Department of Toxic Substances Control

Jesse R. Huff, Director
700 Heinz Avenue, Bldg. F, Suite 200
Berkeley, California 94710-2721

Pete Wilson
Governor

Peter M. Rooney
Secretary for
Environmental
Protection

August 31, 1998

Commanding Officer
Engineering Field Activity, West
Naval Facilities Engineering Command
Attn: Mr. Michael McClelland, Code 1832 MEM
900 Commodore Drive Recd 9/1/98
San Bruno, California 94066-2402

COMMENTS ON PARCEL C DRAFT FINAL FEASIBILITY STUDY REPORT, HUNTERS POINT SHIPYARD, SAN FRANCISCO, CALIFORNIA

Dear Mr. McClelland:

Enclosed are comments on the Draft Final Feasibility Study Report dated July 15, 1998 from the State of California. The San Francisco Bay Regional Water Quality Control Board and the Department of Toxic Substances Control have prepared these comments.

If you have questions regarding these comments, please call me at (510) 540-3844.

Sincerely,

Valerie Heusinkveld

Valerie Heusinkveld
Remedial Project Manager
Office of Military Facilities

Enclosures

cc: see next page

cc: Ms. Sheryl Lauth (SFD-8-2)
U. S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, California 94105-3901

Mr. David Leland
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

Ms. Amy Brownell
San Francisco Department of Public Health
1390 Market Street, Suite 910
San Francisco, California 94102

DTSC COMMENTS ON PARCEL C DRAFT FINAL FEASIBILITY STUDY DATED JULY 15, 1998

GENERAL COMMENTS

1. The Navy has stated its intention to remediate HPS for the land uses in the Reuse Plan. Of particular interest is the site of IR-25, which is proposed for unrestricted reuse (Mixed Use, including residential). It is not clear in some parts of the Draft Final FS that the Alternatives would be consistent with unrestricted reuse. Notably, alternatives that do not directly address concentration reduction in both soil and groundwater at IR-25 do not seem able to reduce health risks to acceptable levels. Please analyze each alternative's probable success at achieving 10^{-6} excess cancer risk for the residential scenario.

2. Recent discussions have amplified the need to consider the B aquifer at HPS as a potential source of drinking water. Please provide a map showing the areas of direct contact between the A and B aquifers as well as the hydraulic contact areas where the A aquifer is contaminated.

3. The merit of the process option of placing a subterranean barrier downgradient of certain RU s is not apparent from the text. Please add this information, or eliminate the process option from consideration. See specific comments for Section 3.3, below.

4. Please provide an analysis of a process option involving pumping and treating groundwater at all seven RU s.

5. Cost estimates for groundwater alternatives should indicate whether costs reflect concurrent implementation of soil alternatives that include excavation. Because soil alternatives that involve excavation and groundwater alternatives that involve excavation are related, a matrix showing the joint cost of the alternatives that involve excavation would be useful.

SPECIFIC COMMENTS

1. Page ES-5, '<u>Carcinogenic Risks</u>.' Please amend the text to indicate that the Navy considers 10^{-6} as the point of departure.

2. Page ES-6, '<u>Risks and hazards from inhalation of COPCs in A-aquifer groundwater,</u>'

also Page ES-7 and other places. The text states that the use of conservative assumptions in the air model causes overestimations of the potential for adverse health effects from vinyl chloride. The FS should use models that the Navy has accepted for planning purposes. If the Navy would like to refine the air model, please propose the revisions to the regulatory agencies. In the meantime, please remove these opinions from the text.

3. Page ES-9, 'Soil.' Please state explicitly that the Soil RAO is directed at soil from ground surface to a depth of 10 feet, and that contaminated soils below 10 feet are proposed to be left in place. Also, please provide the rationale behind the choice of 10 feet rather than some other depth.

4. Page ES-9, 'Soil.' The text says that 'only one soil cleanup goal will be selected for Parcel C based on proposed reuse, [etc.] ...' DTSC does not agree that only one soil cleanup goal is a good idea for Parcel C. There is no environmental or technical reason for choosing a single soil cleanup goal for the entire parcel; the parcels at Hunters Point were designed for administrative ease. It would be a shame to let boundaries developed for unrelated reasons affect important cleanup decisions. DTSC would prefer to see greater flexibility in assigning different soil cleanup goals for different parts of Parcel C, for instance cleanup goals for residential and different cleanup goals for industrial reuse. This would cost less than meeting the higher, residential standard on land destined for industrial reuse. Please assess the possibility of choosing more than one soil cleanup goal at Parcel C. If, in the end, the Navy decides to use a single cleanup goal, then according to the text quoted at the beginning of this comment, the parcelwide soil cleanup goal must be 10^{-6} excess cancer risk for residential reuse because Figure 2-2 shows residential reuse on part of Parcel C and because no greater risk has been justified.

