Nevada
Environmental
Restoration
Project

RECEIVED
APR 01 1997
OSTI

DOE/NV-11718-078
UC-702

Corrective Action
Decision Document

Area 12 Fleet Operations
Steam Cleaning Discharge Area
Nevada Test Site
Corrective Action Unit 339

December 1996

MASTER

Environmental Restoration
Division

U.S. Department of Energy
Nevada Operations Office

CORRECTIVE ACTION DECISION DOCUMENT

***AREA 12 FLEET OPERATIONS
STEAM CLEANING DISCHARGE AREA
NEVADA TEST SITE
CORRECTIVE ACTION UNIT 339***

December 1996

***Prepared for the
U. S. Department of Energy
Environmental Restoration Division and
Environmental Protection Division
Under Contract No. DE-AC08-96NV11718***

MASTER

***Prepared by
Bechtel Nevada
Remediation Projects***

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED HH

This report has been reproduced from the best available copy.

DOE and DOE contractors can obtain copies of this report from the Office of Scientific and Technical Information. P.O. Box 62, Oak Ridge, TN 37831, (423) 576-8401.

This report is publicly available from the Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, (703) 487-4650.

2025 RELEASE UNDER E.O. 14176

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, make any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
FIGURES	ii
TABLE	ii
APPENDICES	ii
ABBREVIATIONS AND ACRONYMS	iii
EXECUTIVE SUMMARY	ES-1
 1.0. INTRODUCTION	 1
1.1 SITE DESCRIPTION	1
1.2 PURPOSE AND OBJECTIVE	1
 2.0 CORRECTIVE MEASURES STUDY	 6
2.1 BASIS OF EVALUATION	6
2.2 IDENTIFICATION OF CLOSURE OPTIONS	6
2.3 ANALYSIS OF CLOSURE ALTERNATIVES	9
2.3.1 Alternative 1	9
2.3.2 Alternative 2	9
2.3.3 Alternative 3	9
2.3.4 Alternative 4	10
 3.0 EVALUATION OF PROPOSED CLOSURE ACTIVITIES	 11
3.1 EVALUATION OF GENERAL DECISION FACTORS	11
3.1.1 Level of Risk	11
3.1.2 Regulatory Requirements	12
3.1.3 Regulatory Acceptance	12
3.1.4 Protection of Human Health and the Environment	13
3.1.5 Attainment of Media Cleanup	13
3.1.6 Controlling the Sources of Releases	13
3.1.7 Compliance With Waste Management Standards	13
3.1.8 Long-term Reliability and Effectiveness	14
3.1.9 Reduction in Toxicity, Mobility or Volume of Waste	14
3.1.10 Short Term Effectiveness	14
3.1.11 Implementability	15

3.1.12 Costs	15
3.2 FAVORED CLOSURE ALTERNATIVE	15
4.0 CONCLUSIONS AND RECOMMENDATIONS	24
4.1 CONCLUSIONS	24
4.2 RECOMMENDATIONS	25
5.0 REFERENCES	26

FIGURES

<u>FIGURES</u>	<u>PAGE</u>
1. SITE LOCATION MAP	2
2. PHASE 2 DRAIN LINE DISCHARGE AREA SAMPLE LOCATIONS AND ANALYTICAL RESULTS	3
3. PHASE 2 FORMER PARKING AREA SAMPLE LOCATIONS AND ANALYTICAL RESULTS	4
4. PHASE 1 DRAIN LINE DISCHARGE AREA, DISCOLORED SOIL AREA AND ANALYTICAL RESULTS	5

TABLE

<u>TABLE</u>	<u>PAGE</u>
1. CORRECTIVE MEASURES STUDY STANDARDS AND DECISION FACTORS EVALUATION	17

APPENDICES

APPENDIX

A. PHASE 2 CHARACTERIZATION REPORT

ABBREVIATIONS AND ACRONYMS

bgs	below ground surface
CADD	Corrective Action Decision Document
CAS	Corrective Action Site
CAU	Corrective Action Unit
CFR	Code of Federal Regulations
CMS	Corrective Measures Study
COC	Constituent(s) of Concern
DOE	U. S. Department of Energy
EPA	U. S. Environmental Protection Agency
MEK	Methyl-ethyl-ketone (2-butanone)
MIBK	Methyl-isobutyl-ketone (4-methyl-2-pentanone)
mg/kg	milligrams per kilogram
NAC	Nevada Administrative Code
NDEP	Nevada Division of Environmental Protection
NTS	Nevada Test Site
RCRA	Resource Conservation and Recovery Act
TPH	Total Petroleum Hydrocarbons
TSDF	Treatment, Storage, and Disposal Facility
VOCs	volatile organic compounds

EXECUTIVE SUMMARY

This Corrective Action Decision Document (CADD) incorporates the methodology used for evaluating the remedial alternatives completed for a former steam cleaning discharge area at the Nevada Test Site (NTS). The former steam cleaning site is located in Area 12, east of the Fleet Operations Building 12-16. The discharge area has been impacted by Resource Conservation and Recovery Act (RCRA) "F Listed" volatile organic compounds (VOCs) and petroleum hydrocarbons (as oil) waste. Based upon these findings, resulting from Phase 1 and Phase 2 site investigations, corrective action is required at the site.

To determine the appropriate corrective action to be proposed, an evaluation of remedial alternatives was completed. The evaluation was completed using a Corrective Measures Study (CMS). The evaluation is supported by the Nevada Administrative Code (NAC) "A through K" analysis for risk based corrective action. Based on the results of the CMS, the favored closure alternative for the site is plugging the effluent discharge line, removing the sandbagged barrier, completing excavation of VOC impacted soils, and fencing the soil area impacted by TPH, east of the discharge line and west of the soil berm.

Management of the "F Listed" VOCs are dictated by RCRA. Due to the small volume of impacted soil, excavation and transportation to a Treatment Storage and Disposal Facility (TSDF) is the most practical method of management. It is anticipated that the TPH (as oil) impacted soils will remain in place based upon; the "A through K" Analysis, concentrations detected (maximum 8,600 milligrams per kilogram), expected natural degradation of the hydrocarbons over time, and the findings of the Phase 2 Investigation that vertical migration has been minimal.

1.0 INTRODUCTION

1.1 SITE DESCRIPTION

The Area 12 Fleet Operations site is located in the southeast portion of the Area 12 Camp at the Nevada Test Site (NTS). Closure of Building 12-16 is not included in this evaluation or previous site investigations. The subject area includes a vehicle parking area, which was potentially impacted from surface runoff of a sand/oil interceptor, and the area east of the steam cleaning discharge line located approximately 104 meters (340 feet) from Building 12-16 (Figure 1). This site has been assigned Corrective Action Site (CAS) Number 12-19-01 and is within Corrective Action Unit (CAU) 339.

1.2 PURPOSE AND OBJECTIVE

The purpose of this report is to prepare a Corrective Action Decision Document (CADD) based upon the evaluation of remedial options for closure of the Area 12, Building 12-16 Fleet Operations steam cleaning discharge area. The vicinity of the sand/oil interceptor and areas within the effluent discharge area have been impacted by volatile organic compounds (VOCs) and total petroleum hydrocarbons (TPH) as oil. The VOCs and TPH are the constituents of concern (COCs) dictating the closure alternatives for the site. VOCs were identified in three areas (Sample Areas B1216-S4, B1216-S9, and B1216-S17) and appear to have been constituents in degreasing solvents previously used at the site (U. S. Department of Energy [DOE], 1996). The Phase 2 sample locations and laboratory analytical results are shown on Figures 2 and 3. The VOCs identified are regulated under the Resource Conservation and Recovery Act (RCRA) and are "F Listed" wastes which require management (40 Code of Federal Regulations [CFR] 261.31).

TPH as oil impacted soils which exceed the Nevada Administrative Code (NAC) Action Level of 100 milligrams per kilogram (mg/kg) were identified predominantly in the discolored areas east of the effluent discharge line. The surficial discolored soil areas and corresponding analytical results, identified in the Phase 1 investigation, are shown on Figure 4. The Phase 2 Investigation identified that the oil hydrocarbons have not migrated to depths greater than 0.9 to 1.2 meters (3.0 to 4.0 feet) below ground surface (bgs). Corrective action is required at the site based upon the findings of the Phase 1 and Phase 2 site investigations.

Detailed information of the site history and results of previous characterizations can be found in the Work Plan dated October 1992 (REECo, 1992), the Preliminary Investigation Report dated July 1996 (DOE, 1996), and the Phase 2 Characterization Report dated November 1996 (Appendix A).

Bechtel Nevada

FIGURE 1
SITE LOCATION

Bechtel Nevada

FIGURE 2
PHASE 2 DRAIN LINE DISCHARGE AREA
SAMPLE LOCATIONS AND ANALYTICAL RESULTS

Bechtel Nevada

FIGURE 4
PHASE 1 DRAIN LINE DISCHARGE AREA
DISCOLORED SOIL AREAS AND ANALYTICAL RESULTS

2.0 CORRECTIVE MEASURES STUDY

2.1 BASIS OF EVALUATION

The objective of the Corrective Measure Study (CMS) is to provide a basis for the selection of the preferred corrective action (which includes the site remediation closure options). The results of the CMS supports closure of the discharge areas by limited soil excavation, plugging of the source point, and limiting access to the site. Corrective action decisions for the closure are based upon a variety of site specific factors and issues which provide the option(s) most suitable for site remediation and closure. The factors and issues considered include:

- Level of risk to human health and the environment;
- Regulatory requirements;
- Regulatory acceptance;
- Protection of human health and the environment;
- Attainment of media cleanup standards;
- Control of the sources of releases;
- Compliance with standards for management of the waste;
- Long term reliability and effectiveness;
- Reduction of toxicity, mobility, or volume of wastes;
- Short-term effectiveness;
- Implementability; and
- Costs.

The last nine issues listed for evaluation are the general decision standards described in Title 40 CFR Part 264.525, proposed Subpart S. These standards are used to address corrective action for solid waste management units (Environmental Protection Agency [EPA], 1990).

2.2 IDENTIFICATION OF CLOSURE OPTIONS

As part of the CMS, a number of closure options were evaluated for the site. After preliminary evaluation, a total of nine options were decided upon as viable alternatives for closure or post-closure management. The selections were narrowed using the criteria and decision factors listed in Section 2.1. Many of the options can be implemented in conjunction with one another or considered individually. The final options considered for the CMS are as follows:

Option 1 - No Action - Under this option, no further action is taken to address closure of the discharge line, sand/oil interceptor, removal of hydrocarbon impacted soils, or removal of the VOC impacted soils. In essence, the site would remain as is, with the COCs being allowed to degrade naturally over an indefinite period of time. In addition, the discharge line and

interceptor would not be addressed.

This option is viable for this site based upon evaluation of the site risks, however, due to the presence of "F Listed" wastes in the near surface soil, the VOC impacted soils require management under RCRA standards.

Option 2 - Removal of the Steam Cleaning Effluent Discharge Line - This involves the removal of approximately 104 meters (340 feet) of the clay line which extends from the interceptor to the effluent discharge point. Associated excavated soils will also require segregation, characterization, and disposal.

In conjunction with other options this could be used as part of a closure alternative. Independently this option does not address the identified impacted soils associated with the site.

Option 3 - Removal of the Sand/Oil Interceptor - This involves the characterization, content removal, cleaning, and excavation of the sand/oil interceptor. Surrounding soils excavated would also require segregation, characterization, and disposal. The location of the sand/oil interceptor is shown on Figure 1.

In conjunction with other options this could be used as part of a closure alternative. Independently this option does not address the identified impacted soils associated with the overspill or effluent discharge areas of the site.

Option 4 - Partial Plugging of the Discharge Line and Removal of the Sandbag Barrier - This involves plugging the discharge line with Sulfaset Cement (or equivalent) to a minimum of 0.9 meters (3.0 feet). In addition, the sandbag barrier would be removed from around the discharge line. Soil from the sandbag berm would be used for site grading and backfill.

In conjunction with other options this could be used as part of a closure alternative. Independently this option does not address the impacted soils associated with the site.

Option 5 - Excavation/Disposal of the Oil Impacted Soils Exceeding NAC Action Levels - This involves large scale excavation and disposal of all impacted areas with TPH exceeding the NAC Action Level to an average depth of approximately 0.9 meters (3.0 feet). Confirmation soil samples are required to verify that cleanup was achieved. After confirmation results are received and verified, the excavation area will be backfilled. Figure 4 identifies the discolored soil areas east of the effluent discharge line where TPH concentrations exceeded the NAC Action Level. The discolored area comprises the majority of the release area that requires excavation using this option (Figure 4).

In conjunction with other options this could be used as part of a closure alternative. Independently, this option does not address the required management of the VOC impacted soils,

the sand/oil interceptor, or the discharge line associated with the site. In addition, based upon the concentrations detected, the extent of migration identified, the depth to groundwater, and the "A through K" Analysis in the Phase 2 Characterization Report (Appendix A, Attachment D), removal of the impacted areas would not provide a significant benefit to human health or the environment.

Option 6 - Excavation/Disposal of RCRA "F Listed" Impacted Soils -

This involves the excavation and disposal of areas with RCRA "F Listed" waste. Excavation will be completed to an average depth of approximately 0.9 meters (3.0 feet). Confirmation soil samples will also be required to verify that cleanup was achieved. Cleanup will be based on nondetectable concentrations of the "F Listed" VOCs reported by the laboratory. The maximum laboratory detection levels are dictated by U. S. EPA Method 8240B, Revision 2 (EPA, 1994).

In conjunction with other options this could be used as part of a closure alternative. Independently this option does not address the hydrocarbon impacted soils, sand/oil interceptor or the discharge line associated with the site.

Option 7 - Post Closure Inspection - This involves inspection for potential migration of contaminants or discharge. Inspection would be required for up to ten years. This may be a regulatory requirement if the discharge sources and impacted soils remain in place or if limited closure activities occur.

In conjunction with other options this could be used as part of a closure alternative. Due to the presence of "F Listed" wastes identified, this option alone would not meet the requirements of RCRA.

Option 8 - Fencing and Demarcation of Effluent Discharge Area - This involves demarcation around the sand/oil interceptor and around the perimeter of the effluent discharge area. Fencing will consist of "T-Posts" with cable wiring. Signs will be placed to indicate that the area is impacted by the identified COCs. This will prevent disturbance of the area and allow for natural degradation of the COCs.

This option could be used as part of a closure alternative in conjunction with other options. Independently it does not address the closure of the sand/oil interceptor or effluent discharge line, or removal of the impacted soils.

Option 9 - Bioventing to Remediate COCs in Place - This requires the installation of numerous shallow bioventing and monitoring wells; designing and installing a venting system using conventional or alternate energy sources; continuing venting for up to 10 years with periodic off-gas monitoring for oxygen, carbon dioxide, and methane; monitoring and reporting on a quarterly basis for 10 years; and confirmatory sampling upon completion of remedial activities.

Due to the type of site specific COCs, the concentrations detected, the evaluation of the "A through K" analysis, the depth of migration, the restrictions of the site geology, and the costs in comparison to the benefits added, this is not a viable option for consideration.

2.3 ANALYSIS OF CLOSURE ALTERNATIVES

The following closure alternatives were developed using one or more of the options presented in Section 2.2. Based upon a review of each of the options, the following alternatives have been developed based upon; the risk evaluation ("A through K" Analysis) for the protection of human health and the environment, control of the sources of the releases, long term effectiveness, implementability, and estimated cost to complete in relation to the other alternatives under consideration.

2.3.1 Alternative 1 (Options 1, 7, and 8)

Under this alternative, no further action is taken to address closure of the discharge line, sand/oil interceptor, removal of hydrocarbon impacted soils, or removal of the VOC impacted soils (Option 1). However, for this alternative to be considered, an inspection program (Option 7) will be necessary for regulatory compliance. This alternative also requires the fencing and posting of the TPH and VOC impacted areas (Option 8). This is the lowest cost alternative.

2.3.2 Alternative 2 (Options 2 and 3)

Alternative 2 involves the removal of the steam cleaning effluent discharge line (Option 2) and sand/oil interceptor (Option 3). This involves the removal of approximately 104 meters (340 feet) of the clay line which extends from the interceptor to the discharge point. It also requires the characterization, removal of residuals, cleaning, and excavation of the sand/oil interceptor. Alternative 2 also involves the limited excavation of the surrounding soils of the interceptor and discharge line which would require segregation, characterization, and disposal.

Although this removes the historic effluent sources, it does not address the impacted soil areas identified at the site. In addition, it is recommended that removal of the sand/oil interceptor be completed as part of future decontamination and decommissioning activities associated with Building 12-16. Completion of Alternative 2 would be completed at considerable cost without much benefit added.

2.3.3 Alternative 3 (Options 4, 6, and 8 [Modified])

Alternative 3 includes the partial plugging of the effluent discharge line and removal of the sandbag barrier (Option 4), excavation and disposal of the RCRA "F Listed" impacted soils (Option 6), and fencing with demarcation east of the effluent discharge area (Option 8). Partial

plugging of the effluent discharge line would effectively close out the line without having to remove it. This prevents future discharges from being made from the line. Since discharge has ceased, the sandbag barrier is no longer needed. The resulting soils from the sandbag barricade will be used on site for area grading or excavation backfill during site closure activities.

Management of the RCRA "F Listed" constituents is required. At a minimum, this will be a regulatory requirement for site closure. Excavation of the VOC impacted soils is the best management practice for this site. The estimated volume of VOC contaminated soil is approximately 19 cubic meters (25 cubic yards). This estimate is based on the dimensions of three sample areas identified as being impacted by VOCs. The combined area dimensions are estimated at 4.6 meters by 4.6 meters (15 feet by 15 feet) with a maximum thickness of 0.9 meters (3.0 feet).

Confirmation samples will be required at the completion of the remedial activities. Confirmation for cleanup will be the analytical method/laboratory detection level as required by EPA Method 8240B, Revision 2 (EPA, 1994). The maximum detection levels will be 0.1 mg/kg for acetone, 0.1 mg/kg for 2-butanone (MEK), and 0.050 mg/kg for 4-methyl-2-pentanone (MIBK).

Using this alternative fencing and demarcation of the impacted areas will be completed (Option 8). However, since excavation of the VOC impacted soils is recommended under this alternative, Option 8 has been modified to address fencing the area of the highest concentration of TPH impacted soils. The fenced area will be east of the effluent discharge line and west of the soil berm. The area will be fenced using "T-Posts" with cable wiring. The area will also be posted with signs indicating the presence of hydrocarbon impacted soils.

This alternative will be easy to implement and able to be completed at a lower cost than Alternatives 2 and 4.

2.3.4 Alternative 4 (Options 5 and 6)

This alternative involves the removal of approximately 3,600 cubic meters (4,711 cubic yards) of hydrocarbon impacted soil (Option 5), and approximately 19 cubic meters (25 cubic yards) of VOC impacted soil (Option 6). The confirmation for cleanup of the VOC impacted soils will be the analytical method/laboratory detection level as required by U.S. EPA Method 8240B, Revision 2 (EPA, 1994). The maximum detection levels will be 0.1 mg/kg for acetone, 0.1 mg/kg for 2-butanone (MEK), and 0.050 mg/kg for 4-methyl-2-pentanone (MIBK). Cleanup levels for the TPH impacted soils will be the NAC Action Level of 100 mg/kg.

Based upon the findings of the Phase 1 and Phase 2 Investigations of the concentrations detected, the extent of migration identified, the depth to groundwater, and the "A through K" Analysis (Appendix A, Attachment D) this alternative may not be warranted for site closure. This alternative will be the most difficult and costly to implement.

3.0 EVALUATION OF PROPOSED CLOSURE ALTERNATIVES

3.1 EVALUATION OF GENERAL DECISION STANDARDS

Each of the potential site closure alternatives are evaluated with the specific decision standards described in the Title 40 CFR Part 264.525, proposed Subpart S, as related to the site specific conditions and extent of environmental impact. All twelve of the standards and decision factors as listed in Section 2.1 are evaluated as they apply to the site specific conditions. The general decision standards are also supported by the NAC "A through K" Analysis. The "A through K" Analysis is included in the Phase 2 Characterization Report located in Appendix A, Attachment D.

3.1.1 Level of Risk

Based upon the type of contaminant and the concentrations identified during the previous site investigations, the surface and shallow soil contamination does not present a significant risk to human health or the environment under current or potential future land-use scenarios. The human and animal exposure pathways of concern are through ingestion, inhalation, and dermal contact. The exposure pathways would likely be due to dust or volatile emissions from the exposed impacted area.

Due to the heavy hydrocarbons present and the surrounding vegetation, the hydrocarbon impacted soil does not readily become airborne in windy conditions. The VOCs identified are at very small concentrations (maximum 1.2 mg/kg acetone) and are not anticipated to pose a threat to human health, the local animal population, or the environment. The most likely potential for ingestion or inhalation would be during excavation activities. In addition, exposure through dermal contact is a potential if an individual disturbs the upper impacted soils without appropriate protective equipment. Excavation for remedial activities will be completed following an approved health and safety plan. It is recommended that any subsequent excavation or soil disturbance be mitigated by placing "T Post" fencing with sign postings identifying the hydrocarbon impacted area.

Infiltration to groundwater, located at approximately 326 meters (1,068 feet) bgs is not a likely pathway of concern. Lateral migration of the hydrocarbon impacted soils, east of the effluent line, will be mitigated by the soil berm which separates the discharge area from the arroyo.

Based on the level of risk scenario, Alternative 1 is not a viable alternative since it does not address the closure of the effluent discharge line or management of the RCRA "F Listed" VOC constituents. Alternative 2 would not reduce the level of risk, although minimal, since it does

not address the removal of the identified impacted soil areas. Alternative 3 would reduce the level of risk by removing the VOC impacted soil and would reduce the potential for future discharge by plugging the effluent line. Alternative 3 also addresses fencing the area with the highest concentrations of TPH. This will prevent unauthorized excavation of the impacted soils and prevent grazing of horses or deer in the area. Alternative 4 would reduce the level of risk by removing the regulated impacted soil from the overspill and discharge line release areas.

3.1.2 Regulatory Requirements

The site specific contaminants are under the regulatory requirements of the TPH Action Level of 100 mg/kg per NAC 459.9925 through 459.999 and RCRA "F Listed" waste per 40 CFR Part 261.24. Alternative 1 does not address the regulatory requirements of the TPH or RCRA regulations. Alternative 2 addresses the characterization, excavation, and disposal of the sand/oil interceptor, discharge line, and surrounding soils. TPH and RCRA regulatory requirements to complete this activity are applicable. Alternative 3 addresses the requirements for management of the VOC impacted soils. Alternative 4 addresses the cleanup levels and requirements of both the TPH and RCRA regulations.

3.1.3 Regulatory Acceptance

In a meeting held with the Nevada Division of Environmental Protection (NDEP) on September 9, 1996, prior to initiating the Phase 2 Investigation, potential remedial/closure options for the site were briefly discussed based upon the COCs identified in the Phase 1 Investigation. Pending the outcome of the Phase 2 Investigation it was discussed that hydrocarbon levels, at the concentrations detected (maximum 8,600 mg/kg), would likely be able to remain onsite assuming limited migration. This was because the oil hydrocarbon present is heavy and fairly immobile, and the probability of impacting groundwater at a depth of approximately 326 meters (1,068 feet) is very unlikely. Surface runoff into the arroyo is mitigated by the soil berm located east of the discharge line. It is recommended that the soil berm remain in place (Appendix A).

The VOCs were not addressed in detail during the NDEP meeting since it could not be confirmed at the time if they were a result of laboratory contamination or present in the soil. However, the Phase 2 sampling confirmed that the VOCs are present in the soil and information on previous site operations indicate that they are RCRA "F Listed" constituents. The presence of these constituents dictate that they be managed regardless of the concentration. Based on this requirement, Alternatives 1 and 2 would not meet NDEP acceptance requirements. Alternative 3, which includes the proposal to remove the VOC impacted soils, plug the effluent line, and fence the TPH impacted area, will meet regulatory requirements assuming acceptance of the NAC "A through K" risk based analysis for leaving the hydrocarbon impacted soils in place (Appendix A). Alternative 4 would also meet regulatory requirements by removing all impacted soils to the required concentration levels.

3.1.4 Protection of Human Health and the Environment

Alternative 1 offers no additional measures for the protection of human health and the environment. Alternative 2 offers only removal of the sand/oil interceptor, effluent discharge line, and surrounding impacted soil, and does not address removal of identified TPH and VOC impacted soil areas. Alternative 3 offers limited cleanup of the VOC impacted soils and does not provide for removal of the TPH impacted soils (other than the TPH impacted soils removed in conjunction with the VOC impacted soils). Alternative 4 provides for soil cleanup but does not address the closure of the effluent discharge line.

