

**RESPONSES TO REGULATORY AGENCY COMMENTS ON THE
DRAFT PARCEL D REVISED FEASIBILITY STUDY
HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA**

This document presents the U.S. Department of the Navy's responses to comments on the "Draft Parcel D Revised Feasibility Study for Hunters Point Shipyard, San Francisco, California" dated March 8, 2002. The comments addressed below were received from the U.S. Environmental Protection Agency (EPA) Region IX on June 27, 2002 (two commentors); the Department of Toxic Substances Control (DTSC) on June 8, 10 and 21, 2002 (three commentors); the City and County of San Francisco on July 2, 2002; Lennar/Bay View Hunters Point (BVHP) on June 10, 2002; and a local resident on July 2, 2002.

ACTIVITIES CONDUCTED SUBSEQUENT TO 2002 FEASIBILITY REPORT AND COMMENTS

The Navy reviewed the comments received on the draft revised feasibility study (FS) report and determined that additional coordination with the Base Realignment and Closure Cleanup Team (BCT) would be appropriate before issuing the draft final revised FS report. Working with the BCT, the Navy developed revised approaches to soil and groundwater risk assessments and presentation methods during 2003 and 2004. The Navy also completed an additional time-critical removal action (TCRA) to address a former fuel line site and several soil stockpiles at Parcel D (Tetra Tech EM Inc. [Tetra Tech] and Innovative Technical Solutions, Inc. [ITSI] 2005). The Navy developed a revised approach to the Parcel D FS, which was presented to the regulatory agencies at a storyboard meeting in June 2004. The draft final revised FS report includes two new human health risk assessments (HHRA), one for total risk and one for incremental risk. First, the total risk assessment evaluates all chemicals and all chemicals are included as chemicals of potential concern (COPC) regardless of concentration, except for the essential nutrients calcium, magnesium, potassium, and sodium. Second, the incremental risk assessment excludes the above essential nutrients as COPCs, and excludes all metals with maximum measured concentrations below Hunters Point ambient levels (HPAL) as COPCs, on a grid-by-grid basis. Additional components of the revised FS include reevaluation of areas requiring remediation based on the incremental HHRA; revised remedial action objectives (RAO) and remediation goals; and revised alternatives, designed to meet the revised RAOs.

**RESPONSES TO EPA COMMENTS FROM CLAIRE TROMBADORE, REMEDIAL PROJECT
MANAGER RECEIVED ON JUNE 27, 2002**

General Comments

- 1. Comment: Risk Range Approach:** During the May-June 1997 public comment for the Parcel D Proposed Plan, the Navy received comments urging the selection of a 1E-6 cancer risk cleanup level for both residential and industrial reuse areas. The 1997 proposed plan preferred alternative had a 1E-5 cancer cleanup level as did the selected remedy in the Navy's Draft Record of Decision (ROD) for Parcel D. Following protracted negotiations, the BCT initiated the Risk Management Review (RMR) process to take a second and closer look at the

contaminated soil sites on Parcel D and determine whether or not additional remedial investigation, remediation or no further action was appropriate. A 1E-6 cancer risk cleanup level for both residential and industrial reuse areas was considered during the RMR process. The sites that needed additional action went to the TCRA where the cleanup goals were based on a 1E-6 cancer risk cleanup level for both residential and industrial reuse areas. Given all of this background, EPA was surprised that the Navy is proposing a risk range approach in the Revised Parcel D FS. Throughout the document, the text refers to an "acceptable "excess lifetime cancer risk (ELCR) level and states in the Section 5 tables that "residual soil contamination does not pose an unacceptable risk to human health or the environment." The use of the terms like "acceptable ELCR level" or "unacceptable risk" are misleading as these phrases imply that risk in the 1E-6 to 1E-4 range is "acceptable." EPA considers an excess cancer risk level of 1E-6 as the point of departure for considering when to implement remedial measures at a site. The range between 1E-6 and 1E-4 is often referred to as the "risk range," and EPA strives to make decisions regarding whether remedial action is warranted on a case by case basis after consideration of all factors, of which the risk assessment is only one of many components. In summary, it is EPA's recollection that the Navy had committed to regulators, City and community that cleanup of soil sites on Parcel D, would meet 1E-6 for both residential and industrial reuse areas and for non carcinogens, a hazard index (HI) of 1. Soil cleanup to 1E-6 was one of the primary reasons the BCT undertook the Risk Management Review process for cleanup goal for the Parcel D TCRA reflects this agreement as do the soil remedial action objectives set forth on page ES-5 of the Parcel D Revised FS. Please clarify and revise the text as necessary.

Response: The draft final revised FS report was revised to reflect an excess lifetime cancer risk (ELCR) of 1×10^{-6} or a maximum segregated hazard index of 1, as a point of departure for considering whether to implement remedial measures. Remedial measures are designed to address the incremental risk, which excludes the risk posed by metals at concentrations below background in accordance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) guidance. The need for response actions at Parcel D are based on the results of this incremental HHRA, adjusted for implementing feasible remedial measures where the chemicals of concern that pose the risk occur at concentrations above the laboratory's practical quantitation limit based on standard EPA analytical methodologies.

2. **Comment:** **Alternative S-3:** EPA does not understand the need for soil alternative S-3. EPA understands that the Navy developed S-3 in response to requests from the City of San Francisco. However, EPA is not convinced that soil alternative 3 is appropriate or helpful to future reusers. There is a lot of uncertainty associated with this alternative. Further, as the Navy does not have a clear picture of soil contamination below 10 feet, land use controls related to depth will probably continue to be necessary. The BCT should discuss the City's concerns in greater detail and revise or eliminate alternative S-3 as appropriate.

Response: The draft final revised FS report presents revised remedial alternatives and excludes the previous Alternative S-3 from consideration.

3. **Comment:** **Background:** The revised FS should include even more detail on the steps that led to the revised FS. If possible, include pertinent tables from the RMR and TCRA documents in the revised FS. For example, EPA recommends including RMR Table 1, TCRA action memo Tables 1 and 2, and TCRA closeout report Tables 1, 11, and 12.

Response: Section 1.0 of the draft final revised FS report includes a discussion of the need to update the FS. The conclusions reached in the previous risk management review (RMR) and TCRA are incorporated by reference and are further discussed in the background, previous investigations, and interim remedial actions sections of the draft final revised FS report (Tetra Tech 2000; Tetra Tech and IT Corp 2001; and Tetra Tech and ITSI 2005). Table 2-4 of the draft final revised FS report chronicles the history of investigations and interim remedial actions at each of the IR sites in Parcel D, and provides summary information on the RMR recommendations. In addition, the tables requested by EPA can be included in an appendix of the draft final revised FS report.

4. **Comment:** **Buffer Zone:** The regulators have not concurred with the parameters established by the Navy for the buffer zone and would like to have further BCT discussions. At a minimum, the Navy should provide more detailed discussion and justification for the buffer zone scenario. It would be prudent to include regulatory and community in this discussion.

Response: Discussion of the buffer zone was removed from the draft final revised FS report.

5. **Comment:** **Manganese:** The Manganese ambient level continues to be unresolved. EPA is concerned about applying a different ambient level for manganese while the issue remains unresolved.

Response: At the time these comments were written, the supplemental manganese ambient level was proposed by the Navy as a manganese screening level; it is no longer

being considered. The draft final revised FS report uses the manganese HPAL of 1,431 milligrams per kilogram (mg/kg). This is the HPAL value that was developed with the BCT (DTSC 1996).

6. **Comment:** **Groundwater:** What happened to the discussion of the Tidally Influenced Zone in the revised FS? Modeling in the revised FS suggests that contaminants will not reach San Francisco Bay at concentrations exceeding aquatic criteria. But what about contaminants present in the Tidally Influenced Zone in the vicinity of IR-22? In the original RI/FS for Parcel D, the RWQCB supported the notion that the tidally influenced zone was in direct contact with the Bay. Please explain why groundwater monitoring should not be included as a remedial alternative.

Response: The draft final revised FS report does not include groundwater modeling to estimate tidally influenced zones or groundwater concentrations at potential discharge points. Instead, the Navy presents an evaluation of recent available groundwater monitoring data, which shows that the known groundwater plumes at Parcel D do not appear to be in contact with the surface waters of the bay. Long-term groundwater monitoring is now included as a component of the groundwater remedial alternatives.

Specific Comments

1. **Comment:** **Executive Summary:** The executive summary is generally well written although it omits some key steps that led the Navy to this revised FS for Parcel D. For example, the first paragraph on page ES-2 should include more detail about what happened to the sites that were identified as requiring further action under the RMR process and were included in the TCRA. Briefly discuss which sites were excavated versus simply delineated. While six IR sites were addressed by the TCRA, the total number of individual soil sites delineated was actually 15 of which 6 were excavated. Also, discuss the cleanup goals for the TCRA. The cleanup goals for the TCRA were to remove soil from 0 to 10 feet below ground surface that contained chemicals in excess of 1×10^{-6} ELCR and an HI greater than 1. Further, a residential reuse scenario was assumed for the mixed use area and to a depth of 2 feet in the buffer zone, for this reason, the Navy included produce uptake in its cleanup numbers for these areas. The exception to these goals was when an HPAL exceeded a cleanup goal in which case the HPAL would apply as the cleanup goal. In addition, in some cases PAHs for example, the detection limit was routinely used as the cleanup goal. Also, EPA agrees with the soil remedial action objectives presented on page ES-5 with the exception of the 1,000 mg/kg industrial reuse cleanup goal for lead as 750 mg/kg has been the PRG since November 2000. However, the main text of the revised FS presents a risk range approach. Please explain.

Response: The executive summary was revised to reflect the revised approach in the draft final revised FS report. The draft final revised FS report summarizes the conclusions of the RMR and TCRA, but details for each action are presented in the respective documents (Tetra Tech 2000; Tetra Tech and IT Corporation 2001; Tetra Tech and ITSI 2005). Follow on TCRA work was conducted subsequent to receiving these comments. The follow-on TCRA activities and results are summarized in the TCRA closeout report dated May 13, 2005 (Tetra Tech and ITSI 2005). The HHRA in the draft final revised FS report uses the current (2004) EPA Region 9 industrial preliminary remediation goal (PRG) of 800 mg/kg to characterize risks from industrial and construction worker exposure to lead in soil.

2. **Comment:** Parcel D acreage, page ES-1 and page 2-1: The acreage is cited as 102 on page ES-3 and 101 on page 2-1. Please determine the correct acreage for Parcel D and revise the text as appropriate.

Response: The text of the draft final revised FS report has been revised to indicate the correct acreage for Parcel D as 98 acres, based on the modified Parcel D and E boundary established in February 2005.

3. **Comment:** Page 1-3, section 1.2: The CERCLA process does not include Finding of Suitability to Transfer (FOST). The FOST is a Department of Defense requirement not a CERCLA requirement.

Response: The text of the draft final revised FS report was revised to delete references to the finding of suitability to transfer (FOST).

4. **Comment:** Figure 2-1: On a number of figures (2-1, 2-3, 2-10, 2-14, 2-15, etc.) Building 436 is identified as the building next to Building 435. On figure 2-6 and in the text on page 2-22, this same building is identified as Building 430. Please resolve this discrepancy.

Response: The draft final revised FS report text and figures were revised to indicate that the structure located west of Building 435 is Building 436.

5. **Comment:** Figure 2-9: Areas where the Bay Mud Deposits are missing should be bounded by the zero foot thickness contour, but the zero foot contour was drawn through the middle of the brown shaded area (which is labeled "Area Where Bay Mud Deposits May Be Absent"). This implies that the brown-shaded areas that fall between the 0 and 10 foot thickness contours have Bay Mud Deposits with some thickness. In southern IR-09, the brown-shaded area extends between the 10 and 20 foot contours. Similarly, there is an area near Building 400 where the zero foot thickness lines is drawn through an area that is not shaded brown. Please review this figure and revise it to consistently depict the zero thickness contour and the area where Bay Mud Deposits may be absent.

Response: The figures and text in the draft final revised FS report were revised to properly indicate the hydrogeological units.

6. **Comment:** Figure 2-12 and the tidally influenced area at IR-22: The tidally influenced area appears to have been drawn with uniform width and does not appear to have been based on data collected during the groundwater data gap investigations. Please explain why the tidally influenced area was drawn with uniform width, consider whether the available data supports this depiction, and revise the figure as necessary. Further, please clarify why the Navy has decided in this revised FS to no longer monitor groundwater at IR-22 which has recently had exceedances and is in the tidally influenced zone. EPA would like to see additional rounds of monitoring prior to signing a ROD for Parcel D in which groundwater monitoring at IR-22 for bay protection is not required.

Response: The tidally influenced area in the hydrogeologic section and in the beneficial use sections of the draft final revised FS report is estimated as uniform in width where data are insufficient. The groundwater alternatives developed in the draft final revised FS report include groundwater monitoring to assess potential migration, as well as natural recovery, and in situ treatment to degrade the groundwater plumes.

7. **Comment:** Section 2.3.1.2, IR-9: Since the industrial PRG for lead in soil was changed to 750 mg/kg, the 920 mg/kg at 1.25 feet at IR09B030 may need to be delineated and perhaps excavated. The Navy states in the text that the lead is at a depth that limits exposure but 1.25 feet bgs is very shallow and does not support the Navy's statement. At a minimum, the Navy should present further justification to support not excavating this shallow lead contamination.

Response: The draft final revised FS report does not contain recommendations for additional actions or no further action based on results of the interim removal

actions conducted at Parcel D. Instead, the draft final revised FS report relies on the results of the updated incremental HHRA to identify areas requiring remediation and the need for additional response actions. The incremental HHRA evaluates risk using current soil data for sampling locations not already excavated. The HHRA in the draft final revised FS report uses the current (2004) EPA Region 9 industrial PRG of 800 mg/kg to characterize risks from industrial and construction worker exposure to lead in soil. The alternatives presented in the draft final revised FS report are sufficiently protective to address lead throughout Parcel D, and also specifically address lead at boring IR09B030.

8. **Comment:** **Section 2.3.1.6, Site IR-32, Page 2-16 and radiological issues on Parcel D in general: The radiation detection in soil on the regunning pier is not discussed in this section. Nor are the investigation and cleanup of Building 351A piping and Building 364 and adjacent sump. The cesium peanut spill adjacent to Building 364 was only one issue at Building 364. The building itself, associated piping and sump outside the building are undergoing investigation and remediation. Please discuss all radiological sites investigated on Parcel D. The radiological cleanup actions on Parcel D have been interim/removal actions. It is preferable that all radiation issues on Parcel D be addressed, cleanup completed and a close out report submitted before EPA signs the Parcel D ROD. If this is not possible, the Navy must state in the Revised FS and subsequent documents in what CERCLA decision document the Navy will make the formal determination that no further action is required under CERCLA for radiation on Parcel D. If not in the Parcel D ROD, there are several options. This determination can be made in sea basewide ROD, a ROD for radiological issues at HPS, or be included in the Parcel E ROD as it will likely be that final ROD for the HPS site.**

Response: Radiological removal actions at HPS are being conducted by Naval Sea Systems Command, Radiological Affairs Support Office (RASO), which provides technical support for the Navy. Radiological investigations and removal actions are ongoing, as discussed in the historical radiological assessment (HRA) (RASO 2004). The Navy will address radiologically contaminated areas under CERCLA, and is evaluating several possible mechanisms to do this. Potential options under consideration include, but are not limited to, the following: incorporating radiological remedies and cleanup status into the ROD for Parcel D, adding radiological remedies into the final FS or the proposed plan, or developing a separate ROD for radiological sites.

