



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

January 21, 1997

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

Re: U.S. EPA Comments On Draft Phase II Remedial Investigation Report For Operable Unit (OU3-A), Marine Corps Air Station El Toro

Dear Mr. Joyce:

U.S. EPA (EPA) has reviewed the above referenced document and our comments are attached to this cover letter. Some clarification and revision to the document are necessary before EPA can approve it.

Please be advised that for sites that meet industrial cleanup standards and are recommended for no further action, a deed restriction will still be necessary to protect public health in the event land use changes to residential. Deed restrictions are considered (limited) actions by EPA. In addition, the Navy may wish to investigate conducting some small scale excavations of "hot spots" at selected sites where such action may allow unrestricted use of the site(s).

If you have any questions, please contact me at (415) 744-2210.

Sincerely,

A handwritten signature in cursive script that reads "Glenn R. Kistner".

Glenn R. Kistner
Project Manager

Attachments

cc: Tayseer Mahmoud, DTSC
Larry Vitale, RWQCB
Andy Piskin, NFEC, SWDIV
Craig Carlisle, Bechtel National, Inc.

**COMMENTS ON THE DRAFT PHASE II
REMEDIAL INVESTIGATION REPORT,
OU 3A SITES, MCAS EL TORO**

1. **Executive Summary, p. ES-20, paragraph 2.** The extent of contamination has not been fully defined at sites 8, 9, 11, and 16, and further action at these sites to resolve the data gaps should be recommended.
2. **Figure 1-2.** Several of the sites listed in Table 1-1 are not included on this figure. Please revise the figure to include the missing sites (1, 7 and 14), or add a statement to the figure explaining why they are missing.
3. **Section 1.2.2.2, p. 1-14.** The information included in this section was based on 1991 data. Please update it so that the information is more current.
4. **Section 5.1.1.1, p. 5-2.** Entrained soil may also be deposited as sediment in storm drain sumps and basins. Indicate if investigation/analysis of this potential contaminant "sink" was performed.
5. **Section 5.1.2.3, p. 5-3.** Expand the discussion of catch basins and storm drain sumps to indicate that elevated concentrations of potential contaminants were present in some locations.
6. **Table 5-1.** It would be helpful to have a column indicating the number of samples analyzed or the frequency of detection to put the number of detections in perspective. Also, this table does not include analytes detected in groundwater. Please provide a table that presents similar information for groundwater.
7. **Table 5-2.** It would be helpful to cite or reference sources for individual physicochemical values presented since literature values often vary by several orders of magnitude. Also, please include literature values of the soil-water partition coefficients (K_d) for metals of concern at the facility.
8. **Section 5.2.1.1, p. 5-14, paragraph 3.** The fractional organic carbon content (f_{oc}) is a property of the soil, not the given organic chemical. Please revise the second sentence in this paragraph.
9. **Section 5.2.1.2, p. 5-15, paragraph 1.** It should be noted that the half-life times presented in Table 5-2 which are obtained from field studies include loss due to factors in addition to biodegradation (e.g., volatilization, leaching, etc.) and may overestimate biodegradation rates.
10. **Section 5.2.1.2, p. 5-15, paragraph 2.** Indicate that biodegradation rates are also influenced by nutrient concentrations and diffusion rates of contaminants.

11. **Section 5.2.1.2, Semivolatile Organic Compounds, p. 5-16.** An interpretation is made that the wider distribution of PAH compounds compared to VOCs is due to their greater persistence. The distribution may also reflect the prevalence of petroleum products used at the facility. In general, petroleum fuels (with the exception of gasoline and JP-4) contain few or no targeted VOCs.
12. **Section 5.2.2, p. 5-17.** It would be useful to expand the section to discuss the metal species used or produced at the facility. For example, if metal plating was conducted any metals released would initially be present as highly soluble species while, if sources were metals fabrication, sandblasting, or painting, metals would likely be present as relatively insoluble elemental or oxide forms.
13. **Section 5.2.2, p. 5-17, paragraph 4.** It is unclear how "well drained soils" provide conditions that render most metals immobile. It is recognized that alkaline conditions tend to retard metals migration though there are significant exceptions, notably arsenic, selenium, thallium, and manganese. It should also be noted that the concentration of clay minerals, iron and manganese oxides, aluminosilicates and soil organic matter strongly influence metals mobility.