3.1.5 Attainment of Media Cleanup

Alternative 1 offers no additional measures for the cleanup of the impacted areas. Alternative 2 offers only the cleaning and removal of the sand/oil interceptor, effluent discharge line, and surrounding impacted soils. Alternative 2 does not address removal of VOC and TPH impacted soil areas identified in the Phase 1 and Phase 2 site investigations. Alternative 3 offers limited cleanup of the VOC impacted soils and does not provide for removal of the TPH impacted soils. Alternative 4 provides for soil cleanup but does not address the closure of the effluent discharge line.

3.1.6 Controlling the Sources of Releases

The source of the release stopped once the facility was closed. The soil berm, separating the discharge area from the down gradient arroyo, acts as a control to prevent lateral migration of the COCs. Alternative 1 does not provide for control of release sources other than site inspection. Alternative 2 offers control of release sources through removal of the sand/oil interceptor and associated piping. Alternative 3 offers limited control of a release source by plugging the effluent discharge line. Alternative 4 does not address controlling the release source.

3.1.7 Compliance With Waste Management Standards

The closure activities would achieve compliance with waste management standards for any waste generated and removed from the site (soil, debris, decontamination water, etc.). Waste would not be generated using Alternative 1, therefore, compliance with waste management standards is not applicable. Using Alternative 2, waste requiring characterization and disposal will be generated as a result of removing the sand/oil interceptor, discharge line, and surrounding soils. Under Alternative 3, the excavated soil would be managed under RCRA standards and be treated/disposed by a permitted Treatment, Storage, and Disposal Facility (TSDF). Alternative 4 would require management of the VOC containing soil under RCRA regulations during and after excavation and required treatment/disposal at a permitted TSDF. In addition, hydrocarbon soils excavated during the Alternative 4 activities would require disposal in the Area 6 Hydrocarbon Landfill at the NTS.

3.1.8 Long-term Reliability and Effectiveness

Alternatives 1 or 2 do not sufficiently address all aspects of an effective long term closure alternative. Alternative 3 would be effective and reliable in reducing the, already minimal, long-term risk associated with the surface contamination. The VOC impacted areas are recommended for removal. Therefore, the TPH concentrations in the impacted areas, for long-term consideration, will naturally degrade. Alternative 4 would be effective and reliable in reducing the, already minimal, long term risk associated with the surface contamination.

3.1.9 Reduction in Toxicity, Mobility, or Volume of Wastes

Alternative 1 offers no reduction in toxicity, mobility, or volume. Alternative 2 addresses the waste associated with the sand/oil interceptor and discharge line and would not reduce the toxicity or mobility of the impacted areas identified. It also creates an additional waste volume from the unnecessary removal of the discharge line.

Alternative 3 would be effective in reducing the VOC impacted soil areas through excavation and subsequent treatment/disposal. The reduction in the volume of waste would be attained by allowing the TPH impacted areas to degrade naturally in place. Mobility of the oil impacted soils are minimal by the nature of the contaminant. Lateral migration of the TPH impacted soils, east of the discharge line, is mitigated by a soil berm up gradient of the arroyo drainage area (Figure 2). Vertical migration to the depth of groundwater (found at approximately 326 meters [1,068 feet]) is highly unlikely.

Alternative 4 would reduce (eliminate) the VOCs and hydrocarbons through excavation and removal. However, it is estimated that to remove the TPH and VOC impacted areas requires the excavation of approximately 3,593 cubic meters (4,700 cubic yards) of soil. This is a large volume of waste considering that the maximum "F Listed" VOC concentration is 1.2 mg/kg (acetone) and the maximum TPH (as oil) concentration is 8,600 mg/kg (surface sample).

3.1.10 Short Term Effectiveness

Alternative 1 does not provide for short term effectiveness other than restricting access to the impacted areas by installing fencing. Alternative 2 does not provide for cleanup of identified impacted soil areas and only removes source points which are no longer active. Alternative 3 provides for both short and long term effectiveness. It provides for the removal of the RCRA regulated VOC impacted soils and plugging of the effluent discharge line. Alternative 3 does not provide for addressing the hydrocarbon impacted areas in the short term. However, the vertical and lateral extent of impacted areas does not pose a significant threat to human health or the environment. Alternative 4 provides for short term effectiveness by removal and disposal of the impacted soils.

3.1.11 Implementability

Alternative 1 would be the least difficult to implement since no action other than an inspection program is required. Alternative 2 is the most difficult to implement due to; the characterization, cleaning, and removal of the sand/oil interceptor contents; and the associated excavation and disposal of the surrounding soils generated while removing the sand/oil interceptor and approximately 104 meters (340 feet) of the effluent line. Implementation of Alternative 3 would be relatively easy due to the limited excavation of the VOC impacted soil areas and minimal effort required to partially plug the effluent line with cement and post the TPH impacted area east of the discharge line. Alternative 4 would be the most difficult to implement due to the extent of the surficial impact, the uneven terrain, the large percentage of cobbles and boulders on the surface and subsurface, and segregation of the TPH and VOC impacted soils.

3.1.12 Costs

Alternative 1 would have the lowest cost to implement since no field activities other than quarterly inspections and fencing would be required. Alternative 2 would have high associated costs without a great deal of benefit added, due to the required effort for characterization, removal, and disposal of the sand/oil interceptor, effluent discharge line, and surrounding soils. In addition, Alternative 2 also does not provide for an adequate site closure.

The highest cost associated with Alternative 3 would be the disposal of the hazardous VOC impacted soils. Management of the soil is a requirement under RCRA and must be a part of the closure alternative. In addition, Alternative 3 provides for permanent site closure. The amount of hazardous soil generated will be approximately 19 cubic meters (25 cubic yards). Verification samples will be required in the area where VOC impacted soils were excavated. The required partial grouting of the effluent line and area fencing requires minimal effort.

The costs associated with Alternative 4 would be the highest of the alternatives because of the disposal costs of the VOC containing soils (discussed in previous paragraph) and the approximate 3,600 cubic meters (4,711 cubic yards) of hydrocarbon containing soils. The associated labor and field equipment required to excavate and transport the hydrocarbon soil would be significantly more than Alternative 3. In addition, based upon the large area of hydrocarbon impact, numerous samples are required to be collected and analyzed to confirm closure.

3.2 FAVORED CLOSURE ALTERNATIVE

Each of the alternatives were evaluated using the general decision factors described in the proposed Title 40 CFR Part 264.525, Subpart S. Based on the results of the CMS, the favored closure alternative for the site is Alternative 3. This alternative includes partial plugging of the

effluent discharge line, removal of the sandbag barrier, and excavation of the RCRA "F Listed" VOC impacted soils, and fencing around the TPH impacted area east of the discharge line. Table 1 summarizes the evaluation of the CMS standards and decision factors.

TABLE 1 - CORRECTIVE MEASURES STUDY STANDARDS AND DECISION FACTORS EVALUATION

ALTERNATIVE	OPTIONS	STANDARDS AND DECISION FACTORS EVALUATION
1	<p>1 - No Further Action ,</p> <p>7 - Quarterly Inspection, and</p> <p>8 - Area Fencing</p>	<p><u>Levels of Risk to Human Health & Environment</u> Low risk due to concentrations, constituents, and exposure pathways</p> <p>Based upon the COCs and the concentrations identified during the previous site investigations, the impacted surface and shallow soil does not present a significant risk to human health or the environment under current or potential future land-use scenarios. Infiltration to groundwater, located at approximately 326 meters (1068 feet) bgs, is not a likely pathway of concern. Lateral migration of the hydrocarbon area, with the maximum TPH concentrations, are limited by the soil berm located east of the effluent line. Ingestion and inhalation is unlikely due to the surrounding vegetation and the heavy hydrocarbons present.</p> <p>Based on the level of risk scenario, Alternative 1 is not a viable alternative since it does not address the closure of the effluent discharge line or the management of the RCRA "F Listed" VOC constituents.</p> <p><u>Regulatory Requirements</u> The site specific contaminants are under the regulatory requirements of the TPH Action Level of 100 mg/kg per NAC 459.9925 through 459.999 and RCRA "F Listed" waste per 40 CFR Part 261.24. Alternative 1 does not address the regulatory requirements of the TPH or RCRA regulations.</p> <p><u>Regulatory Acceptance</u> The presence of RCRA "F Listed" constituents require management of the impacted soil areas. Based on this requirement, Alternative 1 would not meet NDEP acceptance requirements.</p> <p><u>Protection of Human Health & Environment</u> Alternative 1 offers no additional measures for the protection of human health and the environment. Protection of wild horses and deer in the area would be addressed by fencing the impacted areas to prevent grazing.</p> <p><u>Attainment of Media Cleanup Standards</u> Alternative 1 offers no additional measures for the cleanup of the impacted areas.</p> <p><u>Control of Release Sources</u> The source of the release stopped once the facility was closed. Alternative 1 does not provided for control of release sources other than site inspection.</p> <p><u>Compliance with Waste Management</u> Waste would not be generated using Alternative 1, therefore, compliance with waste management standards is not applicable.</p> <p><u>Long Term Reliability and Effectiveness</u> Alternative 1 does not sufficiently address all aspects of an effective long term closure alternative.</p>

ALTERNATIVE	OPTIONS	STANDARDS AND DECISION FACTORS EVALUATION
1 (Cont.)		<p><u>Reduction of Toxicity, Mobility, or Waste Volume</u> Alternative 1 offers no immediate reduction in toxicity, mobility, or volume. A reduction in the toxicity and waste volume would be attained by allowing the impacted areas to degrade naturally in place. Mobility of the oil hydrocarbon impacted soils are minimal by the nature of the contaminant.</p> <p><u>Short Term Effectiveness</u> Alternative 1 does not provide for short term effectiveness.</p> <p><u>Implementability</u> Alternative 1 would be the least difficult to implement since no action other than an inspection program and site fencing would be required.</p> <p><u>Costs</u> Alternative 1 would have the lowest cost to implement since no field activities other than quarterly inspections and fencing would be required.</p>
2	<p>2 - Removal of Steam Cleaning Discharge Line and surrounding soils, and</p> <p>3 - Removal of Sand/Oil Interceptor and surrounding soils</p>	<p><u>Levels of Risk to Human Health & Environment</u> Alternative 2 would not reduce the level of risk, although minimal, since it does not address the removal of the identified impacted soil areas.</p> <p><u>Regulatory Requirements</u> The site specific contaminants are under the regulatory requirements of the TPH Action Level of 100 mg/kg per NAC 459.9925 through 459.999 and RCRA "F Listed" waste per 40 CFR Part 261.24. The activities associated with using Alternative 2 would be completed per TPH and RCRA regulatory requirements, however, this alternative alone does not address the impacted soil areas identified during the Phase 1 and Phase 2 site investigations.</p> <p><u>Regulatory Acceptance</u> The presence of RCRA "F Listed" constituents will require management of the identified impacted soil areas. Based on this requirement, Alternative 2 would not meet NDEP acceptance requirements.</p> <p><u>Protection of Human Health & Environment</u> Alternative 2 offers only removal of the sand/oil interceptor, effluent discharge line, and surrounding soils and does not address removal of identified impacted soil areas.</p> <p><u>Attainment of Media Cleanup Standards</u> Alternative 2 does not address the removal of the VOC and TPH impacted soil areas identified in the Phase 1 and Phase 2 site investigations.</p>

ALTERNATIVE	OPTIONS	STANDARDS AND DECISION FACTORS EVALUATION
2 (Cont.)		<p><u>Control of Release Sources</u> The source of the release stopped once the facility was closed. Alternative 2 offers control of release sources through removal of the sand/oil interceptor and associated piping.</p> <p><u>Compliance with Waste Management</u> The closure activities would achieve compliance with waste management standards for any waste generated and removed from the site (soil, debris, decontamination water, etc.). Alternative 2 activities generate waste requiring characterization, excavation, and disposal from the removal of the sand/oil interceptor, discharge line and surrounding soils.</p> <p><u>Long Term Reliability and Effectiveness</u> Alternative 2 does not sufficiently address all aspects of an effective long term closure alternative.</p> <p><u>Reduction of Toxicity, Mobility, or Waste Volume</u> Alternative 2 addresses the waste associated with the sand/oil interceptor and discharge line but does not reduce the toxicity or mobility of the impacted soil areas identified.</p> <p><u>Short Term Effectiveness</u> Alternative 2 does not provide for cleanup of impacted soil areas and only removes source points which are no longer active.</p> <p><u>Implementability</u> Alternative 2 would be difficult to implement due to; the characterization, cleaning, and removal of the sand/oil interceptor contents; and the associated excavation and disposal of the surrounding soils generated during the removal of the sand/oil interceptor and approximately 104 meters (340 feet) of the effluent line.</p> <p><u>Costs</u> Alternative 2 would have high associated costs without a great deal of benefit added due to the required effort for characterization and removal of the sand/oil interceptor along with the effluent line. Alternative 2 also does not provide for an adequate site closure.</p>
3 FAVORED ALTERNATIVE	<p>4 - Plugging the Effluent Discharge Line and Removal of Sandbag Barrier,</p> <p>6 -Excavation/ Disposal of RCRA "F Listed" Soil, and</p>	<p><u>Levels of Risk to Human Health & Environment</u> Alternative 3 would reduce the level of risk by removing the VOC impacted soil and would reduce the potential for future discharge by plugging the effluent line. It also requires fencing of the area with the highest concentrations of TPH (east of the effluent line) to prevent future unauthorized excavation or grazing of horses or deer in the area.</p> <p><u>Regulatory Requirements</u> Alternative 3 addresses the requirements for disposal/treatment of the VOC impacted soils. Although TPH concentrations, exceeding the NAC Action Level, have been identified, it is recommended that the soils be left in place as supported by the NAC "A through K" risk based analysis (Appendix A).</p>

ALTERNATIVE	OPTIONS	STANDARDS AND DECISION FACTORS EVALUATION
3 (Cont.)	8 - Fencing and posting the area most impacted by TPH	<p><u>Regulatory Acceptance</u> Alternative 3, which includes the proposal to remove the VOC impacted soils and plugging the effluent line will meet regulatory requirements assuming acceptance of the A through K risk based analysis for leaving the hydrocarbon impacted soils in place.</p> <p><u>Protection of Human Health & Environment</u> Alternative 3 offers limited cleanup of the VOC impacted soils and does not provide for removal of the TPH impacted soils. However based upon the "A through K" Analysis, the hydrocarbon impacted soil does not pose a significant threat to human health or the environment. In addition, the alternative requires fencing to prevent unauthorized excavation in the area and grazing of horses and deer known to inhabit the vicinity.</p> <p><u>Attainment of Media Cleanup Standards</u> Alternative 3 offers cleanup of the VOC impacted soils to detection levels as dictated by US EPA Method 8240B, Revision 2, and does not provide for removal of the TPH impacted soils.</p> <p><u>Control of Release Sources</u> The source of the release stopped once the facility was closed. Alternative 3 offers limited control of a release source by partial plugging the effluent discharge line. The soil berm, separating the discharge line area and the down gradient arroyo, acts as a control to prevent lateral migration of the COCs.</p> <p><u>Compliance with Waste Management</u> The closure activities would achieve compliance with waste management standards for any waste generated and removed from the site (soil, debris, decontamination water, etc.). Under Alternative 3, the excavated soil would be managed under RCRA standards and be treated/disposed by a permitted TSDF.</p> <p><u>Long Term Reliability and Effectiveness</u> Alternative 3 would be effective and reliable in reducing the already minimal, long-term risk associated with the surface contamination. The VOC impacted areas are recommended for removal. The TPH concentrations in the impacted areas, for long-term consideration, will naturally attenuate.</p> <p><u>Reduction of Toxicity, Mobility, or Waste Volume</u> Alternative 3 would be effective in reducing the VOC impacted soil areas through excavation and subsequent treatment/disposal. The reduction in the volume of waste would be attained by allowing the TPH impacted areas to degrade naturally in place. Mobility of the oil hydrocarbon impacted soils are minimal by the nature of the contaminant. In addition, the soil berm, separating the discharge line area and the down gradient arroyo, will prevent lateral migration of the impacted TPH area.</p> <p><u>Short Term Effectiveness</u> Alternative 3 provides for both short and long term effectiveness. It provides for the removal of the RCRA regulated VOC impacted soils and plugging of the effluent discharge line. Alternative 3 does not address the hydrocarbon impacted areas in the short term. However, the vertical and lateral extent of impacted areas does not pose a significant threat to human health or the environment.</p>

ALTERNATIVE	OPTIONS	STANDARDS AND DECISION FACTORS EVALUATION
3 (Cont.)		<p><u>Implementability</u> Implementation of Alternative 3 would be relatively easy due to the limited excavation of the VOC impacted soil areas and minimal effort required to partially plug the effluent line.</p> <p><u>Costs</u> The highest cost associated with Alternative 3 would be the disposal of the hazardous VOC impacted soils. Removal of the soils is a requirement under RCRA and must be a part of the closure alternative. The amount of hazardous soil generated will be approximately 19 cubic meters (25 cubic yards) and the required partial plugging of the effluent line and site fencing requires minimal effort.</p>
4	<p>5 - Excavation/ Disposal of Hydrocarbon Soils and</p> <p>6 - Excavation/ Disposal of RCRA "F Listed" Soils</p>	<p><u>Levels of Risk to Human Health & Environment</u> Alternative 4 would reduce the level of risk by removing all of the impacted soil from the overspill and discharge line release areas.</p> <p><u>Regulatory Requirements</u> Alternative 4 addresses the cleanup levels and requirements of both the TPH and RCRA regulations.</p> <p><u>Regulatory Acceptance</u> Alternative 4 would meet regulatory requirements by removing all impacted soils to the required cleanup Action Levels.</p> <p><u>Protection of Human Health & Environment</u> Alternative 4 provides for soil cleanup but does not address the closure of the effluent discharge line.</p> <p><u>Attainment of Media Cleanup Standards</u> Alternative 4 provides for soil cleanup but does not address the closure of the effluent discharge line.</p> <p><u>Control of Release Sources</u> The source of the release stopped once the facility was closed. Alternative 4 does not address the controlling the release source.</p> <p><u>Compliance with Waste Management</u> The closure activities would achieve compliance with waste management standards for any waste generated and removed from the site (soil, debris, decontamination water, etc.). Alternative 4 would require management of the VOC containing soil under RCRA regulations during and after excavation and treatment/disposal at a permitted TSDF. In addition, hydrocarbon soils excavated during the Alternative 4 activities would require disposal in the Area 6 Hydrocarbon Landfill at the NTS.</p> <p><u>Long Term Reliability and Effectiveness</u> Alternative 4 would be effective and reliable in reducing the, already minimal, long-term risk associated with the surface contamination.</p>

ALTERNATIVE	OPTIONS	STANDARDS AND DECISION FACTORS EVALUATION
4 (Cont.)		<p><u>Reduction of Toxicity, Mobility, or Waste Volume</u> Alternative 4 would reduce (eliminate) the VOCs and hydrocarbons through excavation and removal. However, it is estimated that to remove the TPH and VOC impacted areas it would require the excavation of approximately 3,593 cubic meters (4,700 cubic yards) of soil. This is a large volume of waste considering that the maximum "F Listed" VOC concentration is 1.2 mg/kg (acetone) and the maximum TPH (as oil) concentration is 8,600 mg/kg (surface sample).</p> <p><u>Short Term Effectiveness</u> Alternative 4 provides for short term effectiveness by removal and disposal of the impacted soils, but is not a practical approach because of the low risk to human health and the environment.</p> <p><u>Implementability</u> Implementation of Alternative 4 would be relatively difficult due to the large area of excavation, total estimated volume of material to be excavated, topography, and abundance of cobbles and boulders at the site.</p> <p><u>Costs</u> The costs associated with Alternative 4 would be high due to the disposal costs of approximately 19 cubic meters (25 cubic yards) of VOC containing soils and approximately 3,593 cubic meters (4,700 cubic yards) of hydrocarbon containing soils. The associated labor and field equipment required to excavate and transport the hydrocarbon soil would be significantly more than the other alternatives. Based upon the large area of hydrocarbon impact, numerous samples would be required to be collected and analyzed to confirm closure.</p>

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

The Area 12 Building 12-16, Fleet Operations discharge area has been impacted by RCRA "F Listed" VOCs and petroleum hydrocarbons (as oil). Based upon these findings, resulting from Phase 1 and Phase 2 site investigations, corrective action is required. To determine the appropriate corrective action to be proposed, an evaluation of remedial alternatives was completed. The evaluation was completed using a CMS which evaluates the general decision standards described in Subpart S 40 CFR Part 264.525. The evaluation is supported by the NAC "A through K" analysis for risk based corrective action.

Based on the results of the CMS, the favored closure alternative for the site is Alternative 3. This alternative involves partial plugging the effluent discharge line, removing the sandbagged barrier, completing excavation of VOC impacted soils, and fencing the soil area impacted by TPH, east of the discharge line and west of the soil berm. Management of the "F Listed" VOCs are dictated by RCRA. Due to the small volume of impacted soil, excavation and transportation to a TSDF is the most practical method of management.

It is anticipated that the TPH (as oil) impacted soils will remain in place based upon; the "A through K" Analysis, concentrations detected, expected natural degradation of the hydrocarbons over time, and the findings of the Phase 2 Investigation that vertical migration has been minimal.

Alternative 3 is considered a reasonable approach for:

- Meeting regulatory acceptance;
- Protection for human health and the environment;
- Controlling the source of the effluent release;
- Maintaining compliance with waste management standards;
- Short term and long term effectiveness;
- Reducing the toxicity, mobility, and waste volume; and
- Implementing a practical and cost efficient remedial site cleanup at a cost lower than Alternatives 2 and 4.

4.2 RECOMMENDATIONS

Based on the conclusion that Alternative 3 is the most viable alternative for site remediation and closure, the following recommendations for completing the closure are as follows;

Partial Plugging of the Effluent Discharge Line

Sulfaset Cement (or equivalent) would be used to plug the end of the effluent line to a minimum 0.9 meters (3.0 feet). This would effectively close the line without having to remove it so that future discharges could not be made.

Removal of the Sandbag Barrier

Remove the sandbag berm and use the soils for site grading and backfill.

Excavation of RCRA "F Listed" Impacted Soils

Excavate approximately 19 cubic meters (25 cubic yards) of VOC impacted soils from three areas of the site (Sample Areas B1216-S4, B1216-S9, and B1216-S17).

Complete confirmation soil sampling in the excavation areas. Cleanup will be determined based upon nondetectable concentrations of VOCs using EPA Method 8240. The Action Level for cleanup is recommended to be the method/laboratory detection level for the VOC contaminants of concern identified in the previous site investigations. As required by Method 8240B, Revision 2, the maximum detection limits are 0.1 mg/kg for acetone, 0.1 mg/kg for 2-butanone (MEK), and <0.050 mg/kg for 4-methyl-2-pentanone (MIBK) (EPA, 1994).

Fencing and Demarcation of Effluent Discharge Area

Fencing will consist of using "T-Posts" with cable wiring. Signs will be placed to indicate that the area is impacted by petroleum hydrocarbons. Fencing will be placed east of the effluent discharge line to the soil berm limits located west of the arroyo. This will prevent unauthorized disturbance of the impacted soils, allow for degradation of the oil hydrocarbons, and prevent horses and deer from grazing in the impacted area.

5.0 REFERENCES

NAC, 1992, Hazardous Materials: Storage Tanks, Nevada Administrative Code 459.9921 through 459.999.

REEC Co, 1992, Work Plan - Phase 1 Preliminary Characterization of Building 12-16, Wastewater Discharge Area, Reynolds Electrical and Engineering Company, October 23, 1992.

U. S. DOE, Preliminary Investigation, Area 12 Fleet Operations Steam Cleaning Discharge Area, Nevada Test Site, prepared by Bechtel Nevada, July 1995. DOE/NV/11718-054

U.S. EPA, 1990, EPA Proposed Corrective Action Rule For Solid Waste Management Units, U. S. Environmental Protection Agency Proposed Rule Subpart S Title 40 CFR Part 264.525.

U.S. EPA, 1991, Guidance on RCRA Corrective Action Decision Documents, The Statement of Basis Final Decision and Response to Comments. Office of Solid Waste and Emergency Response Directive 9355.0-30

U.S. EPA, 1994, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, U. S. Environmental Protection Agency, Test Method 8240B, Revision 2, September 1994.

