

**CLEAN**

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**MOFFETT FEDERAL AIRFIELD, CALIFORNIA**

**OPERABLE UNIT 6  
RESPONSES TO COMMENTS ON  
DRAFT FINAL REMEDIAL INVESTIGATION REPORT**

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## ACRONYMS AND ABBREVIATIONS

Cal EPA	California Environmental Protection Agency
COC	Chemical of concern
CSF	Cancer slope factor
DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
FS	Feasibility study
GI	Gastrointestinal
HHRA	Baseline Human Health Risk Assessment
IRIS	Integrated Risk Information System
MFA	Moffett Federal Airfield
$\mu\text{g}/\text{kg}$	micrograms per day
$\text{mg}/\text{day}$	milligrams per day
$\text{mg}/\text{kg}$	milligrams per kilogram
$\text{mg}/\text{kg}/\text{day}$	milligrams per kilogram per day
OU	Operable unit
PAH	Polycyclic Aromatic Hydrocarbons
ppb	parts per billion
PRC	PRC Environmental Management, Inc.
PRG	Preliminary Remediation Goal
RAGS	Risk Assessment Guidance for Superfund
RfD	Reference dose
RI	Remedial Investigation
SGRA	State of California Risk Assessment Guidance
SQL	Sample Quantitation Limit
SVOC	Semivolatile Organic Compounds
SWRI	Station-wide Remedial Investigation
VOC	Volatile Organic Compounds

## 1.0 INTRODUCTION

This report presents point-by-point responses to comments received from regulatory agencies for the draft final Moffett Federal Airfield (MFA) operable unit 6 (OU6) remedial investigation (RI) report dated May 3, 1994. The comments were from Mr. Michael Gill of the U.S. Environmental Protection Agency (EPA) in a letter dated June 6, 1994, and from Mr. Joseph Chou of the California Environmental Protection Agency (Cal EPA), Department of Toxic Substances Control (DTSC) in a letter dated June 9, 1994.

This response to comments report has been divided into three sections. Section 1.0 presents an introduction. Section 2.0 addresses general comments and Section 3.0 addresses specific comments.

## 2.0 GENERAL COMMENTS

The following sections present responses to general comments. Section 2.1 presents DTSC comments and responses, and Section 2.2 presents EPA comments and responses.

### 2.1 DTSC COMMENTS

1. The DTSC agrees with the Navy that a purposive sampling is not appropriate in investigating every unknown source. However, in OU6, the contaminants were identified and it is necessary to conduct a hot spot analysis to further delineate the extent of contamination.

*Response: The Navy agrees that a hot spot analysis should be conducted for hazardous waste sites to further delineate the extent of contamination. By convention, hot spots are defined as small areas of contamination that exceed the site-wide mean concentration by a factor of 100 or greater. Based on this premise, the nature and extent of contamination investigation did not reveal evidence of hot spots at OU6.*

2. It is premature to conclude that groundwater is an incomplete exposure pathway in OU6. More on-going quarterly monitoring data will be evaluated in the OU1 Feasibility Study to further characterize the groundwater in the Runway Landfill (Site 1) area, the results can also provide important information to OU6 risk assessment. Therefore, the Navy should include this information in station-wide risk assessment when data are available.

*Response: Groundwater at OU6 is monitored during quarterly sampling at MFA. The data generated during these sampling events for wells in the vicinity of the Site 1 landfill are evaluated in the OUI feasibility study (FS). In addition, groundwater monitoring data collected throughout OU6 will be included in the station-wide remedial investigation (SWRI) and the associated baseline human health risk assessment (HHRA). The text of the OU6 RI has been amended to include a statement to this effect.*

3. The DTSC believes that the importance of full disclosure of the risks to the public cannot be over-emphasized. Especially when the contaminants are present at significant levels or are site specific. The Navy should invest time, effort, and cost communicating any risk information to the public at its first opportunity.