General Comments on Attachments

1. Please discuss whether field screening results and fixed laboratory results were comparable. If not, discuss the potential impact on each investigation.
2. **Section 4 of each attachment:** Given the common occurrence of variable detection limits for some analytes (see specific comments), the procedure of only reporting hits in the data tables for each site (a generally acceptable practice) could allow potentially high concentrations of some analytes to be unreported. If a particular analysis results in "non-detects" with higher detection limits, the detection limit should be included in the table or noted in a footnote.
3. The *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (USEPA, 1988)* clearly emphasizes the need to delineate both the horizontal and vertical extent of contamination. In each attachment of the El Toro RI, color-coded maps are included which show the types of contamination found at each sampling location. This is helpful for showing the general horizontal extent of contamination, but vertical profiles or cross-sections are needed to show the vertical extent of contamination. In addition, the color-coded maps (e.g. Figure 4-2 in Attachment C) only show analyte detections, which can be deceptive because of the highly variable detection limits for some analytes. Also, the maps are completely qualitative in nature; the reader is given no sense as to the actual concentrations of COPCs in the soil. Contour maps showing the concentrations of COPCs might be more helpful.
4. Units used to present analytical results for TRPH (diesel and gasoline): both $\mu\text{g}/\text{kg}$ and mg/kg are used. Please be consistent and use the same units in the text, figures, and tables.

5. The Fate and Transport sections are too general. Please discuss specific compounds and metals present at each site rather than providing general characteristics of analytical classes as a group. Volatiles and metals tend to be presented generically when they should be discussed on an analyte specific basis.
6. In the fate and transport discussions, provide concentration ranges when it is stated that "Due to low concentrations, ... (a chemical class) will not be addressed."
7. The presentation of potential ranges of organics adsorbed (Tables 5-1) is a good concept. There is, however, an inconsistency when tables from different attachments are compared. The "percent sorbed" values for many COPCs in Table 5-1 are not consistent with values reported at other sites even though the high and low TOC values are identical.

The origin of the range of values for fraction of organic carbon (f_{oc}) used at each of the sites to estimate the percent of the COCP that is sorbed onto the soil isn't referenced. Ideally, site-specific data should be used for the f_{oc} value, especially if site soils differ significantly from those referenced in the literature.

A simplified calculation for the percent of the COPC sorbed onto soil is used. There are many factors present in the subsurface which are not included in this approach. Other important factors are the rate at which contaminants were introduced into the soil and the limited number of surface sites in the soil onto which a compound can be sorbed. The text should state that the calculations presented in Table 5-1 are only gross estimations.

It would be beneficial to expand this presentation for the organics present and to also present similar tabulations for inorganics of concern using the range of literature values for soil-water partition coefficients (K_d).

8. In addressing surface water (and sediment) transport through storm drains for each site, discuss whether storm drain sediment from sumps or catch basins was analyzed and if concentrations indicated that this was a pathway.

Specific Comments on Attachments

Attachment B

1. Figure 2-1. The circle with triangle symbols in the AOC204 area are not defined in the legend. Please include this symbol in the legend. If these are sample locations, the results should be summarized in the text.
2. Lead was detected at a concentration 2 orders of magnitude above the background level for lead in sample 06_GN1. The blood borne lead calculation was not done to evaluate whether this is a potential hazard. Evaluate whether future use of this site could result in exposure to lead in shallow soils and consider calculating the blood lead level from exposure to site soil. If lead is found to present unacceptable risk, action may be necessary.

Attachment C

1. A review of the 1992 aerial photograph shows that there is debris or drums piled in the southeast corner of the West Storage Yard and drums or other containers in the northeast corner of the East Storage Yard. Neither of these areas has been sampled. A review of analytical results from the nearest borings revealed that there were detections of PAHs and PCBs; this suggests that there could be contamination in these areas. This is a data gap that should be investigated.
2. Table 4-6, p. C4-27. Some detection limits for Aroclor 1260 are elevated and vary from 34 $\mu\text{g}/\text{kg}$ to 450 $\mu\text{g}/\text{kg}$. This may have resulted in some false negative results.
3. Figure C-4-3. In the old salvage yard (Unit 5), there is a large area in the northwest corner of the unit where no soil samples were taken. The soil samples bounding this area (08B506, 08B505) had high concentrations of PAHs. This suggests that the area of impacted soils may be much greater. Since this area has not been sampled, the horizontal extent of contamination has not been established.
4. Table 4-9, p. C4-39 and Table 4-14, p. C4-57. Some detection limits for Aroclor 1260 are elevated; detection limits vary from 34 $\mu\text{g}/\text{kg}$ to 680 $\mu\text{g}/\text{kg}$. This may have resulted in some false negative results.
5. Lead was detected at more than 100 times the background at location 08_ST3, which is located in the unpaved Unit 1. This area should either be considered for a hot spot removal, or a blood lead calculation should be completed.
6. Section 7.2.1, p. C7-9. This site should be recommended for further investigation, to fill in the data gaps, and then should be evaluated in a feasibility study (due to an ELCR of 1×10^{-4}).

