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HUNTERS POINT
SSIC NO. 5090.3

DEPARTMENT OF THE NAVY
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

5090
Ser 06CH.AP/004
January 3, 2000

Ms. Claire Trombadore
U.S. Environmental Protection Agency
Region IX
75 Hawthorne St (SFD8-2)
San Francisco, CA 94104-3901

Dear Ms. Trombadore:

Attached is one copy of the response to comments from the regulatory agencies on the revised draft technical memorandum for groundwater classification and analysis of the A- and B-aquifer interconnections for Parcel D of Hunters Point Shipyard. Please contact Mr. Dave DeMars at (619) 532-4163 with any questions regarding this deliverable.

Sincerely,

JOSEPH J. JOYCE
BRAC Environmental Coordinator
Hunter's Point Shipyard
by direction of the Commander

Response to Comments

Enclosure (1): Revised Draft Technical Memorandum for Gorundwater Classification and Analysis of the A- and B- Aquifer Interconnections for Parcel D of Hunter's Point Shipyard.

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NAVAL FACILITIES ENGINEERING COMMAND
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SAN DIEGO, CA 92132-5190

5090
Ser 06CH.AP/005
January 3, 2000

Mr. Chein Kao
California Department of Toxic Substances Control
Northern California Region
700 Heinz Avenue, Suite 200
Berkley, CA 94710

Dear Mr. Kao:

Attached is one copy of the response to comments from the regulatory agencies on the revised draft technical memorandum for groundwater classification and analysis of the A- and B-aquifer interconnections for Parcel D of Hunters Point Shipyard. Please contact Mr. Dave DeMars at (619) 532-4163 with any questions regarding this deliverable.

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Enclosure (1): Revised Draft Technical Memorandum for Gorundwater Classification and Analysis of the A- and B- Aquifer Interconnections for Parcel D of Hunter's Point Shipyard.

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SAN DIEGO, CA 92132-5190

5090
Ser 06CH.AP/006
January 3, 2000

Mr. Chris Maxwell
California Regional Quality Control Board
San Francisco Bay Region
1515 Cisy St Suite 1400
Oakland, CA 94612

Dear Mr. Maxwell:

Attached is one copy of the response to comments from the regulatory agencies on the revised draft technical memorandum for groundwater classification and analysis of the A- and B-aquifer interconnections for Parcel D of Hunters Point Shipyard. Please contact Mr. Dave DeMars at (619) 532-4163 with any questions regarding this deliverable.

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Enclosure (1): Response to Comments on Revised Draft Technical Memorandum for Gorundwater Classification and Analysis of the A- and B- Aquifer Interconnections for Parcel D of Hunter's Point Shipyard.

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January 3, 2000

Blind copy w/attachments to:
06CH
06CH.JJ
06CH.AP
06CH.DD
06CH.JC
01.LS.DS
3EN
4EN2
4EN.LH
Chron file

Tetra Tech EM Inc.

135 Main Street, Suite 1800 ◆ San Francisco, CA 94105 ◆ (415) 543-4880 ◆ FAX (415) 543-5480

December 13, 1999

Ms. Julie Crosby
Remedial Project Manager
Southwest Division
Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, CA 92132

Subject: **Response to Regulatory Agency Comments on the Revised Draft Technical Memorandum Groundwater Classification and Analysis of the A- and B-Aquifer Interconnections for Parcel D,**
Hunters Point Shipyard, San Francisco, California
CLEAN II Contract No. N62474-94-D-7609, Contract Task Order No. 128

Dear Ms. Crosby:

Attached please find one copy of the response to comments from the regulatory agencies on the revised draft technical memorandum for groundwater classification and analysis of the A- and B-aquifer interconnections for Parcel D of Hunters Point Shipyard. Please call me at (415) 222-8217 if you have questions or comments concerning this deliverable.

Sincerely,

Scott Wald
Project Manager

Attachment

cc: Jason Brodersen, TtEMI
File

RESPONSE TO AGENCY COMMENTS ON THE REVISED DRAFT TECHNICAL MEMORANDUM FOR GROUNDWATER CLASSIFICATION AND ANALYSIS OF THE A- AND B-AQUIFER INTERCONNECTIONS FOR PARCEL D HUNTERS POINT SHIPYARD

This document presents the U.S. Department of the Navy's (Navy) responses to comments from the regulatory agencies on the draft technical memorandum for groundwater analysis of the A- and B-aquifer interconnections for Parcel D, Hunters Point Shipyard (HPS), dated July 15, 1999. The comments addressed below were received from the U.S. Environmental Protection Agency (EPA) on September 2, 1999, and the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), on September 8, 1999.

RESPONSES TO COMMENTS FROM EPA

General Comments

1. **Comment:** **Section 3.3 of the Draft Technical Memorandum, Groundwater Classification and Analysis of the A- and B-Aquifer Interconnections for Parcel D, Hunters Point Shipyard, San Francisco, dated July 15, 1999 (the Report) concludes that the A-aquifer at Parcel D (the A-aquifer) is not a potential drinking water source, even though the total dissolved solids (TDS) and well yield data presented in the Report indicate that much of this aquifer falls within the U.S. EPA's definition of a potential drinking water source. The Report's conclusion is based upon consideration of "other site-specific factors" (SSFs).**

   ***Enclosure 5 – Application of Federal Criteria for Determining Beneficial Uses of Groundwater for CERCLA Cleanups* of EPA's May 12, 1999 letter to the Navy (Enclosure 5) provided the Navy with specific recommendations on how to determine whether a contaminated aquifer should be considered a potential drinking water source for the purposes of making CERCLA cleanup decisions using the *Guidelines for Ground-Water Classification Under the EPA Ground-Water Protection Strategy* dated June 1988 (The 1988 EPA Guidelines). In Enclosure 5, EPA Region IX lists the following SSFs that can be considered in order to make this determination:**

   - **Thickness of aquifer (size of groundwater resource impacted);**
   - **Actual TDS levels (are they closer to 10,000 mg/l or closer to 3,000 mg/l);**
   - **Actual groundwater yield;**
   - **Proximity to salt water;**
   - **Potential for salt water intrusion;**
   - **Quality of underlying water bearing units;**

