Parker, Mary E CTR OASN (IE) BRAC PMO West

From: Parker, Mary E CTR OASN (I&E) BRAC PMO West
Sent: Tuesday, February 27, 2007 1:03 PM
To: 'tran.xuan-mai@epa.gov'; 'Dot Lofstrom'; 'ERSimon@waterboards.ca.gov'
Cc: Macchiarella, Thomas L CIV OASN (I&E) BRAC PMO West
Subject: RTC for Draft IR Sites 20/24 RI Report

Attachments: rtc_site_20_24_draft_ri_02_22_07.pdf

rtc_site_20_24_draft_ri_02_22_...

Good afternoon!
The RTCS to agency comments on the Sites 20/24 Draft RI Report issued in March 2006 are attached. These RTCs incorporate comments provided during the July 2006 comment resolution meeting with the regulatory agencies and results of the September 2006 sampling at Site 24, and detail revisions to the text in the Draft RI Report, Revision 1, that you received yesterday. If you have any questions, please let me know.
Mary

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9-80 with Alternate Fridays Off

Response to Agency Comments on the Draft RI Report for IR Sites 20 and 24, Dated March 2006
Alameda Point, Alameda, California

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	General Comments from Ms. Xuan-Mai Tran, U.S. EPA (dated May 18, 2006)	
1	In Section 4 temporal differences in the distribution of organic and inorganic constituents are difficult to assess because the sampling did not reoccur in the same location. Even though there are sampling sites that are proximal to one another among the various years studied, the differences over time could be interpreted as spatial differences because the sample locations are not co-located. This is of particularly concern when locations in 2005 have lower concentrations than previous years, yet these sites are at a greater distance from the outfall and the shore. Temporal analyses should be limited to co-located sample locations and to locations that are the same distance from the sources (i.e., outfalls and piers). Please limit the comparison of temporal differences in constituent distributions to co-located samples and to those samples that are located the same distance from outfalls and piers.	The Draft RI Report has been revised to describe the uncertainties of drawing temporal conclusions based upon data that are not co-located, and comparison of temporal differences in constituent distributions have been limited to co-located samples and to those samples that are located the same distance from outfalls and piers. Minimal significance is attributed to temporal differences, since they could be the result of gradual decreases in contaminant concentrations, spatial distributions, or differences in analytical methods. Rather, the current risk as represented by the most recent sampling event, and risk from all years of data is used for decision-making purposes. The 2005 data was collected using the most current, appropriate sampling methods and analytical methods, and a combination of systematic and judgment-based sampling design was used to ensure adequate coverage for developing a representative exposure point concentration (Section 3.3 of the approved work plan; Battelle et. al., 2005). Therefore, as stated in the response to DTSC's Specific Comment #1, the 2005 data are considered most representative of the overall site, most representative of current conditions, and most appropriate for use in evaluating risk.
2	Analytical sampling results for site sediments were compared to background, or "ambient" chemical concentrations in the Draft Remedial Investigation Report, IR Site 20 (Oakland Inner Harbor) and IR Site 24 (Pier Area), Alameda Point (the RI Report), but it is not clear how the background information is being used or when it is being applied in the risk assessment process. Furthermore, it is not clear that information obtained on the "ambient background levels for San Francisco Bay" is appropriate for use as representative background values. For example, additional discussion should be provided to clarify that the background data is representative and	Section 4.1.2 of the RI Report was revised to describe the derivation and use of the ambient data (please see Attachment 1 at the end of these RTCs for the new text). Please note that these values were determined to be appropriate for use as representative background values at this site based on input from the Alameda Point regulatory agencies. The use of ambient comparisons was described in the Offshore Sediment Study Workplan (Battelle et al., 2005), and these ambient data were used at Seaplane Lagoon, which is adjacent to Site 24, and for which a record of decision has been prepared. Mr. Mark Ripperda of U.S. EPA may be a source for additional background information, since he reviewed the work plan for Sites 20 and 24, attended previous planning and comment resolution

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	useable; and to provide sampling depths, analytes examined, the date when the data was collected, sampling methodologies used for data collection. In addition any assumptions associated with the data set and discussion of background locations relative to the IR sites should be discussed. Some of this information appears to be provided in sections spread throughout the RI Report, but the RI Report should be revised to provide the additional requested information, along with all other information regarding the methodologies and assumptions used for collecting and using background data sets, in one complete comprehensive section. Please revise the RI Report to include this information in one section.	meetings, and is the U.S. EPA Project Manager for Seaplane Lagoon.
3	The environmental data sets collected for the various ecological measurement endpoints appear to have been gathered independently and were not always spatially or temporally co-located. For example, it appears that the bioassay analyses were completed in 1998 for IR Site 24, but it appears that the sediment sample analyses were completed at different time periods. Additional information should be provided in the RI Report in order to aid in assessing the connection between bioassay analysis results and contaminant concentrations. Please revise the RI Report to provide the types of data collected for each sampling event for each site, to provide a time-line that lists all of the activities and analyses or tests for each event, and to discuss any uncertainties that may arise from the spatial and temporal gaps between measurement endpoint sampling efforts.	Tables 2-2 and 2-3 of the Draft RI report summarize the types of data and the dates collected for each of the sites evaluated. For each sampling event with both sediment chemistry and laboratory bioassasys listed, the analyses were performed on spatially co-located samples. Additional information also is included in Appendix A. To further clarify, the text in Section 6.4.2.1.1 has been revised to include the following statement: **"Bulk sediment chemistry data for IR Site 20 bioassay locations are presented in Appendix A, Table A-1."** The text in Section 6.4.2.2.1 has been revised to include the following statement: **"Bulk sediment chemistry data for IR Site 24 bioassay locations are presented in Appendix A, Table A-2."**
4	It is unclear whether the default value is one-half the detection limit or one-half the reporting limit. Since the detection limit and reporting limit can vary by as much as	The text has been revised to clarify that to the extent possible, one-half the reported detection limit (DL) was used. The historical study documentation does not clearly indicate which indicator for method

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	a factor of 5, consistency is important. For example, the second bullet at bottom of page 13 indicates that the reporting limit was used, but in numerous other places throughout the RI Report, such as in the second bullet on Page 14 the detection limit is referenced. Please resolve this discrepancy.	sensitivity was provided by the laboratory; however one-half the reported value was used. Given the nature of the sediment matrix, it is possible (likely) that the matrix specific DL would vary from that reported, however given there was no general requirement for laboratories to establish this value, the reported value was used as the best representation of the surrogate value. If the reported value was a reporting limit, using one-half this value would result in a higher value than if it were the actual method detection limit, and therefore would be conservative. The associated tables were edited to clarify which values were used.
5	The information provided in figure form for data results is useful and aides in interpretation of the information obtained for the ecological risk assessment (ERA) effort. However, the inclusion of additional figures would be useful for interpreting the data, including a site map showing selected chemicals of potential ecological concern (COPECs) hazard quotient (HQ) exceedance for sampling locations, and the HQ values for various receptors. This information provides a clearer picture of which COPECs might be risk drivers based on spatial examination of HQ exceedance. Please consider revising the RI Report to include this information for compounds that appear to be the major risk drivers at the IR sites.	The results of the BERA (Tables 6-24 through 6-41) show that there are few chemicals for which HQs exceeded one across a range of datasets, SUFs, and receptors. Therefore, the bubble plots presented in Appendix A provide a clearer depiction of the relative distribution of the chemicals than the requested figures.
6	It is unclear why marine mammals were not selected as receptors of concern (ROCs) for the IR sites. Section 6.2.1.4 indicates that mammals such as the seal lion and harbor seal could be present in the site area. Please revise the RI Report to provide further justification for not selecting marine mammals as potential ROCs, or include this receptor in the ERA process.	Appendix E contains additional information regarding the potential for exposure for marine mammals. The California sea lion (*Zalophus californianus*) is known to forage occasionally in the vicinity of Alameda Point, but does not haul-out near Alameda, and no known breeding occurs in San Francisco Bay. Therefore, the potential for exposure to possible contaminants originating at Alameda Point is low. Appendix E.5 (page E-64) contains a qualitative exposure assessment for the Pacific harbor seal (*Phoca*

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		vitulina richardsi) that concludes that the contribution of contaminants at Alameda Point to the regional status of the harbor seal is minimal. The last sentence of Section 6.2.1.4 has been revised to state (revisions in bold): "Appendix E provides a list of potential marine mammal species observed within or near Alameda, **as well as a qualitative exposure assessment for the harbor seal.**"
7	It is unclear why measurement endpoints are not provided and discussed for the associated assessment endpoints for the screening-level ecological risk assessment (SLERA) portion of the RI Report. Please revise the RI Report to include measurement endpoints for the assessment endpoints provided in the SLERA. These measurement endpoints can then be modified as necessary in the baseline ecological risk assessment (BERA).	Section 6.2.5 of the Draft Final RI Report has been revised to include a discussion of measurement endpoints for the SLERA (please see Attachment 2).
Specific Comments from Ms. Xuan-Mai Tran, U.S. EPA (dated May 18, 2006)		
1	Executive Summary, Page vii: The text describing the distribution of analytes at Sites 20 and 24 states that the distribution is "relatively uniform," and that concentrations do not generally exceed Effects-Range Median (ER-M) values, but as discussed in several comments below, there are areas of both sites where there are elevated concentrations of both inorganic and organic constitutents. There are also several exceedences of ER-Ms at each site. Please revise the text to provide a more accurate description of the distribution of inorganic and organic constituents and acknowledge the ER-M exceedences.	The text provided in the Executive Summary of the Draft Report is accurate, but, for brevity, it did not specify details of each analyte and sampling event. Additional detail was added to Page vii of the Executive Summary as follows (revisions in bold): "Concentrations of most inorganic constituents (metals) and organic chemicals in sediment are relatively uniform across the site, both horizontally and vertically, and typically do not exceed ecological screening benchmark values such as the effects range-median (ER-Ms). **Additional information on the concentrations and distribution of metals and organic chemicals follows.** **At Site 20, all metals analytical results were below the ER-M and/or ambient values in all surface sediment samples collected**

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		during the 2005 remedial investigation, with the exception of mercury at one location. Chromium, lead, nickel, and mercury were the only metals with historic concentrations exceeding their repective ER-Ms in surface sediment. Only nickel, which is typically naturally occurring, showed an ER-M exceedance in the 1993/1994 samples, which were collected near stormwater discharge points. The historic surface sediment data with concentrations exceeding the ER-M for the other metals were from the 2001 sampling event. Concentrations of these metals exceeded the ER-M in 2001 historic surface sediment samples at only a few locations. In the subsurface samples collected at IR Site 20, metals are generally uniform with depth and all metals are consistent with background reference concentrations except at one location, where copper, lead, mercury, and zinc exceeded the ER-M. However, copper, lead, and zinc did not exceed the ER-M in the surface sample collected at this location in 2005. In 2001, a surface sediment sample was collected at this location, and background and ER-M values were not exceeded for any metals. At IR Site 20, Total PAHs, pesticides, and Total PCBs were not detected at concentrations exceeding the screening benchmark ER-M values in any of the surface sediment samples collected during the 2005 remedial investigation. Two PAHs, pyrene and phenanthrene, exceeded their ER-Ms at one location. In the historical surface sediment data set, no PAHs exceeded the ER-M values, and most pesticides were either not detected or below the ER-M. In the 1993/1994 data set, only 4,4'-DDD was detected in each sample collected from the outfall areas, with a maximum concentration near the ER-M (detected maximum of 22.37 parts per billion (ppb) and ER-M of 20 ppb). In

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		1993/1994, most other pesticides were not detected, and no other pesticides exceeded the ER-M. Concentrations of Total PCBs in the historical data exceeded the ER-M at a few stations, but the ER-M for PCBs was not exceeded in the 2005 sampling event. The detection limits for the PCBs in the historical data were high, so use of one half the reported detection limit for the non-detects resulted in anomolously high PCB concentrations in the historic data. **In the subsurface samples collected at IR Site 20, organic chemicals are generally uniform with depth, except at a few locations, where concentrations are higher. For Total PAHs, pesticides, and Total PCBs, between 1 and 3 of the 27 subsurface samples exceeded the ER-M."** Under the Site 24 heading (revisions in bold): "Concentrations of most inorganic constituents (metals) and organic chemicals in sediment **in the open water portions of the Pier Area** are low and typically do not exceed ecological screening benchmark values such as the ER-M. **Concentrations of inorganics and some organic constituents were higher in the area under the roadway between Piers 1 and 2 than in the open water areas. Additional information on the concentrations and distribution of metals and organic chemicals follows.** **The 2006 sampling, which was conducted near the shoreline and under the roadway in an area not previously sampled, showed that concentrations of cadmium, chromium, lead, mercury, nickel, selenium, silver, and zinc each exceeded their respective ER-Ms in at least one sample from underneath the roadway. In the open water portions of IR Site 24, all metals analytical**

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		results were below the ER-M values in all surface sediment samples collected during the 2005 remedial investigation, with the exception of nickel and silver, which are likely naturally occurring. Historical data included sediment samples collected in 1996 from each of the storm-sewer outfalls, 1997 surface sediment data collected from a wider area, and 1998 surface sediment data collected in non-dredged areas near the seawall and piers. Therefore, the 1996 and 1998 data represent conditions where contamination would be most likely to be found. In the three historic sampling events, nickel was the only metal detected in all three sampling events above the ER-M. Cadmium, chromium, copper, mercury, nickel, and silver were detected at least once in the historic data above their ER-Ms. Mercury was detected once in 1996 at a concentration of 0.76 ppb, which is slightly above the ER-M of 0.71 ppb. In the 2005 subsurface samples collected in open water areas at IR Site 24, metals were generally uniform with depth, and all metals were below the ER-M except for nickel and silver, which are likely naturally occurring. In the 2006 subsurface samples collected underneath the roadway, concentrations of most metals were highest in the 5-25 cm depth interval, primarily in samples located adjacent to outfalls J and K. At IR Site 24, PAH concentrations were higher in samples collected in 2006 beneath the roadway than in the 2005 samples collected from the open water portions of IR Site 24. High molecular weight PAH and low molecular weight PAH concentrations in the 2006 surface sediment samples collected underneath the road exceeded ER-Ms at six locations. Total PAHs were not detected at concentrations exceeding the screening benchmark ER-M values in any of the surface sediment samples collected in the open water areas during the