APPENDIX A

PHASE 2 CHARACTERIZATION REPORT

***AREA 12 FLEET OPERATIONS
STEAM CLEANING DISCHARGE AREA
NEVADA TEST SITE
CORRECTIVE ACTION UNIT (CAU) 339***

1

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
FIGURES	A-ii
TABLES	A-ii
ATTACHMENTS	A-iii
ABBREVIATIONS AND ACRONYMS	A-iv
EXECUTIVE SUMMARY	ES-1
 1.0. INTRODUCTION	 A-1
1.1 BACKGROUND	A-1
1.2 SITE DESCRIPTION	A-1
1.3 PRELIMINARY (PHASE 1) INVESTIGATION	A-4
1.4 PHASE 2 INVESTIGATION - PURPOSE AND SCOPE	A-10
 2.0 SITE INVESTIGATION	 A-11
2.1 FIELD ACTIVITIES	A-11
2.2 LABORATORY ANALYSES	A-16
 3.0 FINDINGS	 A-17
3.1 OBSERVATIONS	A-17
3.2 HEADSPACE READINGS	A-17
3.3 LABORATORY ANALYTICAL RESULTS	A-17
3.4 RESIDUAL MANAGEMENT	A-25
 4.0 CONCLUSIONS AND RECOMMENDATIONS	 A-26
4.1 CONCLUSIONS	A-26
4.2 RECOMMENDATIONS	A-27
 5.0 SCHEDULE	 A-29
 6.0 REFERENCES	 A-31

FIGURES

<u>FIGURES</u>	<u>PAGE</u>
1. SITE VICINITY MAP	A-2
2. SITE LOCATION MAP	A-3
3. PHASE 1 DRAIN LINE DISCHARGE AREA - DISCOLORED SOIL AREAS AND ANALYTICAL RESULTS	A-9
4. SITE SAMPLE LOCATIONS - DRAIN LINE DISCHARGE AREA	A-14
5. SITE SAMPLE LOCATIONS - FORMER PARKING AREA	A-15
6. PHASE 2 DRAIN LINE DISCHARGE AREA - SAMPLE LOCATIONS AND ANALYTICAL RESULTS	A-22
7. ANALYTICAL RESULTS - FORMER PARKING AREA	A-23
8. REPORT SCHEDULE FOR AREA 12 STEAM CLEANING DISCHARGE AREA ..	A-30

TABLES

<u>TABLES</u>	<u>PAGE</u>
1. PHASE 1 - SUMMARY OF SOIL ANALYTICAL RESULTS	A-5
2. SAMPLE LOCATION AND LOGIC	A-12
3. PHASE 2 - SUMMARY OF SOIL ANALYTICAL RESULTS	A-19

ATTACHMENTS

ATTACHMENTS

A. GEOPROBE SYSTEM

B. FIELD NOTES

C. ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY

D. A THROUGH K ANALYSIS

E. RINSATE WASTE MANIFEST

ABBREVIATIONS AND ACRONYMS

BN	Bechtel Nevada
CAS	Corrective Action Site
CAU	Corrective Action Unit
CFR	Code of Federal Regulations
cm	centimeter
DOE	U. S. Department of Energy
EPA	U. S. Environmental Protection Agency
eV	Electron Volt
MEK	Methyl-ethyl-ketone (2-butanone)
mg/kg	milligrams per kilogram
mg/l	milligrams per liter
MIBK	Methyl-isobutyl-ketone (4-methyl-2-pentanone)
ml	milliliter
NAC	Nevada Administrative Code
NDEP	Nevada Division of Environmental Protection
NIOSH	National Institute for Occupational Safety and Health
NTS	Nevada Test Site
OVM	Organic Vapor Monitor
pCi/g	picoCuries per gram
pCi/l	picoCuries per liter
ppm	parts per million

RCRA	Resource Conservation and Recovery Act
REEC	Reynolds Electrical & Engineering Co., Inc.
RSN	Raytheon Services Nevada
Semi-VOCs	semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
ug/kg	microgram per kilogram
ug/l	microgram per liter
VOCs	volatile organic compounds

EXECUTIVE SUMMARY

This report documents the characterization activities and findings of a former steam cleaning discharge area at the Nevada Test Site (NTS). The former steam cleaning site is located in Area 12, east of the Fleet Operations Building 12-16. This site has been assigned Corrective Action Site (CAS) Number 12-19-01 and is within the Corrective Action Unit (CAU) 339.

A preliminary investigation (Phase 1) of the site was completed in September 1995 (U.S. DOE, 1996). Based on the findings of the preliminary investigation additional sampling was required. The scope of work for the second phase of work (Phase 2) was increased to evaluated conditions of two separate areas of the site. The first area is located east of the steam cleaning operations discharge pipe. The second area is a vacant lot, previously used for vehicle parking, located east of a sand/oil interceptor.

The following conclusions are based on the findings of the Phase 1 and Phase 2 field investigations and data evaluation.

Steam Cleaning Effluent Discharge Area

- Hydrocarbon impacted soils, exceeding the Nevada Administrative Code (NAC) Action Level of 100 milligrams per kilogram (mg/kg), appear to be primarily defined by the discolored surface soil areas of the site. TPH concentrations range from <25 milligrams per kilogram (mg/kg) to 8,600 mg/kg.
- The oil impacted soil, identified in Phase 1 sampling, has not migrated to depths greater than 0.9 meters to 1.2 meters (3.0 to 4.0 feet) with the exception of Sample Area B1216-S3 located in an arroyo to the northeast of the discharge line (refer to Figure 6 in report).
- The eastern extent of hydrocarbon impacted soil has been defined in Sample Area B1216-S1 but was not defined in Sample Area B1216-S3.
- Soil analytical results from Sample Area B1216-S9 indicate that Resource Conservation and Recovery Act (RCRA) "F Listed" VOCs have impacted the soil in this area based upon the concentrations detected as well as being identified in the Phase 1 sampling investigation.

Sand/Oil Interceptor Overspill Area

- TPH as oil was identified at a maximum concentration of 1,100 mg/kg which exceeds the NAC Action Level. Oil hydrocarbons appear to have impacted the overspill area to a minimum depth of 0.5 meters (1.5 feet).
- RCRA "F Listed" VOCs were identified in Sample Areas B1216-S15 and B1216-S17.

The following recommendations are supported by the NAC Action by Division When Excessive Petroleum Is Present in Soil, ("A through K" Analysis) and are based upon the findings and conclusions of the Phase 1 and Phase 2 characterization activities:

Steam Cleaning Effluent Discharge Area

Excavation of soils impacted by hydrocarbons, *is not recommended* based upon the following rationale;

- TPH as oil, identified in the Phase 1 sampling investigation, has not migrated to depths greater than 0.9 to 1.2 meters (3.0 to 4.0 feet) with exception of Sample Area B1216-S3.
- Although surficial impacted soils and soil in Sample Area B1216-S3 exceed the NAC Action Level it is not likely that the oil hydrocarbon as concentrations identified would impact groundwater at approximately 326 meters (1,068 feet) below ground surface (bgs).
- The soil berm, placed up gradient of the arroyo and down gradient of the effluent discharge line, will prevent lateral migration of the impacted soils identified with the highest TPH concentrations.

Excavation of soils impacted by VOCs, Sample Areas B1216-S4 and B1216-S9, *is recommended* based upon the following rationale;

- The presence of RCRA "F Listed" VOCs were detected in both the Phase 1 and Phase 2 Investigations.
- The presence and concentrations of the compounds (other than methylene chloride and toluene) cannot be attributed to laboratory contamination.

In addition, the following activities are recommended;

- The sandbag berm around the discharge line should be removed and resulting soils should be used for area grading and backfill during closure activities.
- The steam cleaning discharge line should be plugged at the outfall with Sulfaset Cement (or equivalent) to a minimum of 0.9 meters (3.0 feet).
- The discharge area east of the effluent line and west of the soil berm should be fenced and posted as a "hydrocarbon contamination" area.
- The soil berm should remain in place to mitigate lateral migration of the hydrocarbon impacted soils into the arroyo.

Sand/Oil Interceptor Overspill Area

- Excavation of soils in the vicinity of the sand/oil interceptor, Sample Area B1216-S17, *is recommended.*
- Excavation of soils impacted by hydrocarbons in the former vehicle parking area, *is not recommended.*

Sand/Oil Interceptor

- The removal and closure of the sand/oil interceptor is recommended to be completed as part of future decontamination and decommissioning activities associated with Building 12-16.

1.0 INTRODUCTION

1.1 BACKGROUND

The former Area 12 Fleet Operations Building 12-16 was constructed in approximately 1965 and functioned as a maintenance facility for light- and heavy-duty vehicles up to January 1993. Services performed at the Fleet Operations site included steam cleaning, tire service, and preventative maintenance on vehicles and special purpose equipment.

Typical maintenance operations included the use of pressurized high-temperature steam with soap. Solvents may have been used during past operations prior to the steam cleaning activities. Antifreeze, used oil, fuel, grease, and asbestos (from brake linings) may have been present in the waste stream (REECo, 1992). Since 1989, the use of cleaning solvents containing Resource Conservation and Recovery Act (RCRA) constituents has been discontinued (REECo, 1992). Discharge from steam cleaning activities ceased on November 20, 1992 when maintenance activities requiring steam cleaning were transferred to the Area 23 Fleet Operations. The reduced mission at the Nevada Test Site (NTS) resulted in the closure of Building 12-16 on January 4, 1993. This site has been assigned Corrective Action Site (CAS) Number 12-19-01 and is within the Corrective Action Unit (CAU) 339.

1.2 SITE DESCRIPTION

The Area 12 Fleet Operations site is located in the southeast portion of the Area 12 Camp and support facilities (Figure 1). Water for the site is obtained from Well Number 8 (the closest well), which is located approximately 12 kilometers (7.5 miles) west of the site. Based on available hydrogeologic data (RSN, 1986), the groundwater level at Well Number 8 is estimated to be at a depth of 326 meters (1,068 feet) below the surface. Approximate Nevada Coordinates for the site are N 890,000 and E 650,000 (from NTS Road and Facility Map, Holmes and Narver, 1986 update).

A sand/oil interceptor, which segregated the materials generated from the steam cleaning activities, is located at the south east side of the Fleet Operations Building (Figure 2). The discharge effluent line from the separator is located approximately 104 meters (340 feet) east of the sand/oil interceptor (Figure 2). Physical site boundaries include the Rainier Mesa Road to the south, a helicopter pad to the east, a natural erosional channel (arroyo) to the north, and a topographic high to the west. Surface flow from the discharge pipe and other Fleet Maintenance activities appears to follow the native topography which slopes predominantly to the east and northeast.

A soil berm, previously constructed at the site, appears to have been built in an effort to prevent releases to the arroyo north and east of the discharge pipe; however, records could not be located indicating the time of construction.

Bechtel Nevada

FIGURE 1 SITE VICINITY MAP

SOURCE: USGS RAINIER MESA, NEV. 7.5' QUADRANGLE 1986

Bechtel Nevada

**FIGURE
SITE LOCATION**

1.3 PRELIMINARY (PHASE 1) INVESTIGATION

A preliminary investigation of the site was completed in September 1995. The preliminary (Phase 1) investigation was completed as outlined in the 1992 Work Plan (REECo, 1992). The investigation included the sampling of 12 locations within the surface discharge area of the outflow pipe.

Soil samples were analyzed for;

- Total Petroleum Hydrocarbons (TPH) using Environmental Protection Agency (EPA) Method 8015, Modified;
- Volatile Organic Compounds (VOCs) using EPA Method 8240;
- Semi-Volatile Organic Compounds (Semi-VOCs) using EPA Method 8270;
- Toxicity Characteristic Leaching Procedure (TCLP) Metals using EPA Extraction Method 1311 and Method 6010;
- Bulk Asbestos Count using National Institute for Occupational Safety and Health (NIOSH) Method 7400; and
- Gamma Scan using Reynolds Electrical and Engineering Company (REECo) Counting & Instrumentation Procedure.

In addition, the sample collected at the discharge point was also analyzed for TCLP VOCs using EPA Method 8240 and TCLP Semi-VOCs using EPA Method 8270. The parameters were selected based on process knowledge of the types of materials that had been, or potentially could have been, discharged in the area during past operations. Table 1 summarizes the analytical results of the Phase 1 soil sampling. Figure 3 shows the discolored soil boundaries and analytical results of the Phase 1 sampling.

Discoloration of the surface soil was observed in the area of the discharge pipe and in localized areas in the natural drainage channel (Figure 3). The discoloration appeared to be consistent with the topographically low areas of the site. Hydrocarbon odors were noted in the areas of discoloration only.

TABLE 1: PHASE 1 - SUMMARY OF SOIL ANALYTICAL RESULTS

SAMPLE NUMBER	ASBESTOS COUNT ⁽¹⁾ (percent)	TCLP METALS ⁽²⁾ (mg/l)	TOTAL PETROLEUM HYDROCARBONS ⁽³⁾ (mg/kg)	VOCS ⁽⁴⁾ (ug/kg or ug/l)	SEMI- VOCS ⁽⁵⁾ (ug/kg or ug/l)	OVM READINGS ⁽⁶⁾ (ppm)	DISTANCE FROM PIPE (meters/feet)	GAMMA ⁽⁷⁾ (pCi/g)
B1216-S1 (Sample Point 1)	ND ⁽⁸⁾	Ba ⁽⁹⁾ 1.7	Diesel <40 Gas <0.05 Oil 3,400	ND	ND	14.6	155/507	¹³⁷ Cs 0.457 ⁴⁰ K 19.1 ²²⁶ Ra 1.27 ²²⁸ Th 2.04 ²³² Th 2.25
B1216-S2 (Sample Point 2)	ND	Ba 1.7	Diesel <40 Gas <0.05 Oil 6,100	ND	ND	21.2	80/261	¹³⁷ Cs 0.592 ⁴⁰ K 17.2 ²²⁶ Ra 1.24 ²²⁸ Th 1.59 ²³² Th 1.64
B1216-S3 (Sample Point 3)	ND	Ba 1.6	Diesel <4 Gas <0.05 Oil 830	ND	ND	3.1	106/348	¹³⁷ Cs 1.21 ⁴⁰ K 24.6 ²²⁶ Ra 1.16 ²²⁸ Th 1.91 ²³² Th 1.04
B1216-S4 (Sample point 4)	ND	Ba 2.2	Diesel <4 Gas <0.05 Oil <20	Acetone 22B Methylene Chloride 6	ND	0.9	68/222	⁴⁰ K 28.9 ²²⁶ Ra 1.21 ²²⁸ Th 2.50 ²³² Th 2.54
B1216-S5 (Sample Point 5)	ND	Ba 2.3	Diesel <4 Gas <0.05 Oil 90	ND	ND	1.4	0.6/2	¹³⁷ Cs 0.323 ⁴⁰ K 26.3 ²²⁶ Ra 1.15 ²²⁸ Th 2.50 ²³² Th 2.11

SAMPLE NUMBER	ASBESTOS COUNT⁽¹⁾ (percent)	TCLP METALS⁽²⁾ (mg/l)	TOTAL PETROLEUM HYDROCARBONS⁽³⁾ (mg/kg)	VOCS⁽⁴⁾ (ug/kg or ug/l)	SEMI- VOCS⁽⁵⁾ (ug/kg or ug/l)	OVM READINGS⁽⁶⁾ (ppm)	DISTANCE FROM PIPE (meters/feet)	GAMMA⁽⁷⁾ (pCi/g)
B1216-S6 (Sample Point 6)	ND	Ba 1.9	Diesel <4 Gas <0.05 Oil 490	ND	ND	4.0	71/234	¹³⁷ Cs 0.477 ⁴⁰ K 28.2 ²²⁶ Ra 15.3 ²²⁸ Th 2.46 ²³² Th 3.08
B1216-S7 (Sample Point 7)	ND	Ba 1.1	Diesel <4 Gas <0.05 Oil 84	ND	ND	0.3	91/297	¹³⁷ Cs 0.695 ⁴⁰ K 19.9 ²²⁶ Ra 1.03 ²²⁸ Th 2.04 ²³² Th 1.97
B1216-S8 (Sample Point 8)	ND	Ba 1.7	Diesel <4 Gas <0.05 Oil 1,300	ND	ND	12.5	37/123	¹³⁷ Cs 0.229 ⁴⁰ K 21.1 ²²⁶ Ra 1.02 ²²⁸ Th 2.18 ²³² Th 1.59
B1216-S9 (Sample Point 9)	ND	Ba 1.7	Diesel <40 Gas <0.05 Oil 4,800	Acetone 42B 2-Butanone 20B 4-Methyl-2- pentanone 10 2-Hexanone 12	ND	19.0	38/126	¹³⁷ Cs 0.49 ⁴⁰ K 18.4 ²²⁶ Ra 0.989 ²²⁸ Th 1.78 ²³² Th 1.99
B1216-S10 (Sample Point 10)	ND	Ba 2.1	Diesel <4 Gas <0.05 Oil <20	ND	ND	0.6	50/164	¹³⁷ Cs 0.447 ⁴⁰ K 24.6 ²²⁶ Ra 1.02 ²²⁸ Th 1.92 ²³² Th 1.84

SAMPLE NUMBER	ASBESTOS COUNT⁽¹⁾ (percent)	TCLP METALS⁽²⁾ (mg/l)	TOTAL PETROLEUM HYDROCARBONS⁽³⁾ (mg/kg)	VOCS⁽⁴⁾ (ug/kg or ug/l)	SEMI- VOCS⁽⁵⁾ (ug/kg or ug/l)	OVM READINGS⁽⁶⁾ (ppm)	DISTANCE FROM PIPE (meters/feet)	GAMMA⁽⁷⁾ (pCi/g)
B1216-S11 (Sample Point 11)	ND	Ba 1.9	Diesel <40 Gas <0.05 Oil 7,200	Acetone 44B Methylene Chloride 6 2-Butanone 21B 4-Methyl-2- pentanone 12	ND	20.1	38/126	¹³⁷ Cs 0.408 ⁴⁰ K 19.9 ²²⁶ Ra 1.06 ²²⁸ Th 1.74 ²³² Th 1.68
B1216-S12 (Sample Point 12)	ND	Ba 1.6 Cd ⁽¹⁰⁾ 0.06	Diesel <40 Gas <0.05 Oil 6,000	Acetone 17B	ND	16.7	13/41	¹³⁷ Cs 0.285 ⁴⁰ K 17.3 ²²⁶ Ra 0.984 ²²⁸ Th 1.66 ²³² Th 1.75
B1216-S13 (Sample Point 13)	ND	Ba 1.5 Cd 0.09	Diesel <40 Gas <0.05 Oil 8,600	ND <u>TCLP</u> ND	ND <u>TCLP</u> ND	56.0	0.6/2	¹³⁷ Cs 0.149 ⁴⁰ K 14.6 ²²⁶ Ra 0.79 ²²⁸ Th 14.1 ²³² Th 1.50
95DDM09061 (Trip Blank)	NA ⁽¹¹⁾	NA	NA	Acetone 41 2-Butanone 22	NA	NA	NA	NA
95DDM09062 (Trip Blank)	NA	NA	NA	Acetone 44 2-Butanone 24	NA	NA	NA	NA

Notes:

- 1 Bulk Asbestos Counting: NIOSH Method 7400 (Polarized Light Microscopy)
- 2 Toxicity Characteristic Leaching Procedure (TCLP) Metals: Extraction Method 1311 and Methods 6010 and 7470
- 3 TPH: Method 8015, Modified
- 4 Volatile Organic Compounds: Method 8240
- 5 Semi-Volatile Organic Compounds: Method 8270

Notes:

- 1 Bulk Asbestos Counting: NIOSH Method 7400 (Polarized Light Microscopy)
 - 2 Toxicity Characteristic Leaching Procedure (TCLP) Metals: Extraction Method 1311 and Methods 6010 and 7470
 - 3 TPH: Method 8015, Modified
 - 4 Volatile Organic Compounds: Method 8240
 - 5 Semi-Volatile Organic Compounds: Method 8270
 - 6 Organic Vapor Monitor (OVM) readings: readings taken a minimum of 30 minutes after collection.
 - 7 20 minute Gamma Scan: REEC Co Counting Procedure
 - 8 Not Detected above method/laboratory detection levels
 - 9 Barium (Ba)
 - 10 Cadmium (Cd)
 - 11 Not analyzed
- B Indicates constituent was found in the associated trip blank.

Bechtel Nevada

FIGURE 3
PHASE 1 DRAIN LINE DISCHARGE AREA
DISCOLORED SOIL AREAS AND ANALYTICAL RESULTS

The following conclusions were determined based upon the Phase 1 findings of the field investigation and data evaluation:

- Hydrocarbon impacted soils, exceeding the Nevada Administrative Code (NAC) Action Level, appeared to be defined by the discolored areas of the site.
- Discharge into the down-gradient arroyo occurred prior to the construction of the soil berm located north and east of the discharge pipe.
- Analytical data indicated that the discharge area was not impacted by asbestos, TCLP metals, semi-VOCs, or elevated levels of radiological constituents.

VOCs could not be verified to have impacted the area. Although it appeared likely that the concentrations of VOCs detected could be attributed to laboratory contamination, confirmation samples were required since process knowledge indicated that VOCs may have been components of a solvent formerly used at the site. In addition, the depth of hydrocarbon impact was not determined in the preliminary investigation. Refer to the Preliminary Investigation Report dated July 1996 for detailed discussion of the findings, conclusions, and recommendations (DOE, 1996).

1.4 PHASE 2 INVESTIGATION - PURPOSE AND SCOPE

The purpose of this project is to complete a second phase of characterization for the former steam cleaning discharge area. The project area encompasses the vacant lot (previously used for vehicle parking) east of a sand/oil interceptor and the area east of the steam cleaning operations discharge pipe (located approximately 104 meters [340 feet] east of the interceptor). The characterization was completed as a required condition of the "Temporary Water Pollution Control Permit for the Discharge From Fleet Operations Steam Cleaning Facility." The permit was issued by the Nevada Division of Environmental Protection (NDEP) in a letter dated July 14, 1992.

The scope of this phase of activity, as indicated in the Preliminary Investigation Report (DOE, 1996), was to:

- Collect additional soil samples to evaluate and/or confirm the presence and concentrations of VOCs detected during Phase 1 sampling;
- Evaluate the depth of petroleum hydrocarbons at the site;
- Define the eastern boundary of the hydrocarbon impacted soils; and
- Evaluate if overspill from the sand/oil interceptor, located near the southeast of the Fleet Operations Building, impacted the surface and subsurface soils with hydrocarbons and/or VOCs (verbal request by NDEP prior to initiating field activities [BN,1996]).

2.0 SITE INVESTIGATION

2.1 FIELD ACTIVITIES

Soil samples were collected on September 11 and 12, 1996. A total of 14 locations were sampled east of the steam cleaning effluent discharge line. These locations were in vicinity of the Phase 1 sample areas. An additional four locations were sampled from the vicinity of the former flow path areas down gradient from the sand/oil interceptor. The sand/oil interceptor currently remains at the site and is located near the south east portion of the building (Figure 2). The additional sampling was recommended by the NDEP to determine if potential overspilling from the interceptor impacted the underlying soils across the former parking lot areas (BN, 1996). One background sample was also collected in the former parking area. Sample logic is presented in Table 2 and soil sample locations collected at the steam cleaning effluent discharge area and the sand/oil interceptor overspill area are shown on Figures 4 and 5, respectively.

An example of sample nomenclature for this investigation is:

B1216-S9AS, A1, or A3 where;

"B1216" = Building 12-16 (Area 12 Fleet Operations),

"S9" = Phase 1 sample point location;

"AS, A1, or A3" = Phase 2 soil sample location collected at the surface (AS), target depth of 0.3 meters (1.0 foot [A1]) below ground surface (bgs) or a target depth of 0.9 meters (3.0 feet [A3]) bgs.

Surface samples were collected by hand using a cleaned stainless steel scoop. Samples taken below the surface were collected using a truck mounted, hydraulic ram, Geoprobe® system. Geoprobe® samples were collected from various depth intervals dependant on location of the sample and/or core barrel refusal. Samples were obtained by pushing or driving a 0.6-meter (2.0-foot) core barrel into the soil to the desired depth. A description of the Geoprobe® system and sampling operations is provided in Attachment A.

Soil from each sample point (depending on volume of sample recovery) was placed in Ziploc™ plastic bags and allowed to volatilize for a minimum of 30 minutes for headspace readings. The headspace was then measured using an Organic Vapor Monitor (OVM) Model 580B equipped with an 11.4 electron volt (eV) lamp. The OVM was calibrated to 100 parts per million (ppm) Isobutylene at the beginning of each day. Soil headspace readings were performed by opening a minimal area in the seal area of the bag, inserting the tip of the OVM, closing the seal around the tip of the OVM, and allowing the OVM to withdraw the stabilized atmosphere from the bag for VOC measurement. Soil descriptions, soil moisture, OVM headspace readings, and other pertinent data were recorded in the Field Notes (Attachment B).

