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Ernesto Galang, Remedial Project Manager
Engineering Field Activity West
Naval Facilities Engineering Command
San Bruno, California

ADDENDUM TO ECOTOXICOLOGICAL TESTING SAMPLING AND ANALYSIS PLAN FOR DEVELOPMENT OF PETROLEUM CLEANUP GOALS NAVAL STATION TREASURE ISLAND

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Prepared By

PRC ENVIRONMENTAL MANAGEMENT, INC.
135 Main Street, Suite 1800
San Francisco, CA 94105
(415) 543-4880

Sharon Tobias

Sharon Tobias, Project Manager

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ECOTOXICOLOGICAL TESTING SAMPLING AND ANALYSIS PLAN FOR DEVELOPMENT OF PETROLEUM CLEANUP GOALS

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RESPONSE TO AGENCY COMMENTS ON THE ECOTOXICOLOGICAL TESTING SAMPLING AND ANALYSIS PLAN FOR DEVELOPMENT OF PETROLEUM CLEANUP GOALS, NAVAL STATION TREASURE ISLAND

This document presents the Navy's response to comments from the Regional Water Quality Control Board (RWQCB) on the Ecotoxicological Testing Sampling and Analysis Plan for Development of Petroleum Cleanup Goals, Naval Station Treasure Island (NAVSTA TI). Comments were received September 6, 1996.

General Comments

1. **Comment:** **In general, the document and approach is satisfactory. However, there are a few points which require clarification before field work can begin. We suggest that a conference with interested agencies, the Navy, and their contractors might be the most efficient way to resolve our questions.**

   Response: The Navy agreed to participate at the meeting which was held via telephone with the interested parties on September 12, 1996.

Specific Comments

2. **Comment:** **Section 4.1, Regulatory Framework: The Navy should cite San Francisco Bay Regional Water Quality Control Order No. 95-136, which required the San Francisco International Airport to determine soil [total petroleum hydrocarbon] TPH cleanup values based on a similar approach described in the subject document.**

   Response: The Navy will cite the RWQCB order in an addenda to the Sampling and Analysis Plan (SAP).

3.A. **Comment:** **Section 4.2, Soil Sampling and Analysis, page 15: The Navy should provide the rationale used for selecting Sites 06, 12, 15, and 22 as the sites being representative of the types of TPH found at TI. There are a number of sites which have varying mixtures of petroleum compounds; why are these particular sites the most appropriate? Review of Tables 2 through 5 seem to indicate that the emphasis is on TPH-diesel; is this adequate coverage of other types of petroleum compounds? One consideration for selecting the sites is the issue of assigning EC10 to mixtures particularly where percentages of each compound might vary at the different sites.**

   Response: The Navy selected sites based on the following factors: sites most likely to be remediated, volume of suspected contamination, suspected contaminant toxicity to the receptors, and proximity to the Bay. Sites listed under "Other Fuel Types" were not selected for the testing program because the fuel type at each of these five sites were different from the majority of sites at NAVSTA TI. Therefore, data collected at sites associated with other fuel types would not be generally representative for NAVSTA TI. In addition, the suspected level of contamination is much lower at these sites than at the other TPH sites selected.

The Navy acknowledges that the sampling approach appears to emphasize TPH-diesel because diesel was the main constituent quantified. However, the analytical method may quantify a fuel as diesel when the source is actually a different type of fuel. Please review Table 1 in the SAP for fuels identified at the sites.

3.B. **Comment:** **The approach for selecting three soil samples at each of the four sites to represent high, medium, and low concentrations of TPH types seems clear. However, Section 5.2, page 18 sampling procedures are unclear as to whether the three samples will be homogenized or retained as separate for the testing.**

Response: The three samples collected at each site will be tested separately, as described in the addenda to the SAP.

3.C. **Comment:** **Based on the results at the San Francisco Airport site, the medium concentration range of 100 to 1,000 mg/kg may need to be refined (although the constituents are different). It seems likely that the EC10 value could fall closer to the 100 mg/kg concentration than the 1,000 mg/kg concentration. Will the range finding approach prior to performing the dilutions assist in honing in on the likely effects concentration? The Navy might consider taking backup soil samples at the medium concentration areas to be held an only utilized if needed, should the first attempt on the bioassay fail to identify an EC10.**

Response: As explained in the addenda to the SAP, the sampling procedure has been changed to collect three soil samples with high concentrations of TPH. No medium and low concentrations samples will be collected. For each sample, after the elutriate is prepared, a series of dilution samples will be prepared to determine the EC10 value. Determining the EC10 values using this approach reduces the test dependency on the original soil sample concentration and will increase the likelihood of identifying an EC10 value.