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		2005 remedial investigation sampling, but PAHs exceeded their ER-Ms in all historical sampling events. During the 1996 sampling event, the majority of the PAHs exceeded their ER-Ms at the two southern outfall locations. PAHs in the 1997 samples collected in offshore areas generally had similar concentrations to the 1996 outfall samples (sometimes higher and sometimes lower for individual PAHs). Concentrations of PAHs in the 1998 samples collected from the undredged areas near the seawall and piers were much lower than the PAH concentrations in the 1996 outfall and 1997 offshore samples, but several PAH ER-Ms were exceeded in these samples. Dieldrin, *gamma*-chlordane, 4,4'-DDD, and 4,4'-DDT exceeded their respective ER-M values in at least one surface sediment sample beneath the roadway in 2006, but pesticides were not detected at concentrations exceeding the screening benchmark ER-M values in any of the surface sediment samples collected in the open water areas during the 2005 remedial investigation sampling. For the historical data, pesticides were sampled in 1996 and 1998, and were seldom detected. In 1996, 4,4'-DDT was detected in one outfall sample at a concentration over the ER-M (10 ppb with ER-M of 7 ppb). In 1998, no pesticides were detected in the samples collected from the undredged areas near the seawall and piers at concentrations exceeding the ER-Ms. In samples collected eastward of the quay wall in 2006, total PCB concentrations in surface sediment exceeded the ER-M at ten of twelve sampling locations. Total PCBs at one open water location at IR Site 24 were detected at concentrations exceeding the screening benchmark ER-M during the 2005 remedial investigation sampling. In addition, two 1996 samples from the two northern outfalls and two 1998 surface sediment samples

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		had total PCB concentrations exceeding the ER-M. **As evidenced by the 2005 samples at IR Site 24, organic chemicals are generally uniform with depth in the open water areas, and total PCBs, total PAHs, and pesticides were not detected at concentrations exceeding the screening benchmark ER-M values in any of the subsurface sediment samples, except for total PCBs at one location. PAH concentrations in subsurface sediment under the roadway increased with depth at five of the twelve 2006 sampling locations, and exceeded ER-Ms at six locations. *Alpha*-chlordane, *gamma*-chlordane, dieldrin, and the DDx compounds were the only pesticides detected in subsurface sediment samples. Maximum concentrations of 4,4,'-DDx occurred in the 5-25 cm subsurface interval at 2006 sampling locations C-21 and C-24, but were uniform or decreased at depth across the remaining 2005 and 2006 samples. With the exception of dieldrin at one location, the remaining pesticides were uniform or decreased with depth in sediments under the road. Eight 2006 subsurface locations had total PCB concentrations exceeding ER-M values."**
2	Section 1.0, Introduction, Page 1 and Section 2.1.1, IR Site 20, Page 3-4: The description of Site 20 in relationship to Todd Shipyards appears to contradict Figure 2-2. Most of Site 20 is to the west of Todd Shipyard, and is not offshore from Todd Shipyards as implied by the statement in the text. Please resolve this discrepancy.	Figure 2-2 has been revised to remove Todd Shipyards. The text on pages 1, 3, and 97 has been revised to remove mention of "Todd Shipyards".
3	Section 2.1.1, IR Site 20, Pages 3 and 4: Although the text describes dredging in the Oakland Inner Harbor, it is not clear how much of Site 20 would be impacted by dredging. Please clarify the extent of the impact that dredging would have on Site 20.	The Navy has not seen the specifications for the planned dredging of the inner harbor to accommodate larger container vessels, so cannot comment on the area to be dredged.

Response to Agency Comments on the Draft RI Report for IR Sites 20 and 24, Dated March 2006
Alameda Point, Alameda, California

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4	Section 2.1.2, IR Site 24, Page 4: The text states that radiological compounds were eliminated from further consideration from the site based on the results of a Historical Radiological Assessment (DON, 2000), and an independent U.S. EPA study. However, as a conservative measure, Ra226 and Ra228 were retained for further consideration of potential ecological exposures at the IR sites. No information is provided in the RI Report regarding the methods and results of these studies, such as a general discussion of how radiological compounds were screened to evaluate potential risk of ecological exposures, whether data from the assessments was collected at or near the IR sites, or even the reference for the U.S. EPA study. Please revise the RI Report to include a general summary and presentation of the information contained in the two referenced RI Reports in order to support the approach presented for examining radionuclide compounds at the IR sites.	This section is "Site History and Description" for Site 24. Therefore, the methods and detailed results for these background reports were not added. In addition, it was the U.S. EPA independent study that confirmed the radiological compounds are not potential contaminants. Radiological compounds were discussed during a conference call with the regulatory agencies held on March 28, 2005 (see Appendix E, item 1 of the Offshore Sediment Study Work Plan; Battelle et al., 2005), and the final approach was presented in the approved Workplan. Please contact Mr. Mark Ripperda for any questions on this topic. Please note that the data collected in 2005 confirmed that radium is not a COPC. Radium 226 and 228, which are naturally occurring, were either not detected or detected at concentrations less than 1 pCi/g, as presented in Appendix A.
5	Section 2.2.1, IR Site 20, Page 5: Information contained in this section indicates that tidal marsh habitat within the vicinity of the site area is limited. However, there is no information about the size of actual tidal marsh habitat available in the area. Please revise the RI Report to provide the actual percentages of habitat types present near and within the site areas, as well as a map depicting these habitat areas. In addition, this section should also be revised to provide a full reference for the March 2001 sediment study that was cited to support the claim that the soft, undredged sediment shelf in the area is expected to be less extensive than previously believed.	Section 2.2.1 does not cite any tidal marsh habitat, and there is no tidal marsh habitat at Site 20. The text has been revised to provide the full reference for the March 2001 sediment survey.
6	Section 2.2.2, IR Site 24, Page 5: Please provide a better description of the location of the sediment shelf and	Detailed bathymetry evaluations confirming the presence of this shelf have not been conducted, so it is not possible to accurately

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	include this feature on a figure.	depict it on a map.The text has been revised as follows (revisions in bold): "Berthing areas at the piers have been dredged to approximately 14 m for navigational purposes; consequently, **it is likely that** most site-related chemicals transported there by the storm drains and deposited in sediments have been removed. **However, it is unlikely that dredging equipment was able to remove all sediments immediately adjacent to the piers, therefore, it is assumed that a** 'shelf' remains in the front (east side) of both berths. **In addition, based on observations made in July 2006, the sediment shelf along the eastern quay wall between Piers 1 and 2 in the northeastern corner of IR Site 24 extends eastward past the quay wall beneath the roadway."**
7	Section 2.4.1, IR Site 20, Page 6: It is stated towards the end of the first paragraph that historical sediment samples collected to the west of IR Site 20 were not included in the RI Report, as the samples were outside the IR boundary and did not contain chemicals at potential levels of concern. However, it does not appear that the data and results of the data screening have been presented in the RI Report for review. It is important to provide this information in order to justify the statements made in this section. In addition, this data could provide useful information on the nature and extent of contamination in the area. Please revise the RI Report to include the samples in the ERA analysis, or provide further justification as to why these sample results were not provided for initial review before being removed from the risk assessment process.	Historical data within or immediately west of the site were included in the RI, as stated in the last sentence of paragraph 1 and specified in the approved work plan. Basewide data collected outside the site boundary is not relevant and was not included in the RI Report. This determination is in accordance with the approved work plan. The referenced sentence of Section 2.4.1, paragraph 1 has been deleted to avoid confusion.
8	Section 2.4.1, IR Site 20, Page 8: It is stated in the second paragraph that, "Historical dredging of piers is	The quoted statement has been deleted from the RI report.

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	likely to have removed much of the contamination associated with wastewater discharges along the piers." No information has been provided to support this claim, such as confirmatory sediment sampling results from the dredged areas. In addition, dredge materials are often compiled into bank material immediately adjacent to the dredged area, creating a new exposure scenario of potential concern. Please revise the RI Report to provide more information to support the claim that dredge spoils were actually removed and that the remaining material has decreased COPEC concentrations, or remove the quoted statement from the RI Report.	
9	Section 2.4.2, IR Site 24, Page 8: The text states that "a core sample was collected from a reference station outside of the footprint of IR Site 24 to characterize ambient surface sediments that have not been influenced by the pilings or outfalls," but this location is still within the breakwater. Since sediment contaminated by discharge from the outfalls may have been redistributed inside the breakwater, information about current and historic sediment transport pathways needs to be considered before it can be concluded that this location has not been influenced by the pilings or outfalls or that it is representative of ambient conditions. Also, it is unclear if the breakwater is composed of the same material as the pilings. Please discuss the composition of the breakwater and specify whether it was constructed of wood with creosote. Then, please present an evaluation of sediment transport within the breakwater, including the pier area and outfalls. This evaluation should include sediment transport during tidal changes, storms that originate from different directions (e.g., during conditions	The reference location for IR Site 24 was selected jointly with the regulatory agencies during a conference call on March 28, 2005 and finalized with the agencies prior to issuance of the Final Work Plan in April 2005. Therefore, no additional evaluations have been conducted, and no text has been added to the Draft Final RI Report. Please see Appendix E, item 3 of the Offshore Sediment Study Work Plan (Battelle et al., 2005).

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	with high wind and waves), and due to movement of large ships.	
10	Figure 2-2, Alameda Point: This figure depicts Site 24 as a small area between piers 1and 2 but the written description in section 2.1.2, paragraph 1, page 4, includes the area surrounding all three piers. Please change the map to illustrate total area of Site 24. Also, Figure 2-2 indicates that Site 20 is offshore of a portion of Site 28, but Figure 2-4 indicates that Site 20 is offshore of all of Site 28. Please resolve this discrepancy.	Figure 2-2 has been revised to include the complete boundary of IR Site 24. The apparent discrepancy between Figures 2-2 and 2-4 is because the scale in Figure 2-4 is much larger than that in Figure 2-2. However, once the scale is considered, the boundaries of IR Site 20 are identical in the two figures.
11	Figure 2-3, Storm-Sewer Lines and Outfalls at Alameda Point: Figure 2-3 does not identify the locations of buildings referenced in Section 2.1.2. The relationship between buildings and respective activities would facilitate interpreting data associated with the outfalls. Please label buildings referenced in section 2.1.2 on Figure 2-3.	Building labels could not be added to Figure 2-3 without obscuring the sewer lines. Therefore, the text in Section 2.1.2 has been revised to include a reference to the Storm-Sewer Study Report for Alameda Point, Alameda, California (TtEMI, 2000) which identifies these buildings and the IR sites with which they are associated.
12	Figure 2-7, IR Site 24 Sampling Stations: Some sample stations listed in Appendix A data are missing from the map. Please include sample stations PA 11 through PA 30 of 1997 data set on Figure 2-7.	Figure 2-7 has been revised to include all of the 1997 data set.
13	Table 2-1, Summary of Development and Potential Historical Sources and Releases to the Offshore Sites, Page 163: The importance of the construction of the San Antonio Channel is not clear. Please indicate the significance of this event in relation to sources or releases to the offshore sites.	This table was intended to provide some historical background for the sites being evaluated. The San Antonio Channel was mentioned because it was located in the area currently occupied by Oakland Inner Harbor, as indicated on the table. The title of this table has been changed to "Historical Summary of the Offshore Areas at Alameda Point, Including Potential Sources and Releases" to more accurately reflect the intent.
14	Section 3.1.2, Transport Mechanisms, Surface Runoff, Page 9: It is stated in the first paragraph that a 1999 on-site storm water investigation found that for IR Site 20,	The following text has been added after the referenced sentence: **"The storm sewer system at Alameda Point served as a primary transport route for chemicals from industrial operations and for**

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	engineering controls, wastewater treatment systems, and waste management improvements have reduced discharges to off-shore areas but there is no specific information about these controls, systems, and improvements, nor has any analytical data been presented to verify this claim. Please expand this section to provide a more complete discussion of storm water discharges to off-shore areas, and further justification that discharges, and therefore contaminant loading, have been reduced for this transport pathway.	**surface water runoff to reach the offshore sites. Since 1972, wastes from industrial operations have been diverted to waste treatment plants (TtEMI, 2000). However, residual sediments remaining in the sewer system were considered a potential source of contaminants to the offshore areas. As a result, the storm sewer system was listed as IR Site 18. In 1991, the Navy initiated several removal actions, designed to remove residual contaminated sediments from the sewer lines. The effectiveness of these actions was documented through closed circuit television surveys and the Navy issued a technical memorandum in February 2000 that removed Site 18 as a specific IR site (TtEMI, 2000). "**
15	Section 3.1.2, Transportation Mechanisms, Page 9: The only transportation mechanisms in this section are surface runoff and food chain transport, but other mechanisms for transportation should be considered. Contaminants could be transported in groundwater and discharged into sediment; this pathway is considered in the IR Site 28 RI as a source of metals to Oakland Inner Harbor, so it should also be considered for IR Site 20. In addition, wave action, harbor activity and bioturbation can mobilize sediments, resuspending them into the water column and resulting in contaminant transport. Please include these transportation mechanisms in this section and on Figure 3-1.	The following text has been added to Page 9: **"Groundwater Discharge** In addition to surface runoff, contaminants may also have been transported to the offshore areas via groundwater discharge. The potential movement of groundwater from on-shore sources has been evaluated and addressed as part of the investigations at those sites. **Other Mechanisms** Other potential sediment transport mechanisms at the site include wave action, harbor activity and bioturbidity. Each of these can result in the mobilization of sediments by causing them to be resuspended in the water column."
16	Section 3.1.2, Transportation Mechanisms, Page 10: The second full paragraph on the page states the rationale for excluding surface water as a potential contaminated media at the site, but there is no rationale for the three reasons. The text should be expanded to include a more complete description of the rationale for each of the three presented points, in order to justify excluding surface	Section 3.1.3 has been revised to include the following text: **"Surface water is not considered a media of concern for the following reasons: (1) the primary chemicals of concern (metals, pesticides, PAHs, and PCBs, discussed further in Section 4.0) are relatively insoluble, meaning that partitioning from sediment to surface water will be low; (2) continuing onshore sources of**

