M60050.001611
MCAS EL TORO
SSIC # 5090.3

M6005

STATE OF CALIFORNIA — ENVIRONMENTAL PROTECTION AGENCY

...E WILSON, Governor

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

Regi... 4
24... Broadway, Suite 425
Long... ach, CA 90802-4444

(310) 590-4858

RECEIVED
CODE 10
24 MAY 96 0448 Z

May 17, 1996

Mr. Joseph Joyce
BRAC Environmental Coordinator
U.S. Marine Corps Air Station - El Toro
P. O. Box 95001
Santa Ana, California 92709-5001

COMMENTS ON DRAFT PHASE II REMEDIAL INVESTIGATION REPORT FOR THE MAGAZINE ROAD LANDFILL, SITE 2, OPERABLE UNIT 2B, MARINE CORPS AIR STATION (MCAS) EL TORO

Dear Mr. Joyce:

The California Environmental Protection Agency (Cal/EPA) has completed the review of the above subject document dated March 13, 1996 received at our office on March 21, 1996, prepared by Bechtel National, Inc. The report presents the results of Remedial Investigation (RI) conducted at Site 2, the Magazine Road Landfill. Site 2 is one of two sites in Operable Unit 2B for the MCAS El Toro.

This letter is to transmit the enclosed Department of Toxic Substances Control comments, the Regional Water Quality Control Board comments dated May 15, 1996, and the California Integrated Waste Management Board comments dated April 30, 1996 on the report. The report is well written. A few clarifications and modifications are needed as outlined in the enclosed comments. Please incorporate the agreed upon comments, where appropriate, and send us a response to comments along with a revised document. Thank you for your cooperation. If you have any questions, please call me at (310) 590-4891.

Sincerely,

Tayseer Mahmoud
Remedial Project Manager
Base Closure Unit
Office of Military Facilities
Southern California Operations

Enclosures

cc: Ms. Bonnie Arthur
U. S. Environmental Protection Agency
Region IX
Hazardous Waste Management Division, H-9-2
75 Hawthorne Street
San Francisco, California 94105-3901

cc: Mr. Lawrence Vitale
Remedial Project Manager
California Regional Water Quality Control Board
Santa Ana Region
3737 Main Street, Suite 500
Riverside, California 92501-3339

Mr. Peter Janicki
California Integrated Waste Management Board
8800 Cal Center Drive
Sacramento, California 95826

Mr. Steven Sharp
County of Orange
Environmental Health Division
Solid Waste Local Enforcement Agency
2009 E. Edinger Avenue
Santa Ana, California 92705

Ms. Sherrill Beard
Engineering Geologist
Department of Toxic Substances Control
245 West Broadway, Suite 350
Long Beach, California 90802

Lt. Hope Katcharian
Director, Environmental Engineering Division (1AU)
Marine Corps Air Station-El Toro
P. O. Box 95001
Santa Ana, California 92709-5001

Mr. Tim Latas
Bechtel National, Inc.
401 West A street, Suite 1000
San Diego, California 92101-7905

Mr. Andy Piszkin
Remedial Project Manager
Naval Facilities Engineering Command
Southwest Division
Code 1831.AP
1220 Pacific Highway
San Diego, California 92132-5187

cc: Dr. Dante Tedaldi
Bechtel National, Inc.
401 West A street, Suite 1000
San Diego, California 92101- 7905

DEPARTMENT OF TOXIC SUBSTANCES CONTROL
Comments on
Draft Phase II Remedial Investigation Report For Site 2, OU-2B
Marine Corps Air Station-El Toro
Dated March 1996

GENERAL COMMENTS:

The report presents the results of the Remedial Investigation (RI) conducted at Site 2, the Magazine Road Landfill, to support decisions regarding the need for and scope for future remediation at the site. Data to support the landfill extent include visual mapping, surface geophysics, trenching (twelve trenches 8-180 feet long were completed to 2-9 feet deep), soil borings, topographic and base maps, aerial photograph review, and interviews with MCAS El Tor personnel. The report contains data and results from Phase II RI. In addition, the report presented previous investigations such as Phase I RI and Air SWAT. To determine the nature and extent of contamination, the report described the sampling activities performed in air, soil gas, soil, groundwater, sediment, surface water, and flora and fauna as follows:

Air Sampling: twenty-nine (29) air samples were collected during Phase II RI. Eleven (11) instantaneous surface samples 2-3 inches from the surface. Six (6) ambient air samples and twelve (12) isolation flux samples were taken. According to the fate and transport model, the low-level volatile organic compounds (VOC) emissions from the landfill surface are not impacting ambient air quality offsite.

Soil Gas: During Phase II RI 342 shallow soil gas samples were collected at 278 locations from depth 15 feet below ground surface (bgs). Several areas of total VOC concentrations exceeded the hot spot threshold of 300 ppmv.

Perimeter Gas Migration Sampling: Samples were collected at four sampling stations during the Air SWAT at depth of 6 feet bgs. Twenty (20) samples collected at six sampling stations during Phase II RI at 10, 25, and 40 feet bgs. Results from both the Air SWAT and the Phase II perimeter gas suggest that methane is not migrating beyond the landfill perimeter in excess of the federal standard of 5 percent (50,000 ppmv). Control of methane emissions in a limited area of the landfill would be necessary to bring the landfill into compliance with South Coast Air Quality Management District (SCAQMD) Rule 1150.2

Soil Sampling: During Phase I RI, 14 shallow soil samples from eight sampling locations (0-2 feet bgs) were taken. Fifteen (15) composite surface samples from 15 randomly selected locations (less than .5 feet bgs) were collected during Phase II RI. Low levels of VOCs, TPH, SVOCs, and Aroclor were detected in shallow soil. Metals detected were below background levels.

Sixteen (16) subsurface samples (greater than 10 feet bgs) were collected during Phase I RI from a soil boring and four Phase I monitoring well soil borings. Forty-four subsurface samples were collected during Phase II RI from eight monitoring well soil borings. Low levels of VOCs, SVOCs, pesticides, herbicides, and metals were detected. Herbicides were

detected at significant concentrations in one sample from a depth of 50 feet bgs.

Leachate: Based on groundwater contamination at Site 2, leachate from landfill has evidently impacted groundwater.

Groundwater: Groundwater contamination was identified at Site 2 during Phase I RI based on four sampling events collected from four monitoring wells. During Phase II RI, eight additional monitoring wells were installed to evaluate the horizontal and vertical extent of contamination. Hydropunch groundwater samples were collected from Phase II monitoring well locations. A total of 28 groundwater samples have been collected at Site 2. TCE maximum concentration of 91 µ/l was detected. SVOCs and metals were detected above the MCLs. SVOCs appear to be limited to the vicinity of monitoring wells 02NEW2, and 02_DGMW59.

Sediment: Fifteen (15) sediment samples were collected from six Phase I RI locations at depths of 0, 2, and 4 feet bgs. Three sediment samples were collected during Phase II RI. VOCs, SVOCs, pesticides, herbicides, and metals were detected at low concentrations. The highest TRPH concentration was 4,555 mg/kg at the stained area location 01_SA3.

Surface Water Drainage: Two drainages bound at Site 2 landfill, the Borrego Canyon Wash to the east and the west fork of Borrego Canyon Wash on the west. Surface water samples runoff were collected during storm events in 1993 from Phase I four locations. For Phase II RI, surface water samples were collected from three locations in 1996. VOCs, TPH, metals, and gross alpha/beta were detected in surface water samples during Phase I RI. The evaluation of whether the detected concentrations are significant will occur when the 1996 results are available and will be incorporated into the Final RI Report.

Surface Water Seep: During Phase II RI, samples were collected from two locations. VOCs, SVOCs, pesticides, and metals were detected.

Potential for further erosion of landfill by surface storm runoff with associated transport of debris and waste materials exist under the current conditions of the site.

Flora and Fauna: The Department reviewed the data in Appendix Q, Part III. Discounting duplicates and spikes: there were 15 plant samples collected for fixed based laboratory analysis of 70 organic, pesticide and herbicide chemicals along with 23 inorganic analytes; there were 11 mammalian samples collected for fixed based laboratory analysis of 53 organic, pesticide and herbicide chemicals along with 23 inorganic analytes.

