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HUNTERS POINT
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RESPONSES TO REGULATORY AGENCY COMMENTS ON DRAFT TREATABILITY STUDY WORK PLAN FOR TREATING SUBSURFACE PETROLEUM PRODUCTS AT SITE IR-3 BY BIODEGRADATION, NAVAL STATION TREASURE ISLAND, HUNTERS POINT ANNEX

October 21, 1993

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RESPONSES TO EPA COMMENTS

Response to U.S. EPA comments on Draft Treatability Study Work Plan for Treating Subsurface Petroleum Products at Site IR-3 by Biodegradation, Naval Station Treasure Island, Hunters Point Annex, San Francisco, California, June 29, 1993.

In their August 12, 1993 letter to Region 9, the U.S. EPA's Risk Reduction and Engineering Laboratory raised the following 12 issues relative to the Draft Treatability Study Work Plan for Treating Subsurface Petroleum Products at Site IR-3 by Biodegradation (Draft WP). The 12 issues and the Navy responses are as follows.

General Comments and Navy Responses

General Comment No. 1: **Error in the entries for copper on Table 2.**

General Response No. 1: The Navy has reviewed the table and acknowledges the error in the entries for copper on Table 2. The minimum value is 47.6 ppm and the maximum value is 150 ppm.

General Comment No. 2: **Lack of reference to analytical methods on Tables 2 and 3.**

General Response No. 2: Analytical methods are identified on both Tables 2 and 3. The test methods utilized for the results in both Tables 2 and 3 were modified from the U.S. EPA contract laboratory program (CLP) for metals, volatiles, semivolatiles, and pesticides/PCBs. For total petroleum hydrocarbons as gasoline and diesel the methods utilized were the leaking underground fuel tank (LUFT) field manual methods.

General Comment No. 3: **Lack of reference to detection limits on Tables 2 and 3.**

General Response No. 3: The detection limits for the analyses on Tables 2 and 3 are shown on the analytical results table attached to these responses. Please note that detection limits were matrix-specific.

General Comment No. 4: **Identification of number of samples on Tables 2 and 3.**

General Response No. 4: Table 2 represents a total of six samples collected from the four monitoring wells identified in the footnote to the table. As can be seen in the attached analytical results table, one sample was collected from each of the following monitoring wells: IR02MW146A, IR02MW173A, and IR03MW0-2. Three samples were collected from monitoring well IR03MW0-3. Table 3 represents one composite sample from the four monitoring wells identified in the footnote to the table.

General Comment No. 5: **Absence of soil data in IR-3.**

General Response No. 5: Most samples collected at the oil ponds to date have been groundwater and floating product. Consequently, the bulk of the available data are for groundwater and for/or floating product.

General Comment No. 6: **Use of soil units on Tables 2 and 3.**

General Response No. 6: The units on Tables 2 and 3 are reported as soil units (mg/kg) because the oil samples were handled gravimetrically due to their high density and viscosity.

General Comment No. 7: **Possible difficulties for bioremediation due to high lead and TPH concentrations.**

General Response No. 7: The levels of lead, TPH, and TOC are of a concern and will be monitored during the treatability study. Concerns of possible mass transport limitations to bioremediation due to a high LNAPL content and possible need of reducing LNAPL content prior to treatment by mixing with "clean soil" were important in the selection of ex-situ bioremediation.

General Comment No. 8: **Difficulty of assessment of schedule accuracy.**

General Response No. 8: To allow for a more accurate assessment of the schedule provided in the Draft WP, a more detailed experimental plan will be provided in the Final WP. Also, please refer to General Response No.12.

General Comment No. 9: **Deviation of ECOVA's proposal from the scope of tiers specified in EPA guidance.**

General Response No. 9: The proposal by ECOVA Corporation, presented as Appendix C of the Draft WP, represents a modification of the three tiers of testing as specified in the Guide for Conducting Treatability Studies Under CERCLA, Final (EPA 1992). The first tier of testing in ECOVA's proposal includes the objectives of the first tier and part of the objectives of the second tier of testing as specified in the EPA guidance. The second tier of testing in ECOVA's proposal includes the remaining objectives of the second tier and part of the objectives of the third tier of testing as specified in the EPA guidance. The Navy deemed this approach by ECOVA to be more expedient in terms of cost and time.

General Comment No. 10: **Assessment of the effect of lead and TPH levels and other matrix characteristics and duplication of pans during the first tier of testing.**

General Response No. 10: Monitoring of lead, TPH, and TOC levels, as well as moisture, clay content, and sieve analyses, will be part of the first tier of testing as indicated on page 10 of ECOVA's proposal, in Appendix C of the Draft WP. The first tier of testing (remedy screening pan study) involves the duplication of pans, as specified in ECOVA's proposal on page 11, Appendix C of the Draft WP.

General Comment No. 11: **Provide the rationale of examining saturated and unsaturated soil separately and the use of two different nutrient levels.**

General Response No. 11: It is expected that the rate of biodegradation will depend on the organic content, as well as the nutrient levels. Specifically, it is anticipated that unsaturated soil will exhibit higher biodegradation rates. Therefore, in order to examine the effects of TPH and TOC levels on the performance of biodegradation, saturated and unsaturated soil samples will be tested separately. Likewise, in order to examine their effects on the rate of biodegradation, two different nutrient levels will be tested in the first tier of the study.

General Comment No. 12: **Need for a detailed and comprehensive plan prior to initiation of the treatability study.**

General Response No. 12: The Navy will submit a revised Final WP as a comprehensive document that will address experimental procedures, field sampling and analysis, and QA/QC procedures in additional detail. The Final WP will be prepared after the Navy issues a new contract to conduct this treatability study.

RESPONSES TO BECHTEL COMMENTS

Response to Bechtel's comments on Draft Treatability Study Work Plan for Treating Subsurface Petroleum Products at Site IR-3 by Biodegradation, Naval Station Treasure Island, Hunters Point Annex, San Francisco, California, June 29, 1993.

In their letter to EPA dated July 19, 1993, Bechtel, a subcontractor reviewer for U.S. EPA, offered one general and 13 specific comments on the Draft Treatability Study Work Plan for Treating Subsurface Petroleum Products at Site IR-3 by Biodegradation (Draft WP). The comments and the Navy responses are as follows.

General Comments and Navy Responses

General Comment No. 1: **The document is titled "Treatability Study Work Plan..."; however, the actual function of the draft is to provide an outline for the steps necessary to develop an actual Work Plan. This document in its current state does not satisfy the requirements of a biotreatability Work Plan.**

General Response No. 1: Comment noted. Additional details on the experimental protocol of the treatability study will be specified in the Final Treatability Study Work Plan for Treating Subsurface Petroleum Products at Site IR-3 by Biodegradation (Final WP), after the Navy issues a contract to conduct this treatability study.

