Brown & Root *Services*

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C-NAVY-06-98-1187W

June 12, 1998

Project Number 7578

Mr. Jim Shafer
Northern Division, Naval Facilities Engineering Command
10 Industrial Highway, Mail Stop No. 82
Lester, Pennsylvania 19113-2090

Reference: CLEAN Contract No. N62472-90-D-1298
Contract Task Order 0288

Subject: Response to Regulatory Comments
DRAFT Source Removal Evaluation Report
Old Fire Fighting Training Area (OFFTA)
Naval Education & Training Center (NETC), Newport, Rhode Island

Dear Mr. Shafer:

Brown & Root (B&R) Environmental has completed a review of comments received from the United States Environmental Protection Agency (USEPA) and Rhode Island Department of Environmental Management (RIDEM). Several of the comments address data gaps or supplementing the existing data set. Our responses defer further investigation to future studies. Regulatory comments did not change the conclusion of the report which determined a source removal was not warranted at this time. B&R Environmental recommends responding to the comments in a letter format, instead of re-issuing the report. Regulatory comments are presented in italics, B&R Environmental's responses follow in normal text.

I. RIDEM Comments

1. General Comment

"In an effort to reduce field over sight during field activities the DEM requested that the Navy submit copies of field notebooks, logbooks, photographs and video tapes collected as part of this effort. The Navy agreed to the States requests in a letter dated 26 June 1996. Field work at the site was essentially completed in July of 1997. Upon completion the DEM requested copies of the aforementioned field logs, photographs, etc. The Navy, however did not forward the requested material. The DEM continued to reiterate its requests, specifically for the ***field*** *photographs and video tapes, in order to resolve issues concerning the length and locations of specific test pits. Later on it became apparent that this information would be significant in the review of the Source Removal Evaluation Report for the site. However, despite the repeated request for these documents, the Navy did not submit the photographs and video tapes until five working days prior to the submittal deadline for comments on this site. The State is concerned that there was a seven month delay in a simple submittal of field documents. This length of this delay is not the only concern as the State had reduced field oversight based upon assurances that field documents*

would be submitted in a timely fashion. Delays of this nature should be avoided in the future and the State is willing to offer assistance to the Navy in order to avoid future delays in the process. Please be advised that due to the aforementioned late submittals, additional comments may be forwarded at a later date or during the draft final review period."

The comment is noted.

2. ***Section 2.2.3.1, Monitoring Well Installation: Page 2-6.***

"Monitoring Well MW 101 was constructed using 5 feet of screen (3 to 8 feet BGS) based upon the presence of visual contamination (petroleum like sheen) at a maximum depth of 8-10 feet bgs and an initial water depth of approximately 8 ft bgs.

Monitoring wells screen for obvious reasons, are typically installed within the area of contamination, The Work Plan for this site reflects this philosophy as it stipulates that well screen will be placed in the area of contamination. The above states that the well was terminated above the area of contamination. This does not conform to the provisions of the Work Plan. The Navy should indicate why the requirements of the work plan were not followed and why the monitoring well was screened above the zone of contamination."

Contamination was detected from 4-feet bgs to a maximum depth of 8 to 10-feet. The installation of MW 101 included construction of the sand pack to 9-feet bgs. The monitored interval of MW 101 extends from 3 to 9-feet bgs, across the majority of the area of contamination. Initial water level was encountered between 5 to 6 feet bgs.

3. ***Section 2.2.3.1, Monitoring Well Installation: Page 2-6.***

"This section of the report discusses the monitoring well installation. The report should indicate at what depths the soil samples were taken."

Samples for laboratory analysis were collected from the 6 to 8 feet interval for monitoring wells (MW) 101 and MW-102. The boring logs included in Appendix C document sample intervals for field screening with a flame ionization detector (FID). Sample intervals are also included for exceedances in the Table Summary of Analytical Data, Appendix B.