The reference site had 15 plant samples for fixed based laboratory analysis of 68 organic, pesticide and herbicide chemicals along with 23 inorganic analytes; and there were 5 mammalian samples collected for fixed based laboratory analysis of 53 organic, pesticide and herbicide chemicals along with 23 inorganic analytes.

SPECIFIC COMMENTS:

1. **Executive Summary, Remedial Action Objectives**

   Add the following remedial action objective:

   - Containment monitoring and/or treatment for groundwater. This remedial action objective is listed under DQO #6 on Table 1-1.

2. **Executive Summary, Nature and Extent of Contamination, page ES-5**

   The Report concludes that gross alpha and beta activity in groundwater is a result of naturally occurring potassium in the area. Additionally, Section 4.6.4 - Gross Alpha and Gross Beta, reports gross alpha and gross beta values are a reflection of natural processes, providing no other explanation for MCL accedences. The text states, "The levels detected in groundwater samples collected up- and down gradient of Site 2 do not definitively indicate that the landfills have contributed to gross alpha and gross beta particle activity in groundwater." However, the distribution of reported gross alpha and gross beta particle activity does not necessarily indicate that the landfill is not a contributing factor. It is suggested to calculate a base-wide and/or site-specific background value for gross alpha and beta values before concluding elevated values in groundwater are resultant only from naturally occurring processes.

3. **Executive Summary, Potential Fate and Transport Mechanisms, page ES-6**

   The Report concludes that TCE and PCE contamination in groundwater appears to be derived from point sources in the landfill. This conclusion needs clarification. Include a discussion in Section 4 - Nature and Extent of Contamination, how the analytical and physical data collected during the Phase I and Phase II remedial investigation identifies multi-point sources in the landfill. Later in the document, but not in the executive summary, it is noted that these sources are most likely no longer present. This point should be restated in the executive summary if it supportable.

4. **Executive Summary, Human Health Risk Assessment, page ES-7, 4th paragraph**

   The values represent individual risk calculated under the USEPA and Cal-EPA methods respectively. Therefore, it is probably better to identify them as such and clarify that they do not represent a range.

5. **Section 1.1.1, Guidance and Agreement, Figure 1-3**

Revise Figure 1-3 to add the Remedial Design step before Remedial Action. Also, add Certification step after Operation and Maintenance.

Reference to Department of Health Services now being California Environmental Protection Agency (Cal/EPA) is not accurate. The correct reference is Department of Toxic Substances Control (DTSC). Both DTSC and California Regional Water Quality Control Board (RWQCB) are under the umbrella of CAL/EPA.

Rewrite the sentence regarding FAA signatory agencies as follows: "The BCT consists of representatives from SWDIV, U.S.EPA, and Cal/EPA (DTSC & RWQCB)."

6. **Section 1.1.2, Remedial Investigation Approach**

Reference to Cal/EPA should be changed to DTSC.

7. **Section 1.2.2.2, Recent Station Operations**

Revise the 1st sentence in the 2nd paragraph to read as follows: Currently, hazardous materials/wastes are managed under appropriate Federal, State, local, and DoN requirements.

Also, reference to on-Station RCRA-Interim-Status Storage Facility is not accurate because the term Interim-Status refers to temporary authorization until a final permit is received from the regulatory agencies. Please note that MCAS El Toro was issued a RCRA Hazardous Waste Storage Permit in August 1993. DTSC terminated the permit on March 8, 1996 after we accepted the closure certification for Building 673-T3. MCAS El Toro is allowed to store hazardous waste at generator accumulation areas for periods less than ninety (90) days.

8. **Section 2.7.4, Analytical Methods, page 2-29, Table 2-6**

The analyses biochemical oxygen demand and chemical oxygen demand were apparently not performed for the soil samples. This would be expected since these analyses are not used for solids such as dry soil. The total organic carbon measurement for soil should have been adequate. Confirm that these analyses were not performed or provide the data with interpretation.

9. **Section 2.9.5, Groundwater Sampling, page 2-41**

The text reports that dissolved oxygen measurements were recorded and presented in Appendix J. However, these data are not reported in Appendix J or anywhere else in the RI Report.

10. Section 3.1.4, Surface Water, page 3-5, Figure 3-2

Consider changing the descriptor from an active stream channel to an ephemeral stream channel.

11. Section 3.3, Regional Geology, Figure 3-4

Please show Site 2 on Figure 3-4.

12. Section 3.5.2, Regional Occurrence and Movement of Groundwater

Please change "...approximately 45 to 60 feet bgs in the foothills..." to "approximately 30 to 60 feet bgs in the foothills...." Recent water level measurements indicate depth to water in 02_UGMW25 is about 30 feet below the top of the well casing.

The discussion provides depth to groundwater below ground surface (bgs), however, groundwater contours elevations on Figure 3-8 are shown from mean sea level (MSL). Please clarify the text by providing the elevations of ground surfaces above MSL when reporting the distances below ground surface.

13. Section 3.7.1, Vegetation Communities, page 3-52, top line

"...(Section 6)..." should be ...(Section 7)....

14. Section 4, Nature and Extent of Contamination, page 4-1, 3rd paragraph, 2nd to last sentence

Consider adding clarification of the RI focus by including the following at the end of the sentence, "...[in the media surrounding the landfill] and defining the areal extent of the landfill."

15. Section 4, Nature and Extent of Contamination

Please include a table in Section 4 listing the analytical methods employed for soil and groundwater samples.

16. Section 4.1.3, Trenching, page 4-9

It came to DTSC's attention that medical waste was exposed during trenching at Site 2. Please indicate in the final report if medical waste was exposed while trenching.

17. Section 4.2.2, Integrated Surface Air Sampling, page 4-23,Table 4-4

The air flux data seem to conflict with other results and the text may benefit from a greater discussion of these trends. This comment uses methylene chloride as the example; however, the flux data for several other compounds also appear suspect.

The table indicates that methylene chloride was not detected during the Phase II work in the integrated surface air samples. However, the Phase II isolation flux chamber showed measurable levels of methylene chloride in three of the six locations examined. The ambient air samples and shallow soil gas for Phase II also showed that methylene chloride was not detected. It seems unusual that there would be a measurable flux of an analyte which was not found by any other technique, unless the sensitivity of the analyses were substantially different.

18. Section 4.4.1, Shallow Soil, page 4-55

The process for the selection of COPCs is inconsistent in the text and should be clarified.

The text states that "All organic compounds detected in shallow soil with concentrations that exceed U.S. EPA residential soil PRGs are considered COPCs." However, on page 4-1 and 4-2 and in Section 6 the text indicates that a very different process (yet consistent with USEPA guidance) was used to identify COPCs.

Later, on page 4-187, 5th paragraph, the text notes that the distribution of the COPCs defined by PRGs is provided on Figure 4-26 the presentation within this figure may be in conflict with the COPCs listed in the baseline human health risk assessment.

19. Section 4.4.2, Subsurface Soil, page 4-57, Table 4-12

This table and other similar tables (e.g., Tables 4-13 and 4-16) in the RI do not achieve consistency between the indicated and the apparent units of measure for some of the organic analytes. For example, in Table 4-12 TPH and metals are presented for each boring in units [apparently] equivalent to mg/kg and SVOC data are [apparently] in units of microgram/kg; yet the indicated unit for all of these analytes is microgram/kg. Either the unit indicator or the numeric values must be corrected. Additionally, the complementary comparison PRG column in the table is in units of mg/kg and this makes comparisons between units cumbersome. Regulatory standards, such as PRGs, should always show exceedences by flagging the value (italics, bolding, highlighting, etc.).

20. Section 4.4.2, Subsurface Soil, page 4-117, Table 4-18, footer

The note indicates that shaded rows contain analytes detected above the PRG but it is not clear if these analytes are COPCs as defined in the risk assessment or by some other means or if this table is in fact a screening mechanism to develop a list of COPCs. In addition, background levels are provided in the table, yet no comparisons are apparently made with these values. Please make the entries in this table

consistent with the risk assessment.

21. Section 4.6, Groundwater, page 4-125, Table 4-21

Include the most recent analytical data from the Site 5 upgradient monitoring well, 05_UGMW27, in Table 4-21 since data from this well is used to evaluate the nature and extent of contamination for Site 2.