5. Page ES-9, 'Soil.' Please explain how 'both industrial soil cleanup goal scenarios account for the mixed reuse (including residential reuse) [of specific areas] ...' A pertinent fact is that the Navy is using 10^{-6} excess cancer risk as a point of departure until a different risk level is justified.

6. Page ES-10, 'Soil.' Because no ecological RAOs for soil were established, an institutional control should be developed to prevent any future attempt to develop ecological habitats at Parcel C.

7. Page ES-15, Alternative S-2. The State of California cannot concur with any proposal that requires out-of-state management of hazardous waste. Please revise this paragraph to eliminate the mandatory language, for instance by stating that soil not restricted under federal law, but characterized as hazardous waste by California law, will be

managed appropriately, i.e. by treatment or by disposal in an authorized landfill.

8. Page ES-18, Alternative GW-2. The last sentence of the first paragraph should be changed to read: 'In addition, the installation and any use of groundwater supply wells in the A-aquifer and bedrock water-bearing zone would be prohibited without prior approval from federal and state regulatory agencies.'

9. Page ES-19, Alternative GW-3. DTSC considers subterranean sheetpiling to be an accessory to containment by groundwater extraction. Any containment alternative that does not totally encapsulate contamination must include extraction.

10. Table ES-9, 'Proposed Screening Criteria for Placement at IR-1/21 CAMU.' Please consider removing this table from the Executive Summary, or revising it. The table is not essential to the Feasibility Study for Parcel C, as it discusses standards for soil that would be leaving Parcel C. If a CAMU is selected as part of the remedy at Parcel E, the CAMU designation will detail standards for the remedial wastes that can be deposited there. If the Navy prefers to include this table of standards in the FS, the numerical values should be reviewed. Many of the values, especially for metals and SVOCs, are significantly lower than the proposed soil cleanup values. The rationale behind these numbers should be reviewed.

11. Tables ES-12 and ES-15 (as repeated in Tables 5-8 and 5-16). These tables are of limited usefulness. The idea is a good one: to evoke all nine NCP criteria at the same time for comparing the alternatives. However, the tables suffer from severe logical limitations because they give each of the nine criteria the same weight. For instance, 'Cost Effectiveness' has the same importance as 'Overall Protection of Human Health and the Environment.' A conclusion drawn from the tables could be misleading. Please delete or redesign the tables.

12. Page 3-34, On-Site Placement; also page 4-14, On-Site Placement of Excavated and Solidification/Stabilization Treated Soil. A consideration for material to be placed in a CAMU is soil strength, as the Draft Final FS points out on page 5-16. If a CAMU is designated at Parcel E, the soil strength standard will not be known until the CAMU is designated. Still, the Parcel C FS should include the potential cost of treating or handling the soil to meet the strength standard in its cost estimate.

13. Page 3-36. Off-Site Class I Landfill. 'Out-of-state landfills would treat the hazardous waste prior to disposal ...' What sorts of treatment might they conduct? Would California facilities be able to conduct similar treatment?

14. Page 3-41. Solidification and Stabilization. If solidification / stabilization is selected

as part of the remedy, the remedy selection will also include performance standards for this treatment. Please note this in the text.

15. Page 3-46, In Situ S/S. What types of contaminants are envisioned for being left in place? At what depths? What solubility standards would they have to meet?

16. Pages 3-48 to 3-52, Section 3.3.2.2.3, Containment. The uses of containment barriers in controlling groundwater flow are very limited. A total encapsulation can be said to truly control flow. Caps can be considered gradient control when they are placed on a surface where infiltration makes a significant contribution to groundwater flow. However, vertical barriers other than encapsulating barriers do not comprise containment, but are merely accessories to a containment measure such as groundwater extraction. The discussion of vertical barriers should emphasize that they will be used in coordination with extraction.