9. **Comment:** **Section 2.3.1.11, Site 37, Page 2-23: The text states that “further action was not required at RA 37-1,” but the extent of Aroclor 1260 contamination beneath Building 436 was not investigated during the Time Critical Removal Action (TCRA). TCRA sample 33701N2B was found to have 1.0 milligrams/kilogram (mg/kg) Aroclor 1260 at a depth**

of 0.5 feet, and was on the edge of the excavation. It is unclear if contamination extends beneath the building. This uncertainty should be discussed in the text, as it appears that institutional controls may be necessary to prohibit removal of Building 436, so that potential exposure to Aroclor 1260 is minimized. Please revise the text to include a discussion of the potential that contamination extends beneath Building 436. Also, manganese was detected at a concentration of 16,000 mg/kg of the edge of the excavation at location 3701E3B, but no samples were collected to the east or southeast of this location, so the full extent of manganese contamination is not known. Please discuss this uncertainty in the text.

Response: The draft final revised FS report does not contain recommendations for additional actions or no further action based on results of the interim removal actions conducted at Parcel D. Instead, the draft final revised FS report relies on the results of the updated incremental HHRA to identify areas requiring remediation and the need for additional response actions. The incremental HHRA evaluates risk using current soil data, including data from samples 3701N2B and 3701E3B, for sampling locations not already excavated at Parcel D. The alternatives presented in the draft final revised FS are sufficiently protective to address potential Aroclor contamination below building 436 and manganese throughout Parcel D.

10. **Comment:** Section 2.3.1.11, Site 37, Page 2-24: The extent of antimony at 5.25 and 6.75 feet was not delineated in excavation 37-2. Please discuss this uncertainty in the text.

Response: The draft final revised FS report does not contain recommendations for additional actions or no further action based on results of the interim removal actions conducted at Parcel D. Instead, the draft final revised FS report relies on the results of the updated incremental HHRA to identify areas requiring remediation and the need for additional response actions. The incremental HHRA evaluates risk using current soil data, including antimony data, for sampling locations not already excavated at Parcel D. The alternatives presented in the draft final revised FS are sufficiently protective to address antimony throughout Parcel D.

11. **Comment:** Section 2.3.1.11, Site 37, Pages 2-23 and 2-24: According to the TCRA, benzo(a)pyrene and benzo(a,h)anthracene analyses for some samples in the buffer zone were rejected by the lab. As a result, it is not clear that delineation of contamination in the buffer zone is adequate. Please discuss this uncertainty in the text.

Response: As discussed in the Parcel D TCRA report, two historical surface soil samples at IR-37 (IR37SS22 and IR37SS23) had elevated detection limits. Since these results were not acceptable, two additional samples were collected during the

TCRA field activities at the same location. PAHs were not detected in the TCRA samples (Tetra Tech and IT Corporation 2001). Discussion of the buffer zone was removed from the draft final revised FS report. The draft final revised FS report does not contain recommendations for additional actions or no further action based on results of the interim removal actions conducted at Parcel D. Instead, the draft final revised FS report relies on the results of the updated incremental HHRA to identify areas requiring remediation and the need for additional response actions, including actions for benzo(a)pyrene and benzo(a,h)anthracene. The incremental HHRA evaluates risk using current soil data, including benzo(a)pyrene and benzo(a,h)anthracene data, for sampling locations not already excavated at Parcel D.

12. **Comment:** Section 2.3.1.11, Site 37, Page 2-24: The text states “the residual human health risk at IR-37 in soil from 0 to 10 feet bgs does not exceed an acceptable risk level for residential or mixed reuse (Appendix A)” and then states “no further remediation is required at IR-37 to protect human health or the environment.” However, Figure A-2 indicates that there are four residential risk grids with excess cancer risk between 1E-4 and 1E-5 and four residential risk grids with risk between 1E-5 and 1E-6. Ten risk grids have a hazard index greater than 1. Please clarify and discuss in the text.

Response: The text and figure referenced in this comment are no longer applicable since the HHRA methodology and results have been revised. The draft final revised FS includes revised text and figures that present the results of the updated HHRA. The draft final revised FS report does not contain recommendations for additional actions or no further action based on results of the interim removal actions conducted at Parcel D. Instead, the draft final revised FS report relies on the results of the updated incremental HHRA to identify areas requiring remediation and the need for additional response actions. The incremental HHRA evaluates risk using current soil data for sampling locations not already excavated at Parcel D. An ELCR of 10^{-6} or an HI of 1 are used as the point of departure for considering remedial measures.

13. **Comment:** Section 2.3.1.17, Site IR-50: Storm Drain System, Pages 2-28 through 2-30 and Figure 2-4: The text refers the reader to Figure 2-4 and then discusses the fact that “five separate storm water drainage areas are located completely or partially within Parcel D, including drainage areas A, G, H, I and J.” These drainage areas, which are discussed at length in the text, are not labeled on Figure 2-4. Please label the drainage system areas so that the text on pages 2-29 and 2-30 can be understood or revise the text to delete references to the specific drainage areas. Also, the text on these pages refers to street names, but there are no street names on Figure 2-4. Please label streets on Figure 2-4.

Response: References to specific drainage areas have been removed from the draft final revised FS report. For clarity of presentation, Figure 2-4 does not include street names and no reference to street names is made within the text discussing the sewer lines. Street names are provided on other figures, such as Figure 2-12.

14. **Comment:** **Section 2.3.2.4, Step 3: Calculate Hazardous Substance Concentrations at the Point of Exposure, Page 2-62:** It appears that the only concern that was considered for the discharge of contaminated groundwater to the sanitary sewer was the Hunters Point Groundwater Ambient Level (HGAL)-adjusted aquatic criterion and that discharge requirements for discharge to the local publicly owned treatment works (POTW) were not considered. Please include the discharge limits for discharge of groundwater to the POTW and screen groundwater contaminants detected at sites IR-09 and IR-37 using these discharge limits. If any groundwater contamination is detected above POTW discharge limits, groundwater monitoring of the plumes at IR-09 and beneath IR-37 should be initiated to monitor for potential exceedances.

Response: The draft final revised FS report no longer includes groundwater modeling to estimate groundwater concentrations at potential discharge points, such as the sanitary sewer. In 2006 and 2007, the Navy plans to remove the storm drain and sanitary sewer lines throughout HPS. As a result, the publicly owned treatment works discharge criteria are not applicable to groundwater at Parcel D.

15. **Comment:** **Section 2.3.2.4, Step 3: Calculate Hazardous Substance Concentrations at the Point of Exposure, Page 2-62:** The criterion that a contaminant be detected more than once is too limiting. At IR-22, lead and zinc were detected above the HGAL-adjusted aquatic criterion during the most recent sampling event. It is unclear whether this is a one-time occurrence, and therefore should not be assumed that this is a temporal anomaly. Also, cyanide was detected in grab groundwater samples from two borings located less than 200 feet from the Bay, which is most likely in the tidal mixing zone. Since no monitor wells were installed in the vicinity of these borings or between the borings and the bay, it is not possible to evaluate whether these detections represent an anomaly. Please revise the text to discuss the uncertainty that these detections represent, and recommend that groundwater monitoring be conducted to evaluate the potential impact that metals and perhaps cyanide may have on the Bay. As stated above, EPA would like to see additional rounds of monitoring prior to signing a ROD for Parcel D in which groundwater monitoring at IR-22 for bay protection is not required.

Response: The draft final revised FS report presents the extent of the present groundwater plumes (see Section 2.0), based on an interpretation of the most recent

quarterly groundwater report for data collected in June 2004. The draft final revised FS report also presents groundwater monitoring as an alternative (see Section 5.0), and proposes a groundwater monitoring approach based on the requirement to monitor the present groundwater plumes (see Appendix E). As a result, the criterion cited in this comment is no longer used.

16. **Comment:** Section 2.5.1, Soil Risk Summary, Page 2-68 and Section 4.1, Description of Soil Remedial Alternatives, Page 4-2: The text in Section 2.5.1 states “remaining soil does not pose an unacceptable risk to human health under the anticipated land use scenario for Parcel D” and then states “further remediation at Parcel D is not required under CERCLA to protect human health or the environment.” However, Figure A-2 indicates that there are four residential risk grids in IR-37 with excess cancer risk between $1E-4$ and $1E-5$ and four residential risk grids with risk between $1E-5$ and $1E-6$. Ten IR-37 residential risk grids have a hazard index greater than 1. These areas should be discussed in the text. Please revise the text in these sections to delete the statements that there is no unacceptable risk and that no further remediation is required, and include a recommendation that IR-37 be remediated to an excess cancer risk less than $1E-6$ and a hazard index less than or equal to 1.

Response: The text and figure referenced in this comment are no longer applicable because the HHRA methodology and results have been revised. The draft final revised FS report includes revised text and figures that present the results of the updated HHRA. The draft final revised FS report does not contain recommendations for additional actions or no further action based on results of the interim removal actions conducted at Parcel D. Instead, the draft final revised FS report relies on the results of the updated incremental HHRA to identify areas requiring remediation and the need for additional response actions. The incremental HHRA evaluates risk using current soil data for sampling locations not already excavated at Parcel D.

17. **Comment:** Section 3.1, Remedial Action Objectives, Pages 3-1 and 3-2: The text refers to an “acceptable excess lifetime cancer risk (ELCR) level,” but the use of the term “acceptable ELCR level” is misleading. The soil remedial action objective for carcinogens in Parcel D soils should be $1E-6$. The risk range was not the remedial action objective. If the Navy is changing the remedial action objectives for Parcel D soils to include a risk range approach then the BCT needs to discuss this. As stated in the general comment, EPA considers an excess cancer risk level of $1E-6$ as the point of departure for considering when to implement remedial measures at a site. The range between $1E-6$ and $1E-4$ is often referred to as the “risk range,” and EPA strives to make decisions regarding whether remedial action is warranted on a case by case basis after consideration of all factors, of which the risk assessment is only one of

many components. These risk management decisions should be made by all of the remedial project managers. Please revise the text by deleting all references to acceptable or unacceptable risk levels.

Response: The draft final revised FS report has been revised to reflect an ELCR of 1×10^{-6} or a maximum segregated index of 1, as a point of departure for considering when to implement remedial measures. Remedial measures are designed to address the incremental risk, which excludes the risk posed by metals at concentrations below background in accordance with CERCLA guidance. The need for response actions at Parcel D are based on the results of this incremental HHRA, adjusted for implementing feasible remedial measures where the chemicals of concern that pose the risk occur at concentrations above the laboratory's practical quantitation limit based on standard EPA analytical methodologies.

18. **Comment:** Section 3.1.1.2, RAOs for Protection of the Environment, Page 3-5: The text states that "groundwater modeling shows that groundwater meets the HGAL-adjusted aquatic criteria at the point of exposure," but as discussed in the specific comment on Section 2.3.2.4, single groundwater exceedances were screened out, even if these exceedances occurred in the tidal mixing zone. Groundwater modeling should not be done for contamination that is already in the tidal mixing zone. Please revise the text to discuss the IR-22 exceedances in the tidal mixing zone, and to discuss the uncertainties that detection of metals contamination at IR-22 in the most recent sampling round represents, since there is no additional data to evaluate whether this is a temporal anomaly. Also, please include a remedial alternative for groundwater monitoring at IR-22.

Response: The draft final revised FS report no longer includes groundwater modeling to estimate groundwater concentrations at potential discharge points. The groundwater evaluations and the analytical presentations in the draft final revised FS report are based on the most recent available groundwater data from the quarterly groundwater monitoring program (Tetra Tech 2004), and from previous investigations, sampled in accordance with the approved groundwater monitoring plans. Remedial alternatives include groundwater monitoring.

19. **Comment:** Section 3.3.1, Evaluation of Applicable Soil Process Options, Page 3-13 and Section 4.1.2, Alternative S-2: Land-use Controls Based on Anticipated Reuse, Page 4-3: Dust suppression during redevelopment should be identified as a potential land use control or deed notification.

Response: Dust suppression during redevelopment would be applicable only during construction and would not reduce long-term exposure to soil for potential receptors at Parcel D after redevelopment. In addition, dust control would be required by the Bay Area Air Quality Management District as a mitigation

measure for construction-related impacts under the California Environmental Quality Act and, therefore, would need to be addressed by the City and its developer. As a result, the draft final revised FS report was not revised in response to this comment.

- 20. Comment:** Section 3.3.1, Evaluation of Applicable Soil Process Options, Page 3-13: Because the risks in several residential grids are in the risk management range of 1E-4 to 1E-6, a soil process option for excavation of contaminated soil at IR-37 should be included. Please include a soil process option for excavation of soil in areas proposed for residential reuse and revise the text in Section 4 as necessary.

Response: The draft final revised FS report presents a range of process options, including excavation.

- 21. Comment:** Section 3.3.2, Evaluation of Applicable Groundwater Process Options, Page 3-15: Because there is contamination in the tidal mixing zone, the risk to aquatic receptors is uncertain at IR-22 and a groundwater process option for groundwater monitoring should be included. Also, if it is determined that groundwater contamination exceeds allowable discharge levels for the POTW, groundwater monitoring at sites IR-09 and IR-37 may be necessary. Please include a groundwater process option for groundwater monitoring and revise the text in Section 4 as necessary.

Response: Groundwater monitoring is included as a process option in the draft final revised FS report.

- 22. Comment:** Table 3-2: The TCRA cleanup goal for cyanide was 2 mg/kg, but the residential Preliminary Remediation Goal (PRG) with home-grown produce is 0.17 mg/kg. Please explain why the TCRA cleanup goal exceeded the residential PRG and evaluate the IR-37 data to determine if there are any additional areas that should be evaluated for excavation.

Response: The PRG for cyanide with homegrown produce was below the reporting limit; therefore, the reporting limit of 2 mg/kg was used as the TCRA cleanup goal. The need for additional response actions at Parcel D are based on the results of the HHRA presented in the draft final revised FS report.

- 23. Comment:** Table 3-2: In November 2000, the industrial PRG for lead was changed to 750 mg/kg, but the table still includes the old value of 1,000 mg/kg. The PRG of 750 mg/kg should be used. The risk grids in Appendix A should also use 750 mg/kg.

Response: The HHRA in the draft final revised FS report uses the current (2004) EPA Region 9 industrial PRG of 800 mg/kg to characterize risks from industrial and construction worker exposure to lead in soil.

24. Comment: Section 4.2, Description of Groundwater Remedial Alternatives, Page 4-4: The text states that “the groundwater RAO...for the protection of aquatic life in San Francisco Bay is met,” however, because there is lead, zinc, and cyanide contamination in the tidal mixing zone, the risk to aquatic receptors is uncertain at IR-22. Please delete or revise the quoted statement. Also, as stated above, EPA would like to see additional rounds of monitoring prior to signing a ROD for Parcel D in which groundwater monitoring at IR-22 for bay protection is not required.

Response: This statement is not included in the draft final revised FS report. The groundwater remedial alternatives developed for this FS evaluation include groundwater monitoring to assess potential migration, as well as natural recovery, and in situ treatment to degrade the groundwater plumes.