The analyte trichloroethylene as a target analyte appears twice in separate rows. This appears to be an error in presentation and should be in one row.

22. Section 4.6, Groundwater, page 4-139, Table 4-21

Several general chemistry parameters are presented with MCLs in apparently incorrect units. Confirm and correct if necessary the units for chloride, fluoride, sulfate, and bicarbonate.

23. Section 4.6.1.2, Monitoring Well Groundwater Samples, page 4-168, Figure 4-18

Here and elsewhere, consider listing the date of the sampling event in addition to the non-specific marker - sampling event 1, 2, 3 or 4.

24. Section 4.6.1.2, Monitoring Well Groundwater Samples, Figure 4-23

Figure 4-23 is a cross section showing the vertical distribution of TCE in groundwater at Site 2. It appears that Section B-B' printed on the cross section is a typographical error. Also, quantify the VOCs in the groundwater.

25. Section 4.6.3, Metals, page 4-180, 2nd paragraph

The text should be corrected to read Table 4-25 and the stated value of 36 percent of the manganese detections as above the MCL should be checked. The table does not support such a percentage and it indicates that the MCL is 0.5 mg/L and the maximum detected level was 0.367 mg/L.

26. Section 4.6.4, Gross Alpha and Gross Beta, page 4-183

The discussion of gross alpha and gross beta activity seems to require further development. There is insufficient data presentation to assess the degree of counting error associated with the measurements and this fact combined with the limited overall data set for radionuclides makes it difficult to determine if a measurement of 6 pCi/L is significantly different from 26 pCi/L.

27. Section 4.6.4, Gross Alpha and Gross Beta, page 4-184, Figure 4-25

The figure is apparently a description of gross alpha activity measurements and does not include gross beta and thus, the title should be changed.

28. Section 4.6.5, General Chemistry, page 4-183

Further explanation discussing the processes why TDS decreases down gradient should be included in Section 4.6.5 (reported TDS concentrations for the up gradient monitoring wells 02New11 is 1000 mg/l and 02_UGMW25 is 1380 mg/l, yet the reported concentration for the down gradient monitoring well, 02NEW1 is 428 mg/l).

29. Section 5.1.1.2, Geology/Hydrology, page 5-2, last sentence on the page

The persistence and extent of groundwater flow velocities identified in the document require enhanced discussion and clarification.

The text on page 5-2 identifies flow velocities between 15 to 280 ft/year in groundwater beneath the landfill. Later in the document on page 5-24 the text identifies a velocity of 142 ft/year in the southwest of the site and a velocity of 210 ft/year at the southwestern edge and west of the site. Later, the text notes that the velocity in the western and southwestern area was calculated at 12 ft/year. The extent of these vastly different flow velocity zones should be clarified. This point is significant because the flow and contaminant modeling work included in this report are dependent upon these values.

30. Section 5.1.2.4, Surface Water and Sediment

The 1st paragraph indicates that additional surface water samples will be collected when flow occurs in Site 2 drainage. Please provide approximate dates when the samples will be collected. Also, how will the data be reported to the agencies? Please note that Sections 4.8 and 4.9 indicate that Phase II surface water samples were collected.

31. Section 5.2.1.1, Physicochemical Parameters, page 5-11

The text identifies an average on-site value for total organic carbon as 137 mg/kg; however, there are no data referenced to support this value and the depth and type of material (e.g., clay or silty sand) to which this value applies are not noted.

32. Section 5.2.1.3, VOCS, page 5-15, Table 5-3

The authors should consider the anaerobic biodegradation half-life research conducted by the CLEAN I OU-1 IAFS team. Their research apparently concluded that the VOC biodegradation half-life is about 10 years and thus, significantly greater than the values listed in this table.

33. Section 5.2.1.3, VOCS, page 5-16, Figure 5-4

The order of preference for each degradation pathway should be identified as well as the relative rates (persistence). That is, is trans-1,2,DCE the preferential pathway and is the rate relatively fast until vinyl chloride is formed and then the rate of degradation of vinyl chloride is relatively slow?

34. **Section 5.2.1.5, Metals, page 5-17**

The statement regarding the altering of the "...chemical (valence) state..." of anthropogenic chemicals should be clarified. It is not clear what the meaning of this statement is. Neither is the intent of the statement that supersaturated metals may precipitate out of solution to form "...sediments..." It seems unlikely that the authors intended to use the word sediments.

35. **Section 5.2.1.5, Metals, page 5-17**

It appears that the authors believe that the landfill is under anaerobic or anoxic conditions and thus the reduction processes occurring are releasing free manganese and iron to solution. This seems to be supported by the groundwater data; however, the necessary interpretation and discussion is missing from the text. In addition, it appears that the authors did not intend to limit biodegradation to PAHs and the text should probably be changed to read "...organics..." in place of "...PAH compounds..."

These statements may be supported or refuted by the presentation of dissolved oxygen data from the wells screened near the landfill and within the main part of the VOC plume. Since these dissolved oxygen values are absent from the report, it is not possible to finalize the assessment at this time.

36. **Section 5.3, Contaminant Migration, page 5-18**

The text notes that the significance of the impact from VOCs will decrease as the source mass decreases. The subsequent modeling for groundwater was conducted with no source term so the meaning of the statement is unclear. Do the authors mean that there are continuing VOC sources in the soil, in the groundwater pore paces, or elsewhere?

37. **Section 5.3.2, Groundwater Transport, page 5-24**

The authors may want to consider a semiquantitative assessment of the potential for the presence of DNAPL similar to that provided in the CLEAN I OU-1 RI Report and CLEAN II Site 24 RI Report. Such an evaluation would provide additional support for their position regarding the absence of a continuing source.

38. **Section 5.3.2, Groundwater Transport, page 5-24**

The issue of concern here is that the mathematical modeling does not accurately reflect the site-specific conditions and may be conflict with the conceptual model presented within this section.

The text identifies a velocity of 142 ft/year in the southwest of the site and a velocity of 210 ft/year at the southwestern edge and west of the site. Later, seemingly in conflict with this statement the text then notes that the velocity in the western and southwestern area was calculated at 12 ft/year. Apparently this low velocity is for

the bedrock zone where the highest TCE level was detected in 02_DGMW60. The order of magnitude difference in velocities is due to the fact that the other values are representative of the faster moving flow through the alluvium above the bedrock.

On page 5-25 the authors note that their conceptual model is as follows: "Movement of the VOC contaminant plume through this area [12 ft/yr] is slow. However, in areas adjacent to this low-velocity zone, flow rates are as high as 210 ft/yr. As contaminants enter the region of higher-flow velocities (and a higher flux), they are diluted and dispersed rapidly down gradient to concentrations below regulatory criteria." While the distance "...down gradient..." at which this dilution becomes most evident is not stated, it can be inferred that it is not far from the current detected high of TCE. This being the case, the conceptual model is not supported by the mathematical modeling predictions which follow directly within this section of the RI. Inspection of the modeling results clearly indicates that the dilution phenomenon theorized above is of lesser significance that suspected and the plume will move several thousand feet away from its current location at levels in excess of MCLs over the next 30 years.

It appears that the pivotal assumption of the conceptual model is based on a single step drawdown test result (Phase II at 02_DGMW60 and k=0.0636 ft/day); however, no other measured bedrock hydraulic conductivities were close to this value. Consider that 02NEW2 had a k=1.24 ft/day and Phase I measured k=0.38 ft/day in 02_DGMW60 and 0.52 ft/day in 02_DGMW61. The authors should consider a reexamination of this situation, decide which model is preferred, and then fully explain their rationale for their conclusion.

39. **Appendix R, page R-6**

The authors note that the model was calibrated to hydraulic conductivity values between 1 and 4 ft/day; whereas, the actual values ranged between 0.06 and 4.7 ft/day. The difference between 0.06 and 1 ft/day is large enough to require greater scrutiny. Additionally, the model was adjusted for three zones of hydraulic conductivity; 4 ft/day, 2 ft/day, and 1 ft/day blocks. This approach does not compensate for the apparently very localized, yet significant area of low flow velocities near 02_DGMW60.