- **Determination of whether these water-bearing units are or are not current or potential drinking water sources;**
- **Existence of institutional controls on well construction or aquifer use;**
- **Information on current and historic use of the aquifer on the base or in the community surrounding the base (if available); and**
- **Cost of cleanup to maximum contaminant levels (MCLs).**

The discussion of the SSFs in the Report contains many unsubstantiated statements which attempt to address U.S. EPA Region IX's SSFs. To address the issue of potential future use of the aquifer and the cost to cleanup to MCLs, the Report states that "Groundwater at HPS has never been and is unlikely to ever be used as a drinking water source because of its marginal quality and the need for expensive pretreatment prior to use". To address the issue of the potential for salt water intrusion, the Report states "the main source of recharge of the A-aquifer is saline water intrusion from San Francisco Bay". Either no data is presented in the Report to support these statements, or the data that is presented contradicts these statements. For example, the TDS and limited well yield data presented in the Report support the conclusion that the A-aquifer is a potential drinking water source. These unsubstantiated statements should either be eliminated from the Report, or additional data should be presented in the Report which supports these statements.

Response: The methodology for evaluating site-specific factors (SSF) was revised based on a September 21, 1999, discussion with the RWQCB and EPA. The revised methodology uses a weight-of-evidence approach to evaluate the impact of SSFs at an Installation Restoration (IR) site on the potential for groundwater underlying that site to be used as a drinking water source. The Navy chose six SSFs listed in Enclosure 5 for use in the evaluation: aquifer thickness, depth to groundwater, actual total dissolved solids (TDS) levels, the proximity to salt water, information on historic and current use of the aquifer, and the existence of institutional controls on well construction or aquifer use. The draft final technical memorandum evaluates SSFs using the revised methodology and presents results that are supported by the quantitative weight-of-evidence approach.

SSFs not used in the evaluation consist of actual groundwater yield, the potential for salt-water intrusion, the quality of underlying water-bearing units, and the cost to remediate groundwater to federal maximum contaminant levels (MCL). Groundwater yield could be estimated using a hydrogeologic model; however, the determination of actual groundwater yield would require the collection of additional data. Evaluating the potential for salt-water intrusion would also require additional data collection. The quality of underlying water-bearing units (in this case, the B-aquifer) will be evaluated after the potential for B-aquifer groundwater to be used as a drinking water source is determined. Remediation costs will be evaluated in the feasibility study (FS) addendum for sites that have a potential use as a drinking water source and cannot have their risk mitigated by other factors identified in a risk management process.

2. **Comment:** **The *Guidelines for Groundwater Classification Under the EPA Groundwater Protection Strategy* (June 1988) require that where a contaminated aquifer is potentially interconnected with an uncontaminated aquifer, the classification of the uncontaminated aquifer also needs to be determined for setting cleanup levels in the contaminated aquifer. As indicated on page 2 of the Report, "The B-aquifer is designated as a potential drinking water source under both the State and the federal Guidelines." Additionally, as indicated in the Report there are data gaps regarding potential interconnections between the A- and the B-aquifers. As indicated in General Comment 1, the Enclosure indicates that one of the SSFS to be considered when determining whether all or potential of an aquifer should be considered a potential drinking water source for making a CERCLA cleanup decision is the water quality of underlying water bearing units and whether these units are or are not current or potential drinking water sources. Because the underlying (B) aquifer is considered a potential drinking water source and contamination from the A-aquifer has the potential to impact this drinking water source for the purposes of a CERCLA cleanup, and MCLs may be set as cleanup goals for the A-aquifer. In other words, these two aquifers should effectively be viewed as one aquifer. EPA does not agree that where the bay mud aquitard is absent, the navy can continue to argue that there are separate A- and a B-aquifers. Applying both state and Federal criteria, there is just one aquifer beneath the portion of Parcel D where the bay mud is absent. Further, it appears that much of this portion meets the definition of a potential drinking water source. The IR-sites in this are which have MCL exceedances are IR-9 and IR-33N. It may be reasonable to establish MCLs as CERCLA cleanup goals for the aquifer beneath these sites. The Navy should discuss these issues in the revised report. Further, it would be reasonable for the Navy to finalize plans to fill the so-called B-aquifer data gaps as soon as possible and probably before the FS addendum is completed.**

Response: The Navy agrees that in areas where the A- and B-aquifers are interconnected due to the absence of the Bay Mud aquitard, the A- and B-aquifers are effectively one aquifer. However, potential beneficial uses of and cleanup goals for groundwater in this area cannot be fully evaluated because limited hydrogeologic and no chemical data are available for the B-aquifer. As a result, the evaluation of areas where the A- and B-aquifers are interconnected has been removed from the draft final technical memorandum and will be presented in a separate technical memorandum. The Navy is currently assessing B-aquifer groundwater data needs.

3. **Comment:** **Page 1, Section 1, Introduction and Background. The purpose of the Report is not to "address issues related to groundwater at Hunters Point Shipyard (HPS) that were raised during development of the Parcel D draft Record of Decision (ROD)." The purpose of the Report is to determine which portions, if any, of the A-aquifer are considered potential drinking water sources for a CERCLA cleanup decision. To accomplish this, the Report needs to apply state and Federal criteria for determining potential drinking water sources and then assess whether site specific factors should also be**

used to modify the determinations made. Only IR sites where contaminant concentrations in groundwater above background exceed MCLs need be part of this analysis.

Response: The text describing the purpose of the technical memorandum has been revised as requested. The methodology for evaluating groundwater at Parcel D was revised based on a September 21, 1999, discussion with the RWQCB and EPA. At the request of EPA and the RWQCB, groundwater underlying all IR sites at Parcel D was evaluated for potential use as a drinking water source, and the MCL evaluation was applied as the final step. The methodology described in the comment (in which the MCL evaluation would be the first step) was not used.