4. ***Section 2.2.3.1, Monitoring Well Installation: Page 2-6.***

"It is common practice to take additional samples from soil borings if contamination is observed at different depths. A review of the well log for MW 102 indicates that relatively low FID readings (5-28 ppm) were observed in this boring except for readings taken at 6 ft and 16 ft, 2700 and 400 ppm respectively. As elevated readings were observed at these depths, both locations should

have been sampled. However the Navy did not collect a sample from the lower contamination zone. Justification is requested for not collecting a sample from this zone."

The work plan stipulated that a single sample (from the most contaminated area) would be collected from each boring for laboratory analysis. Since the headspace reading at 6-feet bgs (2,700 ppm) was over 6 times the reading measured at 16-feet, a decision was made in the field to forward one sample to the laboratory for analysis (6-feet bgs).

5. ***Section 2.2.3.1, Monitoring Well Installation:***
Page 2-6.

"A review of the information in boring logs for MW 102 indicated that elevated FID readings were observed at 6 and 16 feet bgs. The report should include a discussion of these two different zones of contamination, including a rationale why elevated levels were observed approximately eight feet apart. In addition, since a sample was not collected from the lower elevation, the Navy should indicate what actions will be taken to ascertain the nature of this contamination."

There is insufficient data to discuss rationale for the two separate zones of contamination. This could be addressed in the remedial investigation. The field activities conducted under this task assignment focused on identifying a discrete source.

6. ***Section 2.2.3.1, Monitoring Well Installation:***
Page 2-6.

"Based upon the information in boring log for MW 101 it appears that one headspace reading was collected. The Work Plan for the site stipulates that continuous split spoons will be taken and undergo headspace analysis. The boring log indicates that this was not done. The Navy should indicate why the field work deviated from the requirements of the Work Plan."

As noted on the boring log, the flame ionization detector (FID) failed during the installation of the boring. Remarks on visual and olfactory observations were documented.

7. ***Section 2.2.3.3, Groundwater Sampling;***
Page 2-7.

"This section of the report discusses the groundwater monitoring conducted at the site and the lack of a sheen as detected by an oil/water interface probe. A review of the findings of the Phase I report and this report indicates that petroleum like sheens were observed during the construction of the monitoring wells and in the test pits. Therefore, since there was evidence of sheen at the site, the Navy should indicate why other measures, other than an oil water interface probe, were not employed to ascertain the presence of a sheen. The simplest, and most basic measure, would have been to observe the contents of groundwater sample collected in a bailer."

All monitoring wells were purged prior to sampling. Extracted ground water was inspected before containerization. No non-aqueous phase liquid (NAPL) was observed, confirming the interface probe readings. MWs 101, 102, 9R, and 6R were purged and sampled using conventional bailing techniques.

8. Section 2.3, Shoreline Investigation; Page 2-8.

"This section of report discusses the shoreline sampling effort. Based upon information obtained form test pits and monitoring wells installed at the site and discussions held in the field with the Navy's contractor it appears that test pits are warranted on the shoreline. These test pits should be installed as part of RI activities."

The comment is noted.

9. Section 2.4, Storm Sewer Outfall Sampling; Page 2-9.

"Sampling an outfall pipe on the northern shoreline was eliminated as a potential sample location because no visible water was flowing from the pipe at low tide.

The above would seem to imply that lack of water flow from the outfall resulted in this outfall not being tested. Obviously, one would not expect water flow from a storm sewer except after rain events. Therefore the lack of water flow should not prohibit this sampling effort. As this report is a public document the above apparent discrepancy should be explained."

Flow through a storm sewer is not only expected during a rain event. In many cases groundwater infiltrates a storm sewer system and contributes to flow. Since there was no standing (or running) water at the outfall point, B&R Environmental collected a sample from an on-site manhole approximately 100 feet upstream of the outfall.

10. Section 2.4, Storm Sewer Outfall Sampling; Page 2-9.

"Storm sewer outfall pipes are potential preferred conduits for groundwater flow from either infiltration or preferential flow through disturbed backfill material surrounding the pipe. The report should indicate what actions were taken to investigate and test this potential flow pathway."