40. **Section 7.2.2.4, VOCS in Groundwater, page 5-26 and 5-27, Figures 5-5 and 5-6**

As noted previously, the modeling predictions are not supportive of the conceptual model which hypothesizes that the concentrations away from the current plume center should be rapidly diluted to levels below MCLs. In addition, the figures include a curious smearing effect along the northern no-flow boundary. This may be an artifact of the modeling mathematics and should be explained since it seems to imply that something, whether it be a pumping well, a low flow condition or something else, is restricting the transport of the VOCs along this barrier. The concentration contour values are not readable on Figure 5-6 and the

contours themselves are entirely absent from Figure 5-6b.

41. **Appendix R, page R-6**

The text indicates that the simulated flow field is in good agreement with the observed data. However, the presentation of the observed heads with the predicted heads is not provided so it is not possible to assess the accuracy of the statement.

42. **Section 5.4, Summary of Fate and Transport, page 5-30**

This summary reiterates the hydrogeologic conceptual model and neglects to account for the conflicting mathematical modeling results and thus the text should be reconsidered. Also, the issue of intermedia transfer should be addressed to a much greater degree within this and preceding subsection. The fact that groundwater is continually rising and falling and thus creating varying redox conditions within the landfill as well as possibly mobilizing readily soluble materials should receive more attention. The implications of these effects can be significant when considering final remedial actions needed for contaminant control.

43. **Section 6, Human-Health Risk Assessment, page 6-1**

Please make the selection of COPCs in both the Human-Health Risk Assessment and Ecological Risk Assessment consistent with Section 4, Nature and Extent of Contamination.

44. **Section 6.1.2, COPCs in Soil and Sediment, page 6-6**

The text notes that there are no background results for PAHs; however, CLEAN II under CTO-065 recently completed a PAH background study. If possible, these data should be considered as part of this assessment if they apply. See also Note C of Table 6-2 on page 6-17 and the second full sentence on page 6-19.

45. **Appendix G, Figure G-1**

The text associated with this figure does not include an adequate discussion of the flow chart items which extend out past the "yes" following the "Proportion of Non-Detect Data ≥15%." Include an explanation why an adjustment to the mean and standard deviation would be required and how it would be done. In addition, explain why an adjustment is only required for data sets with percentage non-detects ≥15 percent but ≤ 50 percent.

Pages G-4 through G-19 are missing.

46. **Appendix T, Ecological Risk Assessment, page T-14, Table T-11**

A 95 percent UCL is presented in the table for what is apparently (though not labeled as such) the surface concentrations; however, no complementary UCL is provided for the subsurface soil. Maximum and minimum and other basic statistics are provided; however, the data set (surface or subsurface) to which they apply is not indicated.

47. Appendix T, Ecological Risk Assessment, pages T-15 andT-16, Table T-11

The number of samples 'N' should be mentioned for each analyte.

48. Section 7.2.2.4, Exposure Pathways of Concern, page 7-8, 4th sentence

Please check the meaning of the sentence. Instead of "devoid of vegetation" the sentence probably should say "presence of vegetation."

49. Section 6 and Section 7, Human-Health Risk Assessment and Ecological Risk Assessment

For additional comments, please see attached Memorandum dated May 14, 1996 from DTSC staff Toxicologist, Dr. John Christopher.

50. Section 8.1.2, Nature and Extent of Contamination

One page 8-15 the 5th bullet item provides a general statement that sediment samples contained TRPH, TPH as gasoline, and MCPP, arsenic, and beryllium which exceed PRG's . . . etc. The statement may not be entirely true. Please rewrite that statement to specify which constituents were exceed.

51. Section 8.2.2, Recommended Remedial Action Objectives

See specific comment #1 regarding containment monitoring and/or treatment for groundwater.

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY PETE WILSON, Governor
DEPARTMENT OF TOXIC SUBSTANCES CONTROL
301 Capitol Mall, 3rd Floor
Sacramento, CA 95814
Mail: P. O. Box 806
Sacramento, CA 95812-0806
Voice: (916) 327-2491
Fax: (916) 327-2509

MEMORANDUM

TO: Tayseer Mahmoud
Office of Military Facilities (OMF)
Region 4, Long Beach

FROM: John P. Christopher, Ph.D., D.A.B.T.
Staff Toxicologist
Office of Scientific Affairs (OSA)
Human and Ecological Risk Section (HERS)

DATE: 14 May 1996

SUBJECT: MCAS El Toro: Site 2
PCA: 14740 Site: 400055-45

Background

Region 4 OMF has asked OSA for continuing support on issues regarding risk assessment at Marine Corps Air Station (MCAS) El Toro. This is a closing base in Orange County which is also designated a Federal Superfund site. Remedial activities at this base are being directed by Naval Facilities Engineering Command, Southwest Division (SWDIV). Site 2 is a landfill in the northern portion of the base. It has significant ecological resources both on the sites and close by. Under the current reuse plan, future development for residential use could occur nearby.

Document Reviewed

We reviewed "Draft Remedial Investigation Report, Operable Unit 2B, Site 2, Marine Corps Air Station El Toro, California". This document, dated March 1996, was prepared by Bechtel National, Inc., contractors to SWDIV.

Scope of Review

The document was reviewed for scientific content. Minor grammatical or typographical errors that do not affect the interpretation have not been noted. However, these should be corrected in any future version of the document. We assume that

sampling of environmental media, analytical chemistry data, and quality assurance procedures have been examined by regional personnel. If inadequacies in this regard for the purposes of risk assessment were encountered, they are noted. Any future changes or additions to the document should be clearly identified.

General Comments

1. **Overall Impression:** The risk assessments of human and ecological health are quite thorough but not always clear. OSA disagrees with some of the methods used. Several clarifications are required. The document can be made acceptable with respect to risk assessment upon adequate responses to the comments below.

2. **Ambient Concentrations of Metals:** The Navy used the maximum value detected in the set of background values for metals in soil, which might have led to inappropriate elimination of cadmium as an inorganic constituents of concern. The Navy's analysis of their set of background values for soil is incomplete.

3. **Human Health Risk Assessment:** The assessment is quite thorough and well written, but we believe the Navy has overestimated risks for the site. Potential exposures to organic chemicals were estimated using the maximum value detected instead of the recommended 95% upper confidence on the mean. Dermal intakes might have been overestimated.

4. **Ecological Risk Assessment:** We cannot accept the Navy's conclusions regarding non-human receptors because of questions about the methods used. Exposure point concentrations did not match those used to assess human health. The derivation of the toxicity criteria was not clear.

Specific Comments

1. **Ambient Concentrations of Metals, Appendix G:** OSA does not approve of the use of upper tolerance limit (UTL) for estimating quantiles of distributions of ambient concentrations of metals, as described on page G-2. The UTL, which is an upper bound on a quantile, can yield an inflated estimate when the sample size is small. For this reason, we recommend using a simple estimate of the quantile, provided the raw or transformed data can reliably be fitted to a normal distribution. If metals are selected as chemicals of potential concern with this procedure but these metals are actually present within the range of background, subsequent levels of decision in the process, i.e. risk assessment and risk management, can be used to correct inequities.

In fact, the method used for selection of inorganic constituents of concern was to compare the highest value detected (C_{MAX}) at the site to the highest detected value among 43 samples judgmentally determined not to have been impacted by site-related activities. OSA does not agree the use C_{MAX} for this purpose for two reasons. First, chemical analysis samples might reveal anthropogenic impacts where none were thought to occur. Second, simple statistical methods, such as plotting cumulative probability, are readily available to determine whether C_{MAX} is a reasonable estimator. These simple methods have been employed successfully at several other Navy bases in California.

Table G-4 presents the summary statistics for ambient metal concentrations. The column labeled "Calculated UTL Value" contains the value for C_{MAX} for 11 of 23 metals, which would seem to make "UTL" a misnomer. With the exception of cadmium, the values shown in this column are similar to values we have seen to represent the upper range of ambient conditions for other military bases in Orange County. The value for cadmium is extremely high; C_{MAX} for cadmium was perhaps one order of magnitude higher than we would have expected. We are accustomed to seeing the 95th quantile for cadmium between 1 and 2 mg/kg. The use of 11.4 mg/kg could have led to inappropriate exclusion of cadmium as a chemical of concern. The Navy should present a detailed analysis of ambient cadmium concentrations.