4. **Comment:** **In order to complete its evaluation, the Navy must follow a series of steps. The Report does not logically follow a series of steps. Instead, the Navy has taken pieces of the various steps and applied them somewhat arbitrarily. For example, per page 2, last paragraph. The Navy states that EPA recommended that Parcel D be divided into D1 and D2. This is not exactly correct. We indicated that after performing our own informal review of the Parcel D groundwater using Federal criteria for TDS and yield, it appeared that the portion of Parcel D that met the criteria and had MCL exceedances and was further threatened due to the absence of bay mud was in the area of Parcel D where IR-9 and IR-33N are located. Therefore, it might make sense to separate D into two areas one of which being this area which includes IR-9 and IR-33N. However, the purpose of the Report was for the Navy to do its own, more in-depth analysis of Parcel D groundwater with respect to the Federal criteria not to start with the premise that EPA recommended from the start that the Navy separate Parcel D in to two areas. The Navy should complete the analysis and after it is completed on of the conclusions the Navy may reach is that it makes sense to carve Parcel D into D1 and D2.**

Response: As noted in the response to general comment 1, the methodology for evaluating groundwater at Parcel D was revised based on a September 21, 1999, discussion with the RWQCB and EPA. The new methodology, which was developed in collaboration with RWQCB and EPA, follows a logical series of steps. The results of the evaluation are presented in the draft final technical memorandum. All references to Parcels D1 and D2 have been deleted from the report.

5. **Comment:** **As EPA has stated in earlier correspondence (5/12/99 and 6/98), the navy must evaluate the Hunters Point Shipyard groundwater (at Parcel D in this case) using a series of steps. Step 1: the Navy should apply the "Guidelines for Groundwater Classification under the EPA Groundwater Protection strategy" ("Federal criteria") to determine what portions of the A-aquifer on Parcel D meet the criteria of less than 10,000 TDS and 150 gallons per day (gpd) yield thereby making it a drinking water source per that criteria. Step 2: Determine the groundwater classification using the TDS and yield data and document by map the portions of the aquifer that meet the Federal criteria for a class II aquifer. Step 3: For the portions that meet the definition of a class II aquifer, determine whether or not here are MCL**

exceedances above background. Step 4: evaluate whether or not these areas where there are MCL exceedances warrant CERCLA cleanup by determining if the exceedances pose a threat to underlying potential drinking water aquifers (e.g. areas where there is no bay mud aquitard between the contaminated A-aquifer and the B- and/or bedrock-aquifers). The Navy should also consider whether contaminant concentrations are in excess of the acceptable risk range (the Navy can use the tap-water PRGs presented in Appendix A to determine this). If the Navy determines that a contaminant concentration is greater than the MCL but in the risk range, the Navy should then determine whether or not the concentration of that contaminant is acceptable and provide justification if the Navy determines the concentration is acceptable. Step 5: apply other specific factors to determine that the A aquifer is or is not a drinking water source for a CERCLA cleanup (e.g. thickness of the aquifer, proximity to salt water, etc. – per Enclosure 5 of EPA's May 12, 1999 letter). As a separate analysis, the state criteria should also be applied to Parcel D groundwater to determine which portions of Parcel D groundwater meet the state criteria.

Response: The revised evaluation methodology agreed upon at the September 21, 1999, meeting between the Navy, EPA, and the RWQCB differs from the methodology described in the comment. As a result, the methodology described in the comment was not used in the draft final technical memorandum.

6. **Comment:** **Section 3.2. EPA is confused by "step 3" as discussed on page 8 and on page 10 under Section 3.2.3 by which the Navy is evaluating technical and economic treatability. Is the Navy referring to the analysis per EPA guidance: *Guidelines for Groundwater Classification Under the EPA Groundwater Protection Strategy* (June 1988), specifically Chapter 6? If yes, then the Navy should explicitly state this in the revised document and follow the guidance in greater detail. If no, then the Navy should delete "step3" discussion from the revised report.**

Response: The evaluation step described in the comment is not part of the revised evaluation methodology. As a result, the text described in the comment has been deleted from the technical memorandum.

7. **Comment:** **Section 5 on the groundwater Point of Compliance should be deleted. This discussion is outside the scope of the Report which is looking at the analysis of and issues related to Parcel D groundwater as a potential drinking water source. The point of compliance issue discussed in Section 5 concerns groundwater contamination threats to the Bay. Further, EPA disagrees with the statements in this section. Section 6.3 should also be deleted.**

Response: The discussion of the point of compliance has been deleted from the technical memorandum.

8. **Comment:** **Figure 1 and 3. Figure 3 appears to be redundant. All of the MCL exceedances are posted on Figure 1. Is Figure 3 needed?**

Response: The figures included in the draft final technical memorandum have been revised. Chemical concentrations that exceed MCLs are shown only on Figure A-1 of the technical memorandum.

9. **Comment:** **Figure 2. EPA disagrees with the steps of the Navy's analysis as presented in Figure 2. Please see EPA comments above. This figure should be revised or deleted.**

Response: The figure has been revised to reflect the evaluation methodology agreed upon by the Navy, EPA, and RWQCB at the September 21, 1999, meeting. Figure 3 of the draft final technical memorandum presents the revised evaluation methodology.

10. **Comment:** **Information pertaining to IR-36 should be deleted from the report. IR-36 is part of Parcel E not Parcel D.**

Response: Information pertaining to IR-36 has been deleted from the report.

Specific Comments

1. **Comment:** **Section 1.1, page 1, second paragraph. The Report should not assume that the A-Aquifer is not a potential drinking water source under State criteria since there is no written concurrence to that for the Hunters Point Shipyard by the State RWQCB. Such written concurrence must be obtained before any part of the A-aquifer can be considered not a potential drinking water source.**

Response: The text referred to in the comment has been deleted from the report. A comprehensive evaluation of the potential for A-aquifer groundwater at Parcel D to be used as a drinking water source based on the State criteria is presented in the draft final technical memorandum.

2. **Comment:** **Section 1.1, page 2, second paragraph. It is incorrect to assume that pumping of the B-Aquifer would have to be restricted if it is threatened by contamination in the A-Aquifer. This document should not discuss remedies. In fact, pumping restrictions by themselves would be an acceptable remedy for the B-zone since it is currently considered a potential drinking water source.**

Response: Text discussing groundwater remedies has been deleted from the report.

3. **Comment:** **Section 1.1, page 2, second paragraph, last sentence. It does not appear that objective 3 is addressed in the Report.**

Response: The objective referred to in the comment is no longer an objective of the technical memorandum. The text has been deleted.