The entire shoreline along the Old Fire Fighting Site was visually inspected. There were no visual signs of staining in the vicinity of the storm sewer outfall. If the sewer, or associated pipe bedding, was acting as a preferential pathway for the contamination, some staining near the outfall would be expected.

11. Section 3.0 Investigation Findings; Page 3-2.

"This section of the report indicates that the industrial/commercial exposure was used for the recreational exposure route. The industrial/commercial exposure target is the adult populations, and utilize exposure scenarios for a typical adult worker. It is inappropriate for the recreational scenario which involves children, who are more sensitive to many contaminates then adults and whose exposure routes are different (for example children consume more dirt then adults).

Therefore, comparisons in this and other sections of the report should be made to the residential scenario and not the industrial/commercial scenario."

To assess whether site subsurface soils, shoreline sediments, and groundwater posed potential threats or impacts to human health and the environment, the analytical results developed during the Source Removal Evaluation were **qualitatively** compared to the direct exposure and leachability criteria presented in Section 8.00 of RIDEM's Remediation Regulations (DEM-DSR-01-93, amended August 1996), which include the Method 1 Soil and Groundwater Objectives.

12. Section 3.2, Groundwater:
Page 3-8/3-9

"The report has previously noted that visibly petroleum contaminated soils and groundwater sheens were observed at the site. However, low levels of SVOCs and TPH were detected in groundwater samples. The report should indicate how high levels of petroleum contamination and/or sheen at or in the water table did not result in detection of analytes in the groundwater."

A possible explanation is that weathered semi-volatile organic compounds (SVOC) typically exhibit low solubility.

13. Section 3.2.1, Volatile Organic Compounds (VOCs);
Page 3-8.

"This section of the report indicates that benzene was detected in groundwater samples. Benzene was not detected in soils samples collected at the site. The report should discuss the lack of detection of a contaminate in the soil yet it is present in the groundwater."

It is possible that groundwater has served as a migration pathway for a previous release of a petroleum product such as gasoline or fuel oil that may have occurred at another location on site other than where overburden soil samples were collected.

14. Section 3.3, Shoreline Sediments:
Page 3-11.

"This section of the report discusses the results from the sediment samples taken at the site and compares them to human health risk standards. The five sediment samples taken at the site were not designed to determine risk via sediment exposure and should not be presented as such. Therefore, any comparison of this nature in this or other sections of the report should be removed."

The National Oil and Hazardous Substances Contingency Plan (title 40, Code of Federal Regulations, Section 300.415) presents eight conditions to be evaluated in determining the need to perform a removal action. The first condition, "(i) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants" must be considered while performing this determination.

The discussion presented in Section 3.3, was presented to address this condition and was not meant to be interpreted as a risk analysis.

15. Section 3.3, Shoreline Sediments:
Page 3-12.

"This section of the report discusses the TPH results for sediment samples collected at the site. Please discuss any duplicate sample results associated with this sampling event."

The sample identified as OFF-S-DUPL6, is a duplicate of OFF-S-SS1-0005. Sample OFF-S-DUPL6 was reported undiluted with 180J mg/Kg of TPH. Sample OFF-S-SS1-0005 was diluted by a factor of 10 due to possible matrix effects and was reported as 250UJ mg/Kg. A comparison of these two results yields a relative percent difference of 32% which is within the quality control criteria for field duplicates. Both were below RIDEM action levels.

16. Section 3.5 Test Pit Observations;
Page 3-15.

" 'However the laboratory reported the sample could not be analyzed for TPH because it contained negligible amounts of oil.'

The above statement is confusing as it would seem to imply that an aqueous sample could not be run for TPH as it contained a negligible amount of oil. The amount of oil in a sample would not affect the ability to perform TPH analysis. Therefore the above should be clarified. In addition, RIDEM requests a letter from the laboratory concerning this issue."