Attachment D

1. Section 1.2.1, p. D1-4, paragraph 1. The site outlines and the location of the east pit on the 1968 aerial photograph do not match the site boundary and pit location shown on Figure 2-1. This is evident when the relative position of the east pit on the 1968 aerial photograph is compared to the fixed position of the two reservoirs (large tanks) and the Taxiway T-5 extension. The western edge of the east pit is actually about 80 or 90 feet east southeast of the aircraft matting boundary and the north edge is about 110 feet south southeast of the edge of the taxiway. This places the east pit in Site 10, in an area that was not investigated. This area should be investigated; samples should be analyzed for the Site 9 investigation parameters (including dioxins), and PCBs (because of the possibility that waste oil was used).

The area investigated as the eastern pit was actually the western pit on the 1968 aerial photograph. If there are other aerial photographs, they should be reevaluated to ascertain whether there were any other burn areas. Note that the western test pits were outside the boundary of the 1968 burn areas. The text should be revised to reflect this.

2. From the location of samples where dioxins were detected, it appears that dioxin contamination may have migrated off-site via surface water pathways. Please discuss the direction of surface water flow in this drainage area and evaluate whether dioxins may have been transported off site.
3. Please explain why contamination was found outside the boundary of the burn pits (e.g., 09B109 is south and up slope from the burn pits.)
4. Section 7.2.1, p. D7-8. This site should be recommended for further action unless the investigation of the eastern burn pit will be done as part of the Site 10 investigation.

Attachment E

1. Given that waste oil was routinely used for dust suppression at Site 10, PCB analyses should have been performed for shallow samples collected from all Phase II sampling locations in Units 1 and 2, however, PCB analyses were only done for four locations in unit 1 and four locations in Unit 22. Please explain.

Attachment F

1. Sections 1.3.2 and 1.3.3, p. F1-4. Please discuss whether focused sampling was done in the stained areas identified from aerial photographs.
2. Section 4. The presence of PCBs, which were normally added to oil strongly suggests that analyses for PAHs and TPH-d should also have been done. The omission of these analyses should be identified as a data gap. If PAHs are found, it is likely that the ELCR numbers for this site would be higher.
3. The vertical extent of PCB contamination has not been defined. In the Phase I soil sample, 11_DD1, taken from 4 feet bgs, Aroclor 1260 was detected at 3,580 $\mu\text{g}/\text{kg}$. No samples were taken below this depth at this location. The samples taken at the surface and at 2' bgs at location 11_DD1 were below detection levels. This situation underscores the potential for liquid contaminants to migrate downward through the unsaturated zone, resulting in higher concentrations of PCBs at depth. If the volume and rate of introduction of PCBs to the soil exceeds the sorption capacity of the soil, PCBs will continue to migrate downward or horizontally along low permeability layers.
4. Figure 5-1 is ambiguous. It appears that the ditch shown in the figure is in the wrong location. The conceptual cross-section should show the compass heading of the section. The buildings should be labeled.
5. Section 7.2.1, p. F7-3. There are data gaps, specifically, the vertical extent of PCBs near location 11_DD1 and whether PAHs are present in the soil. This site should be recommended for further investigation. If PAHs are found, the ELCR will likely exceed 10^{-4} ; if so, the site should be recommended for the FS.

Attachment G

1. The variability of detection limits for PCBs may indicate that the extent of contamination has not been completely defined. If the detection limit for a particular sample is much higher than normal, it would be more accurate to report it as "less than (the detection limit)," not as ND.
2. Please explain why Units 1, 2, and 4 are not recommended for further action. Consider whether Unit 3 could be recontaminated by runoff from the other sites and whether this contamination could then be transported off site.

Attachment H

1. Table 4-2. The reported concentration of arsenic in sample 13_SA3 (2' bgs) was "undetected" at 276 mg/kg. This appears to be a typographical error. Please correct or explain.

Attachment I

1. Lead was detected at elevated concentrations in surface and subsurface soil (as much as 360 times background). Other metals were also detected at more than 5 times background. Please evaluate and discuss whether these metals could leach to groundwater, or, in the case of surface samples, whether soil with elevated metal content could erode and be transported off site.

Attachment J

1. Section 1.2.1, p. J1-4 and Figure 2-1. The pits shown on Figure 2-1 do not match the pits visible on the 1980 and 1996 aerial photographs (Figures 1-2 and 1-3). The main fire fighting pit on Figure 2-1 is in approximately the correct location, but is much smaller than the main pit on the 1980 aerial photograph. The 1980 photograph also shows large stained areas where fuels and other liquids flowed away from the main burn pit. The two other pits visible on the 1996 aerial photograph are in very different locations than shown on Figure 2-1; samples were not collected in the smaller pit areas shown on these photographs. This means that the extent of contamination in soil has not been defined at Site 16. Please reduce or enlarge air photos to the same scale, overlay them (by matching fixed features like the runway, taxiways, and feature 399) over the site map and trace the actual locations of the historic burn pits and stained areas. Then evaluate whether these areas have been investigated and design a sampling program to address the resulting data gaps. This is important because a remedial action, if done using current data, would likely not result in cleanup of all affected areas.
2. Section 3-4, p. J4-45, last paragraph. The local groundwater gradient and flow direction can not be established from the three existing wells. The wells are located roughly along a straight line, making triangulation of flow direction very inaccurate. The text should be changed to reflect this, relying more heavily on regional groundwater information for discussions on groundwater flow directions at the site. Note that

according to the Groundwater Elevation Map of MCAS El Toro (Figure 3-5, Main Report) groundwater flow is to the west northwest in the Site 16 area.

