

**RESPONSES TO REGULATORY AGENCY COMMENTS ON THE
DRAFT SITE 4 HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT
INSTALLATION RESTORATION SITE 4
NAVAL FUEL DEPOT POINT MOLATE, RICHMOND, CALIFORNIA
JANUARY 8, 2003**

This document presents the Department of the Navy's (Navy) responses to comments from the California Regional Water Quality Control Board (RWQCB), San Francisco Bay Region, on the Draft Site 4 Human Health and Ecological Risk Assessment [HHERA] Installation Restoration [IR] Site 4, Naval Fuel Depot [NFD] Point Molate, Richmond, California. Comments were received from Adriana Constantinescu of RWQCB in an electronic mail dated November 6, 2002.

RESPONSES TO RWQCB COMMENTS

General Comment

1. **Comment:** The draft HHERA report describes the results of a field investigation and risk assessment conducted by TtEMI and recommends further evaluation under the underground storage tank (UST) program/no further action. Regional Board does not concur with the recommendation for no further action because the site conceptual models used to produce the numbers for human health and ecological hazard quotient do not consider groundwater to surface water and shallow soils as a potential exposure pathway.

Response: To address the groundwater to on-site surface water pathway for human receptors, the final report will be revised to explain that surface water is not present at IR Site 4 and the depth of groundwater at IR Site 4 (typically greater than 10 feet below ground surface [bgs]) precludes discharge of groundwater to the surface at the site. For these reasons, no complete on-site groundwater to surface water exposure pathways exist.

Although groundwater at IR Site 4 may discharge off-site to the bay, the groundwater to off-site surface water (bay water) pathway for human receptors is likewise incomplete or negligible. Human receptors are not expected to ingest bay water. Although dermal contact by human receptors with bay water may occur, rapid dilution of chemical concentrations in groundwater will occur at the groundwater/bay water interface, rendering dermal exposures negligible. The conceptual site model will be revised to show both on-site and off-site groundwater to surface water exposure pathways as incomplete or negligible for human receptors. None of these pathways will be quantitatively evaluated in the human health risk assessment (HHRA).

To address the groundwater to shallow soils exposure pathway for human receptors, the final report will be revised to evaluate migration of volatile contaminants in groundwater through the vadose zone. This evaluation

will assess the potential exposure associated with vapor intrusion of volatile contaminants in groundwater to indoor air (see response to specific comments #2 and #3).

To address the groundwater to surface water pathway for ecological receptors, the final report will be revised to further explain that there is no surface water present within IR Site 4, but that groundwater from the site may migrate to the bay. The report also will be revised to explain in more detail that the bay was evaluated in a baseline offshore ecological risk assessment (ERA) and that there has been no negative effects to the overall health of the bay as a result of releases from NFD Point Molate (Entrix and Tetra Tech EM Inc. [TtEMI] 1999). Appendix F of the draft report evaluates the groundwater to off-site surface water exposure pathway for ecological receptors by comparing contaminant concentrations to action levels that are protective of ecological receptors (off-site in the bay). For the final report, the conceptual site model will be revised to show that the groundwater to off-site surface water (bay water) pathway is potentially complete for ecological receptors.

RWQCB's specific comments indicate that volatilization of contaminants in deeper soils (3 to 10 feet bgs) or groundwater should be considered for ecological receptors such as burrowing animals. The text will be revised to include a discussion of the potential for vapor exposure in the burrows of the California ground squirrel.

Specific Comments

- 1. Comment:** **Executive Summary, Page ES-2: Please clarify the statement presented at the end of the second paragraph that stated "more refined exposure assumptions was also included in this ecological risk assessment (ERA)."**

Response: According to Navy ERA guidance (1999), the Tier 2, Step 3a evaluation of risk recommends that more refined exposure assumptions be used from available literature on the selected receptors to produce less conservative, but more realistic results. TtEMI will change the above-referenced sentence as follows: "more refined exposure assumptions from the available literature were used in Step 3a of the ecological risk assessment (ERA) for parameters such as body weight, bioconcentration, food ingestion rate, and soil ingestion rate."