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	water as an exposure pathway. For example, for the first listed rationale, specify the COPECs detected at the site, provide a general discussion on site-specific sediment and water chemistry, and include further information on these COPECs to justify the statement that they are fairly insoluble and will not partition under site-specific conditions, among others. Please revise the RI Report to include this information.	**surface water to the offshore areas have been controlled; and (3) tidal action and San Francisco Bay currents result in rapid dilution of chemicals."**
17	Figure 3-1, Conceptual Site Model for Offshore Sites at IR Site 20, and Figure 3-2, Conceptual Site Model for Offshore Sites at IR Site 24: The two Conceptual Site Models refer to oil-water separators (OWSs) as a potential source of contaminants, but it does not appear that any information is provided in the RI Report about these potential sources. Please revise the text in Sections 2 and 3 to include this information.	Oil-water separators are not a potential source, and were mistakenly included in the figures in the Draft Report. Figures 3-1 and 3-2 have been revised to remove oil-water separators.
18	Figure 3-2, Conceptual Site Model for Offshore Sites at IR Site 24: Under primary sources on the flow chart the sixth text box has the words "Creosote treated," but this should read "creosote treated pilings," based on the text in Section 3.1.1. Please correct this figure.	The text has been revised as requested. It should be noted that the forensics evaluation conducted during the RI (see Appendix B) concluded that the PAH signature present in sediments at Site 24 is consistent with ambient sources, indicating that the pilings are not likely a continuing source.
19	Section 4.1.1, Data Preparation, Page 14: The first bullet on the page states that field duplicate samples were excluded from data sets, unless the primary sample was qualified as rejected, but field duplicate samples should be presented and used as part of the risk assessment. In addition, the discussion nature and extent of contamination should include a discussion of whether field duplicate results were higher or lower than the primary sample data. Please revise the RI Report to include all field duplicate data in the ERA process and to include a comparison of field duplicate analytical results	Including field duplicates in the risk assessment is not technically appropriate. Field duplicates are collected for use as quality assessment samples. Incorporating all field duplicates in the calculation of EPCs for the risk assessment results in the locations where the duplicates were taken being weighed heavier than other locations, and the assumption of a representative random sample would be violated. For example, if duplicates were collected at locations where very low concentrations were present, the estimate of the EPC would be reduced, and vice-versa. To evaluate the potential impact of the field duplicates on the analysis, a review was performed to compare the results of field samples and field

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	with primary sample data in the nature and extent of contamination discussion.	duplicates. In general, very few field duplicates were collected. In 1993/94, when triplicates were collected, no one sample was identified as a primary vs duplicate sample, and therefore the average of the three observations was used. No duplicates were collected in 1996 and in 1998, the only duplicate sample collected at IR Sites 20 or 24 was at PA02. In 2001, the only duplicate was at station 60, and given that the duplicate was acutally offset, we included both samples 60 and 60 D in the analyses. In 2005, duplicate cores were collected at three locations (OIH C-5, PA C-11, and PA C-5). A further analysis of duplicates collected in 2005 was performed to evaluate whether the small scale/measurement error represented by the duplicate measurements warranted further consideration in the ERA (please see Attachment 3). This discussion has been added to the uncertainty section of the RI report (Section 8.1).
20	Section 4.1.2, Sediment Chemistry Box Plots, Page 15: It is stated in the third paragraph that data points falling outside of the "whiskers" of the box plots should be considered outliers, but this implies that the data may have been removed from the data sets based on evaluation of the data as an outlier. Please clarify whether data points were removed from the data sets, along with appropriate information to justify removal of the data point (e.g., a laboratory mistake resulted in an elevated value, specific field conditions that indicate the sample is unreliable, etc.).	The text in Section 4.1.2 (Section 4.1.3 in the revised RI report) has been revised from "should be evaluated as potential outliers" to"may be investigated as outliers". In addition, the text has been revised to state that for the data sets considered in the RI report, none of the data lying outside the whiskers were rejected for any reason, so all data were included in all other statistical analyses.
21	Section 4.1.2, Sediment Chemistry Box Plots, Page 15: It is stated in the fourth paragraph that when replicate samples were taken, the average of the replicate and primary sample was presented for box plots, but it is unclear why replicate samples are being averaged for	Section 4.1.2 (Section 4.1.3 in the revised RI report)has been revised to include the following explanation: **"The averaging of replicates refers to 1993/4 data only. Three field replicates were collected and analyzed at all stations in the**

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	presentation in the box plots, and whether this averaged data is being used for the data set in the risk assessments. Please revise the RI Report to clarify and justify this methodology.	**PRC/TtEMI field investigations conducted in 1993/94 at IR Site 20. Given that none of the three replicates were designated as the "original" or "replicate", all samples were considered of equal utility, and the mean of the replicates was used to represent the station. The use of the mean is consistent with the way the data were presented and summarized in the original report."**
22	Section 4.2.1.1, Surface Sediment Spatial Distribution, Page 17: The statement is made in the third paragraph that the 1993 sampling results for antimony are erroneous, based on the fact that subsequent sampling failed to show the same elevated concentrations, but no information has been included to support this argument and samples were not collected from the same locations during later sampling rounds. Please delete this statement, or provide further information to justify the conclusion that the 1993 antimony data set is not representative of sediment conditions at that time period and in those sampling locations.	Please see Attachment 4 for the revised text and associated new figure. Table 1, which includes basewide offshore data, was generated as part of this response to comments. Please also see Attachment 4 for Table 1. Table 1 contains a paired data comparison for 1993 results to subsequent samples collected at locations closer to the outfall or in close proximity to the 1993 locations. All the areas analyzed in 1993 are included in Table 1 in order to show that the pattern is consistent throughout Alameda Point. For example, the Table 1 result at IR 20 (OIH) for 1993 Station E07 located near to Outfall A has an detected antimony concentration of 29.5 mg/kg; the paired 2005 Station OIH C-10 is closer to Outfall A and antimony was not detected at a detection limit of 0.05 mg/kg.
23	Section 4.2.1.1, Surface Sediment Spatial Distribution, Pages 17 and 18: Although the text states that "locations of higher concentrations were sporadic and not consistent through time," but samples were not collected from the same locations during each sampling event, so this statement should not be made. Also, this section is supposed to include a discussion of spatial distributions, not temporal distributions. Please delete the quoted statement. In addition, there are patterns of contamination, so it is	The sentence stating that "locations of higher concentrations were sporadic and not consistent through time" has been deleted because it refers to temporal vs spatial distributions. Copper, cadmium, and zinc, which did not exceed their respective ER-M values but did exceed ambient UTLs in a few samples, had their highest concentrations generally co-located with the highest concentrations of chromium, lead, and nickel. These metals are characteristic of active shipyards, but there is no indication of unacceptable levels of these metals at IR Site 20. Section 4.2.1.1 describes the surface sediment spatial distribution of metals at IR

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	not clear why the text says that locations with higher concentrations were "sporadic." Three metals associations can be observed. 1) There are high concentrations of lead, copper, mercury and zinc in the portion of IR 20 that is offshore from Todd Shipyards. Since copper, mercury and zinc were used as antifouling additives to lead paint, the association of these four metals suggests the presence of spent sandblast grit in sediment. Similarly, in the western portion of IR-20, there is a location with high concentrations of antimony and cadmium. In the vicinity of Stations 28 and 57, it appears that the same or adjacent locations have high concentrations of copper, lead, and chromium, which may indicate discharge from metal plating and other metal-working operations. Please discuss these contaminant associations in the text.	Site 20, including those listed above. Antimony was not added to the discussion for the reasons discussed in the response to U.S. EPA Specific Comment #22.
24	Section 4.2.1.1, Surface Sediment Spatial Distribution, Page 17 and Section 4.2.1.2, Surface Sediment Temporal Distribution, Page 18: The text in these sections attributes temporal difference to differences in testing methodology, but the sample locations for each year of study were different, so it is not appropriate to attribute all of the observed variability to different analytical methods without providing information to substantiate this conclusion. The variable sample locations could account for some of the apparent discrepancies in contaminant distributions. Please discuss the impact of spatial variability of the sampling locations on the apparent distribution of contamination.	The text in Section 4.2.1.1 of the Draft RI Report states "Apparent differences in concentrations between years may be attributed to differences between analytical methods (to include sample preparation methods), sample locations, or actual differences in concentrations." No change was made to the text. The last sentence in Section 4.2.1.2 has been revised to read (revisions in bold): "This **may be** due to differences in analytical methodology: as NOAA Status and Trends methods were used in 2001, but SW-846 methods were used in 1993/94 and 2005. **However, because most samples were not exactly co-located between years, differences may also reflect the spatial variability of contaminant concentrations across IR Site 20".**

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25	Section 4.2.1.3, Subsurface Sediment Spatial Distribution, Page 18: The text states that sediment samples from the 20 to 50 centimeter (cm) sampling interval were frozen for possible later analysis, but there is no information about whether freezing sediment samples is an acceptable method, how this method may impact specific chemicals contained in sediment samples, or what specific requirements or assumptions are related to the use of this method. Please revise the RI Report to include this information.	This methodology is in accordance with the work plan and U.S. EPA references (U.S. EPA and USACE, 1991; Lauenstein and Cantillo, 1993; U.S. EPA, 2001), which will be added to the text.
26	Section 4.2.2.1, Surface Sediment Spatial Distribution, Page 19: The text in paragraph 3 of Section 4.2.2.1 includes a conclusion that the observed pattern of polynuclear aromatic hydrocarbons (PAHs) "can be an indication that the observed pattern is associated with urban background," but this is not the only explanation for the observed pattern. Further, the only information provided in the RI Report to support this conclusion is a brief discussion stating that PAH compounds were plotted for comparison to "urban background signatures," but no information is provided on the approach of using anthropogenic background concentrations for selecting COPECs. For example, no information is provided to justify the data referenced from these studies are appropriate for use (e.g., comparable that sampling methods, analysis methods, sampling locations, sampling depths, site-specific conditions, etc.), much less the use of anthropogenic background or selection of organic COPECs based on a background screen in the ERA process. The observed PAH distribution pattern is most likely the result of discharges from the outfalls, which included industrial sources, and subsequent redistribution	The use of pattern recogniztion techniques is a common means for evaluating potential sources of PAHs in the environment (Stout et al., 2004). This technique is based on the assumption that sediments impacted by a particular source or group of sources will have a similar relative distribution of individual PAH compounds, irrespective of actual concentrations. As discussed in Section 4.2.2.1 the relative distribution of PAHs at the IR Site 20 is consistent with that expected for sediments impacted by "urban background', implying that the site has likely been affected by a wide variety of sources, rather than a single point source. This conclusion does not eliminate the possibility that the PAH may also have been discharged from the outfalls; rather it indicates that other sources have contributed significantly. The last sentence of this paragraph has been clarified as follows (revisions in bold): "Based on this information, it was concluded that the PAHs present in surface sediments at IR Site 20 are likely **associated with a number of sources, including** urban background." The consideration of background as part of the final COPEC screen during the ecological risk assessment was discussed on p. 37 of the approved Offshore Sediment Study Workplan (Battelle et al., 2005).

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	of sediments and the associated contamination; this appears to be substantiated by the fact that PAH concentrations in Site 20 sediment are higher than those in the San Francisco Bay comparison data set (Figure 4-8). Therefore, it should not be concluded that the observed pattern of PAHs can be attributed to urban background in this section or in Section 4.2.4 without substantiating the conclusion. Please discuss the comparison with urban background signatures in detail and or delete the quoted statement. In addition, please discuss the fact that the observed distribution is the result of discharges from the outfalls, which included industrial sources, and subsequent redistribution of the sediments and associated contaminants. Also, please remove the use of anthropogenic background and selection of organic COPECs base on a background screen for the SLERA and BERA.	The use of background concentrations as part of the final COPEC screen for the BERA is in accordance with Navy Policy that baseline risk assessments not be conducted on chemicals that are present at less than background concentrations (CNO, 2002) and is unrelated to the discussion of the background PAH signature discussed above. Therefore, no change was made to the document.
27	Section 4.2.2.2, Surface Sediment Temporal Distribution, Page 20: The text states that "PCB concentrations appear to have declined over time," but the 1993 and 2001 samples were not collected from the same locations, so this conclusion cannot be made. Please delete the quoted statement.	The text has been modified to read (revisions in bold): "PCB concentrations appear to be declining over time, **but this trend cannot be ascertained with certainty because most sample locations were not co-located from year to year. However, co-located samples at Site 20 also show this declining trend in PCBs. Sample E-10 collected in 1993/1994 and sample OIH C-3 collected in 2005 at Outfall E are co-located, as are sample OIH 10 collected in 2001 and sample OIH C-2 collected in 2005. The 1993/94 measurement of Total PCBs reflect the sum of Aroclors, most of which were not detected, while 2001 and 2005 data reflect two times the sum of 20 congeners, with much lower reporting limits, which may also account for some of the observed differences."**
28	Section 4.2.2.3, Subsurface Sediment Spatial Distribution, Page 20, Section 4.3.1.3, Subsurface	Appendix A has been revised to include bubble plots depicting concentrations at depth.

