



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

October 2, 1995

Mr. Dave Song  
Mail Code 09ER1  
Engineering Field Activities West  
900 Commodore Drive, Building B102  
San Bruno, CA 94066-2402

Dear Mr Song:

**DRAFT FINAL TREATABILITY STUDY WORK PLAN FOR TREATING SUBSURFACE  
PETROLEUM PRODUCTS AT SITE IR-3 BY BIODEGREATION HUNTERS POINT  
ANNEX**

Enclosed please find the Environmental Protection Agency's (EPA)  
comments regarding the subject document.

If you have any questions regarding these comments, please call  
me at (415) 744-2410.

Sincerely,

A handwritten signature in cursive script that reads "Sheryl Lauth".

Sheryl Lauth  
Remedial Project Manager

Attachment

cc: Michael McClelland, EFA West  
Cyrus Shabahari, DTSC

**COMMENTS ON THE  
DRAFT FINAL TREATABILITY STUDY  
FOR TREATING SUBSURFACE PETROLEUM PRODUCTS  
AT SITE IR-3 BY BIODEGRADATION WORK PLAN  
for  
Hunters Point Annex  
San Francisco, California**

**GENERAL COMMENTS**

1. Explain how high and low TPH concentration soils will be distinguished for the respirometry and solid phase treatability testing. Because it was stated that these treatability samples cannot be stored for more than 48 hours before they are unsuitable for biodegradation testing, it is assumed that resampling for both of these treatability tests must be performed.

As stated in the SAP, all excavations will be backfilled after initial soil characterization sampling. It was also stated that data from the initial soil characterization sampling will be used to determine high and low TPH concentration soil samples. However, re-excavation at the same location of the high and low TPH hits will not provide similar soil. Because these locations have been backfilled, the soil has also been vertically and horizontally mixed.

2. Please clarify the analytical tests that will be performed at the start of each treatability tests, respirometry and solid phase treatment.
3. The procedures to collect the treatability soil samples can be optimized to reduce the amount of sampling required, while still keeping the quality control and assurance.

**SPECIFIC COMMENTS**

1. **Plate 1-2.** Two borings (IR02MW173 and IR02B098) are shown with floating product and no soil contamination. This is unlikely because floating product is normally smeared onto soil when the water table fluctuates. Please correct. Also, please state that borings are projected into the line of section or correct the "lines of cross section" on Plate 1-4.
2. **Section 4.0: Page 7, 1st paragraph.** The objective of the treatability study should be expanded to include providing performance criteria for a full scale system should the technology be deemed applicable for remediation of the site.
3. **Section 4.0: Page 7, 2nd paragraph.** Explain what is meant by high mobility. High mobility in soil or water? For which contaminants?

4. **Section 4.0: Page 7, last sentence.** Provide the rationale or reference for selecting a TPH-d concentration of 1000 mg/kg as the target value and indicator of successful biodegradation. Further, it would seem that establishing a percentage of the initial sample concentration may be a more appropriate guideline for evaluating the effectiveness of bioremediation.
5. **Section 4.0: Page 10.** This objective should be expanded to include VOC monitoring to assess the fraction of volatilization and anticipated impacts on air quality during full scale implementation.
6. **Section 5.0: Pages 11 & 12.** Describe the in-house methods for performing field moisture holding capacity and plate counts.
7. **Section 5.0: Page 14, Task 5, "Theory of Respirometry."** Please provide an equipment description and applicable schematics for the N-CON respirometer.
8. **Section 5.0: Page 16, Task 5 "Respirometry Task Description," 1st paragraph, 3rd sentence.** It is implied, but not fully explained that for the sterile control samples, mercuric chloride will be added to kill all the biological organisms in the soil. Please explain further.
9. **Section 5.0: Page 17, Task 8 "Solid Phase/Land Treatment Simulation".** As indicated in Specific Comment number 4 above, this task should be expanded to include an evaluation of volatilization and predicated impacts on the air quality during full scale implementation. Unlike the slurry phase respirometry test (task 5), solid phase land treatment is not anticipated to occur within an enclosed system, and would therefore impart VOCs to the atmosphere. Such data would assist in determining the air emissions for future permitting should the process be used in full scale implementation.
10. **Section 5.0: Page 18, Task 8 "Solid Phase/Land Treatment Simulation," 2nd paragraph, 2nd sentence.** This sentence implies that high and low TPH concentration soils, will be sampled at the same grid locations where the respiratory samples were taken. Is this correct?
11. **Section 5.0: Page 18, Task 8 "Solid Phase/Land Treatment Simulation," 2nd paragraph, table.** Explain why control samples with low moisture content will not be prepared. Also, the number of trays needed to test in duplicate appears to be 12, which is inconsistent with the statement on page 10 that 24 pans will be used. Please correct or explain.
12. **Section 5.0: Page 19, Task 8 "Solid Phase/Land Treatment Simulation," 1st paragraph, 3rd full sentence.** This sentence seems to state that water will be added to the pan in an equal amount to the removed aliquots.