3.D. **Comment:** **This methodology also brings into question the selection of location 22-HP19 at Site 22 at an immunoassay concentration of > 100 mg/kg, for similar reasons stated in the above paragraph regarding obtaining a meaningful range of dilution concentrations.**

Response: Only those sampling locations with highest soil concentrations of TPH at each site will be tested using the dilution procedure; therefore, determination of the EC10 value is less dependent on the original soil sample concentrations.

3.E. **Comment:** **One concern with the proposed control site is that there has not yet been chemical analysis performed. RWQCB staff recommend taking soil samples from a different location as a backup, should the original location prove to be inappropriate as a control site.**

Response: Chemical analysis will be performed on the soil collected from the control site. Based on a review of the aerial photographs, a new control location has been selected at the elementary school playgrounds. According to the historical aerial

photographs, this area has been used for recreation during most of TI's past operation. The grassy area in front of the Star Barracks has been selected as a backup location. The control sample from the backup location will be tested at a later date, should the first control sample be contaminated. These areas are not expected to be contaminated.

4. **Comment:** **Section 4.3, Toxicity Testing and Section 5.3.1, Analytical Testing: The Navy has proposed performing chemical analysis on the elutriate of the samples before performing the bioassays. Chemical analysis should also be performed on the elutriate of the control samples, as well, unless the results of the soil analysis will already be available to indicate there are no contaminants present.**

Response: The Navy will perform chemical analysis on the elutriate sample as well as the soil sample from the control location.

5.A. **Comment:** **Section 4.4, Derivation of Cleanup Goals: It is unclear what the outcome will be, is the EC10 values will be averaged by using the three samples from each site. Unless the subsequent dilutions from each concentration range (high, medium, and low) overlap, will it be appropriate to average EC10 values? RWQCB staff would like to discuss this further with the Navy's contractors to better understand how the effects concentration will be used.**

Response: Because three soil samples with the highest TPH concentration will be tested using a dilution series, averaging the EC10 is an appropriate step in developing the cleanup goals. Medium and low TPH concentration samples are no longer being collected.

5.B. **Comment:** **It is unclear from this section if the Navy's intent is to determine a cleanup goal for each one of the petroleum compounds, or if a cleanup goal will be assigned to a specific site, depending upon the mixture at that and sites with similar mixtures. Please clarify.**

Response: Analysis results will be evaluated to determine cleanup goals for both total TPH, which can be applied to those sites that have mixtures of these contaminants (method 1), and the two major TPH components: diesel and gasoline, which can be applied to sites if it is determined that either gasoline or diesel is more toxic than the other (method 2). Data collected from all sites will be combined to develop these cleanup goals; clean up goals for specific sites will not be developed. The analytical procedures and the initial data evaluation steps will be identical for the determination of both cleanup goals; only the final calculations will differ. Information regarding the individual constituents will also be incorporated into the determination of cleanup goals.

<u>Sample Collection and Analysis for Determining TPH Cleanup Goals</u>

Four sites were chosen to evaluate the toxic effects of TPH. These four sites were chosen because they have the largest volume of suspected contamination and highest suspected toxicity to receptors, and, therefore, are most likely to impact the Bay and require remediation.

Three soil samples with the highest levels of TPH contamination will be collected from each site. For each soil sample the following tests will be performed: analyze soil sample for constituent concentration, prepare elutriate sample, analyze elutriate sample for constituent concentration, use elutriate sample to prepare dilution series for bioassay tests. The dilution series prepared will bracket the concentration of TPH expected to kill 50 percent of the test organisms.

In addition, two soil samples, each spiked with known quantities of diesel and gasoline, will be tested in the same manner as the other soil samples. The soil collected from the control site will be used for the spike samples. The results of the spiked samples will be used to evaluate the different toxic effects of gasoline and diesel, and as reference values to compare the toxic effects of unweathered fuel (in the spike sample) with toxic effects of weathered fuels (collected in the field).