25. Comment: Section 5, text and tables: The phrase “do not present an unacceptable risk” occurs numerous times in this section. However, there are several risk grids with risks in the 1E-4 to 1E-6 range in IR-37, which is designated for mixed/residential reuse. Again, EPA does not support use of this term as the Navy has agreed to cleanup soils to 10-6. The range between 10-6 and 10-4 should be referred to as the “risk range.” For non carcinogens, the point of departure corresponds to a HI of 1. A risk range cleanup level approach for Parcel D soils is new and the BCT needs to discuss this further. Please revise the text by deleting all references to acceptable or unacceptable risk levels.

Response: The draft final revised FS has been revised to reflect an ELCR of 1×10^{-6} or a maximum segregated index of 1, as a point of departure for considering when to implement remedial measures. Remedial measures are designed to address the incremental risk, which excludes the risk posed by metals at concentrations below background in accordance with CERCLA guidance. The need for response actions at Parcel D are based on the results of this incremental HHRA, adjusted for implementing feasible remedial measures where the chemicals of concern that pose the risk occur at concentrations above the laboratory’s practical quantitation limit based on standard EPA analytical methodologies.

26. Comment: Appendix A, Section 4.1, Residential Exposure, 0 to 10 Foot Depth, With Ambient Screen and Ingestion of Homegrown Produce, page A-16: The text in the last paragraph on this page states that “residential exposure areas with no data would also be considered available for unrestricted use.” Please elaborate. Lack of data is not in and of itself

sufficient evidence of lack of contamination. Parcel B is a good example of this. Please provide additional justification in the text to support the conclusion that exposure areas with no data are appropriate for unrestricted reuse.

Response: The data set for soils includes samples collected and analyzed during the initial remedial investigation (RI) using a biased sampling method based on an extensive review of site history and visual observations to identify suspected areas of industrial activity or chemical release. Additional soils data were collected during subsequent investigations and removal actions at contaminated areas. The current soils data set used for the HHRA includes all of the validated results for all of the previous investigation and interim remedial activities, except for those soil samples that were collected in locations that have since been excavated. The Navy determined that this soil data set is adequate to conduct the HHRA. The HHRA appendix presents total and incremental risk for each potential exposure scenario (residential, industrial, recreational, and construction worker) for all of the redevelopment blocks across Parcel D regardless of the planned reuse. The HHRA summary section in the main text presents the total and incremental risk for each of the redevelopment blocks according to the planned reuse. For the residential and industrial exposure scenarios, risks from exposure to contaminants in soil are assessed for both surface soil (0 to 2 feet bgs) and subsurface soil (0 to 10 feet bgs). Remedial alternatives presented in the draft final revised FS report are intended for implementation by redevelopment block or parcel wide.

27. Comment: Appendix A, Table A-2, Concentration Terms for Soil Chemicals of Potential Concern, Residential Exposure Areas, 0-10 Feet BGS: For exposure area 066071, please explain why the average concentration for zinc is greater than the 95 percent UCL of the mean (68 mg/kg vs. 59 mg/kg, respectively). In addition, greater care should be exercised in these tables to avoid the use of excessive significant figures (e.g., four significant figures were used for some values in this table).

Response: Exposure point concentrations have been recalculated in the draft final revised FS report based on the agreed upon approach to the HHRA developed with the BCT. Regarding significant figures, the HHRA in the draft final revised FS report was revised to include a consistent and appropriate number of significant figures.

28. Comment: Appendix E, Tables E-2 and E-3: It is unclear why costs for preparation of the Findings of Suitability to Transfer (FOST) are included in the Present Worth Cost Estimate and schedule. Preparation of FOST is not a CERCLA requirement and should not be included in the cost estimates presented in the Feasibility Study. Please delete the FOST from the costing tables and schedule.

Response: The text of the draft final revised FS report was revised to delete references to the FOST.

**RESPONSES TO EPA COMMENTS FROM DANIEL STRALKA, PH.D., REGIONAL TOXICOLOGIST,
RECEIVED ON JUNE 27, 2002**

General Comments

1. **Comment:** Throughout the document and particularly in section 2, there is reference to the Risk Management Review. Please provide additional detail on this process. It included not only the nature and extent of contaminants in soils at each IR site. Other factors including the density of samples, depth of samples, ambient levels, operational history and areal risk were evaluated. Remember the screening risk assessment was only a point estimate of risk.

Response: The draft final revised FS references the Navy's RMR recommendations in the Section 2.0 as part of the summary of past investigations for each IR site. The results of the RMR process are discussed in the draft final RMR report (Tetra Tech 2000) and were the basis for the Parcel D soil TCRAs. The results of the updated incremental HHRA are the basis for proposing action in the draft final revised FS report. The draft final revised FS report does not contain recommendations for additional actions or no further action based on results of the interim removal actions conducted at Parcel D. Instead, the draft final revised FS report relies on the results of the updated incremental HHRA to identify areas requiring remediation and the need for additional response actions. The incremental HHRA evaluates risk using current soil data for sampling locations not already excavated.

2. **Comment:** Discussion of sites IR-45 (steam lines) with asbestos removal and IR-51 (transformer sites) and the fuel line investigations included in the time critical removal action are not expressly included in this document but should be to clearly show that actions were taken.

Response: The summary of the removal actions conducted at Parcel D are discussed in Section 2 of the draft final revised FS report.

3. **Comment:** Appendix A, Human Health Risk Assessment is in general correct but the number of figures and permutations of the data set are confusing and not useful. What is the difference between 0-10 feet bgs and 0-maximum sampled depth? The figures should be simplified by presenting the risk evaluation based on industrial and residential scenarios each on their own map with the mixed use area and buffer zone shaded on each. Also the risk characterization discussion as to why exceedences of the hazard index in the mixed-use areas will be protective with institutional controls needs to be included.

Response: The HHRA in the draft final revised FS report contains figures that present risk results by individual exposure scenario (residential, industrial, recreational, construction worker) and individual soil depth interval evaluated (0 to 2 feet bgs and 0 to 10 feet bgs). Figures are also included that present risk results by planned reuse. Discussions related to response actions, such as the use of institutional controls, are not provided in the HHRA appendix; however, they are included the process options section of the draft final revised FS report.

4. **Comment:** **Appendix B, Groundwater data evaluation. Why are MCLs used as the criteria for evaluation. Drinking water PRGs would allow for the evaluation of multiple chemicals at a single location and address chemicals without a MCL.**

Response: MCLs are not used as criteria for evaluation of exposure to groundwater in the HHRA. Based on the groundwater methodology for the Parcel D FS developed with the BCT and agreed to in a meeting on October 19, 2004, risks from groundwater vapor intrusion are calculated ratiometrically using the risk-based concentrations for groundwater vapor intrusion presented in Table 2c of EPA (2002), adjusted to be based on the most conservative between EPA and DTSC toxicity criteria (Navy 2004b, 2004c). Risks from domestic use of groundwater are also calculated ratiometrically, using the 2004 EPA Region 9 tap water PRGs, adjusted to account for the most conservative between EPA and DTSC toxicity criteria. Both of these approaches allow for additive evaluation of multiple chemicals at a single plume-based or nonplume-based location.

Specific Comments

1. **Comment:** **Executive summary, ES-5, soil remedial action objectives, third bullet. Please reference that there was a change in the screening PRG and it was addressed in section 2.3.1.2. Present the outcome based on the new evaluation using 750 ppm comparison.**

Response: The HHRA in the draft final revised FS report uses the current (2004) EPA Region 9 industrial PRG of 800 mg/kg to characterize risks from industrial and construction worker exposure to lead in soil

2. **Comment:** **Section 2.3 Installation Restoration Site Characterization, page 2-7, first full paragraph. Please spell out RMR the first time it is used.**

Response: The acronym "RMR" is defined the first time it is encountered in the draft final revised FS report.

3. **Comment:** **Ibid., next paragraph, The risk management review discussion should more accurately present all the variables that were addressed in the**

review process, such as, absolute concentration, volume of contamination, density of sampling, operational history and possible source of contamination.

Response: The draft final revised FS report references the Navy's RMR recommendations in the Section 2.0 as part of the summary of past investigations for each IR site. The draft final revised FS report does not contain recommendations for additional actions or no further action based on results of the interim removal actions conducted at Parcel D. Instead, the draft final revised FS report relies on the results of the updated incremental HHRA to identify areas requiring remediation and the need for additional response actions. The incremental HHRA evaluates risk using current soil data for sampling locations not already excavated.

4. **Comment:** Section 2.3.1.2 Site IR-09, page 2-13, last paragraph. Please address the operational history, volume of lead contamination, and that it more than "slightly exceeds" the screening criteria.

Response: Tables in the draft final revised FS report chronicle the history of investigations and interim remedial actions at each of the IR sites in Parcel D. Section 2.5 discusses the extent of lead contamination. Section 3.0 summarizes the human health risk posed by lead, parcel-wide.

5. **Comment:** Section 2.3.1.8 Site IR-33 south, page 2-18, first paragraph. Does this risk value address only the Rad risk? Please clarify. What is the current status of the radiation removal?

Response: Radiological removal actions at HPS are being conducted by RASO, which provides technical support for the Navy. Radiological investigations and removal actions are ongoing, as discussed in the HRA (RASO 2004). The Navy will address radiologically contaminated areas under CERCLA, and is evaluating several possible mechanisms to do this. Potential options under consideration include, but are not limited to, the following: incorporating radiological remedies and cleanup status into the ROD for Parcel D, adding radiological remedies into the final FS or the proposed plan, or developing a separate ROD for radiological sites.

6. **Comment:** Section 2.3.1.11 Site IR-37, page 2-23, last paragraph. Regulatory acceptance of the supplemental manganese level is still pending. Further, this supplemental manganese ambient level should only be applied if chert and/or basalt has been confirmed. Please revise.

Response: At the time these comments were written, the supplemental manganese ambient level was proposed by the Navy as a manganese screening level; it is no longer being considered. The draft final revised FS report uses the manganese HPAL

of 1,431 milligrams per kilogram (mg/kg). This is the HPAL value that was developed with the BCT (DTSC 1996).

7. **Comment:** Section 2.3.1.16 Site IR-48, page 2-27. The statement is made that the site is within the risk range for industrial risk. However, the evaluation of unrestricted land-use, i.e. residential, is necessary for the project team to justify the requirement or strength of further institutional controls. This type of evaluation is presented in Appendix A5 and should be referenced throughout this section.

Response: The draft final revised FS has been revised to reflect an ELCR of 1×10^{-6} or a maximum segregated index of 1, as a point of departure for considering when to implement remedial measures. Remedial measures are designed to address the incremental risk, which excludes the risk posed by metals at concentrations below background in accordance with CERCLA guidance. The need for response actions at Parcel D are based on the results of this incremental HHRA, adjusted for implementing feasible remedial measures where the chemicals of concern that pose the risk occur at concentrations above the laboratory's practical quantitation limit based on standard EPA analytical methodologies.

8. **Comments:** Section 2.3.2.3, Groundwater: Evaluation of Risk to Human Health, page 2-57, step 2. Why are only MCLs used? Comparison to drinking water PRGs would allow additive evaluation of multiple chemicals at a single location.

Response: MCLs are not used as criteria for evaluation of exposure to groundwater in the HHRA. Based on the groundwater methodology for the Parcel D FS developed with the BCT and agreed to in a meeting on October 19, 2004, risks from groundwater vapor intrusion are calculated ratiometrically using the risk-based concentrations for groundwater vapor intrusion presented in Table 2c of EPA (2002), adjusted to be based on the most conservative between EPA and DTSC toxicity criteria (Navy 2004b, 2004c). Risks from domestic use of groundwater are also calculated ratiometrically, using the 2004 EPA Region 9 tap water PRGs, adjusted to account for the most conservative between EPA and DTSC toxicity criteria. Both of these approaches allow for additive evaluation of multiple chemicals at a single plume-based or nonplume-based location.

9. **Comments:** Section 3.1. Remedial Action Objectives, page 3-2, last paragraph. The screening level used to initiate review in the RMR was unrestricted or residential land-use. This should be made clear.

Response: Reference to the RMR is no longer included in the RAO section. The draft final revised FS report does not contain recommendations for additional actions or

no further action based on results of the interim removal actions conducted at Parcel D or the RMR. Instead, the draft final revised FS report relies on the results of the updated incremental HHRA to identify areas requiring remediation and the need for additional response actions. The incremental HHRA evaluates risk using current soil data for sampling locations not already excavated.

10. Comment: **Table 3-1. Please revise the lead standard to 750 ppm.**

Response: The HHRA in the draft final revised FS report uses the current (2004) EPA Region 9 industrial PRG of 800 mg/kg to characterize risks from industrial and construction worker exposure to lead in soil

11. Comment: **Appendix A. Section 1.1 Data Evaluation and Chemicals of Potential Concern, page A-2 last paragraph. The screening level for arsenic was the HPAL of 11 ppm. This is already within the risk range but below the non cancer residential level of concern of 22 ppm which was also taken into consideration in the RMR. Regulatory approval of changes to the manganese ambient level is still pending. However, EPA has recently stated in comments on the most recent manganese technical memorandum that a supplemental manganese level of 10,000 ppm can be applied if chert and basalt are confirmed in the boring logs.**

Response: The arsenic HPAL of 11.1 mg/kg and the manganese HPAL of 1,431 mg/kg are used in the HHRA in the draft final revised FS report. These are the HPAL values that were developed with the BCT (DTSC 1996).

12. Comment: **Ibid, page A-3, last paragraph. The discussion of iron dietary requirements is all well and good but please state if there are exceedences of the PRGs, i.e 23,000 ppm residential or 100,000 ppm for industrial.**

Response: The discussion of iron dietary requirements is not included in the HHRA presented in draft final revised FS report because iron is no longer excluded as a COPC on the basis of being an essential nutrient.

13. Comment: **Appendix A, Section 1.4.2, page A-9, homegrown produce bullet. How does the default assumption of 7% of produce consumed is home grown used in evaluating lead compare to the assumptions used to evaluate the produce pathway calculated in the site-specific soil PRGs?**

Response: The ingestion rates used in the revised HHRA to evaluate homegrown produce for COPCs other than lead are taken from EPA guidance (EPA 1991) and were agreed to during the March 2004 meeting to finalize the methodology for the soil risk evaluation (Navy 2004a). These rates assume that the percentage

of fruits and vegetables consumed that is homegrown is 30 and 40 percent, respectively.

14. **Comment:** **Appendix A, ibid. Please simplify the discussion so that is clear that the screening level used for residential was 221 ppm.**

Response: The HHRA in the draft final revised FS report develops a revised, site-specific lead concentration, derived from the updated DTSC and EPA blood lead models, to characterize risks from residential and recreational exposure to lead in soil.

15. **Comment:** **Appendix A, Section 2.1, Risk from Exposure to Lead, page A-10. Is the discussion of sickle cell anemia and hemochromatosis necessary? Please delete unless there was a community request. If it is to be included, the discussion needs to be made relevant.**

Response: The discussion of sickle cell anemia and hemochromatosis has been eliminated in the HHRA presented in the draft final revised FS report.

16. **Comment:** **Appendix A, Section 3.0, Human health risk assessment results for reasonably anticipated land-use scenario, page A-12. Please state why it may be useful to view the risk with and without the inclusion of the ambient level risks.**

Response: The draft final revised FS report includes revised HHRA methodology and includes assessments both of total risk and incremental risk. Per the interim Navy policy on the use of background chemical levels (Navy 2000), the baseline risk assessment should not be conducted on chemicals that are present at levels less than background chemical levels.