Specific Comments and Navy Responses

Specific Comment No. 1: **Because the document does not fulfill its purpose as a Work Plan, difficulties in the interpretation of its intent arise. For example, on page 5, the text states the two main goals of the initial tier of the treatability study, yet on page 9 of the ECOVA proposal there are 8 main goals of the initial tier and these goals are much broader than that proposed in the main body of text. Thus, it is unclear what is being proposed for Tier 1. Please clarify.**

Specific Response No. 1: Comment noted. The technical approach discussed in Sections 2.0 and 3.0 of the Draft WP identifies the originally intended goals of each tier of testing, in agreement with the Guide for Conducting Treatability Studies Under CERCLA, Final (EPA 1992). On the other hand, ECOVA's proposal, presented in Appendix C of the Draft WP, presents a modification of the three-tiered approach to EPA 1992. The first tier of testing in ECOVA's proposal includes the objectives of the first tier and part of the objectives of the second tier of testing, as specified in the EPA guidance. The second tier of testing in ECOVA's proposal includes the remaining objectives of the second tier and part of the objectives of the third tier of testing, as specified in the EPA guidance. ECOVA's third tier will incorporate the findings of the first and second tiers to generate a full-scale remedial design for the oil ponds. This modified approach by ECOVA was deemed to be more expedient in terms of overall cost and time. The experimental protocol, to be provided in further detail in the Final WP, will correspond to the approach proposed by ECOVA.

Specific Comment No. 2:	**Also on page 5, the text conflicts with itself when it states that Tier 1 is "... not expected to provide...design information." while three sentences later the text states that a main goal of the Tier 1 screening is to "Produce the design information required..." Please clarify.**
Specific Response No. 2	Comment noted. The first reference to cost or design information on page 5 carries the adjective "detailed" as a qualifier. Consequently, the first tier of testing is expected to provide useful design information which will allow for the optimization of experimental parameters for the second tier of testing.
Specific Comment No. 3:	**On page 7 the text states that the FSAP will describe the "type" of samples to be collected. The meaning of the word "type" in this context should be clarified.**
Specific Response No. 3	Type of sample refers to soil boring, hand-auger, or backhoe samples.
Specific Comment No. 4:	**On pages 8 and 9, Task 3, change QAPjP to Work Plan. For Task 6 change SAP to Work Plan. For Task 8 change QAPjP to Work Plan, and for Task 9 Change QAPjP to Work Plan.**
Specific Response No. 4	Comment noted. The Navy intends to submit a Final WP as a comprehensive document which will address experimental procedures, field sampling and analysis, and QA/QC requirements.
Specific Comment No. 5:	**There are numerous unexplained, identical "Max." and "Min." values in Table 2. A footnote should be added to explain why the two values are identical. Copper shows a minimum value of 4,706 ppm and a maximum value of 150 ppm, there is obviously an error here. Please correct.**
Specific Response No. 5	Comment noted. Identical minimum and maximum values in Table 2 correspond to a single detected value. The Navy acknowledges the error in the values for copper. The minimum value is 47.6 ppm and the maximum value is 150 ppm.
Specific Comment No. 6:	**On page 1, the document states that the attached proposal discusses the proposed scope and methodologies for conducting the treatability study. This is not acceptable. It appears the authors intend that a proposal from a potential subcontractor serve as the approved Work Plan.**
Specific Response No. 6	Comment noted. The Final WP will reflect the technical approach of the subcontractor (ECOVA), after it has been evaluated and modified to satisfy the Navy's contractual and technical requirements.

Specific Comment No. 7: **The text states that land farming was selected as the remediation technique. Have the authors considered other biotreatment techniques? Why was land farming chosen for testing? What methods of treatment were proposed by the non-selected vendors (12 vendor proposals were apparently reviewed)?**

Specific Response No. 7 Ex-situ bioremediation was selected, as opposed to in-situ bioremediation, because of concerns regarding:

- possible mass transport limitations to microorganisms due to the high LNAPL content and the possible need of reducing the LNAPL content prior to treatment by mixing with "clean soil"
- hindrance of biodegradation due to buildup of microbial metabolics, which is frequent for high organic soils
- lack of sufficient information on the subsurface distribution of contamination and a detailed understanding of the hydrogeology of the site necessary for the design of in-situ biological treatment

As a result of a request for proposals extended to 12 biotreatability study vendors, the Navy received a total of four proposals. Slurry-phase processes were proposed in addition to land farming by two vendors. Included in all four submitted vendor proposals, land-farming was deemed more appropriate because of concerns regarding the volume of impacted soil at IR-3, cost, and the relative novelty of slurry-phase processes compared to land farming.

Specific Comment No. 8: **The discussion (Section 1.2, page 4) regarding floating oil indicates that although a possibly substantial volume of material is present in the subsurface, attempts at removal have been unsuccessful. What cause is attributed to this difficulty in product recovery? This point is important because regardless of the ability of biodegradation to reduce contaminant levels, ex-situ, the presence of a continuing source of subsurface contamination essentially negates an ex-situ treatment benefits.**

In addition, on page 9 the authors state that Task 11 will include "...a detailed approach concerning the collection, separation, and disposal of groundwater and oil expected..." Because previous attempts at product recovery were unsuccessful there is no reason to believe that such a statement is supportable. The reader can therefore conclude that the floating product will remain in-place and continue to recontaminate soil.

Specific Response No. 8

No continuing source of subsurface contamination will remain in the event ex-situ bioremediation is implemented at IR-3 because the excavated soil will extend to a depth that will include the unsaturated hydrocarbon dispersion zone below the water table. The collection, separation, and disposal of groundwater and floating product will be addressed during the study, although the emphasis will be on bioremediation of excavated, oily soil. The difficulty encountered in the earlier investigation on floating product recovery, which merely utilized existing monitoring wells, demonstrates the inappropriateness of this approach as a long-term solution. The factors which may have contributed to the inefficiency of the recovery investigation include the high viscosity of LNAPL floating product, uneven distribution of LNAPL in pockets, dispersion, capillary, and smearing effects as a result of pumping.

Specific Comment No. 9:

The text states that for the evaluation to proceed to Tier 2, Tier 1 testing should produce reductions in pollutant concentrations of at least 20 percent. Based on the plans described in ECOVA's proposal, 20 percent reductions are too small to form the justification to proceed to Tier 2 which involves a pilot-scale outdoor unit. Consider the statement on page 6 of the report "... the treatability study will need to achieve a value of 1,000 ppm TPD as diesel to indicate success." However, Table 2 of the same report indicates that TPH as diesel was found to be 480,000 ppm which would require approximately 99.9 percent reduction to achieve 1,000 ppm. Thus, although the performance of the system in the Tier 1 stage need not be equivalent to a 99.9 percent reduction, expectations must be much greater than currently indicated. This is especially significant when considering that ECOVA's proposal states that 12 weeks, rather than the 6 weeks mentioned in the main body of the text, would be the period of Tier 1 study. A 12 week period of optimal lab conditions should be sufficient to demonstrate removals in excess 80 percent.

Specific Response No. 9:

The value of 480,000 ppm represents the concentration of TPH as diesel in grab samples of floating product and does not correspond to levels in soil, which are expected to be considerably lower. The duration of the first tier of testing in ECOVA's proposal (12 weeks, instead of 6 weeks) resulted from a modification to the EPA guidance, as discussed in Specific Response No. 1. As stated in Specific Response No. 8, the collection, separation, and disposal of groundwater and floating product will be addressed during the study, although the emphasis will be on bioremediation of excavated, oily soil.