Sample OFF-A-TP-12-0405 was analyzed at a 10,000X dilution. It was noted on the chain of custody that the sample contained heavy oil. The concentration of TPH reported by the laboratory was < 13,000 mg/l. B&R Environmental's comment "However the laboratory reported the sample could not be analyzed for TPH because it contained negligible amounts of oil.", is inaccurate and should be replaced with "Laboratory analysis of the sample reported a dissolved concentration of < 13,000 mg/l." The last sentence under **Section 3.2.6 Test Pit Aqueous Samples** , should also be deleted, "However, the laboratory determined that too little potential LNAPL in the sample was present to permit analysis." and replaced with "Analytical results are presented in Appendix B."

The inaccurate statements were the result of a misunderstanding between B&R Environmental and the laboratory. The portion of the laboratory report pertaining to TPH is attached under Appendix A.

17. Section 3.5, Test Pit Observations;
Page 3-16.

"This section of the report discusses the test pitting efforts with respect to the oil water separator at the site. Please provide the dimensions of the oil/water separators, specifically the distance between the two separators and the length, width and height of each separator."

The discussion included in the report refers to "concrete debris", and states "Additional work may

be needed to identify the function of this subsurface feature". B&R Environmental speculated in the field the concrete debris was related to the former oil/water separator. However, B&R Environmental could not confirm the function of the structure.

18. Section 3.6, Estimated Contaminant Volume; Page 3-16.

"This section of the report discusses volumes of contaminated soil at the site in terms of cubic feet. Quantities of this nature are normally reported in cubic yards. Please adjust the report accordingly."

The volume of TPH contaminated soil, 73,080 cubic feet is equivalent to 2,700 cubic yards.

II. EPA COMMENTS

p. 2-3, §2.2.1

"The excavation at test pit TP-04 was halted owing to the presence of potential asbestos containing material (ACM). The disposition of ACMs should be discussed in this Report. The text should state whether ACM will be handled under the CERCLA program or under a state regulatory program."

Excavation of TP-04 was halted for health & safety reasons due to the presence of an unknown substance, speculated to be asbestos. The substance was not analyzed since the focus of the investigation was the identification of discrete petroleum sources. Further investigation may be performed in future studies.

p. 2-9, §2.4

"The text indicated that sampling of the outfall pipe on the northern shoreline was eliminated because no visible water was flowing from the pipe at low tide. The objective of the storm sewer outfall investigation was to determine if PAH constituents were discharging from the storm sewers. Samples should have been collected right after a storm event. Collecting samples just after a storm event when water is discharging from the outfall should be included in future investigations."

The comment is noted.

p. 3-2, § 3

"It is stated that the default input parameters for the industrial/commercial exposure criteria that are available under Rule 8.02B of the Remediation Regulations are conservative for use in the evaluation of the recreational exposure reflective of the current use. While these exposure parameters may be too conservative for use in evaluating recreational human health exposure at the site, these exposure criteria or Region III RBCs should be compared to the site specific data for screening purposes. The chemicals that exceed these screening level criteria should be evaluated

in the risk assessment using reasonable maximum exposure parameters for current and future use scenarios.

A comparison to Region III residential RBCs showed exceedances for several chemicals and media. For example, the concentration of arsenic at TP-16 (10 to 11 ft bgs) was 74.4 mg/kg. Using the Region III residential soil RBC as a comparison, this concentration yields a 2E-4 relative risk. The concentration of manganese at OFF-A-WM2D-01 was 6,390 mg/L. This concentration, when compared to the Region III tap water RBC yielded a 8E-5 risk. Risks in the E-5 to E-6 range were calculated for several other concentrations in subsurface soil and water using similar comparisons. The report needs to compare current surface soil contaminant concentrations to RBCs or other risk-based criteria."

The focus of the Source Removal Evaluation was the identification of potential discrete sources warranting removal. Comparisons of current surface soil contaminant concentrations to RBCs or other risk-based criteria will be discussed in the RI.

p. 3-5, §3.1.2

"The text states that the RIDEM industrial/commercial direct exposure criterion for 2-methylnaphthalene is 0.04 mg/kg. However, the RIDEM's Remediation Regulation (DEM-DSR-01-93, amended August 1996) states that the criterion is 10,000 mg/kg. Please verify the RIDEM industrial/commercial direct exposure criterion."