17. Comment: Appendix A, Section 3.1.3 and 3.1.4, pages A-13 and 14. How are the calculations different between the 0-10 foot sampling and the maximum depth sampled? Are these additional calculations necessary/ useful?

Response: The HHRA in the draft final revised FS report does not present risk for the “0 to maximum depth sampled” depth interval.

18. Method: Appendix A, Section 3.2 Future mixed use areas, page A-14. Where is the indoor air pathway evaluation from VOCs in aquifer B? Since there is recent concern about the modeling for indoor air from groundwater contamination, a reevaluation of the appropriateness of the parameters used in the HHRA for the A and B aquifers should be included in this document. Also, do the VOCs confirmed in groundwater at IR-36 now in Parcel E, pose a potential indoor air threat to any buildings existing or planned on Parcel D?

Response: As the B-aquifer is overlain by the A-aquifer, the indoor air pathway evaluation is limited to volatile contaminants in the A-aquifer. This methodology was discussed with the BCT and agreed to in a meeting on October 19, 2004, the evaluation of groundwater vapor intrusion is limited to volatile contaminants detected in the A-aquifer (Navy 2004b, 2004c). Building 406 is now in Parcel E; indoor air risks from vapor intrusion of volatile contaminants in groundwater at Building 406 will be assessed in the Parcel E RI report.

19. Comment: Appendix A, Section 4.1 Residential Exposure, page A-16. Again what is the need for 0-10 and 0 to max depth figures? Additional figure is needed to include with produce and without an ambient screen.

Response: The HHRA in the draft final revised FS report does not present risk for the “0 to maximum depth sampled” depth interval. The HHRA in the draft final revised FS report does include presentation of total risk and incremental risk, both of which include the consumption of homegrown produce pathway for the residential exposure scenario.

20. Comment: Appendix A, figures. The titles of the figures are not complete and do not easily distinguish between the figures.

Response: The figures used in the HHRA appendix of the draft final revised FS report have been revised and their associated figure titles have been edited for clarity.

RESPONSES TO DTSC COMMENTS FROM CHEIN KAO, PROJECT MANAGER, RECEIVED ON
JUNE 21, 2002

General Comments

1. **Comment:** In the draft revised FS, the Navy did not provide evaluations and rationales supporting the Navy's recommendations and conclusions, but instead simply stated that, as a result of the RMR process, the *BCT* had concluded that no response action was required for many sites. This statement misrepresents the RMR process, as explained below. (*Emphasis added.*)

It is important to note that regulatory agencies generally agree to provide early input to the Navy before a document is submitted or a decision is made. This is done with the hope that a document will not require multiple or massive revisions. However, early input was never intended to constitute final approval of a document. It is the Navy's responsibility to provide an independent evaluation and rationale to support its recommendations and conclusions. The regulators or the reviewing public can then comment or concur with the document. In the case of Parcel D RMR, regulators did meet with the Navy to discuss each site. But, as stated above, the RMR process was never intended to be a final approval process. Moreover, the parties never reached a consensus for all the sites in RMR report. Since consensus could not be reached, it was decided that the Navy would finalize the report (which represents the Navy's version of the RMR process) as a secondary document. DTSC did not approve the RMR report. DTSC and other regulatory agencies reserved their rights to either concur or dispute the Navy's conclusions during review of the corresponding primary document (the revised FS).

In the revised FS, the Navy must present its decisions for each site with supporting rationales so the public can understand how Navy's decisions are reached for each site. Any reference to BRAC Cleanup Team (BCT) should be deleted. Table 2-3 is a good start, but the text for each site needs more details.

Response: The draft final revised FS report references the Navy's RMR recommendations in the Section 2.0 as part of the summary of past investigations for each IR site. The draft final revised FS report does not contain recommendations for additional actions or no further action based on results of the interim removal actions conducted at Parcel D. Instead, the draft final revised FS report relies on the results of the updated incremental HHRA to identify areas requiring remediation and the need for additional response actions. The incremental HHRA evaluates risk using current soil data for sampling locations not already excavated.

2. **Comment:** It is not clear what is “unacceptable risk”. If the Remedial Action Objective (RAO) is set at 1.0E-06 risk, the text should clearly state the residual risk for a specific site does not exceed 1.0 E-06 risk; instead of using an undefined term of “unacceptable risk.”

Response: The term “unacceptable risk” was deleted throughout the draft final revised FS report. The draft final revised FS report uses an ELCR of 1×10^{-6} or a maximum segregated hazard index of 1, as the point of departure for considering when to implement remedial measures. The RAOs are derived to implement remedial measures when this risk calculation exceeds the incremental HHRA, and the response actions and remedial alternatives are derived to satisfy the RAOs.

3. **Comment:** The document never addressed residual risks for an open space reuse scenario and for an education/cultural reuse scenario as shown on Fig. 2-2 of “Proposed Reuse Plan”.

Response: Based on an agreement between the EPA, DTSC, City, and the Navy in March 2004 (Navy 2004a), total and incremental risks in the draft final revised FS are assessed in Appendix B for each potential exposure scenario (residential; industrial, which addresses educational/cultural reuse; recreational, which addresses open space reuse; and construction worker) for all of the redevelopment blocks across Parcel D regardless of the planned reuse, so that the risks within Parcel D can be easily evaluated if the reuse of selected blocks were to change. In Section 3.0 of the draft final revised FS report, the total and incremental risk for each of the redevelopment blocks is presented according to the planned reuse, consistent with CERCLA guidance.

4. **Comment:** The current data set (established with samples collected by “investigation by excavation” only for sites that require remediation under an industrial reuse scenario) is not adequate to evaluate residual risk under a residential reuse scenario, as explained below.

The data set used to assess residual risk was derived from an “investigation by excavation” process. The “investigation by excavation” process during the various removal actions addressed only sites that required remediation under an industrial reuse scenario. For a residential reuse scenario, a risk grid using the remedial investigation (RI) data set could be constructed, and more remedial areas (RAs) as well as de minimis areas (DMs) would be identified. The ensuing “investigation by excavation” process for residential reuse would result in RAs not only greater in number but also larger in size than that for industrial reuse.

Areas with no data cannot be considered available for unrestricted reuse as suggested at the bottom of page A-16. For the same reason, soil remedial alternative S-3 is not a valid alternative without soil

contamination characterized and residual risk evaluated under an unrestricted reuse scenario. Sections 4.0 to 4.8 of Appendix A as well as Figures A-5 to A-12 should be deleted.

Response: The data set for soils includes data collected during the initial RI using a biased sampling method based on an extensive review of site history and visual observations to identify suspected areas of industrial activity or chemical release. Additional soils data were collected during subsequent investigations and removal actions at contaminated areas. The current soils data set used for the HHRA includes all of the validated results for all of the previous investigation and interim remedial activities, except for those soil samples that were collected in locations that have since been excavated. The Navy determined that this data set is adequate to conduct the HHRA. The HHRA appendix presents total and incremental risk for each potential exposure scenario (residential, industrial, recreational, and construction worker) for all of the redevelopment blocks across Parcel D regardless of the planned reuse; the HHRA summary section in the main text presents the total and incremental risk for each of the redevelopment blocks according to the planned reuse. For the residential and industrial exposure scenarios, risks from exposure to contaminants in soil are assessed for both surface soil (0 to 2 feet bgs) and subsurface soil (0 to 10 feet bgs). Remedial alternatives presented in the draft final revised FS report are intended for implementation by redevelopment block or parcel wide.

5. Comment: DTSC defers the “Groundwater Beneficial Use Determination “ to the United States Environmental Protection Agency (USEPA) and California Regional Water Quality Control Board (RWQCB). However, our evaluation and comment on the fate and transport of groundwater contamination as well as the groundwater remedy selection are provided in attached comments.

Response: No response is required.

6. Comment: Exploratory Excavations (EEs), Time Critical Removal Actions (TCRA), and other removal actions cited on page ES-1 were performed in different time periods with different work plans and criteria. The revised FS needs to address the limitations and the criteria used for each removal action. The Navy must reconcile all differences in removal action criteria. Similarly, the Navy must show that confirmation sampling protocols are comparable and that the final results represent comparable levels of investigation and cleanup (in particular, 10-6 risk).

Response: The discussions of criteria and limitations for each removal action are contained in the respective removal action documents. The draft final revised FS report briefly summarizes the EE and TCRA activities. The additional soil data collected during these activities are used in the HHRA (except for those soil sample results that represent material that was removed). As a result, no areas

are identified for no further action based solely on the interim removal action results, and therefore, detailed presentation of the removal action plans and results are not needed in the draft final revised FS report.

7. **Comment:** **Until a new manganese (Mn) ambient level is approved, the ambient concentration for manganese remains 1,400 ppm. Any conclusions based on Mn ambient concentrations other than 1,400 ppm are not acceptable. References to Mn ambient concentrations other than 1,400 ppm should be deleted.**

Response: At the time these comments were written, the supplemental manganese ambient level was proposed by the Navy as a manganese screening level; it is no longer being considered. The draft final revised FS report uses the manganese HPAL of 1,431 milligrams per kilogram (mg/kg). This is the HPAL value that was developed with the BCT (DTSC 1996).

8. **Comment:** **The Navy needs to explain why areas with industrial or residential cancer risk between 1.0E-06 and 1.0E-05 as shown in Appendix A do not require further action.**

Response: The draft final revised FS report has been revised to reflect an ELCR of 1×10^{-6} or a maximum segregated index of 1, as a point of departure for considering whether to implement remedial measures. Remedial measures are designed to address the incremental risk, which excludes the risk posed by metals at concentrations below background in accordance with CERCLA guidance. The need for response actions at Parcel D are based on the results of this incremental HHRA, adjusted for implementing feasible remedial measures where the chemicals of concern that pose the risk occur at concentrations above the laboratory's practical quantitation limit based on standard EPA analytical methodologies.

9. **Comment:** **For sites where removal actions were completed, was the ground surface always restored to original elevations?**

Response: The sites were regraded to be consistent with existing surfaces, although subtle variations may exist.

10. **Comment:** **The groundwater monitoring program proposed in the draft ROD should be retained. Without fully characterized groundwater plumes, it is impossible to predict the maximum concentration that should be used to conservatively estimate the maximum concentrations reaching the exposure point. Comments on groundwater modeling are attached.**

Response: The draft final revised FS report does not attempt to model or predict the maximum concentrations of chemical of concern that could reach an exposure

point. Groundwater at HPS is currently monitored under the basewide groundwater monitoring program (Tetra Tech 2004). These data, in conjunction with historical data, were used to evaluate the current groundwater condition, as well as derive the potential human health risks based on the revised HHRA methodology for groundwater evaluation. As a result, groundwater monitoring is included as a component of the groundwater remedial alternatives.

- 11. Comment:** Page 2-58, The statement: "... most of the site is paved and infiltration is expected to be very limited" will not hold true unless an enforceable institutional control (IC) is put in place. The IC should require that the current pavement be expanded to cover the entire Parcel D and that the pavement be maintained in perpetuity.

Response: Section 5.0 of the draft final revised FS report describes each of the components of the remedial alternatives, including institutional controls. The description of the proposed institutional controls includes the necessary requirements to control exposure to contaminants. The proposed institutional controls would require covers parcel-wide, and to maintain these covers in perpetuity

- 12. Comment:** The Navy needs to demonstrate that soils left in place will not impact groundwater at levels exceeding cleanup criteria. DTSC has repeatedly noted that the exposure pathway of contaminants leaching from soil to groundwater was a data gap that still needed evaluation (since removal action criteria included direct soil exposure pathways only). There are two cases to consider: (1) soils with concentrations below removal action criteria (based on direct soil exposures only), and (2) soils with concentrations exceeding soil cleanup criteria which were left in place because they are deeper than ten feet bgs (ten feet below the ground surface, the depth used for direct soil pathway exposures).

Response: The Navy agrees that the soil removal action criteria evaluate the soil exposure pathways only, and do not account for the potential leaching of residual chemicals of concern to the groundwater. However, it is recognized that the removal actions have mitigated a large portion of the potential for leaching by removing the highest concentrations of the contaminants. The Navy does not agree that soil left in place needs to be evaluated to determine a hypothetical potential to leach to groundwater. For Parcel D, the only groundwater plumes identified from the recent groundwater monitoring data collected in June 2004 are VOC and hexavalent chromium plumes. Although selected VOCs and hexavalent chromium are found in the soils at Parcel D, the groundwater plumes appear to be stable or decreasing, when compared to the historical data, which does not support the premise that these chemical of concern are continuing to leach into the groundwater from the soil. In the draft final revised FS report,

groundwater monitoring of the plumes is included in the remedial alternatives for a continued assessment of the groundwater condition.

13. **Comment:** The HHRA does not address Parcel D risks from adjacent parcels. DTSC is very concerned with the potential impact from adjacent parcels: specifically, the planned residential area next to Parcel E in very close proximity to the industrial landfill. "Adjacency" issues will have to be addressed before Parcel D is ready for transfer.

Response: Adjacency issues from the Parcel E-2 landfill were addressed prior to the transferring Parcel A.

Specific Comments

1. **Comment:** Page ES-1, The following sentence should be modified to: "RI found Parcel D groundwater did not pose potential risk to the public health and environment because the exposure pathway *will not be complete because institutional controls will prohibit any extraction of groundwater for any use.*"

Response: The executive summary was revised to reflect revisions to the draft final revised FS report.

2. **Comment:** IR-09, DTSC did not agree, in the RMR meetings, that no further action is required for IR-09. Instead, DTSC wanted to see 9-01, 9-02, and 9-03 combined to evaluate potential area-wide hexavalent chromium (Cr+6) issues, especially since Cr+6 was detected in groundwater in the area. DTSC disagrees with the Navy that each exceedence should be isolated as a single point of concern and treated as an individual de minimis (DM) area. Samples rejected after data validation should be re-sampled. (See TCRA close-out report).

Response: The draft final revised FS report does not contain recommendations for additional actions or no further action based on results of the interim removal actions conducted at Parcel D. Instead, the draft final revised FS report relies on the results of the updated incremental HHRA to identify areas requiring remediation and the need for additional response actions. The incremental HHRA evaluates risk using current soil data for sampling locations not already excavated.

The Navy collected numerous soil samples for analysis of hexavalent chromium at Sites 9-01, 9-02, 9-03 and did not detect hexavalent chromium above the TCRA industrial criterion of 10 mg/kg (Tetra Tech and IT Corporation 2001). In addition, areas were resampled during the TCRA at IR-09 to fill any gaps created by rejected data. Data for the resampled areas were also included in the TCRA closeout report (Tetra Tech and IT Corporation 2001). To address

concerns about total chromium concentrations that exceeded the hexavalent chromium criterion (which assumed a 1:6 ratio for hexavalent chromium), the TCRA investigation also included resampling the areas where the highest total chromium concentrations were detected. These samples were analyzed for hexavalent chromium. These additional soil samples collected at IR-09 did not contain hexavalent chromium at concentrations above the TCRA industrial criterion of 10 mg/kg in industrial reuse areas or above the residential criterion of 0.96 mg/kg in residential reuse areas.

3. **Comment:** DM 6967. The TCRA closeout report indicated that numerous Cr+6 samples were rejected and were never re-sampled. DTSC disagrees that no further action is appropriate.