Specific Comment No. 10:	**Another key component which is lacking from this document is a thorough discussion of the proposed methods for data analysis. EPA guidance clearly states treatability studies shall use sound statistical techniques including analysis of variance testing to evaluate the effects of different treatment regimes. There is a noticeable absence of data analysis planning in this document.**
Specific Response No. 10:	Comment noted. Appropriate methods of statistical analysis of the data will be discussed in the Final WP.
Specific Comment No. 11:	**Toxicity testing is mentioned as an aside, yet toxicity to microorganisms is often a prime cause for the failure of biotreatment systems. The work plan should clearly identify the methods to be used for the evaluation of toxicity.**
Specific Response No. 11:	Comment noted. Precisely because toxicity to microorganisms is a concern, microbiological testing will be performed as discussed in ECOVA's proposal on page 10, Appendix C of the Draft WP.
Specific Comment No. 12:	**On page 6 the authors state that remedy selection testing (Tier 2) will consist of bench-scale test and if necessary, pilot-scale tests. In the following paragraph, the authors state that remedy design tests (Tier 3) will consist of small, pilot-scale testing. It remains unclear what the difference or the nature of these pilot tests are, especially when considering that ECOVA's proposal does not include any testing as part of Tier 3.**
Specific Response No. 12:	Comment noted. Please refer to Specific Response No.1.
Specific Comment No. 13:	**On page 7 the text states that the QAPjP will include details of the experimental project description. This is not correct. The work plan should contain such information and the QAPjP should address QA objectives and QC procedures.**
Specific Response No. 13:	Comment noted. Please refer to Specific Response No. 4.

RESPONSES TO DTSC COMMENTS

Response to Department of Toxic Substances Control (DTSC) comments on Draft Treatability Study Work Plan for Treating Subsurface Petroleum Products at Site IR-3 by Biodegradation, Naval Station Treasure Island, Hunters Point Annex, San Francisco, California, June 29, 1993.

In their August 16, 1993 letter to the Navy, the DTSC raised six general and two specific comments relative to the Draft Treatability Study Work Plan for Treating Subsurface Petroleum Products at Site IR-3 by Biodegradation (Draft WP). The general and specific comments and the Navy responses are as follows.

General Comments and Navy Responses

General Comment No. 1: **Inappropriateness of defining cleanup levels when conducting a pilot study.**

General Response No. 1: The Navy did not propose any cleanup levels in the Draft WP. Specifically, a target level of 1,000 ppm for TPH diesel was proposed to be used strictly as an indicator of success of the remedy selection tier of testing.

General Comment No. 2: **Provide an explanation on the derivation of the proposed target level of 10,000 ppm TPH for diesel in soil and sediments.**

General Response No. 2: Comment noted. The derivation of the health-based level of 10,000 ppm for TPH as diesel was presented in detail in various Alternative Selection Reports for Hunters Point Annex. Thus, the proposed target level of 1,000 ppm for TPH as diesel for this treatability study is one order of magnitude less than the health-based level and represents a conservative approach. The Navy recognizes that cleanup levels have not been decided for IR-3.

General Comment No. 3: **Need to address the treatment of LNAPL contamination below the water table.**

General Response No. 3: Samples will be collected from each of the three LNAPL zones: (1) the saturated zone immediately above the water table; (2) the LNAPL capillary fringe zone overlying the saturated zone; and (3) the dispersion zone, or water table fluctuation zone, below the saturated zone. Most LNAPL floats above the water table in the saturated zone, and the LNAPL content in the capillary fringe and dispersion zones decreases away from the saturated zone. As indicated on page 9 of ECOVA's proposal in Appendix C of the Draft WP, representative soil samples will be collected from the saturated and unsaturated zones (capillary fringe and dispersion zones). Details on the location and depth of the samples will be specified in the Final WP.

General Comment No. 4: **Preempting the screening of alternatives by selection of bioremediation.**

General Response No. 4: The Navy has not chosen bioremediation as the process option for treatment at IR-3. The intention of the proposed treatability study is "to evaluate the potential of aerobic ex-situ biodegradation technology to treat the oily soil at the oil pound, Site IR-3" as stated on page 4 of the Draft WP. A parallel treatability study involving thermally and chemically augmented oil recovery is also proposed currently. Containment, excavation and disposal, and thermal process options are considered applicable and effective, although potentially more expensive, and have not been dismissed by the Navy as remedial alternatives.

General Comment No. 5: **Provide a discussion of ex-situ treatment of the free product.**

General Response No. 5: The proposed treatability study will be focused on the treatment of oily soil, and not groundwater and free product. The comprehensive report which will be prepared at the conclusion of the treatability study "will present a detailed approach concerning the collection, separation, and disposal of groundwater and oil expected to be generated...", as stated on page 9 of the Draft WP.

General Comment No. 6: **Provide the rationale for selection of ex-situ remediation.**

General Response No 6: Ex-situ bioremediation was selected, as opposed to in-situ bioremediation, because of concerns regarding:

- possible mass transport limitations to microorganisms due to the high LNAPL content and the possible need of reducing the LNAPL content prior to treatment by mixing with "clean soil"
- hindrance of biodegradation due to buildup of microbial metabolics, which is frequent for high organic soils
- lack of sufficient information on the subsurface distribution of contamination and a detailed understanding of the hydrogeology of the site necessary for the design of in-situ biological treatment

<u>Specific Comments and Navy Responses</u>

Specific Comment 1: **Page 4, top paragraph, please identify these four wells.**

Specific Response 1: The four wells from which grab samples of floating product have been collected are identified in the footnote to Table 2, page A-3, Appendix A, of the Draft WP. The four wells are: IR03MW0-2, IR03MW0-3, IR02MW146A, and IR02MW173A.

Specific Comment 2a: **Page 5, Paragraph 1, please explain how the treatability study will be performed, if you are screening for remedy.**

Specific Response 2a: The term "remedy screening" refers to the first tier of testing in the three-tiered approach defined in the "Guide for Conducting Treatability Studies Under CERCLA, Final" (EPA 1992).

Specific Comment 2b: **Page 5, Paragraph, 3, please explain the process involved in the remedy selection testing. What kind of tests will be done? What is the area of concern for soil testing? And to what depth?**

Specific Response 2b: The proposal by ECOVA Corporation, presented as Appendix C of the Draft WP, represents a modification of the three-tiered approach to treatability studies in the EPA guidance. ECOVA's proposal includes the objectives of the first tier of testing as specified in EPA 1992 <u>and</u> also encompasses some of the objectives of the second tier of testing as specified in EPA 1992. The Navy deemed this approach to be more expedient in terms of cost and time. The second tier of testing, remedy selection, is outlined on page 13 of ECOVA's proposal and entails the establishment of Land Treatment Units (LTUs) using approximately 35 cubic yards of soil from the saturated and unsaturated zones. Field samples which are representative of conditions in both the saturated and unsaturated zones will be collected as specified in the Final WP. The specific area of concern and sampling depths will also be indicated in the Final WP. Weekly analytical testing will include TPH and TOC analyses, total heterotrophic plate counts and nutrient level measurements. Moisture and pH will be checked every 3 days, and the soil will be tilled according to the rates determined during the remedy screening tier. Details of the experimental protocol will be presented in the Final WP, prior to the initiation of the treatability study. The Final WP will be prepared after the Navy issues a contract to conduct the treatability study.

