 6.3.4 Evaluation of Dioxin/Furans, page 6-41, Table 6-21**

31. The second complete paragraph on page 6-42 states "Since CSFs have not been derived by the U.S. EPA for the remaining six PCDDs and ten PCDFs that are also of toxicological significance, a procedure has been developed which incorporates the cancer potencies of these compounds relative to that of 2,3,7,8-TCDD to obtain 2,3,7,8-TCDD TECs. This is done by multiplying the measured concentration of each congener by its established relative potency factor, or TEF." There is no indication, on either Table 6-21 or the risk calculation tables in Appendix I, that this procedure was applied in the risk assessment. Modify the text in Section 6.3.4 to indicate that this procedure was applied in the risk assessment. Modify all associated risk assessment calculations, data summary tables, text, and conclusions as necessary to reflect the use of 2,3,7,8-TECs.

**Section 6.4. Risk Characterization, page 6-42**

32. On the risk characterization tables in Appendix I, chromium was omitted as a COPCs in surface water at SWMU2. Revise the relevant risk calculation tables to indicate that chromium as a COPC in this medium and data grouping. Modify all associated risk assessment calculations, data summary tables, text, and conclusions to reflect this required change.

33. On the risk characterization tables in Appendix I, antimony was omitted as a COPC in groundwater at SWMU 45. Revise the relevant risk calculation tables to include antimony as a COPC in this medium and data grouping. Modify all associated risk assessment calculations, data summary tables, text, and conclusions to reflect this required change.

**Section 6.5.6 Constituents Not Quantitatively Evaluated, page 6-58**

34. Section 6.5.6 states that "based on the conservative nature of the risk assessment, it is unlikely that the lack of promulgated toxicological indices for isodrin, mercury, or lead will result in the underestimation of risk." Revise Section 6.5.6 to provide additional information supporting this conclusion.

    Specifically, revise the text to include a discussion of the frequency and magnitude at which lead concentrations in surface soil, subsurface soil, or sediment exceeded US EPA's residential soil screening level of 400 mg/kg, and lead concentrations in groundwater exceeded US EPA's drinking water action level of 15 ug/L. For each SWMU with lead concentrations exceeding relevant

screening criteria, address the potential adverse health effects associated with non-residential adult exposures to lead-contaminated media at that SWMU. Procedures to assess these risks are outlined in US EPA's *Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil* (Technical Workgroup for Lead, December 1996).

Revise the text to include a qualitative and semi-quantitative evaluation of the potential adverse health effects associated with exposures to mercury. Note that an oral reference dose (RfD) of 3E-4 mg/kg-day for inorganic mercury was withdrawn from HEAST and an oral RfD of 1E-4 mg/kg-day for methyl mercury is provided in IRIS. Discuss the presence of mercury in its inorganic and organic forms at the site. Estimate risks based on the relevant toxicity criteria.

**Section 6.6 Summary of Risk Assessment Results, page 6-58**

35. Section 6.6 provides a lengthy discussion of the COPCs contributing to high risk and hazards in each medium and data grouping evaluated at the site. From this discussion, is difficult to extract the most significant COPCs contributing to high risks and hazards at the site. Revise Section 6.6. to include a table summarizing the predominant chemicals associated with high risks or hazards in each medium and data grouping, and for each exposure pathway. This table may also be used to indicate which of the predominant inorganic COPCs identified at the site were detected at concentrations within background levels.

## SECTION 7.0 CONCLUSIONS AND RECOMMENDATIONS

36. Revise Section 7.0 to reflect the modifications resulting from the Specific Comments on Section 6.0 (Human Health Risk Assessment).

37. Revise Section 7.0 to identify areas where high risks were associated with total dioxin/furan measurements. Discuss the need for additional sampling to identify the specific dioxin/furan congeners present at the site.

**Section 7.2.1 SWMU 1, page 7-3**

40. The text (page 7-3) states "The risk assessment performed on the site data indicated that there were potential unacceptable health risks posed to: Current on-site commercial/maintenance workers; Future on-site residents. The risk assessment indicates that there is no imminent risk posed by SWMU 1."

    Modify the text to state " The risk assessment performed on the site data indicated that there were potential unacceptable health risks and/or hazards posed to: Current on-site commercial/maintenance workers; Future on-site residents; and Future Construction Workers." In addition, delete the sentence "The risk

assessment indicates that there is no imminent risk posed by SWMU 1." Revise the text to indicate the cumulative risks to current on-site workers exceeded USEPA's target risk range of $1x10^{-6}$ to $1x10^{-4}$ and the cumulative hazard index exceeded one.

**Section 7.2.2 SWMU 2, page 7-6**

41. The text (page 7-6) states "The risk assessment performed on the site data indicated that there were potential unacceptable health risks posed to: Current on-site commercial/maintenance workers; Future on-site residents. The risk assessment indicates that there is no imminent risk posed by SWMU 2."

    Modify the text to state " The risk assessment performed on the site data indicated that there were potential unacceptable health risks and/or hazards posed to: Current on-site commercial/maintenance workers; Future on-site residents; and Future Construction Workers." In addition, delete the sentence "The risk assessment indicates that there is no imminent risk posed by SWMU 2." Revise the text to indicate the cumulative risks to current on-site workers exceeded USEPA's target risk range of $1x10^{-6}$ to $1x10^{-4}$ and the cumulative hazard index exceeded one.

**Section 7.2.1 SWMU 1, page 7-1**

42. The final paragraph (page 7-6) states "The only unacceptable human health risks calculated were for "Current on-site commercial/maintenance workers" and for "Future on-site residents."" Revise this sentence to state "The only unacceptable human health risks and/or hazards calculated were for "Current on-site commercial/maintenance workers," "Future construction workers," and "Future on-site residents."" In addition, modify the second to last sentence in this paragraph to indicate that the hazard index associated with future construction worker ingestion exposures to subsurface soil was greater than one (due to iron, manganese, and thallium).

**Section 7.2.2 SWMU 2, page 7-3**

43. Expand Section 7.3.2 to address the same issues identified above for SWMU 1 (See Comment 40).

**Section 7.2.3 SWMU 45, page 7-9**

44. Revise Section 7.2.3.4 to include a brief summary of the results of the risk assessment.