Comparison of Constituent Concentrations to AWQC Values

The concentrations of constituents, such as polynuclear aromatic hydrocarbons (PAH), benzene, toluene, ethylbenzene, and xylenes (BTEX), and metals, that may be present in the tested elutriate will be evaluated to determine their effect on the test results. First, compare the constituent concentration detected in the elutriate sample to the Ambient Water Quality Criteria (AWQC) (EPA 1994) or the Great Lakes Water Quality Initiative Tier II (EPA 1996) values to determine if the constituents are present at concentrations above a level believed to cause a toxic effect. Second, compare the concentration level of each of the constituents that exceed a water quality criteria, and determine if the constituent concentration exceeds the AWQC by less than one-half of the AWQC value. If this is true, then the effect of the constituent to the overall toxicity, as measured by the EC10 value, is minimal and, therefore, can be disregarded. If all the constituent concentrations fall below the cutoff criteria of one-and-a-half times the AWQC value, the TPH will be considered to be the primary source of toxicity in the sample.

Method 1 for Calculating a TPH Cleanup Goal

Once it has been determined that TPH is the primary source of toxicity, the average EC10 value and the TPH cleanup goal can be calculated. The EC10 value determined by the bioassay tests will be averaged for all samples collected at all sites; this average is the TPH concentration which is protective of ecological receptors in the Bay and will be used to calculate a cleanup goal for TPH mixtures. The soil and groundwater cleanup goals that will protect the Bay will be determined through modeling as proposed by PRC (1996).

Method 2 for Calculating a TPH Cleanup Goal

The second method, to determine TPH cleanup goals for the individual fuel types diesel and gasoline, will follow the same initial procedure as the first method for determining cleanup goals. The same sample data will be used and the comparison of constituent concentrations to AWQC values, for BTEX, PAHs, and metals, will be performed.

Once it has been determined that TPH is the primary source of toxicity, there are five steps to calculate the TPH cleanup goal. An example, using three samples from each of two sampling sites, is presented in Table 1. First, the laboratory will determine the concentrations of gasoline and diesel in the elutriate sample, and determine the EC10 value for each sample. Second, using the concentrations for diesel and gasoline present in the elutriate sample, the percentages of each TPH type compared to the total amount of TPH will be calculated. Third, the EC10 value determined for the elutriate sample will be split by multiplying it by the percentage of each TPH type. For example, if the concentrations of gasoline and diesel were equal, each TPH type would be 50 percent of the mixture and the EC10 value for gasoline and diesel would each be half of the total EC10. Fourth, the EC10 values calculated for a particular fuel type will be averaged over all samples to obtain one EC10 value for each of these types of TPH. Fifth, the TPH concentration which is protective of ecological receptors in the Bay (EC10) can be used to calculate a soil and groundwater cleanup goal for each type of TPH through modeling, as proposed by PRC (1996).

6. **Comment:** **Appendix A: page A-4 describes the methodology for porewater extraction. Please modify to reflect the methodology to be used for elutriate preparation.**

Response: The Navy will note in the addenda to the SAP that Section 5.0 of Appendix A on pore water extraction should be replaced with Section 5.0 of Appendix B on elutriate preparation. Toxicity testing will be conducted on soil elutriate media only.

REFERENCES

PRC Environmental Management, Inc. 1996. "Approach to Development of Petroleum Cleanup Goals Protective of the San Francisco Bay, Naval Station Treasure Island, San Francisco, California." January.

U.S. Environmental Protection Agency (EPA). 1994. *Water Quality Standards Handbook*. Second Edition. EPA 83-B-R-94-005a. Office of Water. Washington, DC. August.

EPA. 1996. "Ecotox Thresholds." *ECO Update*. Vol. 3, No. 2, EPA 540/F-95/038. January.

TABLE 1
EXAMPLE: DEVELOPMENT OF CLEANUP GOALS FOR DIESEL AND GASOLINE
All Data Was Created for this Example and Does Not Represent Actual Conditions at Treasure Island

Calculation Steps to Determine Separate TPH Cleanup Goal for Gasoline and Diesel (Method 2)	1. Laboratory determines concentrations of gasoline and diesel in the elutriate sample and the EC10 value				
	2. Calculate percent of diesel and gasoline compared to total TPH concentration				
				3. Multiply the percentage of each TPH type by the EC10 to determine a separate EC10 for each TPH type	
				4. Calculate an average EC10 values for each TPH type; this is the toxicity value protective of receptors in the Bay	
				5. Calculate the TPH cleanup goal using contaminant modeling	
Sample No.	**Percent of TPH Type in Elutriate (Step 2)**		**EC10 (mg/L) (Step 1)**	**EC10 Attributed to Each TPH Type (Step 3)**	
	Diesel (Percent)	**Gasoline (Percent)**		**Diesel (mg/L)**	**Gasoline (mg/L)**
4-A	10	90	1,500	150	1,350
4-B	50	50	1,200	600	600
4-C	30	70	1,350	405	945
6-A	20	80	1,325	265	1,060
6-B	60	40	1,375	825	550
6-C	100	0	1,300	1,300	0
Average EC10 (Step 4)	--	--	--	591	751
Calculate TPH Cleanup Goal (Step 5)	--	--	--	Determined through groundwater modeling	Determined through groundwater modeling