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	Sediment Spatial Distribution, Page 23, and Section 4.3.2.3, Subsurface Sediment Spatial Distribution, Page 25: There are several statements that discuss the areal distribution of contamination, but there are no figures to substantiate this information. The box plots cannot be used to substantiate statements about the areal distribution of contaminants, although they can be used to demonstrate the vertical distribution of contamination in the most general way. Please provide figures (i.e., postings maps or a series of bubble plots) that depict the areal distribution of contaminants in subsurface sediments for the analytes discussed in the text that were detected in more than one location.	
29	Section 4.3.2.1, Surface Sediment Spatial Distribution, Page 24: The first paragraph asserts that the PAH concentrations appear to be declining over time at IR Site 24, but this assertion cannot be made without acknowledging that the older samples collected at Site 24 were closer to the source of contamination and that the 2005 sample locations were farther from the probable sources. Please acknowledge in the text that this apparent decrease over time could be associated with the distance between sampling locations and the outfalls and piers or delete the statement that PAH concentrations appear to be declining over time.	The text has been revised to read (revisions in bold): "The highest PAH concentrations **in the open water areas of IR Site 24** were observed in 1996 and 1997, and the lowest PAH concentrations were observed in 2005, as illustrated in the box plots for Total HPAHs and Total LPAHs (Figure 4-22). **Although this would** suggest PAH concentrations are declining over time, **this conclusion cannot be drawn with certainty because, while 2005 samples were chosen to be most representative of open water areas of IR Site 24 as a whole, they were not co-located with the highest concentrations observed in the 1996 and 1997 sampling events."**
30	Section 4.3.2.1, Surface Sediment Spatial Distribution, Page 24: The last sentence at the end of the second paragraph implies that pesticide concentrations declined over time, based on elevated pesticide results from a 1996 data set as compared to the 1998 and 2005 data set, when the more recent data sets were not co-located with the 1996 data set. It is unclear how this statement is	The referenced sentence, as currently written, acknowledges that samples between years are not co-located and concludes that "...the elevated pesticide concentrations observed in the surface sediment in 1996 are not currently present in IR Site 24 surface sediment (e.g. *alpha*-chlordane), or are confined to very small areas in the immediate vicinity of the outfalls and eastward of the quay wall (e.g. dieldrin and 4,4'-DDx)." This conclusion is supported by the

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	supported by the data presented. Please revise the text to further support the statement, or remove the statement from the RI Report.	analytical results and examination of the bubble plots in Appendix A.
31	Section 4.3.2.2, Surface Sediment Temporal Distribution, Page 24: The text states that "temporal patterns across years for Total PCBs and PAHs show a decline in concentration at IR Site 24," but since samples were not collected from the same locations each year and the apparent decline may be spatially related to distance from the outfalls and piers, this conclusion is unsubstantiated. Most of the 2005 samples were not collected at the same distance from sources as samples collected in previous years. Please limit this temporal analysis to samples collected at the same distance from the outfalls and piers or delete this section.	The text for Section 4.3.2.2 has been revised to reflect the uncertainty associated with non-collocated samples. In addition, please see the response to U.S. EPA General Comment #1.
32	Section 4.3.3, Distribution of Radionuclides at IR Site 24, Page 25: The conclusion that the distribution of Radium 226 (Ra-226) is not indicative of a release is not supported by the data, which indicate that the concentrations of Ra-226 were higher at depth. Since the deeper sediments would have been deposited when Ra-226 containing paint, dials, and devices were used at Alameda Point, it appears that the data may indicate that there was a release. However, since samples from only 3 locations near the outfalls were analyzed for radium, it may not be appropriate to draw conclusions based on this limited data set. Please delete the conclusion that the distribution of Ra-226 does "not appear to be indicative of a release associated with site activities."	The number of radium samples collected was in accordance with regulatory agency input and the approved work plan. The purpose of these samples was to verify if radium concentrations were high in the areas where concentrations were likely to be highest, if there had been a release. The analytical results support the text in the draft report. For radium 226, the concentrations in the surface (0.28 pci/g to 0.32 pci/g) are very similar to those in the subsurface (0.42 pci/g to 0.47 pci/g). Both surface and subsurface concentrations of radium were below 1 pCi/g or nondetect, which supports the conclusion that radium is not a COPC at the site. Therefore, no change was made to the text.
33	Section 4.3.5, Summary of IR Site 24 Sediment Data, Page 26: This summary primarily focuses on 2005 data,	The discussion as written summarizes data from all years. All of the sample locations in the discussion that begin with the identifier "SS"

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	but since the 2005 data was generally not collected from the same locations as earlier data, the summary should include data collected in earlier sampling rounds. Please revise the text of this section to include a discussion of the data collected prior to 2005.	are 1996 and 1997 samples, and samples with the identifier "PA" are samples from 1998. To provide additional detail, the expanded text added to the Executive Summary (please see U.S. EPA Specific Comment #1) has been added to this section.
34	Figure 4-8, Histograms Showing PAH Distributions and Concentrations for Three Urban Sediments Impacted by Urban Runoff and for IR Site 20: For each of the different locations the y-axis has a different scale, which makes comparison of PAH concentration distributions between Site 20 and urban background difficult. Please use the same scale on the y-axis for all locations depicted on Figure 4-8.	By changing the scale, considerable detail would be lost, and the existing scales seem to best represent the data.
35	Table 4-9, Study of Organic Chemical Results for Surface Sediment at IR Site 24: The maximum value reported for Radium 226 on the table is 0.32 pCi/g (picoCuries per gram), but the maximum value in Appendix A is actually listed at 0.43 pCi/g. Please reconcile this inconsistency.	The value of 0.32 pCi/g is the maximum for Ra-226 in surface sediments. Ra-228 had a maximum detection limit of 0.43 pCi/g, and it was reported correctly in Table 4-9 as [0.215], where the brackets indicate non-detected concentration at one-half the sample-specfic detection limit.
36	Section 5.1, Summary of Tissue Data, Page 27: It is stated that tissue data were prepared for analysis according to Section 4.1.1, but Section 4.1.1 only contains information on how the tissue data points were processed. Specific details and procedures for tissue data preparation or collection were not included. Please provide the correct reference or expand the text to include this information.	The reviewer appears to be confusing "Data Preparation" with "sample preparation". The purpose of Section 5 is to discuss the tissue data preparation and data analysis, not sample preparation and analysis. Sample preparation and analyses for all media analyzed are discussed in the appropriate work plans for the various investigations, as referenced in Section 2 of the RI Report.
37	Section 5.1.1, IR Site 20 Tissue Data, Page 28: The last paragraph of the section states, "Given that none of the organic constituents were detected in tissue, no attempt to compare values (DLs) to 90th percentiles was made," but it is unclear why this comparison was not made since the methodology had been approved by the Regulatory	None of the organic constituents were detected in tissue but the detection limits achieved while analyzing the 1994 site tissues were often more than an order of magnitude greater than those achieved in 2001 when analyzing tissues from reference locations. Table 5-1 shows that the site values (half-DLs) were consistently higher than the 90th percentile reference tissue value (q90). However, given the

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	Agency and 4 samples is a very small data set. In addition, tissue chemical residues could be present below detection limits (DLs) and above comparison criteria for non-detect data. Therefore, DLs should be compared to the 90th percentile data. Please revise the RI Report to include a comparison of DLs with the 90th percentile data.	large disparity between the 1994 and 2001 detection limits, no meaningful comparison of site tissue organics to reference values can be made. All that one can conclude is the old tissue detection limits were high relative to reference values obtained using low detection limits. It does not follow that tissue concentrations in 1994 were elevated.
38	Section 5.4, Sediment Exposure Point Concentrations, Page 30: The text in the first paragraph of the section indicates that analytes that were never detected in sediment or tissue from any year were eliminated from further consideration, but this statement implies that data for chemicals where DLs were above benchmarks was not taken into considered by using one-half the detection limit of a chemical in this situation. Please clarify how chemicals with DLs above benchmarks were handled.	Chemicals were eliminated as COPC only if they were never detected in sediment or tissue in any of the sampling events. While it is true that detection limits were elevated for some sampling events, the detection limits for the more recent investigations were below the relevant benchmarks. For all constituents that were detected, even in one sample, one-half the DL was used for all other NDs.
39	Section 6.2.4.2, Selection of the Piscivorous Avian ROC, Page 41: The second bullet of the section states that double-crested cormorants forage in shallow waters overlying substrates with flat relief, while the second paragraph on Page 42 appear to contradict that statement, indicating that double-crested cormorants will not forage in areas with "bottoms having no relief." Please resolve this discrepancy.	The text in the second paragraph on page 42 has been revised to state (revisions in bold): "Ainley et. al. (1981) also found that the double-crested cormorant preferred to forage on schooling prey from the surface to near **flat** bottoms."
40	Section 6.3.3, Screening-level Risk Estimate, Page 51: Hazard quotient (HQ) results are examined in the RI Report by establishing a relative impact scale, with HQ results below 10 qualified as a low potential of risk for contaminant exposure to ecological receptors, values of less than 50 considered to be a measure of moderate risk, and HQ values over 50 considered a high potential risk, but justification or description of this scaling system does	The qualitative descriptions of risk (low, moderate, and high) in the RI report have been removed and replaced with a numerical description of the HQ results.

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	not appear to be present in the RI Report. Please revise the RI Report to remove the use of a qualitative scaling system, or provide a complete and clear technical rationale to justify this approach.	
41	Section 6.2.1.2, IR Site 24, Page 77: It has been reported to EPA that people fish from these piers. Please evaluate the fish ingestion pathway for IR 24. Also, please include Ra226+D in this assessment.	The RI was conducted according to the approved Offshore Sediment Study Work Plan (Battelle et al., 2005), which states in Section 3.1.1.1 (page 20) that given the current and future uses of IR Site 24, there were no complete human exposure pathways for that site and that a human health evaluation was not warranted. As discussed in the Offshore Sediment Study Work Plan (Battelle et al., 2005), it is possible that indirect exposures via fishing may occur at the IR Site 24; however, the fish species likely to be targeted by recreational anglers at that location have extensive foraging ranges. Therefore it is difficult to distinguish risk that may be attributable to the site from risk associated with other point sources in the Bay. In addition, based on the bioaccumulation factors developed in Section 5.6.2, estimated fish tissue concentrations associated with the sediments at Site 24 are similar to those associated with reference areas. Section 7.2.1.2 has been revised to clarify this, as indicated in Attachment 5. With respect to radium, concentrations measured were either non-detect or below 1 pCi/g, as described in Section 4.3.3, therefore, radium is not considered a COPC.
42	Section 7.3, Toxicity Assessment, Page 81-82: Note as of March 2005, EPA's weight of evidence cancer classification are Carcinogenic to Humans, Likely to be Carcinogenic to Humans, Suggestive Evidence of Carcinogenic Potential, Inadequate Information to assess Carcinogenic Potential, and Not likely to be Carcinogenic to Humans. For more information, please visit http://cfpub.epa.gov/ncea/raf.	Section 7.3 and associated tables have been updated to reflect the history of U.S. EPA's weight of evidence cancer classification system, including the March 2005 update.

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43	Section 7.4.3, Risk Characterization Results, Page 84: The risk characterization section must present and discuss the results of the quantitative evaluation, rather than simply referring the reader to a set of tables. Please include details about chemical drivers of risk, the location(s) of significant contamination and which pathways contribute most to the risk and hazard estimates. Also, this section must present additional discussion regarding the comparison of analytical results to reference concentrations. Please revise the risk characterization section of the RI Report to include additional discussion about the quantitative evaluation and the comparison of analytical data to reference concentrations.	Paragraphs 2 through 5 of Section 7.4.3 briefly summarize the data on the tables referenced in the first paragraph. Additional discussion about the quantitative evaluation and the comparison of analytical data to reference concentrations has been added based on the referenced tables.
44	Section 9:1, IR Site 20, Page 97: The text states that IR Site 20 "is defined as the 1,207-m portion of the Oakland Estuary adjacent to the former NAS Alameda, including areas offshore from Todd Shipyards," but only a small portion of the area offshore from Todd Shipyards is included in IR Site 20. Please resolve this discrepancy.	Please see response to U.S. EPA Specific Comment #2.
45	Section 9.1.1, Nature and Extent of Sediment Contamination, Page 97: The text concludes that "concentrations of most inorganic constituents and organic chemicals are relatively uniform across the site," but there are several areas with higher concentrations, based on the bubble plots in Appendix A. Please delete the quoted statement or revise it to clarify that there are areas with higher concentrations.	The detailed information in the responses to U.S. EPA Specific Comment #1 will be added to this section.
46	Section 9.1.1, Nature and Extent of Sediment Contamination, Page 97: It is unclear why the text only acknowledges that concentrations of mercury exceeded ER-M values when concentrations of antimony,	Section 9.1.1 in the Draft Report summarizes the 2005 RI data and the historic data. The detailed information in the responses to U.S. EPA Specific Comment #1 will be added to this section.

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	chromium, lead, and zinc also exceeded ER-Ms. Further, the text states that pesticide concentrations do not exceed ER-Ms, but concentrations of 4,4-DDT (4,4'-dichlorodiphenyltrichloroethane) in surface sediment exceeded its ER-M. Since samples were collected from different locations during different sampling events, it is not appropriate to focus only on the 2005 data set. Please revise the text to discuss all exceedences of ER-Ms.	Appropriately, the focus is primarily on the RI data collected in 2005. Samples from historical efforts were not designed to be representative of the overall IR site; rather, they were intentionally biased to represent specific outfalls and other locations of interest. Representativeness is a qualitative data quality indicator comprised of a number of key elements including sample size, spatial coverage (capturing small and large scale variability), temporal coverage, and ability of the sample collection, handling and analysis approach to accurately reflect what is in the field. The 2005 sampling event was designed with many of these elements in mind, to represent the sediment chemistry throughout each area, not just at outfalls. The design specifically included both areas where previous investigations found elevated concentrations, and areas not previously sampled, by using a modified systematic sampling plan. In addition, sediment cores, rather than grab samples, were collected to ensure that the concentration profile with depth was characterized. When performing a risk assessment, U.S. EPA guidance on calculating exposure point concentrations presents a variety of methods to calculate the 95% upper confidence limit on the average concentration. The assumption is made that data are random, independent samples that fully characterize the nature and extent of contaminant distribution in the area of interest. Use of biased data in the calculation of EPCs violates these assumptions; however, in many cases the EPC is calculated with the understanding that it is an overestimate of the true EPC, and hence conservative. The 2005 data is considered to be the best representation of the site for the following reasons: good spatial coverage in x, y, and z dimensions, use of sediment cores, rather than grabs, to ensure that each layer of sediment is carefully evaluated, the 2005 timeframe is more indicative of current conditions than samples taken as much as 11-12 years ago, and the modern analytical laboratory achieves lower

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		detection limits, thereby reducing uncertainty related to the presence or absence, and concentration of the full range of potential constituents of interest.
47	Section 9.2.1, Nature and Extent of Sediment Contamination, Page 98: The text states that concentrations of analytes at locations other than in the northeast corner of the site are 'lower and relatively uniform in distribution," but elevated concentrations of some analytes were detected in samples collected near Outfall L, which is located between Piers 2 and 3, and in the case of some PAHs, at a location south of Pier 2. Please revise the text to more accurately describe the locations of samples with elevated concentrations of analytes.	The text in the Draft RI Report is accurate but has been expanded to include more specific sample information, including the information in the response to U.S EPA Specific Comment #1.
48	Section 9.2.1, Nature and Extent of Sediment Contamination, Pages 98 and 99: It is unclear why the text only states that nickel and silver concentrations exceeded ER-Ms when concentrations of cadmium, chromium, copper, and mercury also exceeded ER-Ms. Since samples were collected from different locations during different sampling events, it is not appropriate to focus only on the 2005 data set. Please revise the text to discuss all exceedences of ER-Ms. In addition, the concentrations of PCBs were not relatively uniform in surface sediment; locations in the northeast corner had much higher concentrations of Aroclor 1254 and 1260 than other locations. Concentrations of certain PCB congeners were also elevated near Outfalls J and K. Please revise the text to more accurately describe the locations of samples with elevated concentrations of PCBs.	Section 9.2.1 summarizes the 2005 RI data and the historic data. The text has been expanded to include more specific sample information, including detailed information in the response to U.S. EPA Specific Comment #1.