17. Page 3-54, Gradient Control. In this section, extraction wells are eliminated from consideration as a process option for gradient control. Unfortunately, sheet piling should not be considered as a vertical containment option unless accompanied by extraction. Please revise this section.

18. Page 4-4, Alternative S-2. An ARAR for the management of excavated soils is Health and Safety Code Section 25123.3(b). Please amend the discussion of soil stockpiling to reflect this, and keep this in consideration during the detailed evaluation of any alternative that involves stockpiling soil.

19. Page 4-10, Ex Situ Solidification and Stabilization. This section refers to comparing soil concentrations to Table 3-13, 'Proposed Screening Criteria for Placement at IR-1/21 CAMU,' as well as conducting hazardous waste characterization procedures on the soil. The cleanup concentration values in Table 3-13 are very low, in part because of their consideration of long-term health effects. The concentrations that define hazardous waste are much higher, in part reflecting potential short-term health effects. The first paragraph of this section states that SVE-treated soil will be analyzed using the WET and TCLP extraction procedures, presumably to determine whether the soil meets the definition of hazardous waste, before determining whether to treat the soil by Solidification and Stabilization in order for the soil to meet the values listed in Table 3-13. The logical link between the high-contaminant test and the low-contaminant test needs to be spelled out for the reader. Please outline the reasoning behind this decision process.

20. Page 4-17, In Situ Solidification/Stabilization Using Shallow Soil Mixing. How will the target depth of mixing be determined? Page 4-18: How was the performance

standard of 90% immobilization of COCs in soils derived? Given the RI's analytical results, what would the maximum concentrations of COCs be and how would they compare with the health-based standards used for the other soil alternatives? The Navy will need this information to evaluate this alternative according to the nine criteria in Section 5.1.5.

Also, the discussion should describe the general physical structure of the end product of solidification. Is it expected to be soil-like, monolithic, or in some other form? If the end product is soil-like, will health risks associated with dermal contact remain? If the end product is monolithic, will it have ramifications for future land use at the site?

21. Page 4-30, Section 4.2.3, Alternative GW-3 -- Containment, Extraction, On-Site Treatment, Discharge to POTW. The option of extraction and treatment at all seven RU s should be explored. Please add that alternative, or replace the current GW-3 with an alternative that does not include containment.

22. Page 4-30, Mitigative Measures and Groundwater Monitoring. DTSC is doubtful of the efficacy of foundation sealing in preventing vapor migration, both in the short run for technical reasons and in the long run for reasons of practicality. We would find it hard to make a determination of reliability on retrofitting buildings to be impermeable to subterranean gases, especially in a seismically-active area such as San Francisco. Please provide references. In terms of practicality, it would be difficult to perpetuate the building maintenance that would be needed until there was no significant risk due to the vapors. Please provide additional discussion of these considerations.

23. Page 4-31, Containment. As the discussion points out, a sheet pile wall without groundwater extraction is a diversion system, not containment. The structures shown in Figure 4-8 would cause groundwater to mound behind the barrier. Two of the RU s proposed for a sheet pile barrier are entirely in the Direct Tidally Influenced Zone: RU-1 and RU-3. How many tidal cycles would it take before the barrier structures were filled with water? Analogously, consideration of barriers at RU-4 and RU-7 would require specific discussion of the magnitude of groundwater flow at the sites. Page 4-33 points out that migration will occur eventually. Available information, such as the location of two of the RU s in the Tidally Influenced Zone, indicates that migration will occur soon. Therefore, the discussion should describe how the migrating contamination will be addressed. If extraction would be part of this contingency and direct remediation of the RU s would not, the cost estimate for the extraction system must assume that extraction will be necessary into perpetuity.

The discussion of the 'Containment' feature of Alternative GW-3 does not justify its retention for consideration. If the Navy knows of other information that supports the

consideration of 'Containment,' the FS should include it. If not, this feature should be deleted.

24. Page 5-9, Destruction of Toxic Hazardous Substances. Please rewrite this paragraph. If the Navy has estimated that 5% of the excavated soil will be treated before disposal at the off-site landfill, the next sentence should not contradict that.

25. Page 5-58, Section 5.3.2.4, Reduction of Toxicity, Mobility, or Volume through Treatment - Alternative GW-2. The information presented does not support the assertion that this alternative destroys toxic hazardous substances, reduces the mass of hazardous substances, reduces hazardous substance mobility, or reduces the volume of contaminated media. Please remove statements that the information does not support.