2. **Chemicals of Potential Concern (COPC) in Water, Secs. 6.1.3-6.1.4, Tables SI-2 and SI-3:** Values for selenium and chromium in the upgradient well are surprisingly high. Please explain this. It seems possible that these metals might have been inappropriately eliminated as COPC.

3. **Exposure Point Concentration (EPC), Sec. 6.2.3, p. G-11, p. S-1, Table SI-1:** A potential problem arises when C_{MAX} is used as the EPC. The rules described on page S-1 for selecting EPC seem reasonable, especially if high detection limits or very low frequencies of detection are encountered, because these conditions make estimates of the mean uncertain or artificially inflated. However, in Table SI-1 for Site 2, C_{MAX} is selected as the EPC for all 41 detected organic chemicals, even though detection limits are acceptably low for nearly every chemical. Surely, something is wrong with such a method. The Navy and the agencies should meet to arrive at a consensus on this subject.

4. **Dermal Absorption Factor, Table SII-1:** Department guidance allows a default value of 10% (1E-01) for dermal absorption of organic chemicals. However, on the first two pages of this table, the exponent for the dermal absorption factor is shown as 1E-00. Does the Navy mean to imply that these organic chemicals are

absorbed to the extent of 100% through the skin? For endosulfan I and endrin aldehyde, the value shown is 5E-00. Surely, this is an error. Please check to see which value was used in the risk assessment. It seems possible that dermal intakes might have been overestimated. In view of the rather striking contribution of the total hazard at this site estimated for the herbicide MCPP via the dermal route, we strongly urge the Navy to verify that reasonable values were used for estimation of dermal intakes.

5. **Risk Characterization, Sec. 6.4, pp. 6-16 ff.:** Figures 6-2 through 6-7 are particularly well done; contributions to risk and hazard by pathway and chemical are clearly and dramatically shown for each receptor group. In section 6.4.2.1, please use scientific notation for numbers with many zeroes to the right of the decimal.

   The factors enumerated in comments 3 and 4 suggest that the Navy has overestimated risk and hazard at Site 2. Therefore, we do not disagree with the Navy's conclusions regarding human health risk.

6. **Uncertainty in the Exposure Assessment, Sec. 6.5.2, p. 6-29:** Somewhere in this section, the Navy should present a discussion of how the use of C_{MAX} as the exposure point concentration might have overestimated risk or hazard.

7. **Chemicals of Potential Ecological Concern (COPEC), Sec. 7.2.2.3, p. 7-6, Table 7-1, Sec. T1.1, p. T-2:** We note that the following metals were selected as COPEC (Table 7-1) but were deselected as COPC for human health after comparison with background (Table SI-1): aluminum, arsenic, barium, cadmium, cobalt, selenium, thallium, vanadium, and zinc. Departmental guidance on ecological risk assessment, cited in the Navy's report, does present a discussion on why COPC do not necessarily have to match COPEC. However, comparison with background should yield identical lists of metals. Treatment of background concentrations of metals continues to be a problem; the Navy, the Department, and USEPA must resolve this confusion and controversy.

8. **Intake Factors, Table 7-3:** This table would be easier to read if scientific notation were used.

9. **Assessment Endpoints, Table 7-4:** For carnivores and raptors, the principal exposure is via prey items. Therefore, the information in the right-hand column should describe food chain modeling, bioconcentration, etc. Toxicity to the predator via direct contact is not likely to be relevant and toxicity to food items via direct contact should be covered in assessments of those trophic levels.

10. **EPC, Sec. T.1.4, p. T-4, Table T-11:** The very useful discussion of the rules for determining EPC is much more detailed than that presented in Section 6.2.3 for human health. Please state that EPCs used for Site 2 are shown in Table T-11. Many EPCs for soil shown in Table T-11 differ from entries Table SI-1 for the same chemical. This is extremely confusing. Why are EPCs for metals in surface soil used for ecological risk uniformly lower than those used for human health? Why aren't entries for EPC the same in the two tables for DDE and Aroclor 1260? Why do heptachlor epoxide and methoxychlor appear as detected chemicals in Table T-11 but not in Table SI-1? Under the heading "Distribution" in Table T-11, does "neither" mean the same as "nonparametric" in Table SI-1?

11. **Toxicity Benchmark Values. Secs. T.1.4, T.4.4, Tables T-4 and T-17:** We are unable to decipher how the toxicity screening criteria and toxicity benchmark values were derived and how they are used. What is the column labeled "Dose" in Table T-4? Is this an administered dose from a laboratory study? If so, what is the literature reference for the study? Is a "Modifier" the same as an uncertainty factor? How does one link the values in Table T-4 to those in Table T-17? If an allometric extrapolation was performed, what values were used for body weights and where did they come from? The text in Section T.3.2, "Body Size Scaling", is not adequate to reproduce the derivation. Please present tables with complete derivations of these toxicity criteria. The same comment applies to Table T-9 and toxicity criteria for plants and invertebrates.

12. **Risk Characterization, 7.5, Table T-16:** The Navy claims that a comparison of hazard indices, chemical by chemical and species by species, for Site 2 versus the reference area yields no differences greater than an order of magnitude. The construction of Table T-16 made such comparisons very cumbersome. Please construct tables with data from the site and the reference area juxtaposed for each species, e.g. one table for each species or two species per table at most. Also, please present summed hazard indices for each indicator species.

    The Navy seems interested in basing its interpretation of the ecological assessment on the number and magnitude of hazard quotients which exceed those seen for the reference area. If this is the case, it would be useful to create a summary table with all the hazard indices, by chemical and species, which exceed the reference area. This table should contain some representation of the degree to which the value in the reference area was exceeded.

13. **Ecological Significance, Sec. 7.5.2, p. 7-21:** We cannot agree with the Navy's interpretation of the results of the ecological assessment, because we are unsure of the COPEC, the EPC, and the toxicity criteria.

Conclusions and Recommendations

1. The Navy should complete its analysis of the 43 samples designated as background, especially for cadmium. Such analysis should include plots of cumulative probability. If additional data are required to resolve ambiguities for one or more metals, the data base may be expanded to include samples from other locations on the base. Such an expansion need not be limited to Site 2; it could include data from all the sites investigated in Operable Units 2 and 3.

2. The Navy has probably overestimated risks to human health by choosing the maximum value detected to represent exposure. The Navy should propose a method more in keeping with the concept of the "reasonable maximum exposure". We are unsure whether dermal intakes have calculated correctly.

3. The ecological risk assessment can probably be made acceptable upon clarification of how exposure point concentrations were selected, how toxicity criteria for non-human receptors were derived, and by presenting the risk characterization in a more intelligible format.

Reviewer: Michael J. Wade, Ph.D., D.A.B.T.
Senior Toxicologist, HERS

cc: Mr. J. Paull, USEPA Region IX
Dr. C. Callahan, USEPA Region IX

State of California

Memorandum

To: Mr. Tayseer Mahmoud
Department of Toxic Substances Control
245 West Broadway, Suite 350
Long Beach, CA 90802-4444

Date: May 15, 1996

From: CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD - SANTA ANA REGION
2010 IOWA AVENUE, SUITE 100, RIVERSIDE, CALIFORNIA 92507-2409
Telephone: CALNET 532-4130 Public (909) 782-4130

Subject: DRAFT REMEDIAL INVESTIGATION REPORTS, LANDFILL SITES 2 AND 17, EL TORO MARINE CORPS AIR STATION

We have reviewed the subject reports dated March 13, 1996 and recieved by us on March 21, 1996. Based on the data in the reports, we have the following comments:

A. For Site 2

1. Provide a Chapter 15 closure cap for the landfill (Section 2581, Division 3, Title 23, CCRs) to minimize water infiltration and to eliminate the discharge of waste to waters of the state. In accordance with Section 2581, a two-foot foundation layer, a one-foot 10-7 cm/s low permeability layer, and a two-foot vegetative layer are required for the cap. Closure and postclosure maintenance plans are required and need to be submitted for our approval. For closure requirements, please see Section 2580. A copy is attached for your information.

2. Install a gas extraction and collection system to eliminate gas migration to the groundwater and gas emission to the atmosphere. Install gas monitoring probes to detect any gas migration to the atmosphere. For landfill gas related issues, the California Integrated Waste Board and the SCAQMD should be contacted. Findings: Hot spots of soil gas are sporadic across the central portion of the landfill and consist primarily of Freon 12; volatilization of landfill gases will occur.

