



California Regional Water Quality Control Board

San Francisco Bay Region

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HUNTERS POINT
SSIC NO. 5090.3.A



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Department of Navy
Base Realignment and Closure Program
Management Office West
ATTN: Mr. Keith Forman
1455 Frazee Road, Suite 900
San Diego, California 92108-4310

SUBJECT: Water Board comments on the March 2007 Draft Parcel E-2 Remedial Investigation/Feasibility Study (RI/FS), Hunters Point Shipyard, San Francisco

Dear Mr. Forman:

We reviewed the subject report and our comments follow. Our review team included myself, Ms. Agnes Farres, (Appendices L and O), Mr. Alan Friedman, P.E, (Appendices K and Q), and Mr. Erich Simon, (Section 7 and Appendix K). If you have any questions, you can contact me via phone (510) 622-2492 or email at jponton@waterboards.ca.gov.

It should be noted that our review was based on an incomplete report, since the report does not include an evaluation of groundwater remediation options or the radiological assessment. At this time we find the RI/FS unacceptable as it is incomplete.

General Comments

1. Groundwater

Available groundwater data show that groundwater at the E-2 landfill may pose a risk to aquatic receptors in the Bay. The remedial alternatives developed in the RI/FS however, do not include groundwater remediation options, only long-term groundwater monitoring. Failure to evaluate groundwater remediation alternatives is unacceptable.

The report cites that groundwater remediation alternatives were not evaluated because of:

- a. Data limitations (need for replacement of PCB hot spot wells, need for additional data to evaluate seasonal changes, and need to evaluate groundwater flow patterns following removal of storm drain and sanitary sewers); and,
- b. Lack of consensus on a method for comparing groundwater data to aquatic criteria.

With regard to Point A, the existing groundwater data demonstrates that the landfill waste contaminates groundwater. In turn, contaminated groundwater migrates vertically (into

the B-zone drinking water aquifer) and laterally towards the Bay where it discharges to surface water. We believe that there is adequate groundwater data to develop and evaluate groundwater remedial alternatives and that the existing data captures seasonal variability. It is unlikely that the sewer line removal actions will significantly alter the groundwater flow system/regime, which is generally directed through landfill waste (source area for leachate and contaminated groundwater) towards the Bay.

With regard to Point B, I feel that the RI/FS does not portray the significant progress made towards resolving this issue. On March 2006, we sent the Navy a letter¹ which:

- Clarified our position on the locations of the points of compliance (POC) for measuring (pollutants in) groundwater prior to its discharge to the Bay;
- Encouraged incorporating both fate and transport modeling and sampling as a means of evaluating the attenuation of contaminant groundwater plumes; and,
- Provided case examples where the groundwater/surface water interface was successfully addressed.

Although we received no written response to our letter, the Navy acknowledged receipt of the letter and has told the BRAC Cleanup Team (BCT) that it intends to address the issues raised in upcoming documents (i.e., feasibility studies, etc.). Along those lines, the Navy created attenuation nomographs for Parcel E-2, that showed that within 50 to 100 ft of the shore, attenuation of groundwater plumes is essentially equal to one (i.e., surface water and groundwater concentrations are the same), supporting the interrelationship of surface water to groundwater. The focused discussion and presentation of the nomographs was promising, leading us to conclude that we were moving closer towards consensus.

In summary, the path forward discussed with the BCT (nomographs, modeling, etc) should be included. Until groundwater containment/treatment is addressed, we will find the RI/FS unacceptable and incomplete and therefore unacceptable.

2. ARARs for Groundwater and Surface Water

Failure to propose groundwater and leachate containment and treatment options in the RI/FS is in violation of the standards, requirements, and criteria for the protection of the beneficial uses of groundwater and surface water.

Shoreline monitoring well data show discharge of contaminated A-zone groundwater to surface water. Similarly, limited B-zone groundwater data show landfill contamination of the B-zone drinking water aquifer. The proposed long-term groundwater monitoring strategy does not address contaminated A-zone groundwater/landfill leachate from degrading the water quality of the Bay and deeper drinking water aquifers.

¹ March 16, 2006, letter to Keith S. Forman, Navy BEC, from James D. Ponton, Water Board Project Manager, regarding Water Board Position on Groundwater Evaluation Criteria, Points of Compliance, and Next Steps, Hunters Point Shipyard, San Francisco.

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3. Presumptive Remedy

We find that the RI/FS is inconsistent with the presumptive remedy guidance and incomplete with respect to groundwater/leachate containment and source control.

