

December 23, 2003

Mr. Thomas Macchiarella
Environmental Engineer
BRAC Department
1230 Columbia St.
San Diego, CA 92101-8571

Dear Mr. Macchiarella:

This letter contains the Alameda Reuse and Redevelopment Authority's (ARRA's) comments on the October 9, 2003 *Draft Groundwater Remedial Investigation/Feasibility Study Alameda Point Site 25 and Alameda Annex IR-02 Alameda, California*, prepared by EERG for the Navy.

The comments were prepared for the ARRA by Peter Russell, Ph.D., PE and are as follows:

1. Section 3.1.3, Paragraph 2, last Sentence: Since it (Marsh Crust FS) concluded that the Marsh Crust did not merit remedial action, it was ruled out as a possible groundwater contamination source in this report. (emphasis added) This sentence goes too far in implying that, even if the Marsh Crust FS had not concluded remedial action is merited, the Marsh Crust being a source of groundwater contamination is not possible. First, the FS cannot rightly have concluded that such a source is impossible, only improbable – one cannot prove the negative in this case. Second, the Marsh Crust Ordinance is a remedial action, and not an engineering remedy.
2. Section 4.2.4, Paragraph 2, Sentence 2: *...benzene concentrations are decreasing in the majority of plume locations....* Figures 4-6 through 4-16 omit important data, primarily from 2002 and 2003. The cited text should be reconsidered in light of the missing data. It appears to be incorrect. The reliance on the faulty data is propagated into the final three paragraphs of this section. The Mann-Kendall tests should be repeated, using all of the data, for all wells that are not clearly decreasing in benzene concentration. The next to the last paragraph of this section

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claims that the decrease in benzene concentrations is a *fact*. The conclusion that benzene concentrations have decreased is based on statistics and judgment, and is at most a probability, not a fact. The statement in the final paragraph of this section: *Figure 4-17 illustrates that benzene concentrations are decreasing at the outer edges of the plume...*, appears to be incorrect, especially at Monitoring Wells P181-MW46 and S-13.

3. Figure 4-17: Some of the plots on this figure (e.g., Monitoring Well P181-MW46) appear to disagree with the data in Table A-1. Additionally, because there are no benzene-free wells shown on this figure, it is unclear why the plume boundary contour is drawn through wells, rather than outside them. In the case of Monitoring Well S-13, there is some question as to whether the data support drawing any plume boundary, without querying the boundary line to indicate uncertainty.
4. Figures 4-19 and 4-20: At which location(s) were the data on these figures collected? These plots appear not to agree with the data in Table 4-1.
5. Section 4.2.6, 4th bullet: Contrary to the text of this bullet, the naphthalene concentrations in Monitoring Wells P181-MW45 and P181-MW46 appear not to be generally decreasing. These exceptions should be stated in the text.
6. Section 4.6, Paragraph 2, last Sentence: Neither of the sources (point-source discharges and contaminated fill materials) appears to be acting as an ongoing source responsible for plume expansion or contaminant concentration increases. This sentence goes too far in that it doesn't acknowledge a potential scenario where one or more sources still exist, but compensating processes (e.g., biodegradation) lessen the source's effect. This is important because the continued presence of the source renders natural attenuation and other remedies less effective than they would be without the sources.
7. Section 5.2, Paragraph 2: Dissolved oxygen concentrations are incorrectly stated in $\mu\text{g/L}$, rather than mg/L .
8. Section 5.5 and Figures 5-1 through 5-7: Most of these figures disagree with Figure 4-17 and Table A-1. Important data are omitted from the plots, and presumably from the curve-fitting regressions as well. Had the missing data been included, many of the curves would look appreciably different and the R^2 values would be larger. Section 5.5 and other sections of the FS referring to or relying on these figures should be revisited and changed as needed once the figures are corrected.
9. Section 5.6, Paragraph 4 and 5: These paragraphs rely heavily on Section 4.2.4 and Figures 5-1 through 5-7, all of which are incorrect as described above in Comments 2 and 8.