3. Submit a Report of Waste Discharge (ROWD) for an Evaluation Monitoring Program (EMP) for the site. The ROWD shall consist of Form 200 and shall include the information required under Section 2550.3(k)(5) for the proposed EMP. The purpose of the EMP is to assess the nature and extent of the release from the landfill in the groundwater. After the EMP is completed, the MCAS El Toro shall submit an engineering feasibility study, proposing groundwater remediation alternatives, and a workplan for Corrective Action Program (CAP).

Findings: The presence of TCE, PCE, other VOCs, metals, and general water quality parameters indicate that the landfill has leached to groundwater and these contaminants have been transported by groundwater to off-site locations. The extent of the landfill boundary was defined; however, the extent of contamination off the site has not been defined.

4. Institute a surface water monitoring program. Monitor the surface water (Borrengo Canyon Wash) for metals, VOCs, and general minerals. Quarterly or semi-annual monitoring is recommended. Findings: At Site 2, VOCs and high levels of metals were found in the surface water. At Site 17, large pieces of landfill debris were found in the drainage; no surface water sampling was conducted.

B. For Site 17

Recommendations for Site 17 are essentially the same as those for Site 2 except that a gas monitoring program should be instituted. A gas extraction and collection may not be needed because only soil gas with low concentrations of VOCs and methane below the regulatory thresholds were found. VOCs were found in the groundwater but below USEPA's MCLs.

If you have any questions, please call me at (909) 782-4998.

Sincerely,

Lawrence Vitale

Lawrence Vitale
DoD Section

Article 3. Closure and Post-Closure Maintenance

§ 2580. General Closure Requirements.

(a) Partial or final closure of new and existing classified waste management units shall be in compliance with the provisions of this article. If a unit has been partially closed in accordance with an approved closure plan by the effective date of these regulations, the cover over the closed portion does not need to be modified to conform to these regulations, unless monitoring data indicate impairment of beneficial uses of ground water. Classified waste management units shall be closed according to an approved closure and post-closure maintenance plan which provides for continued compliance with the applicable standards for waste containment and precipitation and drainage controls in Article 4 of this subchapter, and the monitoring program requirements in Article 5 of this subchapter, throughout the closure and post-closure maintenance period. The post-closure maintenance period shall extend as long as the wastes pose a threat to water quality. For land treatment facilities, the post-closure maintenance period shall extend until treatment is complete.

(b) Closure shall be under the direct supervision of a registered civil engineer or a certified engineering geologist.

(c) Class II waste management units and Class III landfills shall be closed in accordance with one of the following options:

(1) landfill: pursuant to Section 2581 of this article;

(2) surface impoundment: pursuant to Section 2582 of this article; (3) waste pile: pursuant to Section 2583 of this article; or

(4) land treatment: pursuant to Section 2584 of this article.

(d) Closed waste management units shall be provided with at least two permanent monuments installed by a licensed land surveyor or a registered civil engineer, from which the location and elevation of wastes, containment structures, and monitoring facilities can be determined throughout the post-closure maintenance period.

(e) Vegetation for closed waste management units shall be selected to require minimum irrigation and maintenance, and shall not impair the integrity of containment structures including the final cover.

(f) The regional board shall require the discharger to establish an irrevocable closure fund or provide other means to ensure closure and post-closure maintenance of each classified waste management unit in accordance with an approved plan.

Note: Authority cited: Section 1058, Water Code. Reference: Section 13172, Water Code.

§ 2581. Landfill Closure Requirements.

(a) Final Cover requirements:

(1) Closed landfills shall be provided with not less than two feet of appropriate materials as a foundation layer for the final cover. These materials may be soil, contaminated soil, incinerator ash, or other waste materials, provided that such materials have appropriate engineering properties to be used for a foundation layer. The foundation layer shall be compacted to the maximum density obtainable at optimum moisture content using methods that are in accordance with accepted civil engineering practice. A lesser thickness may be allowed for waste management units if the regional board finds that differential settlement of waste, and ultimate land use will not affect the structural integrity of the final cover.

(2) Closed landfills shall be provided with not less than one foot of soil containing no waste or leachate, placed on top of the foundation layer and compacted to attain a permeability of either 1×10^{-6} cm/sec or less, or equal to the permeability of any bottom liner system or underlying natural geologic materials, whichever is less. Permeability determinations for cover materials shall be as specified in Article 4 of this subchapter and shall be appended to the closure and maintenance report.

(3) Closed landfills shall be provided with not less than one foot of soil, containing no waste or leachate, placed on top of the material described in subsection (a)(2) of this section; the rooting depth of any vegetation planted on the cover shall not exceed the depth to the material described in subsection (a)(2) of this section.

(4) The cover shall be designed and constructed to function with the minimum maintenance possible.

(b) Grading requirements:

(1) Closed landfills shall be graded and maintained to prevent ponding and to provide slopes of at least three percent. Lesser slopes may be allowed if an effective system is provided for diverting surface drainage from covered wastes.

(2) Areas with slopes greater than ten percent, surface drainage courses, and areas subject to erosion by water and wind shall be protected or designed and constructed to prevent such erosion.

(c) Throughout the post-closure maintenance period, the discharger shall:

(1) maintain the structural integrity and effectiveness of all containment structures, and maintain the final cover as necessary to correct the effects of settlement or other adverse factors;

(2) continue to operate the leachate collection and removal system as long as leachate is generated and detected;

(3) maintain monitoring systems and monitor the ground water, surface water, and the unsaturated zone in accordance with applicable requirements of Article 5 of this subchapter;

(4) prevent erosion and related damage of the final cover due to drainage; and

(5) protect and maintain surveyed monuments.

Note: Authority cited: Section 1058, Water Code. Reference: Section 13172, Water Code.

§ 2582. Surface Impoundment Closure Requirements.

(a) All free liquid remaining in a surface impoundment at the time of closure shall be removed and discharged at an approved waste management unit. All residual liquid shall be treated to eliminate free liquid.

(b) Following removal and treatment of liquid waste, impoundments shall be closed in one of two ways, as approved by the regional board:

(1) All residual wastes, including sludges, precipitates, settled solids, and liner materials contaminated by wastes, shall be completely removed from the impoundment and discharged to an approved waste management unit. Remaining containment features shall be inspected for contamination and, if not contaminated, may be dismantled. Any natural geologic materials beneath or adjacent to the closed impoundment that have been contaminated shall be removed for disposal at an appropriate waste management unit. If, after reasonable attempts to remove such con-

taminated materials, the discharger demonstrates that removal of all remaining contamination is infeasible, the waste management unit shall be closed as a landfill pursuant to Section 2581 of this article.

(2) All residual wastes, including sludges, precipitates, settled solids, and liner materials, shall be compacted, and the waste management unit shall be closed as a landfill pursuant to Section 2581 of this article, provided that the closed waste management unit meets applicable standards for landfill waste management units in Articles 3 and 4 of this subchapter, and further provided that the moisture content of residual wastes, including sludges, does not exceed the moisture-holding capacity of the waste either before or after closures. Surface impoundments which contain only decomposable wastes at closure may be closed as land treatment facilities under Subsections 2584(a)(2), (3), and (4) of this article.

NOTE: Authority cited: Section 1058, Water Code. Reference: Sections 13260 and 13263, Water Code.

HISTORY

1. Change without regulatory effect of NOTE filed 4-6-88; operative 4-6-88 (Register 88, No. 17).

§ 2583. Waste Pile Closure Requirements.

(a) Waste piles shall be closed in one of two ways, as approved by the regional board:

(1) All waste materials and any components of the containment system which are contaminated by wastes shall be removed from the waste pile and discharged to an appropriate waste management unit. Remaining containment features shall be inspected for contamination and, if not contaminated, may be dismantled. Any soil or other materials beneath the closed waste pile that have been contaminated shall be removed for disposal at an appropriate waste management unit. If, after reasonable attempts to remove such contaminated materials, the discharger demonstrates that removal of all remaining contamination is infeasible, the waste management unit shall be closed as a landfill pursuant to Section 2581 of this article.