The RI/FS compares the characteristics of the Parcel E2 landfill to the relevant characteristics of municipal landfills for the applicability of the presumptive remedy to military landfills. The presumptive remedy for municipal landfills relies on source containment. We consider landfill generated leachate and contaminated groundwater sources that require control, containment, and/or treatment.

The report does not evaluate source containment (i.e., leachate/groundwater containment, control, and treatment) and proposes only long-term groundwater monitoring for verification of A- or B-aquifer groundwater concentrations at the Parcel E-2 boundary. As previously stated, long-term groundwater monitoring is unacceptable for it does not stop continuing contamination of the B-aquifer, bedrock aquifers, and of San Francisco Bay.

4. Nature and Extent of Solid Waste

The distribution of waste excavated during the PCB TCRA appears to contradict the "isolated" and "non-contiguous" nature of waste for the PCB area described in the report. For example, Figure 4-1 (Isolated Waste Locations in Adjacent Areas) shows that a majority of the samples located within the proposed excavation boundary reportedly contained no waste. During the PCB TCRA, however, excavators uncovered very significant contamination (i.e., 110 drums and 537 assorted waste containers from within the removal area). Field observations confirmed that waste extends beyond the East Adjacent Area into the Shoreline, Landfill, and offshore Parcel F Areas.

We recommend reviewing the nature and extent of solid waste discussion in light of the TCRA findings and revising the report as appropriate.

5. Landfill Waste Composition

Although there are no complete records for the waste stream deposited in the landfill, the RI/FS repeatedly states that the E-2 Landfill Area is comprised primarily of municipal-type waste and inert construction debris. In our experience, with the exception of ammonia and trace levels of VOCs and metals, the assemblage of groundwater contaminants and their respective elevated concentrations is not typical of the groundwater conditions encountered at typical municipal/inert solid waste landfill and provides further justification for evaluating groundwater containment measures.

6. Screening Level Ecological Risk Assessment

The Screening Level Ecological Risk Assessment (SLERA) is incomplete and cannot be appropriately evaluated at this time for the following reasons:

- a) The exposure pathway to surface water and groundwater was not evaluated. The SLERA evaluates risk to onshore receptors exposed to soil but does not evaluate potential ecological risk from exposure to surface water and groundwater.

However, a 1.3-acre seasonal freshwater wetland is located in the Panhandle Area of Parcel E-2 and provides potential ecological habitat. According to the Navy, the diversity and abundance of aquatic organisms is low in the seasonal freshwater wetland "presumably due to the toxicity of the soil and water". Ecological risk from exposure to contaminated surface water and potential recharge of contaminated groundwater must be evaluated.

- b) The Appendix L SLERA evaluates risk to terrestrial receptors within the onshore area while a separate SLERA evaluated potential risk to aquatic receptors exposed to intertidal sediment within the Shoreline Area of Parcel E-2. However, terrestrial receptors such as the American kestrel and red-tailed hawk could feed on prey in the shoreline areas (e.g. in the intertidal wetlands). As such, ecological risk to terrestrial organisms should be evaluated for both upland and shoreline areas including both inland and intertidal wetlands. Further, the shoreline areas should be clearly defined in all the figures and text to distinguish between inland and intertidal wetland habitats.
7. The results of the SLERA are based on an incomplete data set. Parcel E-2 was divided into three areas (Panhandle Area, Landfill Area, and East Adjacent Area) which are not well characterized. Sample points are few and clustered in focused areas. Specifically, very few samples are located in wetland habitats in the Panhandle Area. In addition, no data is currently shown for the PCB and Metal Slag Hotspots and post-excavation data will be presented in the draft final RI/FS. The Panhandle area should be better characterized with more samples taken in the wetland areas to support the conclusions in the SLERA. In addition, a more complete evaluation of the SLERA will have to wait until post-excavation data are made available for the PCB and Metal Slag Hotspots.

SPECIFIC COMMENTS

1. Section 7, Appendix K: Throughout Section 7 and Appendix K there needs to be a clear indication that about half of the 150' x 150' evaluation areas do not have data available for assessing potential risk, and all risk characterization results are based only on those grid areas where there was sufficient data to evaluate. This important detail is missing, leading the reader of the narrative sections to believe that the risk assessment results pertain to every grid area in Parcel E-2. Please revise Section 7 and Appendix K as appropriate.
2. Section 7, Page 7-1, Third Paragraph: This paragraph describes how site-specific prey tissue data was used to represent actual bioavailability of chemicals at the site instead of using published bioaccumulation factors. Please at least indicate how site-specific bioaccumulation data compares with published bioaccumulation data to show how different the two approaches may be in estimating ecological risks at the site.