3. **Table 4-6, p. J4-45.** The detection limits for VOCs are quite high (3000 $\mu\text{g}/\text{kg}$); significant contamination could be present. When results less than the detection limits are transposed to the figures showing extent of contamination on figures, analytical results are represented as "ND." The figures should instead show results of "< [detection limit]". For example, if the detection limit for benzene was 3,000 $\mu\text{g}/\text{kg}$, the result on the figures should be reported as "< 3000 $\mu\text{g}/\text{kg}$ ". Alternately, the NDs should be footnoted and the elevated detection limits should be specified.
4. **Section 4.4.3, p. J4-101, first paragraph.** Based on the fact that the wells are in a straight line and the resulting uncertainty in the groundwater flow direction, it is unclear whether monitoring well 16_DBMW81 is truly downgradient of the burn pits. Without installing a new monitoring well to more accurately establish the local groundwater flow direction at Site 16, it is inappropriate to make statements regarding the downgradient extent of contamination in groundwater. It is likely that since main report Figure 3-5 shows groundwater flow to the west northwest, that groundwater contamination would be found west northwest of the main burn pit.
5. **Figure 5-3, p. J5-12.** This figure is missing the arrow that represents the major transformation of cis 1,2-DCE; cis 1,2-DCE is primarily transformed to vinyl chloride (the 1,2-DCA transform is only a minor pathway).
6. The DQOs have not been met because the extent of contamination in soil and groundwater has not been established. The soil investigation did not cover the lesser burn pits shown in the 1996 aerial photo, nor did it include the stained area west of the main pit shown in the 1980 aerial photograph. The analytical results support the fact that there is a data gap associated with the hand-held training and residual fluids pits because there were no significant detections in the areas that were investigated; this should be contrasted with the fact that VOCs and petroleum-related analytes were detected in the soil from main pit area.

The extent of groundwater contamination has likely not been defined because there were no wells west northwest of the main pit.

Attachment N

1. **Figure 4-3, p. N4-17.** Phase I sampling location 22_2FB3 exhibited high levels of petroleum hydrocarbons in the soil in the deepest sample analyzed (from 4 feet bgs). The location of Phase II sample 22B201 appears to have been chosen to define the vertical extent of contamination noted at 22_2FB3 (which was located approximately 18 feet to the east), but only trace amounts of petroleum hydrocarbon at 2-3.5 feet and 6-7 feet bgs were detected. It appears likely that Phase II sampling may have missed the area of soil contamination detected in the Phase I sampling program. This suggests that the extent of contamination in shallow soil has not been defined. Hence, it is uncertain whether deeper soils have been impacted the 22_2FB3 area.

**Independent Review of Data Validation Reports
Appendices J and L
Draft Phase II Remedial Investigation Report
OU-3A Sites Marine Corps Air Station, El Toro, California**

General Comments

1. Data validation reports were reviewed for completeness and to determine if validation was performed according to accepted procedures. Data were spot checked to determine if qualifiers were appropriately applied. Overall, the validation of the data was complete and followed the format of the EPA National Guidelines for Data Review. Quality control acceptance criteria for evaluation of data, in some cases, were modified from EPA guidelines to reflect specific requirements of analytical methods employed and the project-specific Quality Assurance Plan. The following standard data qualifiers were used:

U - The analyte was not detected

J - The analyte was detected. The concentration is considered an estimated value due to minor exceedance of QC criteria or because concentrations are lower than the lowest calibration standard. Data are considered valid and usable for all purposes.

R - Data are rejected and not usable due to major exceedance of QC criteria. Resampling and reanalysis must be performed to verify the presence or absence of the analyte.

N - Presumptive evidence (tentative identification) of the presence of the analyte (generally interferences may be present).

UJ - The analyte was not detected. The associated value is the estimated detection limit.

In general, data are acceptable as qualified.

2. Sample identification numbers presented in data validation memoranda (Appendix J) appear to be laboratory identification numbers and cannot be cross referenced to actual station locations and field sample identification numbers discussed in the report in the Appendix H data compilation. Add columns to Appendix H listing sample delivery group and laboratory identification number for all samples so results can be verified, or include a cross-reference table.

Specific Comments

Specific comments are presented only for cases which, in USEPA's judgment, data should have been qualified differently than presented in the validation reports. It should be noted that these differences in judgment, for the most part, have little impact on data quality and usability.