26. Page 5-63, Containment at RU-1, RU-3, RU-4, and RU-7. The text states that the Waterloo barrier technology will produce a bulk hydraulic conductivity of 10^{-8} to 10^{-10} cm/s. What is the expected thickness of the layer with this conductivity?

27. Appendix E, Cost Assumptions for Remedial Alternatives, page E-1; also page E-5. The information available does not support the statement that costs are estimated within the +50% and -30% accuracy laid out in Federal guidelines in the case of alternatives involving soil solidification. Bench-scale treatability tests using Parcel C soil would have to be conducted for each soil treatment type to reach this level of accuracy. The amounts and types of additives needed to achieve a particular performance standard vary widely from site to site. DTSC would prefer that treatability studies be conducted in advance of the final Feasibility Study report so that fewer contingencies will have to be built into the ROD. In view of time constraints facing the Navy, however, we realize that these treatability studies are unlikely to happen before the ROD. Therefore, Appendix E should discuss the uncertainties associated with solidification costs, acknowledging that they fall outside of the Federal accuracy guidelines.

28. Appendix E, page E-8. Some of the FS alternatives involve leaving contaminants at Parcel C above risk-based levels. These alternatives must include features that prevent the exposure to the contaminants, such as sheetpile walls or institutional controls. The estimated costs for these alternatives must reflect maintenance of the exposure prevention features. These costs should be estimated into perpetuity unless there will be a time when the contaminants will no longer exceed risk-based levels. Using the sheetpile walls as an example, what is the anticipated lifetime of a sheetpile wall under HPS conditions? Would the replacement cost be calculated the same way as the original installation cost? What are the costs associated with monitoring and maintaining a sheetpile wall?

Cal/EPA

San Francisco Bay Regional Water Quality Control Board

1515 Clay Street
Suite 1400
Oakland, CA 94612
(510) 622-2300
FAX (510) 622-2460

Pete Wilson
Governor

August 27, 1998
File: 2169.6032

Ms. Valerie Heusinkveld
Department of Toxic Substances Control
Northern California Region
700 Heinz Avenue, Suite 200
Berkeley, CA 94710

Re: RWQCB Comments on Draft Final Parcel C Feasibility Study Report, Hunters Point Shipyard, San Francisco, California, dated July 15, 1998

Dear Ms. Heusinkveld:

Regional Water Quality Control Board (RWQCB) staff have reviewed the above-referenced report and are providing comments as an attachment to this letter.

If you have any questions regarding this letter, please call me at 510-622-2377.

Sincerely,

David F. Leland, P.E.
Groundwater Protection and Waste Containment Division

Attachment

C:\Hunters Point\cfsdfc.au8

cc: Ms. Sheryl Lauth, USEPA (SFD-8-2)

Regional Water Quality Control Board, San Francisco Bay Region, Comments on the Draft Final Parcel C Feasibility Study Report, Hunters Point Shipyard, dated July 15, 1998.

GENERAL COMMENTS:

1. The TPH screening value used to delineate TPH plume areas is a value proposed by the Navy and is still under discussion with the RWQCB. Once a screening value is agreed on, the RWQCB will ask the Navy to replot the TPH plume areas to reflect the agreement.

2. Appendix D presents the methodology used to calculate Dilution Attenuation Factors for screening of groundwater concentrations. Given the decision to use a default factor of 10 to account for dilution and attenuation in Parcel B, the RWQCB recommends using a similar approach in Parcel C.

3. The possibility that the A-aquifer and B-aquifer are in hydraulic connection and that elevated concentrations of chemicals in the A-aquifer may degrade water quality in the B-aquifer needs to be addressed. The B-aquifer at Hunters Point Shipyard retains the Basin Plan designated beneficial use of municipal and domestic supply, in which case the screening values for assessing potential impacts of A-aquifer waters on B-aquifer waters would be MCLs. Please present an analysis of the potential for degradation of B-aquifer water quality as a result of migration from the A-aquifer. This should include a presentation of the nature and locations of hydraulic connection between the two aquifers, locations with both hydraulic connection between the aquifers and measured concentrations of constituents in the A-aquifer above MCLs, and locations where contaminated soil treatment discussed in the FS may address these groundwater quality issues.

4. The groundwater alternatives that rely on sheetpile installation to control groundwater migration do not appear to provide any reduction in contaminant toxicity, mobility, or volume and as such do not provide the requisite environmental protection.