3. Section 7.1.2, Tables 7.2 and 7.3: Please include a discussion in the applicable narrative sections that clearly explains what the 'RME Segregated HI' is and how it's different from the 'RME HI'. This comment also applies to tables in Appendix K.
4. Section 7.1.3.2, Page 7-8, First Paragraph: Other sections in this report clearly indicate that the A-aquifer may be in communication with the B-aquifer. While this is the case, the RBCs for the A-aquifer do not consider ingestion whereas the RBCs for the B-aquifer do. Please include more discussion explaining why RBCs based on ingestion are not appropriate for the A-aquifer.
5. Table 7.15: This table indicates that the Hunters Point Groundwater Ambient Level for arsenic (43.26 ug/L) is over 6000 times the applicable Risk Based Concentration (0.007 ug/L). Please confirm that this ambient level is applicable to this site and confirm that the arsenic background levels were calculated appropriately and approved by the regulatory agencies. Please include discussion in the text regarding the high 'background' arsenic level and how this arsenic concentration impacts total risk at the site.
6. Appendix K, Grid development: There is a potential disconnect between selection of the 0.5 acre grid areas and predicted future uses. The 0.5 acre area was selected because that is a typical size for a light industrial lot, but several sections indicate that light industrial is not expected to occur at this site. Furthermore, recreational and construction worker exposures were assumed to occur within the same 0.5 acre area selected for industrial workers. There needs to be some additional language explaining that the 0.5 acre area is an appropriate area for assessing exposure for recreational and construction workers
7. Section K2.0: While this section indicates that total and incremental risk evaluation were performed to evaluate risk from exposure to soil, it does not indicate that a similar comparison was made for evaluating exposure to groundwater. Instead a risk-based screening approach was used to evaluate exposures to groundwater. It remains unclear whether total and incremental risks are included in groundwater exposure evaluation. Please clarify and include further justification for use of a risk-based screening approach for groundwater at Parcel E-2.
8. Section K2.0, Page K-2, Second bullet list, Third bullet: This bullet item indicates that 12 rounds of monitoring data were used to delineate risk plumes, but does not indicate the time span, seasonality, or period in tide cycle associated with the 12 rounds of sampling. Without this information, I don't know if the sampling rounds span 12 years (annual sampling) or 12 hours (1 sample/ hour on one day). This also needs to be clarified in Section K4.3.2, first sentence.
9. Section K3.3, Page K-4: This section indicates that, based on chemical release and transport mechanisms, contaminants may migrate to indoor air. Please clarify that migration to indoor air is only expected from domestic use of groundwater from the B-aquifer.

10. Section K3.4, Page K-4: Some sections of this report seem to indicate that only recreational and open space reuse will occur at this site, whereas other sections indicate that some portion is planned for research or industrial reuse. If a portion of the site is currently planned for research or industrial reuse, then the potentially exposed receptors described in this section should reflect that. If these are not the reuse plans, please discuss, or reference the appropriate section of this report that discusses, what controls may be put in place to limit future research or industrial reuses at this site. Also include reference to any applicable decision documents that may indicate that future land uses will be restricted to recreation/open space. Lastly, please briefly describe what further risk characterization would be needed if future land use changes to include research or industrial activities.
11. Section K3.5.2, Page K-6, First Paragraph: This paragraph includes discussion that the A-aquifer does not have the potential beneficial use of drinking water. However, it does not describe other potential beneficial uses associated with this aquifer that may be appropriate in evaluating groundwater exposure pathways, including use as irrigation water or industrial process water. Please include a discussion of all other potential beneficial uses of the A-aquifer and potential groundwater exposure pathways associated with these beneficial uses.
12. Section K4.4, Page K-11, Second paragraph: This paragraph is confusing and doesn't present a clear argument for why incremental risks were not assessed for the groundwater domestic use evaluation.
13. Section K6.4, Page K-20, First Paragraph: Please include references to the 'HPS-specific risk-based concentration for lead for recreational receptors' and the 'EPA Region IX Industrial PRG for Lead'.
14. Section 7.1.1, Page K-20: This section discusses the characterization of cancer risks at Parcel E-2, however it does not clearly indicate if the characterization of chemical-specific cancer risks or pathway-specific cancer risks includes compounds below HPS 'background' levels. Please clarify.
15. Section K7.2, Page K-22, Fourth Paragraph: This paragraph indicates that the PRGs used in this HHRA do not account for exposure from dermal contact with groundwater. Please include further explanation/justification as to why this exposure pathway is not incorporated into the evaluation of exposure to groundwater, and briefly discuss how the risk-based screening approach may underestimate risks associated with domestic use of groundwater.
16. Table K-10: This table indicates that there are no RfDs for dioxins and furans. Please confirm that there are no other sources that provide appropriate RfDs for dioxins and furans.

