

**Response to Comments Submitted by Cyrus Shabahari (DTSC)  
on the Operable Unit 1 Draft RI Report for  
NAS Moffett Field, California**

**General Comments:**

1. The Navy is quite convinced that the boundaries of both landfills have been well established. The RI modified the boundaries of both landfill sites from the boundaries assumed in the Initial Assessment Study; in the case of the Runway Landfill, the site boundary expanded considerably. The new boundaries were established by direct evidence from historic aerial photography and were confirmed by extensive geophysics. In fact, this RI effort to determine the exact boundaries of the landfills found that the location of the Golf Course Landfill as depicted in the Initial Assessment Study was incorrect and that a potential new landfill (now being investigated as the "new" Golf Course Landfill) exists. The Navy is, therefore, quite confident that the methods used to identify the landfill boundaries were complete and very successful.

Additionally, the Navy believes that the extent of contamination resulting from the landfill sites has been identified sufficiently to proceed with the preparation of a FS Report. If additional data regarding contaminant distribution are needed as a result of the FS Report, additional data could be collected in a treatability study.

2. Section 1.4 of the report has been revised to reflect the current status of the OU definitions and investigations.
3. The Operable Unit 1 RI report addresses the following media at Sites 1 and 2:
  - Soil and vadose zone
  - Leachate
  - Surface water and sediments
  - Air

Groundwater at Sites 1 and 2 will be discussed in the Operable Unit 5 RI Report, along with the associated background levels.

No organic background levels for the above referenced media at Sites 1 and 2 have been established. All organic detections are considered to be contamination.

Inorganic background values for soil and vadose zone samples as well as sediment samples have been established and were implemented throughout the discussion in the text and associated tables. Section 3.5 contains a detailed discussion of the development of the inorganic background values and Table 3.5-1 provides a summary of these values.

Inorganic concentrations in leachate samples from Site 1 and 2 were compared to adjacent and upgradient water samples from aquifer monitoring wells that had not

leached or otherwise come into contact with landfill waste. Inorganic comparison values for leachate samples from Site 1 and 2 are discussed in Sections 4.2 and 5.2, respectively, and are summarized in Tables 4.2-3 and 5.2-3, respectively. Surface water samples were collected within salt evaporation ponds. Therefore, the average concentration of elements in seawater as shown on Table 4.3-3 was utilized for inorganic comparison at Sites 1 and 2. Air sampling did not include inorganic analysis.

4. No analytical data from other contractors was utilized in characterizing the extent of contamination at Sites 1 and 2 or in preparing the risk assessment. Previous investigative sampling and analytical analysis by ESA at Sites 1 and 2 are presented in Chapters 4.0 and 5.0 for reference only. Assuming the "1988 data" is referencing the geophysical investigation by Norcal, no formal validation process is required or has been provided. However, the landfill boundaries as delineated by the investigation are in agreement with the other techniques utilized to arrive at the landfill boundaries and should be considered accurate.
5. The Navy agrees that the pumping station (Building 191), which pumps water from the storm sewer system into the perimeter drainage ditch, has influenced groundwater flow in the vicinity of Sites 1 and 2. In addition, the landfill material at Sites 1 and 2 is partially submerged (saturated). Finally, the Navy also agrees that the storm sewer system is intercepting contaminated groundwater from the regional chlorinated solvent plume and discharging it to the perimeter drainage ditch.

Groundwater analytical results from the OU5 RI indicate that the groundwater in the vicinity of Sites 1 and 2 is not contaminated with landfill leachate. Based on these laboratory results, it does not appear the pumping station has significantly caused or accelerated the migration of leachate from Sites 1 and 2.

Groundwater contamination associated with Sites 1 and 2 will be discussed in the OU5 RI. The OU5 RI will discuss the pumping station influence on groundwater flow in the vicinity of Sites 1 and 2.

6. Two depictions of the landfill configurations have been presented: by ESA (in the Confirmation Study) and by IT (in the SWAT, Phase I Characterization Report, and in this RI Report). The results used in this RI Report are based on evaluation of the ESA depiction plus results from the RI efforts and have been verified.

The draft OU1 RI Report discusses geophysical work performed by Norcal in 1988; the discussion is in Section 2.1, "Previous Studies." This work was performed by Norcal under contract to IT as part of the RI and is discussed in some detail in Section 2.3, "Field Investigations." The inclusion of the Norcal work in Section 2.1 was an error and is apparently a source of confusion, because it implies that the "Norcal investigation" is different than the RI geophysical investigation. That discussion has now been removed from Section 2.1. The results of the geophysical investigation were also discussed previously in the SWAT Report prepared by IT in 1989. The raw geophysical data were presented in an appendix to that report and are summarized and discussed in this OU1 RI Report.