TABLE 2 – SAMPLE LOCATION AND LOGIC

PHASE 1 SAMPLE LOCATION	PHASE 2 - SAMPLE ANALYTICAL PARAMETERS AND LOGIC
B1216-S1	Sample B1216-S1A3 was collected to verify the vertical extent of TPH as oil. Sample B1216-S1B3 was collected to verify the lateral (eastern) and vertical extent of TPH as oil. Samples were collected from intervals of 0.6 to 1.2 meters (2.0 to 4.0 feet) and 0.3 to 0.9 meters (1.0 to 3.0 feet), respectively.
B1216-S2	Sample B1216-S2A3 was collected to verify the vertical extent of TPH as oil. The sample was collected from an interval of 0.6 to 0.9 meters (2.0 to 3.0 feet).
B1216-S3	Sample B1216-S3A3 was collected at a sample interval of 0.46 to 0.9 meters (1.5 to 3.0 feet) to verify the vertical extent of TPH as oil. Samples B1216-S3B3 and B1216-S3C3 were collected at sample intervals of 0.6 to 0.9 meters (2.0 to 3.0 feet), respectively, to verify the lateral (eastern) and vertical extent of TPH as oil.
B1216-S4	Samples B1216-S4AS, B1216-S4BS, and B1216-S4CS were collected from the surface to 7.6 cm (3.0 inches) to verify/confirm the presence of VOCs identified in Phase 1 sampling. An additional sample was not collected at depth due to core barrel refusal of the Geoprobe® after numerous attempts..
B1216-S6	Sample B1216-S6A3 was collected at a sample interval of 0.76 to 1.1 meters (2.5 to 3.5 feet) to verify the vertical extent of TPH as oil.
B1216-S9/-S11	Samples B1216-S9AS, B1216-S9BS, B1216-S9CS and B1216-S9DS were collected from the surface to 7.6 cm (3.0 inches) to verify/confirm the presence of VOCs identified in Phase 1 sampling. Sample B1216-S9A3 was collected at a sample interval of 0.46 to 1.1 meters (1.5 to 3.5 feet) to verify the vertical extent of TPH as oil and determine if VOCs were present at depth.
B1216-S13	Sample B1216-S13A3 was collected at a sample interval of 0.46 to 1.1 meters (1.5 to 3.5 feet) to verify the vertical extent of TPH as oil.

<i>PHASE 1 SAMPLE LOCATION</i>	<i>PHASE 2 - SAMPLE ANALYTICAL PARAMETERS AND LOGIC</i>
NA - sand/oil interceptor release area (not characterized during Phase 1 sampling).	Samples B1216-S14S and B1216-S14-1 were collected from intervals of surface to 7.6 cm (3.0 inches) and 0.15 to 0.46 meters (0.5 to 1.5 feet), respectively. The samples were analyzed for VOCs and TPH as diesel and oil to determine if the area was impacted from interceptor overspill occurrences.
NA - sand/oil interceptor release area (not characterized during Phase 1 sampling).	Samples B1216-S15S and B1216-S15-1 were collected from intervals of surface to 7.6 cm (3.0 inches) and 0.15 to 0.46 meters (0.5 to 1.5 feet), respectively. The samples were analyzed for VOCs and TPH as diesel and oil to determine if the area was impacted from interceptor overspill occurrences.
NA - sand/oil interceptor release area (not characterized during Phase 1 sampling).	Sample B1216-S16S was collected from the surface to 7.6 cm (3.0 inches) and analyzed for VOCs and TPH as diesel and oil to determine if the area was impacted from interceptor overspill occurrences.
NA - sand/oil interceptor release area (not characterized during Phase 1 sampling).	Samples B1216-S17S and B1216-S17-1 were collected from intervals of surface to 7.6 cm (3.0 inches) and 0.15 to 0.46 meters (0.5 to 1.5 feet), respectively. The samples were analyzed for VOCs and TPH as diesel and oil to determine if the area was impacted from interceptor overspill occurrences.
NA - sand/oil interceptor release area (not characterized during Phase 1 sampling).	Samples B1216-BGS and B1216-BG1 were collected from intervals of surface to 7.6 cm (3.0 inches) and 0.15 to 0.46 meters (0.5 to 1.5 feet), respectively. The samples were analyzed for VOCs and TPH as diesel and oil to determine if the area was impacted from interceptor overspill occurrences.

Notes: The laboratory analyzed all TPH samples as diesel and oil since both can be quantified from the same chromatograph. Therefore, results for both the diesel and oil range are provided.

Refer to Figures 4 and 5 for Soil Sample Locations.

Bechtel Nevada

FIGURE 4
SITE SAMPLE LOCATIONS - DRAIN LINE DISCHARGE AREA

One background sample (B1216-BG), which represents the parking area background conditions, was collected from the former parking area approximately 56 meters (185 feet) north of Rainier Mesa Road and 28 meters (93 feet) east of Building 12-16 (Figure 5).

2.2 LABORATORY ANALYSES

All soil samples were placed into clean laboratory grade glass jars with Teflon seals, sealed, labeled, placed on ice in an ice chest and cooled to approximately four degrees Centigrade (39.2 degrees Fahrenheit). Two trip blanks, and two matrix spike/matrix spike duplicate samples were collected for quality assurance purposes. All samples were transported to the Bechtel Nevada Analytical Services Laboratory in Mercury, Nevada following standard chain-of-custody procedures.

Soil samples were analyzed for TPH (as diesel and oil) using EPA Method 8015, Modified. A majority of TPH samples were collected for analysis of oil only, however, since results of oil and diesel can be quantitated from the same chromatograph, the laboratory provided results for each. VOCs were also analyzed using EPA Method 8240. The parameters were selected based on the results of the Phase 1 Investigation (DOE, 1996). Chemical sample analysis was performed by Quanterra Laboratories in Earth City, Missouri.

3.0 FINDINGS

3.1 OBSERVATIONS

Moisture or wetness was not observed in the discharge pipe or surrounding area during exploratory field activities on September 11 and 12, 1996. The northwest portion of the sandbagged berm area around the discharge pipe was removed to allow access of the Geoprobe®. However, enough soil remains in place to act as a barrier to any run-on or run-off water flow.

Soil discoloration, from the discharge effluent, and hydrocarbon odors were noted within surface samples B1216-S9AS, B1216-S9BS, B1216-S9CS, and B1216-S9DS collected east of the discharge line. Discoloration was not noted in the sample collected at depth (B1216-S9A3) in this area (observations can be found in the Field Notes in Attachment B).

Discoloration, potentially from asphalt or parked vehicles, was noted within surface samples B1216-S15S, B1216-S16S, and B1216-S17S collected in the former parking area. No discoloration was noted in the samples collected at depth in these areas.

Soils samples predominantly consisted of dry, silty sand with fine to coarse gravels, and were light to medium brown in color. Cobbles and boulders were encountered at each of the sample locations. One sample (B1216-S15-1) consisted of a clayey sand with fine gravel, was medium brown in color and slightly moist (no staining was observed and no hydrocarbon odors were noted).

3.2 HEADSPACE READINGS

Headspace readings can be found in the Field Notes in Attachment B and are summarized in Table 3. Headspace readings for the soil samples ranged from 0.0 ppm to 11.6 ppm. The low headspace readings are attributed to the low concentrations of VOCs detected.

3.3 LABORATORY ANALYTICAL RESULTS

Analytical results for the Phase 2 sampling are summarized in Table 3. Analytical results have also been included in Figure 6 (drain line discharge area) and Figure 7 (former parking area) to show the relationship between sample location and wastewater flow paths. The laboratory analytical data report is provided in Attachment C.

Total Petroleum Hydrocarbons (TPH) - Steam Cleaning Effluent Discharge Area

TPH as diesel concentrations in the discharge area were not detected above the laboratory detection level of 25 mg/kg which is below the NAC Action Level of 100 mg/kg (NAC, 1992).

TPH as oil was detected in two of the nine samples collected within the arroyo discharge area (Sample Area B1216-S3) at concentrations of 180 mg/kg and 760 mg/kg, exceeding the NAC Action Level. Each of these samples were collected at a sample interval of 0.3 to 0.9 meters (1.0 to 3.0 feet).

Total Petroleum Hydrocarbons (TPH) - Sand/Oil Interceptor Discharge Area

TPH as diesel was detected in Sample B1216-S15-1 at a concentration of 36 mg/kg which is below the NAC Action Level. Diesel was not detected (<25 mg/kg) in the other samples analyzed.

TPH as oil was detected in six of the nine samples collected adjacent to, and in the parking area east of, the oil/sand separator (Sample Areas B1216-S14, B1216-S15, and B1216-S17). Four of the samples had concentrations ranging from 150 mg/kg to 1,100 mg/kg which exceed the NAC Action Level. These samples were collected to a maximum depth of 0.5 meters (1.5 feet).

Volatile Organic Compounds - Steam Cleaning Effluent Discharge Area

Methylene chloride was detected in each of the samples analyzed for VOCs. Concentrations ranged from 0.004 mg/kg to 0.56 mg/kg. Methylene chloride was also detected in the laboratory method blanks indicating laboratory contamination occurred. The proposed Subpart S Regulatory Action Level for methylene chloride is 90 mg/kg (EPA 1990) which is considerably above the maximum concentration of 0.56 mg/kg detected in the soil samples from the discharge area.

Acetone was detected in six soil samples collected from Sample Areas B1216-S4 and B1216-S9. Concentrations range from 0.017 mg/kg to 1.2 mg/kg. Acetone was also detected in one method blank at a concentration of 0.003 mg/kg which was an estimated concentration below the laboratory detection limit. Based on the maximum concentration detected in the soil (1.2 mg/kg), acetone appears to have impacted the soil in the Sample Areas B1216-S4 and B1216-S9. Based on process knowledge of the solvents being used at the site, the acetone is considered to be a RCRA "F Listed" waste. The proposed Subpart S Regulatory Limit for acetone is 8,000 mg/kg which is considerably above the range of concentrations detected.

2-Butanone (Methyl-ethyl-ketone [MEK]) was detected in four samples collected from Sample Area B1216-S9 at concentrations ranging from 0.062 mg/kg to 0.550 mg/kg. The concentrations are well below the TCLP Action Level of 200 mg/l (40 CFR 261.24) and the proposed Subpart S Regulatory Limit of 4,000 mg/kg for 2-butanone (EPA 1990). Based on process knowledge of solvents being used at the site, the MEK is considered to be a RCRA "F Listed" waste.

TABLE 3: PHASE 2 - SUMMARY OF SOIL ANALYTICAL RESULTS

PHASE I SAMPLE AREA	PHASE II SAMPLE NUMBER	SAMPLE INTERVAL (meters [feet])	TPH⁽¹⁾ (mg/kg)	VOCs⁽²⁾ (mg/kg or mg/l)	OVM⁽³⁾ (ppm)
B1216-S1	B1216-S1A3	0.6-1.2 [2.0-4.0]	Diesel <25 Oil <25	NA	6.7
	B1216-S1B3	0.3-0.9 [1.0-3.0]	Diesel <25 Oil <25	NA	3.4
B1216-S2	B1216-S2A3	0.6-0.9 [2.0-3.0]	Diesel <25 Oil <25	NA	0.0
B1216-S3	B1216-S3A3	0.3-0.9 [1.0-3.0]	Diesel <25 Oil 760	NA	0.0
	B1216-S3B3	0.6-0.9 [2.0-3.0]	Diesel <25 Oil <25	NA	0.0
	B1216-S3C3	0.3-0.9 [1.0-3.0]	Diesel <25 Oil 180	NA	0.0
B1216-S4	B1216-S4AS	0-0.6 [0-0.2]	NA	Methylene Chloride 0.009 B	0.4
	B1216-S4BS	0-0.6 [0-0.2]	NA	Methylene Chloride 0.007 B Acetone 0.017 J Toluene 0.004 BJ	0.0
	B1216-S4CS	0-0.6 [0-0.2]	NA	Methylene Chloride 0.008 B Acetone 0.110 Toluene 0.004 BJ	0.6
B1216-S6	B1216-S6A3	0.8-1.1 [2.5-3.5]	Diesel <25 Oil <25	NA	0.0
B1216-S9	B1216-S9AS	0-0.6 [0-0.2]	NA	Methylene Chloride 0.043 B Acetone 1.2 E 2-Butanone 0.550 E 4-Methyl-2-Pentanone 0.051 2-Hexanone 0.360 E Toluene 0.006 B	0.0
	B1216-S9ASDL (Dilution of Sample ID B12-S9AS)	NA	NA	Methylene Chloride 0.056 BD Acetone 0.130 BD 2-Butanone 0.140 D 4-Methyl-2-Pentanone 0.061 DJ 2-Hexanone 0.076 DJ Toluene 0.024 BDJ	NA

PHASE I SAMPLE AREA	PHASE II SAMPLE NUMBER	SAMPLE INTERVAL (meters [feet])	TPH ⁽¹⁾ (mg/kg)	VOCs ⁽²⁾ (mg/kg or mg/l)		OVM ⁽³⁾ (ppm)
B1216-S9 (cont.)	B1216-S9A3	0.5-1.1 [1.5-3.5]	Diesel <25 Oil <25	Methylene Chloride	0.004 B	0.0
	B1216-S9BS	0-0.6 [0-0.2]	NA	Methylene chloride Acetone 2-Butanone 4-Methyl-2-Pentanone 2-Hexanone Toluene	0.004 BJ 0.210 0.090 0.025 0.040 0.008 BJ	0.0
	B1216-S9CS	0-0.6 [0-0.2]	NA	Methylene Chloride Acetone 2-Butanone 4-Methyl-2-Pentanone 2-Hexanone Toluene	0.030 B 0.380 BE 0.120 0.033 0.037 0.007 B	0.9
	B1216-S9CSDL (Dilution of Sample ID B1216-S9CS)	NA	NA	Methylene Chloride Acetone 2-Butanone 4-Methyl-2-Pentanone Toluene	0.018 BD 0.260 D 0.100 D 0.033 DJ 0.008 BDJ	NA
	B1216-S9DS	0-0.6 [0-0.2]	NA	Methylene Chloride Acetone 2-Butanone 4-Methyl-2-Pentanone 2-Hexanone Toluene	0.022 B 0.240 E 0.100 0.029 0.065 0.005 B	2.0
	B1216-S9DSDL (Dilution of Sample ID B1216-S9DS)	NA	NA	Methylene Chloride Acetone 2-Butanone 4-Methyl-2-Pentanone Toluene	0.014 BD 0.079 D 0.062 D 0.027 DJ 0.007 BDJ	NA
	B1216-S13	0.5-1.1 [1.5-3.5]	Diesel <25 Oil <25	NA		0.0
B1216-S14	B1216-S14S	0-0.6 [0-0.2]	Diesel <25 Oil 25	Methylene Chloride Toluene	0.008 B 0.005BJ	3.8
	B1216-S14-1	0.2-0.5 [0.5-1.5]	Diesel <25 Oil 290	Methylene Chloride Toluene	0.004 BJ 0.004 BJ	NA

<i>PHASE I SAMPLE AREA</i>	<i>PHASE II SAMPLE NUMBER</i>	<i>SAMPLE INTERVAL (meters [feet])</i>	<i>TPH⁽¹⁾ (mg/kg)</i>	<i>VOCs⁽²⁾ (mg/kg or mg/l)</i>		<i>OVN⁽³⁾ (ppm)</i>
B1216-S15	B1216-S15S	0-0.6 [0-0.2]	Diesel <25 Oil 150	Methylene Chloride 2-Butanone Toluene	0.007 B 0.016 J 0.005 BJ	11.6
	B1216-S15-1	0.15-0.46 [0.5-1.5]	Diesel 36 Oil <25	Methylene Chloride Toluene	0.003 BJ 0.004BJ	0.0
B1216-S16	B1216-S16S	0-0.6 [0-0.2]	Diesel <25 Oil <25	Methylene Chloride Toluene	0.006 B 0.004 BJ	9.6
B1216-S17	B1216-S17S	0-0.6 [0-0.2]	Diesel <25 Oil 1,100	Methylene Chloride Acetone 2-Butanone Toluene	0.009 B 0.067 0.028 0.004 BJ	0.6
	B1216-S17-1	0.2-0.5 [0.5-1.5]	Diesel <25 Oil 200	Methylene Chloride Acetone Toluene	0.003 BJ 0.004 J 0.004 BJ	0.0
B1216-BG (back ground)	B1216-BGS	0-0.6 [0-0.2]	Diesel <25 Oil <25	Methylene Chloride Acetone Toluene	0.006 B 0.001 J 0.004 BJ	0.0
	B1216-BG-1	0.2-0.5 [0.5-1.5]	Diesel <25 Oil <25	Methylene Chloride Toluene	0.003 BJ 0.004 BJ	NA
Trip Blank	96SEW0911-1	NA	NA	Methylene Chloride Toluene	0.009 B 0.006 B	NA
Trip Blank	96SEW0911-2	NA	NA	Methylene Chloride Toluene	0.007 B 0.005 B	NA

Notes:

- 1 Total Petroleum Hydrocarbons: Method 8015, Modified
- 2 Volatile Organic Compounds: Method 8240
- 3 Organic Vapor Monitor (OVN) readings: readings taken a minimum of 30 minutes after collection.
- 4 Not Detected above method/laboratory detection levels
- 5 Not analyzed
- B Indicates component was detected in the associated method blank.
- D Indicates that component concentration was acquired from analysis of a dilution.
- E Indicates that the detected concentration exceeded the instrumentation calibration range.
- J Indicates component was detected below the method detection limit.

Bechtel Nevada

FIGURE 6
PHASE 2 DRAIN LINE DISCHARGE AREA
SAMPLE LOCATIONS AND ANALYTICAL RESULTS

4-Methyl-2-pentanone (methyl-isobutyl-ketone [MIBK]) was detected in four samples collected from Sample Area B1216-S9 at concentrations ranging from 0.025 mg/kg to 0.061 mg/kg. The proposed Subpart S Regulatory Action Level for MIBK is 4,000 mg/kg (EPA 1990) which is considerably above the concentration detected. Based on process knowledge of solvents being used at the site, the MIBK is considered to be a RCRA "F Listed" waste.

2-Hexanone was detected in four samples collected from Sample Area B1216-S9 at concentrations ranging from 0.037 mg/kg to 0.360 mg/kg. A regulatory Action Level for 2-hexanone has not been established.

Toluene was detected in six of the samples collected from Sample Areas B1216-S4 and B1216-S9 at concentrations ranging from 0.004 mg/kg to 0.024 mg/kg. Toluene was also detected in the laboratory method blanks indicating laboratory contamination occurred. The proposed Subpart S Regulatory Action Level for toluene is 20,000 mg/kg (EPA, 1990) which is considerably above the maximum concentration of 0.024 mg/kg detected in the soil samples from the discharge area.

Volatile Organic Compounds - Sand/Oil Interceptor Discharge Area

Methylene chloride and toluene were detected in each of the samples analyzed for VOCs. Concentrations ranged from 0.004 mg/kg to 0.009 mg/kg for methylene chloride and 0.004 mg/kg to 0.006 mg/kg for toluene. Methylene chloride and toluene were both detected in the laboratory method blanks indicating laboratory contamination occurred. The proposed Subpart S Regulatory Action Levels for methylene chloride is 90 mg/kg and for toluene is 20,000 mg/kg (EPA, 1990) which are considerably above the maximum concentrations detected in the soil samples from the interceptor discharge area.

Acetone was detected in three soil samples collected from Sample Areas B1216-S17 and B1216-BG. Concentrations range from 0.001 mg/kg to 0.067 mg/kg. Acetone was also detected in one method blank at a concentration of 0.003 mg/kg which is an estimated concentration below the laboratory detection limit. Based on the maximum concentration detected (0.067 mg/kg), and knowledge that solvents were used at the site, the acetone is considered to be a RCRA "F Listed" waste, and appears to have impacted the soil in Sample Area B1216-S1. The proposed Subpart S Regulatory Limit for acetone is 8,000 mg/kg which is considerably above the range of concentrations detected.

2-Butanone (MEK) was detected in two samples collected from Sample Areas B1216-S15 and B1216-S17 at concentrations of 0.016 mg/kg to 0.028 mg/kg, respectively. The concentrations are well below the TCLP Action Level of 200 mg/l (40 CFR 261.24) and the proposed Subpart S Regulatory Limit of 4,000 mg/kg for 2-butanone (EPA, 1990). Based on the knowledge that solvents were used on the site, MEK is considered to be a RCRA "F Listed" waste.

3.4 RESIDUAL MANAGEMENT

Approximately 3.8 liters (1.0 gallon) of rinsate was generated during the Phase 2 sampling. The rinsate was generated from decontaminating the sample scoop and Geoprobe® core barrel sampling equipment. Based on the presence of "F Listed" RCRA constituents in the soil samples collected, the rinsate was characterized as hazardous by Bechtel Nevada Waste Management Program personnel. The residual was picked up on December 3, 1996 and is tracked by the NTS Onsite Waste Transport Manifest Number 97016 (Attachment E).

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

The following conclusions are based upon the findings of the Phase 1 and Phase 2 field investigations and data evaluation:

Steam Cleaning Effluent Discharge Area

- Hydrocarbon impacted soils, exceeding the NAC Action Level of 100 mg/kg, appear to be primarily defined by the discolored surface soil areas of the site. TPH concentrations range from <25 mg/kg to 8,600 mg/kg.
- Oil impacted soil, identified in Phase 1 sampling, has not migrated to depths greater than 0.9 meters to 1.2 meters (3.0 to 4.0 feet) with the exception of Sample Area B1216-S3 located in an arroyo to the northeast of the discharge line (refer to Figure 6 in report). Since samples in Sample Area B1216-S3 were composited from an interval of 0.3 to 0.9 meters (1.0 to 3.0 feet), impacted soils identified may be more attributed to the surficial hydrocarbon impact identified in the Phase 1 sampling.
- The eastern extent of hydrocarbon impacted soil has been defined in Sample Area B1216-S1 but was not defined in Sample Area B1216-S3.
- Methylene chloride and toluene detected in the VOC analysis can be attributed to laboratory contamination as they were also detected in the associated method blanks. The acetone detected in Sample Area B1216-S4 cannot definitively be attributed to laboratory contamination and may be attributed to past discharge occurrences. In addition, acetone, 2-butanone, 4-methyl-2-pentanone, and 2-hexanone detected in Sample Area B1216-S9 indicates that VOCs have impacted the soil in this area based upon the concentrations detected, as well as being identified in the Phase 1 sampling investigation. Based on process knowledge that solvents were used at the site, acetone, 2-butanone, and 4-methyl-2-pentanone, identified in the discharge area, are considered to be "F Listed" wastes regulated by RCRA.

Sand/Oil Interceptor Overspill Area

- TPH as diesel has not impacted the suspected overspill area at concentrations exceeding the NAC Action Level. TPH as oil was identified at a maximum concentration of 1,100 mg/kg which exceeds the NAC Action Level. Oil hydrocarbons appear to have impacted the overspill area to a minimum depth of 0.5 meters (1.5 feet) (i.e., concentrations exceeded 100 mg/kg at maximum sample depths of 0.5 meters).

- Methylene chloride and toluene detected in the VOC analysis can be attributed to laboratory contamination as they were also detected in the associated method blanks. The acetone detected in Sample Area B1216-S17 cannot definitively be attributed to laboratory contamination and may be attributed to past overspill occurrences. 2-butanone was also identified in Sample Areas B1216-S15 and B1216-S17 and may be attributed to past overspill occurrences. Based on process knowledge that solvents were used at the site, acetone, and 2-butanone, identified in the discharge area, are considered to be "F Listed" wastes regulated by RCRA.

4.2 RECOMMENDATIONS

The following recommendations are supported by the NAC Action by division when excessive petroleum is present in soil, (A through K Analysis) located in Attachment D, and are based upon the findings and conclusions of the Phase 1 and Phase 2 characterization activities:

Steam Cleaning Effluent Discharge Area

Excavation of soils impacted by hydrocarbons, *is not recommended* based upon the following rationale;

- TPH as Oil, identified in the Phase 1 sampling investigation, has not migrated to depths greater than 0.9 to 1.2 meters (3.0 to 4.0 feet) with exception of Sample Area B1216-S3. The TPH concentration detected in this sample area during the Phase 1 Investigation was 830 mg/kg (collected from 0-0.3 meters [0-1.0 feet]) and was identified at a maximum concentration of 760 mg/kg (collected from 0.3 to 0.9 meters [1.0 to 3.0 feet]) in the Phase 2 Investigation. However, the concentration detected in Phase 2 may be partly attributed to the surficial impact as samples collected using the Geoprobe® are composited.
- Although surficial impacted soils and soil in Sample Area B1216-S3 exceed the NAC Action Level it is not likely that the oil hydrocarbon, identified at a maximum concentration of 830 mg/kg, would impact groundwater at approximately 326 meters (1,068 feet) bgs.
- The hydrocarbon impact of surficial soils has had a minimal effect on the growth of the native vegetation.