17. Sections 11, 12 and 13 (Identification, Development and Evaluation of Remedial Alternatives): Section 11.1 et al states that containment actions apply to groundwater, landfill gas, and other media. This is contradicted by Section 11.7 which states that "...these were not included in any of the proposed remedial alternatives...because the need for their implementation cannot be supported by existing data.," as there is no method "for translating contaminant concentrations in groundwater...to determine if existing groundwater conditions pose a risk to aquatic receptors." Additionally, with respect to landfill gas, "additional data are needed regarding the volume and concentrations of gas." We ask that you please resolve these contradictions.
18. Section 11.5.1.1: This section should be revised to state that the soil layer should have a maximum permeability of 1 E-6 cm/sec or a maximum permeability equal to the hydraulic conductivity of the base liner system or of the underlying geologic materials.
19. Appendix Q: The remedial options emphasizing waste containment by installing a cap include drainage layers above the liner to preclude the buildup of head, but these options must also consider the impacts of groundwater building up beneath/behind the liner, and if necessary, should include upstream diversions to prevent this.
20. Figure 11-2: This figure contains inconsistencies for landfill gas and groundwater. The text, and the color coding, indicate that treatment and physical containment of both will not be considered, and yet the final column (labeled retained for analysis) indicates otherwise. Please review and correct.
21. Figure 12-1: This figure should be revised to more clearly show the existing and the proposed new caps. We request you modify this map to show where all of the subsequent cross-sections, such as Figures 12-3, 12-8, 12-13 and 12-14 are located.
22. Section 13, Appendix O: The new landfill cap is proposed to be constructed directly on the existing landfilled waste. Please clarify the expected excavation needed to create the necessary final slopes and whether the waste will be compacted to serve as a suitable foundation layer.
23. Section 12.2.3.7: This section states that freshwater and tidal wetlands will be restored on top of the new cap in the Panhandle Area, as well as in other portions of the Landfill, the East Adjacent Areas and the Shoreline Area. As we discussed, placing a wetland on top mounded waste (i.e., Landfill and East Adjacent Areas) is problematic. Proper landfill closure requires the minimization of the volume of water contained above the waste.
24. Appendix M (Evaluation of Groundwater Chemical Migration to the Aquatic Environment): Appendix M summarizes ten years or more of groundwater data for conventional, inorganic and organic substances present within tidally influenced shoreline wells. The report states that the actual concentrations in the Bay are not known, given the

unknown amount of attenuation and dilution that occurs within this zone. We do not grant dilution credits at the surface/groundwater interface because it can not be reliably estimated within the active tidal zone. As such, we require that surface water quality criteria be met at the furthest downgradient edge of a site. We believe that there exists sufficient data to show that there is a potential risk from the discharge of site groundwater and that this groundwater must be contained.

25. Appendix P (Cap Infiltration Evaluation): Appendix P2 estimates future landfill gas generation for the E-2 landfill at 6,000 – 35,000 SCFD. We request use of these data in the development of a remedial control option for landfill gas.
26. Appendix Q (Qualitative Slope Stability Evaluation): We request an explanation of:
 - a. How the cross-section for the static and pseudo-static analyses was chosen, and whether it represents the critical (or lowest factor of safety) case; and,
 - b. The source and composition of the fill material proposed for the toe-berm construction.
27. Appendix Q (Qualitative Slope Stability Evaluation): The analysis of the sand and silt underlying the proposed toe berm is based on a single boring log and cone penetrometer test (CPT) boring log. Figure 2, however, shows several additional CPT and boring locations. We request they be analyzed to see if they are consistent with the chosen data.
28. Please explain whether:
 - a. Translational slope failures along the proposed new liner were evaluated in addition to circular failures.
 - b. Short-term factors of safety during construction were calculated and found to be acceptable.
29. Appendix Q (Qualitative Slope Stability Evaluation): What is the seismic event or maximum probable earthquake (MPE) used to determine the peak accelerations in the pseudostatic analyses?
30. Appendix Q (Qualitative Slope Stability Evaluation): What is the seismic event or maximum probable earthquake (MPE) used to determine the peak accelerations in the pseudostatic analyses?
31. Appendix Q (Qualitative Slope Stability Evaluation): Please justify the factor of safety of 1.1 calculated for the revised static analysis with liquefaction. Typically, a minimum factor of safety of at least 1.5 is considered acceptable.
32. Appendix L (Screening Level Ecological Risk Assessment for Onshore Areas): It is unclear how the Protective Soil Concentrations (PSCs) were derived for any of the chemicals of ecological concern. Throughout Appendix L, I am referred to various