Response: This area was resampled to fill in any gaps created by rejected data. As the TCRA closeout report explains on page 25, "An initial review of the data for soil samples collected in the 0- to 2-foot depth range revealed that results for three of the four samples were rejected after data validation. The rejected data are marked with an (R) to clearly distinguish them from the rest of the data. For additional information on rejected data please refer to the TCRA closeout report, Appendix B – Quality Control Summary Report, TCRA Soil Data. Additional shallow soil samples were then collected at these locations. A 'C' is appended to the identification for the recollected soil samples. None of the recollected soil samples contained hexavalent chromium or total chromium at concentrations above the TCRA residential cleanup goal. In addition, none of the soil samples collected between 2 and 10 feet bgs contained hexavalent chromium or total chromium at concentrations above the TCRA industrial cleanup goal" (Tetra Tech and IT Corporation 2001).

The draft final revised FS report does not contain recommendations for additional actions or no further action based on results of the interim removal actions conducted at Parcel D. Instead, the draft final revised FS report relies on the results of the updated incremental HHRA to identify areas requiring remediation and the need for additional response actions. The incremental HHRA evaluates risk using current soil data for sampling locations not already excavated.

4. **Comment:** IR-33N. EE 12 (DM 7353) was not completed consistent with TCRA. All EEs need to be re-evaluated to demonstrate consistency with TCRA goals.

Response: All exploratory excavation sites, as well as all current soil data associated with sampling locations not excavated, were reevaluated in the HHRA. The HHRA in the draft final revised FS report uses current soil data to assess risk, and RAOs and remediation goals were developed for each contaminant of concern. Therefore, demonstrating consistency with TCRA goals is not necessary.

5. **Comment:** RA33N-1. The Navy did not address RA33N-1 in the TCRA report nor was it addressed in the revised FS.

Response: RA33N-1 is addressed in the HHRA in the draft final revised FS report because the HHRA uses current soil data to assess risk, and RAOs and remediation goals were developed for each contaminant of concern. The need for additional response actions at Parcel D are then based on the results of the incremental HHRA presented in the draft final revised FS report.

6. **Comment:** IR-33S. In addition to the two parcel-wide ICs (the parcel-wide industrial use IC and the 10-feet-bgs IC), an IC will be required for all soils underneath Building 411.

Response: Land use controls, including institutional controls, are described in the alternatives section of the draft final revised FS report. Institutional controls to prevent soil contact are included in the alternatives. Several of the land use controls are intended to be applied parcel-wide.

7. **Comment:** IR-34. It is unclear whether the Cesium-137 removal action is completed. Where is the documentation that the area has been cleared for unrestricted industrial use and for open space?

Response: Radiological removal actions at HPS are being conducted by RASO, which provides technical support for the Navy. Radiological investigations and removal actions are ongoing, as discussed in the HRA (RASO 2004). The Navy will address radiologically contaminated areas under CERCLA, and is evaluating several possible mechanisms to do this. Potential options under consideration include, but are not limited to, the following: incorporating radiological remedies and cleanup status into the ROD for Parcel D, adding radiological remedies into the final FS or the proposed plan, or developing a separate ROD for radiological sites.

8. **Comment:** IR-35. Work that was conducted to cleanup the drain and sumps should be described here. Justify why no further action is required.

Response: Storm drain and sanitary sewer lines for the entire base are all included as part of IR-50. Cleanup of storm or sanitary lines, drains, and sumps is discussed as part of the removal action summary in Section 2.0 of the draft final revised FS report. In 2006 and 2007, the Navy plans to remove the storm drain and sanitary sewer lines throughout HPS. The draft final revised FS report does not contain recommendations for additional actions or no further action based on results of the interim removal actions conducted at Parcel D.

9. **Comment:** IR-37. EE-14 was not completed consistent with TCRA confirmation sampling. Polycyclic aromatic hydrocarbons (PAHs) were not analyzed

for. DTSC does not agree with the use of Supplemental Manganese Ambient Level (SMAL) as cleanup criteria.

Response: The exploratory excavations removal action was not a TCRA. Thirty-seven cubic yards of soil containing metals, PCBs and TPH was excavated from EE-14. PAHs were not target contaminants for EE-14. At the time these comments were written, the supplemental manganese ambient level was proposed by the Navy as a manganese screening level; it is no longer being considered. The draft final revised FS report uses the manganese HPAL of 1,431 milligrams per kilogram (mg/kg). This is the HPAL value that was developed with the BCT (DTSC 1996).

10. Comment: DM6671. DTSC does not agree with the use of Supplemental Manganese Ambient Level (SMAL) as cleanup criteria.

Response: At the time these comments were written, the supplemental manganese ambient level was proposed by the Navy as a manganese screening level; it is no longer being considered. The draft final revised FS report uses the manganese HPAL of 1,431 milligrams per kilogram (mg/kg). This is the HPAL value that was developed with the BCT (DTSC 1996).

11. Comment: IR-45. The steam line was removed under TCRA. STLC or TTLC are not acceptable as screening criteria for wipe samples.

Response: The TCRA work plan, which included steam line sampling procedures, was approved by the agencies (IT Corporation 2001). Wipe samples were analyzed to characterize potential contamination in the steam line pipe. Based on the results of these analyses, Total Maximum Leachable Concentrations (TMLC) were calculated from the results of the "total wipe sample" analyses. The TMLC calculated results are the total maximum leachable concentrations reported in mg/L, that a detected analyte could impact the environment, assuming that all of the available contaminant is liberated from the steam line. These results were compared to the STLC and TCLP limits as guidance to assess if the steam lines could potentially impact the soils if they were left in place. These results can not be compared to soil guidance limits, such as EPA PRGs reported in mg/kg, because the volume of soil that would potentially be impacted is not known or calculated by this procedure.

12. Comment: IR-50. Storm drain and sanitary sewer lines were not evaluated in IR sites where they are located.

Response: Storm drain and sanitary sewer lines for the entire base are all included as part of IR-50. Soil samples collected adjacent to storm drain or sanitary sewer lines were evaluated in the HHRA as part of the IR site through which IR-50 traverses. Cleanup of the actual storm or sanitary lines, drains, and sumps is

discussed as part of the removal action summary in Section 2.0 of the draft final revised FS report. In 2006 and 2007, the Navy plans to remove the storm drain and sanitary sewer lines throughout HPS.

13. **Comment:** **IR-53. DM 11260. Three of the four side boundary confirmation samples exceed cleanup level and resampling data were rejected. TCRA did not meet cleanup criteria. Further action is required.**

Response: The excavation at DM 11260 was successful in removing polynuclear aromatic hydrocarbons (PAH) detected at the site. Detection limits for PAHs were elevated for the original sidewall samples collected at DM 11260. Additional samples were then collocated at these locations and were reanalyzed for PAHs. The validated data for these samples were rejected because of low surrogate recovery. After the rejected data were received, the original sample results were reevaluated. Detection limits did not exceed three times the cleanup goal for any of the samples.

The draft final revised FS report does not contain recommendations for additional actions or no further action based on results of the interim removal actions conducted at Parcel D. Instead, the draft final revised FS report relies on the results of the updated incremental HHRA to identify areas requiring remediation and the need for additional response actions. The incremental HHRA evaluates risk using current soil data for sampling locations not already excavated.

14. **Comment:** **Page 2-65, Exploratory Excavation Removal Actions (EEs). Artificial limitations imposed for the areas excavated should be discussed here. Any inconsistency in removal action criteria and confirmation sampling between EEs and TCRA should be discussed and efforts to reconcile the differences need to be documented.**

Response: Removal action criteria are valid at the time the action took place; reconciliation of differing criteria between actions does not need to be presented in the draft final revised FS report because the HHRA in the draft final revised FS report evaluates risk using current soil data for sampling locations not already excavated. The need for additional response actions at Parcel D were then based on the results of the incremental HHRA presented in the draft final revised FS report.

15. **Comment:** **Page 2-67, Radiological Time Critical Removal Action. All soil contamination including radiological contamination should be evaluated in remedial alternatives proposed in Section 4.0.**

Response: Radiological removal actions at HPS are being conducted by RASO, which provides technical support for the Navy. Radiological investigations and removal actions are ongoing, as discussed in the HRA (RASO 2004). The

Navy will address radiologically contaminated areas under CERCLA, and is evaluating several possible mechanisms to do this. Potential options under consideration include, but are not limited to, the following: incorporating radiological remedies and cleanup status into the ROD for Parcel D, adding radiological remedies into the final FS or the proposed plan, or developing a separate ROD for radiological sites.

16. Comment: **Table 2-4 should indicate whether Hunters Point Ambient Levels (HPALs) were used to screen the data.**

Response: Text, figures, and tables have been revised to reflect current modifications to the HHRA. An evaluation of total risk is included in the revised HHRA. All detected chemicals, regardless of concentration, are included as COPCs in the revised total HHRA (except essential nutrients; that is, calcium, magnesium, sodium, and potassium). An evaluation of incremental risk, which excludes metals with maximum measured concentrations below HPALs on a grid-by-grid basis, is also presented. The tables for the HHRA clearly indicate if results shown pertain to total or incremental risk.

17. Comment: **Page 3-2. The proposal of “a buffer zone of soil from 0 to 2 feet to be considered residential reuse and 2 to 10 feet bgs to be industrial reuse” should include an IC to maintain the long term integrity of the buffer zone.**

Response: Discussion of the buffer zone was removed from the draft final revised FS report.

18. Comment: **Appendix A. The residual risk calculation should present all data in each particular grid and all sample locations used in the risk calculation. See attachment 1: comments from Jim Polisini.**

Response: The data used in the HHRA are presented in Appendix B of the draft final revised FS report. This appendix includes tables, organized by both sample identifier and analyte, that summarize all soil and groundwater analysis results. An additional table is provided in Appendix B that identifies the sampling locations associated with each grid.

19. Comment: **Appendix B. No comment.**

Response: No response is required.

20. Comment: **Appendix C. See attachment 2: comments from Mark Malinowski**

Response: See responses to comments from Mark Malinowski.

21. **Appendix D. No comment.**

Response: No response is required.

22. **Comment: Appendix E. Include breakdown of long-term costs for ICs.**

Response: Long-term costs for institutional controls are included in all of the alternatives in the draft final revised FS report, except for the no action alternative. The breakdown of costs associated with these alternatives is presented in the cost evaluation appendix of this FS report.

RESPONSES TO DTSC COMMENTS FROM JAMES M. POLISINI, PH.D., SENIOR TOXICOLOGIST; HUMAN AND ECOLOGICAL RISK DIVISION [HERD], RECEIVED JUNE 10, 2002

General Comments:

- 1. Comment:** HERD cannot agree with the results of any Human Health Risk Assessment (HHRA) which excludes manganese based on a revised 'ambient' concentration. HERD provided comments on this proposal in an April 9, 2002 memorandum and has not received yet a response.

Response: At the time these comments were written, the supplemental manganese ambient level was proposed by the Navy as a manganese screening level; it is no longer being considered. The draft final revised FS report uses the manganese HPAL of 1,431 milligrams per kilogram (mg/kg). This is the HPAL value that was developed with the BCT (DTSC 1996).

- 2. Comment:** HERD has continuously recommended that point estimates of incremental cancer and non-cancer hazard be contoured by isopleth rather than constructing hypothetical industrial and residential lots to develop the Exposure Point Concentration (EPC) for the intake calculations. Development of the EPC term based on hypothetical lots requires additional effort by the Navy contractors, which is not required.

Response: The methodology used in the HHRA, including use of the residential and industrial exposure grids, was initially developed by the Navy and accepted by the BCT at the time of the original FS in 1996 (PRC, LFR, and U&A 1996). DTSC also agreed to the grid-based approach during the March 2004 meeting to finalize the methodology for the soil risk evaluation (Navy 2004a).

Specific Comments

- 1. Comment:** The DTSC Preliminary Endangerment Assessment (PEA) manual is meant to provide guidance for a screening level Human Health Risk Assessment (HHRA). As this is a 'revised' Feasibility Study (FS) this guidance would not appear appropriate (Appendix A, Section 1.0, page A-1) unless there are significant differences in the PEA manual, which are more health protective, than the U.S. EPA guidance documents which are listed.

Response: The draft final revised FS has been revised to eliminate the reference to the preliminary endangerment assessment (PEA) manual as a primary guidance document for the framework of the HHRA. However, the HHRA in the draft final revised FS uses the PEA as a source for dermal absorption factors (ABS) for evaluating risks from exposure to soil, as the ABS values provided in the

PEA are more health-protective than those provided in EPA risk assessment guidance documents.

2. **Comment:** Calcium, magnesium, potassium and sodium are eliminated as Contaminants of Concern (COCs) (Appendix A, Section 1.0, page A-2) based on the fact that all are essential human nutrients. This decision criterion needs to be coupled with a consideration of concentration for evaluation of ecological risk issues. Please amend the text to indicate that the concentration of these elements does not exceed toxic levels.

Response: At Parcel D, approximately 85 percent of the ground surface is covered by pavement and former industrial buildings, and no significant terrestrial habitat exists at Parcel D. Therefore, ecological criteria are not addressed and the draft final revised FS report was not revised in response to this comment.

3. **Comment:** There is no scientific basis for considering an arsenic soil concentration of two times the Hunters Point Ambient Level (HPAL) a criterion in eliminating arsenic from the HHRA (Appendix A, Section 1.0, page A-2). This criterion might be applied in risk management as part of the balancing criteria, but must not be applied in the risk assessment selection of COCs. A statistical test such as the Wilcoxon Rank Sum Test or Kolmogorov-Smirnov two sample test should be applied to evaluate the statistical difference between the site and ambient data set. Please include an assessment of the arsenic carcinogenic cancer risk for consideration of the risk managers.

Response: The HHRA presented in the draft final revised FS report includes an evaluation of total and incremental risks from exposure to COPC in soil. In the total risk evaluation, with the exception of essential human nutrients (calcium, magnesium, potassium, sodium), all metals, regardless of concentration, are included as COPCs. In the incremental risk evaluation, metals measured at maximum concentrations below HPALs are excluded as COPCs, on a grid by grid basis. A factor of two times the HPAL is no longer used. The uncertainty analysis presented in the HHRA includes an evaluation of the potential risks and hazards associated with metals at concentrations equal to HPALs.

4. **Comment:** HERD has not agreed to any 'supplemental manganese ambient' concentration (Appendix A, Section 1.0, page A-2) for selection of COCs. The present HPAL for manganese is 1,400 mg/kg. This HPAL was set based on several regressions between manganese and other co-occurring elements, during a multiyear investigation, in samples collected from HPS. The current US EPA Preliminary Remediation Goal (PRG) for manganese in soil is 1,800 mg/kg, excluding the homegrown produce pathway. HERD's comments on this issue are contained in a HERD memorandum dated April 9, 2002. No response has been received regarding the April, 2002 HERD memorandum.

HERD cannot, therefore, agree with a HHRA which excludes manganese based on a manganese soil criterion of nearly 14,000 mg/kg.

Response: At the time these comments were written, the supplemental manganese ambient level was proposed by the Navy as a manganese screening level; it is no longer being considered. The draft final revised FS report uses the manganese HPAL of 1,431 milligrams per kilogram (mg/kg). This is the HPAL value that was developed with the BCT (DTSC 1996). Additionally, the HPAL for manganese was not based on regressions between manganese and other co-occurring elements; the HPALs for nickel, cobalt, and chromium were calculated based on a regression analysis.

5. Comment: HERD agrees that a 50 foot buffer is most likely a health protective value (Appendix A, Section 1.2.1, page A-3) for separation of mixed use and industrial use areas.