Because the groundwater in the area of the landfills is included in OU5 rather than OU1, the configurations of the OU1 sites are not dependent on the area of groundwater contamination, but on the landfills themselves. The extent of migration of any groundwater contaminants will be addressed in OU5.

### **Specific Comments:**

1. The "disposal site detection limits" (DSDLs) are detection limits specified by the California Air Resources Board (CARB) for specific air contaminants at hazardous waste disposal sites.
2. On page 2-4, the subsection titled, "Solid Waste Assessment Test" is presented to give a general summary of the SWAT report that was prepared in accordance with the requirements of the California Water Code. The SWAT investigation was conducted in accordance with the SWAT Work Plan approved by the Regional Water Quality Control Board, San Francisco Region. In the context of this SWAT report "drinking water supplies" refers to any actual sources of drinking water in the Moffett Field Area being used or in existence at the time of the SWAT investigation/report. The A1 and A2 aquifers may be potential drinking water aquifers as defined by the California Water Code; however, they did not (at the time of the report) supply drinking water to sources in the vicinity of the two landfills. It was then concluded (in the context of SWAT guidance) that potential harm from the landfill was not to drinking water but to ecological or food chain areas. Hence, in that context, water quality standards were not relevant.
3. As noted previously, this section only summarizes the SWAT report. The metals and organics detected in the leachate wells were not detected in the A aquifer wells. The different contaminants detected in the leachate wells and the A aquifer wells lead to the conclusion that the A aquifer wells were being contaminated by some source other than the landfills. The purpose of the SWAT is to determine whether the landfill are leaking hazardous materials that may enter the groundwater system and degrade the groundwater system, not to identify any other sources of groundwater contamination. It is the purpose of the RI process to identify other sources of groundwater contamination.
4. The referenced sentence has been deleted.
5. The OU1 RI states "VOCs are captured at Building 191 and are not being released into the wetlands or NASA/Ames and Navy SWRP as long as pumping at Building 191 continues." The context of this sentence was that groundwater contaminants are being captured by the storm sewer system and discharged via the pumping station into the perimeter ditch rather than NASA or into storm water retention pond (SWRP) wetlands, via groundwater flow. The appropriate text will be revised to more clearly state this as well as that VOCs are being released to the drainage ditch, which ultimately drains into Guadalupe Slough and then into San Francisco Bay.
6. The intent of the electromagnetic induction surveys at Sites 1 and 2 was to confirm the limits of the landfill material within the construction fill material, and estimate the

approximate depth of the landfills. The horizontal extent of the landfills were previously determined based on historical knowledge of the sites and aerial photographs. The geophysical surveys were conducted to confirm the landfill boundaries prior to installation of monitoring and leachate wells. Electromagnetic induction surveys are commonly used to define the limits of excavations by measuring the relative change in conductivity between the fill material and the surrounding material. In the case of Sites 1 and 2, electromagnetic induction surveys were conducted to define the limits of the landfill material within the construction fill material. Based on the results of the geophysical surveys as well as knowledge of the landfills, it was determined that areas of low conductivity represent landfill material.

Based on the interpretation of the electromagnetic induction survey field data, it was determined that the 200 millisiemen/m contour appears to represent the boundary between the fill materials at Site 1. This determination is interpretative and takes into account existing site data and experience at other facilities using electromagnetic induction surveys.

The accuracy of geophysical surveys cannot be quantified (i.e., with a set distance) because they measure relative changes in the media surveyed. The accuracy of the electromagnetic induction survey appears to be quite good. Based on subsequent soil borings as well as monitoring and leachate well installation, the geophysical surveys were able to define the horizontal limits of the landfill material; however the geophysical surveys were not able to accurately define the vertical extent (depth) of the landfill material. The depth of the landfill material was determined based on soil borings and leachate well installation data.

7. Earlier estimations of the landfill boundaries at Sites 1 and 2, as provided by ESA in 1986, reportedly relied on personal interviews and magnetometer surveys. The current landfill boundary, as determined during the RI, includes information provided by aerial photographs, as well as geophysical surveys, soil borings, and monitoring and leachate wells. The limits of the landfill boundaries have been revised as more data was collected during the RI. Based on subsequent data collected at Site 2 it has been determined the landfill is smaller than originally estimated.

The RI was not able to locate or detect the reported burn pits. Information on the existence and locations of the burn pits was based on interviews during the Initial Assessment Study and have not been confirmed. Furthermore, based on the information provided by the above discussed investigations, the landfill material did not extend to the reported location of the eastern burn pit.