Response to Agency Comments on the Draft RI Report for IR Sites 20 and 24, Dated March 2006
Alameda Point, Alameda, California

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	General Comments from Michele Dalrymple, DTSC (dated April 20, 2006)	
A	The RI report should discuss whether the nature and extent of contamination is fully characterized at each site, and the basis for such determination. For example, are hot spots fully delineated including depth of contamination (see Specific Comments 6, 9, and 10)?	Please see responses to specific comments below.
B	The following deviations from the final RI work plan were noted: • The data quality objectives (DQOs) presented in the RI work plan state that the results will be evaluated separately for fine-grained and course-grained sediment. This analysis is not presented in the RI report. • The DQOs for IR Site 24 in the RI work plan include an evaluation of whether or not the undredged "shelf" area along the quay wall is acting as a continuing source of contamination to the sediments offshore of this area. This does not appear to be addressed in the RI. • Some of the sampling stations appear to have been moved from the locations proposed in the RI work plan. **The RI report should include a discussion of any deviations from the RI work plan and the basis for such deviations.**	The DQOs indicate that when performing comparisons of the distribution of chemicals at IR Sites 20 and 24 to ambient background distributions, the comparisons will be made separately for fine grain (greater that 40% fines) and coarse grain (less than 40% fines). This analysis is presented in the RI report Appendix C – Background Comparison Test and in Sections 4.2.3 (IR Site 20) and 4.3.4 (IR Site 24). Additional text has been added to the RI Report discussing conclusions with regard to whether the quay wall is acting as a continuing source of contaminants to the sediments offshore of this area. Sample stations were moved due to the inability to sample under docked vessels. These changes were reported in the Field Report (Battelle, 2005), and have been included in more detail by showing the planned and actual locations in a figure for each of the sites.
	Specific Comments from Michele Dalrymple, DTSC (dated April 20, 2006)	
1	Section 4.1.1 – Data Preparation. It is stated that the 2005 sampling effort is believed to adequately represent current conditions. However, the 2005 sampling grid was mostly designed to fill in data gaps and did not include re-sampling in areas where previous hot spots were found. **Please clarify how the 2005 sampling effort was determined to be representative since the areas of**	The premise of this comment seems to be that a historical sampling scheme intentionally biased toward suspected hot spots is representative. Samples from historical efforts were not designed to be representative of the overall IR site; rather, they were intentionally biased to represent specific outfalls and other locations of interest. Representativeness is a qualitative data quality indicator comprised of a number of key elements including sample size,

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	highest contamination found in previous sampling events were not re-sampled during this event.	spatial coverage (capturing small and large scale variability), temporal coverage, and ability of the sample collection, handling and analysis approach to accurately reflect what is in the field. The 2005 and 2006 sampling events were designed with many of these elements in mind, to represent the sediment chemistry throughout each area, not just at suspected "hot spots." The design specifically included both areas where previous investigations found elevated concentrations, and areas not previously sampled, by using a modified systematic sampling plan. In addition, sediment cores, rather than grab samples, were collected to ensure that the concentration profile with depth was characterized. When performing a risk assessment, U.S. EPA guidance on calculating exposure point concentrations presents a variety of methods to calculate the 95% upper confidence limit on the average concentration. The assumption is made that data are random, independent samples that fully characterize the nature and extent of contaminant distribution in the area of interest. Use of biased data in the calculation of EPCs violates these assumptions; however, in many cases the EPC is calculated with the understanding that is an overestimate of the true EPC, and hence conservative. The 2005/2006 data is considered to be the best representation of the site for the following reasons: good spatial coverage in x, y, and z dimensions, use of sediment cores, rather than grabs, to ensure that each layer of sediment is carefully evaluated, the 2005/2006 timeframe is more indicative of current conditions than samples taken as much as 11-12 years ago, and the modern analytical laboratory achieves lower detection limits, thereby reducing uncertainty related to the presence or absence, and concentration of the full range of potential constituents of interest. This discussion has been incorporated into Section 2.4 (Previous Investigations) of the RI Report.

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2	Section 4.2.1.1 – Surface Sediment Spatial Distribution. It is stated that the elevated concentrations of antimony found in the sediment samples collected in 1993 were determined to be erroneous and that, due to the inability to replicate the 1993 results, antimony is not believed to be present at concentrations that would make it a contaminant of concern. However, the samples containing elevated antimony were collected from outfall locations. With only one exception, these outfall locations were not re-sampled in subsequent events. Is it possible that elevated antimony is related to the outfalls and still remains high at these locations? **Please provide further justification for the determination that antimony is not present at levels that would make it a contaminant of concern. Please clarify that the assumed erroneous antimony results were included in the risk assessment.**	Please see response to U.S. EPA Specific Comment #22.
3	Section 4.2.1.1 – Surface Sediment Spatial Distribution. It is stated that the locations of higher concentrations of metals were sporadic and not consistent through time. However, differences in concentrations between years may also be attributed to differences in analytical methods, sampling procedures, or to sample location biases (i.e., the locations of hotspots were not investigated in 2005.) Therefore, spatial and temporal trends are not reliable. **Please clarify.**	The statement that "locations of higher concentrations of metals were sporadic and not consistent through time" has been deleted, and the text has been modified to better describe the spatial distribution of the contaminants. Please see response to U.S. EPA Comment #23.
4	Section 4.2.1.1 – Surface Sediment Spatial Distribution. The highest levels of chromium, lead, and nickel were observed in samples collected in 2001 at locations 28 and 57. It is stated that concentrations of these constituents were not elevated in samples collected in 2005 "near" locations 28 and 57. However, the 2005 samples were collected more than 100 feet away from the 2001 sample	The sentence has been modified to read: "Concentrations of those constituents were not elevated in sediments from C-7, C-8, and C-9, the 2005 sampling locations closest to locations 28 and 57 (~100 ft away), as illustrated in Figures 4-4 through 4-6."

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	locations. **Please clarify.**	
5	Section 4.2.1.2 – Surface Sediment Temporal Distribution. It is stated that the changes in concentration across time could be the result of gradual decreases in sediment concentrations due to mixing with less contaminated subsurface sediment or deposition of cleaner sediment. However, at the locations where samples were collected from multiple depth intervals, concentrations are typically fairly uniform. Observed temporal changes in concentration are more likely the result of other factors, including sample location biases and differences in analytical methods. **The significance of the observed temporal distributions should be explained.**	As stated, the difference between years could indeed be the result of gradual decreases; however, the text was revised to note that differences between years could also be attributed to spatial distributions. Please see the response to U.S EPA Specific Comment #24 for revised text.
6	Section 4.2.1.3 – Subsurface Sediment Spatial Distribution. It is stated that subsurface samples were collected from the 50-100 centimeter (cm) interval and were frozen to be analyzed in case the 25-50 cm sample contained unacceptable concentrations of some constituents of concern. **Please clarify whether the 50-100 cm sample from location C-2 should be analyzed since the 25-50 cm sample contained copper, lead, mercury, and zinc at concentrations exceeding their respective effects range-median (ERM) values.**	Bounding sediment concentrations exceeding screening benchmarks would be required if remedial action were being considered. Given that the risk associated with sediments in biologically available layers was not found to pose an unacceptable risk, tracking sediments at deeper depths in this one location was not considered to be a necessary step to support decision making in IR Site 20.
7	Section 4.2.2.1 – Subsurface Sediment Spatial Distribution. The location of sample 60 collected in 2001, which was reported to have an elevated 4,4-DDT concentration, is not shown on Figure 2-6. **Please add this sample location to the figure.**	The sampling locations 60 and 60D were added to the map. The 2005 sampling effort sampled as close as possible to this location (C-13), given the discrepancy between the historical duplicate at station 60 and that elevated DDT concentrations were not observed.
8	Section 4.2.2.2 – Subsurface Sediment Temporal Distribution. Temporal changes may be related to a number of factors including sample location biases and	The text has been modified to read (revisions in bold): "PCB concentrations appear to **be declining** over time, **but this**

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	differences in analytical methods. **The significance of the observed temporal distributions should be explained.**	**trend cannot be ascertained with certainty because most sample locations were not co-located from year to year. However, co-located samples at IR Site 20 also show this declining trend in PCBs. Sample E-10 collected in 1993/1994 and sample OIH C-3 collected in 2005 at Outfall E are co-located, as are sample OIH 10 collected in 2001 and sample OIH C-2 collected in 2005. The** 1993/94 measurement of Total PCBs reflect the sum of Aroclors, most of which were not detected, while 2001 and 2005 **data** reflect two times the sum of 20 congeners, with much lower DLs, **which may also account for some of the observed differences."**
9	Section 4.2..4 – Summary of IR Site 20 Sediment Data. Copper, lead, mercury, zinc, and several organic constituents exceeded their respective ERM values in subsurface sediment samples collected at IR Site 20, most notably at location C-2. **Please discuss the results of subsurface sediment samples in this section, and clarify whether the vertical and horizontal extent of contamination has been adequately delineated at IR Site 20.**	The analytical results for subsurface sediment samples and clarification of the vertical and horizontal extent of contamination have been added to this section. Please see the responses to U.S. EPA Specific Comment #1 and DTSC Comment #6 for information on the subsurface samples.
10	Section 4.3.5 – Summary of IR Site 24 Sediment Data. It is stated that concentrations of PAHs have apparently declined over time because no PAHs exceeded ERM values in the 2005 samples. However, only one sample was collected in 2005 near the northeastern corner of IR site 24,where several samples were previously found to contain elevated organic and inorganic constituents. This declining trend can not be supported by the results of a single sample. **Please provide further justification to support the observed spatial and temporal trends, and clarify whether the vertical and horizontal extent of contamination has been adequately delineated at IR Site 24.**	Clarification and additional detail of the vertical and horizontal extent of contamination has been added to this section.

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	General Comments from DTSC HERD (dated May 8, 2006)	
1	Both the Ecological Risk Assessment (ERA) of the IR 20 and IR 24 biological community and Human Health Risk Assessment (HHRA) evaluation of IR 20 exposure for collection and consumption of shellfish are concise and well written. HERD has only minor comments on presentation and methodology listed below. Human exposure to sediments (dermal and incidental ingestion) during collection and ingestion fish and shellfish in IR Site 20 appear similar to reference areas. While the ecological hazard for IR 20 and IR 24 appear to be minimal over the entire area of each IR, HERD concludes that remedial alternatives should be evaluated for restricted areas of IR Site 24 along the eastern quay wall.	Please see response to DTSC HERD Specific Comments - Ecological Risk Assessment - #13.
	Specific Comments - Ecological Risk Assessment - from DTSC HERD (dated May 8, 2006)	
1	Three separate sediment data sets were evaluated in the ERA: Surface sediments (0-5 cm) for all years; 2005 surface sediments (0-5 cm); and, 2005 Subsurface sediments in two groups, of 5-25 cm and 25-50 cm (Executive Summary, page vii; Section 4.1.1, page 13) HERD concurred with this division during development of the work plan. While these divisions do not capture the entire depth of sediments available to burrowing organisms in one sediment group, the sediment groups utilized allow some consideration of changes in surface sediment concentrations over the time interval of 1993 through 2005. This comment is meant for the DTSC Project Manager and no response is required from the Navy or Navy contractor.	Comment noted.
2	One local reference core was collected outside the boundary of IR Site 24 (Section 2.4.2, page 8). HERD concurred with the location of this sample during	Comment noted.

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	development of the work plan to represent 'localized' sediment concentrations in an area with sediment characteristics similar to the other IR Site 24 samples, but removed some distance from the IR Site 24 samples taken to investigate potential releases. This comment is meant for the DTSC Project and no response is required from the Navy or Navy contractor.	
3	A surrogate value of one-half the reporting limit is first identified (Section 4.1.1, page 13, second bulleted item). The surrogate value is then described as one-half the reported Detection Limit (DL) (Section 4.1.1, page 14, fifth bulleted item and Section 4.1.2, page 15). U.S. EPA guidance (EPA, 2000; section 4.7.1, page 4-43) directs that one-half the Method Detection Limit (MDL) be used as a surrogate value. Please amend all references to this surrogate value to be correct and in agreement.	Please see response EPA General Comment #4. The associated tables were edited to clarify which values were used.
4	HERD agrees that extremely high sediment antimony concentrations reported from 1993, which were not detected in IR 20 sediments during the 2002 and 2005 sampling (Section 4.2.1.1, page 17), can be eliminated as Contaminants of Potential Ecological Concern (COPECs). This comment is meant for the DTSC Project Manager and no response is required from the Navy or Navy contractor.	Comment noted.
5	Sediment concentrations elevated above screening criteria are evident in several discrete sample locations (e.g., IR Site 20 C-2 and IR Site 24 C-13 and C-16) in the 2005 samples (Section 4.2 and Section 4.3, pages 17 through 26; Section 6.5, page 69). However, average sediment concentrations, as represented by the 2005 samples, do not indicate IR-wide extremely elevated sediment concentrations. This comment is meant for the DTSC	Comment noted.