Notes: EC10 = Effective concentration 10; concentration at which 10 percent of the test organisms develop abnormally
TPH = Total petroleum hydrocarbon

This addenda documents revisions to the Ecotoxicological Testing Sampling and Analysis Plan for Development of Petroleum Cleanup Goals, Naval Station Treasure Island (NAVSTA TI). The addenda was prepared in response to comments received from the Regional Water Quality Control Board (RWQCB) on September 6, 1996.

1. **The following statement should be added to Section 4.1, Regulatory Framework, page 15.**

   The document which required the San Francisco International Airport to determine soil TPH cleanup values is San Francisco Bay Regional Water Quality Control Order No. 95-136.

2. **The following changes apply to Section 4.2, Soil Sampling and Analysis, page 15.**

   Add the following statement:

   The Navy selected sites based on the following factors: sites most likely to be remediated, volume of suspected contamination, suspected contaminant toxicity to the receptors, and proximity to the Bay. Sites listed under "Other Fuel Types" were not selected for the testing program because the fuel type at each of these five sites were different from the majority of sites at NAVSTA TI. Therefore, data collected at sites associated with other fuel types would not be generally representative for NAVSTA TI. In addition, the suspected level of contamination is much lower at these sites than at the other TPH sites selected.

   Delete the three sentences starting with "Soil samples from each ... and (3) high--more than 1,000 mg/kg."

   Replace Tables 2 through 5 with attached revised tables.

3. **The following statement should be added to the text in Section 4.4, Derivation of Cleanup Goals, page 16.**

   EC10 values will be evaluated to determine cleanup goals for both total TPH, which can be applied to those sites that have mixtures of these contaminants (method 1), and the two major TPH components: diesel and gasoline, which can be applied to sites if it is determined that either gasoline or diesel is more toxic than the other (method 2). Data collected from all sites will be combined to develop these cleanup goals; clean up goals for specific sites will not be developed. The analytical procedures and the initial data evaluation steps will be identical for the determination of both cleanup goals; only the final calculations will differ. Information regarding the individual constituents will also be incorporated into the determination of cleanup goals.

   <u>Sample Collection and Analysis for Determining TPH Cleanup Goals</u>

   Four sites were chosen to evaluate the toxic effects of TPH. These four sites were chosen because they have the largest volume of suspected contamination and highest suspected toxicity to receptors, and, therefore, are most likely to impact the Bay and require remediation.

   Three soil samples with the highest levels of TPH contamination will be collected from each site. For each soil sample the following tests will be performed: analyze soil sample for constituent concentration, prepare elutriate sample, analyze elutriate sample for constituent concentration, use

elutriate sample to prepare dilution series for bioassay tests. The dilution series prepared will bracket the concentration of TPH expected to kill 50 percent of the test organisms.

In addition, two soil samples, each spiked with known quantities of diesel and gasoline, will be tested in the same manner as the other soil samples. The soil collected from the control site will be used for the spike samples. The results of the spiked samples will be used to evaluate the different toxic effects of gasoline and diesel, and as reference values to compare the toxic effects of unweathered fuel (in the spike sample) with toxic effects of weathered fuels (collected in the field).

Comparison of Constituent Concentrations to AWQC Values

The concentrations of constituents, such as polynuclear aromatic hydrocarbons (PAH), benzene, toluene, ethylbenzene, and xylenes (BTEX), and metals, that may be present in the tested elutriate will be evaluated to determine their effect on the test results. First, compare the constituent concentration detected in the elutriate sample to the Ambient Water Quality Criteria (AWQC) (EPA 1994) or the Great Lakes Water Quality Initiative Tier II (EPA 1996) values to determine if the constituents are present at concentrations above a level believed to cause a toxic effect. Second, compare the concentration level of each of the constituents that exceed a water quality criteria, and determine if the constituent concentration exceeds the AWQC by less than one-half of the AWQC value. If this is true, then the effect of the constituent to the overall toxicity, as measured by the EC10 value, is minimal and, therefore, can be disregarded. If all the constituent concentrations fall below the cutoff criteria of one-and-a-half times the AWQC value, the TPH will be considered to be the primary source of toxicity in the sample.