*Response: The Navy concurs that full disclosure of reasonable and appropriate risks be discussed with the public. The Navy intends to present this information at public meetings and Restoration Advisory Board meetings as part of the Navy's ongoing community relations efforts.*

## **2.2 EPA COMMENTS**

1. The Navy has stated that some significant differences exist between EPA Risk Assessment Guidance (RAGS) and the State of California risk assessment guidance (SGRA). Consistency in approach is important when performing risk assessment at different sites. But it should be noted that in the case where differences do arise between state and federal guidance, the Navy should be following whichever guidance provides the most health protection. If this is not the case for OU6, the Navy needs to use the most health protective methods.

*Response: Differences do exist between EPA and DTSC guidance. The Navy has attempted to conduct all risk assessment investigations with the most scientifically tenable risk assessment methodology. Risk assessment is carried out to be neither health "protective" nor "unprotective." Ultimately, these are risk management terms and do not apply to estimates of risk which are based on scientifically based risk information. The purpose of the risk assessment is not to derive the highest risk estimate, but the most accurate risk estimate. The degree of protectiveness will ultimately be determined by risk management decisions.*

2. Many responses to comments indicate that the Navy has strong feelings towards positions taken. Our intent in pointing out various Navy qualifying statements used to validate these positions<sup>1</sup> was not meant to slow down the remedial process in any way, but merely to indicate to the Navy that EPA did not view these statements as helping the reader to objectively come to any scientific conclusions regarding contamination at the site. All parties are very busy and we are sure no one finds that time necessary to argue about subjectivity is time well spent. It is suggested that in future Moffett Field documents, care be taken to be as objective as possible, so that both regulators and the community will be able to make decisions from objective points of view.

*Response: The Navy agrees that a collaborative effort should be developed among all MFA stakeholders. Every effort has been taken to conduct investigations under the most scientific, rigorous standards. However, communicating risk information is an inherent part of the risk assessment process. It is important to convey risk assessment information so that there is a sound understanding of what the risk estimates mean. The Navy welcomes the opportunity to work closely with all stakeholders, particularly regulators, to make all documents as technically correct and free from subjective interpretation as possible.*

3. The issue of background is one where the Navy continues to disagree with EPA. Simply stated, if the Navy does additional sampling to establish background for inorganics at Moffett Field, it should be noted that there is not guarantee that the results will be accepted by the regulators. Methods for screening chemicals of concern (COCs) using preliminary remediation goals (PRGs) have been communicated to the Navy in the past and decisions regarding OU1 and OU2 have been made using offsite background data.

*Response: When COCs were screened for the OU6 RI, OU-specific background concentrations for metals were not defined. In addition, uncertainty associated with off-site background concentrations used in the OU1 and OU2 RIs is being discussed. In an effort to be conservative, metals were not screened against background and those that would likely be eliminated in this process were retained as COCs. If the background issue is resolved, screening will be used in the SWRI.*

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<sup>1</sup> EPA General Comment #1 - risk assessment method overcautiousness  
EPA Specific Comment #8 - potential for abuse of frequency of detection criteria  
EPA Specific Comment #15 - finalization of guidance documents

4. Hotspots. No hotspot analysis was done for benzo(a)pyrene or any other COC. If an evaluation of hotspots was done, regardless of how cursory, it should be presented to the regulatory agencies.

*Response: A hot spot analysis for OU6 was conducted. The Navy concluded no further analysis was warranted because there was no historical information to show the presence of a source in OU6 and no apparent, clearly demarcated areas of elevated concentration (typically considered to be in excess of 100 to 1,000 times the mean site-wide concentration). If EPA has developed detailed criteria for defining a hot spot or statistical methods to identify a hot spot, it could be incorporated into the OU6 RI report.*

5. Purposive Sampling. It seems that the Navy may have misinterpreted the concept of "purposive sampling". While it may be true that an initial site investigation should not involve purposive sampling (sampling intended to better characterize known contamination), it is clear this type of sampling is necessary to narrow in on hotspots of contamination. How else can one sufficiently characterize nature and extent of contamination once an initial site investigation has been completed?