5. It isn't clear whether the groundwater alternatives that involve soil excavation account for soil that would be excavated or otherwise treated as part of one or more of the soil remediation alternatives. If for purposes of the cost estimate the groundwater alternatives assume that the soil alternatives are not implemented (i.e., that the soil no action alternative is selected), the Navy should provide a summary of the incremental costs for the groundwater alternatives for each of the soil remediation scenarios.

6. The RWQCB believes that SWRCB Resolutions 68-16 and 88-63 are ARARs for Parcel C. The Navy discusses Resolution 88-63 in Section 3.1.2 in considering potential drinking water pathway exposures. The text of this section suggests that if an aquifer's characteristics do not meet the definitions in Resolution 88-63, then the resolution is not an ARAR. This is confusing. The definitions in the resolution are used here as screening criteria. As such, they would apply regardless of the results of the screening. To put it another way, if the Basin Plan designates one of the beneficial uses of an aquifer as municipal and domestic supply, then Resolution 88-63 is used to further assess whether this beneficial use should be retained at a specific location. Thus, both must be considered ARARs for the Navy to reach a conclusion that the drinking water pathway should not be considered when assessing risks associated with contaminants in groundwater. As we have noted elsewhere, we also believe that the criteria are intended for application in consideration of the spatial characteristics of an aquifer, and that averaging results over an area is not appropriate.

SPECIFIC COMMENTS

Executive Summary

1. Page ES-4, Human Health Risk Assessment Results. The reference to RWQCB indications is overly broad in referring to "Parcel C groundwater", and fails to provide adequate context for the statement. The present San Francisco Bay Region Basin Plan retains the beneficial use of municipal supply for groundwater at Hunters Point. This section would be clearer if the Navy noted its position regarding potential future uses of Parcel C groundwater and stated that groundwater pathways based on water supply scenarios were not evaluated in the risk assessment.

2. Page ES-19, Alternative GW-3. Please clarify whether groundwater extraction would form a portion of the remedial alternative at those remedial units where containment is proposed.

3. Figure ES-1. Given that a remedial alternative has not been selected for Parcel C, it would better represent the analysis described in the document and better serve the public to include in the Executive Summary figures showing actions that would be undertaken under Cleanup Scenarios 2 and 3. This would also align the graphical presentation with the tabular data. Also, please review the risk assessment legends for accuracy.

4. Section 1.2, second paragraph. The reference to Parcel A should note that the RI was approved by EPA and Cal/EPA, and that RODs have been signed for both Parcels A and B.

5. Page 2-6, paragraph 2. Please update this paragraph.

6. Section 2.2.8. The possibility that the A-aquifer and B-aquifer are in hydraulic connection is noted. Please present an analysis of the nature and locations of hydraulic connection of the two aquifers. This should include a map showing areas where Bay mud is absent, and areas where the A-aquifer and B-aquifer are in contact. Also, on p. 2-9 in the B-aquifer discussion, the A-aquifer should be included as a likely source of recharge to the B-aquifer.

7. Section 2.2.9. The discussion of beneficial uses relies heavily on measured values of TDS and salinity, although Figure 2-13 presents only very limited data on measured TDS and salinity values. Please present a map showing all values measured in the parcel, and including an estimate of the 3,000 mg/L TDS line.

8. Page 2-17. The descriptions of chemicals identified during the site characterization and chemicals of concern are not in good agreement. For example, pesticides and PCBs were found at and near the dip tank but are not mentioned in Section 2.3.1.2 as COCs at the dip tank.

9. Pages 2-17 and 2-18. Please clarify whether the "northwestern portion of IR-25" is the same as or different from the area "beneath and south of the dip tank." Are there two or three areas of concern at IR-25? Also, please clarify which wells are considered to be in the southeastern portion of Building 134.

10. Section 2.3.3.4. Please clarify whether the results presented for A-aquifer groundwater address individuals living in industrial buildings and individuals working in residential buildings.

11. Section 2.3.5.3. Please clarify whether potential chemicals of concern were detected in bedrock groundwater samples.

12. Section 2.3.5.4. This section states that A-aquifer groundwater samples were not collected at IR-30. This seems to contradict Section 2.3.5.3. Please clarify.

13. Section 2.3.8.1. Please update the status of storm drain cleanout activities.

14. Section 2.3.8.2. The second paragraph implies a connection between chemicals in storm drains and chemicals in adjacent soils, while the third paragraph states that correlations were weak. Please clarify.