Excavation of soils impacted by VOCs, Sample Areas B1216-S4 and B1216-S9, *is recommended* based upon the following rationale;

- The presence of RCRA "F Listed" VOCs were detected in both the Phase 1 and Phase 2 Investigations.

- The presence and concentrations of the "F Listed" compounds (other than methylene chloride and toluene) cannot be attributed to laboratory contamination.

In addition, the following activities are recommended;

- Soils in Sample Areas B1216-S4 and B1216-S9 should be excavated to a maximum depth of 0.9 meters (3.0 feet) followed by verification soil sample analysis. Verification of cleanup will be based upon nondetectable concentrations of VOCs using U. S. EPA Method 8240, Revision 2 (EPA, 1994). The maximum detection limits are 0.1 mg/kg for acetone, 0.1 mg/kg for 2-butanone, and 0.050 mg/kg for 4-methyl-2-pentanone.
- The sandbag berm around the discharge line should be removed and resulting soils should be used for area grading and backfill during closure activities.
- The steam cleaning discharge line should be plugged at the outfall with Sulfaset Cement (or equivalent) to a minimum of 0.9 meters (3.0 feet).
- The discharge area east of the effluent line and west of the soil berm should be fenced and posted as a "hydrocarbon contamination" area.
- The soil berm should remain in place to mitigate lateral migration of the hydrocarbon impacted soils into the arroyo.

Sand/Oil Interceptor Overspill Area

- Excavation of soils impacted by VOCs in the vicinity of the sand/oil interceptor (Sample Area B1216-S17) *is recommended*. The soil in this area should be excavated to a maximum depth of 0.9 meters (3.0 feet) followed by verification soil sample analysis. Verification of cleanup will be based upon nondetectable concentrations of VOCs using EPA Method 8240, Revision 2 (EPA, 1994).
- Excavation of soils impacted by hydrocarbons in the former vehicle parking area, *is not recommended*. Although impacted soils were identified to exceed the NAC Action Level it is not likely that the oil hydrocarbon identified would impact groundwater at depths of approximately 326 meters (1,068 feet) bgs or have a significant impact on human health or the environment.

Sand/Oil Interceptor

- The removal and closure of the sand/oil interceptor is recommended to be completed as part of future decontamination and decommissioning activities associated with Building 12-16.

5.0 SCHEDULE

Figure 8 provides the proposed schedule for the completion of the Corrective Action Plan (CAP) and Closure Report (CR). Changes to the schedule may be required depending upon weather conditions, availability of personnel and equipment, and/or delays beyond our control or which cannot be anticipated. The DOE/NV Subproject Manager will be informed of any changes to the schedule.

Item No.	Milestone Description	Completion Date	1997															
			OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
1	Corrective Action Plan (CAP) to DOE	20MAR97*						◆										
2	Corrective Action Plan (CAP) to NDEP	02JUN97*								◆								
3	Closure Report to DOE	27OCT97*													◆			
4	Closure Report to NDEP	31DEC97*															◆	

Project Start 01OCT96
 Project Finish 31DEC97
 Data Date 27OCT96
 Plot Date 18NOV96

STCL

FIGURE 8
REPORT SCHEDULE FOR AREA 12
STEAM CLEANING DISCHARGE AREA (CAU 339)

Sheet 1 of 1

Bechtel Nevada

(c) Primavera Systems, Inc.

6.0 REFERENCES

BN, 1996, Verbal Communication with H. VanDrielen (NDEP), DOE/NV-ERD, and BN RP staff regarding Phase 1 Report and proposed Phase II sampling activities, Bechtel Nevada, September 9, 1996

NAC, 1992, Hazardous Materials: Storage Tanks, Nevada Administrative Code 459.9921 through 459.999.

NDEP, 1992, Temporary Water Pollution Control Permit, Nevada Division of Environmental Protection, July 14, 1992.

REECO, 1992, Work Plan - Phase 1 Preliminary Characterization of Building 12-16, Wastewater Discharge Area, Reynolds Electrical & Engineering Co., Inc., October 23, 1992.

REECO, 1995, Nevada Test Site Performance Objective for Certification of Nonradioactive Waste, Reynolds Electrical and Engineering Company, December 18, 1995.

RSN, 1986, Nevada Site Development Plan, Part I, Raytheon Services Nevada, May 1986.

U.S. DOE, 1996, Preliminary Investigation Area 12 Fleet Operations Steam Cleaning Discharge Area Nevada Test Site, prepared by Bechtel Nevada, July 1996 DOE/NV/11718-054.

U.S. EPA, 1990, EPA Proposed Corrective Action Rule For Solid Waste Management Units at Hazardous Waste Facilities, 55 FR 30798, July 27, 1990, proposed rule.

U.S. EPA, 1994, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, U. S. Environmental Protection Agency, Test Method 8240B, Revision 2, September 1994.

ATTACHMENT A
GEOPROBE SYSTEM

GEOPROBE

OVERVIEW

Soil samples were obtained from selected locations and depths using a truck mounted hydraulic ram manufactured by Geoprobe® Systems of Salina, Kansas. This soil probing equipment is design to obtain soil gas and/or soil core samples to a maximum depth of approximately 12 meter (40 feet). The soil samples were obtained by pushing or driving a 0.6 meter (2.0 foot) core barrel into the soil to the desired depth, unlocking the sample barrel and driving an additional 0.6 meter (2.0 feet) which fills the core barrel. Unlike split spoon samplers, the probe drive sampler remains completely sealed by a piston tip at the end of the sample tube while it is pushed or driven to the desired depth. The sampler uses a nickel plated sample tube, replaceable hardened cutting shoe and a removable brass liner which contains the sample. It recovers a 0.6 meter (2.0 foot) long by 2.86 centimeter (cm) (1.125 inch) diameter core of approximately 400 milliliter (ml) volume. The brass liner is divided into four 15 cm (6.0 inch) sections aligned within an outer plastic sleeve. Typical recovery is approximately 320 ml.

SAMPLING OPERATIONS:

The sample barrels were prepared by decontamination of the cutting shoe, barrel, stop pin, and drive rods using Alconox detergent and water with a final rinse of distilled water. The brass liner inserts and end caps needed no preparation and therefore could be used without decontamination procedures. The entire core barrel and drive rods were decontaminated after each use.

Sampling operations used a truck mounted hydraulic ram to drive the sample barrel to the desired sample depth where the locking pin is unlocked and a 51 to 61 cm (20 to 24 inch) sample was obtained. If the soil conditions warranted hammering through resistant layers or cobbles, a fixed point driver was driven to 15 cm (6.0 inch) above the desired depth and removed. The sample barrel was then inserted and driven an additional 15 cm (6.0 inches), where the locking pin was released and a 0.6 meter (2.0 foot) sample taken.

The four individual brass liners recovered from the core barrel were transferred to an unused sealable bag. The contents were uniformly mixed (composited) and placed into a clean laboratory sample jar. The samples were labeled with the samplers initials, the sample identification, time sample collected, and sample analysis requested. The samples were subsequently placed in an ice chest and cooled to four degrees Celsius (39.2 degrees Fahrenheit).

Since the probe is advanced by percussion hammering, which does not transfer cuttings to the surface, there was no waste material generated requiring disposal after the sample was obtained.

SAFETY OPERATIONS:

Equipment operators comply with all DOE, OSHA and pertinent safety requirements. Equipment operators are required to have OSHA 40 hour hazardous worker training. The operation of the sampling equipment was as specified by the equipment manufacturer. Hard hats, safety glasses, hearing protection, and steel toe safety boots are mandatory for equipment operators.

Standard Operating Procedures and applicable orders can be found in the following documents:

Bechtel Nevada, Safety Manual

DOE Order 54XG.1-39, "NV Radiological Safety Manual for the NTS"

Geoprobe Systems. 8-M Operations Manual, 27 July 1990

ATTACHMENT B

FIELD NOTES

9-11-96 Clear, Calm, ~90°F

0830 ARRIVE ON SITE; J. BOWEN, J. McCloskey, D. GINSER, D. THOMAS,
J. M. FORD WITH AREA & DISCUSS APPROACH.

0900 CONDUCT TARGET BRIEFING. WILL SET UP ON LOC B1216-S6

SAMPLE WILL BE COLLECTED FOR TPH AS OIL @ DEPTH OF 3'

0930 COLLECTED OVM IN DEPT 580B TO 100 PPM ISO BUTYLENE

1015 BEGIN DRIVING SAMPLE FOR B1216-S6A3 SAMPLE DEPTH
INTERVAL 2.5-3.5'

1020 SAMPLE LOCATION MOVED - 3' NE DUE TO REFUSAL OF SAMPLE BARREL

SAMPLE STILL COLLECTED IN AREA OF STR. DISCOLORATION. H/T

REFUSAL AGAIN BACK UP & S - 2'. ABLE TO DRIVE SAMPLE AT

LOCATION AT INTERVAL STARTING @ 2'. SAMPLE DRIVEN

FROM 2-4'

1040 SAMPLE COLLECTED 2.5'-3.5' SOIL INTERVAL USED.

SOIL LT BRN., SILTY ^{JB} SAND W/ GRAVEL FINE TO 1/4". NO

DISCOLORATION NOTED. HARRY VANDERKAM (NIDSP) ON SITE.

1125 HARRY OFF SITE - WALKED OVER PUM AREA FROM OIL/WATER

SEPARATOR. HARRY IS PRIMARILY CONCERNED W/ UPPER 2" OF

DISCOLORED AREA. NOTES THAT A COUPLE SAMPLE PANTS

SHOULD BE SUFFICIENT. SAMPLES COLLECTED AT DEPTH IN

AREA SHOULD BE FROM ~6" & SHOULD BE SUBMITTED BASED ON

OVM RECORDS. THE AREA SAMPLES WILL BE IN DIRECT

LINE FROM OIL SEP. TO SAND BAGGED AREA WITH ONE ADD'L

^{JB}IN CLUSTER N. OF DRAIN AREA IN ZONE OF DISCOLORIZATION.

1130 CREW SET UP ON B1216-S3A - AGAIN HAVING REFUSAL PROBLEMS

1145 LOCATED AREA FOR SAMPLE - HOWEVER @ 2.2' REFUSAL ENCOUNTERED.

WILL MOVE BACK & TRY TO START SAMPLE INTERVAL @ 1' BGS

1150 SAMPLE BEING DRIVEN - AGAIN REFUSAL

SIGNATURE		DATE 9-11-96	
DISCLOSED TO AND UNDERSTOOD BY	DATE	WITNESS	DATE

166 TITLE

Work continued from Page 165

PROJECT NO.

BOOK NO.

1210 SAMPLE DRIVEN FROM 1'-3' INTERVAL; 1.5 TO 3' INTERVAL
WILL BE CONSIDERED AS LAB SAMPLE. SAMPLE ID B1210-S3A3
SAMPLE LT BENISH GRAY, SILTY SAND w/ GRAVELS, NO OOD or
STAINING. SAMPLE LOCATION ~ 3' SOUTH of ORIG. S3 LOC. BUT
IS STILL WITHIN STAINED DEPRESSION AREA. NEW STAKE MARKER
SET.

1230 Crew Breakes for Lunch. OVM Reading of Sample B1216-S6A3 is 0.0 ppm. OVM Reading of Sample B1216-S3A3 is 0.0 ppm.

1320 CREW CONTINUES AT LOCATION B1216-S³/B. I WILL SET UP TO COLLECT SURFACE SAMPLES UNTIL GEO-PROBE HAS RECEIVED SAMPLE RESULTS.

1325 Coulter Sfc. Sample B (216-S9A5) for VOC ANALYSIS. GC/MS/MSD.

1335 " " " B1216-S9BS " " " - 5m R6

Location ~ 8' WEST of S9A Loc. - SURFACE DISCOLORATION.

1340 Core Retrieved Sample from BIZIG-5383. Sample Drive
Interval 2' to 3'. Sample Silty Sand, Lt. Brn. Fine to
med Gravel, no staining or odor, dry.

1355 PREPARE TO SAMPLE D1216-59CS LOCATED ~10' EAST OF S9A

Location. SAMPLES COLLECTED IN DISCARDO AREA. MINOR SHAWS
BUTLETS ON SITE AREA.

1410 Center B1216-S9DS WITHIN STANED SOIL AREA. Loc.
OR SAMPLE IS ~ 8' SOUTH OF S9A.

1415 C&W COLLECTS SAMPLE B.46-53C.3. SAMPLE INTERVAL 1'-3'

Sixty Sams, LT BR, fine Grange, DPr, no staining, no odor

1430 α m Resonances B1216-S383 = 0.0 ppm; B1216-945 = 0.0 ppm
B1216-985 = 0.0 ppm.

1450 Crew Set up @ B1216-S2A3 Location.

Work continued to Page

SIGNATURE

DATE _____

DISCLOSED TO AND UNDERSTOOD BY

DATE _____

WITNESS

DATE _____

- 1455 I Set up @ B1216-S4 Location to Collect Surface VOC SAMPLES AFTER DECON OF SAMPLE SCOOPS.
- 1500 Collect B1216-S4AS; Soil is SILTY SAND, LT BRN, FINE TO MED GRAVEL, NO ODR, NO STAINING, DRY.
- 5 1505 Crew Collected B1216-S2A3 @ Sample Interval of 2-3'. Soil is SILTY SAND, LT BRN, FINE GRAVEL, NO STAINING, NO ODR, DRY.
- 1510 Collect Sample B1216-S4BS. Soil is SILTY SAND, MED. BRN TO RED BROWN, FINE GRAVEL, NO ODR, NO STAINING, DRY. Sample Collected ~ 8' West of S4A Location
- 10 1515 Collect Sample B1216-S4CS. Location is ~15' East of S4A Location. Soil is SILTY SAND, MED BRN, FINE TO COARSE GRAVEL, NO STAINING, NO ODR, DRY.
- 1525 Find OVM Remaining Results. B1216-S9DS = 3.8^{ppm}
B1216-S3CS = 0.0 ppm; B1216-S2A3 20.0 ppm; B1216-S9CS = 0.9
- 15 1540 OVM Remaining for B1216-S4DS = 0.0 ppm, B1216-S4CS = 0.6 ppm, B1216-S4AS = 0.4 ppm
- 1540 Crew Collected B1216-S1A3; Sample Interval 2-4'. Sample SILTY SAND, LT BRN, FINE TO COARSE GRAVEL, DRY, NO ODR, NO STAINING; STAINING NOTED ON STE. AREA.
- 20 1545 Crew Set up ~15' East of S1A Location. Site Loc ID B1216-S1B3
- 1600 OVM Remaining of B1216-S1A3 = 6.7 ppm
- ONLY 2 SAMPLES WILL BE COLLECTED IN AREA OF S2 SINCE THERE APPEARS TO BE A DISTINCT EASTERN BOUNDARY. WE WILL
- 25 SAMPLE ~~IN~~ THE EASTERN BOUNDARY AREA TO THE EXTENT POSSIBLE. THE EASTERN EXTENT IS LIMITED DUE TO SIGNS IDENTIFIABLE "BURIED CABLE"
- 1605 Sample B1216-S1B3 Collected. Samples Collected from

SIGNATURE		DATE 8/11/86	
DISCLOSED TO AND UNDERSTOOD BY	DATE	WITNESS	DATE

168 TITLE

PROJECT NO.

Work continued from Page 167

BOOK NO.

INTERVAL 1-3'; SILTY SAND, LT DRN, FINE TO COARSE GRAVEL, NO
STANDING, NO OODR, DR

1610 BEAN SHUTDOWN. ~ 1/2 GALLON OF RINSATE GENERATOR PLACED
IN DRUM 10'D W/ BRADY 592-508. DRUM LOCKED.

5 1710 DVM READING OF B1216-5183 = 3.4 ppm.

1715 SAMPLES TURNED IN TO BN ASL. REQUESTED TURN AROUND
DATE OF 10-14-96. SAMPLES WILL BE SHIPPED TO QUANTSECA
9-12-96.

10

15

20

25

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Made in USA

9-11-96

Work continued to Page _____

SIGNATURE

DATE

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

TITLE

ARSA 12 FERT OPS
STEAM CLEAN EXHAUST SAMPLING

Work continued from Page _____

PROJECT NO.

169

BOOK NO.

9-12-96 Clear, SE 5-15 mph, ~ 95°F

0900 ARRIVE AT SITE. CREW FOR DAY: J. BROWN, J. McCloskey, D. Omer, D. TOBINSON. WILL START AT B1216-S4 LOCATION TO COLLECT

VOC SAMPLE AT DEPTH OF ~3'. SAMPLE ID WILL BE B1216-S4A3

0930 NUMEROUS ATTEMPTS TO RETRIEVE SAMPLE B1216-S4A3 HAVE BEEN UNSUCCESSFUL DUE TO REFUSAL RODS & DRIVE POINTS HAVE BEEN PUSHED. WILL MAKE A COUPLE MORE ATTEMPTS PRIOR TO DECIDING TO MOVE OFF LOCATION. I FEEL THAT THIS SAMPLE IS NOT CRITICAL SINCE IT WAS ONLY TO VERIFY THE PRESENCE OF VOCs AT DEPTH WHICH WERE SUSPECT EVEN AT THE SURFACE DUE TO POTENTIAL LAB CONTAMINATION.

1005 REVISAR MET AGAIN - SAMPLE ~~B1216-S4A3~~ ^{B1216-S4A3} WILL NOT BE COLLECTED. 356 SAMPLES FOR THIS AREA WERE COLLECTED 9-11-96. THESE SHOULD BE SUFFICIENT TO VERIFY IF VOCs WERE PRESENT.

1010 MOVED TO B1216-S9 AREA TO COLLECT TPH & VOC DEPTH SAMPLE. NEAR REVISAR @ 2'. WILL BACK OUT DRIVE BARREL & ATTEMPT TO SAMPLE FROM 1.5' - 3.5'. SURFACE AREA OF SAMPLE IS HEAVILY STAINED.

1025 SAMPLE B1216-S9A3 COLLECTED. SAMPLE PUSHED 1.5 TO 3.5'. SAMPLES FOR VOC ANALYSIS COLLECTED. UNSUFFICIENT REGRANSEY FOR TPH SAMPLE. ONE ADD'L DRIVE ADJACENT TO THE LOCATION WILL BE COMPLETED AT SAME 1.5 TO 3.5' INTERVAL. MINOR PORTION LEFT OVER FROM VOC RUN WILL BE USED FOR HEADSPACE ANALYSIS.

1100 COLLECTED B1216-S9A3 FOR TPH ANALYSIS. SAMPLE RUN 1.5 TO 3.5'. SOIL FROM BOTH SAMPLES IS VERY FINE GRANULAR SANDY SOIL w/ FINE TO 1/4" GRAVEL, DRY, NO OIL, NO STAINING (LT. BRN)

1110 CREW WILL SET UP ON B1216-S13. A SECTION OF SAND BAGS

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Made in USA

Work continued to Page _____

SIGNATURE

DATE

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

170 TITLE

Work continued from Page 169

PROJECT NO.

BOOK NO.

will require removal for access. North side will be removed so that it will still be able to serve as a diversion to SW on/off.

1115 VOC HEADSPACE READING for Sample B1216-S4A3 = 0.6 ppm (VERIFY from 9/11 Sample)

READING taken using OVM 580B calibrated to 100 ppm isobutylene.

5 1115 OVM Reading for VOC Sample B1216-S9A3 = 0.0 ppm.

1145 LAY OUT SAMPLE POINTS for PARKING AREA overflows DISCHARGE.

FIVE SAMPLE POINTS PLUS ONE BACKGROUND SAMPLE WILL BE COLLECTED.

AIR SAMPLES WILL BE ANALYZED FOR TPH DISTILLATION & VOCs.

CREW IS STILL WORKING ON ACCESS FOR S13 LOCATION WITHIN SAND

10 BEEN. (STEVE NACHT ON SITE ~ 1120 TO 1145) SAMPLE LOCATIONS

WILL BE 1 D'D AT S14 → S17 MOVING EAST TO WEST.

1150 COLLECTED B1216-S145. SAMPLE WAS COLLECTED FROM MINOR

DRAINAGE PAVEMENT LOCATED IN EASTERN PARKING AREA. LG. PAVES

& GRAVEL WAS BRUSHED AWAY PRIOR TO SAMPLE COLLECTION. ~1'X1' AREA

15 WAS SCOOPED INTO SAMPLE JARS USING DECONTO STAINLESS STEEL

SCOOP. SOIL WAS SILTY SAND, MED BRN, FINE TO COARSE GRAVEL, DRY,

NO STAINING, NO ODOORS.

1205 COLLECT B1216-S153 FROM WESTERN PARKING AREA. ASPHALT

CHIPS WERE PUSHED ASIDE. SURFACE SAMPLE WAS COLLECTED FROM

20 UPPER 2" OF LOOSE SOIL USING DECONTO SCOOP. SOIL CONSISTED

OF SILTY SAND, MED BRN TO LT GRAY, MINOR ASPHALT CHIPS NOTED,

NO ODOOR, MINOR STAINING, DRY. COLOR CHANGE IN SOIL @ 2" DEPTH.

~1220 SARINE CURTIS (DOE) AT SITE TO OBSERVE ACTIVITIES AND GET STATUS

UPDATE. I SHOWED HER VARIOUS SAMPLE AREAS & PROVIDED CURRENT

25 STATUS. OFF SITE ~ 1235

1245 CREW IS SET UP ON B1216-S13. SAMPLE POINT ~ 1' EAST OF

PREV. SAMPLE LOCATION. DISCHARGE LINE IS DRY

1255 AFTER 3 RESUAL HOURS, SAMPLE B1216-S13A3 IS BEING DRIVEN ^{DRIVEN} ~~DRIVEN~~

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Made in USA

Work continued to Page

SIGNATURE		DATE 9/12/96	
DISCLOSED TO AND UNDERSTOOD BY	DATE	WITNESS	DATE

TITLE

PROJECT NO.

171

Work continued from Page 170

BOOK NO.

SAMPLE IS BEING COLLECTED/DRIED FROM 1.5 TO 3.5'. SAMPLE
CONSISTS OF SILTY SAND, LT BRN, FINE TO COARSE GRAVEL, NO STAINING,
NO ODOOR, DRY. SAMPLE ID B1216-S13A3

1305 CREW MOVES TO S14^{9B} LOCATION

- 5 1315 COLLECT B1216-S16S LOCATION IS IN WESTERN PART OF
PARKING AREA NORTH OF VEHICLE BUMPER POSTS. SOIL IS
MED BRN W/SOME DK GRAY STAINING. SAMPLE COLLECTED FROM
~8" x 8" SFC. AREA. DK/DISCOLORED SOIL IS WITHIN TOP ^{1 INCH} OF
MED BRN SOIL THICKNESS IS MINIMUM 3".

- 10 1330 COLLECTED B1216-S17S LOCATED AT SANDPILE OF OIL/SAND
SEPARATOR. SOIL IS SILTY SAND, MEDIAN GRAY, FINE TO
COARSE GRAVEL, DRY, APPEARS TO HAVE MOD. STAINING.
SAMPLE COLLECTED WITHIN UPPER 3" OF SOIL. ALSO COLLECTED
MS/MSD FOR THIS SAMPLE.

- 15 1335 CREW IS RETRIEVING SAMPLE FROM S14 AREA. SAMPLE DRIVING
INTERVAL IS .5 TO 1.5 FEET & WILL BE ANALYZED FOR
TOTA OIL & DIET & VOC'S.

- 1345 SAMPLE B1216-S14-^{9B} COLLECTED. SAMPLE IS SILTY SAND, LT. TO
MED BRN, FINE TO COARSE GRAVEL, DRY, NO STAINING OR ODOOR. NOT
20 SUFFICIENT SAMPLE REMAINS FOR HEADSPACE ANALYSIS (.5" TO 1.5")

- 1400 COLLECT SAMPLE B1216-B6S (BACKGROUND SURFACE
SAMPLE). SAMPLE WAS COLLECTED IN CENTRAL WEST PARKING
AREA FROM DEPTHS OF 0-2" BGS. SAMPLE WAS COLLECTED
AFTER BRUSHING AWAY ASPHALT CHIP CMT. SAMPLE WAS
25 SILTY SAND, MED BRN W/SOME ^{9B} MED GRAY ZONES, FINE TO
COARSE GRAVEL, DRY, NO ODOOR, MINOR STAINING.