RESPONSES TO CRWQCB COMMENTS

Response to California Regional Water Quality Control Board (CRWQCB) comments on Draft Treatability Study Work Plan for Treating Subsurface Petroleum Products at Site IR-3 by Biodegradation, Naval Station Treasure Island, Hunters Point Annex, San Francisco, California, June 29, 1993.

In their August 15, 1993 letter to the Department of Toxic Substances Control, the CRWQCB offered three general and four specific comments relative to the Draft Treatability Study Work Plan for Treating Subsurface Petroleum Products at Site IR-3 by Biodegradation (Draft WP). The general and specific comments and the Navy responses are as follows.

<u>General Comments and Navy Responses</u>

General Comment No. 1: **The proposed target value of 1,000 ppm Total Petroleum Hydrocarbons as diesel (TPHd) in soils and sediments may be insufficient to protect water quality if soils and sediments are to be placed where they may contact groundwater or surface water. Using Marshak's "Designated Level Methodology", the following approach was used to develop a screening level for protection of water quality goals for the contaminant TPHd. The following assumptions were made: a. an environmental attenuation factor of 10 for silt and clay soils with less than 10 feet to groundwater, b. a leachability factor of 10 for organic constituents, c. an assumed average LC50 toxicity to aquatic organisms in water of 1.85 ppm (from Final Vegetation Management in the Coastal Plain/Piedmont, Appendices, Volume II, U.S.D.A., Forest Service, Management Bulletin R8-MB-23, January 1989, Table 6-15), d. a 10-fold protection factor to address the relationship between acute and chronic toxicity data. Using the above assumptions, the maximum concentration of TPHd that would not exceed the Total Designated Level of TPHd for protection of the water quality goal (no chronic toxicity) would be approximately (1.85 ppm x 0.1 x 10 x 10 =) 18.5 ppm. Thus, a minimum target value of 100 ppm TPHd is recommended for determining the suitability of biodegradation as a treatment technology goal. If higher levels of hydrocarbons are proposed, additional performance criteria, such as bioassays to demonstrate that toxicity does not occur, should be considered.**

General Response No. 1: The derivation of the health-based level of 10,000 ppm for TPH as diesel was presented in detail in various Alternative Selection Reports for Hunters Point Annex. Thus, the proposed target level of 1,000 ppm for TPH as diesel for this treatability study is one order of magnitude less than the health-based level and represents a conservative approach. An analysis demonstrating protection of aquatic organisms at the target level of 1,000 ppm for TPH as diesel is presented in a response to CRWQCB comments on the Draft Final SI Parcel A Report.

General Comment No. 2: **The proposed approach focusses on the detection of TPHd as the major component of the waste oil ponds, yet verbal descriptions of the wastes by Navy consultants as "sludges" suggests that long-chain hydrocarbons that are more difficult to bioremediate may comprise some considerable portion of the wastes. In light of this potential difficulty, efficiency of removal should also address the longer chain hydrocarbons by including calculations of the total organic carbon (TOC) in the samples, before and after treatment, in addition to the proposed measures of "average pollutant concentration" that focus on TPHd.**

General Response No. 2: Comment noted. Measurement of TOC levels of all soil samples will be performed as indicated on Table 3, page 10, in Appendix C, of the Draft WP.

General Comment No. 3: **It is hoped that data generated at each stage of development of the remedial alternative will be shared among the agencies.**

General Response No. 3: The Navy intends to provide the agencies with the findings of each tier of testing in the form of interim progress reports and a final comprehensive report.

<u>Specific Comments and Navy Responses</u>

Specific Comment No. 1: **p. A-2: Please check the entries for copper on Table 2.**

Specific Response No. 1: Comment noted. The Navy has reviewed the table and acknowledges an error in the entries for copper on Table 2. The minimum value is 47.6 ppm and the maximum value is 150 ppm.

Specific Comment No. 2: **p. A-3: TPH as diesel is listed twice. Is data missing?**

Specific Response No. 2: Comment noted. No data are missing. The first TPH as diesel entry on Table 2 is intended to be a heading for the test method and the second TPH as diesel entry is intended to be the analyte.

Specific Comment No. 3: **p. 9 of ECOVA's submittal: the proposed screening levels are NOT ARARs. The proposed cleanup levels have not been decided for this site. Please change the text to read "To determine if the target goals for TPH and TOC can be achieved by biodegradation."**

Specific Response No. 3: Comment noted. ARARs will not be used to assess the success of the treatability study. The Navy did not propose any cleanup levels in the Draft WP. Specifically, a target level of 1,000 ppm for TPH diesel was proposed to be used strictly as an indicator of success of the remedy selection tier of testing.

Specific Comment No. 4: **p. 9 of ECOVA's submittal: The remedy screening pan study proposes duplicates for each of the soil samples. Why isn't the study done in triplicate since three values are needed to calculate a mean and standard deviation. If the study is run in duplicate, will the results of both duplicates be presented and the costs presented as a range depending on the results of each test?**

Specific Response No. 4: Comment noted. The Navy will evaluate conducting the remedy screening pan study in triplicate, instead of in duplicate, in future negotiations with the subcontractor. The results of the remedy screening pan study will be presented in the interim progress report.

TABLE OF ANALYTICAL RESULTS FOR SELECTED OIL SAMPLES

IN RESPONSE TO THE U.S. EPA'S
RISK REDUCTION AND ENGINEERING LABORATORY
GENERAL COMMENT NO. 3

Analytical Results for Selected Oil Samples
Hunters Point Annex, California
Date Range: 10/01/90 - 09/27/93