1. For volatiles, total petroleum hydrocarbons, herbicides, and polycyclic aromatic hydrocarbons, the validation of the percent differences of analytes for the continuing calibration verification used a percent difference of 15 percent as stated in the QAPP (per phone conversation with Dante Tedaldi of Bechtel, 1/2/97). In the SOW OLM03.0 as described in the *National Functional Guidelines for Organic Data Review* (EPA OSWER Directive 9240.1-05, February 1994), a QC limit of less than or equal to 25 percent for percent differences is recommended. Since "J" qualified data are considered usable for all purposes, this more stringent qualification is acceptable.
2. In the summary of the data validation, it was noted that, in many cases, laboratory control sample (LCS) analyses were not performed by the laboratory. In the USEPA review, it was noted that many of the lack of LCS results occurred when the laboratory performed an LCS on the soil samples in a sample delivery group (SDG), but not on water samples also included in the SDG. These water samples were typically field or rinsate blanks. While data should be qualified when the LCS was not performed, MS/MSD analyses were run which the reviewer used as a replacement for the LCS. In a few cases neither LCS or MS/MSD analyses were performed. In these instances, the reviewer correctly qualified all the data as estimated.
3. Sample results were not qualified as undetected due to field (or rinsate) blank contamination. This omission is not deemed significant since most contamination detected consisted of common metals such as calcium, magnesium, iron, aluminum, etc. at low concentrations. This lack of sample qualification would be environmentally conservative since samples might be reported as having low levels of metal contamination when, in fact, none may be present.
4. For inorganics, the reviewer did not determine which samples applied to which blank when qualifying for laboratory blank contamination. Some sample results were qualified for blank contamination that did not exist. For example, under the EPA Contract Laboratory Program it is normal laboratory practice not to analyze samples following the initial calibration blank (ICB), but to wait until the first continuing calibration blank (CCB1) is run. In all cases, sample results were qualified for both ICB and CCB1 blank contamination (if it was found). This would result in metal concentrations being qualified as nondetected when low levels of contamination might be present. The omission is not deemed significant since it would only influence reported metal concentrations near the detection limit.
5. For SDG 55717, the MSD percent recovery was 7 percent for indeno(1,2,3-cd)pyrene. While data qualification is generally not done based solely on matrix spike results, indeno(1,2,3-cd)pyrene results should be qualified as estimated (J) if detected and rejected (R) if not detected for the specific spiked sample.
6. Field duplicates were not qualified as estimated if the relative percent difference (RPD) exceeded 50 percent. This is acceptable since field duplicate samples reflect both field and laboratory variability.

7. For SDG 55720, the MS percent recovery was 4 percent for 2,4-D. While data qualification is generally not done based solely on matrix spike results, 2,4-D results should be qualified as estimated (J) if detected and rejected (R) if not detected for the specific spiked sample.
8. For SDG 55720, samples 79L000303 and 79L002703 were reported to be field duplicates. Results for MCPP were ND and 22000 $\mu\text{g/L}$ for the samples, respectively. Based on this large difference comments should be included in the validation memorandum indicating whether the concentration and quantitation limit reported were accurate and steps taken to resolve the discrepancy.
9. In some cases for herbicides, the five point calibration for analytes was not performed as required (three or four point calibrations were performed instead). No qualifiers were assigned by the reviewer. This is acceptable when the calibration discrepancies apply only to the second, confirmation column (RTX-1701). In cases where a complete calibration was not performed for the quantification column (RTX-35), the sample results for detected analytes should be qualified as estimated (J). This is not deemed to have a significant impact on data quality since it would primarily impact samples with concentrations near or below the lowest concentration calibration standard.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
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MEMORANDUM

To: Glenn Kistner
Remedial Project Manager
Federal Facilities Cleanup Office

FROM: Jeffrey M. Paull, MS HYG, MPH, CIH
Regional Toxicologist
Superfund Technical Support Section

DATE: January 16, 1997

SUBJECT: Review of "Draft Phase II Remedial Investigation Report, OU-3A Sites," Marine Corps Air Station (MCAS) El Toro, Orange County, California

Background

The Remedial Investigation (RI) Report presents data for Operable Unit (OU)-3A Installation Restoration Program (IRP) Sites 4,6, 9-13, 15, 16, and 19-22. The sites consist of aircraft refueling sites, former drop tank drainage areas, crash crew training pits, petroleum disposal area, transformer storage area, former wastewater-treatment facility and sludge-drying beds, office storage yard, and hobby and materials management shops. Most of these sites are not currently active, and the operations that contaminated the sites have ceased. The MCAS El Toro Air Station is a designated Federal Superfund Site, scheduled for closure in 1999.