15. Section 2.3.13.4. The future industrial land-use groundwater discussion calls out area AV12. It doesn't appear that any samples from IR-63 are located in area AV12. Also, the text in Section 2.3.13.2 states that no groundwater samples were collected as part of the IR-63 investigation. Please clarify.

16. Section 2.5, paragraph 2. Please present a map showing TDS concentrations in the A-, B-, and bedrock aquifers, and the 3,000 mg/L TDS isoconcentration contour.

17. Table 2-7, Parcel-Wide Hydrogeology. The aquifer materials in Parcel C still retain the designated beneficial use of municipal or domestic supply. This designation may be changed for the A-aquifer, but is not anticipated to change for the B-aquifer. As such, it is important to understand existing water quality in the B-aquifer, particularly in relation to shallow source areas, and to assess the need for action, if any, to preserve or restore water quality in the B-aquifer. As noted in part in other sections of Chapter 2, the RWQCB requests an analysis of the areas of the B-aquifer that meet RWQCB drinking water definitions, a presentation of those areas where the A-aquifer and B-aquifer are in hydraulic contact, of MCL exceedances measured in A-aquifer groundwater in the area of hydraulic contact (to identify areas with the potential to affect water quality in the B-aquifer), and a summary of source areas proposed for remediation in this same area.

18. Section 3.1.2.1. The Navy needs to present the available data to illustrate and support the drinking water source discussion. Specifically, the conclusion regarding technical impracticability needs to describe what is meant by a thin aquifer, show why this leads to a groundwater development limitation, describe the connection between technical impracticability and bay mud deposits or artificial fill overlying an aquifer, describe what is considered to be insufficient yield (does this mean less than 200 gpd?), a low freshwater recharge rate, and how this relates to the RWQCB criteria. Also, the distribution of TDS values in the A-aquifer, B-aquifer, and bedrock water-bearing zones should be presented.

19. Section 3.1.2.2, page 3-8, IR-25, and Figure 3-2a. Please clarify whether 1,4-DCB or 1,2-DCB is the chemical of concern at IR-25.

20. Section 3.1.2.4. After having reviewed a similar discussion in the Parcel E FS regarding the screening process for groundwater chemical data, RWQCB staff do not feel that the use of the term "HGAL-adjusted criteria" is either clear or simple. For example, this terminology leads, in the case of the B-aquifer and bedrock zones, to screening of HGAL-adjusted criteria against HGALs (bottom of page 3-11). While the approach is explained, the reader is left confused. We would suggest that the Navy use a term such as "aquatic

life screening criteria" and present the different values used for the different zones in Table 3-5. In addition, RWQCB staff do not feel that the approach itself is justified. Measured concentrations in the B-aquifer and bedrock wells should be compared to measures of background or ambient reflective of conditions in the formation in question. Use of A-aquifer values to screen concentrations measured in the B-aquifer and bedrock zone implies that water quality in the other formations need be no better than water quality in the A-aquifer, regardless of the existing water quality in these other formations. While we understand that this approach is convenient, given the availability of the A-aquifer HGALs, it is not consistent with an objective of maintaining water quality in the B-aquifer and bedrock zones. The Navy should either develop and present HGALs for the other formations or limit the screening of data from these formations to the water quality criteria presented in Table C-3.

21. Section 3.1.2.6. Although not stated in the text, we assume that the evaluation of the need for further action would include the appropriate regulatory agencies. Please describe the types of contingency measures contemplated by the Navy.

22. Section 3.1.3.1. The designation of beneficial uses as presented in the Basin Plan can only be changed by action of the RWQCB. As such, it is incorrect to state that the beneficial uses of groundwater underlying HPS do not include municipal supply, industrial process supply, or agricultural supply. The aquifers at HPS should be screened against the numerical criteria associated with Resolution 88-63 to identify areas that would be exempt from the municipal supply designation. The language should be revised to reflect the Navy's view that the existing designated beneficial uses should not be used as the basis for setting remedial action objectives.

23. The following RWQCB or SWRCB resolutions and policies should be ARARs for this FS:
    - SWRCB Resolution 68-16
    - SWRCB Resolution 88-63

24. Figure 3-9. Please check the screening results for physical and chemical and in situ treatments. The process option, comment, and effectiveness fields for these options do not make sense.