(2) A waste pile may be compacted, covered, and closed as a landfill under Section 2581 of this article, provided that the closed waste management unit meets applicable standards for landfill waste management units in Articles 3 and 4 of this subchapter, or contains only dry waste and was not required to have a leachate collection and removal system under Section 2543(a) of this subchapter. Waste piles which contain only decomposable wastes may be closed as a land treatment facility under Subsections 2584(a)(2), (3), and (4) of this article.

NOTE: Authority cited: Section 1058, Water Code. Reference: Section 13172, Water Code.

§ 2584. Land Treatment Facility Closure Requirements.

(a) During the closure and post-closure period, the discharger shall:

(1) continue all operations necessary to maximize degradation, transformation, or immobilization of waste constituents within the treatment zone.

(2) continue all ground water and unsaturated zone monitoring in compliance with Article 5 of this subchapter.

(3) continue all operations in the treatment zone to prevent runoff of waste constituents.

(4) maintain the precipitation and drainage control systems.

NOTE: Authority cited: Section 1058, Water Code. Reference: Section 13172, Water Code.

APR 30 1996

Cal/EPA

California Environmental Protection Agency

Integrated Waste Management Board

3800 Cal Center Dr.
Sacramento CA 95826
(916) 255-2200

Pete Wilson
Governor

James M. Strock
Secretary for Environmental Protection

Mr. Tayseer Mahmoud
California Environmental Protection Agency
Department of Toxic Substances Control
Office of Military Facilities
Southern California Operations
245 W. Broadway, Suite 350
Long Beach, California 90802-4444

Subject: Review of Draft Phase II Remedial Investigation Report for Operable Unit 2B - Site 2, Marine Corps Air Station, El Toro, California

Dear Mr. Mahmoud:

We have reviewed the subject document (six volumes) dated March 1996, prepared by Bechtel National, Inc., on behalf of the Department of the Navy. The California Integrated Waste Management Board (Board) staff have reviewed this submittal for conformance with Title 14, California Code of Regulations, Division 7 (14 CCR), Chapter 3, Article 7.8. These regulations consist of potential applicable or relevant and appropriate requirements for the Site 2 Landfill.

Based on our review we are providing the following comments:

1. Site investigation and sampling programs appear to be adequate for the purpose of initial site assessment. However, a waste characterization study may be required later on, if necessitated by the findings of the feasibility study, specifically, if a clean closure and/or consolidation of the landfill are considered.

2. Based on the information about negative impacts of the landfill on the environment (ground water contamination, gas migration, and soil contamination), an alternative addressing clean closure and/or waste consolidation should be considered for the purpose of the feasibility study. For your convenience, we have included a copy of Board's Local Enforcement Agency Advisory discussing the subject of clean closure which may be used as a guidance document in this matter.

3. The Remedial Investigation report does not include a discussion of potential impacts of ground water fluctuation and the landfill seep on landfill gas generation potential. As indicated during the April 24, 1996, meeting, ground water periodically rises into the waste fill and may, potentially, provide moisture necessary to generate landfill gas. Thus, the report should evaluate if such occurrence takes place at Site 2.

Recycled Paper

Should you have any questions regarding this matter, please call me at (916) 255-1195.

Sincerely,

Peter M. Janicki
Closure and Remediation South
Permitting and Enforcement Division

Attachment

LEA ADVISORY
No. 16 September 26, 1994

INTEGRATED WASTE MANAGEMENT BOARD

CLEAN CLOSURE

To All Local Enforcement Agencies

What is "Clean Closure"?

Clean closure of a solid waste disposal site refers to the complete removal of all waste and waste residuals, including contaminated soils. A clean closure is generally defined as being successful when waste materials and residuals are removed to a point where remaining contaminant concentrations are at or below background levels or clean up levels established by the relevant regulatory agencies. Clean closure is an alternative to more conventional closure methods (closure with waste in place) described in Title 14, California Code of Regulations (14 CCR), Division 7, Chapter 3, Article 7.8, and 23 CCR, Division 3, Chapter 15, Article 8. Clean closure may also be considered a remedial action or a step in a remedial action in some cases.

The California Integrated Waste Management Board (Board) has not adopted regulations specifically concerning clean closure. However, the Board's Closure and Remediation Branch has developed a set of guidelines for Board and Local Enforcement Agency (LEA) staff to follow when overseeing a clean closure. The following guidelines should not be construed as regulations. These guidelines, however, are consistent with existing law and regulations and are intended to ensure that public health and safety and the environment are protected from pollution due to the disposal of solid waste. These guidelines are also intended to provide a basis to allow Board and LEA staff of varying background and expertise to deal with clean closure issues in a consistent manner.

What Sites are Candidates for Clean Closure?

Clean closure may be an appropriate alternative for permitted, illegal, or abandoned solid waste disposal sites. Clean closure may also be an appropriate action for sites which closed prior to the current closure regulations, but which are facing a change in land use which may threaten the integrity of the closed site or pose a threat to public health and safety and the environment. Also, clean closure may be an appropriate part of a remedial action for previously closed sites which have developed environmental problems. Sites that generally lend themselves to clean closure include, but are not limited to:

- Small landfills and burn dumps;
- Non-hazardous wood/waste disposal sites;
- Solid and liquid waste treatment and/or processing units; and
- Sites where the cost of clean closure would be less than or equal to the costs of long term monitoring and postclosure maintenance of the site.

What are the Benefits of Clean Closure?

A properly performed clean closure ensures that waste materials and residuals are removed and disposed of in a safe and environmentally sound manner. In addition, clean closing a disposal site can create several advantages for an owner/operator. If done properly, the clean closure of an entire

waste management unit (e.g., a landfill cell or contiguous group of cells) would eliminate the need for the following for that unit: (1) 30 years or more of postclosure maintenance; (2) potential future corrective actions; and (3) Board and LEA inspections of the site. While the clean closure of an illegal disposal site eliminates the necessity for LEA and Board staff inspections, in some areas, particularly rural areas where the use of such sites by local residents has become habitual, continued or even increased inspections may be needed temporarily to prevent reactivation of the illegal disposal site. By clean closing, an owner/operator may also increase the possible postclosure land uses for the site. Furthermore, clean closure plans are typically less involved than conventional closure plans. However, the owner/operator will have to evaluate the potential costs and benefits of clean closure versus those of a conventional closure on a site-by-site basis to determine the viability of this option.

What Does the Clean Closure Process Involve?

The clean closure of a solid waste disposal site is a multiple step process. The steps may include, but are not limited to:

1. Site characterization;
2. Clean closure plan preparation;
3. Review and approval;
4. The actual clean closure; and
5. Verification and approval of the clean closure.

Who Evaluates Clean Closure Proposals?

Adequate advance notification of the appropriate regulatory agencies (Board, Regional Water Quality Control Board [RWQCB], LEA, and in some cases the Air Pollution Control District [APCD] and/or Department of Toxic Substances Control [DTSC] or other agencies as necessary) is necessary to allow review and approval of any proposals as well as observation of the site prior to, during, and after clean closure to verify that the site has been properly clean closed. For clean closures of permitted solid waste disposal sites and those which are subject to 14 CCR, Division 7, Chapter 5, Article 3.4, the review and approval process for clean closure plans is the same as that for conventional closure plans and is described in 14 CCR, Division 7, Chapter 5, Article 3.4. For other sites, the position of coordinating agency for the review and the timeline for the submittal and review of documents by the various agencies should be agreed upon by the agencies at the beginning of each project. The timely submittal of appropriate documentation (e.g., site characterization studies or clean closure plans) allows the approving agencies an opportunity to review and comment on the proposed clean closure prior to the actual clean closure of the site. Failure to involve all of the regulatory agencies early in the clean closure process may lead to lack of final approval of the clean closure of the site and the application of the regulatory requirements described below.

The Board (Closure and Remediation Branch), RWQCB, and LEA must each make a final determination that a solid waste disposal site has been properly clean closed. The determination that a site has been successfully clean closed implies that the potential threats to public health and safety and the environment due to the disposal of solid waste at the site have been mitigated by the clean closure. An owner/operator must provide to these agencies an adequate characterization of the site

and satisfactory evidence that all waste and waste residuals were removed and properly disposed of. If these agencies determine a clean closure was not properly completed, 14 CCR, Division 7, Chapter 3, Article 7.8, and 23 CCR, Division 3, Chapter 15, may apply to the site. If the site was operating on or after January 1, 1988, 14 CCR Division 7, Chapter 5, Articles 3.4 and 3.5 will most likely also apply.