The criterion was changed from 0.04 to 10,000 mg/kg as the regulations were processed from draft to final. There were no exceedances for 2-methylnaphthalene based on the current criterion. No other changes were noted after reviewing the current edition of the regulations.

p. 3-7, §3.1.5

"The text states that arsenic was detected at 4.1 mg/kg in soils collected at the one to two foot interval. However, the direct exposure to this contaminant has not been discussed even though it is above two feet."

The purpose of the investigation was to identify discrete sources of petroleum contamination warranting a removal action. Risk related to exposure to chemicals will be addressed in the RI.

p. 3-10, ¶3, § 3.2.5

"This paragraph discusses the lack of regulatory standards to compare with the concentrations of metals in a GB aquifer. Use of other regulatory standards, such as regulatory standards for other aquifer classifications or Region III tap water RBCs should be considered. Although these other standards may be very conservative for use in screening GB aquifer concentrations, they can provide important information to enable characterization of the contamination in the aquifer. Although the GB aquifer groundwater is not suitable as a potable water supply, it may influence surface water concentrations and therefore could contribute to ecological or human trespasser exposure. The groundwater contaminant concentrations should be compared to regulatory standards for other aquifer classifications or Region III tap water RBCs."

Surface waters and marine sediments adjacent to the OFFTA site will be investigated in the ecological risk assessment (ERA).

p. 3-11, § 3.2.6

"This section discusses the lack of test pit aqueous samples. Three of the four samples were lost. Collection of groundwater at approximately the same depth and location as the test pit should be conducted during the remedial investigation. Also, soil sampling data representative of current conditions needs to be presented or summarized in this section. It is the current soil cover that is of concern for human health exposure."

The comment is noted.

p. 4-6, §4.4

"The second paragraph ends with the following sentence, "Determinations as to whether or not the pipe acts as a potential discrete contaminant source could not be made based on the collection of a single sample." According to the Source Removal Evaluation Work Plan, the purpose of the storm sewer outfall samples and the sediment samples was to "attempt to corroborate the Phase II RI's findings." This section does not discuss the Phase II RI findings and does not attempt to corroborate them. Five sediment samples and storm sewer outfall samples were collected during the Source Removal Evaluation. Therefore, it is inappropriate to indicate the collection of 'a single sample.' "

The draft work plan proposed a comparison of storm sewer outfall samples to those reported in TRC's RI Report. This corroboration was not performed since B&R Environmental was unable to collect the necessary outfall sample. The shoreline sediment sampling program was designed to determine if asphalt present on the beach is a source of PAH contamination. It did not include a comparison to the previous RI results.

The five sediment samples included four shoreline and one marine sediment samples. The single sample reference refers to the one marine sediment sample collected in the vicinity of the 8-inch cast iron pipe.

p. 4-8, § 4.5

"The first paragraph addresses the actual or potential exposure to nearby human populations, animals, or the food web from hazardous substances or pollutants. Although a characterization of the excavated topsoil is included, the remaining soil (now the surface soil) is not characterized. Groundwater concentrations are also not characterized. The surface soil that is presently at the site and the groundwater should be characterized and potential exposure pathways should be discussed."

The remaining soil, after test pitting, is not the current surface soil. All the test pits were backfilled from 1 - 2-feet bgs to grade with imported clean top soil. Regarding potential exposure to human and ecological receptors, a risk assessment will be completed as part of the remedial investigation (RI).

p. 4-8, §4.5, ¶2

"This paragraph addresses the actual or potential contamination of drinking water supplies or sensitive ecosystems. The paragraph does not provide enough information to adequately ensure that drinking water supplies will not be contaminated. The existence of sensitive ecosystems and potential human and ecological exposure pathways should be discussed. Narragansett Bay must be identified as a sensitive ecosystem. The elevated SVOC concentrations detected in sediment sample SS-1 and the adjacent subsurface should be discussed and evaluated under this category."

