UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
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April 8, 2004

Thomas Macchiarella
BRAC Operations, Code 06CA.TM
Department of the Navy, Southwest Division
Naval Facilities Engineering Command
1230 Columbia Street, Suite 1100
San Diego, CA 92101

RE: **Draft Remedial Investigation Report for IR Site 28, Todd Shipyards, Alameda Point**

Dear Mr. Macchiarella:

EPA has reviewed the above referenced document, prepared by Bechtel Environmental, Inc, and submitted by the Navy to EPA on February 13, 2004. The Remedial Investigation Report is very well written and nicely organized and presented. Our major concerns with the document are that it does not include the ingestion of groundwater in the baseline human health risk assessment, and that the conclusions presented in the Report underestimate ecological risk. These concerns should be fairly easy to address in the draft final Remedial Investigation Report.

Our other concerns are detailed in the enclosed comments. Please call me at (415) 972-3029 if you would like to discuss the comments further.

Sincerely,

Anna-Marie Cook

Anna-Marie Cook

enclosure

cc list: Jennifer Stewart, SWDiv
Marcia Liao, DTSC
Judy Huang, RWQCB
Elizabeth Johnson, City of Alameda
Lea Loizos, Arc Ecology
Jean Sweeney, RAB Co-Chair
Karla Brasaemle, TechLaw Inc
Sophia Serda, USEPA

EPA Review of the Draft Remedial Investigation Report, IR Site 28, Todd Shipyards, Alameda Point, February 2004

GENERAL COMMENTS

1. The document is very well written, nicely organized, and appears to have had a very thorough QA/QC performed on spelling, grammar and other editorial type items prior to being released. The figures and tables are very useful and well presented which greatly assists in reviewing and summarizing the findings presented in the text of the document.

2. In July 2002, the BCT, in response to concerns expressed by the RAB and community members, agreed to perform a baseline Human Health Risk Assessment for all IR sites and present this baseline HHRA in all the Remedial Investigation Reports. This revision in the approach to the risk assessment required the Navy to recalculate the HHRA for Site 14 (which is similarly located in proximity to Oakland Inner Harbor as Site 28) to include the ingestion of groundwater pathway. This allowed the Navy, the agencies and the public to determine whether institutional controls or another remedy should be evaluated for this pathway in the Feasibility Study. All subsequent Remedial Investigation Reports at Alameda Point contain a baseline HHRA that includes the ingestion of groundwater pathway.

   The HHRA for Site 28 needs to be recalculated to bring this site into line with all other Alameda Point IR sites' HHRAs and to be able to determine whether any remedial action (including institutional controls) is necessary to address groundwater exposure through the ingestion pathway. Please remove the sections in the document referring to dedesignation of the groundwater beneath Site 28. This discussion is inappropriate in the Remedial Investigation report. Firstly, a baseline risk assessment including ingestion of groundwater needs to be calculated regardless for all IR sites. Secondly, the proposed dedesignation has been on the table for approximately ten years, so it is unknown when the dedesignation will be approved. In addition, the RWQCB's proposed dedesignation does not yet include Site 28. Finally, the EPA's Guidelines for Groundwater Classification are more stringent than the California RWQCB's classification criteria and so would supercede any decision the RWQCB made on this aquifer with respect to aquifer protection. The proposed dedesignation by the State may be one of the arguments presented in the Feasibility Study report to support clean up of the groundwater to Remedial Action Objectives that are less stringent than MCLs. For a well written discussion on the groundwater classification at Alameda Point, please review Section 2.3.2 of the Operable Unit 2A Remedial Investigation Report.

3. EPA disagrees with the logic and conclusions presented in the document that copper in groundwater poses no threat to aquatic life. Allowing for dilution as the copper enters the Oakland Inner Harbor does not address the problem of mass loading of contaminants to the Bay.

4. The work done by the Navy in the Offshore Sediment program needs to be summarized and connected to the information in this document. Otherwise there is a large data gap concerning the effects of soil and groundwater contamination from onshore sources on the offshore environment. This problem of a lack of connection between the onshore and offshore contamination is recurring for all IR sites where the remedial investigations have been done separately and is not unique to the IR 28 report.