What Information Should be Provided in Clean Closure Proposals?

The minimum components of a clean closure plan should include, but not be limited to:

- Site characterization;
- Excavation and material management;
- Confirmation of waste and degraded material removal; and
- Postclosure maintenance and land use.

The plan should be prepared by a registered civil engineer, a certified engineering geologist, or other qualified person depending on the complexity of the site. The owner/operator should submit all information regarding clean closure proposals, including clean closure plans, to all of the appropriate regulatory agencies.

SITE CHARACTERIZATION

The site characterization phase of the clean closure process is probably the most critical phase as it will determine the suitability of the site for clean closure. A complete site characterization will define the extent and character of the wastes present and the levels and extent of any contamination due to the disposal of waste at the site. A complete site characterization may prevent unplanned for and expensive surprises after the actual clean closure process has been initiated. Depending upon the complexity of the site, it may be necessary or advisable to involve the regulatory agencies prior to or during the site characterization process to ensure that an adequate characterization is performed.

- For sites with known or suspected environmental problems, site characterization may occur under an enforcement order by one or more regulatory agencies who may require submittal of a workplan prior to the site characterization.

- For complicated sites, it may be beneficial to submit the results of the site characterization study to the regulatory agencies for review prior to development of the clean closure plan rather than as part of the clean closure plan.

- For relatively uncomplicated sites, it may be adequate to submit the results of the site characterization with the clean closure plan for review.

The owner/operator should supply the following information regarding the site:

- Name and legal description of the site.
- Description of the historical development of the site.
- Name of legal owner/operator, including title, address, and telephone number.
- Map showing the assessor's parcel number, site plot plan, and parcel map including: legal boundaries of the site and adjacent land use, location of existing and proposed footprint of refuse/waste, location of all structures within a 1000-foot radius of the site, including all existing and proposed (if any) environmental monitoring, collection, and control systems.
- A description of all refuse/waste materials encountered at the site including how the waste was generated and the method of disposal used. Provide type of waste, volume, and dimensions of each disposal area at the site. Include any chemical characterization of the waste if available or if requested by the regulatory agencies.
- If burning of waste occurred at the site, a chemical characterization of the ash.
- Sampling results identifying backgound levels of the constituents of concern.
- A description of the character and extent of any soil or ground water contamination discovered during the site characterization study.
- A description of the geology and soils at the site.
- A description of the occurrence of surface water on and adjacent to the site and an estimate of the depth to ground water at the site.
- A description of all existing and proposed environmental monitoring, collection, and control systems for the site as required by the regulatory agencies.
- Information on the occurrence and character of ground water as required by the RWQCB. This information may include but not be limited to:

  A description of the occurrence and character of ground water on and adjacent to the site.

  A detailed geologic map of the site with cross sections showing the relationships between the refuse/waste and geologic units and ground water levels.

  A conceptual hydrogeologic model for the site.

EXCAVATION AND MATERIAL MANAGEMENT

Excavation and removal of solid waste may be considered a project under the California Environmental Quality Act (CEQA) or the National Environmental Policy Act (NEPA). An environmental document or appropriate exemption under CEQA or NEPA may have to be secured and submitted as part of the clean closure plan prior to approval. All applicable federal, state, and local permits (e.g., grading permits, Fish & Game approvals, OSHA reviews, etc.) should be obtained prior to any excavation.

The owner/operator should supply the following information regarding the site and the proposed clean closure:

- Identification of health and safety issues regarding the proposed site activities and a detailed protocol indicating what measures will be taken to ensure protection of the public health and safety and the environment.
- A plan to evaluate and dispose of any hazardous waste encountered during the clean closure operations.
- An excavation plan.
- A description of the sequence of excavation operations including the proposed removal rate and timeframe for the excavation operation.
- A description of the protocol to be followed in monitoring, collecting and controlling leachate, ground and surface water and landfill gas.
- A description of the proposed sampling and testing protocols for verification of clean closure.
- A description of the transport and fate and/or final disposition of the waste materials and residuals that will be excavated from the site.
- A drainage and winterization plan (when applicable).
- Any mitigation measures as called for in any necessary CEQA or NEPA document.
- Financial assurance for the project as necessary.

CONFIRMATION OF REFUSE/WASTE AND DEGRADED MATERIAL REMOVAL

The following activities should be planned for and implemented:

- Observation and documentation of removal of refuse/waste.
- Documentation verifying the final disposition of all refuse/waste materials.
- Adequate sampling must be performed after excavation to verify the removal of all waste materials and residuals, including interpretation of the test results by a qualified professional.
- Prepare and submit a map with a letter certifying that the constituents of concern concentration levels in the target media are either at or below the clean up limits established for the project.
- Submit a report documenting the activities which have occurred and verifying completion of clean closure to the appropriate regulatory agencies.
- Indicate on the site deed and/or title that the project was completed and where it was located.
- If the constituents of concern clean up level has not been met and further excavation is deemed not practical, develop and implement a remedial action plan for the site.
- If the site cannot be clean closed then closure and postclosure maintenance plans should be developed and submitted for review and approval, prior to implementation.

POSTCLOSURE MAINTENANCE AND LAND USE

One of the advantages of clean closing a solid waste disposal site is that a postclosure maintenance plan should not be needed if the entire site has been successfully clean closed. A

description of the proposed postclosure land use should include:

- The proposed postclosure land use for the site.
- If the clean closure was part of a remedial action, describe any postclosure maintenance activities needed to comply with the implementation of the remedial action plan.
- If the clean closure was not successful, a postclosure maintenance plan and a financial assurance mechanism for postclosure maintenance are needed and should be included with the verification report.

These guidelines are intended to provide useful direction for the clean closure of a variety of site types and site conditions. In some instances, certain portions of the information outlined above may not be applicable to a given site or the level of detail necessary may vary due to site conditions. However, it is necessary for all of the regulatory agencies involved to agree on what information is and is not necessary, and the level of detail required, to allow the owner/operator to prepare the necessary documents and to carry out a clean closure that can be approved by all of the agencies.

Additional Information

If you have any questions regarding clean closure, please contact the Closure and Remediation Branch staff person assigned to your jurisdiction for assistance.

Sincerely,

Douglas Okumura, Deputy Director
Permitting and Enforcement Division

For Back copies of the LEA Advisory call (916) 255-2287

(LEA Advisory # 1, Oct. 6, 1992, Asbestos Containing Waste Disposal)
(LEA Advisory # 2, Feb. 17, 1993, 1992 Legislation Impacts Existing Waste Programs)
(LEA Advisory # 3, June 10, 1993, Site Investigation Process for Investigating Closed, Illegal, and Abandoned Disposal Sites)
(LEA Advisory # 4, Sept. 23, 1993, Permitting of Fuel Contaminated Soils Treatment/Processing Facilities)
(LEA Advisory # 5, Dec. 15, 1993, Use of Non Hazardous Contaminated Soil as Daily Cover)
(LEA Advisory # 6, Dec. 16, 1993, Aspergillus, Aspergillosis, and Composting Operations in California)
(LEA Advisory # 7, Dec. 30, 1993, Subtitle D Questions and Answers)
(LEA Advisory # 8, June 24, 1994, General Guidance for Implementing AB 1220 in the Regulation of Solid Waste Disposal Sites, REVISED)
(LEA Advisory # 9, Feb. 10, 1994, Solid Waste Ranking System User Guide: Site Investigation Process (SIP) Part II)
(LEA Advisory #10, Mar. 17, 1994, Procedural Change in Approving Alternative Cover Demonstration Projects Using Geosynthetic Blankets)
(LEA Advisory #11, Mar. 24, 1994, Metallic Discards Management)
(LEA Advisory #12, Mar. 29, 1994, Permitting of Non-Traditional Facilities)
(LEA Advisory #13, May 17, 1994, Wood Waste Landfills)
(LEA Advisory #14, May 25, 1994, Revised Policy and Procedures for Maintaining the Inventory of Solid Waste Facilities Which Violate State Minimum Standards)
(LEA Advisory # 15, June 8, 1994, Completion of Solid Waste Information System Inspection Reports for Disposal Sites and Transfer Stations)