The groundwater at the site is classified by RIDEM as class GB, not suitable for public or private drinking water. Potable water for Coasters Harbor Island is supplied by the Newport Water Department via local reservoirs and distribution piping. The Narragansett Bay ecosystem adjacent to the OFFTA site will be studied in the ERA.

p. 4-8, §4.5, ¶3

"This paragraph addresses the hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release. It is stated that no such containers were found in the field investigation. However, the field investigation did not identify the location of the former fire training facility structures. The uncertainty of locating all possible sources of contamination in the field investigation must be addressed under this category."

Attempts to locate subsurface features (anomalies) were performed utilizing standard industry practices (magnetic metal detectors, and reviewing historical plans of the site). Test pit locations were sited based on the information collected. Although a reasonable effort was made, the above described activities did not locate a discrete source of contamination, and the possibility exists that potential sources of contamination were not identified during the field activities.

p. 4-8, §4.5, ¶4

"This paragraph addresses the presence of high levels of hazardous substances or pollutants in soils largely at or near the surface that may migrate. The topsoil that was removed from the site is characterized, but the remaining soil cover was not discussed. It is the current soil cover that is a concern for potential current human health (recreational or trespasser) exposure. Please add a discussion regarding the current surface soil characterization and the possibilities for migration."

The top 12 to 15 inches of each test pit were backfilled with imported clean topsoil. The characterization of the excavated topsoil did not reveal levels of contaminates above RIDEM's direct exposure criteria.

P. 4-9, §4.5, ¶1

"This paragraph addresses the weather conditions at the site that may cause hazardous substances or pollutants or contaminants to migrate or be released. The paragraph states that

weather conditions have not caused contaminants to migrate over the past three years. This statement is not defended in the text and three years is not a significant time period to conclude that contaminants do not migrate. The discussion should be further expanded to defend the statement and to discuss the possibilities of migration from soil to groundwater owing to rain events and other such precipitation events.

The potential for wave action during storm events to erode the open faced fill material into the bay should be discussed under this category."

Contaminant migration and shoreline erosion will be investigated in detail in the RI and ERA studies. The Source Removal Evaluation Report did not identify migration of contaminants which would warrant a source removal action.

p. 4-9, §4.5, ¶5

"This paragraph discusses other situations or factors that may pose a threat to public health, welfare, or the environment. The discussion does not provide information regarding potential exposure pathways for human health or the environment. The paragraph should be further developed to include a discussion of potential exposure pathways for populations such as trespassers or future use receptors and the magnitude of the potential threat to human and ecological receptors."

The investigation did not identify a discrete source of contamination. Potential exposure pathways for human health and/or the environment will be evaluated in the remedial investigation.

III. SUMMARY

The objective of the investigation/evaluation was to identify potential discrete source(s) of contamination (i.e. drums, tanks, containers). No discrete sources were identified as a result of the investigation. Regulatory comments did not affect the conclusion drawn in the SRE Report, which determined conditions at OFFTA did not warrant a non-time critical removal action.

Comments regarding risk have been deferred to the RI and/or ERA. Should you have any questions or comments regarding this correspondence, please call me at (978) 658-7899.

Sincerely,

Donald F. Conan, P.E.
Project Manager

DC/rt

c: R. Boucher, NDIV Navy
M. Price, B&R Environmental
J. Trepanowski, B&R Environmental
G. Glenn, B&R Environmental
File 7578-3.2

APPENDIX A

LABORATORY REPORT (OFF-A-TP-12-0405) PERTAINING TO TPH ANALYSIS

7578-S

Brown & Root Environmental

INTERNAL CORRESPONDENCE

C-49-08-7-220

TO: D. CONAN **DATE:** SEPTEMBER 15, 1997

FROM: TERRI L. SOLOMON **COPIES:** DV FILE

SUBJECT: INORGANIC DATA VALIDATION - TOTAL PETROLEUM HYDROCARBONS
CTO 288 - NETC NEWPORT, NEWPORT, RHODE ISLAND
SDG - FTA001