5. There are several places where the text indicates that the presence of organotin compounds indicates that metals in soil are related to shipyard waste, but organotin compounds have only been used as biocides in paint since the 1960s and only came into common use in the 1970s. Other metals, like mercury, copper, and zinc were used as anti-fouling agents prior to the introduction of organotins for this purpose. In some cases, the presence of lead, which is also a common constituent of paint, mercury, copper, and zinc were shown to be correlated; this substantiates the statement that metals detected in soil were associated with shipbuilding and repair activities. Please revise the text to include a discussion of other metals that were used as anti-fouling agents.

SPECIFIC COMMENTS

1. **Page ES-3, fourth paragraph**: Please delete this paragraph for the reasons described in General Comment #1.

2. **Page ES-7, fourth paragraph, last sentence**: Please delete this sentence.

3. **Page ES-8, Fate and Transport Mechanisms, last bullet**: Why is the influx of groundwater into the storm sewer considered unlikely? The report states that nothing is known about the condition of storm sewers or even if they exist beneath this site. The "unmarked" outfall appears to have not been sampled and it is not known whether any storm sewer conduits lead to this outfall. The outfall is, however, near areas of higher contamination in soil at this site, and so merits sampling.

4. **Page ES-9, first paragraph**: Please delete this paragraph for the reasons described in General Comment #1, and include ingestion of groundwater in the baseline HHRA.

5. **Page ES-11, second bullet**: Explain why copper is not included in this list of COPCs. It is above the PRG in soil at locations near the shoreline and is present in the groundwater at levels that present a threat to aquatic life. To diminish the levels in groundwater, the soil source will need to be addressed as well.

6. **Page ES-12, third paragraph, last sentence**: Please delete this sentence. It is inappropriate to use a potential future course of action as a reason to omit an exposure pathway in a remedial investigation.

7. **Page ES-12, second to last paragraph, last two sentences**: Does the offshore program have sampling results from the "unnamed outfall"? If there are not results from this location, then there is a data gap that needs to be answered prior to making the assertions in these sentences.

8. **Section 1.3.3.1, Historical Ownership and Operations, Page 1-5:** The text states that the impoundment south of IR-28 appeared after 1971, but does not describe a similar feature located within the IR-28 boundaries. This feature can be seen north of the impoundment (next to the shore) and has the same appearance as the impoundment on figures A-14 and A-15. This feature actually was constructed before the impoundment, and first appears on the 1946 aerial photograph when there is a narrow north-south strip of land that isolates this area from the Oakland Inner Harbor. This feature can be seen on all aerial photographs from 1946 through 1988 except for those photographs that are too dark to show this feature. The fact that this area was isolated from the bay and is located near the outfall identified during the field investigation may indicate that this feature also functioned as a repository for bilgewater or that it possibly functioned as an oil-water separator. Please discuss this feature in the text. Also, it is not clear whether any of the borings intercepted this feature. Please compare the location of this figure on the aerial photographs with the locations of soil borings and discuss whether any borings were completed within the boundary of this feature.

9. **Page 1-13, Storm Drain Investigation section**: It is unclear whether the storm sewer maps did not include Site 28 because the Site was not owned by the Navy or because there were no storm sewers at the Site. Is it definitely known that no storm sewers cross Site 28 and if so, how? It is also unclear upon what information the claim that the "unnamed outfall" has no known connection to the storm sewers is made. It appears to be circular logic to claim that due to an ownership issue no storm sewers beneath Site 28 were mapped and then say that since there are no maps showing the outfall connected to a storm sewer, it must not be connected at all.

10. **Table 3-1, Step 1**: This step needs to be revised to include the ingestion of groundwater pathway. Any reasons for not considering this pathway a likely source of exposure in the future are appropriate for discussion in the Feasibility Study and not the Remedial Investigation phase. The groundwater classification under the federal guidelines does not change.