10. Section 5.6, Paragraph 8, Sentence 3: *However, comparing them (plume maps in this draft RI/FS with maps in an earlier report) indicates that the lateral extent of benzene plume has remained relatively consistent since 1996. Relatively consistent* compared to what? There are *relatively* substantial differences between the maps. Please include the earlier maps so readers can judge for themselves how consistent the lateral extent has been.
11. Section 5.6, Paragraph 9: Most of the statements made in this paragraph are speculative, primarily because the extent of the plume was unknown northwest of Monitoring Well P181-MW45 in 1994 and 1999, and east of Monitoring Well S-03 in 2001 and, was known to a lesser extent, in 1999. The presence of this uncertainty should be stated as a way of qualifying the paragraph's comparisons.
12. Section 5.6, Paragraph 12: The logic of this paragraph ignores the fact that the screened intervals of many of the wells extend below the fill and penetrate the Marsh Crust (EW-2, S-02, S-12, S-13, S-35, P181-MW-45 (S-45), P181-MW46 (S-46), and P181-S-47 (S-47)). Thus, these screened intervals intercept the zone, which based on sampling to date, is expected to have the highest benzene concentrations. Generally, the top of the Marsh Crust occurs within the 16'-20' below ground surface (bgs) depth interval, which is the interval sampled by the deeper Hydropunch pushes. However, this paragraph asserts that the shallower 12'-16' bgs Hydropunch pushes are more comparable to the monitoring well data, even though usually these shallow Hydropunch data are not representative of groundwater concentrations immediately above the fill/Marsh Crust interface, where benzene concentrations are greatest. Comparison of monitoring well data to shallow Hydropunch data is appropriate only for the eastern border of the plume. Otherwise, the deeper Hydropunch data should be used in the comparison. This hybrid comparison should be used to tailor the maps shown on Figures 5-8, 5-9 and 5-11. Interpretation of such comparisons should recognize that the greater screen intervals of the monitoring wells, which cause the wells to also sample the less benzene-contaminated groundwater farther above the fill/Marsh Crust interface, result in dilution that lowers the sample concentration.
13. Section 5.7: This summary must be revisited once the issues about the numerical and graphical comparisons have been resolved.
14. Section 5.8.1, Paragraph. 1: This section is founded on questionable conclusions in Sections 4 and 5. It may need to be revised after the issues about benzene plume concentration trends in the earlier sections are resolved. This same comment applies to Section 9.2.3 and Subsections Nature and Extent of Contamination and Summary of Applicability of MNA of Section 9.3.
15. Section 6., Paragraph 2, last Sentence: *The Hydropunch™ samples detected higher concentrations than have historically been detected in site monitoring wells, because the wells were screened across shallower depths.* This sentence would be more accurately revised to: *The Hydropunch™ samples detected higher*

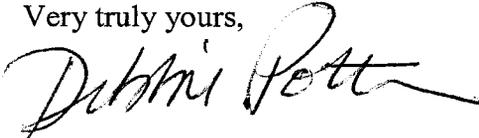
concentration than have historically been detected in site monitoring wells, because the wells' screened intervals often included shallower depths. See Comment 12 above.

16. Section 9., Paragraph 3, Alternative 3: *Biosparging has been included to evaluate an active remedial technology, which could reduce risk levels to allow use of the shallow groundwater as a potable water supply.* This sentence sets illusory expectations for biosparging. Natural attenuation, too, will eventually reduce risk levels compatible with use of the shallow groundwater as a potable water supply. Biosparging unquestionably accelerates that process, but decades will pass before risk levels consistent with such use are achieved by either alternative. The only support for this assertion is apparently the timeframes suggested by the decay rate analyses of Section 5.5, which are suspect because those analyses use censored data sets, which omit higher recent concentrations.
17. Section 9.3, Subsections **Alternative 2 Performance Criteria** and **Alternative 3 Performance Criteria**: These subsections fail to indicate whether meeting cleanup goals later than *the predicted cleanup timeframe* is acceptable or non-acceptable performance. In addition, the predicted cleanup timeframe will probably become much longer once the censored data are considered in Section 5.5.
18. Section 9.3, Subsection Summary of Applicability of MNA, Paragraph. 1: The third sentence of this paragraph includes *...the benzene plume has been shown to be stable and decreasing across the Site....* This draft RI/FS does not convincingly show this. Subsection Nature and Extent of Contamination, earlier in Section 9.3, states the thought more accurately: *...the benzene plume in the first water bearing zone (FWBZ) has been found to be relatively stable and is not migrating or expanding.* Both occurrences would be most accurately restated as: *the benzene plume in the first water bearing zone (FWBZ) appears to be relatively stable and appears not to be migrating or expanding.* This revision is necessary because of the uncertainties about the plume boundaries and concentration changes with time.
19. Section 9.3, Subsection MNA Components, first bullet and Table 9-2, first bullet: These two bullets disagree as to whether Alternative 2 proposes four or nine additional monitoring wells.
20. Table 9-2, bullet 3: It would be very helpful to expand this bullet to describe which hypotheses are to be tested.
21. Section 9.3.5: Although the statements in this section are true, the topic of the section is not addressed. This section should be expanded to discuss the short-term effectiveness of Alternative 2.

22. Section 9.4, Paragraph 6: This paragraph is currently written to recognize that air sparging would be acceptable in Zone 2, but does not state whether air sparging is part of Alternative 3. If air sparging is planned for Zone 2, then the alternative should explicitly include it in the alternative's initial formulation at the beginning of Section 9.

If you have any questions or need additional information, please call me or Dr. Russell at (415) 492-0540.

Very truly yours,

A handwritten signature in black ink that reads "Debbie Potter". The signature is written in a cursive, flowing style with a long horizontal stroke at the end.

Debbie Potter
Base Reuse and Redevelopment Manager

cc: Peter Russell, Ph.D., P.E.
Mike Quillin, ERM
Anna Marie Cook, EPA
Judy Huang, RWQCB
Henry Wong, DTSC
Marcia Liao, DTSC