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	Project Manager and no response is required from the Navy or Navy contractor.	
6	Based on the radioisotope concentrations in three 2005 radioisotope sediment cores obtained (Section 4.3.3, page 25) from IR Site 24, there does not appear to have been a significant release of radium (Ra^{226} or Ra^{228}) associated with site activities. This comment is meant for the DTSC Project Manager and no response is required from the Navy or Navy contractor.	Comment noted.
7	The IR Site 24 Conceptual Site Model (CSM) (Section 6.2.2, page 38; Figure 6-4) should be modified to include an additional Primary Release Mechanism for physical sloughing of creosote-treated pier and quay wall material to sediments in addition to dissolution of creosote into IR Site 24 water. The direct sampling and assessment of sediments already performed account for this release mechanism.	The figure has been revised as requested.
8	Rather than calculate the free-ranging metabolic rate for vertebrate receptors (Nagy, 1999) and then converting the metabolic rate to Dry Weight (DW) Ingestion Rate (IR_{prey}) using the mean of the insectivore and piscivore avian conversion rates (Section 6.3.1.2, page 46), the more recent publication by the same author (Nagy, 2001) should be used. The regression equations directly provide DW IR_{prey} which can differ slightly from the values calculated. For example, using the 1100 gram Body Weight (BW) listed for the surf scoter (Section 6.3.1.2, page 47) the regression equations for marine birds (Nagy, 2001; a=0.880 and b=0.658) yield a DW IR_{prey} of 88.25 grams DW/day or 0.088 kg DW/day rather than 0.084 kg DW/day. This is an approximately 5 percent increase in exposure to COPECs for the same surf scoter BW. Please	The exposure parameters used in IR Sites 20 and 24 ERA (including IRs from Nagy et al., 1999) were those presented in the approved Offshore Sediment Study Work Plan and are meant to be consistent with methods used in the previous Alameda ERAs. Because empirically-derived ingestion rates were not available for the surf scoter and the least tern, models were used to develop these parameters. Uncertainty is inherent with the use of these models as they are developed for a taxonomic or trophic group and then are extrapolated out to a specific species (i.e., species-specific deviations from the rates predicted by the 2001 Nagy regression equations average 21% for Charadriiformes, and 28% for all marine birds). HERD's point that a more current model has become available is appreciated, but the uncertainty inherent within the 2001 model is greater than the difference between the 1999 and 2001 models and does not warrant a recalculation of all HQs. Instead, the following

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	recalculate the vertebrate intake rate where the Field Metabolic Rate method (Nagy, 1999) was used (i.e., surf scoter and least tern) and Hazard Quotients (HQs) for the SLERA and the Baseline ERA (BERA).	text has been added to the uncertainty dicussion in Section 8.2.2.2 on page 8-6: **"Another source of uncertainty associated with estimating exposure to avian receptors is the use of models when empirical data are lacking. To estimate prey ingestion rates for birds, species-specific data were lacking from literature, therefore ingestion rates were estimated based on regression models developed by Nagy et al. (1999). It is recognized that Nagy has published an updated series of models (Nagy, 2001). While, the 2001 regression equations predict slightly higher ingestion rates, these differences do not result in significantly different conclusions. For example, a comparison of HQs using Nagy 1999 and 2001 (Table 8-1) demonstrates that, in general, conclusions drawn from the dose modeling for the least tern and the scoter would be the same whether Nagy 1999 or 2001 was used. Additionally, it should be noted that empirically derived species-specific intake rates, have higher coefficients of variance when compared to the rates predicted by Nagy's regression equations than the coefficients of variance between the different models themselves. Therefore, using the more, recent regression equations to directly predict the dry matter intake would not be expected to significantly increase the certainty in the ecological risk assessment."**
9	HERD reviewed the components of the Screening Level Ecological Risk Assessment (SLERA) and, other than the specific items listed above, has no recommendations on the methodology used. Rather than providing specific comments for each, the components for which HERD has no recommendations or requirements are: a. Sediment Exposure Point Concentration (EPC) (Section 5.4, page 30); b. *Macoma nasuta* tissue EPC (Section 5.5, page 31);	Comment noted.

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	c. Fish tissue EPC (Section 5.6, page 32); d. Assessment Endpoints (Section 6.2.3, page 39); e. Vertebrate Representative Species (Section 6.2.4, page 39 through 43); f. Vertebrate Exposure Parameters, except Ingestion Rate (IR_{prey}) (Section 6.3.1.2, page 44 through 49); g. Benthic Invertebrate Direct Contact Benchmarks (Section 6.3.2.1, page 49 and page 50); and h. Vertebrate Toxicity Reference Value Selection Hierarchy (Section 6.3.2.2, page 50). This list is meant for the DTSC Project Manager and no response is required from the Navy or Navy contractors.	
10	Ecotoxicity Reference Values (ERVs) based on critical tissue concentrations for fish are draft values which were developed by the Navy for Pearl Harbor ERA and currently under review by the U.S. EPA Region 9 (Section 6.4.3.1.1, page 61). HERD generally requires that ecological screening values be final values which have been reviewed and approved of by the appropriate regulatory agencies and trustees. HERD defers to the U.S. EPA Region 9 regarding the application of the draft ERVs to NASA IR Site 20 and IR Site 24.	Comment noted.
11	HERD does not agree that estimates of distance traveled to forage, when used to develop a geometric estimate of foraging area (e.g., using distance traveled to forage as the radius for the area of a circular forage range), are accurate representations of the actual forage range (e.g., surf scoter and double crested cormorant). However, HERD accepts use of the geometric estimates given that incremental values for Site Use Factor (SUF) of 1. 0.5, 0.25 are presented in addition to the receptor-specific geometric estimate (Section 6.4.4.1.1, page 63).	Comment noted.

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12	Based on the lower, and in some cases much lower, sediment concentrations detected in the recent sediment sampling, HERD agrees that the IR-wide current ecological hazard posed by IR Site 20 surface sediments is comparable to reference stations. However, this conclusion applies only to the surface sediments (i.e., 0 to 5 cm) within the IR Site 20 boundary and not the subsurface sediments, particularly in the undredged sediment shelf approximately 75 m in width present along the inshore boundary of IR Site 20 (Section 2.2, page 5).	As discussed in Section 4.2.2.3, PAH, pesticide, and PCB concentrations at certain locations were higher in subsurface samples than surface samples. However, as shown in the summary of BERA HQs (Tables 6-25, 6-26, 6-28, 6-29, 6-31, and 6-32), with very few exceptions the HQs are less than one at both surface and subsurface depths. The lead HQ exceeded one for the three avian receptors but the HQs were nearly equal at surface and subsurface depths when the best available estimate of the SUF was used. These risks were also very similar to ambient risks. Therefore, the the site-wide current ecological hazard posed by IR Site 20 surface and subsurface sediments is comparable to reference.
13	Based on the lower, and in some cases much lower, sediment concentrations detected in the recent sediment sampling, HERD agrees that the IR-wide current ecological hazard posed by IR Site 24 surface sediments is generally comparable to reference stations. However, this does not apply to the sediment shelf along the eastern quay wall of IR Site 24 that was not accessible to historical dredging (Section 2.1.2, page 5). Sediment samples collected in all sampling events, particulary 1996, demonstrate the highest concentrations in this same area immediately adjacent to the quay wall (Figures 4-15 through 4-28) outfalls J and K. Remedial alternatives for this area adjacent to the quay wall should be evaluated.	Navy policy requires that sediment cleanup be risk-based (CNO, 2002). As discussed in Section 9.0 of the RI report, no unacceptable risks were identified in the human health and ecological risk assessments for IR Site 20, therefore, evaluation of remedial alternatives is not proposed for that site. At Site 24, potential risks are limited to the northeastern corner including the sediment shelf that extends eastward past the quay wall between outfalls J and K; therefore, any further evaluation of this site should be focused on this area.
Specific Comments - Human Health Risk Assessment - from DTSC HERD (dated May 8, 2006)		
14	HERD agrees with the estimated ingestion rates for fish and shellfish (Section 7.2.3, page 78) based on the San Francisco Estuary Institute (SFEI, 2002) as reasonable protective estimates for adults and children consuming shellfish. This comment is meant for the DTSC Project Manager and no response is required from the the Navy or Navy contractor.	Comment noted.

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15	The Dermal Absorption Factor (DAF) used should be those outlined in the DTSC Preliminary Endangerment Assessment (PEA) Manual (DTSC, 1994) where these values are more protective than those presented by the U.S. EPA Region 9 (Section 7.2.3, page 79).	Human health risk values from sediment exposures were updated in the associated risk tables and Appendix F with those calculated using the DTSC DAFs, and the discussion of dermal absorption factors was updated to reference the DTSC Preliminary Endangerment Assessment Manual (1994). Due to the relatively minor differences in the values (see Attachment 6), the risk characterization results for sediment exposure did not change with the use of the DTSC DAFs.
16	The U.S. EPA Region 9 Preliminary Remediation Goal (PRG) for soil lead in the residential use scenario is used as a qualitative screening values for the maximum lead concentration in surface sediment of 225.5 mg/kg (Section 7.2.4, page 80). This qualitative comparison is made while acknowledging the difference in media, exposure parameters and exposure pathways. The same qualitative screening for sediment lead should be presented using the Cal-modified Region 9 PRG for lead of 150 mg/kg.	The text in Section 7.2.4 has been revised to include a discussion of the Cal-modified Region 9 PRG for lead as requested.
17	HERD accepts the Contaminant of Concern (COC) toxicity criteria hierarchy as presented (Section 7.3, page 82).	Comment noted.
18	HERD accepts the conclusion that incremental cancer risk and non-cancer hazard associated with collection of and human ingestion of fish and shellfish from IR Site 20 do not appear to differ significantly from the health risk or hazard associated with ingestion of fish and shellfish from the reference locations (Section 9.1.3, page 98).	Comment noted.
19	Lack of habitat, lack of shellfish populations, restricted access due to ship berthing activities and projected continued future use for ship berthing effectively eliminate the shellfish ingestion pathway for IR Site 24 (Section 9.2.3, page 99). This comment is meant for the	Comment noted.

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	DTSC Project Manager and no response is required from the the Navy or Navy contractor.	
	Conclusions - from DTSC HERD (dated May 8, 2006)	
1	HERD recommended minor changes in some of the exposure parameters for the ERA and HHRA. These modifications are unlikely to significantly change the risk and hazard estimates to a degree which would modify the Navy conclusions. It appears from the results of the sediment sampling from 1993 to 2005 that surface sediment (0 to 5 cm) concentrations are decreasing, possibly due to deposition of cleaner sediments exposed during the continued dredging of the Oakland Inner Harbor Channel. If this mechanism is correct, the surface sediments in IR Site 20 are likely to be covered by more clean sediments during the funded 2006 dredge project to 15 meters, thereby decreasing potential exposure. HERD recommends that remedial alternatives be evaluated for the sediments along the quay wall in IR Site 24. Based on the analysis for radium (Ra^{226} and Ra^{228}), there does not appear to have been a release of radium associated with site activities at IR Site 24. These results agree with previous determinations, and concurrence of EPA, by the Navy.	Based on the additional data collected in September 2006, the Navy agrees that remedial alternatives should be evaluated for the sediments in the sediment shelf east of the quay wall and beneath the roadway between Piers 1 and 2 and between outfalls J and K at IR Site 24.

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	General Comments from US F&G, Office of Spill Prevention and Response (dated June 5, 2006)	
1	The evaluation of the 2005 data alone as representative of current conditions assumes that the sample size and distribution of those samples alone is sufficient for each site. However, the text does not clearly describe this information or present results and statistical analysis for locations sampled in multiple years to support the overall conclusion that concentrations are decreasing. Another possibility is that the 2005 results were lower due to the locations sampled rather than the year in which sampling occurred. For example, the 2005 sample locations for IR Site 24 (Figure 2-7) are located further away from the outfalls than the locations where previous sampling occurred. More text and tables should be included that support the hypothesis proposed in the text, and address why alternative possibilities are less likely.	Please see response to DTSC Specific Comments #1 and #5.
2	For the baseline ecological risk assessment (BERA), risk calculations were done for IR Sites 20 and 24 separately, and the adjusted site use factors (SUF) for each species at each site were utilized. However, given the proximity of the two sites relative to the size of the foraging ranges for Least Tern, Surf Scoter, and Double-Crested Cormorant, it is likely that the same individuals are foraging in both locations. In addition to the individual calculations by site, the cumulative risk of exposure to both sites should be addressed by summing the daily doses for each site by species and chemical to ensure that the combined risk is acceptable.	The following text was added to Section 8.2.1.1: **"The ERAs were conducted on a site-specific basis. However, ecological receptors with large home ranges, such as the least tern, may be exposed to chemicals originating at more than one offshore site at Alameda, as well as other areas of greater or lesser concentrations. This may result in an over- or under-estimate of exposure and, therefore, risk."**
3	As mentioned in the DTSC-HERD memorandum dated May 8, 2006, the food ingestion rates should be re-calculated using the 2001 equations (Nagy, 2001).	Please see response to DTSC-HERD Specific Comment #8.

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	Specific Comments from US F&G, Office of Spill Prevention and Response (dated June 5, 2006)	
1	Page 59, Section 6.4.2.2.2. The conclusion that the bioassay results are inconsistent across species and endpoints should not reduce the confidence in the results of the tests as individual lines of evidence. Many factors likely influence the response of the three species, including species sensitivity to different chemicals, exposure media, exposure duration, and endpoints measured. Amphipods and polychaetes were both exposed to bulk sediment, but for different times. Sea urchin embryos were exposed to sediment: water interface, rather than bulk sediments, and were assessed for embryo development. Please revise the text to address potential sources of variability between these bioassays.	The first bullet in Section 6.4.2.2.2 has been revised to read (revisions in bold): "Bioassay testing results were inconsistent. **The strongest conclusion regarding impact to AE(1) can be made if consistent results are seen across MEs for a given location. The bioassay test results were not consistent by location.** For instance, the test producing the lowest amphipod survival (8% at RL-1) produced the highest polychaete growth (11.75 mg) and non-significant response relative to control in the urchin test. Conversely, the station producing the highest amphipod survival (83% at RL-3), produced polychaete growth that was very similar to impacted sites (Table 6-17). **Many factors likely influence the response of the three species, including species sensitivity to different chemicals, exposure media, exposure duration, and endpoints measured. Each test can be considered an individual line of evidence, but taken collectively, impact to AE(1) is not consistently predicted at a given location."**
2	Pages 70 and 71, Section 6.5. Since the hazard quotient (HQ) varies in direct proportion to the corresponding site use factor (SUF), the statements that "HQ based on the low TRV… remained fairly constant… independent of the SUF" are inaccurate. Please revise the text for the instances in which this phrase occurs.	The text on page 6-39, Lead, second bullet now states (revisions in bold): "The HQs based on the low TRV for lead for all the data sets **were comparable** (between 10 and 14). Thus, while lead concentrations at IR Site 20 were found to be statistically greater than ambient concentrations, the potential risk from ambient exposure is similar to site risk. **This is because the EPCs calculated for the site and the reference area were similar."** This edit was made for all instances in which this phrase occurs.