- 2. Comment:** **Executive Summary, Page ES-3: Regional Board staff does not concur with the statement presented on the second paragraph that "no complete exposure to humans was identified because groundwater is more than 10 feet below ground surface." This statement is in total contradiction with the geological description presented on page 6 of this report: "the fill typically contains areas of disturbed colluvium, but is generally unconsolidated and heterogeneous and creates**

unpredictable preferential flow pathways for groundwater and migration of contaminants.” Also in the “Hydrogeology” section of this report it is stated that “the shoreline areas exhibit little or no relief, resulting in a highly variable water table that is, in some places, in hydraulic communication with San Francisco Bay. On the same page it is presented that “*Site 4 is entirely underlain by fill along the bay*” and everyone knows that the fill has a high permeability and is a real conduit for VOCs to migrate to the shallow soils and to San Francisco Bay waters.

Response:

The statement “no complete exposure to humans was identified because groundwater is more than 10 feet below ground surface, which is outside of the potential construction worker scenario” will be revised to state, “Along the shoreline of IR Site 4, no complete groundwater exposure pathways to human receptors were identified.” In addition to the rationale provided in the draft HHERA, further rationale will be provided to explain that surface water is not present at IR Site 4, and the depth of groundwater at IR Site 4 (typically more than 10 feet bgs) precludes groundwater discharge to the surface at the site.

The executive summary also will be revised to explain that in areas of IR Site 4 away from the shoreline, direct groundwater exposure pathways (e.g., ingestion, dermal contact) remain incomplete for human receptors. However, indirect exposure to groundwater via vapor migration represents a potentially complete exposure pathway for human receptors and will be evaluated.

The geological and hydrogeological descriptions presented in the report will be revised to explain that the interface between IR Site 4 groundwater and bay water occurs at depth well below the ground surface (typically more than 10 feet bgs), where rapid dilution of chemical concentrations in groundwater will occur immediately upon discharge to the bay. If necessary, other revisions to the hydrogeology section will be made so that potential contradictory information is not included in the final report.

To further justify the conclusion that contaminants detected in groundwater at IR Site 4 are not expected to have adverse effects on aquatic receptors in the bay, the final report will also explain that while groundwater may migrate to San Francisco Bay, migration of volatile organic compounds (VOC) in groundwater to the bay is not a concern because:

- Although groundwater may migrate to the bay, there have been no negative effects to the overall health of the bay as a result of releases from NFD Point Molate as presented in a baseline offshore ERA (Entrix and TtEMI 1999).
- Concentrations of VOCs in IR Site 4 groundwater are evaluated against ecological risk-based screening criteria in Appendix F of the report; there are no exceedances of these criteria.

3. **Comment:** Section 4.1, HHRA Methodology: Regional Board staff does not concur with the statement presented on page 21, *“The HHRA does not quantitatively evaluate potential health effects associated with exposure to contaminants in groundwater, which is not a potential exposure medium under current site conditions and potential future land use scenarios at Site 4.”* See comment #2 for reasoning.

Response: The text in Section 4.1 will be revised to explain that the HHRA does not quantitatively evaluate potential health effects associated with direct exposure (e.g., ingestion, dermal contact) to contaminants in groundwater. The rationale provided in the response to comment #2 will be restated in this section to justify that direct exposure to groundwater is incomplete. The section will be further revised to evaluate indirect exposure to groundwater via vapor migration of VOCs in groundwater to indoor air.

4. **Comment:** Section 5.0, Ecological Risk Assessment: The recommendation made at the end of the second paragraph on the page 40, i.e. *“because this screening ecological risk assessment (ERA) is based on conservative exposure parameters from the literature, potential risks identified at the investigation areas should not be interpreted as an indicator that definite risks exist for a specific receptor”* should be discussed further. Please modify.

Response: Values of exposure parameters such as body weights, bioconcentration factors, prey ingestion rates, and soil ingestion rates, were taken from the available literature. The use of literature values allows for reasonable risk estimates, without the time and effort of gathering site-specific information. However, literature values tend to be conservative, resulting in uncertainties. These uncertainties include the applicability of the risk to the actual on-site receptor and a greater estimated hazard index (HI) for a specific receptor than the actual HI that contaminants at the site are expected to pose. Therefore, in evaluating the significance of the HI, the conservative nature of the exposure parameters should be considered. Recent guidance reiterates that the conservative assumptions that typically are included in a screening level ERA are likely to result in overly conservative HI estimates. As stated in the Ecological Risk Assessment Guidance for Superfund (U.S. Environmental Protection Agency [EPA] 1997), “Conservative assumptions have been used for each step of the screening level ecological risk assessment. Therefore, requiring a cleanup based solely on this information would not be technically defensible.” The text will be revised to explain in more detail the conservative nature of the exposure assumptions used in the ERA calculations.