4. **Comment:** **Section 1.1, page 2, last sentence. Delete "IR-09 and IR-33 North because, at these sites," and replace with: "where". The Report needs to present the analysis and then conclude which sites, if any, should be carried into a Parcel D2.**

Response: The text referred to in the comment has been deleted.

5. **Comment:** **Section 1.1, page 3, second paragraph. Contaminant concentration summaries allow the analysis of the potential drinking water sources to focus on areas where there is a potentially an unacceptable impact if the aquifer or portions of it, are a potential drinking water source, and it should be used to address the points made by EPA in the last two paragraphs of Enclosure 5.**

Response: Comment noted. The contaminant concentration summaries are presented in Appendix A of the draft final technical memorandum.

6. **Comment:** **Section 2, second paragraph. Please state the thickness of the A-Aquifer.**

Response: The thickness of the A-aquifer ranges from 2 to 50 feet thick at Parcel D. The thickness of the A-aquifer is evaluated on an IR-site-specific basis in step 2 of the revised evaluation methodology.

7. **Comment:** **Section 2, page 5, second paragraph. In last sentence, delete "consists of IR-09 and IR-33 North and is the portion of Parcel D". The Report needs to present the analysis and then conclude which sites, if any, should be carried into a Parcel D2.**

Response: The text referred to in the comment has been deleted.

8. **Comment:** **Section 3.1.2, page 7, Site Specific Factors. These factors are being used to make a site specific determination as to whether the aquifer should be considered a potential drinking water source for CERCLA cleanup purposes.**

Response: The Navy agrees that the determination of whether groundwater at Parcel D is a potential drinking water source will be used to evaluate groundwater remedies under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

9. **Comment:** **Section 3.2, page 8, first paragraph, Step 3 discussion. See EPA general comment 6 above.**

Response: Please refer to the response to general comment 6.

10. **Comment:** **Section 3.2.2, page 8-9, Site Specific Factors. Site specific factors, need to be used wherever either (not both) state or Federal criteria are met and there is a release to groundwater that is above background and MCLs. When there is not a release above background and MCLs, the analysis is unnecessary. Please list the IR-sites where this further analysis is being applied. It is also helpful to note which IR sites have concentrations exceeding the risk range for the drinking water exposure scenario. IR sites within the risk range may not require cleanup even if the groundwater is a potential drinking water source.**

Response: Please see the response to general comments 1 and 5.

11. **Comment:** **Section 3.2.2, page 9, Historic, Current, and Potential Future Groundwater Uses: This section states that "Groundwater at HPS has never been and is unlikely to ever be used as a drinking water source because of its marginal quality and the need for expensive pretreatment prior to use". However, no supporting information is provided for this statement. The Report should be revised to explain what is meant by "marginal quality", and should be revised to provide the names of individuals interviewed or documents, files or records that were reviewed to provide substantiation for this statement. Further, the Navy should look at historic use of shallow groundwater within the area of HPS not just on the Shipyard. Regarding the statement "the City currently prohibits the installation of domestic use wells" - this is not entirely correct. It is EPA's understanding that this prohibition applies to shallow groundwater to a specific depth. Please clarify.**

Response: The former and current use of groundwater at HPS is documented in the Parcel D remedial investigation (RI) report. A citation to this source of information has been added to the draft final technical memorandum. The text referring to marginal groundwater quality and the need for expensive pretreatment has been revised. The report has also been revised to include information about shallow groundwater use in the vicinity of HPS, and to clarify the current City and County of San Francisco (City) prohibition on the installation of domestic use wells.

12. **Comment:** **Section 3.2.2, page 9, Historic, Current, and Potential Future Groundwater Uses: Due to ever-increasing demands on urban water supply, explain why it is reasonable to expect that the City and County of San Francisco will rely solely on the Hetch Hetchy watershed as a source of drinking water.**

Response: The text referred to in the comment has been deleted.

13. Comment: **Section 3.2.2, page 9, Conceptual Groundwater Extraction and Treatment Scenarios: This section states that Total Dissolved Solids (TDS) "values in the A-aquifer at Parcel D vary from 214 to 29,000 mg/l and average 7,300 mg/l, indicating that fresh water is limited." A TDS concentration range of 214 to 29,000 mg/l with an approximate average TDS value of 7,300 mg/l does not necessarily indicate that fresh water is limited. Furthermore, TDS concentrations in 33 of the 73 wells sampled were below 3,000 mg/l and TDS concentrations in 20 wells were between 3,000 and 10,000 mg/l, indicating that most of the A-aquifer groundwater would be considered by the U.S. EPA Region IX as freshwater. Additional information such as the spatial distribution of monitoring wells in the A-aquifer, the associated TDS concentrations of the wells and the method of averaging the TDS values should be evaluated before it can be determined that fresh water is limited. The Report should be revised to omit the phrase "indicating that fresh water is limited". Alternatively, the Report should be revised to provide more detailed information in support of this statement.**

Response: A more detailed analysis of TDS concentrations on an IR-site by IR-site basis is included in the SSF evaluation presented in the draft final technical memorandum.

14. Comment: **Section 3.2.2, page 9, Conceptual Groundwater Extraction and Treatment Scenarios: This section further states that "Due to the limited volume and area for recharge of the A-aquifer, it is unlikely that the few areas of the A-aquifer with TDS concentrations below 10,000 mg/l would yield volumes sufficient to supply public drinking water." Well yield data presented in Table 2 indicate yields of 1,080, 12,816, and 129,600 gallons per day (gpd) for different Parcel D wells. The 1988 EPA Guidelines (page 6-5) state that an aquifer must be capable of yielding 150 gal/day to be considered a potential drinking water source. The State of California guidelines (State Water Quality Control Board Resolution 88-63) state that an aquifer must be capable of yielding at least 200 gal/day to be considered a drinking water source. The well yield data presented in the Report indicate that the A-aquifer is capable of yielding a volume of water that would be sufficient for public drinking water. The Report should be revised to explain the reasoning behind the conclusion that this aquifer will not yield a volume of water sufficient to supply drinking water to the public. Additionally, the Report should be revised to explain the reasoning behind the assumption that the volume and area for recharge in the A-aquifer is limited.**

Response: The text referred to in the comment has been deleted from the draft final technical memorandum. Determining the actual sustained yield of the A-aquifer at Parcel D would require additional data collection.