Scope of Review

We reviewed above-referenced Remedial Investigation (RI) Report, prepared by Bechtel National Inc. (BNI) on behalf of U.S. Department of the Navy, Southwest Division Naval Facilities Engineering Command (SW/DIV), under the Comprehensive Long-Term Environmental Action Navy (CLEAN) II Program. The RI Report, encompassing four volumes, is dated November 12, 1996, and was submitted to USEPA Superfund Technical Support for review on December 19, 1996.

Our review focused on the sections of the RI pertaining to the human health risk assessment (principally Section 6 for each site), and the associated figures, data tables, and appendices. The RI was reviewed for scientific and technical accuracy, and for conformance with USEPA Region IX risk assessment guidelines, policies, and procedures.

We assume that sampling of environmental media, analytical chemistry data, and QA/QC procedures have been adequately reviewed by appropriate USEPA Region IX personnel. Minor grammatical and typographical errors in the RI have been noted only to the extent that they may affect the interpretation of the risk assessment. We request that future changes or additions to the RI be clearly identified.

We previously reviewed and commented upon the Phase II RI/FS Risk Assessment Work Plan (January 20, 1995), the Revised Draft Work Plan (May 24, 1995), the Final Work Plan (September 28, 1995), and the technical memorandum containing the supplemental procedures used in the human health risk assessment for the OU-3 RI (July 25, 1996).

Summary

The information and data presented in the Draft RI is comprehensive, logically structured, well-organized, and professionally presented. The human health risk assessment sections of the RI are consistent with USEPA Region IX risk assessment guidance, and no major methodological problems were evident. The Navy, and its Contractor, Bechtel National Inc., are to be commended for the high quality of the Draft Remedial Investigation Report, and the environmental work that it represents.

General Comments

The methods and procedures used to estimate the human health risks at each IRP site are consistent with USEPA risk assessment guidance. Relevant exposure pathways are considered, exposure assumptions are plausible, and appropriate toxicity values and exposure factors are used to estimate risks. Random checks verified that exposure point concentrations, excess cancer risks, and hazard indices are correctly calculated. The extensive use of graphical information, including plots, color diagrams, and bar charts, greatly enhances the interpretation of data.

The excess cancer risks were estimated to be at or below 1×10^{-4} for all potential receptors, at all sites. With the exception of an excess cancer risk of 1.8×10^{-4} estimated for the residential scenario for the catch basin at Site 21, principally due to PAHs, and for which further action is recommended, these health risks are within the acceptable risk range (10^{-6} to 10^{-4}), as stated in the NCP, where regulatory and risk management options include the no further action alternative.

The cumulative hazard indices exceeded a value of 1 at almost all sites, including IRP Sites 4, 6, 8, 9, 10, 11, 12, 13, 15, 16, 20, 21, and 22 for the residential child scenario, and IRP Sites 11 and 12 for the industrial worker scenario. These noncancer hazard indices appear to be driven primarily by manganese, MCPP, PCBs, trichloroethylene, and to a lesser extent arsenic and cadmium.

Hazard indices which significantly exceed a value of 1 generally require some form of remediation; however, further action is recommended in the RI for only three of these sites--Unit 3 at Site 12, Unit 1 at Site 21, and for groundwater at Site 16, and it is unclear whether further action is being recommended to address cancer risks, or noncancer health effects at these sites.

In general, the specific rationale (e.g., COPC concentration not significantly above background, effect-specific hazard indices less than 1) for not considering the further action alternative for these sites is not made explicit in the Conclusions section of the report (Attachments A - N). Additional information is therefore necessary, to provide justification for the no further action recommendation at the remaining IRP sites.

We have identified several specific technical and human health risk assessment-related issues, explained in more detail below, for which we are requesting additional information, or further clarification, either in the RI Report, or in the form of a written response from the Navy.

Specific Comments

Human Health Risk Assessment, Summary of Results, Vol. 1, §6.4.3, p. 6-29:

The RI Report states that arsenic is the primary cancer-risk driver, and manganese is the primary noncancer-risk driver for most of the areas of potential concern at the OU-3A sites, but that there was no documented use of these two metals at these sites. The RI then draws the following conclusion:

"It appears unlikely that some unknown activity conducted at these areas was responsible for the reported concentrations (above background) of arsenic and manganese in soil. Rather, the reported concentrations probably reflect local, but natural, variations in the actual background levels for these metals that exceed the background level calculated for MCAS El Toro."

We agree it is unlikely that some unknown activity conducted at these areas was responsible for the reported concentrations (above background) of arsenic and manganese in soil, however, there are a number of known activities that could have. Water treatment facilities, particularly sludge drying beds, such as those at site 12, are known to concentrate metals normally present in water, including arsenic and manganese. These metals would also be expected to concentrate in areas where there is sediment movement, such as catch basins, also present at site 12. Arsenic may also be introduced into the soil through activities such as coal burning, and, as noted in the RI Report, through the use of arsenical pesticides.

