

MEMORANDUM

**To:** Jim Sullivan, Treasure Island BRAC Environmental Coordinator, and Treasure Island Restoration Advisory Boardmembers

**From:** John C. Allman, Community Member, Treasure Island Restoration Advisory Board and Technical Subcommittee

**Date:** May 23, 1997

**Re:** Comments concerning *Draft Remedial Investigation Report Addendum 3: Ecotoxicological Testing for the Development of Petroleum Screening Levels*

Following are my comments concerning the abovementioned document. I wish to thank Mr. Sullivan for allowing the community members of the RAB extra time to comment on the document. (Reference transcript of May 20, 1997 General RAB Meeting.) I have first included general comments which apply to the entire document followed by specific comments relevant to particular sections of the document.

**General Comments:**

1. Choice of Receptors

My first general comment concerns the receptors which were used for the bioassay studies. Why were bioassays performed only on the purple sea urchin and blue mussel? In the portion of the Bay where Treasure Island (TI) is located there are several receptors which are likely to come in contact with contamination from the Island. For example, why were bioassays not conducted on the following species:

- Anchovies
- Starry Flounder
- Bat Ray
- Japanese Littleneck Clam
- Asian Clam
- Zebra Mussel
- Sea Squirts

All of these species (and others not listed here) are prevalent in the Bay, and it needs to be explained in the document how the two species tested in this study are representative of the other species.

2. Bioaccumulation

Why was bioaccumulation not considered in determining petroleum screening levels. Although the study contends to determine screening levels based on bioassay results for the two considered species, other animals higher up in the food chain will bioaccumulate the contamination passed on to them while they eat other lower level organisms in the Bay. It needs to be

estimated how the petroleum hydrocarbons will affect organisms higher up on the food chain (considering bioaccumulation), or explained why it is not necessary to include these effects. I am looking for a scientific response to this question and I will not consider the answer "the regulatory agencies involved did not require us to do this" an adequate response.

3. Data Validation

Section 4.3, Data Validation for the toxicity tests, lists many problems with the sample handling and preparation for several samples used in both bioassay tests. Making statements that the result of such QC problems is "unknown" or "is not expected to have had a significant impact on the sample toxicity" is not appropriate in my opinion, especially as concerns the elevated ammonia levels in *two out of the three* Site 12 samples (199TT04E and 199TT09E), which caused these samples not to be used in determining the petroleum screening levels. As Site 12 is one of the most significantly contaminated sites on TI, it is necessary that samples from it be included in determining appropriate screening levels. Since the screening levels arrived at in this report are to be used for establishing cleanup levels throughout TI, it is extremely important that these analyses be carried out meeting *all* QC criteria, and therefore the bioassays should be redone accordingly. Even though additional contaminants, such as ammonia, make the data unusable for determining effects only of TPH's on receptors, bioassays incorporating mixed contaminants would more realistically portray what effect these toxins will have on Bay receptors.

Specific Comments:

Executive Summary

- Page ES-2 - How will the higher screening levels for inland sites be determined?

Section 1.1. Approach, Purpose, and Application

- Page 2 - "Alternatively, if soil disposal was anticipated as part of a removal operation, soils could also be evaluated following dredge disposal guidance wherein preparation of eluates would be prepared following a less aggressive extraction procedure."  
Does this sentence pertain to soil that is disposed of at another location on TI? If not, why would the toxicity of removed soils need to be considered, if all the contaminated soil is to be removed from the Island and therefore will not enter the Bay?

Section 2.2.2. Analytical Procedures

- Page 6 - "Two types of toxicity tests were chosen for this study...."  
As I stated in my general comments, why were these two species chosen, and why was it determined that tests of other species were deemed not necessary?

Section 3.1.2.1 Soil Results

- Page 10 - "Several metals ... exceeded ambient metals concentrations." (This comment also applies to discussion of other samples with mixed contaminants and high levels of metals, ammonia, etc.)  
Will a similar toxicity study be conducted under the CERCLA program for contaminants other than TPH's? Also, will such studies incorporate the synergism of mixtures of contaminants, such as two metals with TPH's, etc?

Section 4.1.1.1. Bivalve Shell Development Test

- Page 20 - "Samples ... collected from Site 15 ... demonstrated almost no toxicity."

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This statement implies that the samples demonstrated *some* toxicity, which may not be significant for the individual receptors studied, but bioaccumulation up the food chain will amplify the effect of the toxins. Please refer to my general comments on bioaccumulation.

#### Section 4.3. Data Validation

- Please refer to my general comments on the problems with meeting QC criteria.

#### Section 4.3.2. Echinoderm Abnormal Development Toxicity Test

- Page 23 - "The eluate for these samples was prepared as soon as possible after the samples were received at the laboratory and were then held until samples received the next day were ready so that all bioassay treatments ran concurrently."  
Why was it necessary to run the bioassays concurrently at the expense of following prescribed QC criteria? The contracted lab should have performed the analyses within the proper time frame for the results to be considered acceptable.

#### Section 5.2.1.3. Discussion of Contaminant Contribution to Eluate Toxicity

- Page 27 - "In summary, there does appear to be some toxicity due to metals and ammonia that is not related to the measured TPH."  
As I asked earlier, at what point will bioassays be conducted under the CERCLA program to determine the effects of metals and ammonia, since they occur as mixed contaminants on several sites.

#### Section 5.2.2.1. Bivalve Threshold Values

- Page 28 - The value of 39.6 mg/L arrived at for a TPH screening level apparently does not include data from even the assumed "validated" sample (199TT05E) at Site 12. No Site 12 samples are included in in Table 12, which is referenced in this section. Why was no Site 12 data used in the determination?

#### Section 5.2.2.2. Echinoderm Threshold Values

- Page 28 - Similar to my comment for the bivalve threshold values, the TPH EC10 of 14.3 mg/L apparently does not include sample information from Site 12, as Table 13 does not show any Site 12 data. Why was no Site 12 data used in the determination?

#### Section 5.3.2. Petroleum Screening Level For Soil

- Page 29 - Please explain how the equation "Petroleum Screening Level for Soil" gives a screening level of 430 mg/kg for soil. By my calculations 14.3 mg/L divided by 3.3 gives a result of 4.3 mg/L. Please show all the steps in the calculation which gave the 430 mg/kg soil result, as these steps were left out of the text and therefore leave the dimensional analysis unclear.

This concludes my comments for the abovementioned document.

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Tetra Tech EM Inc. (Richard Krapp)

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