Station Number	Sample Number	Sample Date	Test Method	Analyte	Units	Value	ND Ind.	HLA Qual
IR02MW146A	9205X477	01/30/92	CLPPEST	Aroclor-1016	ug/kg	6300.00		A
	9205X477	01/30/92	CLPPEST	Aroclor-1221	ug/kg	5000.00	ND	A
	9205X477	01/30/92	CLPPEST	Aroclor-1232	ug/kg	5000.00	ND	A
	9205X477	01/30/92	CLPPEST	Aroclor-1242	ug/kg	5000.00	ND	A
	9205X477	01/30/92	CLPPEST	Aroclor-1248	ug/kg	20000.00	ND	A
	9205X477	01/30/92	CLPPEST	Aroclor-1254	ug/kg	20000.00	ND	A
	9205X477	01/30/92	CLPPEST	Aroclor-1260	ug/kg	17000.00		A
IR02MW173A	9205X473	01/29/92	CLPCVAA	Mercury	mg/kg	0.10	ND	J3
	9205X473	01/29/92	CLPFUAA	Arsenic	mg/kg	0.34	ND	J3
	9205X473	01/29/92	CLPFUAA	Lead	mg/kg	9.90		J23
	9205X473	01/29/92	CLPFUAA	Selenium	mg/kg	0.50	ND	J3
	9205X473	01/29/92	CLPFUAA	Thallium	mg/kg	0.36	ND	J3
	9205X473	01/29/92	CLPICP	Aluminum	mg/kg	4.50		A
	9205X473	01/29/92	CLPICP	Antimony	mg/kg	5.30	ND	A
	9205X473	01/29/92	CLPICP	Barium	mg/kg	2.50		A
	9205X473	01/29/92	CLPICP	Beryllium	mg/kg	0.18	ND	A
	9205X473	01/29/92	CLPICP	Cadmium	mg/kg	0.56	ND	A
	9205X473	01/29/92	CLPICP	Calcium	mg/kg	17.00	ND	U1
	9205X473	01/29/92	CLPICP	Chromium	mg/kg	0.96		A
	9205X473	01/29/92	CLPICP	Cobalt	mg/kg	1.60	ND	A
	9205X473	01/29/92	CLPICP	Copper	mg/kg	47.60		J23
	9205X473	01/29/92	CLPICP	Iron	mg/kg	23.20		A
	9205X473	01/29/92	CLPICP	Magnesium	mg/kg	9.10		A
	9205X473	01/29/92	CLPICP	Manganese	mg/kg	0.26		A
	9205X473	01/29/92	CLPICP	Nickel	mg/kg	12.20		A
	9205X473	01/29/92	CLPICP	Potassium	mg/kg	177.00	ND	R2
	9205X473	01/29/92	CLPICP	Silver	mg/kg	0.34	ND	A
	9205X473	01/29/92	CLPICP	Sodium	mg/kg	18.00		J3
	9205X473	01/29/92	CLPICP	Vanadium	mg/kg	24.50		J2
	9205X473	01/29/92	CLPICP	Zinc	mg/kg	5.60		A
	9205X473	01/29/92	CLPICP	Molybdenum	mg/kg	0.88	ND	A
	9205X473	01/29/92	EPA7196	Chromium VI	ug/kg	1250.00	ND	R2
	9205X473	01/29/92	CLPVOC	Chloromethane	ug/kg	25000.00	ND	A
	9205X473	01/29/92	CLPVOC	Bromomethane	ug/kg	25000.00	ND	A
	9205X473	01/29/92	CLPVOC	Vinyl chloride	ug/kg	25000.00	ND	A
	9205X473	01/29/92	CLPVOC	Chloroethane	ug/kg	25000.00	ND	A
	9205X473	01/29/92	CLPVOC	Methylene chloride	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	Acetone	ug/kg	25000.00	ND	A
	9205X473	01/29/92	CLPVOC	Carbon disulfide	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	1,1-Dichloroethene	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	1,1-Dichloroethane	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	1,2-Dichloroethene (total)	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	Chloroform	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	1,2-Dichloroethane	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	Methyl ethyl ketone	ug/kg	25000.00	ND	A

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IR02MW173A	9205X473	01/29/92	CLPVOC	1,1,1-Trichloroethane	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	Carbon tetrachloride	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	Vinyl acetate	ug/kg	25000.00	ND	A
	9205X473	01/29/92	CLPVOC	Bromodichloromethane	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	1,2-Dichloropropane	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	cis-1,3-Dichloropropene	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	Trichloroethene	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	Dibromochloromethane	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	1,1,2-Trichloroethane	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	Benzene	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	trans-1,3-Dichloropropene	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	Bromoform	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	Methyl isobutyl ketone	ug/kg	25000.00	ND	A
	9205X473	01/29/92	CLPVOC	2-Hexanone	ug/kg	25000.00	ND	A
	9205X473	01/29/92	CLPVOC	Tetrachloroethene	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	Toluene	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	1,1,2,2-Tetrachloroethane	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	Chlorobenzene	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	Ethyl benzene	ug/kg	4900.00		A
	9205X473	01/29/92	CLPVOC	Styrene	ug/kg	12000.00	ND	A
	9205X473	01/29/92	CLPVOC	Xylenes	ug/kg	3000.00		A
	9205X473	01/29/92	CLPSOC	Phenol	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Bis(2-chloroethyl)ether	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	2-Chlorophenol	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	1,3-Dichlorobenzene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	1,4-Dichlorobenzene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Benzyl alcohol	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	1,2-Dichlorobenzene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	2-Methylphenol	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Bis(2-chloroisopropyl)ether	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	4-Methylphenol	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	n-Nitrosodipropylamine	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Hexachloroethane	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Nitrobenzene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Isophorone	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	2-Nitrophenol	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	2,4-Dimethylphenol	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Benzoic acid	ug/kg	800000.00	ND	A
	9205X473	01/29/92	CLPSOC	Bis(2-chloroethoxy)methane	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	2,4-Dichlorophenol	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	1,2,4-Trichlorobenzene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Naphthalene	ug/kg	550000.00		A
	9205X473	01/29/92	CLPSOC	4-Chloroaniline	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Hexachlorobutadiene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	4-Chloro-3-methylphenol	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	2-Methylnaphthalene	ug/kg	2600000.00		A
	9205X473	01/29/92	CLPSOC	Hexachlorocyclopentadiene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	2,4,6-Trichlorophenol	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	2,4,5-Trichlorophenol	ug/kg	800000.00	ND	A
	9205X473	01/29/92	CLPSOC	2-Chloronaphthalene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	2-Nitroaniline	ug/kg	800000.00	ND	A