15. **Comment:** **Section 3.2.2, page 9: Impact of Groundwater on Surface Water Replenishment: This section states that "the main source of recharge of the A-aquifer is saline water intrusion from San Francisco Bay." The data presented in the Report indicates that some areas in the A-aquifer show TDS levels as low as 214 mg/l and 45% of the wells sampled had TDS values below 3,000 mg/l suggesting that the main source of recharge to some areas of the A-aquifer is freshwater. The Report should be revised to provide justification for this statement. Additionally, the Navy may want to evaluate the possibility of installing groundwater production wells in freshwater "pockets" in order to utilize the A-aquifer as a drinking water source.**

Response: The text referred to in the comment has been deleted from the draft final technical memorandum.

16. **Comment:** **Section 3.2.2, page 10: Impact of Consolidation of Soils and Damage to Existing Structures Through Subsidence: This section states that "long-term groundwater extraction from the A-aquifer would likely result in land surface settling and subsidence, which might potentially damage existing structures, as the aquifer is dewatered at a faster rate than it can be replenished by Bay water recharge." No data is provided in the Report to substantiate this statement. The Report should be revised to provide information such as the recharge rate from the Bay to groundwater, the radius of influence / drawdown from groundwater extraction in A-aquifer groundwater monitoring wells and calculations demonstrating at what extraction rate the aquifer would be dewatered.**

Response: The text referred to in the comment has been deleted from the draft final technical memorandum. Quantitatively evaluating the potential for subsidence would require additional data collection.

17. **Comment:** **Section 3.2.3, page 10. See EPA general comment 6 above.**

Response: Please refer to the response to general comment 6.

18. **Comment:** **Section 3.3, page 10, Conclusions of Groundwater Classification Analysis. It needs to be stated that the conclusions of the groundwater classification analysis are specifically for making CERCLA cleanup decisions. The conclusions also need to clearly state that although Federal and state criteria are met over large portions of the A-Aquifer, because of the other site specific factors discussed, for CERCLA cleanup decisions, the Navy does not consider the A-Aquifer to be a potential drinking water source. The state of California (RWQCB) needs to concur and the Report should not be finalized until such concurrence is obtained. Once obtained, the Report should be revised to state that State of California concurrence has been obtained and that a copy of the concurrence letter is provided as an attachment to the revised Report.**

Response: The draft final technical memorandum has been revised to state that areas of the A-aquifer that have a potential use as a drinking water source and demonstrate risk that cannot be mitigated through a risk management process will be further evaluated in the FS addendum as part of the CERCLA cleanup process. Regarding RWQCB concurrence, the Navy requests that the RWQCB and EPA review and comment on the draft final technical memorandum concurrently. The Navy intends to address RWQCB and EPA concerns simultaneously and finalize the technical memorandum after concurrence from both agencies has been obtained.

19. **Comment:** **Section 4.1, page 11, Locations Where the Bay Mud is Absent. This section describes the depositional history around Parcel D and locations of areas where the Bay Mud is absent. Please provide geologic cross-sections and a map showing the location of the 1935 shoreline to support the statements made in this section or reference where this information can be found in the RI or FS reports.**

Response: As stated in the revised draft technical memorandum, a detailed discussion of the geology and hydrogeology at Parcel D is presented in Section 2 of the draft final Parcel D FS report. Additional geologic cross sections are presented in Section 3 of the draft final Parcel D RI report. The 1935 shoreline is shown on Figure 1 of the draft final technical memorandum.

20. **Comment:** **Section 4.2, page 12: A-Aquifer Contaminants of Potential Concern in Areas with A-and B-Aquifer Interconnections. The first two sentences of this section provide a definition of the groundwater chemicals of potential concern (COPCs). Please provide information/references on where this definition came from, for example a previous agreement with U.S. EPA Region IX. If no agreement exists with the regulatory agencies regarding this definition, then the definition of groundwater COPCs may need to be broadened to include "recent, isolated actual or potential detections of hazardous substances exceeding the MCLs". Additionally, according to the data presented in Appendix A of the Report, during several sampling events the method reporting limits (actually listed by the Navy as the method detection limits) for several analytes were higher than the MCLs, and therefore the analyte concentrations may have actually exceeded the MCLs but were reported as non-detects. In these situations, one exceedance of the MCL should not be considered as an "isolated detection of (a) hazardous substance", since there may have only been two rounds of sampling where the analytical method reporting limit was below the MCL for a target analyte.**

Response: The definition of groundwater chemicals of potential concern (COPC) used in the revised draft technical memorandum is the definition that has been used to identify groundwater COPCs in the FS reports for all HPS parcels. The Navy agrees that in cases where the analytical detection limits exceed the MCLs, one exceedance of the MCL should not be considered as an isolated detection. Appendix A has been revised accordingly.

21. **Comment:** **Section 4.2, page 12, A-Aquifer Contaminants of Potential Concern in Areas with A-and B-Aquifer Interconnections, IR Sites Impacted. This text should be revised to discuss all IR-sites with A/B-Aquifer interconnection and then state clearly why only IR-9 and IR-33N are a concern.**

Response: The text referred to in the comment has been deleted from the draft final technical memorandum. Areas in which the A- and B-aquifers are interconnected will be evaluated in a separate technical memorandum once the potential for the B-aquifer to be used as a drinking water source has been determined.

22. **Comment:** **Section 4.2, page 12: A-Aquifer Contaminants of Potential Concern in Areas with A-and B-Aquifer Interconnections: The second paragraph states that "because the A-aquifer has not been classified as a drinking water source, no direct human health exposure pathways to A-aquifer COPCs exist" and "The groundwater COPCs discussed in this section do not pose risk to human health". As stated in Enclosure 5 of EPA's May 12, 1999 letter, even if a class II aquifer is not treated as a potential drinking water source, source control and mass removal of contaminants, the potential for substantial long-term future degradation of the groundwater resource through the continued spread of contamination and the potential for significant health threats from unanticipated use of the groundwater have to be considered. The Report should be revised to address these issues. Also, see EPA general comment 2 above.**

Response: The text referred to in the comment has been deleted from the draft final technical memorandum. Areas in which the A- and B-aquifers are interconnected will be evaluated in a separate technical memorandum once the potential for the B-aquifer to be used as a drinking water source has been determined.