5. **Comment:** Section 5.3.2, Factors of Chemical Fate and Transport: The following assumption presented on the last paragraph of page 49 is not acceptable to the Regional Board staff: *”Only COPC in surface soil (0 to 3 feet bgs) were considered available to ecological receptors at Site 4.”* The general reasons presented in the same paragraph (*“the movement of chemicals in the environment also depends on several factors such as vapor pressure, water solubility, and sorption. These factors govern the distribution of chemicals among various phases (gas, liquid, or solid) and chemical mobility in the environment”*) do not justify this assumption. The 11 chemicals identified as COPECs for Drum Lot 1 because EPCs exceed ecological FPALs were not characterized according to those factors. At Site 4, do we have chemicals identified as COPECs that exceed ecological FPALs between 3 and 10 feet bgs that could vaporize and migrate into the shallow soils?

Response: In the final report, chemicals of potential ecological concern (COPEC) detected in soil between 3 to 10 feet bgs will be considered for their potential to migrate into shallow soils.

6. **Comment:** Section 5.6.2, Uncertainties: This section ends with the statement that *“The overall effect of these uncertainties and conservative assumptions cannot be quantitatively calculated without site-specific information.”* Regional Board staff recommends site-specific information missing from this report be collected and the level of uncertainties be reduced in the decision process for Site 4.

Response: Although literature values are used, the ERA provides a reasonable, conservative estimate of risk that must be considered when evaluating the HI for a specific ecological receptor.

Collection of site-specific data would have a lengthy turn around time, and the relatively low HIs do not warrant an additional collection of data. TtEMI will re-evaluate the uncertainties to determine where further refinements can be made to the overall ERA. In particular, use of the benzo(a)pyrene (B[a]P) as a surrogate for all constituents in motor oil and diesel is very conservative; instead, total petroleum hydrocarbon (TPH) constituents need to be separated into groups of chemicals that produce effects by the same toxic mechanism as recommended by EPA in the Ecological Risk Assessment Guidance for Superfund (EPA 1997).

7. **Comment:** Section 5.9 and 6.0, Summary and Conclusions: Section 5.9 ending the Ecological Risk Assessment section of the report and the following section 6.0 have the same title. Regional Board staff recommends the change of the first one, for clarity.

Response: The Section 5.9 header will be changed from “Summary and Conclusions” to “Ecological Risk Assessment Summary and Conclusions”. In addition, the Section 4.5 header will be changed to “Human Health Risk Assessment Summary and Conclusions” for clarity and consistency. The Section 6.0 header will remain “Summary and Conclusions”.

8. **Comment:** Section 5.9, Summary and Conclusions: Regional Board staff does not concur with the conclusions presented in this section, like: *“Because the HQs for these TPH products are relatively low considering the conservatism of the risk calculations (1.74 to 15 for Step 3a)...no further action is recommended”*. Please see the above comment #6 for reasoning.

Response: HIs greater than 1 were identified at the South Shoreline area for the California ground squirrel (15) and the Western meadowlark (1.93). These HIs are attributed to motor oil range organics (MRO). The RWQCB recently concurred with the Navy’s request to further evaluate the South Shoreline area under the UST program.

In Drum Lot 1, the HI for the California ground squirrel was greater than 1 for MROs (6.82) and diesel range organics (DRO) (1.74). Because no toxicity information is available for MROs and DROs, B(a)P, the most toxic fuel constituent, was used as a surrogate in the ERA. The use of B(a)P as a surrogate for TPH products results in a conservative estimate of risk; therefore, TtEMI will reduce this level of conservatism by separating TPH constituents into groups of chemicals that produce effects by the same toxic mechanism (EPA 1997).

9. **Comment:** Figure 5-1: Figure 5.1 is deficient in the graphical representation of several exposure pathways, like complete exposure pathway between plants and mule deer and others.

Response: The legend in Figure 5.1 will be revised to correct this deficiency; the word “potential” will no longer precede “exposure pathway” and the word “complete” will no longer precede “exposure pathway to be assessed.”