11. **Page 3-7, third bullet**: Was the utility clearance used to confirm the existence, or lack thereof, of storm sewer conduit, particularly with respect to the unnamed outfall?

12. **Section 3.3, Deviations from the Work Plan, Page 3-11, and Section 4.1.1, Soil Investigations, Pages 4-1 through 4-3:** Section 3.3 does not include all of the deviations from the work plan. According to the text on page 4-3, the work plan specified organotin analyses for 6 shallow and 4 deep samples, but 10 shallow and 3 deep samples were analyzed. Also, the text in Section 4.1.1 indicates that 3 deep polynuclear

aromatic hydrocarbons (PAH) samples (page 4-2) and one other deep sample (page 4-3) could not be collected because of obstructions. Please revise Section 3.3 to include all deviations from the work plan.

13. **Section 4.1.2.5, Organotin Compounds, Page 4-10 and Figure 4-8, Results for Organotin Compounds in Soil:** It is unclear why human health screening criteria were used to evaluate the organotin data, since organotins are an ecological issue and some samples were collected a few feet from the shoreline. Please explain why human health criteria were used rather than ecological criteria.

14. **Table 4-2**: It would be helpful to know the detection limit on this table and also the number of samples where the detection limit is above the residential PRG. It would also be useful to know the number of samples that were detected above the PRG versus the number of samples above the detection limit. The column giving the percentage of samples reported above the detection limit is redundant since we have the number of total samples and the number of samples above the detection limit.

15. **Figure 4-17, Results for Mercury in Soil:** It is not clear why sample 215-002-002 is not designated with the symbol used for mercury detections above the Residential PRG, since the detected concentration in the 3 foot sample was 210 mg/kg and the PRG is 23 milligrams per kilogram (mg/kg). Please resolve this discrepancy.

16. **Section 4.1.3.5, Metals, Pages 4-18 and 4-19:** The correlation between lead, copper, zinc and mercury is interesting because copper, zinc and mercury were metals that historically were added to paint as anti-fouling additives. These metals were used before the organotins came into common use as anti-fouling additives in the 1970s. Since lead is also a constituent of marine paint, it is likely that this suite of four metals represents historic contamination from shipyard operations. Please discuss the use of these metals as anti-fouling additives and constituents of marine paint as a probable source of these metals.

17. **Page 4-18, 4-19**: How do the location of metals hits correlate to the location of the buried railway cars and tracks?

18. **Page 4-21**: Why was lead not sampled for in groundwater when it was a COC in soil?

19. Page 4-22, second paragraph: Please delete this paragraph for the reasons described in General Comment #1.

20. **Table 4-5**: Lead in groundwater needs to be sampled for.

21. **Page 4-29, first paragraph**: Please delete this paragraph for the reasons described in General Comment #1.

22. **Page 4-29, Volatile Organic Compounds section**: If MTBE is leaking from a neighboring property under Site 28 it must be addressed. MTBE may be considered a CERCLA contaminant, and at the minimum would end up needing a RWQCB approved clean up.

23. **Page 4-30**: For comparison purposes, it would be helpful to give the Alameda Point 95th UCL background concentration, since the range of each inorganic is fairly large. Falling within the range of background does not mean the samples are all below the background range, but having the 95th UCL available would help when comparing site data ranges.

24. **Page 4-31, last paragraph**: Please revise this paragraph to reflect General Comment #1.

25. **Page 4-32: first paragraph**: Please delete the last sentence of this paragraph.

26. **Section 4.3.2, Metals, Page 4-32:** The text states that metals in groundwater are not correlated with metals in soil, but no information has been provided to support this statement. It appears that although soil from the monitor well borings was not analyzed for metals, high concentrations of copper have been detected in soil samples collected from the eastern portion of the site, so it is possible that the copper detected in groundwater samples collected from 28SW03 and 28SW04 may be related to the presence of metals in soil. Similarly, high concentration of arsenic have been detected in the southeast corner of the site, so the elevated concentrations in groundwater from 28SW04 may be related to the presence of arsenic in soil. In addition, this site was used as a shipyard, so it is possible that activities associated with the shipyard did impact site soil. Please revise the text to discuss the elevated concentrations of metals in soil in the eastern part of the site and the possible correlation with elevated concentrations of metals in groundwater.