23. **Comment:** **Section 4.4, Conclusions for Areas of Interconnection. The Report should clearly state here which IR-sites are a concern.**

Response: The text referred to in the comment has been deleted from the draft final technical memorandum. Areas in which the A- and B-aquifers are interconnected will be evaluated in a separate technical memorandum once the potential for the B-aquifer to be used as a drinking water source has been determined.

24. **Comment:** **Section 5, page 14. This section should be deleted per EPA general comment 7 above.**

Response: The text referred to in the comment has been deleted. Please refer to the response to EPA general comment 7.

25. **Comment:** **Section 6.1, page 15, first sentence. Please add that the Navy has concluded that the A-Aquifer is not a potential drinking water source for a CERCLA cleanup.**

Response: The draft final technical memorandum states that the Navy has concluded that the A-aquifer is not a potential drinking water source based on the TDS and SSF evaluation. As a result of this conclusion, the Navy recommended no sites for further evaluation under the CERCLA cleanup process.

26. **Comment:** **Section 6.2, page 15. As stated in several earlier comments, the Report should clearly conclude which IR-sites are a concern.**

Response: The text referred to in the comment has been revised.

27. **Comment:** **Section 6.3, page 15. This section should be deleted per EPA general comment 7 above.**

Response: The text referred to in the comment has been deleted. Please refer to the response to general comment 7.

28. **Comment:** **Figure 1 (Total Dissolved Solids, Salinity, Well Yield, and MCL Exceedances, Parcel D, Hunters Point Shipyard, San Francisco, CA): The contour lines presented in Figure 1 appear to have mistakes in the following areas, and should be revised:**

in the vicinity of IR22 / IR 35, where federal and/or state criteria are met,

the area inside the 3,000 mg/l contour around PA36MW01A, IR39MW36A and PA39MW01A, and

the 3,000 mg/l contour around PA36MW04A.

Response: The contour lines have been revised. Figures 4 and 5 of the draft final technical memorandum show the contour lines for the State and federal criteria, respectively.

29. **Comment:** **Table 3: Maximum Contaminant Level Exceedances in Groundwater in Areas Where A- and B-Aquifers are Interconnected: Figure 1 lists the maximum concentration for arsenic detected in groundwater samples collected from well IR33MW61A as 70.15 ug/l, which exceeds the MCL (50 ug/l) and the HGAL (27.34 ug/l) for arsenic. This exceedance is not listed in Table 3. Please correct this discrepancy.**

Response: Table 3 has been deleted from the draft final technical memorandum. The areas in which the A- and B-aquifers are interconnected will be evaluated after the potential for the B-aquifer to be used as a drinking water source is determined.

30. **Comment:** **Table 3: Maximum Contaminant Level Exceedances in Groundwater in Areas Where A- and B-Aquifers are Interconnected: The date for Sampling Event 2 for IR09MW35A for chromium is listed as 1/2/96, while the date for the same sampling event for nickel is listed as 1/2/91. Please correct this discrepancy.**

Response: The text referred to in the comment has been deleted from the draft final technical memorandum. Areas in which the A- and B-aquifers are interconnected will be evaluated in a separate technical memorandum once the potential for the B-aquifer to be used as a drinking water source has been determined.

31. **Comment:** **Appendix A, Section 2.1, page A-2: Metals that Exceed a Maximum Contaminant Level: This section states "Antimony and thallium have HGAL values that are greater than the MCL and PRG values for those metals", and that "Arsenic, barium, chromium, and nickel have HGAL values that are below the MCL and the PRG values." One of the tables presented on page A-2 indicates that a tap water preliminary remediation goal (PRG) has not been established for thallium or chromium, and that the HGAL value for arsenic is 27.34 ug/l, which is above the PRG of 0.04 ug/l. Please correct these discrepancies.**

Response: Appendix A has been revised, and the text referred to in the comment has been deleted. The tap water preliminary remediation goals (PRG) were not used as a screening criterion in the revised evaluation because the MCLs are considered to be the applicable or relevant and appropriate requirement for groundwater under CERCLA. The tap water PRGs are presented in Appendix A for informational purposes only.

32. **Comment:** **Appendix A, Sections 3.1 through 3.21: Many of the analyses for groundwater samples collected from Parcel D had method reporting limits that exceeded MCLs, and therefore these data are not useful in evaluating if concentrations of specific analytes in groundwater samples exceeded the MCLs for those analytes. Sections 3.1 through 3.21 in Appendix A, which discuss MCL exceedances in groundwater samples for the different IR sites, do not indicate when the analytical method reporting limits exceeded the MCLs. These discussions imply that if a sample was non-detect for a given analyte, it was below the MCL for that analyte. In many of the cases, it cannot be determined if the analyte was below the MCL because the method reporting limit was above the MCL. The following sections of Appendix A should be revised to discuss when the method reporting limits exceeded the MCLs:**

Section 3.1, IR-08

Section 3.2, IR-09

Section 3.4, IR-17

Section 3.8, IR-33 South

Section 3.19, IR-67

Section 3.21, IR-71

Response: Appendix A has been revised to identify monitoring wells in which the analytical detection limits for nondetected chemicals exceeded the chemical-specific MCLs.

33. **Comment:** **Appendix A, Section 3.1, page A-4, IR-08: In the second paragraph, change the sentence: "Concentrations of antimony in groundwater collected from four of the six A-aquifer monitoring wells exceeded the MCL for antimony" to "Concentrations of antimony in groundwater collected from five of the six A-aquifer monitoring wells exceeded the MCL for antimony".**

Response: The Hunters Point groundwater ambient level (HGAL) for antimony is greater than the MCL. As a result, the HGAL is the applicable screening criterion for antimony. Antimony concentrations detected in groundwater at IR-08 did not exceed the HGAL. The text referred to in the comment has been deleted from Appendix A. The antimony results that exceeded the MCL but not the HGAL are presented in Table A-4.