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3	Figure 4-3. Please include a similar bubble plot for mercury concentrations at IR Site 20 since mercury low TRV HQ exceeded one in the BERA for least tern.	The requested figure is presented in Appendix A of the Draft RI Report.
Conclusions - from US F&G, Office of Spill Prevention and Response (dated June 5, 2006)		
1	DFG-OSPR generally accepts the conclusion of this RI report. As detailed above, the report has several areas of concern to DFG-OSPR that should be addressed. DFG-OSPR recommends that the Navy provide a revised report that clearly addresses these concerns.	The Navy will submit a revised report with the above responses to comments incorporated.

4.1.2 Ambient Sediment Data

As part of the data evaluation, chemical concentrations at IR Sites 20 and 24 were compared to background or ambient concentrations from throughout the San Francisco Bay area. The Cal/EPA Regional Water Quality Control Board (RWQCB) established ambient threshold values (ambient background values) for chemicals in San Francisco Bay based on sediments collected from the least impacted portions of the Bay, located away from point and nonpoint sources of chemical contamination (RWQCB, 1998). To acknowledge the influence of physical factors on chemical concentrations, sediment grain size was considered and separate thresholds were listed for coarse (<40% fines) and fine (>40% fines) grain sediments. The guidance noted that it is appropriate that the threshold values for metals, chlorinated hydrocarbons, and pesticides be based upon the value for 100% fines. Based on the data distribution as a function of particle size, one of three models was used to calculate the ambient thresholds. Parametric methods were used for normal (or normal after log transformation) data; nonparametric methods were used if the data could not be shown to be normal. The thresholds serve as estimates of ambient chemical concentrations that can be compared to sediment chemistry results from a potentially contaminated site. A threshold was calculated as the 95% upper confidence limit on the 85^{th} percentile of the ambient chemical concentrations (an upper tolerance limit, UTL). The choice of the percentile, p-value=0.85, was considered a policy decision intended to best "fit" the data clusters; pvalues in the range of 0.7 to 0.95 were initially calculated and considered in the original report by the statistical consultants (Smith and Riege, 1998). This screening criterion is considered conservative as the false-positive rate on an 85th percentile UTL is quite high.

The RWQCB values described above represent a point estimate of ambient conditions. However, the Tier 2 screening applied in the ecological risk assessment (Section 6.4.1.2) involves comparison of the concentration distributions observed on site to ambient distributions using distribution shift tests (see Section 6.4 and Appendix C for a discussion of the ERA process and the distribution shift tests, respectively). For the purpose of developing the ambient distribution, sediment chemistry results collected by the Bay Protection and Toxic Cleanup Program (BPTCP), and San Francisco Estuary Institute (SFEI) Regional Monitoring Program (RMP) were considered. Specifically, all available sediment chemistry results from 1993 through 1997 from stations classified as ambient in the Ambient Sediment Chemistry report (RWQCB, 1998) were used. The BPTCP stations were Paradise Cove, San Pablo Bay Island #1, San Pablo Bay Tubbs Island, North South Bay, and South South Bay. The RMP stations were Alameda, Davis Point, Dumbarton Bridge, Grizzly Bay, Honker Bay, Horseshoe Bay, Oyster Point, Pacheco Creek, Petaluma River, Pinole Point, Point Isabel, Red Rock, Richardson Bay, Sacramento River, San Bruno Shoal, San Joaquin River, San Pablo Bay, South Bay, and Yerba Buena Island. All samples included were collected from the top 5 cm of sediment using a VanVeen sampler and evaluated using standard analytical methods (BPTCP, 1998; RMP, 1997). Because of observed differences (Smith and Riege,1998), multiple ambient values for chromium were calculated based on two extraction methods (hydrofluoric acid and acid regia); the ambient chromium results using hydrofluoric acid were not comparable to site data and were excluded from the dataset.

For constituents that were not analyzed by the RMP or BPTCP, reference data collected at 10 San Francisco Bay reference sites during the 1998 Alameda Point field sampling effort (TtEMI, 1998) and the Hunters Point Shipyards Parcel F Validation Study (Battelle et al., 2005) were used. Reference data from San Francisco Bay were collected from five 1998 reference sites, and

from five 2001 reference sites used in the Hunters Point Shipyards Parcel F Validation Study. The 10 reference sites are as follows:

1998 stations (Figure 4-1):

- RL01–North South Bay (BPTCP station number 20013)
- RL02–Alameda (RMP station number BB70)
- RL03–Oakland Entrance (offshore from Western Bayside [Chapman et al., 1987])
- RL04–Yerba Buena (RMP station number BC11)
- RL05–Paradise Cove (BPTCP station number 20005).

2001 stations (Figure 4-2):

- AB-Alameda Buoy (same general location as RL02)
- PC-Paradise Cove (same general location as RL05)
- AE-Alcatraz Environs
- BF-Bay Farms
- RR-Red Rocks.

Detection limits were reported for the 1998 and 2001 San Francisco Bay reference site results, whereas the RMP and BPTCP databases have coded values for nondetected results and no reported DLs. For presentation in the box plots, one-half of the smallest detected concentration for a specific analyte in the RMP/BPTCP data set was used as the DL.

For organic compounds, both individual analytes and summed totals of analytes within a group (i.e., total LPAHs, total HPAHs, and Total PCBs) are presented. For consistency of presentation, total concentrations at ambient locations were summed from individual congeners following the same methodology applied to the Alameda site sampling results.

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6.2.5 Selection of SLERA Measurement Endpoints

A measurement endpoint (ME) is defined as a "measurable ecological characteristic that is related to the valued characteristic chosen as the assessment endpoint" and is a measure of biological effects (e.g., mortality, reproduction, growth) (U.S. EPA, 1997). The AEs and their associated MEs selected for the SLERA are summarized below.

AE(1): Sufficient rates of survival growth, and reproduction to sustain the benthic invertebrate community in offshore areas.

- ME(1): Compare bulk sediment chemistry results to conservative screening benchmarks from the literature.

AE(2): Sufficient rates of survival, growth, and reproduction to sustain benthic feeding and piscivorous fish communities in offshore areas.

- ME(1): Compare bulk sediment chemistry results to conservative screening benchmarks from the literature.

AE(3): Sufficient rates of survival, growth, and reproduction to sustain the avian community in the area. This assessment endpoint also includes the protection at the level of the individual for special-status species as appropriate.

- ME(1): Compare conservative exposure doses (i.e., derived from maximum sediment and tissue concentrations and conservative exposure parameters) for benthic feeding birds to TRVs.
- ME(2): Compare conservative exposure doses for piscivorous birds represented by the least tern (a special status species) to TRVs.
- ME(3): Compare conservative exposure doses for piscivorous birds represented by the double-crested comorant to TRVs."

Attachment 3

Field duplicates provide a measure of variability associated with sample collection, handling, small scale variability and measurement error. These components of total study error are typically small, relative to the overall heterogeneity of constituents in the environment; however further analysis was performed to compare the field sample to its duplicate and to determine whether any individual constituent warranted further consideration in the ERA. The figures presented below confirm that duplicate variability would have minimal impact on subsequent risk analyses.

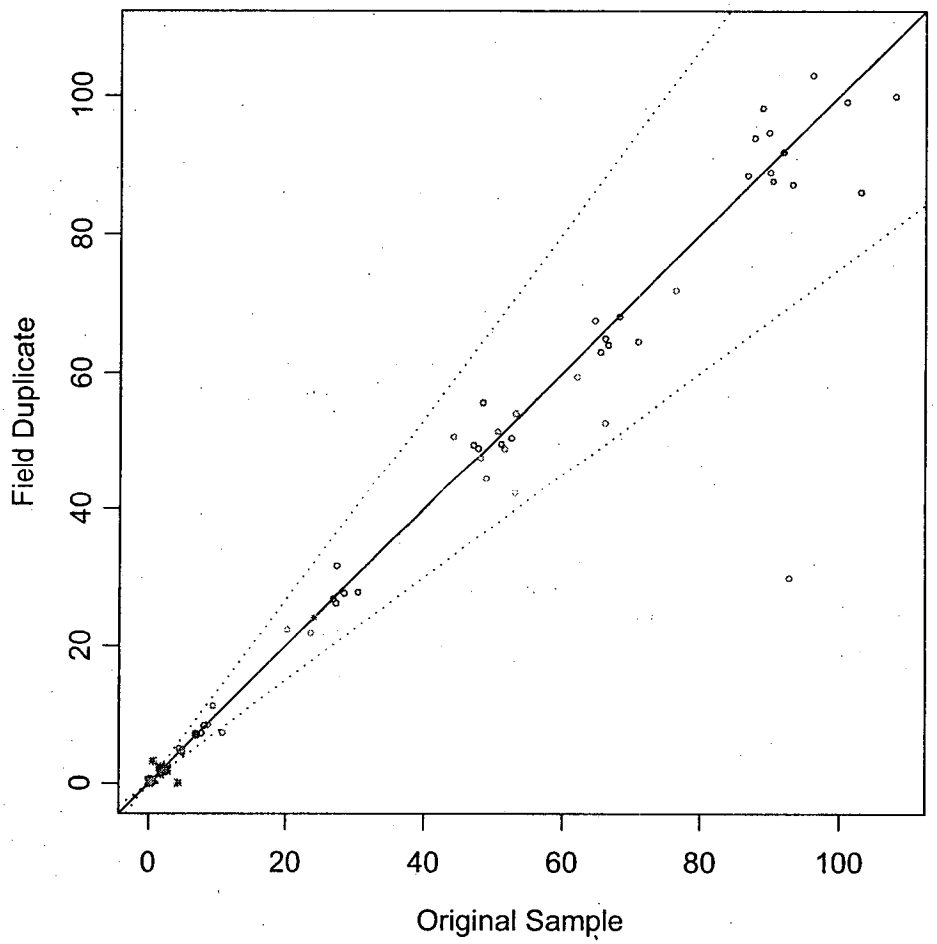

Figure 1. Bivariate Plot of 2005 Results for Original Samples (SA) versus Field Duplicates (FD).
Sites: Blue=IR 24, Orange=IR 20. Suites: Metals="o", TBT="*", Pesticides="x".
Solid Line at equality (SA=FD).

In Figure 1, dotted lines enclose ratios for which FD differs from SA by less than 25%. For those values falling above the upper dotted line (FD>SA), both the SA & FD are below screening values, with the exception of mercury in surface sediment at PA C-5, where results of SA=0.259 and FD=0.451 are both larger than the ERL (0.15) and both less than the ERM (0.71). The variability in FD vs SA for mercury is larger than 50% of the overall variability for mercury in surface sediments at IR 24. To further evaluate the potential impact of the duplicate variability for mercury, EPCs were recalculated. The corresponding change in estimated EPCs is

an increase of 0.018 (from 0.299 to 0.317) in 2005 Surface sediments and 0.007 (from 0.352 to 0.359) in All Years Surface sediments. This minimal change would not expectalter the BERA conclusions.

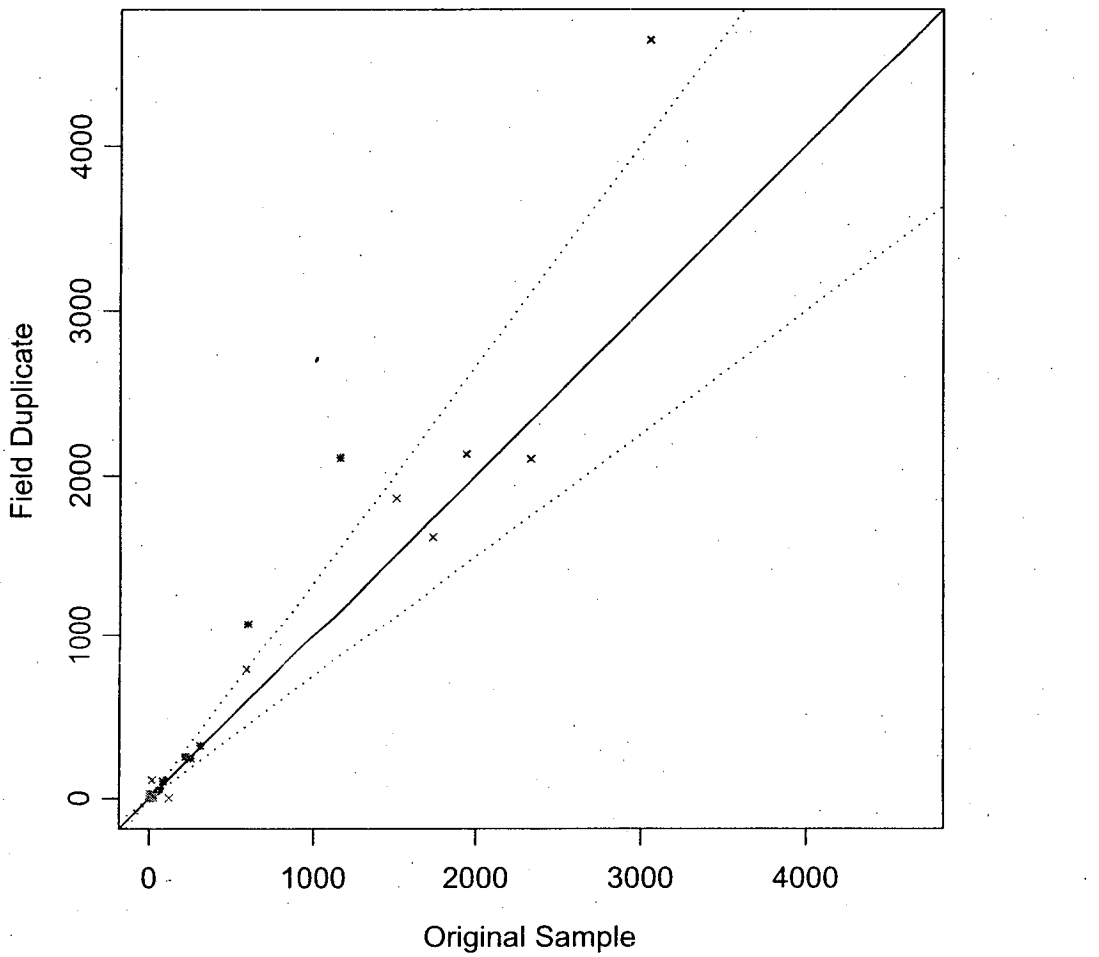

Figure 2. Bivariate Plot of 2005 Totals Results for Original Samples (SA) versus Field Duplicates (FD).
Sites: Blue=IR 24, Orange=IR 20. Suites: Total PCBs="o", Total LPAH (6)="*", Total HPAH (6)="x",
Total 4,4'-DDx="+".
Solid Line at equality (SA=FD).