27. **Page 4-32, last paragraph**: It seems that the source of the very high levels of arsenic in groundwater still needs to be further investigated.

28. **Page 5-2, Section 5.1.2**: Please address the high levels of lead in soil?

29. **Page 5-5, first paragraph, Section 5.2.5**: The results of sediment sampling at the unnamed outfall should be briefly discussed here (see General Comment # 4).

30. **Section 5.3.1.1, Polynuclear Aromatic Hydrocarbons, Page 5-6:** The meaning of the statement that, "PAHs also tend to be electrochemically stable" in the context of chemical mobility is unclear because electrochemical properties are not usually related to chemical mobility in soils. Electrochemical properties are related to oxidation/reduction chemical reactions, whereas mobility (or sorption coefficients) are a function of molecular weight and polar groups on the molecule. Polar groups such as alcohol or carboxylic acid groups do allow PAH structures to be transformed more readily, but other polar groups such as fluoride and chloride functionalities make the structures more

resistant to oxidative biotransformation. A major factor in the persistence of PAHs is the molecular weight, as demonstrated by the fact that lower molecular weight structures are more soluble and therefore more bioavailable for microbial transformation processes. Please consider the information presented in this comment and revise or delete the quoted statement as necessary.

31. **Section 5.3.2.4, Mobility of Arsenic and Manganese, Pages 5-13 through 5-15:** This discussion of the estimated rate of movement of manganese and arsenic in groundwater is speculative because it combines limited site specific data with literature data. The extent to which literature data is applicable to the site is unclear. For example, the cited distribution coefficients (Kd) are maximum and mean values from a literature compilation but it is not known whether the soil and water conditions of the literature (experimental) data are indeed comparable to the actual soil and water geochemical site conditions in this estuarine system. In particular, site groundwater is likely of varying salinity and the geochemistry is variable as demonstrated by site specific measurements. In addition, arsenic and manganese have already been detected in 28SW02 above the Federal Maximum Contaminant Level (MCL) or Region 9 Tap Water PRG, respectively, so these metals are apparently more mobile than the calculations suggest. Please validate the discussion with site-specific distribution coefficients or other information that indicates that the experimental conditions cited in literature match those at Site IR-28 or delete this discussion.

    Further, the speciation of arsenic based on Eh/pH measurements is also speculative, and some actual speciation data of arsenic in groundwater is necessary to support the conclusions. If arsenic speciation data is available, please present it; otherwise, please delete this argument.

32. **Page 5-15, last bullet**: There is no support provided in the RI for this conclusion.

33. **Page 6-1, last paragraph**: Please delete this paragraph for the reasons described in General Comment #1.

34. **Page 6-2, Section 6.2.1**: EPA believes that most of the EBS data were validated and the data gap sampling effort was in part to verify the EBS findings. Since EBS data is of sufficient quality upon which to base RCRA clean up decisions, it seems it would also work for the CERCLA program. Please provide better justification for not using EBS data in the risk assessments.

35. **Page 6-6, first bullet**: Please include ingestion of groundwater as part of the residential HHRA.

36. **Table 6-7**: It would be much more informative to have the Alameda Point 95th UCL background number presented in the first column for the inorganics section of the table

rather than the more cryptic NS. The text already states that any inorganic compound not statistically greater than background was eliminated as a COPEC.

37. **Table 6-8**: Lead is missing from this table and is a data gap.

38. **Page 6-36, Section 6.4.2.2 and Table 6-14**: How was lead evaluated?

39. **Section 6.4.4**: Lead in soils showed an unacceptable risk to terrestrial wildlife, but was not evaluated for aquatic life.

40. **Page 6-44, last paragraph**: EPA disagrees with the conclusion that no further investigation or assessment of ecological risk should be performed for Site 28.

41. **Page 7-2, first bullet**: The risk from ingestion of groundwater needs to be evaluated.