SAMPLES: 13/Soils/

OFF-S-TP-02-0203	OFF-S-TP-04-0102	OFF-S-TP-05-0708
OFF-S-TP-06-0607	OFF-S-TP-07-0708	OFF-S-TP-08-0304
OFF-S-TP-11-0506	OFF-S-TP-12-0405	OFF-S-DUPL1
OFF-S-TP-13-0607	OFF-S-TP-14-0304	OFF-S-DUPL2
OFF-S-TP-15-0506		

6/Aqueous/

OFF-A-TP-02-0203-RB1	OFF-A-TP-04-0102-RB2	OFF-A-FB1
OFF-A-TP-11-0506-RB3	OFF-A-TP-13-0607-RB4	OFF-A-TP-12-0405

Overview

The sample set for CTO 288, NETC Newport, SDG FTA001, consists of thirteen (13) soil environmental samples, one (1) aqueous environmental sample, four rinsate blanks (OFF-A-TP-02-0203-RB1, OFF-A-TP-04-0102-RB2, OFF-A-TP-11-0506-RB3 and OFF-A-TP-13-0607-RB4) and one (1) field blank (OFF-A-FB1). Two (2) field duplicate pairs (OFF-S-TP-11-0506 / OFF-S-DUPL1 and OFF-S-TP-14-0304 / OFF-S-DUPL2) were included within this SDG.

All samples were analyzed for Total Petroleum Hydrocarbon (TPH). The samples were collected by Brown and Root Environmental on June 30, July 1, 2 and 3, 1997 and analyzed by Katahdin Analytical Services under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. All analyses were conducted using EPA method 418.1.

These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Calibration Verifications
* • Laboratory Blank Analyses
• Field Blank Analyses
• Matrix Spike / Matrix Spike Duplicate Results
• Laboratory Control Sample Results
• Field Duplicate Results
* • Analyte Quantitation
* • Detection Limits

* - All quality control criteria were met for this parameter.

The attached Table 1 summarizes the validation recommendations which were based on the following information:

Blank results:

The following contaminants was detected in the rinsate blank at the following maximum concentration :

Analyte	Maximum Concentration	Action Level (aqueous)	Action Level (soil)
TPH	1.2 mg/L	NA	280 mg/kg

Samples affected: OFF-S-TP-07-0708, OFF-S-TP-08-0304, OFF-S-TP-11-0506, OFF-S-TP-12-0405 and OFF-S-DUPL1

An action level of 5X the maximum concentration has been used to evaluate the sample data for blank contamination. Sample aliquot, percent solids and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the action level for TPH in the affected sample have been qualified as nondetected "U". It should be noted that field quality control samples are not qualified for field blank contamination.

Matrix Spike / Matrix Spike Duplicate results:

The Matrix Spike / Matrix Spike Duplicate Percent Recoveries (%Rs) for TPH affecting the soil samples were > 125% quality control limit. The positive results reported for TPH in the affected samples were qualified as estimated, "J".

Laboratory Control Sample results:

The Laboratory Control Standard (LCS) %R affecting the aqueous matrix was > 120% quality control limit. The positive result reported for TPH in the affected sample was qualified as estimated, "J".

Field Duplicate results:

Field duplicate imprecision was noted for TPH in sample pair OFF-S-TP-14-0304 / OFF-S-DUPL2. The positive results reported for TPH affecting the soil samples were qualified as estimated, "J".

Notes

Sample OFF-A-TP-12-0405 was analyzed at a 10000X dilution. It was noted on the chain of custody that the sample contained heavy oil.

Executive Summary

Laboratory Performance: The LCS %R for TPH affecting the aqueous matrix was > 120% quality control limit.

Other Factors Affecting Data Quality: TPH was present in the rinsate blank. The MS/MSD %Rs for TPH affecting the soil matrix were > 125% quality control limit.