Method 1 for Calculating a TPH Cleanup Goal

Once it has been determined that TPH is the primary source of toxicity, the average EC10 value and the TPH cleanup goal can be calculated. The EC10 value determined by the bioassay tests will be averaged for all samples collected at all sites; this average is the TPH concentration which is protective of ecological receptors in the Bay and can be used to calculate a soil and groundwater cleanup goal for TPH mixtures. The soil and groundwater cleanup goal that will protect the Bay will be determined through modeling as proposed by PRC (1996).

Method 2 for Calculating a TPH Cleanup Goal

The second method, to determine TPH cleanup goals for the individual fuel types diesel and gasoline, will follow the same initial procedure as the first method for determining cleanup goals. The same sample data will be used and the comparison of constituent concentrations to AWQC values, for BTEX, PAHs, and metals, will be performed.

Once it has been determined that TPH is the primary source of toxicity, there are five steps to calculate the TPH cleanup goal. First, the laboratory will determine the concentrations of gasoline and diesel in the elutriate sample, and determine the EC10 value for each sample. Second, using the concentrations for diesel and gasoline present in the elutriate sample, the percentages of each TPH type compared to the total amount of TPH will be calculated. Third, the EC10 value determined for the elutriate sample will be split by multiplying it by the percentage of each TPH type. For example, if the concentrations of gasoline and diesel were equal, each TPH type would be 50 percent of the mixture and the EC10 value for gasoline and diesel would each be half of the total EC10. Fourth, the EC10 values calculated for a particular fuel type will be averaged over all

samples to obtain one EC10 value for each of these types of TPH. Fifth, the TPH concentration which is protective of ecological receptors in the Bay (EC10) can be used to calculate a soil and groundwater cleanup goal for each type of TPH through modeling, as proposed by PRC (1996).

4. **The following statement replaces all information in the second bullet item in Section 5.2, Soil Sampling with a Hydraulic Punch, page 19.**

- Soils will be sampled continuously by using a 4-foot bore sampler with a transparent acetate liner, which enables personnel to visually identify the boundary between saturated and unsaturated soil.

  - At each soil sampling site, soil samples will be collected with a bottom depth two feet below the target sample depth as listed in Tables 2 through 5.

  - At each site, three soil samples will be collected. All soil from the 4-foot sampler will be considered one sample. The acetate sleeve will be divided into managable portions, the ends covered with Teflon, and sealed with plastic caps.

  - Samples will be properly labeled and placed on ice in insulated coolers for shipment to the testing laboratory. The laboratory will be responsible for homogenation and storage of the sample.

  - Soil samples will be analyzed as described in Section 5.3

5. **Add the following statement regarding the collection and sample analysis of control sample in Section 5.3.1, Analytical Testing, page 20.**

The Navy will perform chemical analysis on the elutriate sample as well as the soil sample from the control location to ensure that the soil is appropriate for use as a control. Based on a review of the aerial photographs, a new control location has been selected at the elementary school playgrounds. According to the historical aerial photographs, this area has been used for recreation during most of TI's past operation. The grassy area in front of the Star Barracks has been selected as a backup location. The control sample from the backup location will be tested at a later date, should the first control sample be contaminated. These areas are not expected to be contaminated.

Two soil samples, in addition to the three control samples, will be collected at the control site for use as clean soil for the two spike samples. The exact location of these five samples have not been determined and can be selected where it is convenient within the elementary school playground. The samples should be collected from a depth of 0 to 4 feet below ground surface.

6. **Add the following statement of the analytical procudure described in Section 5.3.2, Toxicity Testing, page 20.**

For each sample, after the elutriate is prepared, a series of dilution samples will be prepared to determine the EC10 value. Determining the EC10 values using this approach reduces the test dependency on the original soil sample concentration and will decrease the likelihood of failing to identify an EC10 value.

If analytical results from the elutriate analysis are available before the start of the bioassay test, they should be evaluated. If no TPH is detected in the elutriate samples, then the bioassay test should not be performed.

7. **Appendix A**

Section 5.0 of Appendix A on pore water extraction should be replaced with Section 5.0 of Appendix B on elutriate preparation. Toxicity testing will be conducted on soil elutriate media only.