34. **Comment:** **Appendix A, Section 3.1, page A-4, IR-08: In the second paragraph, it is unclear whether the fourth sentence refers to antimony concentrations, to thallium concentrations or to both. Please clarify this sentence.**

Response: The text referred to in the comment has been deleted from the draft final technical memorandum.

35. **Comment:** **Appendix A, page A-6, Section 3.5, IR-22: The first sentence in the second paragraph and the second-to-last sentence in this section should be revised to also mention the HGAL exceedances.**

Response: Appendix A has been revised to include a discussion of chemical concentrations that exceed HGALs.

36. **Comment:** **Appendix A, page A-7, Section 3.7, IR-33 North: Please change the second sentence in the second paragraph from: "The arsenic concentration exceeded the MCL and HGAL (27.3 ug/l) in one of three sampling events" to "The arsenic concentration exceeded the MCL in one and the HGAL (27.3 ug/l) in two of three sampling events.**

Response: The text has not been revised. The MCL for arsenic is greater than the HGAL; as a result, the MCL is the applicable screening criterion. Arsenic was detected in only one sampling round at monitoring well IR33MW61A at a concentration exceeding the MCL.

37. **Comment:** **Appendix A, page A-8, Section 3.8, IR-33 South: Change the last sentence from: "The thallium concentration exceeded the MCL in one of three sampling events..." to "The thallium concentration exceeded the MCL in one of two sampling events..." since thallium was not analyzed in the third**

sampling event and, as such, the actual number of sampling events with regard to thallium was only two.

Response: The HGAL for thallium is greater than the MCL; as a result, the HGAL is the applicable screening criterion. The text referred to in the comment has been deleted from the text because thallium was not detected at concentrations exceeding the HGAL.

38. **Comment:** **Appendix A, Table A-1 and Table A-2: Please reference the source for the U.S. EPA and the State of California MCLs for bis(2-ethylhexyl)phthalate and methylene chloride, since these compounds are not listed in EPA document 822-B-96-002 "Drinking Water Regulations and Health Advisories" dated October 1996.**

Response: The text and tables of Appendix A have been revised to include references for all cited drinking water standards.

39. **Comment:** **Appendix A, Table A-1: Please, change the U.S. EPA MCL for Heptachlor Epoxide to "0.2 ug/l"on page 3 of 5: Site IR36S, well PA36MW07A.**

Response: The table has been revised as requested.

40. **Comment:** **Appendix A, Table A-2: There are many discrepancies between the data presented in Table A-2 and the data presented in Tables A-5 through A-26, particularly in the columns entitled "Maximum Results", "Number of Times Exceeding a MCL", and "Number of Times Sampled". Please review these tables carefully to correct these discrepancies.**

Response: Appendix A has been reviewed and revised to correct discrepancies.

41. **Comment:** **Appendix A, Table A-2: Footnote the column entitled "Number of Times Exceeding a MCL" for the following:**

Site IR33S, well IR09P040A for benzo(a)pyrene (page 2 of 5). The footnote should say: "the concentration of benzo(a)pyrene in one additional sample was detected at the MCL of 0.2 ug/l";

Site IR55, well IR55MW02A for thallium (page 4 of 5). The footnote should say: "the detected concentration was at the MCL of 2.0 ug/l".

Response: Table A-1 of the draft final technical memorandum contains the information formerly presented in Table A-2. The footnote on the benzo(a)pyrene concentration at IR09P040A has been revised as requested. However, the footnote on thallium at IR55MW02A was not revised. The HGAL for thallium is greater than the MCL; as a result, the HGAL is the applicable screening criterion. Thallium was not detected at concentrations exceeding the HGAL at IR55MW02A.

42. **Comment:** **Appendix A, Table A-3 and A-4: The word "Maximum" should be removed from the column entitled "Maximum Result" as hydropunch and grab groundwater samples are collected on a one-time basis and concentrations detected in these samples do not represent maximum values. This comment will also affect Figures 1 and 3 (unless figure 3 is deleted per EPA general comment 8 above).**

Response: The tables have been revised as requested.

RESPONSES TO COMMENTS FROM RWQCB

General Comments

1. **Comment:** **The text of the evaluation in Section 3.2.2 (Step 2) is not well supported by any analysis or results. The report must provide better support for the various factors discussed in this section.**

Response: The methodology for evaluating SSFs was revised based on a September 21, 1999, discussion with the RWQCB and EPA. The revised methodology uses a weight-of-evidence approach to evaluate the impact of SSFs at an IR site on the potential for groundwater underlying that site to be used as a drinking water source. The draft final technical memorandum evaluates SSFs using the revised strategy.

2. **Comment:** **The Navy needs to propose specific locations and a schedule for investigation of the B-aquifer.**

Response: The Navy is currently evaluating B-aquifer data needs.

3. **Comment:** **The RWQCB does not agree with the Navy is proposed redefinition of the point of compliance at the shoreline.**

Response: The discussion of the point of compliance has been deleted from the technical memorandum.

Specific Comments

1. **Comment:** **Page 2, first paragraph. The last sentence notes only one type of activity that would be affected by consideration of B-aquifer water quality. The statement should be broader in that any activities affecting or conducted in the A-aquifer would need to consider water quality impacts on the B-aquifer, whether or not the B-aquifer were being pumped. This would include source control activities in the A-aquifer.**

Response: The relationship between the A- and B-aquifers will be fully addressed in a separate technical memorandum that will be completed after the potential for the B-aquifer to be used as a drinking water source has been determined.

2. **Comment:** **Page 7, first paragraph. The federal guidelines are actually more stringent in the sense that more water is considered as a potential drinking water source by federal guidelines than by state guidelines.**

Response: Comment noted. The text referred to in the comment has been deleted from the draft final technical memorandum.

3. **Comment:** **Page 9, Historic, Current, and Potential Future Groundwater Uses. The first sentence refers to poor water quality and expensive pretreatment. Since there are no B-aquifer wells in Parcel D it does not seem possible to make these statements with respect to Parcel D. We encourage the Navy to propose specific locations for installation of B-aquifer wells.**

Response: The text referred to in the comment has been deleted from the draft final technical memorandum. The Navy is currently evaluating B-aquifer data needs.