25. Page 3-65. At the top of this page, carbon adsorption is noted as well suited for use in the central treatment unit at Parcel C. At the bottom of the page, ion exchange is apparently rejected in part because it is best suited for use at a centralized treatment plant. Please explain or reconcile this apparent inconsistency.

26. Pages 3-65 and 3-66, Ion Exchange. This process option is in part rejected because it is not considered effective over a wide range of contaminants. Please explain what is meant by the phrase "a wide range of contaminants". Please also clarify what constitutes dilute solutions suited to this technology, and whether such solutions would be anticipated at Parcel C.

27. Section 4.2.2, Rehabilitation of Storm Drain Lines. Please verify that 2.3 of 4.54 miles of line would require rehabilitation. From the text, this would imply that over two miles of piping are under Building 211.

28. Section 4.2.2, Removal and Disposal of Fuel Lines. Please state the portion of the fuel line length in Parcel C that is in utilidors and the portion that is buried.

29. Section 4.2.2, p. 4-24. The text should be revised to state that any contingency remedial actions will be taken with the participation and concurrence of the regulatory agencies.

30. Page 4-25, first paragraph. The data analysis should look at conditions at the point of compliance, the inland edge of the tidally influenced zone.

31. Page 4-33. The Navy acknowledges that with the groundwater containment technology proposed for this alternative, groundwater will eventually migrate beyond the wall. The document should include an analysis of the environmental benefits of the approach. There would seem to be no impact on toxicity or volume, and only minimal, short-term influence on mobility, with no long-term control of groundwater discharge to the Bay.

32. Page 4-34. Are the 5 existing wells proposed for incorporation in the extraction network 6"-diameter wells?

33. Pages 4-34 and 4-35, RU-2, RU-5, and RU-6. The text is confusing, stating in one place and showing on Figure 4-8 that wells will be placed within buildings, and stating at the end of each paragraph that no wells will be placed within buildings. Also, the placement of the wells in relation to the plumes needs to be supported with a demonstration of the expected 120' capture zones at the assumed 2 gpm flow rates.

34. Page 4-41, Air Sparging. The distance between the proposed air sparging wells at RU-2 is about 90'. Please clarify how this spacing is consistent with the assumed 25' ROI. Also, how would the area between the existing and proposed air sparging wells (a distance of about 200') be addressed in the proposed configuration shown on Figure 4-10.

35. Page 5-9. If toxic hazardous substances are destroyed, wouldn't this result in a reduction of the mass of toxic hazardous substances and a reduction of the total volume of contaminated media?

36. Section 5.1.2.6. Administrative Feasibility. The discussion for this alternative should include a plan for treatment of collected groundwater in the event that monitoring data showed water quality not acceptable for disposal to the SWPCP.

37. Section 5.1.4.6, Implementability, Technical Feasibility. The text does not address any potential difficulties associated with excavation in or near buildings or other obstructions. How would such constraints affect the technical feasibility of this alternative?

38. Page 5-37, Soil Vapor Extraction. Please confirm that the SVE system would be designed to treat only soils from 4 to 10 feet bgs for this alternative, and that the soil from 0 to 4 feet bgs would not be treated by SVE.

39. Page 5-45, Time Required for Remedial Action. The text here states that the top 4 feet of soil will be excavated prior to SVE treatment. This appears inconsistent with statements on p. 5-37.

40. Page 5-55. Please clarify whether the estimated 70 wells for groundwater monitoring refer to Parcel C or to the Hunters Point facility.

41. Section 5.3.2, Alternative GW-2. It isn't clear from the text how this alternative would be coordinated with the soil alternatives. For example, Soil alternatives S-2, S-3, and S-4 each involve excavation, as does Alternative GW-2. Are soil volumes assumed for the soil alternatives the same soil volumes that would be excavated in GW-2? Does the analysis for GW-2 assume a stand-alone implementation? The document should present some analysis of how this and the other groundwater alternatives integrate with the soil alternatives, and should account for coordinated implementation in developing integrated cost estimates. The reader must have the ability to look at total estimated remediation costs for the parcel.

42. Section 5.3.3.1. This alternative does not appear to meet the ecological risk RAO, as the sheet pile will do nothing more than temporarily delay the discharge of groundwater to the Bay. RWQCB staff do not agree that this alternative results in prevention of migration of contaminated groundwater to the Bay.