*Response: The Navy agrees that purposive sampling should be conducted to evaluate the nature and extent of contamination.*

6. A point should be made regarding the use of Monte Carlo uncertainty analysis. The Navy infers that this analysis tool is widely used, but then claims that development of simulations are still ongoing at Harvard University's Center for Risk Analysis. It appears that an incomplete tool was used at Moffett Field, as EPA stated earlier. The results from this test were unusable, yet the Navy must still pay their contractor for this work. One could argue that the Navy should have questioned the test's usefulness from the start.

*Response: According to an EPA Region 8 toxicologist, Monte Carlo simulations will at some point replace or augment the point estimate approach risk assessment. EPA is currently expending considerable resources refining its application, indicating EPA's commitment to probabalistic analysis. Monte Carlo simulation is a powerful tool for risk managers.*

### 3.0 SPECIFIC COMMENTS

The following are specific comments and responses for DTSC (Section 3.1) and EPA (Section 3.2) comments.

#### 3.1 DTSC COMMENTS

Comment Number 1. Page 2-2, Section 2.2. It is stated that there are no contaminant sources in OU6; this statement does not reflect the different contaminant sources mentioned in the Executive Summary and Section 1.3.

*Response: Section 1.3 refers to potential sources within OU6 based on historical station operations. Data do not indicate that the runway landfill (Site 1), the engine test stand (Site 11), and sump and separator 64 areas are sources of contamination at OU6. The Executive Summary and Section 1.3 have been modified to be consistent with the statement in Section 2.2 that there are no contaminant sources in OU6.*

Comment Number 2. Page 2-2, Section 2.3. Please clarify that the quarterly groundwater monitoring results in the vicinity of Runway Landfill will be included in OU1 Feasibility Study.

*Response: Quarterly groundwater monitoring results in the vicinity of the Site 1 landfill are included in the OUI FS. The text of the OU6 RI has been amended to include this information.*

Comment Number 3. Page 4-2, Section 4.1.1. The DTSC disagrees with eliminating micronutrients such as zinc and copper as chemicals of concern (COCs). Unlike macronutrients, they have appreciable toxicity. Copper and zinc should be carried through the risk assessment and summed with other contaminants to derive an overall hazard index in conformity with EPA and DTSC guidance.

*Response: Copper and zinc have been added as COCs to the risk assessment, although EPA has not developed toxicity values for copper for use in risk assessments.*

*Therefore, adding copper as a COC will not have a significant effect on the quantitative results of the risk assessment. Zinc has an oral reference dose of 3.0E-01 milligrams per kilogram per day (mg/kg/day), and therefore, will be carried through the quantitative portion of the risk assessment.*

Comment Number 4. Page 4-4, Section 4.1.3. In Table A-3A.1, 34 of 47 samples have detection limits from 1,000 to 400,000 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ). It is not uncommon that different factors may contribute to the high detection limits of Polycyclic Aromatic Hydrocarbons (PAHs) as was extensively discussed in Navy's responses to regulatory agencies comments. For example, the concentration of benzo(a)pyrene at SSRP-023 was 140  $\mu\text{g}/\text{kg}$ . This value is much higher than DTSC suggested screening value of 20  $\mu\text{g}/\text{kg}$ . Therefore, the DTSC thinks that benzo(a)pyrene should be carried through the baseline human health risk assessment (HHRA) as COCs.

*Response:* *After meeting with the regulatory agencies on July 13, 1994, seven soil and sediment locations were resampled on July 22, 1994. These locations were chosen based on elevated detection limits for semivolatile organic compounds (SVOCs). Consequently, the samples were analyzed only for SVOCs, and validated using the National Functional Guidelines for Organic Data Review (EPA 1991). These data replace the previous SVOC analytical results for these sample locations, and the nature and extent of contamination and risk assessment have been re-evaluated using the resampling data.*

*The sample quantitation limits (SQLs) for each of the seven soil and sediment samples collected in July 1994 were consistently lower than the SQLs reported for the samples collected from these locations during 1993. In the seven 1994 samples, benzo(a)pyrene was not detected and the SQLs for this compound ranged from 730 to 1,600  $\mu\text{g}/\text{kg}$ . In addition, benzo(a)pyrene was detected in only one of the remaining samples collected in 1993; therefore, it was not retained as a COC nor was it carried through the risk assessment.*

Comment Number 5. Page 6-8, Section 6.3.2.2. The DTSC recognizes that the frequency of detection is generally used as an optional screening criteria to eliminate COCs. However, if any elevated concentration of contaminants have been identified, the Navy should carry the COCs through the Baseline Human Health Risk Assessment (HHRA).