42. **Page 7-3, Section 7.1.4**: Clarify which PRGs are being referred to in the first sentence?

43. **Page 7-3, Section 7.1.5**: Lead may be present in groundwater at levels that are of ecological concern, but since lead was not sampled for, this data gap still needs to be addressed.

44. **Page 7-4, Section 7.1.7**: Residential risk scenario needs to be reevaluated to include ingestion of groundwater.

45. **Section 7.1.6, Metals in Groundwater Impacting Drinking Water, Page 7-4:** In reference to 28SW04, the text states, "There is no readily identifiable source of the elevated metals concentrations found in groundwater at this location," but metals were detected above background in soil in the southeastern part of the site. Soil samples were not collected in the immediate vicinity of this well, so it is not reasonable to conclude that there is no source of metals. Please revise the text or delete the quoted statement.

46. **Page 7-5, third paragraph**: Please revise this paragraph. Groundwater beneath Site 28 will remain a Class II aquifer under federal guidelines regardless of the designation given it by the RWQCB.

47. **Page 7-6, first full paragraph**: Delete the last sentence.

48. **Section 7.2, Recommendations, Page 7-6:** The statement that ecological risk from copper is unlikely because, "Site 28 is small (2.9 acres) and because any groundwater discharge is actively dispersed by tides and currents," is unsupported. There is no information about tides and currents in the document. Further, this line of argument ignores the mass contribution of copper to the Oakland Inner Harbor and then to the bay and the fact that such discharges are regulated. Please delete the quoted statement or

discuss the mass contribution of copper and whether the discharge of copper is acceptable to the Regional Water Quality Control Board.

MINOR COMMENTS

1. **Figure 4-2, RI Results for Seven PAH Compounds in Soil 0 to 2 feet and Figure 4-3, RI Results for Seven PAH Compounds in Soil 0 to 2 feet:** The dots used to delineate sample results exceeding PRGs indicate redundant information and, in some cases, conflicting information so the figure does not make sense. One problem is that the legend for the largest and lightest colored dot is "all of the above and California Industrial PRG," but the California-modified Industrial PRG (CAL PRG) is lower than both the Region 9 Residential PRG and the Region 9 Industrial PRG. Therefore, if the Region 9 Residential PRG is exceeded, both the CAL Residential PRG and CAL Industrial PRG have been exceeded. The dots should be redefined from the lowest to highest PRG. The second problem is that the CAL PRG only applies to crysene and benzo(k)fluoranthene. This suggests that the dots need to be two different colors or that chrysene and benzo(k)fluoranthene should be shown on a separate figure. For polynuclear aromatic hydrocarbons (PAHs) other than chrysene and benzo(k)fluoranthene, one color should be chosen and the existing legends for the smallest three dots should be used. For chrysene and and benzo(k)fluoranthene, a different color should be chosen and the second smallest dot should read "California Residential PRG," the middle dot should read "All of the above and California Industrial PRG," the next largest should read "All of the above and Region 9 Residential PRG," and the largest should read "All of the above and Region 9 Industrial PRG." Then, the data should be re-evaluated and reclassified as necessary.

2. **Figure 4-4, Results for Aldrin in Soil and Figure 4-5, Results for Dieldrin in Soil:** Based on the legend, there should be two sizes of dots on these figures, one to indicate exceedences of the detection limit and another to indicate that the Region 9 Residential PRG was exceeded, but all of the dots appear to be the same size and it is almost impossible to distinguish between the blue and dark blue dots on the figures. Please revise the figures to make the difference between the symbols clearer.

3. **Section 5.1.1, Physical Characteristics of the Site, Page 5-1:** The first sentence of the second paragraph indicates that the site is unpaved, with the exception of the landscaped portions of the dog park. However, the text in Section 4.1.1 states that 1 foot of asphalt was found in some areas. Please resolve this discrepancy.

4. The CD-ROM provided for Attachment H1 was not readable. Please provide a readable CD-ROM in the next version of this document.

APPENDIX J, HUMAN HEALTH RISK ASSESSMENT

1. The risk management discussion in Sections J.6.2.1 and J8 should not be included in a discussion of risk characterization (EPA, 1995) and should be moved to the Feasibility Study.