- OVM MALFUNCTIONING - BATTERY & CALIBRATION PROBLEMS. I WILL RUN
HEADSPACE ON SAMPLES BACK IN OFFICE.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Made in USA

Work continued to Page

SIGNATURE		DATE 9/12/86	
DISCLOSED TO AND UNDERSTOOD BY	DATE	WITNESS	DATE

172 TITLE

PROJECT NO.

Work continued from Page 171

BOOK NO.

- 1420 Collect ~~ST26-S16~~^{q8} S1216-S15-^{q8}6' SAMPLE DRIVE FROM .5" TO 1.5'. SAMPLE COLLECTED FOR TPH DIESEL OIL & VOCs. SAMPLE CLAYEY SAND, MED. BRN, DAMP, NO ODOOR, NO STAINING, FINE GRAIN. 2 DRIVES READ TO OBTAIN SUFF. SMP.
- 5 1430 SET UP ON B1216-S17-^{q8}1 ADJACENT TO SAND PILE OF OIL SAND SEPARATOR. SAMPLE DRIVE INTERVAL FROM .5" TO 1.5' TWO RUNS READ FOR SUFFICIENT SAMPLE VOLUME. SAMPLE WAS STILL SHORT VOLUME FOR TPH ANALYSIS. LAB SHOULD BE ABLE TO USE VOC SOME ^{q8}1 FOR THE EXTRA TPH SAMPLE READ.
- 10 SOIL WAS MED BRN, SILTY SAND, FINE TO MED. GRAVEL, DRY, NO ODOOR, NO STAINING NOTED. DUE TO INSUFFICIENT SAMPLE VOLUME NO HEADSPACE SAMPLE AVAILABLE.
- 1450 CREW MOVES TO B1216-BG-1 SAMPLE LOCATION.
- 1505 Collect B1216-BG-1 DRIVE INTERVAL .5" TO 1.5" 2 DRIVES COLLECTED. NOT ENOUGH RESIDUAL VOLUME FOR HEADSPACE ANALYSIS. SAMPLE SILTY SAND, LT TO MED. BRN, FINE TO COARSE GRAIN, DRY, NO ODOOR, NO STAINING.
- 1515 WILL RECOLLECT TPH SAMPLE FROM B1216-S17-1 SINCE PREVIOUS SAMPLE MAY NOT HAVE SUFF. VOLUME. THIS WILL BE LAST SAMPLE COLLECTED. NO DEPTH SAMPLES FROM B1216-S16 WILL BE COLLECTED SINCE THIS IS OUTSIDE THE MAIN DRAINAGE PATTERN & IF ANYTHING SHOULD ONLY SHOW SURFACE IMPACT.
- 25 1525 Collect TPH SAMPLES FOR B1216-S17-1, RESIDUAL SOIL WILL BE USED FOR HEADSPACE READING.
- 1630 TURN IN SAMPLES TO ASD. REQUESTED TURNAROUND DATE 10.21-96.

SCIENTIFIC BINDERY PRODUCTIONS CHICAGO 60605 Made in USA

Work continued to Page

SIGNATURE		DATE	
DISCLOSED TO AND UNDERSTOOD BY	DATE	WITNESS	DATE 9/12/96

TITLE

PROJECT NO.

173

Work continued from Page 172

BOOK NO.

1645 Completed Headspace BAO, 565 using oven model 5808
 11.86V lamp. Once Pincasso into Pincasso source instrument
 calibrated to 100 ppm 150 BUTTLE W/OUT ANY PROBLEMS.
 THE FOLLOWING OVEN RESPONSES WERE RECORDED;

B1216-S13A3 = 0.0 ppm

B1216-S15S = 11.6 ppm

B1216-S14S = 3.8 ppm

B1216-S16S = 8.6 ppm

B1216-S17S = 0.6 ppm

B1216-S15-13th = 0.0 ppm

B1216-BGS = 0.0 ppm

B1216-S17-th = 0.0 ppm

~~B1216-S17-th~~ B1216-S9A3 = 0.0 ppm (RECHECKED)

For consistency in sample nomenclature the samples were
 ID'd to reflect location in ^{VICINITY} of previous sampling.

For example; B1216-S9A3 where;

B1216-S9 = BLDG # & PREVIOUS SAMPLE (PHASE I) LOCATION

A3 = PHASE II SAMPLE LOCATION & TARGET DEPTH. "S"

WAS USED FOR SURFACE SAMPLE LOCATIONS. IN

MANY CASES TARGET DEPTH WAS NOT ACHIEVED DUE TO RESISTANCE.
 THE ACTUAL SAMPLE DEPTH INTERVAL WILL BE IDENTIFIED ON
 THE LAB SUMMARY TABLE. SAMPLE LOCATIONS WILL BE
 MAPS OUT WEEK OF 9/16/96.

SIGNATURE

DATE

DISCLOSED TO AND UNDERSTOOD BY

DATE

WITNESS

DATE

9/12/96

ATTACHMENT C

***ANALYTICAL RESULTS AND
CHAIN-OF-CUSTODY FORMS***

Bechtel Nevada

Interoffice Memorandum

To: S. J. Nacht

Date: October 24, 1996

From: A. R. Latham
Analytical Services Laboratory, 295-7472

No.: E110-AS-97-060

Subject: **DATA REPORT FOR SAMPLE DELIVERY GROUP (SDG) V096**
Project No. 4001

Enclosed are Quanterra Environmental Services' results, requested by J. F. Bonn, for the volatile organics and total petroleum hydrocarbons (diesel, oil) analyses of twenty-five samples and the volatile organics analysis of two trip blanks collected on September 11 and 12, 1996, at Fleet Operations Building 1216 in Area 12. Also enclosed is a Statement of Services which indicates the charge number associated with this SDG.

Preliminary data were faxed to the client October 15, 1996.

SPECIFIC:

Volatile Organics

Method associated quality assurance and control criteria were met. Results qualified with a "J" indicate the component was detected below the method detection limit. Sample results qualified with a "B" indicate the component was detected in the associated method blank. Results qualified with a "D" indicate the associated component concentration was acquired from analysis of a dilution.

Analysis of samples **B1216-S4AS** and **B1216-S9A3** produced internal standard recoveries outside control limits (low).

Samples **B1216-S9AS**, its Matrix Spike (MS) and MS Duplicate (MSD), were analyzed diluted and undiluted. The undiluted analysis resulted in several QC outliers including surrogate and internal standard recoveries and the Relative Percent Difference (RPD) for recoveries of trichloroethene and toluene in the MS and MSD. Also, levels of acetone, 2-butanone, 4-methyl-2-pentanone, and 2-hexanone were outside calibration range. Re-analysis was undertaken using 1 gram aliquots instead of the usual 5 grams. Quality Control (QC) criteria were met, however, the levels of the over-range components were not consistent with the undiluted results when accounting for the dilution. The laboratory reported that the cause for this disagreement was unknown, but that it was reproducible, noting that the 1 gram aliquots gave consistent results for the components in question.

Analysis of sample **B1216-S9CS** resulted in recoveries outside control limits for the toluene-d8 and 1,2-dichloroethane-d4 surrogates. Re-analysis of a dilution produced an acceptable recovery for toluene-d8, but not for 1,2-dichloroethane-d4 or the internal standard chlorobenzene-d5.

E110-AS-97-060
S. J. Nacht
Page 2 of 2
October 24, 1996

Analysis of sample **B1216-S9DS** gave a high recovery for the 1,2-dichloroethane-d4 surrogate and low recovery for internal standard chlorobenzene-d5. Re-analysis of a dilution gave acceptable recoveries for the internal standards, however, recovery for the surrogate was still high. Also, the result for acetone (outside calibration when analyzed undiluted) did not compare with that from the undiluted analysis when accounting for the dilution.

Total Petroleum Hydrocarbons (Diesel, Oil)

DIESEL/OIL - Method associated quality assurance and control criteria were met.

Please direct any questions you may have to your Client Service Representative, Ted Redding, at 295-7220.

R. D. Brooksbank

RDB:bv
Subject Code: ENV 3

Enclosures: as stated

Correspondence Control, w/o encs., M/S NLV008
K. A. Mobley, w/o encs., M/S NLV022
J. F. Bonn, w/encs., M/S NTS306
ASL SDG V096, w/encs., M/S NTS273

LABORATORY

CASE

NARRATIVE

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CASE NARRATIVE

Bechtel Nevada
USDOE, Zone 1
Building 652
Mercury, NV 89023

October 16, 1996

Attention: Ted Redding

Quanterra Project Number	: 625.01
Date Received	: September 17, 1996
Number of Samples	: Twenty-seven (27)
SDG Name	: V096
Bechtel Report No.	: W1104
Sample type	: See Below

INTRODUCTION

The following samples from Bechtel Nevada were received at Quanterra Environmental Services, Earth City, MO for Volatiles and Total Petroleum Hydrocarbon (Oil and Diesel) analysis. The analytical test performed, as well as date of receipt and analysis, can be found in the attached report. Enclosed is the full data package.

Reviewed and Approved

Allen M. Field
Quanterra Project Manager

PAGE 2 of 4

October 16, 1996

Quanterra Project Number: 625.01

The samples were labeled as follows:

<u>CLIENT ID</u>	<u>LAB ID</u>	<u>MATRIX</u>
B1216-S1A3	12182-001	Soil
B1216-S1B3	12182-002	Soil
B1216-S3C3	12182-003	Soil
B1216-S2A3	12182-004	Soil
B1216-S3A3	12182-005	Soil
B1216-S3B3	12182-006	Soil
B1216-S6A3	12182-007	Soil
B1216-S4AS	12182-008	Soil
B1216-S4BS	12182-009	Soil
B1216-S4CS	12182-010	Soil
B1216-S9AS	12182-011,MS,MSD	Soil
B1216-S9BS	12182-012	Soil
B1216-S9CS	12182-013	Soil
B1216-S9DS	12182-014	Soil
96SEW0911-1	12182-015	Water
B1216-S9A3	12183-01	Soil
B1216-S14S	12183-02	Soil
B1216-S15S	12183-03	Soil
B1216-S13A3	12183-04	Soil
B1216-S16S	12183-05	Soil
B1216-S17S	12183-06,MS,MSD	Soil
B1216-S14-1	12183-07	Soil
B1216-BGS	12183-08	Soil
B1216-S15-1	12183-09	Soil
B1216-S17-1	12183-010	Soil
B1216-BG1	12183-011	Soil
96SEW0911-2	12183-012	Water

ANALYTICAL RESULTS/METHODOLOGY

The analytical results are presented by analytical test in the attached packages and summary reports. This report includes information on client identification numbers, lab identification numbers, preparation date, analysis date, results, units, and results for quality control samples. The following table is a list of the analyses requested, and the methods used for the above samples:

<u>Analysis</u>	<u>Method</u>
TPH (Oil and Diesel)	EPA 8015
Volatiles	EPA 8240

PAGE 3 of 4
October 16, 1996
Quanterra Project Number: 625.01

QUALITY CONTROL

A method blank and a laboratory control sample were analyzed with the samples listed above per parameter. A matrix spike and matrix spike duplicate were performed on samples B1216-S9AS and B1216-S17S.

NONCONFORMANCES

There were nonconformances associated with the analysis of these samples.

COMMENTS

Receipt

Login 12182/3 received at a temperature of 6°C.

Analytical Notes

Volatiles

Sample B1216-S9AS (12182-011) was difficult to analyze. The sample, and its MS and MSD, when analyzed at the 5-gram level, gave low and high surrogate recoveries. These also gave low responses for one or more internal standards per the CLP SOW criteria. The MS and MSD also gave high RPD's for trichloroethene and toluene. This sample was gave overcalibration results for acetone, 2-butanone, 4-methyl-2-pentanone and 2-hexanone.

This sample and its MS and MSD were re-analyzed using 1-gram aliquots. This resulted in acceptable surrogate and MS and MSD recoveries and acceptable internal standard responses. However, the concentrations of the four ketone compounds is significantly lower than expected from the 5-gram analysis. The cause is unknown, but is reproducible (i.e. the 1-gram results match each other).

Sample B1216-S9CS (12182-013) gave a low recovery for toluene-d8 surrogate, a high recovery for 1,2-dichloroethane-d4 surrogate and low responses for all three internal standards. Re-analysis at a 2.5-gram level also gave a high 1,2-dichloroethane-d4 surrogate recovery and a low response for one internal standard, but gave a normal toluene-d8 surrogate recovery.

PAGE 4 of 4

October 16, 1996

Quanterra Project Number: 625.01

Sample B1216-S9DS (12182-014) gave a high recovery for 1,2-dichloroethane-d4 surrogate and a low response for one internal standard. Re-analysis at a 2.5-gram level also gave a high 1,2-dichloroethane-d4 surrogate recovery but gave normal responses for all three internal standards. However, the result for acetone, which was overcalibration in the 5-gram analysis, is lower than expected.

Sample B1216-S4AS (12182-008) gave low responses for all three internal standards per the CLP SOW criteria. Sample B1216-S9A3 (12183-001) gave a low response for one internal standard. Method 8240 does not require re-analysis for this criteria.

QUALIFIERS/DEFINITIONS

B	: Analyte was found in blank, as well as sample. (organic)
B	: Results were between the PQL and the IDL. (inorganic)
U	: Results are less than the IDL.
J	: Denotes an estimated value below the detection limit.
ND	: Compound was analyzed for but not detected.
NA	: Not applicable.
%REC	: Percent Recovery.
QCBLK	: Laboratory Method Blank.
QCLCS	: Laboratory Control Sample.
Qual.	: Qualifier.
UG/L	: Micrograms per Liter.
MG/L	: Milligrams per Liter.
UG/KG	: Micrograms per Kilogram.
MG/KG	: Milligrams per Kilogram.

**VOLATILE
ORGANICS
RESULTS**

INSTRUMENT

BLANKS

RESULTS

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBK01

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: QCBLK113734

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F6990

Level: (low/med) LOW

Date Received:

% Moisture: not dec.

Date Analyzed: 09/23/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	3	J
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	5	U
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK02

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: QCBLK113987

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7033

Level: (low/med) LOW

Date Received:

% Moisture: not dec.

Date Analyzed: 09/24/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	10	
67-64-1-----	Acetone	3	J
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	5	J
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBK03

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: QCBLK114130

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7054

Level: (low/med) LOW

Date Received:

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/KG

Q

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	5	
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	4	J
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK04

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: QCBLK114142

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7076

Level: (low/med) LOW

Date Received:

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	5	
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	4	J
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK05

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: QCBLK113778

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7016

Level: (low/med) LOW

Date Received:

% Moisture: not dec.

Date Analyzed: 09/24/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	3	J
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	4	J
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

LABORATORY

CONTROL

SAMPLES

RESULTS

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VSPK01

Lab Name: QUAN TERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: QCSPK113734

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F6991

Level: (low/med) LOW

Date Received:

% Moisture: not dec.

Date Analyzed: 09/23/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	66	
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	7	B
67-64-1-----	Acetone	5	J
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	70	
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	54	
107-06-2-----	1,2-Dichloroethane	51	
78-93-3-----	2-Butanone	63	
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	54	
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	50	
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	52	
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	52	
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	46	
108-90-7-----	Chlorobenzene	51	
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VSPK02

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) WATER

Lab Sample ID: QCSPK113987

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: F7034

Level: (low/med) LOW

Date Received:

% Moisture: not dec.

Date Analyzed: 09/24/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	57	
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	13	B
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	66	
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	52	
107-06-2-----	1,2-Dichloroethane	51	
78-93-3-----	2-Butanone	51	
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	54	
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	51	
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	52	
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	52	
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	51	B
108-90-7-----	Chlorobenzene	50	
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VSPK03

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: QCSPK114130

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7055

Level: (low/med) LOW

Date Received:

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	57	
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	5	BJ
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	67	
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	54	
107-06-2-----	1,2-Dichloroethane	52	
78-93-3-----	2-Butanone	52	
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	55	
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	51	
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	52	
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
103-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	51	
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	48	B
108-90-7-----	Chlorobenzene	49	
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VSPK04A

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: QCSPK114142-1

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7077

Level: (low/med) LOW

Date Received:

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	53	
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	6	B
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	66	
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	56	
107-06-2-----	1,2-Dichloroethane	54	
78-93-3-----	2-Butanone	58	
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	55	
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	51	
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	52	
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	51	
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	47	B
108-90-7-----	Chlorobenzene	53	
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VSPK04B

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: QCSPK114142-2

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7078

Level: (low/med) LOW

Date Received:

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soi Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	49	
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	5	B
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	64	
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	54	
107-06-2-----	1,2-Dichloroethane	56	
78-93-3-----	2-Butanone	65	
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	56	
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	52	
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	53	
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	50	
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	49	B
108-90-7-----	Chlorobenzene	51	
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VSPK05

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: QCSPK113778

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7017

Level: (low/med) LOW

Date Received:

% Moisture: not dec.

Date Analyzed: 09/24/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	60	
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	1	BJ
67-64-1	Acetone	20	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	67	
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	53	
107-06-2	1,2-Dichloroethane	50	
78-93-3	2-Butanone	66	
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	53	
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	49	
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	50	
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	20	U
591-78-6	2-Hexanone	20	U
127-18-4	Tetrachloroethene	50	
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	44	B
108-90-7	Chlorobenzene	50	
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

TRIP

BLANKS

RESULTS

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

96SEW0911-1

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) WATER

Lab Sample ID: 12182-015

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: F7043

Level: (low/med) LOW

Date Received: 09/17/96

Moisture: not dec.

Date Analyzed: 09/24/96

Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	9	B
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	6	B
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

96SEW0911-2

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) WATER

Lab Sample ID: 12183-012

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: F7044

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/24/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	7	B
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	5	B
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

SAMPLES

RESULTS

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-BG1

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12183-011

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7091

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/26/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	3	BJ
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	4	BJ
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-BGS

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12183-008

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7072

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	6	B
67-64-1-----	Acetone	1	J
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	4	BJ
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S4AS

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12182-008

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7007

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/24/96

Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	9	B
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	5	J
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S4BS

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12182-009

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7008

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/24/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	7	B
67-64-1-----	Acetone	17	J
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	4	J
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S4CS

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12182-010

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7009

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/24/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	8	B
67-64-1-----	Acetone	110	
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	4	J
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S9A3

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12183-001

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7064

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	4	BJ
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	5	U
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S9AS

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12182-011

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7029

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/24/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	43	B
67-64-1-----	Acetone	1200	E
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	550	E
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	51	
591-78-6-----	2-Hexanone	360	E
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	6	B
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S9ASMS

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12182-011MS

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7030

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/24/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

S Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	75	
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	43	B
67-64-1-----	Acetone	1500	E
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	54	
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	45	
107-06-2-----	1,2-Dichloroethane	77	
78-93-3-----	2-Butanone	710	E
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	35	
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	38	
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	59	
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	57	
591-78-6-----	2-Hexanone	400	E
127-18-4-----	Tetrachloroethene	39	
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	35	B
108-90-7-----	Chlorobenzene	48	
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S9ASMD

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12182-011MSD

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7031

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/24/96

Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	68	
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	24	B
67-64-1-----	Acetone	600	E
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	66	
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	54	
107-06-2-----	1,2-Dichloroethane	68	
78-93-3-----	2-Butanone	310	E
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	51	
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	49	
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Penzene	61	
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	29	
591-78-6-----	2-Hexanone	110	
127-18-4-----	Tetrachloroethene	52	
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	46	B
108-90-7-----	Chlorobenzene	54	
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S9ASDL

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12182-011DL

Sample wt/vol: 1.00 (g/mL) G

Lab File ID: F7035

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/24/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	50	U
74-83-9-----	Bromomethane	50	U
75-01-4-----	Vinyl Chloride	50	U
75-00-3-----	Chloroethane	50	U
75-09-2-----	Methylene Chloride	56	BD
67-64-1-----	Acetone	130	BD
75-15-0-----	Carbon Disulfide	25	U
75-35-4-----	1,1-Dichloroethene	25	U
75-34-3-----	1,1-Dichloroethane	25	U
540-59-0-----	1,2-Dichloroethene (total)	25	U
67-66-3-----	Chloroform	25	U
107-06-2-----	1,2-Dichloroethane	25	U
78-93-3-----	2-Butanone	140	D
71-55-6-----	1,1,1-Trichloroethane	25	U
56-23-5-----	Carbon Tetrachloride	25	U
75-27-4-----	Bromodichloromethane	25	U
78-87-5-----	1,2-Dichloropropane	25	U
10061-01-5-----	cis-1,3-Dichloropropene	25	U
79-01-6-----	Trichloroethene	25	U
124-48-1-----	Dibromochloromethane	25	U
79-00-5-----	1,1,2-Trichloroethane	25	U
71-43-2-----	Benzene	25	U
10061-02-6-----	trans-1,3-Dichloropropene	25	U
75-25-2-----	Bromoform	25	U
108-10-1-----	4-Methyl-2-Pentanone	61	DJ
591-78-6-----	2-Hexanone	76	DJ
127-18-4-----	Tetrachloroethene	25	U
79-34-5-----	1,1,2,2-Tetrachloroethane	25	U
108-38-3-----	Toluene	24	BDJ
108-90-7-----	Chlorobenzene	25	U
100-41-4-----	Ethylbenzene	25	U
100-42-5-----	Styrene	25	U
1330-20-7-----	Xylene (total)	25	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S9ASDLMS

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12182-011DLMS

Sample wt/vol: 1.00 (g/mL) G

Lab File ID: F7038

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/24/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	50	U
74-83-9-----	Bromomethane	50	U
75-01-4-----	Vinyl Chloride	330	D
75-00-3-----	Chloroethane	50	U
75-09-2-----	Methylene Chloride	72	BD
67-64-1-----	Acetone	260	BD
75-15-0-----	Carbon Disulfide	25	U
75-35-4-----	1,1-Dichloroethene	340	D
75-34-3-----	1,1-Dichloroethane	25	U
540-59-0-----	1,2-Dichloroethene (total)	25	U
67-66-3-----	Chloroform	270	D
107-06-2-----	1,2-Dichloroethane	270	D
78-93-3-----	2-Butanone	380	D
71-55-6-----	1,1,1-Trichloroethane	25	U
56-23-5-----	Carbon Tetrachloride	260	D
75-27-4-----	Bromodichloromethane	25	U
78-87-5-----	1,2-Dichloropropane	25	U
10061-01-5-----	cis-1,3-Dichloropropene	25	U
79-01-6-----	Trichloroethene	240	D
124-48-1-----	Dibromochloromethane	25	U
79-00-5-----	1,1,2-Trichloroethane	25	U
71-43-2-----	Benzene	270	D
10061-02-6-----	trans-1,3-Dichloropropene	25	U
75-25-2-----	Bromoform	25	U
108-10-1-----	4-Methyl-2-Pentanone	65	DJ
591-78-6-----	2-Hexanone	110	D
127-18-4-----	Tetrachloroethene	260	D
79-34-5-----	1,1,2,2-Tetrachloroethane	25	U
108-88-3-----	Toluene	230	BD
108-90-7-----	Chlorobenzene	250	D
100-41-4-----	Ethylbenzene	25	U
100-42-5-----	Styrene	25	U
1330-20-7-----	Xylene (total)	25	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S9ASDLMD

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12182-011DLMD

Sample wt/vol: 1.00 (g/mL) G

Lab File ID: F7039

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/24/96

Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	50	U
74-83-9-----	Bromomethane	50	U
75-01-4-----	Vinyl Chloride	320	D
75-00-3-----	Chloroethane	50	U
75-09-2-----	Methylene Chloride	62	BD
67-64-1-----	Acetone	190	BD
75-15-0-----	Carbon Disulfide	25	U
75-35-4-----	1,1-Dichloroethene	330	D
75-34-3-----	1,1-Dichloroethane	25	U
540-59-0-----	1,2-Dichloroethene (total)	25	U
67-66-3-----	Chloroform	270	D
107-06-2-----	1,2-Dichloroethane	270	D
78-93-3-----	2-Butanone	340	D
71-55-6-----	1,1,1-Trichloroethane	25	U
56-23-5-----	Carbon Tetrachloride	270	D
75-27-4-----	Bromodichloromethane	25	U
78-87-5-----	1,2-Dichloropropane	25	U
10061-01-5-----	cis-1,3-Dichloropropene	25	U
79-01-6-----	Trichloroethene	250	D
124-48-1-----	Dibromochloromethane	25	U
79-00-5-----	1,1,2-Trichloroethane	25	U
71-43-2-----	Benzene	270	D
10061-02-6-----	trans-1,3-Dichloropropene	25	U
75-25-2-----	Bromoform	25	U
108-10-1-----	4-Methyl-2-Pentanone	61	DJ
591-78-6-----	2-Hexanone	75	DJ
127-18-4-----	Tetrachloroethene	250	D
79-34-5-----	1,1,2,2-Tetrachloroethane	25	U
108-88-3-----	Toluene	250	BD
108-90-7-----	Chlorobenzene	260	D
100-41-4-----	Ethylbenzene	25	U
100-42-5-----	Styrene	25	U
1330-20-7-----	Xylene (total)	25	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S9BS

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12182-012

Sample wt/vol: 2.50 (g/mL) G

Lab File ID: F7057

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	20	U
74-83-9-----	Bromomethane	20	U
75-01-4-----	Vinyl Chloride	20	U
75-00-3-----	Chloroethane	20	U
75-09-2-----	Methylene Chloride	18	B
67-64-1-----	Acetone	210	
75-15-0-----	Carbon Disulfide	10	U
75-35-4-----	1,1-Dichloroethene	10	U
75-34-3-----	1,1-Dichloroethane	10	U
540-59-0-----	1,2-Dichloroethene (total)	10	U
67-66-3-----	Chloroform	10	U
107-06-2-----	1,2-Dichloroethane	10	U
78-93-3-----	2-Butanone	90	
71-55-6-----	1,1,1-Trichloroethane	10	U
56-23-5-----	Carbon Tetrachloride	10	U
75-27-4-----	Bromodichloromethane	10	U
78-87-5-----	1,2-Dichloropropane	10	U
10061-01-5-----	cis-1,3-Dichloropropene	10	U
79-01-6-----	Trichloroethene	10	U
124-48-1-----	Dibromochloromethane	10	U
79-00-5-----	1,1,2-Trichloroethane	10	U
71-43-2-----	Benzene	10	U
10061-02-6-----	trans-1,3-Dichloropropene	10	U
75-25-2-----	Bromoform	10	U
108-10-1-----	4-Methyl-2-Pentanone	25	J
591-78-6-----	2-Hexanone	40	U
127-18-4-----	Tetrachloroethene	10	U
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U
108-88-3-----	Toluene	8	BJ
108-90-7-----	Chlorobenzene	10	U
100-41-4-----	Ethylbenzene	10	U
100-42-5-----	Styrene	10	U
1330-20-7-----	Xylene (total)	10	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S9CS

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12182-013

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7041

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/24/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	30	B
67-64-1-----	Acetone	380	BE
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	120	
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	33	
591-78-6-----	2-Hexanone	37	
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	7	B
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S9CSDL

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12182-013DL

Sample wt/vol: 2.50 (g/mL) G

Lab File ID: F7058

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.