Response: Discussion of the buffer zone was removed from the draft final revised FS report.

6. Comment: Please provide a list in the text of the groundwater contaminants which were dropped from the HHRA based on the assumption that workers would not ingest drinking water from the bedrock water-bearing zone (Appendix A, Section 1.2.2, page A-4). This exposure pathway was considered complete in the former HHRA.

Response: Based on the groundwater methodology for the draft final revised FS developed with the BCT and agreed to in a meeting on October 19, 2004, the HHRA only includes ingestion of groundwater under the residential exposure scenario (Navy 2004b, 2004c). The HHRA in the draft final revised FS report includes evaluation of domestic use exposure pathways (ingestion, inhalation during household use) for the B-aquifer and bedrock water bearing zone groundwater for the residential exposure scenario. No contaminants were eliminated from this evaluation.

7. Comment: The City of San Francisco and the Base Closure Team (BCT) are listed as agreeing with the limit of buffer zone soil concentrations to the zero to two foot level (Appendix A, Section 1.2.3, page A-5). Please indicate separately whether DTSC agreed to this limitation.

Response: Discussion of the buffer zone was removed from the draft final revised FS report.

8. Comment: Please provide the total incremental risk and non-cancer hazard for indoor inhalation of volatile compounds rather than make a comparison to U.S. EPA Region 9 Preliminary Remediation Goals (PRGs)

(Appendix A, Section 1.2.3, page A-5). A copy of the Johnson and Ettinger model, which incorporates the Office of Environmental Health Hazard Assessment (OEHHA) California-specific cancer slope factors and non-cancer toxicity values, is available from HERD.

Response: Based on the groundwater methodology for the draft final revised FS developed with the BCT and agreed to in a meeting on October 19, 2004, risks from groundwater vapor intrusion are calculated ratiometrically using the risk-based concentrations for groundwater vapor intrusion presented in Table 2c of EPA guidance (EPA 2002a), adjusted to use the most conservative of both the EPA and DTSC toxicity criteria (Navy 2004b, 2004c). The revised HHRA presents chemical-specific cancer and noncancer estimates of risks from groundwater vapor intrusion, as well as total risks and hazards for this exposure scenario.

9. **Comment:** The discussion of a 'risk range' of 1×10^{-4} to 1×10^{-6} (Appendix A, Section 1.4.1, page A-7) is applicable to risk management decisions once the nine balancing criteria are being evaluated for selection of a remedial alternative. This portion of the text should be transferred to the sections after the HHRA.

Response: The draft final revised FS report has been revised to reflect an ELCR of 1×10^{-6} or a maximum segregated index of 1, as a point of departure for considering when to implement remedial measures. Remedial measures are designed to address the incremental risk, which excludes the risk posed by metals at concentrations below background in accordance with CERCLA guidance. The need for response actions at Parcel D are based on the results of this incremental HHRA, adjusted for implementing feasible remedial measures where the chemicals of concern that pose the risk occur at concentrations above the laboratory's practical quantitation limit based on standard EPA analytical methodologies.

10. **Comment:** Surely there are drinking water lead measurements after more than 20 years of human health risk assessment at HPSY. The measured concentration of lead in water should be used for input into the DTSC lead spread model (Appendix A, Section 1.4.3, page A-9) rather than the default $2.0 \mu\text{g/l}$ California public health goal. If measured HPSY lead concentrations in drinking water are not available, contact the City of San Francisco to obtain lead concentration data for the plant serving HPSY. In the event site-specific data is not available use the lead spread default of $15 \mu\text{g/l}$.

Response: The measured concentration of lead in HPS groundwater or the measured concentration of lead in City of San Francisco water will be used in the DTSC Leadsread model to develop a site-specific residential screening level for lead in soil.

11. Comment: Consideration of the soil concentrations in the surface to 10 feet below ground surface may not necessarily be protective of all construction workers (Appendix A, Section 3.1, page A-13). Please determine whether there are any current lift stations or areas of the sewer system within Parcel D deeper than 10 feet. Also please consult with the City of San Francisco to determine portions of the sewer system which might require installation of an additional lift station. A sewer lift station repair to approximately 40 feet was discussed for Parcel B.

Response: Based on agreement between the Navy and the BCT in March 2004, the HHRA evaluates soil exposures from 0 to 10 ft bgs for the construction worker scenario (Navy 2004a). This approach is consistent DTSC and EPA guidance for assessing risks from exposure to soil.

12. Comment: Please identify any residential exposure parcels where cancer risk associated with polychlorinated biphenyl (PCB) exceeds 1×10^{-6} (Appendix A, Section 4.0, page A-16) separate from those where polycyclic aromatic hydrocarbons (PAH) compose the majority of the risk in excess of 1×10^{-6} .

Response: The HHRA presented in the draft final revised FS report identifies chemical-specific risk drivers for both soil and groundwater.

13. Comment: How is it possible to conclude (Appendix A, Section 4.0, page A-16) that '...residential exposure areas with no data would be considered available for unrestricted reuse...' No available data does not equal no risk or hazard (Appendix A, Figure A-1). This decision is unacceptable to HERD. Comparison to adjacent parcels should be made by contouring the soil concentrations in the surrounding parcels. The actual risk and hazard for these parcels will, however, remain uncertain.

Response: The data set for soils includes data collected during the initial RI using a biased sampling method based on an extensive review of site history and visual observations to identify suspected areas of industrial activity or chemical release. Additional soils data were collected during subsequent investigations and removal actions at contaminated areas. The current soils data set used for the HHRA includes all of the validated results for all of the previous investigation and interim remedial activities, except for those soil samples that were collected in locations that have since been excavated. Biased sampling is a reasonable sampling methodology to employ at Parcel D because the industrial activities are well documented and sampling occurred at those sites mostly to have an environmental impact. Because biased sampling focuses on areas of suspected or known releases, the uniform grid approach to the HHRA that is overlaid on the parcel is expected to have grids with no data where there is no suspected or known release. Although it is reasonable to assume, based on historical knowledge of the site, that the HHRA grids with no data are not likely to pose a

risk, remedial alternatives in the draft final revised FS report include institutional controls for redevelopment-block wide implementation that also include HHRA grids with no data.

14. **Comment:** HERD reviewed the general methodology but did not perform a detailed review of the HHRA due to the following critical flaws: (1) Arsenic was eliminated as a COC based on two times the HPAL; (2) Manganese was eliminated as a COC based on a proposed 'revised ambient' previously reviewed by HERD but not responded to by the Navy; (3) the lead concentration in drinking water was based on a California guidance value rather than actual lead concentrations which should be easily available, and; (4) Parcels with no data were considered available for unrestricted use.

Response: Based on agreement between the Navy, EPA, DTSC, and City in March 2004, the HHRA was revised to include an evaluation of total risks without screening to identify COPCs (Navy 2004a). Both arsenic and manganese are included in the total risk evaluation. The HHRA also includes an evaluation of incremental risks, for which metals measured at concentrations below HPALs are excluded as COPCs. The uncertainty analysis presented in the HHRA includes an evaluation of the potential risks and hazards associated with metals at concentrations equal to HPALs. The risk characterization for lead for residential and recreational receptors uses a health-protective concentration that was developed using HPS-specific data for lead in groundwater.

RESPONSES TO DTSC COMMENTS FROM MARK MALINOWSKI, R.G., SENIOR HAZARDOUS SUBSTANCES ENGINEERING GEOLOGIST, RECEIVED ON JUNE 8, 2002

General Comments:

1. **Comment:** The BIOSCREEN model is a screening model developed to simulate remediation through natural attenuation of dissolved hydrocarbons at petroleum fuel release sites to assess if a full-scale evaluation of natural attenuation is appropriate. It is unclear why such a simple screening model was used to evaluate contaminant transport and dispersion in a complex hydrogeologic condition. As stated in the BIOSCREEN Manual (Version 1.3, June, 1996): "Because BIOSCREEN incorporates a number of simplifying assumptions, it is not a substitute for the detailed mathematical models that are necessary for making final regulatory decisions at complex sites." The Manual also states: "The model should not be used where hydrogeologic conditions change dramatically over the simulation domain." The potential for: high variability in hydraulic conductivity due to the nature of fill material, natural drainage channels that were subsequently filled but may still act as preferential flow paths, tidal influences and, leaking storm drains that intersect contaminated groundwater clearly makes use of the simple screening model problematic. The model addresses only a simplistic hydrogeologic scenario. Even use of "conservative values" in the BIOSCREEN model may not provide representative model results for determining if contaminated groundwater will or has impacted the bay water.

Response: In the draft final revised FS report, the Navy no longer includes groundwater modeling to estimate groundwater concentrations at potential discharge points. Instead, the groundwater plumes are delineated based on the recent groundwater data collected in June 2004 and the groundwater plumes are not in contact with the bay. The groundwater remedial alternatives developed for this FS evaluation include groundwater monitoring to assess potential migration as well as natural recovery, and in situ treatment to degrade the groundwater plumes.

2. **Comment:** Regardless of the model used, groundwater sampling (validation) of any model needs to be conducted. Without an adequate understanding of the hydrogeology and calibration to existing data, the results of any modeling are suspect. DTSC has traditionally not accepted validation of "no-impact" or clean-up solely based on modeling results. Verification of model results must be made based on actual data.

Response: In the draft final revised FS report, the Navy no longer includes groundwater modeling to estimate groundwater concentrations at potential discharge points. Instead, the groundwater plumes are delineated based on the recent

groundwater data collected in June 2004 and the groundwater plumes are not in contact with the bay. The groundwater remedial alternatives developed for this FS evaluation include groundwater monitoring to assess potential migration as well as natural recovery, and in situ treatment to degrade the groundwater plumes.

3. **Comment:** I did not review site-specific data to ensure source area definition and adequate characterization to determine the extent of groundwater plumes. The BIOSCREEN model is sensitive to source zone width and without adequate characterization the simple model could provide results that are off by orders of magnitude.

Response: Comment noted. In the draft final revised FS report, the Navy no longer includes groundwater modeling to estimate groundwater concentrations at potential discharge points or to present source areas.

4. **Comment:** The text states that the model was "...calibrated to simulate changes in chemical concentrations over time in the exceedance well. The model then was run to estimate the maximum contaminant concentration at the point of exposure." Based on the statement, I assume that actual monitoring well contaminant trend data was used to calibrate the model. There is no data showing how the calibration was performed or differences between modeled and actual results. The document should include the data used for the model calibration and provide further description of the calibration methods.

Response: The draft final revised FS report no longer includes groundwater modeling to estimate groundwater concentrations at potential discharge points.

5. **Comment:** The Dilution Attenuation Factors (DAF) were developed and based on ratios of the highest concentration in a well to the maximum estimated concentration at an exposure point (as estimated by the screening model). Again, without understanding the actual hydrogeology and calibration to actual data, even use of "conservative" modeling values may not provide worst case scenario results.

Response: The draft final revised FS report no longer includes groundwater modeling to estimate groundwater concentrations at potential discharge points. Dilution attenuation factors are no longer developed or presented.

6. **Comment:** The text should explain why a book value instead of an actual site-derived value was used for the effective porosity (Table C-2).

Response: The draft final revised FS report no longer includes groundwater modeling to estimate groundwater concentrations at potential discharge points.

7. **Comment:** It is highly unlikely that the longitudinal, transverse and vertical dispersivity values compiled by Gelhar et al. and used in this model represent fill material under tidal influence. As discussed in Appendix A.4 of the BIOSCREEN Manual, selection of dispersivity values is difficult and a single relationship between scale and dispersivity should not be used to estimate dispersivity

Response: The draft final revised FS report no longer includes groundwater modeling to estimate groundwater concentrations at potential discharge points.

RESPONSES TO CITY COMMENTS FROM AMY BROWNELL, RECEIVED ON JULY 2, 2002

General Comments:

1. **Comment:** As you know, the City began asking the Navy in January of this year to include an alternative in this Feasibility Study (FS) that identified areas on Parcel D where the proposed ten foot below ground surface (bgs) blanket deed restriction might not be required. We believe an alternative of this nature is entirely appropriate for a Feasibility Study, given that the purpose of the study is to analyze the full range of possible remedial alternatives. After the analysis is completed, the Navy can choose which option it will recommend.

The Navy has already begun one of the required steps in this analysis. The production of the risk figures, including Figure A-4, gives an indication of residual risks on the site, including risks from contamination greater than ten feet bgs. Assuming the Navy's remedial investigation was comprehensive, it follows that the Navy should be able to identify any areas that would not require a 10-foot restriction due to the absence of contamination. In addition, in areas where the Navy has remediated and, through confirmation sampling, has come up with clean samples on sidewalls and on excavation bottoms, then there also should be no need for a 10-foot restriction. The only areas where the Navy might need the ten-foot restriction are the areas where it stopped at 10 feet and the bottom samples were dirty, assuming that the Navy, regulators, City and community felt that was the best option for controlling the residual contamination.

Response: Based on an agreement between the EPA, DTSC, City, and the Navy in March 2004 (Navy 2004a), total and incremental risks in the draft final revised FS report are assessed in Appendix B for each potential exposure scenario (residential, industrial, recreational, and construction worker) for all of the redevelopment blocks across Parcel D regardless of the planned reuse, so that the risks within Parcel D can be easily evaluated if the reuse of selected blocks were to change. In Section 3.0 of the draft final revised FS report, the total and incremental risk for each of the redevelopment blocks is presented according to the planned reuse, consistent with CERCLA guidance.

2. **Comment:** The BCT, the City and the public have not approved the details of the Buffer Zone including the size, depth and cleanup levels. If the Buffer Zone details are not approved as the Navy has presented, then all the Buffer Zone cleanup areas will have to be revisited. Please propose a process for getting approval of the details of the Buffer Zone.

Response: Discussion of the buffer zone was removed from the draft final revised FS report.

3. Comment: It appears that there is a contradiction between the text and figures as to the residual risk levels at Parcel D. Figure A-1 shows some grids where the residual risk is between 10^{-5} and 10^{-6} . But the some areas of the text suggest that all residual risks are below the 10^{-6} level. This residual risk is even higher when the ambient screen is removed as shown on Figure A-2. Please explain any discrepancies and how they will be reconciled with commitments that the Navy has made to the City in the MOA and the Addendum to clean the parcel up to a 10^{-6} risk level.

Response: The HHRA methodology, including text, figures, and tables, was revised per the BCT agreement of March 2004 (Navy 2004a). Text, figures, and tables were thoroughly reviewed to ensure consistency. The draft final revised FS report has been revised to reflect an ELCR of 1×10^{-6} or a maximum segregated index of 1, as a point of departure for considering when to implement remedial measures. Remedial measures are designed to address the incremental risk, which excludes the risk posed by metals at concentrations below background in accordance with CERCLA guidance. The need for response actions at Parcel D are based on the results of this incremental HHRA, adjusted for implementing feasible remedial measures where the chemicals of concern that pose the risk occur at concentrations above the laboratory's practical quantitation limit based on standard EPA analytical methodologies.

4. Comment: If the Navy is required to do more clean up in areas where there is residual risk above 10^{-6} , then a excavation option will need to be evaluated in this Feasibility Study.

Response: The draft final revised FS report includes an evaluation of a range of remedial technologies, including excavation.

5. Comment: The Navy needs to identify a method for getting regulatory sign off on all radiological issues as part of the CERCLA process. This sign off will need to occur prior to the transfer of the Parcel.