ECOLOGICAL RISK ASSESSMENT

GENERAL COMMENTS

1. EPA policy (EPA 2002) does not support the elimination of metals from risk assessments based solely on a comparison to background or ambient levels. In order to provide a more complete characterization of potential risks associated with exposures at the site, metals that exceed risk-based screening concentrations should not be excluded from consideration as Chemicals of Potential Ecological Concern (COPECs) in the screening-level ecological risk assessment (SLERA). The contribution to the overall risk due to metals with high background concentrations should be discussed in the risk characterization.

2. Presentation of the Navy's Step 3a (refinement) as part of the SLERA is not appropriate because it incorporates non-conservative assumptions that are not acceptable without collecting further site-specific data, a step that would typically occur after risk managers had decided to proceed with a baseline ecological risk assessment. For example, the less conservative exposure assumptions in wildlife exposure models do not appear to be supported by any site-specific data regarding site use by sensitive ecological receptors. Further, the arithmetic mean is improperly used as the exposure point concentration (EPC) in the Step 3a portion of the SLERA. EPA guidance and policy for risk assessments specify that the 95 UCL is the proper approximation of the mean in estimating exposure point concentrations. Finally, the elaborate groundwater modeling effort described in Attachment K-1 departs from the conservative assumption appropriate to a SLERA that aquatic receptors are exposed to water containing COPECs at concentrations similar to those sampled from tidally-influenced groundwater monitoring wells (in the absence of further site-specific information pertaining to potential exposures for aquatic organisms). For these reasons, Step 3a should be removed from the SLERA. In the event that risk managers decide further evaluation (i.e., a baseline ecological risk assessment) is warranted, the refinement step could be included at the beginning of this process.

3. The SLERA lacks a description of the derivation and justification for EPCs. The EPCs listed in Table K-2 appear to be identical to those derived for the Human Health Risk Assessment, in which the 95th percentile of the upper confidence limit of the arithmetic mean was calculated. However, 1997 EPA guidance for Ecological Risk Assessments recommends that the maximum measured concentration be used as the EPC in a

screening-level evaluation. The SLERA should be revised to use the maximum detected concentration as the EPC.

SPECIFIC COMMENTS

1. **Section 6.3, Screening-Level Ecological Risk Assessment, Page 6-14, and Section 6.4, Refined Exposure Estimate, Page 6-31:** The text states that the SLERA includes a step for refinement of exposure estimates described by Step 3a of Navy policy "and U.S. EPA guidance." The refinement step described in Navy guidance and conducted in the RI is not described in the cited EPA guidance. Further, this step does not incorporate conservative assumptions that are appropriate in a screening-level ERA. For example, use of the arithmetic mean as the exposure point concentration is not appropriate to estimate the potential for risk. Because it fails to incorporate the necessary conservative assumptions required by EPA guidance, Step 3a should be removed from the SLERA. If risk managers decide that a baseline ecological risk assessment is warranted, Step 3a could be included as part of that report.

2. **Section 6.3.1, Problem Formulation, Page 6-15, and Section 6.3.1.4, Identification of COPECS, Page 6-16:** It is unclear why soil and groundwater COPECs are described in the SLERA prior to presenting a conceptual site model that identifies complete exposure pathways and potentially exposed receptor groups (i.e., it is not clear why soil and groundwater are the media of concern at this point in the SLERA). The conceptual site model should be introduced early in the problem formulation in order to aid in describing the selection of potentially-exposed receptor groups and to explain how media of concern were identified.

3. **Section 6.3.1.4, Identification of COPECs, Page 6-16, and Section K1.3.1, Soil COPECs, Page K-7: :** The text states that inorganic compounds "not statistically greater than background values were eliminated as COPECs." A consideration of background concentrations is not appropriate in Step 1 of a screening-level ERA; rather, it is a factor to be considered in the risk characterization after the potential for risk has been determined.