43. Section 5.3.3.2. This alternative does not appear to comply with ARARs because it results in no improvement to water quality.

44. Page 5-69, Time Required for Remedial Action. Please include an estimate for the sheet pile installation.

45. Section 5.4. As noted previously, the proposed sheet pile remedy included in GW-3 does not appear to meet the two threshold criteria.

Appendix B

46. Section 5.2.2, Future worker noncarcinogenic hazards. Please explain why child residents are discussed under this heading. Also, please clarify how additional exposures are identified in the average case as compared to the RME case.

Appendix C

47. There are several well locations where occurrences of concentrations above HGAL-adjusted criteria are noted and are screened out of the analysis. Of these, two in the A-aquifer (IR28MW294A and PA50MW03) and one bedrock well (IR50MW13F) fall out in part because only one round showed concentrations above screening criteria. The RWQCB requests that these wells be resampled to verify that current concentrations remain below screening criteria. At other locations (e.g., IR29MW56F and -85F), hits above water quality criteria but below HGALs are screened out based on use of A-aquifer derived HGALs to assess bedrock or B-aquifer wells. The RWQCB does not feel that this is appropriate. Measured concentrations in the B-aquifer and bedrock wells should be compared to measures of background or ambient reflective of conditions in the formation in question. Use of A-aquifer values implies that water quality in the other formations need be no better than water quality in the A-aquifer, regardless of the existing water quality in these other formations. The Navy should either develop and present HGALs for the other formations or limit the screening to the water quality criteria presented in Table C-3.

48. Table C-1, fourth bullet. Please clarify whether and how organics were HGAL-adjusted. Review of Tables C-3 and C-4 shows no adjustments of the water quality criteria, with the exception of benzene.

49. Table C-1, Step 1, and Figure C-1, footnote. The table states that HGAL-adjusted criteria are not applicable to B-aquifer or bedrock groundwater, while the figure states that the Navy proposes to use the HGAL-adjusted criteria to screen groundwater concentrations measured in the B-aquifer and bedrock

water-bearing zone. As presented, the table and figure contradict one another. Please clarify the approach that was used and revise the table and figure as appropriate.

50. Table C-4. Please explain the basis for increasing the criteria for benzene by a factor of ten from the water quality criteria presented in Table C-3.

51. Table C-5. In the second subgroup in the table, it would be more accurate to say that DAFs were not calculated, rather than "could not be calculated".

52. Table C-5 and Figure C-2. For the following constituents, inconsistencies or incomplete explanations were noted:
    - 2-chloronaphthalene at IR28MW129A is not shown on Figure C-2
    - TCE at IR28MW151A is not shown on the figure
    - Phenanthrene at IR28MW311A is screened out in the table but is shown as DAF-calculated on the figure
    - Zinc at PA50MW03A is screened out in the table but is shown as hatched on the figure.

53. Table C-6. In the evaluations for wells IR58MW31A and -MW33B, it is noted that 1,2-dichlorobenzene was not detected or detected at low concentrations at wells nearby. These wells appear to be quite close to one another. Please explain what is meant by "nearby", and also discuss the potential for vertical migration in this area.

54. Table C-6, pp.11-12. Please explain why sandblast grit is considered a potential source for copper and zinc but not for other metals measured at elevated concentrations at Well IR28MW294A. Some discussion of the pattern of elevated metals concentrations in groundwater in the November 1995 sampling event should be included. Also, what is meant by "nearby" soils: at the well? What was the original rationale for well installation at this location?

55. Table C-6, pp. 13-14, Well IR28140F. It isn't clear what is meant by the statements that "the distribution is not consistent with the pattern of an environmental release". There are not enough wells at this location to define much of a distribution. Furthermore, the only other well at this location shows elevated copper concentrations. Please clarify.

56. Table C-7. Please improve the contrast of the shading on this table.

57. Figure C-2. Callout boxes for the following wells are not shown on the figure: IR06MW42A, 4 IR25 wells, and IR28MW151A. In the tidally-influenced zone,

check B-aquifer and bedrock wells for consistency of the use of hatching. It appears that a number of boxes that should be hatched are not.

Appendix E

58. Please confirm or revise as necessary the sampling assumptions to be consistent with the procedures worked out for the Parcel B1 soil remediation. For example, it appears that the RAC has used pre-excavation sample results to secure landfill acceptance. This would eliminate the need for stockpile sampling.