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IR02MW173A	9205X473	01/29/92	CLPSOC	Dimethyl phthalate	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Acenaphthylene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	2,6-Dinitrotoluene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	3-Nitroaniline	ug/kg	800000.00	ND	A
	9205X473	01/29/92	CLPSOC	Acenaphthene	ug/kg	93000.00		A
	9205X473	01/29/92	CLPSOC	2,4-Dinitrophenol	ug/kg	800000.00	ND	A
	9205X473	01/29/92	CLPSOC	4-Nitrophenol	ug/kg	800000.00	ND	A
	9205X473	01/29/92	CLPSOC	Dibenzofuran	ug/kg	47000.00		A
	9205X473	01/29/92	CLPSOC	2,4-Dinitrotoluene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Diethyl phthalate	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	4-Chlorophenyl phenylether	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Fluorene	ug/kg	200000.00		A
	9205X473	01/29/92	CLPSOC	4-Nitroaniline	ug/kg	800000.00	ND	A
	9205X473	01/29/92	CLPSOC	2-Methyl-4,6-dinitrophenol	ug/kg	800000.00	ND	A
	9205X473	01/29/92	CLPSOC	n-Nitrosodiphenylamine	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	4-Bromophenylphenylether	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Hexachlorobenzene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Pentachlorophenol	ug/kg	800000.00	ND	A
	9205X473	01/29/92	CLPSOC	Phenanthrene	ug/kg	480000.00		A
	9205X473	01/29/92	CLPSOC	Anthracene	ug/kg	49000.00		A
	9205X473	01/29/92	CLPSOC	Di-n-butylphthalate	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Fluoranthene	ug/kg	37000.00		A
	9205X473	01/29/92	CLPSOC	Pyrene	ug/kg	110000.00		A
	9205X473	01/29/92	CLPSOC	Butylbenzylphthalate	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	3,3'-Dichlorobenzidine	ug/kg	320000.00	ND	A
	9205X473	01/29/92	CLPSOC	Benzo(a)anthracene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Chrysene	ug/kg	70000.00		A
	9205X473	01/29/92	CLPSOC	Bis(2-ethylhexyl)phthalate	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Di-n-octylphthalate	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Benzo(b)fluoranthene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Benzo(k)fluoranthene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Benzo(a)pyrene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Indeno(1,2,3-cd)pyrene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Dibenzo(a,h)anthracene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPSOC	Benzo(g,h,i)perylene	ug/kg	160000.00	ND	A
	9205X473	01/29/92	CLPPEST	Aroclor-1016	ug/kg	4200.00		A
	9205X473	01/29/92	CLPPEST	Aroclor-1221	ug/kg	5000.00	ND	A
	9205X473	01/29/92	CLPPEST	Aroclor-1232	ug/kg	5000.00	ND	A
	9205X473	01/29/92	CLPPEST	Aroclor-1242	ug/kg	5000.00	ND	A
	9205X473	01/29/92	CLPPEST	Aroclor-1248	ug/kg	10000.00	ND	A
	9205X473	01/29/92	CLPPEST	Aroclor-1254	ug/kg	10000.00	ND	A
	9205X473	01/29/92	CLPPEST	Aroclor-1260	ug/kg	9100.00		A
	9205X473	01/29/92	LUFTD	TPH-Diesel	mg/kg	100000.00	ND	A
	9205X473	01/29/92	LUFTD	TPH-Extractable Unknown Hydrocarbon	mg/kg	550000.00		A
	9205X473	01/29/92	LUFTG	TPH-Gasoline	mg/kg	2500.00	ND	A
	9205X473	01/29/92	LUFTG	TPH-Purgeable Unknown Hydrocarbon	mg/kg	2500.00	ND	A

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IR03MWO-2	9204X458	01/24/92	CLPPEST	Aroclor-1016	ug/kg	6400.00		A
	9204X458	01/24/92	CLPPEST	Aroclor-1221	ug/kg	5000.00	ND	A
	9204X458	01/24/92	CLPPEST	Aroclor-1232	ug/kg	5000.00	ND	A
	9204X458	01/24/92	CLPPEST	Aroclor-1242	ug/kg	5000.00	ND	A
	9204X458	01/24/92	CLPPEST	Aroclor-1248	ug/kg	10000.00	ND	A
	9204X458	01/24/92	CLPPEST	Aroclor-1254	ug/kg	10000.00	ND	A
	9204X458	01/24/92	CLPPEST	Aroclor-1260	ug/kg	9600.00		A
IR03MWO-3	9043J049	10/26/90	CLPCVAA	Mercury	mg/kg	0.05	ND	J*5
	9043J049	10/26/90	CLPFUAA	Arsenic	mg/kg	1.00	ND	J*
	9043J049	10/26/90	CLPFUAA	Lead	mg/kg	359.00		J*
	9043J049	10/26/90	CLPFUAA	Selenium	mg/kg	1.10		J*
	9043J049	10/26/90	CLPFUAA	Thallium	mg/kg	1.00	ND	J*
	9043J049	10/26/90	CLPICP	Aluminum	mg/kg	21.00	ND	J*
	9043J049	10/26/90	CLPICP	Antimony	mg/kg	10.00	ND	J*
	9043J049	10/26/90	CLPICP	Barium	mg/kg	7.70		J*
	9043J049	10/26/90	CLPICP	Beryllium	mg/kg	0.40	ND	J*
	9043J049	10/26/90	CLPICP	Cadmium	mg/kg	1.00	ND	J*
	9043J049	10/26/90	CLPICP	Calcium	mg/kg	132.00		J*
	9043J049	10/26/90	CLPICP	Chromium	mg/kg	7.30		J*
	9043J049	10/26/90	CLPICP	Cobalt	mg/kg	3.20	ND	J*
	9043J049	10/26/90	CLPICP	Copper	mg/kg	150.00		J*
	9043J049	10/26/90	CLPICP	Iron	mg/kg	83.70		J*
	9043J049	10/26/90	CLPICP	Magnesium	mg/kg	440.00		J*
	9043J049	10/26/90	CLPICP	Manganese	mg/kg	0.79		J*
	9043J049	10/26/90	CLPICP	Nickel	mg/kg	17.40		J*
	9043J049	10/26/90	CLPICP	Potassium	mg/kg	119.00		J*
	9043J049	10/26/90	CLPICP	Silver	mg/kg	2.00	ND	J*
	9043J049	10/26/90	CLPICP	Sodium	mg/kg	3500.00		J*
	9043J049	10/26/90	CLPICP	Vanadium	mg/kg	44.70		J*
	9043J049	10/26/90	CLPICP	Zinc	mg/kg	26.20		J*
	9043J049	10/26/90	CLPICP	Molybdenum	mg/kg	2.00	ND	J*
	9043J049	10/26/90	EPA7196	Chromium VI	ug/kg	50.00	ND	J3
	9043J049	10/26/90	CLPVOC	Chloromethane	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Bromomethane	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Vinyl chloride	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Chloroethane	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Methylene chloride	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Acetone	ug/l	125000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Carbon disulfide	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	1,1-Dichloroethene	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	1,1-Dichloroethane	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	1,2-Dichloroethene (total)	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Chloroform	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	1,2-Dichloroethane	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Methyl ethyl ketone	ug/l	125000.00	ND	R16

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IR03MWO-3	9043J049	10/26/90	CLPVOC	1,1,1-Trichloroethane	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Carbon tetrachloride	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Vinyl acetate	ug/l	125000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Bromodichloromethane	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	1,2-Dichloropropane	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	cis-1,3-Dichloropropene	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Trichloroethene	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Dibromochloromethane	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	1,1,2-Trichloroethane	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Benzene	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	trans-1,3-Dichloropropene	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Bromoform	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Methyl isobutyl ketone	ug/l	125000.00	ND	R16
	9043J049	10/26/90	CLPVOC	2-Hexanone	ug/l	125000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Tetrachloroethene	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Toluene	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	1,1,2,2-Tetrachloroethane	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Chlorobenzene	ug/l	170000.00		R6J5
	9043J049	10/26/90	CLPVOC	Ethyl benzene	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Styrene	ug/l	63000.00	ND	R16
	9043J049	10/26/90	CLPVOC	Xylenes	ug/l	65000.00		R6J5
	9043J049	10/26/90	CLPSOC	Phenol	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Bis(2-chloroethyl)ether	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	2-Chlorophenol	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	1,3-Dichlorobenzene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	1,4-Dichlorobenzene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Benzyl alcohol	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	1,2-Dichlorobenzene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	2-Methylphenol	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Bis(2-chloroisopropyl)ether	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	4-Methylphenol	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	n-Nitrosodipropylamine	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Hexachloroethane	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Nitrobenzene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Isophorone	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	2-Nitrophenol	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	2,4-Dimethylphenol	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Benzoic acid	ug/l	2000000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Bis(2-chloroethoxy)methane	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	2,4-Dichlorophenol	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	1,2,4-Trichlorobenzene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Naphthalene	ug/l	490000.00		R6
	9043J049	10/26/90	CLPSOC	4-Chloroaniline	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Hexachlorobutadiene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	4-Chloro-3-methylphenol	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	2-Methylnaphthalene	ug/l	1300000.00		R6
	9043J049	10/26/90	CLPSOC	Hexachlorocyclopentadiene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	2,4,6-Trichlorophenol	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	2,4,5-Trichlorophenol	ug/l	2000000.00	ND	R6
	9043J049	10/26/90	CLPSOC	2-Chloronaphthalene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	2-Nitroaniline	ug/l	2000000.00	ND	R6