## APPENDIX A: Sampling and Analysis Plan

1. **Section 2.0: Page A-1, 3rd paragraph, 1st sentence.** Please correct this sentence: "Samples collected from the will be homogenized..."
2. **Section 3.0, Page A-3, 3rd paragraph.** The text implies that each lift will be treated as an independent stratum. However, Table A-1 on page A-5 suggests that the 2-foot lift does not fit the definition of a stratum since it is heterogeneous.; i.e., the standard deviation of the measurements is greater than the mean concentration.
3. **Section 3.0, Page A-5, Eqn 1.** The text is unclear as to the purpose of estimating the sample requirements. Indicate if the purpose is to compare results for each stratum to a regulatory standard or to determine (via a treatability study) if contaminant concentrations are decreasing as a result of treatment.

If the purpose is to determine if results are less than a regulatory limit, The  $\Delta$  in Equation 1 is the smallest difference needed to be able to distinguish from the standard at a preset confidence level. For example, if the limit is 1,000 mg/kg what concentration is statistically less than 1,000 (990, 900, etc.)? If the mean concentrations in Table A-1 are realistic, the approach is acceptable. However, if the difference between the 1,000 mg/kg limit and sample average (assuming the same standard deviation) is less than that used to calculate number of samples, the average concentration cannot be stated to be less than 1,000 mg/kg.

If the purpose is to determine if concentrations are decreasing over time due to treatment, a much smaller difference must be distinguished and significantly more samples would be required.

4. **Section 5.1.1, Page A-6, item 7.** If the treatability study samples are collected in 1-gallon buckets, then to collect enough for just the solid phase treatability test, 24 pans of 0.5 cubic feet each, approximately 90 buckets will need to be collected.

$$\begin{aligned} \# \text{ of buckets} &= (24 \text{ pans} \times 0.5 \text{ cubic feet/pan}) / (1 \text{ gallon} \times 0.13368 \text{ cubic feet/gallon}) \\ &= 90 \text{ gallon buckets} \end{aligned}$$

If the soil is composited, then additional amounts will be required. This procedure should be re-examined to optimize this process, unless justification can be given for this particular procedure.

5. **Section 5.1.1, Page A-7, Table A-2.** Specifically describe how grid locations were selected.
6. **Section 5.1.1, Page A-7, Table A-2.** Table A-2 implies that three samples will be sufficient to estimate the average concentration for each of the strata and be able to

determine that results are statistically different from a value of 1,000 mg/kg at the 90% confidence level. This assumption is valid only if the average concentrations and standard deviations found are no larger than those presented in Table A-1.

7. **Section 5.1.2, Page A-9.** It is stated that soil will be composited and homogenized prior to treatability study testing. Indicate if site soils would be homogenized prior to actual treatment. If not, studies using a range of concentration conditions would be more appropriate.
8. **Section 5.1.2, Page A-9.** It is unclear how the high level and low level TPH concentration soil samples for the respirometry and solid phase treatability test will be collected, and how the concentration levels will be determined.
9. **Section 5.3, Page A-10, Item 5.** Based on its boiling point and vapor pressure, isopropyl alcohol is unlikely to evaporate within a reasonable time period.

#### **APPENDIX C: Quality Assurance Project Plan**

1. **Section 4.2, Page C-6.** Include copies of the laboratory Quality Assurance Manuals as an Appendix.
2. **Section 6.1, Page C-9.** Include standard operating procedures (SOPs) for all non-standard or in-house analytical methods.
3. **Section 6.1, Page C-10, Table C-1.** Specify all individual analytes for complete carbon range and metals analyses. Specify reporting limits for all analytes.
4. **Section 7.0, Page C-9.** While the laboratory should review data to determine if QC criteria were achieved, data validation must be performed by an individual or group independent from the laboratory. There is an inherent conflict of interest in having laboratory personnel validate their own laboratory's data.
5. **Section 7.1, Page C-11.** Specifically state how data reduction will be performed. EPA methods (other than CLP) generally do not specify how data reduction is to be done.
6. **Section 7.3, Page C-11.** Specify how data validation will be performed and what criteria will be used to qualify data. CLP guidelines are not appropriate since CLP QC criteria are specific only to CLP methods.
7. **Section 8.0, Page C-12.** Specify QC criteria and actions to be taken if criteria are not achieved for all field and laboratory QC samples listed in this section.
8. **Section 9.1.1, Page C-16.** Include a copy of the audit checklist to be used.

9. **Section 9.1.2, Page C-16.** It is stated that a laboratory audit will be performed. Specify who will perform the audit, audit frequency, and include a copy of the audit checklist to be used.
10. **Section 9.2, Page C-17.** Indicate how the contractor's QA/QC Coordinator will obtain system check sample results in a timely manner to ensure performance is acceptable.
11. **General comment.** As a part of our data quality oversight program, U.S. EPA intends to perform a routine audit on the samples analyzed for the IR-3 Treatability Study. We therefore request that the Navy provide to us the GC/MS magnetic data tapes for all analyses performed on samples collected and shipped over a four or five concurrent days during the treatability study field effort. The specific days of sampling should not be selected by the laboratory, but by U.S. EPA in conjunction with the Navy. In addition, we request that the Navy send performance evaluation samples to the laboratory. EPA can assist the Navy in this process, if needed.