In Figure 2, dotted lines enclose ratios for which FD is +/- 75% of SA. Those values falling above the upper dotted line, with FD>ERL, consist of 3 surface sample results at IR 24: Total HPAH at PA C-5 and Total LPAH at PA C-5 and PA C-11. The variability attributed to FDs vs SAs for Total HPAH (6) at Site 24 is less than 1% of the overall variability of Total HPAH (6) in surface sediments at Site 24. The variability attributed to FDs vs SAs for Total LPAH (6) at Site 24 is less than 1% of the overall variability of Total LPAH (6) in the surface at Site 24. Given the minimal impact on concentration variability, it is highly unlikely that substituting the larger FDs for SAs would change the calculated EPCs or subsequent BERA analysis.

Attachment 4

Antimony was collected in 1993 from three offshore areas at Alameda Point. Elevated concentrations were present at 1993 locations both close to and distant from outfalls. In 1996 and later years, most 1993 areas were sampled at locations closer to the outfalls than those sampled in 1993. Antimony analyzed in subsequent years from all locations at Alameda Point have reported concentrations approximately an order of magnitude smaller than 1993 concentrations [see Figure 4-3A]. The high concentrations in 1993 are believed to be erroneous. A review of 1993 antimony data did not find a definitive discrepancy in the data that would account for a large-scale error. However, discrepancies were noted with respect to the various dilution factors. The logic in the use of some dilution factors was not always apparent from the raw instrument files and bench sheets. It appears that dilutions were taken both at the bench and at the instrument. The final concentration reported was a calculated adjustment based on hand written dilution factors on the bench sheet. The inability to replicate the 1993 antimony concentrations in subsequent years, including in samples collected closer to the outfalls, indicates that antimony is not a COPEC.

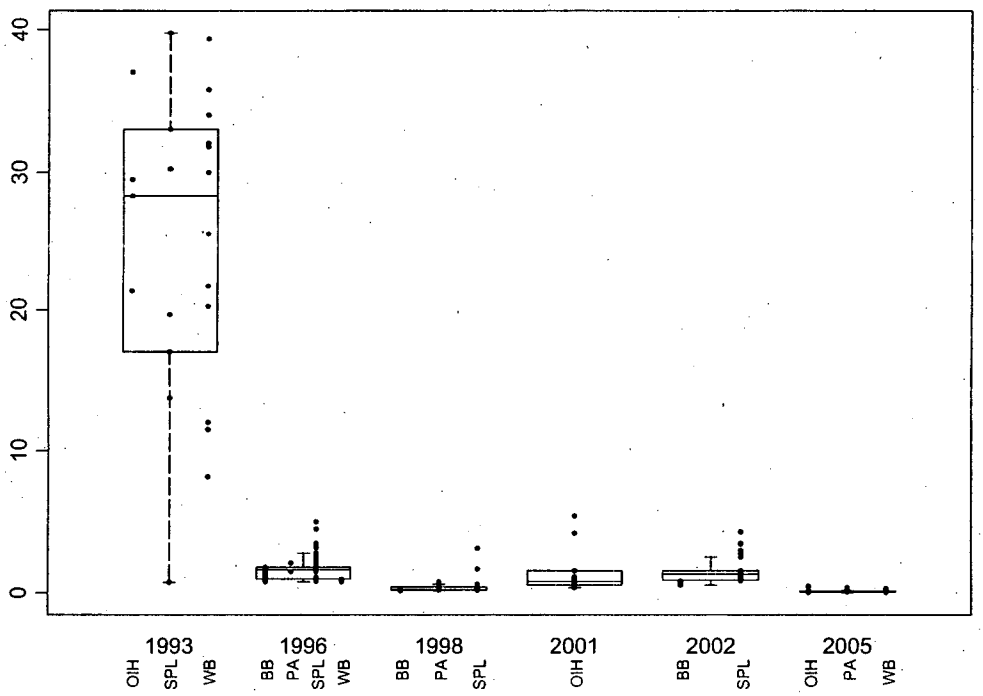

Figure 4-1A. Antimony Concentrations by Year at Alameda Point. Offshore Areas are indicated within boxplots: BB=Breakwater Beach, OIH=Oakland Inner Harbor (IR Site 20), PA=Pier Area (IR Site 24), SPL=Seaplane Lagoon, WB=Western Bayside.

Table 1. Antimony results from 1993 paired with results from subsequent years. All locations closer to outfalls than 1993 results are indicated; other choices are closest locations to 1993 locations.

1993 Antimony Results						Locations from Comparison				
Area	Station	Outfall	Where	Result	Qual	Year	Station	Where	Result	Qual
SPL	S01	FF	perimeter of Lagoon	13.75		1996	SPL06	equidistant to FF	3.50	
SPL	S02		North Central Lagoon	0.73		1996	SPL09	N of S02	0.55	U
						1996	SPL17	S of S02	0.85	U
SPL	S03	G&H	perimeter of Lagoon	39.75		1996	SPL13	closer to G&H	4.50	
						1998	SP01	closer to G&H	0.62	
SPL	S04	F&R	perimeter of Lagoon	17.00		1998	SP08	closer to R	0.34	
						1996	SPL05	closer to F	5.00	
						1998	SP06	closer to F	3.14	
						1998	SP07	closer to F	1.68	
						2002	BERC13	closer to F	4.29	
SPL	S05		Central Lagoon	33.00		1996	SPL25	N of S05	0.90	U
						1996	SPL26	NE of S05	2.00	
						1998	SP05	S of S05	0.21	
SPL	S06	I	perimeter of Lagoon	19.67		1996	SPL37	closer to I	0.85	U
						1996	SPL42	closer to I	0.85	U
SPL	S07		Entrance to Lagoon	30.25		2002	BERC9	S of S07	1.12	
OIH	E07	A	shore<100'	21.33		2005	OIH C-10	closer to A	0.05	U
OIH	E08	B	shore<100'	29.50		2005	OIH C-6	E of E8	0.09	
OIH	E09	D	shore<100'	28.33		2001	OIH02	W of E9	0.42	
						2005	OIH C-5	NW of E9	0.07	
OIH	E10	E	shore<100'	37.00		2005	OIH C-3	closer to E	0.11	
WB	B02		shore (300-400')	31.75						
WB	B03	EE	shore (300-400')	39.33		1996	WB003	closer to EE	0.40	U
WB	B04		shore>100'	20.25						
WB	B05	GG	shore (300-400')	32.00		1996	WB007	closer to GG	0.41	U
WB	B06	HH	shore<100'	30.00		1996	WB009	closer to HH	0.86	
WB	B07		shore (300-400')	25.33						
WB	B08		shore<100'	12.00		1996	WB011	closer to shore	0.44	U
WB	B09		shore (300-400')	8.17						
WB	B11		shore (300-400')	21.67						
WB	B12	U	shore<100'	11.50						
WB	B13		shore>1000'	34.00						
WB	B14		shore>1000'	35.75						

Area: SPL=Seaplane Lagoon, OIH=Oakland Inner Harbor (IR Site 20), WB=Western Bayside.

Attachment 5

7.2.1.2 IR Site 24:

The following text has been added at the end of the Section 7.2.1.2 text in the Draft RI Report.

With respect to consumption of sport fish, individuals have been reported to fish from the piers. The limited shallow habitat makes it unlikely that there are a significant number of resident fish species; therefore, fish targeted by anglers at the site are likely to be sport fish with relatively large foraging ranges, making it difficult to apportion site-specific risks. To evaluate the potential risks, fish tissue concentrations were modeled based on the sediment EPCs and the BAFs developed in Section 5 (see Section 5.6.1) and compared to tissue concentrations reported at reference locations (Table 7-2). In general, tissue concentrations are lower than or similar to those reported for reference. The risks associated with those reference concentrations are presented in Table 7-3. Based on this information, the potential risks to human health were determined to be low and comparable to reference and no further evaluation is recommended.

Table 7-2 . Comparison of Modeled Fish Tissue Concentrations for IR Site 24 to Reference

Chemical	All Years (mg/kg)	2005/2006 (mg/kg)	Reference (mg/kg)
Antimony	0.0006	0.0006	0.004
Arsenic	0.262	0.249	0.293
Cadmium	0.0328	0.0309	0.0205
Chromium	0.497	0.408	0.641
Copper	1.62	1.33	1.55
Lead	0.279	0.320	0.0816
Mercury	0.0123	0.0108	0.0593
Nickel	0.0988	0.0818	0.124
Selenium	0.181	0.134	0.244
Silver	0.0272	0.0293	0.0169
Zinc	12.4	10.9	18.8
2-Methylnaphthalene	8.48E-03	NA	1.38E-03
Acenaphthene	4.69E-02	1.07E-02	3.06E-03
Acenaphthylene	2.08E-04	1.12E-04	1.28E-04
Anthracene	1.01E-02	6.99E-03	6.18E-04
Benzo(a)anthracene	6.14E-03	2.38E-03	1.40E-04
Benzo(a)pyrene	2.67E-03	1.54E-03	6.19E-05
Benzo(b)fluoranthene	4.34E-03	1.84E-03	3.37E-04
Benzo(g,h,i)perylene	1.13E-03	8.10E-04	2.20E-04
Benzo(k)fluoranthene	3.37E-03	2.12E-03	5.15E-05
Chrysene	1.64E-02	7.10E-03	6.47E-04
Dibenzo(a,h)anthracene	1.57E-04	7.45E-05	4.31E-05
Fluoranthene	5.68E-02	2.48E-02	4.59E-03
Fluorene	3.19E-02	5.82E-03	3.34E-03
Indeno(1,2,3-cd)pyrene	1.10E-03	7.49E-04	1.24E-04
Naphthalene	1.88E-03	4.65E-04	2.97E-03
Phenanthrene	1.65E-01	3.75E-02	2.69E-02
Pyrene	2.77E-02	1.31E-02	1.11E-03
2,4'-DDD	2.57E-05	2.98E-05	2.33E-05
2,4'-DDE	2.63E-04	6.89E-06	7.73E-05
2,4'-DDT	1.96E-05	1.95E-05	3.02E-05
4,4'-DDD	6.53E-03	7.58E-03	5.28E-03
4,4'-DDE	5.71E-03	5.14E-03	1.64E-02
4,4'-DDT	3.89E-04	3.46E-04	4.44E-03
Aldrin	4.61E-06	2.16E-07	2.02E-05

alpha-BHC	3.97E-06	4.00E-07	3.13E-05
alpha-Chlordane	8.74E-04	1.86E-04	1.62E-03
Dieldrin	7.18E-04	7.57E-04	2.05E-03
Endosulfan I	3.32E-05	2.83E-07	3.60E-05
Endosulfan II	7.82E-06	8.49E-07	4.23E-05
Endosulfan Sulfate	8.08E-06	2.10E-06	4.51E-05
Endrin	1.07E-06	4.03E-08	1.72E-05
Endrin Aldehyde	4.65E-06	2.58E-07	3.51E-05
gamma-BHC	4.43E-06	3.09E-07	3.13E-05
gamma-Chlordane	1.72E-04	1.43E-04	4.68E-04
Heptachlor	1.52E-06	1.05E-07	2.33E-05
Heptachlor Epoxide	3.20E-06	2.53E-07	1.97E-05
Total PCBs	0.277	0.305	0.174
Tributyl tin	0.154	0.186	0.037

Attachment 6

COPC	DAF U.S. EPA, 2004	DAF DTSC, 1994
Inorganics		
Ag	0.01	0.01
As	0.03	0.03
Cd	0.001	0.001
Cr (VI)	0.01	0
Cu	0.01	0.01
Hg	0.10	0.01
Ni	0.01	0.01
Sb	0.01	0.01
Se	0.01	0.01
Zn	0.01	0.01
SVOCs		
Acenaphthene	0.10	0.15
Acenaphthylene	0.10	0.15
Anthracene	0.10	0.15
Benzo(a)anthracene	0.13	0.15
Benzo(a)pyrene	0.13	0.15
Benzo(b)fluoranthene	0.13	0.15
Benzo(g,h,i)perylene	0.10	0.15
Benzo(k)fluoranthene	0.13	0.15
Chrysene	0.13	0.15
Dibenz(a,h)anthracene	0.13	0.15
Fluoranthene	0.13	0.15
Fluorene	0.10	0.15
Indeno(1,2,3-cd)pyrene	0.13	0.15
2-Methylnaphthalene	0.10	0.15
Naphthalene	0.10	0.15
Phenanthrene	0.10	0.15
Pyrene	0.10	0.15
Dibenzofuran	0.10	0.15
PCBs/Pesticides		
2,4'-DDD	0.03	0.05
2,4'-DDE	0.03	0.05
2,4'-DDT	0.03	0.05
4,4'-DDD	0.03	0.05
4,4'-DDE	0.03	0.05
4,4'-DDT	0.03	0.05
alpha-Chlordane	0.04	0.05
alpha-BHC	0.04	0.05
Dieldrin	0.10	0.05
Endosulfan II	0.10	0.05
Endrin aldehyde	0.10	0.05
gamma-BHC	0.04	0.05
gamma-Chlordane	0.04	0.05
Heptachlor	0.10	0.05
Total PCBs	0.14	0.15
Organotins		
Tributyltin	0.10	0.10

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