Manganese, which is alloyed with metals to impart hardness, (e.g., alloyed with iron in the manufacture of steel), can be introduced into the environment through the disposal of ferrous metals, and their subsequent oxidation, and weathering. Manganese above background level in soil at site 20 (Hobby Shop) could be due to the disposal and subsequent weathering of metals containing manganese.

Manganese may also be present in low concentrations in metal-contaminated fluids, including waste oils. Virgin diesel fuel contains 0.29-6.2 ppm manganese (and 0.012-0.13 ppm arsenic) by weight,¹ and concentrations in waste diesel fuel would obviously be expected to be higher.

¹ The Installation Restoration Program Toxicology Guide. Health and Safety Research Division, Oak Ridge National Laboratory (July 1989)

This may explain the presence of elevated manganese levels at Site 13 (Oil Change Area), Site 15 (Suspended Fuel Tank Area), Site 16 (Crash Crew Pit), Site 19 (Aircraft Expeditionary Refueling Site), Site 21 (Materials Management Group), and Site 22 (Tactical Air Fuel Dispensing System).

Regardless of the source of the arsenic and manganese at these sites, there appear to be elevated levels of these metals which significantly contribute to noncancer risks above acceptable hazard indices at several sites, and this will need to be addressed by the RI.

Site 4, Attachment A, §6. Human Health Risk Assessment, and §7. Conclusions and Recommendations:

In the Conclusions section, it is stated that, "[T]he chemicals identified in soil at Site 4 do not pose an imminent risk to human health or the environment..." However, there appears to be no discussion, or adequate explanation in the conclusions for dismissing the noncancer hazard above a hazard index (HI) of unity (1.4) calculated for the on-site resident at Unit 1.

It is important to note that even when COPCs are segregated by specific noncancer effect, and separate hazard indices (HI) were derived specific to each effect group, several of the effect-specific HIs exceeded unity, indicating the potential for systemic toxicity. The effect-specific HIs estimated for site 4 are: gastrointestinal effects (1.13), hematological effects (1.05), neurotoxicity effects (1.37), reproductive effects (1.27), and respiratory effects (1.37).

Based on the information presented in the RI, which indicates the potential for systemic toxicity to the on-site resident, we do not agree with the conclusion that no remedial action is required to address contaminants at Site 4.

Site 6, Attachment B, §6. Human Health Risk Assessment, and §7. Conclusions and Recommendations:

No adequate explanation is presented for dismissing the noncancer hazard index of 1.1, and 1.4 calculated for the industrial worker, and on-site resident at Units 1, 2, and 3, respectively. Based on the information presented in the RI, indicating the potential for systemic toxicity to the industrial worker, and on-site resident, and for similar reasons to those stated above, we do not agree with the conclusion that no remedial action is required to address contaminants at Site 6.

Site 8, Attachment C, §6. Human Health Risk Assessment, and §7. Conclusions and Recommendations:

No adequate explanation is presented for dismissing the noncancer hazard index of 1.1, and 2.3 calculated for the on-site resident at Unit 5, and at Units 2 and 3, respectively. Based on the information presented in the RI, indicating the potential for systemic toxicity to the on-site resident, we do not agree with the conclusion that no remedial action is required to address contaminants at Site 8.

Site 9, Attachment D, §6. Human Health Risk Assessment, and §7. Conclusions and Recommendations:

No adequate explanation is presented for dismissing the noncancer hazard index of 1.4 calculated for the on-site resident. Based on the information presented in the RI, indicating the potential for systemic toxicity to the on-site resident, we do not agree with the conclusion that no remedial action is required to address contaminants at Site 9.

Site 10, Attachment E, §6. Human Health Risk Assessment, and §7. Conclusions and Recommendations:

No adequate explanation is presented for dismissing the noncancer hazard index of 1.2 calculated for the on-site resident at Units 1,2, and 3, and 2.2 calculated for the on-site resident at Unit 4. Based on the information presented in the RI, indicating the potential for systemic toxicity to the on-site resident, we do not agree with the conclusion that no remedial action is required to address contaminants at Site 10.

Site 11, Attachment F, §6. Human Health Risk Assessment, and §7. Conclusions and Recommendations:

No adequate explanation is presented for dismissing the noncancer hazard index of 1.1 calculated for the on-site industrial worker, or the hazard index of 4.5 calculated for the on-site resident, both at Unit 1. Based on the information presented in the RI, indicating the potential for systemic toxicity to the on-site resident, and industrial worker, we do not agree with the conclusion that no remedial action is required to address contaminants at Site 11.

Site 12, Attachment G, §6. Human Health Risk Assessment, and §7. Conclusions and Recommendations:

Recommended actions for Site 12 include reducing exposure to contaminated soil from the drainage ditch (Unit 3), and reduce the likelihood of contaminated soil from this area being transported off-site. This recommended action is appropriate, and will serve to reduce potential exposures to on-site industrial worker, and the on-site resident at Unit 3, for whom noncancer hazard indices of 2.3, and 5.9 were calculated.