   Second, the text states that exposure point concentrations for each COPEC represent the 95th percentile of the upper confidence limit of the arithmetic mean. This is not an acceptable way of estimating exposure point concentrations for a screening-level evaluation in which the number of samples ranges from 4 to 39. The maximum detected concentration of each COPEC should be used as the exposure point concentration in the screening-level ERA.

4. **Section 6.3.1.6, Conceptual Site Model, Page 6-25, and Section K1.6.1, Soil Model, Page K-17, and Section K1.6.2, Groundwater Model, Page K-17:** Phrases such as "the American robin models small birds" demonstrate a departure from EPA guidance. The

text should be revised to clearly explain that the mouse, squirrel, sparrow, robin, hawk, harbor seal, least tern, pelican, and snowy plover were selected as ecological receptors to represent feeding guilds in the SLERA, and that potential exposures for these representative receptors were estimated using food-chain modeling.

5. **Section 6.3.3.1, Terrestrial Exposure Model, Page 6-26, and Section K3.1, Soil COPEC Concentrations, Page K-29:** The text states that maximum concentrations reported for each soil COPEC were used as exposure point concentrations. However, this contradicts statements elsewhere in the text and tables that show that the 95 UCL was used. This discrepancy should be resolved by revising the SLERA to reflect that the maximum detected concentration was used to estimate the potential for risk across the site.

6. **Section 6.4.1, Refined Exposure Factors, Page 6-31, and Section K5.2, Bay Water COPEC Concentrations, Page K-50:** The derivation of exposure point concentrations for aquatic receptors exposed to groundwater lacks technical justification. The justification for deriving "bay water concentrations of COPECs... by using calculations that estimate the average concentration of COPECs in the bottom 1 foot of bay water" are not evident. It is unclear how estimating the concentrations here would provide a conservative estimate of exposure that would be representative of all potential aquatic receptors, in the absence of further site-specific information regarding potential ecological receptors that would be more characteristic of a baseline ecological risk assessment. This approach should be removed from the SLERA and only maximum detected concentrations in available water samples (groundwater) should be compared to the most conservative surface water criteria to estimate the potential for risk to aquatic receptors.

7. **Section K2.2, Toxicity Reference Values for Aquatic Life, Page K-29:** The text indicates that if multiple toxicity reference values were available for aquatic receptors, the most recent value was selected. Please clarify whether the selected criteria are the most recent or the most conservative values, and explain why these selected values are appropriate. Additionally, the rationale for the "order of preference" provided in the bullet list is unclear and does not appear to correspond with the stated selection preferences (e.g., choosing a state-promulgated 1995 criterion over a promulgated 2000 criterion does not appear to result in selection of the most recent value). The report should be revised to more clearly describe selection of surface water criteria, and/or include a table listing possible values and denoting the selected value.

8. **Section K7.8, Uncertainty Analyses of Risk Characterization, Page K-63:** The uncertainty discussion states that "the risk assessment is more likely to overestimate than underestimate the actual hazard of adverse ecological effects at IR Site 28 because of the conservative nature of the assumptions used." This statement is particularly inappropriate in Step 3a, in which the assumptions used are not suitably conservative to a SLERA. Further, according to EPA guidance the SLERA should discuss sources of

uncertainty leading to both the overestimation and underestimation of potential risk. The SLERA should be revised to provide a full uncertainty discussion following Steps 1 and 2 that is consistent with guidance.

9. **Section K8.1, Terrestrial Receptors, Page K-64:** The text states, "an evaluation of background concentrations of soil COPECs indicates that potential ecological risk is associated with background COPEC concentrations." This statement seems to be misleading because 1) the SLERA only evaluated COPECs that were found to significantly exceed background concentrations (see comments above), 2) the SLERA does not appear to include an evaluation of exposure based solely on background concentrations (although such an evaluation would be appropriate to the risk characterization as commented above), and 3) based on Tables K-13 and K-14, most Hazard Quotients from metals fall between 1 and 5000. The SLERA should be revised to accurately describe the methodology and results of exposure and effects estimates, and risk should be fully characterized following Steps 1 and 2 of the SLERA.