COMPOUND

Q

74-87-3-----	Chloromethane	20	U
74-83-9-----	Bromomethane	20	U
75-01-4-----	Vinyl Chloride	20	U
75-00-3-----	Chloroethane	20	U
75-09-2-----	Methylene Chloride	18	BD
67-64-1-----	Acetone	260	D
75-15-0-----	Carbon Disulfide	10	U
75-35-4-----	1,1-Dichloroethene	10	U
75-34-3-----	1,1-Dichloroethane	10	U
540-59-0-----	1,2-Dichloroethene (total)	10	U
67-66-3-----	Chloroform	10	U
107-06-2-----	1,2-Dichloroethane	10	U
78-93-3-----	2-Butanone	100	D
71-55-6-----	1,1,1-Trichloroethane	10	U
56-23-5-----	Carbon Tetrachloride	10	U
75-27-4-----	Bromodichloromethane	10	U
78-87-5-----	1,2-Dichloropropane	10	U
10061-01-5-----	cis-1,3-Dichloropropene	10	U
79-01-6-----	Trichloroethene	10	U
124-48-1-----	Dibromochloromethane	10	U
79-00-5-----	1,1,2-Trichloroethane	10	U
71-43-2-----	Benzene	10	U
10061-02-6-----	trans-1,3-Dichloropropene	10	U
75-25-2-----	Bromoform	10	U
108-10-1-----	4-Methyl-2-Pentanone	33	DJ
591-78-6-----	2-Hexanone	40	U
127-18-4-----	Tetrachloroethene	10	U
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U
108-88-3-----	Toluene	8	BDJ
108-90-7-----	Chlorobenzene	10	U
100-41-4-----	Ethylbenzene	10	U
100-42-5-----	Styrene	10	U
1330-20-7-----	Xylene (total)	10	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S9DS

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12182-014

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7059

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	22	B
67-64-1-----	Acetone	240	E
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	100	
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	29	
591-78-6-----	2-Hexanone	65	
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	5	B
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S9DSDL

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12182-014DL

Sample wt/vol: 2.50 (g/mL) G

Lab File ID: F7063

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	20	U
74-83-9-----	Bromomethane	20	U
75-01-4-----	Vinyl Chloride	20	U
75-00-3-----	Chloroethane	20	U
75-09-2-----	Methylene Chloride	14	BD
67-64-1-----	Acetone	79	D
75-15-0-----	Carbon Disulfide	10	U
75-35-4-----	1,1-Dichloroethene	10	U
75-34-3-----	1,1-Dichloroethane	10	U
540-59-0-----	1,2-Dichloroethene (total)	10	U
67-66-3-----	Chloroform	10	U
107-06-2-----	1,2-Dichloroethane	10	U
78-93-3-----	2-Butanone	62	D
71-55-6-----	1,1,1-Trichloroethane	10	U
56-23-5-----	Carbon Tetrachloride	10	U
75-27-4-----	Bromodichloromethane	10	U
78-87-5-----	1,2-Dichloropropane	10	U
10061-01-5-----	cis-1,3-Dichloropropene	10	U
79-01-6-----	Trichloroethene	10	U
124-48-1-----	Dibromochloromethane	10	U
79-00-5-----	1,1,2-Trichloroethane	10	U
71-43-2-----	Benzene	10	U
10061-02-6-----	trans-1,3-Dichloropropene	10	U
75-25-2-----	Bromoform	10	U
108-10-1-----	4-Methyl-2-Pentanone	27	DJ
591-78-6-----	2-Hexanone	40	U
127-18-4-----	Tetrachloroethene	10	U
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U
108-88-3-----	Toluene	7	BDJ
108-90-7-----	Chlorobenzene	10	U
100-41-4-----	Ethylbenzene	10	U
100-42-5-----	Styrene	10	U
1330-20-7-----	Xylene (total)	10	U

FORM I VOA

000134^{3/90}

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S14-1

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12183-007

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7071

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	4	BJ
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	4	BJ
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S14S

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12183-002

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7065

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	8	B
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	5	BJ
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S15-1

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12183-009

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7073

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	3	BJ
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	4	BJ
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S15S

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12183-003

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7066

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	7	B
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	16	J
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	5	BJ
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S16S

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12183-005

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7067

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	6	B
67-64-1-----	Acetone	20	U
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	4	BJ
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S17-1

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12183-010

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7074

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	3	BJ
67-64-1-----	Acetone	4	J
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	20	U
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	4	BJ
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S17S

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12183-006

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7068

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	10	U
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	9	B
67-64-1-----	Acetone	67	
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	5	U
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	5	U
107-06-2-----	1,2-Dichloroethane	5	U
78-93-3-----	2-Butanone	28	
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	5	U
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	5	U
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	5	U
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	4	BJ
108-90-7-----	Chlorobenzene	5	U
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S17SMS

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12183-006MS

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7069

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.

COMPOUND

Q

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	59	
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	5	B
67-64-1-----	Acetone	3	J
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	65	
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	53	
107-06-2-----	1,2-Dichloroethane	58	
78-93-3-----	2-Butanone	77	
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	53	
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	50	
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	53	
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	47	
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	46	B
108-90-7-----	Chlorobenzene	50	
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S17SMD

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix: (soil/water) SOIL

Lab Sample ID: 12193-006MSD

Sample wt/vol: 5.00 (g/mL) G

Lab File ID: F7070

Level: (low/med) LOW

Date Received: 09/17/96

% Moisture: not dec.

Date Analyzed: 09/25/96

GC Column: RTX-502.2 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
---------	----------	---	---

74-87-3-----	Chloromethane	10	U
74-83-9-----	Bromomethane	10	U
75-01-4-----	Vinyl Chloride	57	
75-00-3-----	Chloroethane	10	U
75-09-2-----	Methylene Chloride	6	B
67-64-1-----	Acetone	11	J
75-15-0-----	Carbon Disulfide	5	U
75-35-4-----	1,1-Dichloroethene	66	
75-34-3-----	1,1-Dichloroethane	5	U
540-59-0-----	1,2-Dichloroethene (total)	5	U
67-66-3-----	Chloroform	54	
107-06-2-----	1,2-Dichloroethane	61	
78-93-3-----	2-Butanone	95	
71-55-6-----	1,1,1-Trichloroethane	5	U
56-23-5-----	Carbon Tetrachloride	55	
75-27-4-----	Bromodichloromethane	5	U
78-87-5-----	1,2-Dichloropropane	5	U
10061-01-5-----	cis-1,3-Dichloropropene	5	U
79-01-6-----	Trichloroethene	50	
124-48-1-----	Dibromochloromethane	5	U
79-00-5-----	1,1,2-Trichloroethane	5	U
71-43-2-----	Benzene	56	
10061-02-6-----	trans-1,3-Dichloropropene	5	U
75-25-2-----	Bromoform	5	U
108-10-1-----	4-Methyl-2-Pentanone	20	U
591-78-6-----	2-Hexanone	20	U
127-18-4-----	Tetrachloroethene	50	
79-34-5-----	1,1,2,2-Tetrachloroethane	5	U
108-88-3-----	Toluene	45	B
108-90-7-----	Chlorobenzene	54	
100-41-4-----	Ethylbenzene	5	U
100-42-5-----	Styrene	5	U
1330-20-7-----	Xylene (total)	5	U

**QUALITY
CONTROL
DATA**

2B
SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Level: (low/med) LOW

	EPA SAMPLE NO.	SMC1 (TOL) #	SMC2 (BFB) #	SMC3 (DCE) #	OTHER	TOT OUT
	=====	=====	=====	=====	=====	=====
01	B1216-BG1	102	93	106	0	0
02	B1216-BGS	99	91	113	0	0
03	B1216-S14-1	94	89	111	0	0
04	B1216-S14S	99	93	106	0	0
05	B1216-S15-1	98	93	115	0	0
06	B1216-S15S	98	90	111	0	0
07	B1216-S16S	92	83	110	0	0
08	B1216-S17-1	96	90	114	0	0
09	B1216-S17S	93	88	118	0	0
10	B1216-S4AS	108	89	83	0	0
11	B1216-S4BS	104	98	114	0	0
12	B1216-S4CS	104	98	116	0	0
13	B1216-S9A3	105	102	115	0	0
14	B1216-S9AS	69 *	65 *	167 *	0	3
15	B1216-S9ASDL	97	94	105	0	0
16	B1216-S9BS	95	92	117	0	0
17	B1216-S9CS	73 *	74	150 *	0	2
18	B1216-S9CSDL	90	88	127 *	0	1
19	B1216-S9DS	83	78	134 *	0	1
20	B1216-S9DSDL	93	87	122 *	0	1
21	VSPK01	103	98	103	0	0
22	VSPK05	103	101	104	0	0
23	VSPK02	100	95	100	0	0
24	VSPK03	101	94	100	0	0
25	VSPK04A	100	96	103	0	0
26	VSPK04B	103	97	110	0	0
27	B1216-S17SMS	97	87	114	0	0
28	B1216-S17SMD	94	88	115	0	0
29	B1216-S9ASDLMS	99	95	105	0	0
30	B1216-S9ASDLMD	93	90	105	0	0

QC LIMITS

SMC1 (TOL) = Toluene-d8 (80-120)
 SMC2 (BFB) = Bromofluorobenzene (74-121)
 SMC3 (DCE) = 1,2-Dichloroethane-d4 (70-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

2B
SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Level: (low/med) LOW

	EPA SAMPLE NO.	SMC1 (TOL) #	SMC2 (BFB) #	SMC3 (DCE) #	OTHER	TOT OUT
	=====	=====	=====	=====	=====	=====
01	B1216-S9ASMS	74 *	68 *	158 *	0	3
02	B1216-S9ASMD	89	91	128 *	0	1
03	VBLK01	103	97	100	0	0
04	VBLK05	104	98	112	0	0
05	VBLK02	99	94	98	0	0
06	VBLK03	101	98	105	0	0
07	VBLK04	100	96	103	0	0

QC LIMITS

SMC1 (TOL) = Toluene-d8 (80-120)

SMC2 (BFB) = Bromofluorobenzene (74-121)

SMC3 (DCE) = 1,2-Dichloroethane-d4 (70-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix Spike - EPA Sample No.: B1216-S9AS

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	50.00	0	53.78	108	1-234
Trichloroethene	50.00	0	38.31	77	71-157
Benzene	50.00	0	59.14	118	37-151
Toluene	50.00	6.318	35.37	58	47-150
Chlorobenzene	50.00	0	47.89	96	37-160

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS.	
					RPD	REC.
1,1-Dichloroethene	50.00	65.54	131	19	22	1-234
Trichloroethene	50.00	49.31	99	25 *	24	71-157
Benzene	50.00	60.53	121	3	21	37-151
Toluene	50.00	46.00	79	31 *	21	47-150
Chlorobenzene	50.00	54.39	109	13	21	37-160

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 2 out of 5 outside limits

Spike Recovery: 0 out of 10 outside limits

COMMENTS:

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix Spike - EPA Sample No.: B1216-S9ASDL Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	250.0	0	342.2	137	1-234
Trichloroethene	250.0	0	243.2	97	71-157
Benzene	250.0	0	267.0	107	37-151
toluene	250.0	23.60	233.2	84	47-150
o-xylene	250.0	0	253.8	102	37-160

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS	
					RPD	REC.
1,1-Dichloroethene	250.0	333.2	133	3	22	1-234
Trichloroethene	250.0	252.0	101	4	24	71-157
Benzene	250.0	270.8	108	1	21	37-151
toluene	250.0	246.0	89	6	21	47-150
o-xylene	250.0	259.0	104	2	21	37-160

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits

Spike Recovery: 0 out of 10 outside limits

COMMENTS:

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Matrix Spike - EPA Sample No.: B1216-S17S

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	50.00	0	64.57	129	1-234
Trichloroethene	50.00	0	49.83	100	71-157
Benzene	50.00	0	53.11	106	37-151
Toluene	50.00	4.187	45.68	83	47-150
Chlorobenzene	50.00	0	50.39	101	37-160

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS	
					RPD	REC.
1,1-Dichloroethene	50.00	66.46	133	3	22	1-234
Trichloroethene	50.00	50.12	100	0	24	71-157
Benzene	50.00	55.57	111	5	21	37-151
Toluene	50.00	44.82	81	2	21	47-150
Chlorobenzene	50.00	53.75	108	7	21	37-160

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits

Spike Recovery: 0 out of 10 outside limits

COMMENTS:

4A
VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLK01

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: VC96

Lab File ID: F6990

Lab Sample ID: QCBLK113734

Date Analyzed: 09/23/96

Time Analyzed: 1629

GC Column: RTX-502.2 ID: 0.530 (mm)

Heated Purge: (Y/N) Y

Instrument ID: MSF

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	B1216-S4AS	12182-008	F7007	0137
02	B1216-S4BS	12182-009	F7008	0208
03	B1216-S4CS	12182-010	F7009	0239
04	VSPK01	QCSPK113734	F6991	1720

COMMENTS:

4A
VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLK02

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID: F7033

Lab Sample ID: QCBLK113987

Date Analyzed: 09/24/96

Time Analyzed: 1700

GC Column: RTX-502.2 ID: 0.530(mm)

Heated Purge: (Y/N) Y

Instrument ID: MSF

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	B1216-S9ASDL	12182-011DL	F7035	1816
02	B1216-S9CS	12182-013	F7041	2123
03	VSPK02	QCSPK113987	F7034	1745
04	B1216-S9ASDLMS	12182-011DLMS	F7038	1951
05	B1216-S9ASDLMD	12182-011DLMD	F7039	2022

COMMENTS:

4A
VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLK02

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID: F7033

Lab Sample ID: QCBLK113987

Date Analyzed: 09/24/96

Time Analyzed: 1700

GC Column: RTX-502.2 ID: 0.530 (mm)

Heated Purge: (Y/N) Y

Instrument ID: MSF

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	96SEW0911-1	12182-015	F7043	2225
02	96SEW0911-2	12183-012	F7044	2255
03	VSPK02	QCSPK113987	F7034	1745

COMMENTS:

000008

4A
VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBK03

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID: F7054

Lab Sample ID: QCBLK114130

Date Analyzed: 09/25/96

Time Analyzed: 0505

GC Column: RTX-502.2 ID: 0.530 (mm)

Heated Purge: (Y/N) Y

Instrument ID: MSF

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	B1216-BGS	12183-008	F7072	1433
02	B1216-S14-1	12183-007	F7071	1402
03	B1216-S14S	12183-002	F7065	1056
04	B1216-S15-1	12183-009	F7073	1504
05	B1216-S15S	12183-003	F7066	1127
06	B1216-S16S	12183-005	F7067	1158
07	B1216-S17-1	12183-010	F7074	1535
08	B1216-S17S	12183-006	F7068	1229
09	B1216-S9A3	12183-001	F7064	1026
10	B1216-S9BS	12182-012	F7057	0650
11	B1216-S9CSDL	12182-013DL	F7058	0720
12	B1216-S9DS	12182-014	F7059	0751
13	B1216-S9DSDL	12182-014DL	F7063	0955
14	VSPK03	QCSPK114130	F7055	0548
15	B1216-S17SMS	12183-006MS	F7069	1300
16	B1216-S17SMD	12183-006MSD	F7070	1331

COMMENTS:

4A
VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLK04

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID: F7076

Lab Sample ID: QCBLK114142

Date Analyzed: 09/25/96

Time Analyzed: 1711

GC Column: RTX-502.2 ID: 0.530 (mm)

Heated Purge: (Y/N) Y

Instrument ID: MSF

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO. =====	LAB SAMPLE ID =====	LAB FILE ID =====	TIME ANALYZED =====
01	B1216-BG1	12183-011	F7091	0124
02	VSPK04A	QCSPK114142-1	F7077	1755
03	VSPK04B	QCSPK114142-2	F7078	1826

COMMENTS:

4A
VOLATILE METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLK05

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID: F7016

Lab Sample ID: QCBLK113778

Date Analyzed: 09/24/96

Time Analyzed: 0726

GC Column: RTX-502.2 ID: 0.530 (mm)

Heated Purge: (Y/N) Y

Instrument ID: MSF

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
	=====	=====	=====	=====
01	B1216-S9AS	12182-011	F7029	1423
02	VSPK05	QCSPK113778	F7017	0811
03	B1216-S9ASMS	12182-011MS	F7030	1453
04	B1216-S9ASMD	12182-011MSD	F7031	1524

COMMENTS:

5A
VOLATILE ORGANIC GC/MS TUNING AND MASS
CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID: FF771

BFB Injection Date: 09/22/96

Instrument ID: MSF

BFB Injection Time: 0828

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) RTX-502.2

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	22.0
75	30.0 - 60.0% of mass 95	49.1
95	Base peak, 100% relative abundance	100.0
	5.0 - 9.0% of mass 95	7.6
	Less than 2.0% of mass 174	0.7 (1.1)1
	Greater than 50.0% of mass 95	64.1
	5.0 - 9.0% of mass 174	4.2 (6.6)1
	Greater than 95.0%, but less than 101.0% of mass 174	62.0 (96.7)1
	5.0 - 9.0% of mass 176	4.6 (7.4)2

1-Value is % mass 174

2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	F6961	09/22/96	0956
02	VSTD010	VSTD010	F6962	09/22/96	1026
03	VSTD020	VSTD020	F6963	09/22/96	1056
04	VSTD100	VSTD100	F6964	09/22/96	1127
05	VSTD200	VSTD200	F6965	09/22/96	1157

5A
VOLATILE ORGANIC GC/MS TUNING AND MASS
CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID: FF773

BFB Injection Date: 09/23/96

Instrument ID: MSF

BFB Injection Time: 1527

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) RTX-502.2

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	20.6
75	30.0 - 60.0% of mass 95	50.0
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	65.6
175	5.0 - 9.0% of mass 174	4.2 (6.4)1
76	Greater than 95.0%, but less than 101.0% of mass 174	64.6 (98.5)1
77	5.0 - 9.0% of mass 176	4.4 (6.8)2

1-Value is % mass 174

2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	F6989	09/23/96	1543
02	VBLK01	QCBLK113734	F6990	09/23/96	1629
03	VSPK01	QCSPK113734	F6991	09/23/96	1720
04	B1216-S4AS	12182-008	F7007	09/24/96	0137
05	B1216-S4BS	12182-009	F7008	09/24/96	0208
06	B1216-S4CS	12182-010	F7009	09/24/96	0239

5A
VOLATILE ORGANIC GC/MS TUNING AND MASS
CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID: FF774

BFB Injection Date: 09/24/96

Instrument ID: MSF

BFB Injection Time: 0356

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap)

ION ABUNDANCE CRITERIA		% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	22.1
75	30.0 - 60.0% of mass 95	49.1
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.3
173	Less than 2.0% of mass 174	0.6 (0.9)1
174	Greater than 50.0% of mass 95	65.4
175	5.0 - 9.0% of mass 174	4.6 (7.1)1
176	Greater than 95.0%, but less than 101.0% of mass 174	65.5 (100.1)1
177	5.0 - 9.0% of mass 176	4.3 (6.6)2

1-Value is % mass 174

2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	F7015	09/24/96	0641
02	VBLK05	QCBLK113778	F7016	09/24/96	0726
03	VSPK05	QCSPK113778	F7017	09/24/96	0811
04	B1216-S9AS	12182-011	F7029	09/24/96	1423
05	B1216-S9ASMS	12182-011MS	F7030	09/24/96	1453
06	B1216-S9ASMD	12182-011MSD	F7031	09/24/96	1524

5A
VOLATILE ORGANIC GC/MS TUNING AND MASS
CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID: FF775

BFB Injection Date: 09/24/96

Instrument ID: MSF

BFB Injection Time: 1601

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) RTX-502.2

ION ABUNDANCE CRITERIA		% RELATIVE ABUNDANCE
=====		=====
50	15.0 - 40.0% of mass 95	20.1
75	30.0 - 60.0% of mass 95	47.3
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.8
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	73.9
175	5.0 - 9.0% of mass 174	5.4 (7.3)1
176	Greater than 95.0%, but less than 101.0% of mass 174	73.6 (99.6)1
177	5.0 - 9.0% of mass 176	5.7 (7.7)2

1-Value is % mass 174

2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	=====	=====	=====	=====	=====
01	VSTD050	VSTD050	F7032	09/24/96	1614
02	VLK02	QCBLK113987	F7033	09/24/96	1700
03	VSPK02	QCSPK113987	F7034	09/24/96	1745
04	B1216-S9ASDL	12182-011DL	F7035	09/24/96	1816
05	B1216-S9ASDLMS	12182-011DLMS	F7038	09/24/96	1951
06	B1216-S9ASDLMD	12182-011DLMD	F7039	09/24/96	2022
07	B1216-S9CS	12182-013	F7041	09/24/96	2123
08	96SEW0911-1	12182-015	F7043	09/24/96	2225
09	96SEW0911-2	12183-012	F7044	09/24/96	2255

5A
VOLATILE ORGANIC GC/MS TUNING AND MASS
CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID: FF776

BFB Injection Date: 09/25/96

Instrument ID: MSF

BFB Injection Time: 0352

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) RTX-502.2

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	20.6
75	30.0 - 60.0% of mass 95	49.7
95	Base peak, 100% relative abundance	100.0
	5.0 - 9.0% of mass 95	7.6
	Less than 2.0% of mass 174	0.0 (0.0)1
	Greater than 50.0% of mass 95	69.7
	5.0 - 9.0% of mass 174	5.6 (8.1)1
	Greater than 95.0%, but less than 101.0% of mass 174	67.1 (96.3)1
	5.0 - 9.0% of mass 176	5.7 (8.5)2

1-Value is % mass 174

2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	F7053	09/25/96	0420
02	VBLK03	QCBLK114130	F7054	09/25/96	0505
03	VSPK03	QCSPK114130	F7055	09/25/96	0548
04	B1216-S9BS	12182-012	F7057	09/25/96	0650
05	B1216-S9CSDL	12182-013DL	F7058	09/25/96	0720
06	B1216-S9DS	12182-014	F7059	09/25/96	0751
07	B1216-S9DSDL	12182-014DL	F7063	09/25/96	0955
08	B1216-S9A3	12183-001	F7064	09/25/96	1026
09	B1216-S14S	12183-002	F7065	09/25/96	1056
10	B1216-S15S	12183-003	F7066	09/25/96	1127
11	B1216-S16S	12183-005	F7067	09/25/96	1158
12	B1216-S17S	12183-006	F7068	09/25/96	1229
13	B1216-S17SMS	12183-006MS	F7069	09/25/96	1300
14	B1216-S17SMD	12183-006MSD	F7070	09/25/96	1331
15	B1216-S14-1	12183-007	F7071	09/25/96	1402
16	B1216-BGS	12183-008	F7072	09/25/96	1433
17	B1216-S15-1	12183-009	F7073	09/25/96	1504
18	B1216-S17-1	12183-010	F7074	09/25/96	1535