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IR03MW0-3	9043J049	10/26/90	CLPSOC	Dimethyl phthalate	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Acenaphthylene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	2,6-Dinitrotoluene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	3-Nitroaniline	ug/l	2000000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Acenaphthene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	2,4-Dinitrophenol	ug/l	2000000.00	ND	R6
	9043J049	10/26/90	CLPSOC	4-Nitrophenol	ug/l	2000000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Dibenzofuran	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	2,4-Dinitrotoluene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Diethyl phthalate	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	4-Chlorophenyl phenylether	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Fluorene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	4-Nitroaniline	ug/l	2000000.00	ND	R6
	9043J049	10/26/90	CLPSOC	2-Methyl-4,6-dinitrophenol	ug/l	2000000.00	ND	R6
	9043J049	10/26/90	CLPSOC	n-Nitrosodiphenylamine	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	4-Bromophenylphenylether	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Hexachlorobenzene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Pentachlorophenol	ug/l	2000000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Phenanthrene	ug/l	330000.00		R6
	9043J049	10/26/90	CLPSOC	Anthracene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Di-n-butylphthalate	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Fluoranthene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Pyrene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Butylbenzylphthalate	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	3,3'-Dichlorobenzidine	ug/l	800000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Benzo(a)anthracene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Chrysene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Bis(2-ethylhexyl)phthalate	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Di-n-octylphthalate	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Benzo(b)fluoranthene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Benzo(k)fluoranthene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Benzo(a)pyrene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Indeno(1,2,3-cd)pyrene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Dibenzo(a,h)anthracene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPSOC	Benzo(g,h,i)perylene	ug/l	400000.00	ND	R6
	9043J049	10/26/90	CLPPEST	alpha-BHC	ug/l	1.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	beta-BHC	ug/l	1.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	delta-BHC	ug/l	1.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	gamma-BHC	ug/l	1.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Heptachlor	ug/l	1.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Aldrin	ug/l	1.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Heptachlor epoxide	ug/l	1.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Endosulfan I	ug/l	1.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Dieldrin	ug/l	2.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	4,4'-DDE	ug/l	2.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Endrin	ug/l	2.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Endosulfan II	ug/l	2.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	4,4'-DDD	ug/l	2.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Endosulfan sulfate	ug/l	2.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	4,4'-DDT	ug/l	2.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Methoxychlor	ug/l	10.00	ND	R6J3

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Station Number	Sample Number	Sample Date	Test Method	Analyte	Units	Value	ND Ind.	HLA Qual
IR03MW0-3	9043J049	10/26/90	CLPPEST	Endrin ketone	ug/l	2.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	alpha-Chlordane	ug/l	10.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	gamma-Chlordane	ug/l	10.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Toxaphene	ug/l	20.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Aroclor-1016	ug/l	10.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Aroclor-1221	ug/l	10.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Aroclor-1232	ug/l	10.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Aroclor-1242	ug/l	10.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Aroclor-1248	ug/l	10.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Aroclor-1254	ug/l	20.00	ND	R6J3
	9043J049	10/26/90	CLPPEST	Aroclor-1260	ug/l	1500.00		R6J3
	9043J049	10/26/90	LUFTD	TPH-Diesel	mg/kg	540000.00		R6
	9043J049	10/26/90	LUFTG	TPH-Gasoline	mg/l	15000.00		R6J5
	9043J049	10/26/90	EPA9070	Total Oil & Grease	mg/l	868.00		R6
	9204X459	01/24/92	CLPVOC	Chloromethane	ug/kg	25000.00	ND	A
	9204X459	01/24/92	CLPVOC	Bromomethane	ug/kg	25000.00	ND	A
	9204X459	01/24/92	CLPVOC	Vinyl chloride	ug/kg	25000.00	ND	A
	9204X459	01/24/92	CLPVOC	Chloroethane	ug/kg	25000.00	ND	A
	9204X459	01/24/92	CLPVOC	Methylene chloride	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	Acetone	ug/kg	25000.00	ND	A
	9204X459	01/24/92	CLPVOC	Carbon disulfide	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	1,1-Dichloroethene	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	1,1-Dichloroethane	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	1,2-Dichloroethene (total)	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	Chloroform	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	1,2-Dichloroethane	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	Methyl ethyl ketone	ug/kg	25000.00	ND	A
	9204X459	01/24/92	CLPVOC	1,1,1-Trichloroethane	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	Carbon tetrachloride	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	Vinyl acetate	ug/kg	25000.00	ND	A
	9204X459	01/24/92	CLPVOC	Bromodichloromethane	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	1,2-Dichloropropane	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	cis-1,3-Dichloropropene	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	Trichloroethene	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	Dibromochloromethane	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	1,1,2-Trichloroethane	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	Benzene	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	trans-1,3-Dichloropropene	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	Bromoform	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	Methyl isobutyl ketone	ug/kg	25000.00	ND	A
	9204X459	01/24/92	CLPVOC	2-Hexanone	ug/kg	25000.00	ND	A
	9204X459	01/24/92	CLPVOC	Tetrachloroethene	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	Toluene	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	1,1,2,2-Tetrachloroethane	ug/kg	12000.00	ND	A
	9204X459	01/24/92	CLPVOC	Chlorobenzene	ug/kg	60000.00		A
	9204X459	01/24/92	CLPVOC	Ethyl benzene	ug/kg	7700.00		A J
	9204X459	01/24/92	CLPVOC	Styrene	ug/kg	12000.00	ND	A