*Response:* The following chemicals were eliminated as COCs in soil and sediments based on frequency of detection: aldrin, bis(2-ethyl)hexyl phthalate, benzo(a)pyrene, chloroform, and chlorobenzene. The maximum detected concentrations for these chemicals are as follows: aldrin, 0.060 milligrams per kilogram (mg/kg); azinphos-methyl, 0.270 mg/kg; endosulfan sulfate, 0.0037 mg/kg; bis(2-ethylhexyl)phthalate, 0.7 mg/kg; benzo(a)pyrene, 0.140 mg/kg; chloroform, 0.025 mg/kg; and chlorobenzene, 0.046 mg/kg. These concentrations were not considered elevated and the chemicals were not selected as COCs.

Comment Number 6: Page 6-18, Section 6.4.4. In the Supplemental Guidance for Human Health Multimedia Risk Assessments of Hazardous Waste Sites and Permitted Facilities (DTSC, 1992), it is addressed that the soil ingestion rate for an industrial worker is 50 to 100 mg/day. EPA and DTSC recommend 480 milligrams per day (mg/day) for construction workers and it should be applied to OU6.

*Response:* Construction workers were not considered potential receptors at OU6. Construction activities would violate laws applicable to federally delineated wetlands. Industrial workers such as people performing limited maintenance activities at the pump stations are the most likely receptors at OU6. An ingestion rate of 50 mg/day was assumed for this type of worker. It would be unreasonable to assume that an industrial worker would be involved in activities that would result in ingestion of large quantities of soil such as 480 mg/day.

Comment Number 7: Page 6-18, Section 6.4.4. As previously mentioned in our Specific Comment 10 on Draft OU6 RI, the default value of 350 days per year should be used for yearly exposure. Based on the site visit record, even during the "wet season", most area of OU6 is still accessible for recreational uses.

*Response:* The exposure period assumed for occupational and recreational receptors is 250 days per year. The first full paragraph on page 6-17 of the final OU6 RI states that during the months of May through September, occupational and recreational receptors are exposed to soils and sediments, and for the months of October through April they are exposed to soils only.

Comment Number 8: Page 6-20, Section 6.4.5. According to Preliminary Endangerment Assessment Guidance (DTSC, 1994) the dermal absorption factor of arsenic is 3 percent and this value should be used in OU6 HHRA. DTSC uses this value for all risk assessments be they baseline or screening.

*Response: The value of 3 percent has been used to evaluate dermal absorption of arsenic. All relevant exposure calculations have been adjusted accordingly.*

Comment Number 9: Page 6-28, Section 6.5.2.8. The third sentence of the first paragraph should be revised as "Although classified by EPA as a probable carcinogen (Class B2), the systemic manifestation of non-carcinogenic pathological effects indicates that DDT is not highly toxic as indicated by the dose-response relationship...".

*Response: This change has been incorporated in the final OU6 RI report.*

Comment Number 10: Page 6-37, Section 6.5.2.18. It is incorrectly to state that the Cal/EPA inhalation cancer slope factor (CSF) only applies to nickel dust. The Cal/EPA CSFs applies to all forms of nickel.

*Response: The text has been changed to indicate that the California value applies to all forms of nickel.*

Comment Number 11: Page 6-38, Section 6.5.2.20. The reason that there is no direct evidence of PAHs carcinogenicity is simply because that studies of exposure to purified PAHs only have not been carried out in humans. As it is stated in the text that epidemiological studies have shown many evidences of increased human cancers from exposure to PAH containing mixtures.

*Response: In addition to referencing studies on humans exposed to PAH mixtures, the text states, that these mixtures are chemically complex and the diversity of exposures makes it difficult to identify a single PAH.*

Comment Number 12: Page 6-43, Section 6.6. The DTSC disagrees that gastrointestinal absorption factors should be used in the HHRA because gastrointestinal absorption is accounted for in determination of the reference dose (RfD) or CSF.