10. **Comment:** **Figure 5-2:** Figure 5.2 is deficient in the representation of groundwater as an “*incomplete or minor*” exposure pathway. Groundwater is actually one of the main pathways leading to the Bay, the aquatic receptor. See also, comments #3 and #4 above and please modify.

Response: This figure will be revised so that the groundwater to surface water pathway is not shown as incomplete or minor. However, the aquatic pathway to the bay was evaluated in the offshore ERA (Entrix and TtEMI 1999) and thus, will not be considered further in the final IR Site 4 document.

11. **Comment:** **Appendix E, Evaluation of Groundwater Data:** Regional Board staff considers that the reasons presented to justify the assumption that “*human health effects from exposure to groundwater at Site 4 are not evaluated because groundwater is not a potential exposure medium*”. Regional Board staff requests additional discussion of this assumption taking into consideration the fate in the environment of the five chemicals detected in the groundwater samples at levels above the action levels. See also comment # 2.

Response: The text in Appendix F will be revised to refer the reader to the appropriate sections of the HHRA elsewhere in the document that discuss incomplete and potentially complete groundwater exposure pathways at IR Site 4. As discussed in the responses to general comment #1 and specific comments #2 and #3, the HHRA will be revised to evaluate indirect human exposure to groundwater via vapor intrusion.

References

Department of the Navy (Navy). 1999. Navy Guidance for Conducting Ecological Risk Assessments. On line at: <http://web.ead.anl.gov/ecorisk/process>

Entrix and Tetra Tech EM Inc (TtEMI). 1999. “Final Offshore Ecological Risk Assessment for Naval Fuel Depot, Point Molate, Richmond, California.” November 24.

Environmental Protection Agency (EPA). 1997. Ecological Risk Assessment Guidance for Superfund. Process for Designing and Conducting Ecological Risk Assessments. Interim Final. EPA 540-R-97-006. June.



Tetra Tech EM Inc.

4940 Pearl East Circle, Suite 100 ♦ Boulder, CO 80301 ♦ (303) 441-7900 ♦ FAX (303) 449-5585

January 8, 2003

Mr. John Kowalczyk
Department of the Navy
Southwest Division
Naval Facilities Engineering Command
1230 Columbia Street, Suite 1100
San Diego, California 92101

**Subject: Response to Agency Comments on the Draft Site 4 Human Health and Ecological Risk Assessment Report
Naval Fuel Depot Point Molate, Richmond, California
CLEAN II Contract No. N62474-94-D-7609, Contract Task Order (CTO) 384**

Dear Mr. Kowalczyk:

Enclosed are six copies of the response to comments for the Draft Site 4 Human Health and Ecological Risk Assessment for your review and distribution.

If you have any questions or comments, please call me at 303-441-7916.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jim Knight', is written over a horizontal line.

Jim Knight
Project Manager

Enclosure

cc: See Document Transmittal Form



TRANSMITTAL/DELIVERABLE RECEIPT

Contract No. N62474-94-D-7609

Document Control No. DS . 0384 . 15690

TO: Mr. Ron Fuller, Code 02R1.RF
Contracting Officer
Naval Facilities Engineering Command
Southwest Division
1230 Columbia Street, Suite 1100
San Diego, CA 92101-8517

DATE: 01/08/03
CTO: 384
LOCATION: NFD Point Molate, Richmond

FROM: Daniel Chow, Program Manager

DOCUMENT TITLE AND DATE:

Response to Regulatory Agency Comments on the Draft Site 4 Human Health and Ecological Risk Assessment Report
January 8, 2003

TYPE: Contractual Deliverable (unchecked), Technical Deliverable (checked), Other (TC) (unchecked)

VERSION: NA REVISION #: NA

ADMIN RECORD: Yes (checked), No (unchecked) CATEGORY: Confidential (unchecked)

SCHEDULED DELIVERY DATE: 04/01/02 ACTUAL DELIVERY DATE: 01/08/03

NUMBER OF COPIES SUBMITTED TO NAVY: O/9C/9E
Legend: O = original transmittal form, C = copy of transmittal form, E = enclosure

COPIES TO: (Include Name, Navy Mail Code, and Number of Copies)

Table with columns: NAVY, TtEMI, OTHER. Rows include John Kowalczyk (06CM.JK), Basic Contract File (02R1), Diane Silva (05G.DS) *.

Date/Time Received