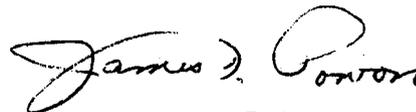
sections for an explanation, none of which provide one. Include a discussion on how PSCs were derived.

33. Section 1.2 of Appendix O: Section 1.2 concludes that the soil screening evaluation “confirms that existing soil within and adjacent to existing Parcel E-2 wetlands is not suitable to support additional wetland construction without some form of remedial action”. It also states that remedial alternatives “will address the soil contamination that makes the existing conditions unsuitable for wetlands construction”. It is not evident how this conclusion was reached since no sample data is provided. Provide tables and figures showing soil sample locations and results.
34. Appendix L, Section L.3.2.2: Cumulative risk is not evaluated “because of differences in the degree of conservatism in selecting PSCs for various chemicals”. It is difficult to evaluate this statement without knowing how the PSCs were derived. However, in my experience, screening criteria are often literature-derived values based on a variety of studies with different degrees of conservatism. The SLERA is the initial step in the risk assessment and should incorporate the most conservative assumptions. Therefore, cumulative risk should be evaluated at least initially, with further refinement of ecological risk at a later stage of the risk assessment. A discussion of the differences in degree of conservatism in selecting PSCs can be included in the Uncertainty Analysis.
35. Sections L3.3.1, L3.3.2 and L3.3.3: The information presented in these sections would be better summarized in a table.
36. Section L4.4: This section provides conclusions but no recommendations. Based on the results of the SLERA, a number of chemicals were identified to pose a potential threat to birds and mammals in all subareas of Parcel E-2. Provide recommendations on the next steps based on the SLERA results.
37. Appendix O, Section 1.1: Clarify if the confirmatory assessment conducted on April 2002 is the same as a jurisdictional determination. If not, the wetlands delineation conducted on December 2001 should be verified by the Corps.
38. Appendix O, Section 1.1: This section states that “an abundance and diversity of wintering and migrating waterfowl species is a potentially significant feature [at Parcel E-2 wetlands]; however, only red-winged blackbirds were observed to nest in the seasonal freshwater wetland”. Provide information on whether wildlife surveys were conducted (when and where) and the results (e.g. species observed, not just those species nesting).
39. Appendix O, Section 1.1: The last two paragraphs focus mainly on the low functions and values of wetlands at Parcel E-2. However, it should be included in this discussion that these wetlands likely serve an important role in sediment retention and water filtration of stormwater runoff. In other words, they filter out contaminants in sediment and stormwater runoff that would otherwise impact the Bay.

40. Appendix O, Section 1.2: In developing the wetland cover and foundation soil screening criteria, please also refer to the *Draft Staff Report Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines* (Water Board 2000). This document updates previous Water Board documents and contains updated information on ambient concentrations of contaminants in SF Bay sediments as well as updated biological effects concentrations (ER-Ls and ER-Ms).
41. Appendix O, Section 3.3.2: This section states that wetland mitigation will be at a 1:1 ratio, and if performed outside of Parcel E-2, "its timing would be independent of the remedial action at Parcel E-2 but would be dependent upon actions and activities at other portions of HPS". Typically, construction of mitigation wetlands is required concurrently with impacts to wetlands. If not, higher mitigation ratios are often required to compensate for temporal impacts. Because the existing wetlands serve an important function in sediment retention and water filtration, we would prefer that mitigation occur immediately at the time of impact, or otherwise at a higher ratio.
42. Appendix O, Section 3.3.3: If restoration occurs within Parcel E-2, mitigation wetlands will be constructed on top of the cap. One project, the Shell Refinery in Martinez, is used as an example of successful implementation of wetland restoration over a cap. Given the regulatory agencies' concerns over building mitigation wetlands on top of a cap designed to contain landfill waste, provide more details on the Shell Refinery project and its relevance to the current project.

We forward to working with you to resolve our comments.

Sincerely,



James D. Ponton, P.G.
Project Manger

cc:

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Water Board Comments on Parcel E2 RI/FS

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