Response: Radiological removal actions at HPS are being conducted by RASO, which provides technical support for the Navy. Radiological investigations and removal actions are ongoing, as discussed in the HRA (RASO 2004). The Navy will address radiologically contaminated areas under CERCLA, and is evaluating several possible mechanisms to do this. Potential options under consideration include, but are not limited to, the following: incorporating radiological remedies and cleanup status into the ROD for Parcel D, adding radiological remedies into the final FS or the proposed plan, or developing a separate ROD for radiological sites.

6. **Comment:** The Supplemental Manganese Ambient Level (SMAL) has not been approved by the BCT. If the SMAL is not approved, then all the sites where the SMAL was used will have to be revisited using the approved residential cleanup level. If a SMAL procedure is approved and that procedure includes having to identify chert or basalt in the samples, we are concerned that some of your existing samples did not have chert or basalt identified in the boring logs. Please review your boring logs if the SMAL is approved.

Response: At the time these comments were written, the supplemental manganese ambient level was proposed by the Navy as a manganese screening level; it is no longer being considered. The draft final revised FS report uses the manganese HPAL of 1,431 milligrams per kilogram (mg/kg). This is the HPAL value that was developed with the BCT (DTSC 1996).

7. **Comment:** Since other Navy documents are critical in reviewing this FS, it would be helpful if copies of those other documents were included on the CD. In particular, the Time Critical Removal Action Closeout Report and the Risk Management Review Process Report should be included on the CD.

Response: The Navy provided the BCT with both hard copies and compact disks of the Parcel D TCRA doseout report on December 6, 2001 (Tetra Tech and IT Corporation 2001), and the RMR on June 20, 2000 (Tetra Tech 2000). The Navy will provide complete references for publicly available documents used to support the draft final revised FS report. Completed, published documents have already been provided on compact disk. Published documents will not be included as appendices to the draft final revised FS report.

Specific Comments

1. **Comment:** Section 2.3.1.2 The lead exceedance at IR09B030 at has not been delineated. The statement that the sample was collected a depth (1.25 feet) where exposure is limited is not explained.

Response: The draft final revised FS report relies on the results of the updated incremental HHRA to identify areas requiring remediation and the need for additional response actions. The incremental HHRA evaluates risk using current soil data for sampling locations not already excavated, which includes sample data from IR09B030. The alternatives presented in the draft final revised FS report are sufficiently protective to address lead throughout Parcel D, and also specifically address lead at boring IR09B030. The statement regarding limited exposure was deleted from the draft final revised FS report.

2. **Comment:** Section 2.3.1.7, page 2-18 When will the basewide CAP issues be resolved? Do you have a schedule?

Response: Total petroleum hydrocarbon (TPH) cleanup goals have been developed with the San Francisco Bay Regional Water Quality Control Board (Water Board 2004). In 2006, a revised draft corrective action plan (CAP) will be developed that incorporates these TPH cleanup goals. The current CAP schedule is provided in the Federal Facilities Agreement schedule.

3. **Comment:** Section 2.3.1.11 a)The manganese SMAL of 10,000 has not been approved by the regulatory agencies and excavations 37-1, DM 6671, and DM 6771 may still require further action. b) Manganese was left under Building 436. Is the building required to remain in place?

Response: (a) At the time these comments were written, the supplemental manganese ambient level was proposed by the Navy as a manganese screening level; it is no longer being considered. The draft final revised FS report uses the manganese HPAL of 1,431 milligrams per kilogram (mg/kg). This is the HPAL value that was developed with the BCT (DTSC 1996). The draft final revised FS report relies on the results of the updated incremental HHRA to identify areas requiring remediation and the need for additional response actions. The incremental HHRA evaluates risk using current soil data for sampling locations not already excavated.

(b) The need for response actions, including whether existing covers such as buildings are required to remain in place, are based on the results of the incremental HHRA presented in the draft final revised FS report.

4. **Comment:** Section 3.1.3.1 All ARARs that were used in the FS process should be presented. Chemical-specific ARARs do exist and were used to evaluate whether soil and groundwater in Parcel D required remedial action.

Response: The applicable or relevant and appropriate requirements (ARAR) section of the draft final revised FS report was revised to include a full list of ARARs, including chemical-specific ARARs.

5. **Comment:** Section 3.1.3.2 Based on the groundwater use evaluation and to the degree Resolution No. 88-63 is more stringent than the federal standards, it is likely an applicable location-specific ARAR.

Response: The Navy concluded that the substantive provisions of Resolution No. 88-63 are potential state requirements for the draft final revised FS report, but are not controlling ARARs. The Navy has concluded that, according to the criteria contained in Resolution 88-63, the only beneficial use of groundwater in the A-aquifer is freshwater replenishment. In addition, the Water Board has

concluded in the Navy's conclusion that groundwater in the A-Aquifer is not a potential source of drinking water (Water Board 2003). For the B aquifer, there is no unacceptable risk and therefore the requirement to meet ARARs is not triggered.

6. **Comment:** **Section 3.1.3.4 The San Francisco Redevelopment Agency Hunters Point Shipyard Redevelopment Plan dated July 14, 1997 should be included as a TBC as it guides the land use and cleanup levels for Parcel D.**

Response: The Navy considers the redevelopment plan the basis of future land use scenarios for risk assessment. However, the Navy does not consider the redevelopment plan a potential ARAR or a "to be considered" (TBC) criterion because it is not a federal or state regulation.

7. **Comment:** **Section 5.1.3 Estimated costs for Soil Alternative 3 should cost somewhat more than those for Soil Alternative 2 since the deed restrictions will be more complicated.**

Response: The draft final revised FS report presents updated costs for each alternative. For those alternatives that include deed restrictions, costs for institutional controls consider the type of document produced, but not necessarily the level of complexity associated with the deed restrictions.

8. **Comment:** **Section 5.3.1.7 Because groundwater monitoring is not a part of this alternative, estimated costs should include groundwater monitoring well abandonment.**

Response: The draft final revised FS report presents groundwater monitoring as part of all of the groundwater alternatives, except for the "no action" alternative; therefore, costs for groundwater monitoring well abandonment are not appropriate.

9. **Comment:** **Section 5.3.2.7 Because groundwater monitoring is not a part of this alternative, estimated costs should include groundwater monitoring well abandonment.**

Response: The draft final revised FS report presents groundwater monitoring as part of all of the groundwater alternatives, except for the "no action" alternative; therefore, costs for groundwater monitoring well abandonment are not appropriate.

10. **Comment:** **Section 6.0 References You have listed a reference for a San Francisco Redevelopment Agency ... "Final Hunters Point Shipyard Final Land Use Alternatives and Proposed Draft Plan". While some version(s) of a document of this title exist, it is not an approved document for the**

redevelopment of the Shipyard. If you are referring to the Redevelopment Plan then your reference should be as follows: San Francisco Redevelopment Agency. 1997. "Hunters Point Shipyard Redevelopment Plan". July 14.

Response: The reference was revised as requested.

11. **Comment:**
- (a) **Appendix A, Revised Human Health Risk Assessment Section 1.2.3 Buffer Zone, 3rd sentence:** A reference is made to the buffer zone and a 0-to-2-foot bgs depth interval.... "as agreed to by the City and BCT". I do not recall any formal agreements on the Buffer Zone concept. In our comments on the Parcel D TCRA Closeout Report dated 11/30/2001 we specifically raised this issue. Your Response to Comments acknowledged "that the City has not approved" the buffer zone concept and the discussions on this concept would be more "appropriate for the discussion during the review of the feasibility study". Please remove any reference to an approved Buffer Zone concept and please determine a process for having discussions and getting approval on the buffer zone concept.
 - (b) **Appendix A, Revised Human Health Risk Assessment Section 1.2.3 Mixed Use Area:** The area around IR37 has been designated as a mixed use area and exposure concentrations were developed by taking the soil data for the 0-10 foot soil interval in IR37 and the 0-2 foot interval in the 50-foot buffer zone around IR37. Although there is text discussion of the results in Section 3.2, there do not appear to be data tables specifically addressing the mixed area. Tables should be included accordingly.
 - (c) **Appendix A, Revised Human Health Risk Assessment Section 1.2.3 VOCs in bedrock water-bearing zone:** Although only exposure to groundwater via inhalation of VOCs in indoor air is noted as being evaluated, the industrial use and residential receptors do not appear to include this pathway in the risk results (Section 3.1 and Section 4.0, respectively). Groundwater exposure is only discussed for the mixed-use exposure scenario (Section 3.2). Additionally, total excess cancer risks and noncancer hazard should include the addition of contributions from soil and groundwater.
 - (d) **Appendix A, Revised Human Health Risk Assessment Section 1.2.4:** It is not clear whether indoor or outdoor air or both were evaluated for the industrial use receptor for soil and groundwater (see Section 1.2.3 comment also). Indoor air was apparently evaluated for VOCs in groundwater, but it is not clear that VOCs in soil were evaluated. Table A-11 presents chemical-specific parameters that include a volatilization factor that appears to be from U.S. EPA Region IX 2000 Preliminary Remediation Goals. These volatilization factors are for estimating emission to outdoor air from VOCs in soil. Were

these factors used to estimate outdoor air emissions? Table A-9 indicates that exposure point concentrations for the inhalation pathway were estimated using the U.S. EPA Region IX 2000 Preliminary Remediation Goals methodology. This must refer only to chemical-affected soil. Please note that the methodology does not include an evaluation of an indoor air component for either soil or groundwater. Indoor air must be evaluated for residual VOCs in soil. Although soil and groundwater exposure point concentrations are presented in the Appendix A tables, air exposure point concentrations are not presented. The air exposure point concentrations should be presented, as well as the example calculation sheets for the estimation of indoor air emissions from soil. Information related to the calculation of outdoor air exposure point concentrations, which may be described in the HHRA portion of the 1996 RI report, should be summarized within this section. Additionally, a graphical conceptual site model indicating complete exposure pathways evaluated in the HHRA should be included.

(e) Appendix A, Revised Human Health Risk Assessment Section 1.4.3 Lead: The lead value of 213 mg/kg (from DTSC Lead Spread) should be used as the comparison point for lead in soil. Use of the 221 mg/kg level (the previous level of concern in the previous RI) because the use of the lower value would yield "no changes in results of the HHRA" is confusing. The 213 mg/kg should be used in the text and figures.

(f) Appendix A, Revised Human Health Risk Assessment Section 1.2.4 and general comment: Exposure areas for residential exposure, industrial and mixed-use exposure are not easily identified. Tables A-2 through A-5 include reference to exposure area identifiers, but no key to the identifiers is provided directly. Although it is possible to correlate the exposure areas with the Sites and therefore the attached figures by using Tables A-15 and A-17, an overall key should be provided to correlate the exposure areas. Tables A-15 and A-17 are organized in descending order of Sites, while the data tables (A-2 through A-5) are organized in order of exposure areas. Consequently, cross-referencing for locations on figures is extremely difficult.

(g) Appendix A, Revised Human Health Risk Assessment Tables A-15 and A-17: Do these tables reflect the total excess lifetime cancer risks and segregated hazard indices with or without the ambient metals screen? The tables should include contributions from groundwater or separate tables for groundwater should be prepared and the cumulative excess cancer risks and segregated hazard indices that include soil and groundwater combined should also be included.

- Response:**
- (a) Discussion of the buffer zone was removed from the draft final revised FS report.
 - (b) The HHRA presented in the draft final revised FS includes analytical data summary statistics and risk calculations for all exposure areas (grids) throughout Parcel D, including the area around IR-37. Based on an

agreement between the EPA, DTSC, City, and the Navy in March 2004 (Navy 2004a), total and incremental risks in the draft final revised FS are assessed in Appendix B for each potential exposure scenario (residential, industrial, recreational, and construction worker) for all of the redevelopment blocks across Parcel D regardless of the planned reuse, so that the risks within Parcel D can be easily evaluated if the reuse of selected blocks were to change. In Section 3 of the draft final revised FS report, the total and incremental risk for each of the redevelopment blocks is presented according to the planned reuse, consistent with CERCLA guidance.

- (c) The HHRA presented in the draft final FS report includes evaluation of the vapor intrusion exposure pathway for A-aquifer groundwater for residential and industrial exposure scenarios. Inhalation of volatile chemicals in groundwater released to a construction trench and dermal contact with groundwater is also evaluated for the construction worker exposure scenario. The HHRA includes a residential domestic use evaluation (such as ingestion and inhalation pathways) for B-aquifer groundwater for the residential exposure scenario. Tables will be included in the HHRA that show cumulative risks from exposure to both soil and groundwater.
- (d) The HHRA presented in the draft final revised FS report includes evaluation of the outdoor air inhalation pathway for volatile organic compounds (VOC) in soil for the residential, industrial, recreational, and construction worker exposure scenarios. The HHRA also evaluates inhalation of VOCs in A-aquifer groundwater for residential, industrial, and construction worker exposure scenarios and inhalation of VOCs from domestic use of groundwater in the B-aquifer for the residential exposure scenario. The HHRA now includes a conceptual site model graphically indicating complete exposure pathways. Tables listing exposure point concentrations for soil and groundwater are included in the HHRA appendix of the revised draft final FS report. Following the methodology established for the groundwater HHRA, the vapor intrusion evaluation is limited to groundwater sources (Navy 2004b, 2004c). Tables listing exposure point concentrations for air are not included in the HHRA; however, the methodologies used to estimate concentration in air will be detailed in the HHRA.
- (e) The risk characterization for lead for residential and recreational receptors uses a health-protective concentration that was developed using HPS-specific data for lead in groundwater.
- (f) The HHRA figures and tables in the draft final revised FS report have been revised to clearly show the redevelopment block associated with each exposure area and the planned reuse associated with each redevelopment block. Both figures and tables include risk grid numbers for cross-referencing; the tables will group grids by associated redevelopment block.
- (g) The HHRA in the draft final revised FS report presents a new set of tables based on the new HHRA methodology. Tables included in the HHRA present total risk, including risk from ambient metals, and incremental risk

that excludes risk from ambient metals. Tables included in the HHRA also present cumulative risks from soil and groundwater exposure pathways.

12. Comment: (a) Appendix B, Groundwater Data Evaluation Section 3.3.3.2, Last paragraph: Clarify this discussion. A neutral to basic pH would not favor hexavalent chromium reduction though the presence of high TOC would. Hexavalent chromium is the prevailing chromium oxidation state in basic or alkaline (pH above 7) and high dissolved oxygen (high Eh) environments. Trivalent chromium typically occurs in low (acidic) to neutral pH and low Eh or reducing conditions. Hexavalent chromium is more mobile in groundwater than trivalent chromium due to its higher solubility and low adsorption to aquifer materials. Hexavalent chromium can be reduced to trivalent chromium in the presence of ferrous iron, organic matter, and/or dissolved sulfides in oxygen-poor areas of the aquifer. Though the chromium plume appears to be stable, provide more specifics and basis for the claim that conditions at Parcel D favor hexavalent chromium reduction and immobilization.