However, no remedial actions were recommended for Units 1, where a value of 4.6 was calculated for the noncancer hazard index for on-site residents, or for Units 2 and 4, where an HI value of 2.1 was calculated for on-site residents. These hazard index values are approximately equal in magnitude to those calculated for Unit 3. The rationale for recommending remedial actions for Unit 3, but not for Units 1, 2, and 4 is therefore unclear, and requires further explanation and justification.

Site 13, Attachment H, §6. Human Health Risk Assessment, and §7. Conclusions and Recommendations:

No adequate explanation is presented for dismissing the noncancer hazard index of 1.1 calculated for the on-site resident, although no effect-specific HI exceeds a value of 1. If this is the basis for the conclusion that no remedial action is required to address contaminants at Site 15, this rationale needs to be made more explicit in the Conclusions.

Site 15, Attachment I, §6. Human Health Risk Assessment, and §7. Conclusions and Recommendations:

A noncancer hazard index of 1.1 calculated for the on-site resident, although no effect-specific HI exceeds a value of 1. If this is the basis for the conclusion that no remedial action is required to address contaminants at Site 15, this rationale needs to be made more explicit in the Conclusions.

Site 16, Attachment J, §6. Human Health Risk Assessment, and §7. Conclusions and Recommendations:

Remedial actions are recommended at Site 16, for Units 1 and 2, to reduce VOC concentrations in the vadose zone and minimize degradation of the shallow aquifer, although potential human cancer risks and noncancer hazards associated with exposures at these Units were within acceptable ranges. However, no further action is recommended for Unit 3, where a noncancer hazard index of 1.3 was calculated for the on-site resident, driven primarily by TCE in groundwater. The basis for this apparent contradiction requires further explanation.

Site 19, Attachment K, §6. Human Health Risk Assessment, and §7. Conclusions and Recommendations:

We are in agreement with the no further action recommendation for Site 19, based upon cancer risks (3.6×10^{-6} to 1.3×10^{-5}) and noncancer hazards (0.036 to 0.95) to the on-site resident and industrial worker, that are within acceptable ranges.

Site 20, Attachment L, §6. Human Health Risk Assessment, and §7. Conclusions and Recommendations:

No adequate explanation is presented for dismissing the noncancer hazard index of 1.3 calculated for the on-site resident at Unit 1, or the hazard index of 1.2 calculated for the on-site resident at the catch basin. Unit 4 cancer risks and hazard indices are within the acceptable range. If the absence of an effect-specific HI exceeding unity is the basis for the conclusion that no remedial action is required to address contaminants at Site 20, this rationale needs to be made more explicit. Based on the information presented in the RI, indicating the potential for systemic toxicity to the on-site resident, we do not agree with the conclusion that no remedial action is required to address contaminants at Site 20.

Site 21, Attachment M, §6. Human Health Risk Assessment, and §7. Conclusions and Recommendations:

Remedial actions are recommended at Site 21, to reduce exposure to contaminated sediment in the catch basin, although potential human cancer risks and noncancer hazards associated with exposures at the catch basin were within acceptable ranges.

However, no further action is recommended for Unit 1, where a noncancer hazard index of 2.0 was calculated for the on-site resident, driven by manganese, arsenic, and the herbicide MCPP in soil. The basis for this apparent contradiction requires further explanation.

Site 22, Attachment N, §6. Human Health Risk Assessment, and §7. Conclusions and Recommendations:

There appears to be a typographic transposition error in the hazard index calculated for the on-site resident at Unit 1. In Table 6-5 a value of 0.52 is presented, while in the Conclusions and Recommendations Section, (p. N7-5), an HI value of 5.2 is cited. Additionally, no adequate explanation is presented for dismissing the noncancer hazard index of 1.2 calculated for the on-site resident at Unit 2, as a basis for consideration of the further action alternative.

If the absence of an effect-specific HI exceeding unity, or the relationship of manganese and aluminum concentrations to background, is the basis for the conclusion that no remedial action is required to address contaminants at Site 22, this rationale needs to be made more explicit. Based on the information presented in the RI, indicating the potential for systemic toxicity to the on-site resident, we do not agree with the conclusion that no remedial action is required to address contaminants at Site 22.

Conclusions

The Draft Remedial Investigation Report for OU-3A is generally meets its objective of collecting sufficient data to determine the nature and extent of contamination, and for appropriately characterizing human health risk. Appropriate recommendations were made with respect to the evaluation of potential human cancer risk, however, additional information is required to support the no further action decision at IRP Sites where the noncancer hazard index indicated the potential for systemic toxicity, before we can issue approval of the RI report.

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