Katahdin
ANALYTICAL SERVICES

CLIENT: Liyang Chu
HALLIBURTON NUS CORP, C/O BROWN & ROOT
55 JONSPIN ROAD
WILMINGTON, MA 01887-1062

Lab Number : WN-1739-8
Report Date: 07/25/97
PO No. : N62472-90-D-1298
Project : NEWPORT, RI

WIC#: MA 1051-95-3021-1298

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
OFF-A-TP-12-0405	Aqueous	JALKURT CHU BASTOW	07/02/97	07/03/97

PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Total Petroleum Hydrocarbons (TPH)	<13000	mg/L	1300	1.0	E418.1	07/25/97	KT	1,2

* PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.
(1) Sample Preparation on 07/23/97 by TCB
(2) Results for the LCS and/or LCSD associated with this sample were outside laboratory acceptance criteria. The sample was not reanalyzed due to insufficient sample.

07/25/97

LJO/ejnlp(dw)/mft/pph
NG23TPW1

Katahdin ANALYTICAL SERVICES
PO Box 720
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Shipped 1 cooler 7/2/97

CHAIN of CUSTODY

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Page 1 o

Client: Brown & Root Environmental	Contact: Luyang Chu	Phone #: (508) 658 7899	Fax #: (508) 658-78
Address: 55 Jonspin Rd	City: Wilmington	State: MA	Zip Code: 01887
Purchase Order #	Proj. Name / No.: CTO 288 OFFTA		Katahdin Quote #
Bill (if different than above)	Address		
Samoler (Print / Sign): KAYLEEN JALBERT Kayleen Jalbert; LIYANG CHU Liyang Chu; RICHARD BARTON Richard F. Barton			Copies To:

LAB USE ONLY

WORK ORDER #: WN1739

KATAHDIN PROJECT MANAGER

REMARKS

SHIPPING INFO ☐ FED EX ☐ UPS ☐ CLIENT

AIRBILL NO

TEMP°C ☐ TEMP BLANK ☐ INTACT ☐ NOT INTACT

ANALYSIS AND CONTAINER TYPE PRESERVATIVES

*	Sample Description	Date / Time coll'd 1997	Matrix	No. of Cntrs.	TCL VOCs w/HCl 40 ml vials Filt. ☐Y ☐N	TPH-418.1 1x1L AMB GL w/HCl Filt. ☐Y ☐N	TCL SVOCs 1x1L AMB GL Filt. ☐Y ☐N	TCL P/P 1x1L AMB GL Filt. ☐Y ☐N	TOTAL MNFS w/ HNO3 1x500ml PL Filt. ☐Y ☐N	TPH (418.1)/SVOCs/ TOTAL MNFS / P-P 1x8oz soil jar Filt. ☐Y ☐N	TCL VOCs 1x4oz soil jar Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N	Filt. ☐Y ☐N
	OFF-A-TB3	7/2 /0810	Ag	2	2									
	OFF-S-TP-07-0708	7/2 /0935	S	2						1	1			
	OFF-S-TP-08-0304	7/2 /1027	S	2						1	1			
**	OFF-S-TP-11-0506	7/2 /1230	S	2						1	1			
	OFF-A-TP-11-0506-RB3	7/2 /1350	Ag	6	2	1	1	1	1					
*	OFF-A-TP-12-0405	7/2 /1435	Ag	1		1								
**	OFF-S-TP-12-0405	7/2 /1450	S	2						1	1			
	OFF-S-DUP1	7/2 /1230	S	2						1	1			

E Jalbert 7/2/97

COMMENTS * Analyze by TPH 418.1 - heavy oil floating
** Soils w/usual petroleum-like residues

Switched over to EPA method 418.1 for TPH per RIDEM (Paul Kulpa) AB# 79896085G1

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature)
Kayleen Jalbert	7/2/97 1800	K Wyks	7/3/97 1035		
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Relinquished By: (Signature)	Date / Time	Received By: (Signature) 00002

FORMSOURCE INC (207) 782 3311
FORM # CHN-OF-CSTDY