(b) Appendix B, Groundwater Data Evaluation Section 3.3.3.3: Evaluation of the discharge points would be clearer if the discharge points, groundwater elevation contour map, and chromium plume were shown on the same figure. The nearest potential hexavalent chromium discharge point is approximately 330 feet to the south of IR09PPY1 versus the chosen point 900 feet to the southwest. Although IR09PPY1 is not shown on the groundwater elevation contour map (Figure B-4), the gradient applied to the storm water sewer to the southwest seems simplified, based on Figure B-4. On Figure B-4, a trough appears to exist in the groundwater surface through IR-36 where the potential flow pathway from IR09PPY1 to the discharge point shown on Figure B-5 would exist. The potential discharge point south of IR09PPY1 near IR09MW35A is located within the hexavalent chromium plume shown on Figure B-10 and based on the groundwater elevations shown in Table C-4, a gradient would exist between these two wells and the discharge point near IR09MW35A. Why wouldn't the hexavalent chromium found in both wells IR09PPY1 and IR09MW35A discharge to the closest "below groundwater storm sewer" discharge point near IR09MW35A? Based on this discharge point, what would the estimated concentrations be at that exposure point? Would they still be below the aquatic criteria?

Response: (a) The draft final revised FS report makes no claim that the conditions at Parcel D favor hexavalent chromium reduction and immobilization, but does recognize the nature and extent of the hexavalent chromium plumes from the most recent facility-wide groundwater monitoring data. This report also evaluates remedial alternatives to mitigate the hexavalent chromium plumes by monitored natural recovery, or by injection of a reductive substrate into the aquifer

(b) The hydrogeology section in the draft final revised FS report discusses the groundwater elevations and potential gradients. In the draft final revised FS report, the Navy no longer includes groundwater modeling to estimate groundwater concentrations at potential discharge points. Instead, the Navy presents groundwater plumes based on the most recent available groundwater data, and evaluates the groundwater alternatives of monitored natural recovery, and active in situ groundwater remediation.

13. Comment: **Appendix D, Applicable or Relevant and Appropriate Requirements A complete ARAR assessment was not performed.**

Response: A complete ARARs assessment was performed in the draft final revised FS report and is included as Appendix C.

14. Comment: (a) **Appendix E, Cost Assumptions for Remedial Alternatives Table E-1, Hourly Discipline and Unit Rates: Labor rates appear to be too low for Bay Area engineers and attorneys. Provide basis for these rates.**

(b) **Appendix E, Cost Assumptions for Remedial Alternatives Page E-2, FV of O&M Costs and NPV Annual O&M Costs: Future worth is based on a 3 percent inflation rate, then net present worth is based on a 7 percent discount rate, for a “net” discount rate of 4%. Both Office of Management and Budget (OMB) recommends using a 3.9% “net” discount rate. Provide references for basis of these terms in the FS.**

Response: (a) Labor rates presented in the draft final revised FS report appendix F were derived using actual contract labor rates with existing and ongoing contractors in the San Francisco Bay Area.

(b) Based on the Office of Management and Budget Circular No. A-94, Appendix C, May 2005 (OMB 2005), the “net” discount rate used for the cost estimates in the draft final revised FS report is 3.1 percent.

15. Comment: (a) **Figure 2-10 “BERTH 11” is misspelled “BETH 11”.**
(b) **Section 1.2.1, page 1-5, 1st paragraph, line 2 extra word. Soil at the site sites.....**
(c) **Section 2.3.2.2.3, page 2-53, 1st sentence Parcel B should read Parcel D**
(d) **Section 2.3.2.2.3, page 2-53, 2nd sentence, item 4 “ordnance” should read “ordinance”**

Response: (a) through (d): Text, figures, and tables were reviewed to correct typographical errors.

RESPONSES TO LENNAR/BVHP COMMENTS, RECEIVED ON JUNE 10, 2002

- 1. Comment:** The remedial alternatives selected are incomplete. Remediation to residential cleanup levels is not evaluated. Remediation to residential levels would eliminate land use controls. On page 5-15, section 5.2.8 Community Acceptance, the Navy states that "in 2001, City residents voted in favor of Proposition P, which stated that residents wanted the Navy to remediate HPS to levels suitable for unrestricted reuse. This factor will be considered when community acceptance is evaluated". The Navy also states that 233 (with homegrown produce) and 255 (without homegrown produce) of the 287 residential risk grids in Parcel D meet the residential risk criteria. The risk evaluation appears to have considered unrestricted use (i.e. residential reuse) and indicates that this remedial alternative may be a feasible option for all if not most of Parcel D.

Response: Based on an agreement between the EPA, DTSC, City, and the Navy in March 2004 (Navy 2004a), total and incremental risks in the draft final revised FS report are assessed in Appendix B for each potential exposure scenario (residential, industrial, recreational, and construction worker) for all of the redevelopment blocks across Parcel D regardless of the planned reuse, so that the risks within Parcel D can be easily evaluated if the reuse of selected blocks were to change. In Section 3.0 of the draft final revised FS report, the total and incremental risk for each of the redevelopment blocks is presented according to the planned reuse, consistent with CERCLA guidance.

The draft final revised FS report has been revised to reflect an ELCR of 1×10^{-6} or a maximum segregated index of 1, as a point of departure for considering when to implement remedial measures. Remedial measures are designed to address the incremental risk, which excludes the risk posed by metals at concentrations below background in accordance with CERCLA guidance. The need for response actions at Parcel D are based on the results of this incremental HHRA, adjusted for implementing feasible remedial measures where the chemicals of concern that pose the risk occur at concentrations above the laboratory's practical quantitation limit based on standard EPA analytical methodologies.

- 2. Comment:** The costs for implementing the alternatives S-2 and S-3 appear to be overly optimistic. The costs should include costs for community information bulletins to periodically remind residents and inform new residents and industrial users about the land use restrictions.

Response: The draft final revised FS report provides updated costs for each remedial alternative. Community information bulletin costs are considered to be part of the 5-year review process and are included in each remedial alternative cost. The 5-year review process involves preparing a report, performing drive-by inspections, compiling permits and variances, and identifying legal costs such as

for enforcement of institutional controls. Enforcement of institutional controls may include bulletins and general support for disseminating information to the community.

3. **Comment:** The Parcel D Revised Feasibility Study and the TCRA used 10,000 mg/kg manganese in soil as the residential soil cleanup level goal. This represents a departure from the HPAL of 1,400 mg/kg for Manganese. In the case of Area 6671 the TCRA dismisses excavation in the buffer zone for one sample that contained 11,908 mg/kg manganese. This same area has a number of soil samples in the upper 2 feet that exceed the HPAL of 1,400 mg/kg. In contrast, shallow soil samples in an adjacent TCRA area (6771) have manganese concentrations below the HPAL of 1,400 mg/kg. The Navy has not provided justification for the supplemental manganese action level (SMAL) of 10,000 mg/kg.

Response: At the time these comments were written, the supplemental manganese ambient level was proposed by the Navy as a manganese screening level; it is no longer being considered. The draft final revised FS report uses the manganese HPAL of 1,431 milligrams per kilogram (mg/kg). This is the HPAL value that was developed with the BCT (DTSC 1996).

4. **Comment:** The Human Health Risk Assessment (HHRA) in Appendix A used revised ambient levels for arsenic (22.2 mg/kg) and manganese (SMAL of 13,600 mg/kg). The SMAL of 13,600 mg/kg differs from the SMAL used in the TCRA. It is CH2M Hill's understanding that these revised values have not been accepted by the regulators.

Response: The draft final revised FS report uses the arsenic HPAL of 11.1 mg/kg and the manganese HPAL of 1,431 mg/kg. These are the HPAL values that were developed with the BCT (DTSC 1996).

5. **Comment:** The HHRA evaluates future residential exposure by direct contact and ingestion with soil from 0 to 10 feet bgs. This scenario may underestimate exposures to some COPCs that may occur at higher concentrations in the upper 2 feet of soil (e.g. lead, arsenic) in areas where grading and excavation of the site is limited to the upper few feet of soil. The HHRA does assume residential exposure to COPCs in the 0-2 feet depth interval for the buffer zone area.

Response: Based on an agreement between the EPA, DTSC, City, and the Navy in March 2004 (Navy 2004a), total and incremental risks in the draft final revised FS are assessed in Appendix B for each potential exposure scenario (residential, industrial, recreational, and construction worker) for all of the redevelopment blocks across Parcel D regardless of the planned reuse, so that the risks within Parcel D can be easily evaluated if the reuse of selected blocks were to

change. In Section 3.0 of the draft final revised FS report, the total and incremental risk for each of the redevelopment blocks is presented according to the planned reuse, consistent with CERCLA guidance. For the residential and industrial exposure scenarios, risks from exposure to contaminants in soil were assessed for both surface soil (0 to 2 feet bgs) and subsurface soil (0 to 10 feet bgs). Discussion of the buffer zone concept was removed from the draft final revised FS report.

6. **Comment:** **There is a lack of chemical analysis data for significant portions (approximately one-third) of Parcel D. The Human Health Risk Assessment, Appendix A concludes that, "In addition to the 233 exposure areas, residential exposure areas with no data would also be considered available for unrestricted reuse." It appears that most of the proposed mixed use area and a total of approximately one-third of the risk exposure areas defined by the Navy have no chemical analysis data. The absence of data is not a rationale to conclude that these areas are acceptable for the proposed reuse.**

Response: The data set for soils includes data collected during the initial RI using a biased sampling method based on an extensive review of site history and visual observations to identify suspected areas of industrial activity or chemical release. Additional soils data were collected during subsequent investigations and removal actions at contaminated areas. The current soils data set used for the HHRA includes all of the validated results for all of the previous investigation and interim remedial activities, except for those soil samples that were collected in locations that have since been excavated. The Navy determined that this data set is adequate to conduct the HHRA. The HHRA appendix presents total and incremental risk for each potential exposure scenario (residential, industrial, recreational, and construction worker) for all of the redevelopment blocks across Parcel D regardless of the planned reuse; the HHRA summary section in the main text presents the total and incremental risk for each of the redevelopment blocks according to the planned reuse. For the residential and industrial exposure scenarios, risks from exposure to contaminants in soil are assessed for both surface soil (0 to 2 feet bgs) and subsurface soil (0 to 10 feet bgs). Remedial alternatives presented in the draft final revised FS report are intended for implementation by redevelopment block or parcel wide.

RESPONSES TO COMMENTS FROM KEVYN LUTTON, RESIDENT, RECEIVED ON JULY 2, 2002

1. **Comment:** On page A16, no data is presented to support the conclusion that many areas are designated as suitable for unrestricted use.

Response: In the draft final revised FS report, the Navy does not propose that areas be considered available for unrestricted use without supporting data. Remedial alternatives presented in the draft final revised FS report are intended for implementation by redevelopment block or parcel wide.

2. **Comment:** The presentation of "residue risk" in terms of risk ranges seems too casual. I believe the community needs to see estimates of actual remaining risks based on site data and sample collection.

Response: The current soils data set used for the HHRA includes all of the validated results for all of the previous investigation and interim remedial activities, except for those soil samples that were collected in locations that have since been excavated. The HHRA appendix presents total and incremental risk for each potential exposure scenario (residential, industrial, recreational, and construction worker) for all of the redevelopment blocks across Parcel D regardless of the planned reuse; the HHRA summary section in the main text presents the total and incremental risk for each of the redevelopment blocks according to the planned reuse. For the residential and industrial exposure scenarios, risks from exposure to contaminants in soil are assessed for both surface soil (0 to 2 feet bgs) and subsurface soil (0 to 10 feet bgs).

3. **Comment:** It seems important that areas designated for residential reuse investigation of soils and groundwater be done in an exacting, methodological manner. The community needs much more sampling.

Response: The Navy agrees that investigation of soil and groundwater be conducted in a methodical and scientifically defensible manner. The data set for soils includes data collected during the initial RI using a biased sampling method based on an extensive review of site history and visual observations to identify suspected areas of industrial activity or chemical release. Additional soils data were collected during subsequent investigations and removal actions at contaminated areas. The current soils data set used for the HHRA includes all of the validated results for all of the previous investigation and interim remedial activities, except for those soil samples that were collected in locations that have since been excavated. The Navy determined that this data set is adequate to conduct the HHRA. The Navy does not propose additional sampling. Remedial alternatives presented in the draft final revised FS report were developed to provide protective solutions.

4. **Comment:** We need the “time critical removals” explained and the validated results shown and discussed clearly.

Response: The draft final revised FS report was revised to include summaries of the TCRAAs, as well as provide full references for the TCRA closeout reports that have been published subsequent to the draft revised FS report. These closeout reports contain validated results.

5. **Comment:** Please state clearly exact target levels.

Response: For each chemical of concern, exposure scenario-specific remedial goals have been developed that are based on the highest of the laboratory practical quantitation limit, lowest risk-based concentration (calculated using a target cancer risk of 10^{-6} and noncancer hazard of 1.0), and HPAL (metals only) for the chemical of concern.

6. **Comment:** Buffer zones, their width and depth, should be discussed with the City, the community, and the regulators. Not just arbitrarily decided by the Navy.

Response: Discussion of the buffer zone was removed from the draft final revised FS report.

7. **Comment:** It is not appropriate to settle for a residue cancer risk of $1.0E-6$ and $1.0E-5$.

Response: The draft final revised FS report has been revised to reflect an ELCR of 1×10^{-6} or a maximum segregated index of 1, as a point of departure for considering when to implement remedial measures. Remedial measures are designed to address the incremental risk, which excludes the risk posed by metals at concentrations below background in accordance with CERCLA guidance. The need for response actions at Parcel D are based on the results of this incremental HHRA, adjusted for implementing feasible remedial measures where the chemicals of concern that pose the risk occur at concentrations above the laboratory’s practical quantitation limit based on standard EPA analytical methodologies.

8. **Comment:** It is not appropriate to even consider letting the ground water remain unremediated. This is not Prop. P compliant.

Response: Although Proposition P is not an ARAR, the draft final revised FS report does include groundwater remedial alternatives in response to the remedial action objectives. The Navy is not considering the “no action” alternative as the selected remedy.

9. **Comment:** The document gives no indication that elevated levels of chromium, manganese, and PAHs has been removed.

Response: Assuming the comment is in reference to the results of the interim soil remedial actions, Section 2.0 of the draft final revised FS report includes subsections that summarize and reference the removal actions. The incremental HHRA in the draft final revised FS report evaluates risk using current soil data for sampling locations not already excavated. The need for additional response actions at Parcel D are then based on the results of the incremental HHRA presented in the draft final revised FS report.

10. **Comment:** Cesium-137 in IR 34 must be removed.

Response: Radiological removal actions at HPS are being conducted by RASO, which provides technical support for the Navy. Radiological investigations and removal actions are ongoing, as discussed in the HRA (RASO 2004). The Navy will address radiologically contaminated areas under CERCLA, and is evaluating several possible mechanisms to do this. Potential options under consideration include, but are not limited to, the following: incorporating radiological remedies and cleanup status into the ROD for Parcel D, adding radiological remedies into the final FS or the proposed plan, or developing a separate ROD for radiological sites.

11. **Comment:** Contaminated soil under buildings must be removed.

Response: The draft final revised FS report does not attempt to address the planned reuse of existing buildings or to assume none are planned for reuse. Some of the buildings are designated to remain in the projected land use. As a result, it is not appropriate to assume buildings should be razed to access underlying soils. In addition, the remedial alternatives in the draft final revised FS report include use of covers as a remedy to break the exposure pathway to soils. These covers include existing buildings and paved areas.

12. **Comment:** The residential use of Parcel D must not go forward until the toxic landfill problems with adjacent Parcel E have been resolved.

Response: Potential risk and the need for remedial actions to address the industrial landfill will be presented in the draft RI/FS report for Parcel E-2.

REFERENCES

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