4. **Comment:** **Page 9, Conceptual Groundwater Extraction and Treatment Scenarios. The Navy needs to provide a more specific demonstration of the statements with respect to limited yield and expensive pretreatment. The beneficial uses identified by the state are associated with specific daily pumping rates. Is pumping at these rates possible? What is the basis for the statement that pumping from any portion of the A-aquifer would require expensive pretreatment? Additional support for these statements is necessary to give them credibility.**

Response: The text referred to in the comment has been deleted from the draft final technical memorandum because quantitative pumping data is not available. As noted in the response to RWQCB general comment 1, the SSF evaluation methodology has been revised to include a more quantitative evaluation of SSFs at each Parcel D site.

5. **Comment:** **Page 9, Impact of Groundwater on Surface Water Replenishment. We do not understand the statement that San Francisco Bay is recharging the A-aquifer. Some more detailed discussion and support for this statement are necessary. A water balance for the parcel would more clearly illustrate the main elements of recharge for the parcel. With regard to the last sentence, what level of sustained extraction could be implemented without causing declining quality of A-aquifer groundwater?**

Response: Quantitative recharge and sustained groundwater extraction data are not available, and additional investigation and analysis would be required to evaluate these factors. As a result, these factors are not included in the revised SSF evaluation methodology. The text referred to in the comment has been deleted from the draft final technical memorandum.

6. **Comment:** **Page 9, Vulnerability of Groundwater to Contamination. The analysis in this section appears flawed. With a minimum seal length of 20 feet, any aquifer occurring at depths of greater than 20 feet could be developed in accordance with the ordinance. In other words, it is the distance from ground surface to the bottom of the aquifer that is important, not the depth from ground surface to the water table. This section should be revised to be more specific as to areas that don't meet the minimum seal depth requirements. It is our understanding that this would comprise areas where the depth to Bay Mud is less than 20 feet from ground surface.**

Response: The analysis has been revised as requested (see Sections 3.1.1 and 3.2.1 of the draft final technical memorandum).

7. **Comment:** **Page 10, Impact of Consolidation of Soils and Damage to Existing Structures Through Subsidence. Some specific demonstration of land settling and subsidence that would result from groundwater extraction is needed to strengthen this point.**

Response: Quantitative land settling and subsidence data are not available, and additional investigation and analysis would be required to evaluate these factors. As a result, these factors are not included in the revised SSF evaluation methodology. The text referred to in the comment has been deleted from the draft final technical memorandum.

8. **Comment:** **Section 3.2.3. We do not see any analysis that supports this conclusion. What specific parts of the exemption criteria in Section 3.1.2 are being invoked here to make this statement? If a case cannot be made with respect to the criteria, it is not possible to state that no portions of the A-aquifer retain the stated beneficial use designation.**

Response: The text referred to in the comment has been deleted. As noted in the response to RWQCB general comment 1, the methodology was revised to evaluate SSFs at each individual IR site using a weight-of-evidence approach. The draft final technical memorandum evaluates SSFs using the revised strategy.

9. **Comment:** **Section 4.2. The COPC analysis is not clear. Are COPCs only associated with IR-09 and IR-33? Even using the one round criteria, there are sites other than these two where chemicals were detected at concentrations above MCLs and HGALs (for metals). The first sentence in the section appears to contradict this.**

Response: Chemicals were detected in groundwater at several IR sites at Parcel D at concentrations exceeding the MCLs (and HGALs for metals). A comprehensive evaluation of the presence of chemicals in groundwater at each Parcel D IR site is presented in Appendix A of the technical memorandum.

10. **Comment:** **Section 4.3. The Navy needs to propose specific locations and a schedule for investigation of the B-aquifer.**

Response: Please refer to the response to RWQCB general comment 2.

11. **Comment:** **Section 5.0. The RWQCB does not concur with the Navy's proposed redefinition of the point of compliance as the shoreline in areas of the parcel where the seawall is absent. This is not consistent with the agreement reached earlier with respect to Parcel D, the agreement documented in the Parcel B Record of Decision, or with long-standing regulatory policy. Separation between the point of compliance and the point of exposure is used routinely to allow for response to exceedances without threatening water quality of the receiving water. The separation between compliance point and exposure point varies from site to site based on site hydrogeologic conditions, nature of the contaminants, and the demonstrated ability of the responsible party to mobilize a timely response, among other factors. The RWQCB finds no basis for agreement to the Navy's proposal. In fact, site-specific factors including those noted above indicate a large separation is warranted at Hunters Point. The RWQCB supports the use of the inland edge of the tidally influenced zone in those areas of Parcel D where there is no seawall. In areas where there is seawall, the Navy must propose a monitoring network and program to verify the integrity of the seawall and its continued functionality in preventing Parcel D groundwater from discharging through or across the seawall.**

Response: Please refer to the response to RWQCB general comment 3.

<u>Appendix B</u>

12. **Comment:** **Section 2.0. Please provide a reference for the groundwater screening criterion of 100 ug/L.**

Response: Appendix B has been deleted from the report. Petroleum hydrocarbons in groundwater are being evaluated under the petroleum corrective action plan (CAP).

13. **Comment:** **Section 2.0, tables. Please modify the tables to provide the following information: method reporting limits, frequency of exceedances and dates of exceedances. Tables like those presented in Appendix A should be prepared for Appendix B and would address these concerns. Similar information should be presented for the other sites in Parcel D as part of the Parcel D Corrective Action Plan.**

Response: Appendix B has been deleted from the report. Petroleum hydrocarbons in groundwater are being evaluated under the CAP.

14. **Comment:** **Section 3.0. Please provide a reference for the groundwater screening criteria for the various TPH measures.**

Response: Appendix B has been deleted from the report. Petroleum hydrocarbons in groundwater are being evaluated under the CAP.

15. **Comment:** **Section 3.0, tables. The tables should present method reporting limits and should include the measured value for those samples where results were below the screening criteria. Alternatively, a set of data tables showing all the TPH results should be presented for the sites considered here. Similar information should be presented for the other sites in Parcel D as part of the Parcel D Corrective Action Plan.**

Response: Appendix B has been deleted from the report. Petroleum hydrocarbons in groundwater are being evaluated under the CAP.