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Station Number	Sample Number	Sample Date	Test Method	Analyte	Units	Value	ND Ind.	HLA Qual
IR03MW0-3	9204X459	01/24/92	CLPVOC	Xylenes	ug/kg	26000.00		A
	9204X459	01/24/92	CLPPEST	Aroclor-1016	ug/kg	5900.00		A
	9204X459	01/24/92	CLPPEST	Aroclor-1221	ug/kg	5000.00	ND	A
	9204X459	01/24/92	CLPPEST	Aroclor-1232	ug/kg	5000.00	ND	A
	9204X459	01/24/92	CLPPEST	Aroclor-1242	ug/kg	5000.00	ND	A
	9204X459	01/24/92	CLPPEST	Aroclor-1248	ug/kg	20000.00	ND	A
	9204X459	01/24/92	CLPPEST	Aroclor-1254	ug/kg	20000.00	ND	A
	9204X459	01/24/92	CLPPEST	Aroclor-1260	ug/kg	17000.00		A
	9205X482	01/31/92	CLPCVAA	Mercury	mg/kg	0.10	ND	J3
	9205X482	01/31/92	CLPFUAA	Arsenic	mg/kg	0.34	ND	J3
	9205X482	01/31/92	CLPFUAA	Lead	mg/kg	28.10		J23
	9205X482	01/31/92	CLPFUAA	Selenium	mg/kg	0.50	ND	J3
	9205X482	01/31/92	CLPFUAA	Thallium	mg/kg	0.36	ND	J3
	9205X482	01/31/92	CLPICP	Aluminum	mg/kg	6.40		A
	9205X482	01/31/92	CLPICP	Antimony	mg/kg	5.30	ND	A
	9205X482	01/31/92	CLPICP	Barium	mg/kg	3.00		A
	9205X482	01/31/92	CLPICP	Beryllium	mg/kg	0.18	ND	A
	9205X482	01/31/92	CLPICP	Cadmium	mg/kg	0.56	ND	A
	9205X482	01/31/92	CLPICP	Calcium	mg/kg	106.00		A
	9205X482	01/31/92	CLPICP	Chromium	mg/kg	1.00		A
	9205X482	01/31/92	CLPICP	Cobalt	mg/kg	1.60	ND	A
	9205X482	01/31/92	CLPICP	Copper	mg/kg	49.50		J23
	9205X482	01/31/92	CLPICP	Iron	mg/kg	33.40		A
	9205X482	01/31/92	CLPICP	Magnesium	mg/kg	338.00		A
	9205X482	01/31/92	CLPICP	Manganese	mg/kg	0.55		A
	9205X482	01/31/92	CLPICP	Nickel	mg/kg	5.80	ND	A
	9205X482	01/31/92	CLPICP	Potassium	mg/kg	177.00	ND	R2
	9205X482	01/31/92	CLPICP	Silver	mg/kg	0.34	ND	A
	9205X482	01/31/92	CLPICP	Sodium	mg/kg	2380.00		J3
	9205X482	01/31/92	CLPICP	Vanadium	mg/kg	13.00		J2
	9205X482	01/31/92	CLPICP	Zinc	mg/kg	7.40		A
	9205X482	01/31/92	CLPICP	Molybdenum	mg/kg	0.88	ND	A
	9205X482	01/31/92	EPA7196	Chromium VI	ug/kg	250.00	ND	A
	9205X482	01/31/92	CLPSOC	Phenol	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Bis(2-chloroethyl)ether	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	2-Chlorophenol	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	1,3-Dichlorobenzene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	1,4-Dichlorobenzene	ug/kg	40000.00		A
	9205X482	01/31/92	CLPSOC	Benzyl alcohol	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	1,2-Dichlorobenzene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	2-Methylphenol	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Bis(2-chloroisopropyl)ether	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	4-Methylphenol	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	n-Nitrosodipropylamine	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Hexachloroethane	ug/kg	99000.00	ND	A

Station Number	Sample Number	Sample Date	Test Method	Analyte	Units	Value	ND Ind.	HLA Qual
IR03MW0-3	9205X482	01/31/92	CLPSOC	Nitrobenzene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Isophorone	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	2-Nitrophenol	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	2,4-Dimethylphenol	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Benzoic acid	ug/kg	480000.00	ND	A
	9205X482	01/31/92	CLPSOC	Bis(2-chloroethoxy)methane	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	2,4-Dichlorophenol	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	1,2,4-Trichlorobenzene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Naphthalene	ug/kg	230000.00		A
	9205X482	01/31/92	CLPSOC	4-Chloroaniline	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Hexachlorobutadiene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	4-Chloro-3-methylphenol	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	2-Methylnaphthalene	ug/kg	580000.00		A
	9205X482	01/31/92	CLPSOC	Hexachlorocyclopentadiene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	2,4,6-Trichlorophenol	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	2,4,5-Trichlorophenol	ug/kg	480000.00	ND	A
	9205X482	01/31/92	CLPSOC	2-Chloronaphthalene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	2-Nitroaniline	ug/kg	480000.00	ND	A
	9205X482	01/31/92	CLPSOC	Dimethyl phthalate	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Acenaphthylene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	2,6-Dinitrotoluene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	3-Nitroaniline	ug/kg	480000.00	ND	A
	9205X482	01/31/92	CLPSOC	Acenaphthene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	2,4-Dinitrophenol	ug/kg	480000.00	ND	A
	9205X482	01/31/92	CLPSOC	4-Nitrophenol	ug/kg	480000.00	ND	A
	9205X482	01/31/92	CLPSOC	Dibenzofuran	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	2,4-Dinitrotoluene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Diethyl phthalate	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	4-Chlorophenyl phenylether	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Fluorene	ug/kg	72000.00		A
	9205X482	01/31/92	CLPSOC	4-Nitroaniline	ug/kg	480000.00	ND	A
	9205X482	01/31/92	CLPSOC	2-Methyl-4,6-dinitrophenol	ug/kg	480000.00	ND	A
	9205X482	01/31/92	CLPSOC	n-Nitrosodiphenylamine	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	4-Bromophenylphenylether	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Hexachlorobenzene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Pentachlorophenol	ug/kg	480000.00	ND	A
	9205X482	01/31/92	CLPSOC	Phenanthrene	ug/kg	160000.00		A
	9205X482	01/31/92	CLPSOC	Anthracene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Di-n-butylphthalate	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Fluoranthene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Pyrene	ug/kg	33000.00		A
	9205X482	01/31/92	CLPSOC	Butylbenzylphthalate	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	3,3'-Dichlorobenzidine	ug/kg	200000.00	ND	A
	9205X482	01/31/92	CLPSOC	Benzo(a)anthracene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Chrysene	ug/kg	17000.00		A
	9205X482	01/31/92	CLPSOC	Bis(2-ethylhexyl)phthalate	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Di-n-octylphthalate	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Benzo(b)fluoranthene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Benzo(k)fluoranthene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Benzo(a)pyrene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Indeno(1,2,3-cd)pyrene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	CLPSOC	Dibenzo(a,h)anthracene	ug/kg	99000.00	ND	A

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Station Number	Sample Number	Sample Date	Test Method	Analyte	Units	Value	ND Ind.	HLA Qual
IR03MW0-3	9205X482	01/31/92	CLPSOC	Benzo(g,h,i)perylene	ug/kg	99000.00	ND	A
	9205X482	01/31/92	LUFTD	TPH-Diesel	mg/kg	480000.00		A
	9205X482	01/31/92	LUFTD	TPH-Extractable Unknown Hydrocarbon	mg/kg	100000.00	ND	A
	9205X482	01/31/92	LUFTG	TPH-Gasoline	mg/kg	2500.00	ND	A
	9205X482	01/31/92	LUFTG	TPH-Purgeable Unknown Hydrocarbon	mg/kg	2500.00	ND	A