8. As stated in referenced Section 2.3.2, geophysical borings are utilized to recognize and delineate stratigraphic units, aquifer zones, and aquitards and to facilitate selection of the monitoring well screening intervals. It is IT's position that the information as provided by the previously drilled borings adequately satisfied these objectives. Lithologic identification ("physical conditions") and logging of soils in the landfill and surrounding areas is provided during collection of subsurface soil samples from soil borings and monitoring well borings. Geophysical borings were not utilized to delineate

landfill boundaries. As previously noted in Comment Response #7, landfill boundaries were determined by techniques discussed in Section 2.3.1.

9. Analytical summaries of the leachate water samples are provided in Tables 4.2-1, 4.2-2, 5.2-1, and 5.2-2. Complete analytical data of the leachate water samples are provided in Appendix C.
10. The requested information is not presently available. The Draft Final Work Plan for the Base-Wide Ecological Remedial Investigation (RI) Report is due March 1, 1993. The Final Base-Wide Ecological Remedial Investigation (RI) Report will not be available until February 1994.
11. As specified in the Sampling and Analysis Plan (SAP), 1988, subsurface soil samples were to be analyzed for VOCs, BNAs, PCBs, and inorganics. The SAP did not provide for the analysis of pesticides due to the lack of historical evidence citing the use and/or disposal of pesticides in the landfill or adjacent areas.
12. CRQLs for organics analysis on soils/sediments, as provided in the EPA Contract Laboratory Program, Statement of Work for Organics Analysis, are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment are calculated on a dry weight basis, as required by the contract, and will subsequently be higher. The CRQLs listed in Appendix B are the low soil/sediment CRQLs. The medium soil/sediment CRQLs for semivolatiles are 60 times the low soil/sediment CRQL (19,800 to 96,000 ppb). Additionally, CRQLs for both water and soil/sediments are highly matrix dependent and are provided as guidance with the acknowledgement within the statement of work that they may not always be achievable. The detection limits reported for sample W0206AMD2 are from seven to eight times the recommended CRQL for medium soil/sediment samples and most likely represent dilutions that were required to alleviate interferences caused by the sample matrix. IT believes that the reported detection limits are consistent with the guidance and that the interpretation of the data in determining the nature and extent of contamination is appropriate.
13. Comment No. 13 was not included in reviewer's comments.
14. TCE was detected in perimeter air sampling location LGMW 1-1 at 6.1 ppb at Site 1. This concentration is below the Disposal Site Detection Limit (DSDL) for TCE (10 ppb). The following corrections will be made to the OU1 RI text: "Based on laboratory analytical results, TCE has not migrated outside Sites 1 and 2 above the DSDL concentration of 10 ppb. TCE was detected in one perimeter air sampling location at a concentration of 6.1 ppb."
15. The site data were obtained using a site-specific QAPP and SAP. This RI utilized U.S. EPA Contract Laboratory Program (CLP) methods, which define the CRQLs (U.S. EPA Contract Laboratory Program, Statement of Work for Organic Analysis, February 1988 and U.S. EPA Contract Laboratory Program, Statement of Work for Inorganic Analysis, July 1988). However, it is recognized that some uncertainty exists with having CRQLs

for some chemicals above the lower limit of acceptable risk. This uncertainty is addressed in the baseline risk assessment for this RI (See Chapter 7.0, Section 7.2.6).

16. Historical records, previous reports, and current practice at NAS Moffett Field do not indicate any known sources for metals contamination (i.e. plating operations, manufacturing) or subsequent disposal of metals contaminated material. Furthermore, the concentrations and distribution of metals at the referenced locations are consistent with other samples collected throughout the Moffett Field area. Based on these two items, metals concentrations cannot be utilized to delineate landfill boundaries. The current landfill boundary, as estimated during the RI, is a result of the investigative techniques previously described in Comment Response #7.
17. PCBs were detected in one ESA soil sample from soil boring A02-02, not monitoring well boring W02-02A. This isolated detection of PCBs is approximately 400 feet southeast of the landfill boundary as established by the investigative techniques discussed in Comment Response #7. This area has not been designated as landfill material, because it is an isolated detection and investigative techniques indicate the landfill boundary is located as shown in Figure 2.3-11. Leachate well boring (W02-10[F]) is located within the fill area of the landfill as shown in the referenced figure. Again, based on the information provided by the previously discussed investigations, the landfill material did not extend to the reported location of the eastern burn pit.
18. See Comment Response #16. Additionally, detected Nickel concentrations (above background) are presented in both nature and extent chapters and Nickel is evaluated in the baseline risk assessment.
19. The selection of chemicals of potential concern (COPC) is outlined in Section 7.2.4. If inorganic constituents were present in the field samples at naturally occurring background levels, they are not selected as COPCs. Specifically, a chemical is not considered further if the upper 95 percent confidence limit of the sample concentrations in soil was within the range of background concentrations developed for Moffett Field.