*Response: Section A.1 Adjustments of Toxicity Value from Administered to Absorbed Dose pages A-1 and A-2 of RAGS states that "most RfDs and some slope factors are expressed as the amount of substance administered per unit time and unit body weight, whereas exposure estimates for the dermal route of exposure are eventually expressed as absorbed doses. Thus, for dermal exposure to contaminants in water or in soil, it may be necessary to adjust an oral toxicity value from an administered to an absorbed dose." If gastrointestinal absorption were accounted for in the derivation of toxicity values, it would be stated so in the Integrated Risk Information System (IRIS) toxicity profile. This is not the case for any COCs in the OU6 risk assessment. Therefore, it is necessary to account for gastrointestinal absorption when estimating risks due to dermal exposure. To do otherwise would likely underestimate risks.*

### 3.2 EPA COMMENTS

Comment Number 7: From EPA General Comment #3. The constituent benzo(a)pyrene should be carried through the risk assessment process. If it does drive the risk assessment, a risk management decision can be made on how to proceed by also looking at history of use, areas of high hits, etc. The Navy should perform initial screening using the EPA Preliminary Remediation Goal (PRG) tables. If in fact the highest detection limits<sup>2</sup> for benzo(a)pyrene in soils and sediment are the result of media interference, more proof should be given. By retaining this carcinogen throughout the risk assessment regardless of the questions surrounding the high detection limits, risk managers will be able to see its effect on the total risk. In fact, the areas where the highest detection limits of this constituent are found may be areas for a hotspot analysis to be performed.

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<sup>2</sup> For example, Table A-3A.1 shows detection limits of 260,000 parts per billion (ppb) for SSNC-002 and 400,000 ppb for SSNC-003, 15,000 ppb for SSRP-013.

*Response:* After meeting with the regulatory agencies on July 13, 1994, seven soil and sediment locations were resampled on July 22, 1994. These locations were chosen based on elevated detection limits for SVOCs. Consequently, the samples were analyzed only for SVOCs, and validated using the National Functional Guidelines for Organic Data Review (EPA 1991). These data replace the previous SVOC analytical results for these sample locations, and the nature and extent of contamination, and risk assessment have been re-evaluated using the resampling data.

*The SQLs for each of the seven soil and sediment samples collected in July 1994 were consistently lower than the SQLs reported for the samples collected from these locations during 1993. In these seven samples, benzo(a)pyrene was not detected and the SQLs for this compound ranged from 730 to 1,600 µg/kg. In addition, benzo(a)pyrene was detected in only one of the remaining samples collected in 1993, therefore, it was not retained as a COC nor was it carried through the risk assessment.*

**Comment Number 8:** From EPA Specific Comment #9. It is stated here that methylene chloride and chloroform are volatile organic compounds (VOC's). Table 6-47 shows them listed as SVOC's. Also, Table 6-48 does not contain these compounds at all, as the response states. Please clarify.

*Response:* Methylene chloride and chloroform are VOCs. All tables have been corrected to list these compounds under the correct analytical group. Table 6-48 lists risks associated with compounds detected in surface water and was incorrectly referenced in the response to comments on the draft OU6 RI. Methylene chloride was not retained as a COC in surface water, and chloroform was not selected as a COC in any medium.

**Comment Number 9:** From EPA Specific Comment #12. The Navy agreed to incorporate this statement regarding carcinogen risk levels, but it does not appear in the draft final.

*Response:* The omission has been corrected.

Comment Number 10: From EPA Specific Comment #13. Please be sure that the correct gastrointestinal (GI) absorption factor for inorganics, 5%, is used in the formula for toxicity factors and not .05% as shown in Tables 6-62 and 6-63.

*Response:*                    *The correct absorption factor has been presented.*

#### **4.0 REFERENCES**

U.S. Environmental Protection Agency (EPA). 1991. National Functional Guidelines for Organic Data Review, Multi-Media, Multiconcentration and Low Concentration of Water. EPA Contract Laboratory Program. June.

EPA. 1994. Personal Communication with Susan Griffin, EPA Region 8.