8. **The following references should be added to the reference list.**

PRC Environmental Management, Inc. 1996. "Approach to Development of Petroleum Cleanup Goals Protective of the San Francisco Bay, Naval Station Treasure Island, San Francisco, California." January.

U.S. Environmental Protection Agency (EPA). 1994. *Water Quality Standards Handbook.* Second Edition. EPA 83-B-R-94-005a. Office of Water. Washington, DC. August.

EPA. 1996. "Ecotox Thresholds." *ECO Update*. Vol. 3, No. 2, EPA 540/F-95/038. January.

TABLE 2
SUMMARY OF SITE 6 TPH DATA AND SELECTED SAMPLING LOCATIONS

Sample Location	Depth	TPH-diesel Concentration, mg/kg	Location to be Sampled
06HP14	2.00	25	
06HP18	2.00	79	
06HP04	6.00	100	
06HP57	1.75	62	
06HP57	3.75	55	
06HP57	6.75	11	
06HP58	2.00	17	
06HP58	3.75	43	
06HP58	7.75	27	
06HP24	1.00	820 (31)	
06HP28	7.00	430 (4.7)	
06HP18	7.50	210 (150)	
06HP23	1.00	2900 (150)	Yes
06HP14	7.75	1900 (61)	
06HP15	5.75	14,000 (45)	Yes
06HP11	7.75	12,000 (180)	
06HP10	6.50	17,000 (240)	Yes

Notes:

Results from phase IIB remedial investigation.
Concentrations shown in ( ) are TPH-gasoline.
Sample 06HP23 was chosen because this location is in a different area than locations 06HP10, 06HP11, and 06HP15.

TABLE 3
SUMMARY OF SITE 12 TPH DATA AND SELECTED SAMPLING LOCATIONS

Sample Location	Depth	TPH-diesel Concentration, mg/kg	Location to be Sampled
12HP12	2.75	54	
12HP14	4.75	37	
12HP18	0.75	25	
12HP21	1.75	36	
12HP27	1.50	88	
12HP36	1.50	46	
12HP66	1.25	62	
12HP67	1.50	36	
12HP80	2.00	30	
12HP82	3.75	62	
12HP93	2.75	40	
12HP100	1.75	43	
12HP101	2.5	32	
12HP02	3.25	270 (220)	Yes
12HP27	3.75	190	
12HP32	5.00	880	Yes
12HP66	3.75	290	
12HP67	3.75	850	Yes
12HP71	3.75	260	
12HP72	3.75	150	
12HP75	2.00	600	
12HP76	3.75	160	
12HP84	3.75	130	

Notes:
Results from phase IIB remedial investigation.
Concentrations shown in ( ) are TPH-gasoline.
Sample 12HP02 was chosen because it contains a mixture of gasoline and diesel.

TABLE 4
SUMMARY OF SITE 14/22 TPH DATA AND SELECTED SAMPLING LOCATIONS

Sample Location	Depth	TPH-diesel Concentration, mg/kg	Location to be Sampled
22HP24	5.25	ND (38)[a]	
22SB01	10.5	ND (5.48)	
22SB02	4.00	ND (0.12)	
22SB01	10.0	784 (202)	
22SB02	8.00	866 (683)	
22HP19	7.0	> 100[b]	Yes [c]
22SB01	9.5	1,580 (4,430)	
22SB02	7.00	2,350 (1,330)	Yes
22SB03	8.50	3,460 (2,070)	Yes

Notes:

All results from the phase I remedial investigation except where noted.

a Results from 1992 phase IIB remedial investigation.
b Immunoassay results from 1995 phase IIB remedial investigation
c Location 22HP19 was selected for sampling since the more recent phase IIB remedial investigation results indicate the contamination is present.

Concentrations shown in ( ) are TPH-gasoline.

TABLE 5
SUMMARY OF SITE 15 TPH DATA AND SELECTED SAMPLING LOCATIONS

Sample Location	Depth	TPH-diesel Concentration, mg/kg	Location to be Sampled
15HP08	1.50	74	
15HP08	3.00	15	
15HP10	1.00	63	
15HP16	1.25	53	
15HP16	3.50	49	
15HP18	1.00	17	
15HP18	3.50	83	
15HP18	6.50	25	
15HP10	6.50	190	
15HP16	7.50	7200	Yes
15HP19	4.30	10,000	Yes, 2 samples

Notes:

Results are from the phase II remedial investigation.
Two samples should be collected near location 15HP19.
The samples do not need to be colocated, but
should be from a similar depth.