5A
VOLATILE ORGANIC GC/MS TUNING AND MASS
CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID: FF777

BFB Injection Date: 09/25/96

Instrument ID: MSF

BFB Injection Time: 1612

Matrix: (soil/water) SOIL Level: (low/med) LOW Column: (pack/cap) RTX-502.2

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	20.5
75	30.0 - 60.0% of mass 95	49.7
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.9
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	65.6
175	5.0 - 9.0% of mass 174	4.6 (7.0)1
176	Greater than 95.0%, but less than 101.0% of mass 174	64.6 (98.5)1
177	5.0 - 9.0% of mass 176	4.4 (6.8)2

1-Value is % mass 174

2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	F7075	09/25/96	1624
02	VBLK04	QCBLK114142	F7076	09/25/96	1711
03	VSPK04A	QCSPK114142-1	F7077	09/25/96	1755
04	VSPK04B	QCSPK114142-2	F7078	09/25/96	1826
05	B1216-BG1	12183-011	F7091	09/26/96	0124

6A
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Instrument ID: MSF

Calibration Date(s): 09/22/96

09/22/96

Heated Purge: (Y/N): Y

Calibration Times: 0956

1157

GC Column: RTX-502.2 ID: 0.530 (mm)

LAB FILE ID:		RRF10 = F6962			RRF20 = F6963		
RRF50= F6961		RRF100= F6964			RRF200= F6965		
COMPOUND		RRF10	RRF20	RRF50	RRF100	RRF200	% RSD
Chloromethane	#	0.982	1.017	0.893	0.731	0.749	15.0#
Methane		1.335	1.416	1.346	1.092	0.789	21.6
Chloride	*	0.861	0.934	0.821	0.618	0.596	19.7*
Chloroethane		0.665	0.702	0.672	0.548	0.444	17.8
Methylene Chloride		1.572	1.419	1.257	1.183	1.282	11.5
Acetone		2.119	1.092	0.702	0.423	0.506	71.6
Carbon Disulfide		2.672	2.754	2.544	2.445	2.691	4.8
1,1-Dichloroethene	*	1.105	1.089	0.981	0.925	1.010	7.4*
1,1-Dichloroethane	#	2.753	2.770	2.507	2.416	2.605	5.9#
1,2-Dichloroethene (total)		1.366	1.346	1.259	1.183	1.278	5.7
Chloroform	*	3.222	3.156	2.918	2.829	3.102	5.4*
1,2-Dichloroethane		0.542	0.479	0.481	0.469	0.523	6.4
2-Butanone		0.757	0.575	0.626	0.513	0.787	18.0
1,1,1-Trichloroethane		2.589	2.617	2.393	2.302	2.511	5.4
Carbon Tetrachloride		0.612	0.578	0.558	0.533	0.601	5.6
Bromodichloromethane		0.802	0.727	0.742	0.722	0.822	6.0
1,2-Dichloropropane	*	0.442	0.410	0.402	0.387	0.442	5.9*
1,3-Dichloropropene		0.572	0.533	0.553	0.542	0.612	5.6
Chloroethene		0.476	0.443	0.426	0.416	0.463	5.6
Bromochloromethane		0.767	0.703	0.758	0.729	0.850	7.3
1,1,2-Trichloroethane		0.473	0.417	0.442	0.404	0.477	7.4
Benzene		0.973	0.903	0.874	0.824	0.926	6.2
trans-1,3-Dichloropropene		0.589	0.553	0.599	0.555	0.673	8.2
Bromoform	#	0.613	0.508	0.565	0.545	0.652	9.8#
4-Methyl-2-Pentanone		0.639	0.519	0.610	0.558	0.793	16.9
2-Hexanone		0.401	0.302	0.371	0.312	0.498	21.0
Tetrachloroethene		0.495	0.490	0.473	0.430	0.489	5.6
1,1,2,2-Tetrachloroethane	#	0.943	0.718	0.793	0.695	0.892	13.3#
Toluene	*	1.082	1.021	1.004	0.977	1.080	4.5*
Chlorobenzene	#	1.048	0.973	0.943	0.884	0.988	6.2#
Ethylbenzene	*	0.481	0.438	0.417	0.394	0.443	7.4*
Styrene		0.981	0.885	0.893	0.840	0.959	6.3
Xylene (total)		0.578	0.534	0.509	0.487	0.541	6.5
Toluene-d8		0.843	0.886	0.922	0.837	0.884	4.0
Bromofluorobenzene		0.798	0.792	0.792	0.711	0.734	5.2
1,2-Dichloroethane-d4		0.393	0.383	0.413	0.365	0.393	4.5

* Compounds with required minimum RRF and maximum %RSD values.

All other compounds must meet a minimum RRF of 0.010.

FORM VI VOA

600207^{3/90}

6A
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Instrument ID: MSF

Calibration Date(s): 09/22/96

09/22/96

Heated Purge: (Y/N): Y

Calibration Times: 0956

1157

GC Column: RTX-502.2 ID: 0.530(mm)

LAB FILE ID:
RRF50= F6961

RRF10 = F6962
RRF100= F6964

RRF20 = F6963
RRF200= F6965

COMPOUND	x^2 Coefficient	x^1 Coefficient	Intercept
=====	=====	=====	=====
Chloromethane	#	1.38284875	-0.127#
Bromomethane		1.27811308	-0.402
Vinyl Chloride	*	1.76251740	-0.238*
Chloroethane		2.30884671	-0.309
Methylene Chloride		0.79218714	-0.006
Acetone		2.29547468	-0.515
Carbon Disulfide		0.37323943	0.039
1,1-Dichloroethene	*	1.00086277	0.013*
1,1-Dichloroethane	#	0.38693655	0.017#
1,2-Dichloroethene (total)		0.78940211	0.012
Chloroform	*	0.32395826	0.037*
1,2-Dichloroethane		1.91125241	0.063
2-Butanone		1.23962274	0.235
1,1,1-Trichloroethane		0.40081303	0.029
Carbon Tetrachloride		1.66770287	0.059
Bromodichloromethane		1.21177435	0.084
1,2-Dichloropropane	*	2.26117835	0.074*
cis-1,3-Dichloropropene		1.62659357	0.085
Trichloroethene		2.16228216	0.057
Dibromochloromethane		1.16770717	0.107
1,1,2-Trichloroethane		2.09533056	0.088
Benzene		1.08506025	0.048
trans-1,3-Dichloropropene		1.47254190	0.124
Bromoform	#	1.51735223	0.127#
4-Methyl-2-Pentanone		1.22752281	0.235
2-Hexanone		1.93335673	0.286
Tetrachloroethene		2.05602178	0.046
1,1,2,2-Tetrachloroethane	#	1.11437063	0.132#
Toluene	•	0.92611179	0.056*
Chlorobenzene	#	1.01784378	0.042#
Ethylbenzene	*	2.27038602	0.045*
Styrene		1.04357677	0.067
Xylene (total)		1.85732073	0.043
=====	=====	=====	=====
Toluene-d8		1.13660355	0.007
Bromofluorobenzene		1.37995943	-0.033
1,2-Dichloroethane-d4		2.56471793	0.009

FORM VI VOA

000208

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Instrument ID: MSF

Calibration date: 09/23/96 Time: 1543

Lab File ID: F6989

Init. Calib. Date(s): 09/22/96

09/22/96

Heated Purge: (Y/N) Y

Init. Calib. Times: 0956

1157

GC Column: RTX-502.2 ID: 0.530 (mm)

COMPOUND	RRF	MIN RRF	TRUE CONC	ANALYZ CONC	%D	MAX %D
Chloromethane	0.817	0.300	50.0	50.1	.2	
Bromomethane	1.295		50.0	62.7	25.3	
Vinyl Chloride	0.736		50.0	52.9	5.9	20.0
Chloroethane	0.661		50.0	60.9	21.8	
Methylene Chloride	1.433		50.0	56.5	12.9	
Acetone	0.625		50.0	46.0	8.0	
Carbon Disulfide	2.646		50.0	51.3	2.7	
1,1-Dichloroethene	1.010		50.0	51.2	2.4	20.0
1,1-Dichloroethane	2.732	0.300	50.0	53.7	7.4	
1,2-Dichloroethene (total)	1.313		50.0	52.4	4.9	
Chloroform	3.134		50.0	52.6	5.2	20.0
1,2-Dichloroethane	0.539		50.0	54.7	9.3	
2-Butanone	0.711		50.0	55.8	11.6	
1,1,1-Trichloroethane	2.550		50.0	52.5	5.1	
Carbon Tetrachloride	0.595		50.0	52.6	5.1	
Bromodichloromethane	0.803		50.0	52.9	5.7	
1,2-Dichloropropane	0.436		50.0	53.0	5.9	20.0
cis-1,3-Dichloropropene	0.606		50.0	53.6	7.1	
Trichloroethene	0.446		50.0	51.1	2.1	
Dibromochloromethane	0.826		50.0	53.6	7.2	
1,1,2-Trichloroethane	0.473		50.0	53.9	7.8	
Benzene	0.914		50.0	52.0	4.0	
trans-1,3-Dichloropropene	0.664		50.0	55.1	10.2	
Bromoform	0.652	0.100	50.0	55.8	11.7	
4-Methyl-2-Pentanone	0.719		50.0	55.9	11.8	
2-Hexanone	0.455		50.0	58.3	16.7	
Tetrachloroethene	0.479		50.0	51.5	3.0	
1,1,2,2-Tetrachloroethane	0.946	0.300	50.0	59.3	18.6	
Toluene	1.055		50.0	51.7	3.3	20.0
Chlorobenzene	1.036	0.300	50.0	54.8	9.6	
Ethylbenzene	0.456		50.0	53.9	7.9	20.0
Styrene	0.967		50.0	53.8	7.6	
Xylene (total)	0.555		50.0	53.7	7.3	
Toluene-d8	0.927		50.0	53.0	6.1	
Bromofluorobenzene	0.802		50.0	53.7	7.4	
1,2-Dichloroethane-d4	0.434		50.0	56.2	12.3	

FORM VII VOA

000239

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Instrument ID: MSF

Calibration date: 09/24/96 Time: 0641

Lab File ID: F7015

Init. Calib. Date(s): 09/22/96 09/22/96

Heated Purge: (Y/N) Y

Init. Calib. Times: 0956 1157

GC Column: RTX-502.2 ID: 0.530 (mm)

COMPOUND	RRF	MIN RRF	TRUE CONC	ANALYZ CONC	%D	MAX %D
Chloromethane	0.853	0.300	50.0	52.6	5.2	
Bromomethane	1.363		50.0	67.0	34.0	
Vinyl Chloride	0.816		50.0	60.0	20.0	20.0
Chloroethane	0.696		50.0	64.9	29.7	
Methylene Chloride	1.498		50.0	59.0	18.0	
Acetone	0.558		50.0	38.2	23.6	
Carbon Disulfide	3.055		50.0	59.0	18.0	
1,1-Dichloroethene	1.114		50.0	56.4	12.8	20.0
1,1-Dichloroethane	2.996	0.300	50.0	58.8	17.7	
1,2-Dichloroethene (total)	1.396		50.0	55.7	11.4	
Chloroform	3.422		50.0	57.3	14.5	20.0
1,2-Dichloroethane	0.586		50.0	59.2	18.3	
2-Butanone	0.829		50.0	63.1	26.3	
1,1,1-Trichloroethane	2.770		50.0	56.9	13.9	
Carbon Tetrachloride	0.638		50.0	56.2	12.3	
Bromodichloromethane	0.849		50.0	55.6	11.2	
1,2-Dichloropropane	0.466		50.0	56.4	12.8	20.0
cis-1,3-Dichloropropene	0.635		50.0	55.9	11.7	
Trichloroethene	0.478		50.0	54.5	9.1	
Dibromochloromethane	0.856		50.0	55.3	10.7	
1,1,2-Trichloroethane	0.480		50.0	54.7	9.4	
Benzene	0.966		50.0	54.8	9.7	
trans-1,3-Dichloropropene	0.685		50.0	56.6	13.3	
Bromoform	0.658	0.100	50.0	56.2	12.5	
4-Methyl-2-Pentanone	0.789		50.0	60.2	20.4	
2-Hexanone	0.494		50.0	62.1	24.2	
Tetrachloroethene	0.486		50.0	52.2	4.4	
1,1,2,2-Tetrachloroethane	0.938	0.300	50.0	58.9	17.8	
Toluene	1.110		50.0	54.2	8.4	20.0
Chlorobenzene	1.034	0.300	50.0	54.7	9.4	
Ethylbenzene	0.455		50.0	53.9	7.8	20.0
Styrene	0.950		50.0	52.9	5.8	
Xylene (total)	0.551		50.0	53.4	6.7	
Toluene-d8	0.912		50.0	52.2	4.4	
Bromofluorobenzene	0.792		50.0	53.0	5.9	
1,2-Dichloroethane-d4	0.423		50.0	54.8	9.5	

FORM VII VOA

000245

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Instrument ID: MSF

Calibration date: 09/24/96 Time: 1614

Lab File ID: F7032

Init. Calib. Date(s): 09/22/96

09/22/96

Heated Purge: (Y/N) Y

Init. Calib. Times: 0956

1157

GC Column: RTX-502.2 ID: 0.530(mm)

COMPOUND	RRF	MIN RRF	TRUE CONC	ANALYZ CONC	%D	MAX %D
=====	=====	=====	=====	=====	=====	=====
Chloromethane	0.800	0.300	50.0	49.0	2.1	
Bromomethane	1.267		50.0	60.9	21.8	
Vinyl Chloride	0.741		50.0	53.4	6.7	20.0
Chloroethane	0.649		50.0	59.5	19.1	
Methylene Chloride	1.384		50.0	54.5	9.0	
Acetone	0.433		50.0	23.9	52.1	
Carbon Disulfide	2.722		50.0	52.8	5.5	
1,1-Dichloroethene	1.052		50.0	53.3	6.6	20.0
1,1-Dichloroethane	2.670	0.300	50.0	52.5	5.1	
1,2-Dichloroethene (total)	1.322		50.0	52.8	5.6	
Chloroform	3.161		50.0	53.1	6.1	20.0
1,2-Dichloroethane	0.510		50.0	51.9	3.7	
2-Butanone	0.615		50.0	49.9	.2	
1,1,1-Trichloroethane	2.611		50.0	53.8	7.5	
Carbon Tetrachloride	0.597		50.0	52.7	5.4	
Bromodichloromethane	0.788		50.0	51.9	3.8	
1,2-Dichloropropane	0.420		50.0	51.2	2.5	20.0
cis-1,3-Dichloropropene	0.570		50.0	50.6	1.1	
Trichloroethene	0.454		50.0	52.0	3.9	
Dibromochloromethane	0.790		50.0	51.5	3.0	
1,1,2-Trichloroethane	0.454		50.0	51.9	3.8	
Benzene	0.922		50.0	52.5	4.9	
trans-1,3-Dichloropropene	0.622		50.0	52.0	4.0	
Bromoform	0.587	0.100	50.0	50.8	1.7	
4-Methyl-2-Pentanone	0.592		50.0	48.1	3.8	
2-Hexanone	0.365		50.0	49.6	.9	
Tetrachloroethene	0.497		50.0	53.4	6.7	
1,1,2,2-Tetrachloroethane	0.803	0.300	50.0	51.3	2.7	
Toluene	1.061		50.0	52.0	3.9	20.0
Chlorobenzene	0.999	0.300	50.0	52.9	5.8	
Ethylbenzene	0.455		50.0	53.9	7.8	20.0
Styrene	0.931		50.0	51.9	3.8	
Xylene (total)	0.558		50.0	54.0	8.0	
=====	=====	=====	=====	=====	=====	=====
Toluene-d8	0.881		50.0	50.4	.9	
Bromofluorobenzene	0.755		50.0	50.5	.9	
1,2-Dichloroethane-d4	0.388		50.0	50.2	.3	

FORM VII VOA

000251

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Instrument ID: MSF

Calibration date: 09/25/96 Time: 0420

Lab File ID: F7053

Init. Calib. Date(s): 09/22/96 09/22/96

Heated Purge: (Y/N) Y

Init. Calib. Times: 0956 1157

GC Column: RTX-502.2 ID: 0.530 (mm)

COMPOUND	RRF	MIN RRF	TRUE CONC	ANALYZ CONC	%D	MAX %D
=====	=====	=====	=====	=====	=====	=====
Chloromethane	0.752	0.300	50.0	45.6	8.8	
Bromomethane	1.190		50.0	56.0	11.9	
Vinyl Chloride	0.689		50.0	48.8	2.4	20.0
Chloroethane	0.615		50.0	55.6	11.2	
Methylene Chloride	1.412		50.0	55.6	11.2	
Acetone	0.506		50.0	32.3	35.3	
Carbon Disulfide	2.568		50.0	49.9	.2	
1,1-Dichloroethene	0.992		50.0	50.3	.6	20.0
1,1-Dichloroethane	2.573	0.300	50.0	50.6	1.3	
1,2-Dichloroethene (total)	1.269		50.0	50.7	1.4	
Chloroform	3.063		50.0	51.5	2.9	20.0
1,2-Dichloroethane	0.507		50.0	51.6	3.1	
2-Butanone	0.701		50.0	55.2	10.4	
1,1,1-Trichloroethane	2.457		50.0	50.7	1.3	
Carbon Tetrachloride	0.559		50.0	49.6	.9	
Bromodichloromethane	0.749		50.0	49.6	.9	
1,2-Dichloropropane	0.401		50.0	49.0	1.9	20.0
cis-1,3-Dichloropropene	0.558		50.0	49.6	.8	
Trichloroethene	0.438		50.0	50.2	.3	
Dibromochloromethane	0.756		50.0	49.5	1.0	
1,1,2-Trichloroethane	0.444		50.0	50.9	1.9	
Benzene	0.879		50.0	50.1	.2	
trans-1,3-Dichloropropene	0.609		50.0	51.0	2.0	
Bromoform	0.577	0.100	50.0	50.1	.2	
4-Methyl-2-Pentanone	0.555		50.0	45.8	8.4	
2-Hexanone	0.406		50.0	53.5	7.1	
Tetrachloroethene	0.462		50.0	49.8	.5	
1,1,2,2-Tetrachloroethane	0.827	0.300	50.0	52.7	5.3	
Toluene	1.034		50.0	50.7	1.4	20.0
Chlorobenzene	0.945	0.300	50.0	50.2	.3	
Ethylbenzene	0.428		50.0	50.8	1.7	20.0
Styrene	0.904		50.0	50.5	1.1	
Xylene (total)	0.512		50.0	49.7	.5	
=====	=====	=====	=====	=====	=====	=====
Toluene-d8	0.883		50.0	50.5	1.1	
Bromofluorobenzene	0.757		50.0	50.6	1.2	
1,2-Dichloroethane-d4	0.399		50.0	51.6	3.2	

FORM VII VOA

000257

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Instrument ID: MSF

Calibration date: 09/25/96 Time: 1624

Lab File ID: F7075

Init. Calib. Date(s): 09/22/96

09/22/96

Heated Purge: (Y/N) Y

Init. Calib. Times: 0956

1157

GC Column: RTX-502.2 ID: 0.530 (mm)

COMPOUND	RRF	MIN RRF	TRUE CONC	ANALYZ CONC	%D	MAX %D
Chloromethane	0.734	0.300	50.0	44.4	11.3	
Bromomethane	1.209		50.0	57.2	14.4	
Vinyl Chloride	0.696		50.0	49.4	1.1	20.0
Chloroethane	0.634		50.0	57.7	15.5	
Methylene Chloride	1.428		50.0	56.3	12.5	
Acetone	0.540		50.0	36.3	27.5	
Carbon Disulfide	2.589		50.0	50.3	.6	
1,1-Dichloroethene	0.997		50.0	50.6	1.1	20.0
1,1-Dichloroethane	2.684	0.300	50.0	52.8	5.6	
1,2-Dichloroethene (total)	1.241		50.0	49.6	.8	
Chloroform	3.104		50.0	52.1	4.2	20.0
1,2-Dichloroethane	0.530		50.0	53.8	7.6	
2-Butanone	0.704		50.0	55.4	10.7	
1,1,1-Trichloroethane	2.526		50.0	52.1	4.1	
Carbon Tetrachloride	0.598		50.0	52.8	5.6	
Bromodichloromethane	0.786		50.0	51.8	3.6	
1,2-Dichloropropane	0.433		50.0	52.6	5.2	20.0
cis-1,3-Dichloropropene	0.588		50.0	52.1	4.2	
Trichloroethene	0.456		50.0	52.2	4.3	
Dibromochloromethane	0.774		50.0	50.5	1.0	
1,1,2-Trichloroethane	0.438		50.0	50.3	.6	
Benzene	0.907		50.0	51.6	3.3	
trans-1,3-Dichloropropene	0.626		50.0	52.3	4.6	
Bromoform	0.578	0.100	50.0	50.2	.4	
4-Methyl-2-Pentanone	0.672		50.0	53.0	6.0	
2-Hexanone	0.401		50.0	53.1	6.1	
Tetrachloroethene	0.467		50.0	50.3	.5	
1,1,2,2-Tetrachloroethane	0.820	0.300	50.0	52.3	4.6	
Toluene	1.049		50.0	51.4	2.7	20.0
Chlorobenzene	0.969	0.300	50.0	51.4	2.8	
Ethylbenzene	0.437		50.0	51.8	3.6	20.0
Styrene	0.908		50.0	50.8	1.5	
Xylene (total)	0.524		50.0	50.8	1.6	
Toluene-d8	0.885		50.0	50.7	1.3	
Bromofluorobenzene	0.757		50.0	50.6	1.1	
1,2-Dichloroethane-d4	0.414		50.0	53.6	7.1	

FORM VII VOA

000263

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID (Standard): F6989

Date Analyzed: 09/23/96

Instrument ID: MSF

Time Analyzed: 1543

GC Column: RTX-502.2 ID: 0.530(mm)

Heated Purge: (Y/N) Y

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
=====	=====	=====	=====	=====	=====	=====
12 HOUR STD	51570	8.78	209478	10.65	175280	17.94
UPPER LIMIT	103140	9.28	418956	11.15	350560	18.44
LOWER LIMIT	25785	8.28	104739	10.15	87640	17.44
=====	=====	=====	=====	=====	=====	=====
EPA SAMPLE NO.						
=====	=====	=====	=====	=====	=====	=====
01 B1216-S4AS	14812 *	8.78	75115 *	10.64	61320 *	17.91
02 B1216-S4BS	29744	8.79	124883	10.65	104675	17.91
03 B1216-S4CS	30070	8.79	124335	10.64	102214	17.91
04 VSPK01	46937	8.79	199826	10.67	164753	17.92
05 VBLK01	58718	8.81	256405	10.67	208699	17.94

IS1 (BCM) = Bromochloromethane

IS2 (DFB) = 1,4-Difluorobenzene

IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 100% of internal standard area.

AREA LOWER LIMIT = - 50% of internal standard area.

RT UPPER LIMIT = +0.50 minutes of internal standard RT.

RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag values outside QC limits with an asterisk.

* Values outside of QC limits.

3A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID (Standard): F7015

Date Analyzed: 09/24/96

Instrument ID: MSF

Time Analyzed: 0641

GC Column: RTX-502.2 ID: 0.530 (mm)

Heated Purge: (Y/N) Y

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
=====	=====	=====	=====	=====	=====	=====
12 HOUR STD	44696	8.78	183265	10.64	154712	17.90
UPPER LIMIT	89392	9.28	366530	11.14	309424	18.40
LOWER LIMIT	22348	8.28	91632	10.14	77356	17.40
=====	=====	=====	=====	=====	=====	=====
EPA SAMPLE NO.						
=====	=====	=====	=====	=====	=====	=====
01 B1216-S9AS	25286	8.84	65423 *	10.70	26650 *	17.96
02 VSPK05	45303	8.80	188252	10.66	157312	17.93
03 B1216-S9ASMS	28550	8.83	77743 *	10.68	35170 *	17.95
04 B1216-S9ASMD	29923	8.82	100201	10.68	63198 *	17.95
05 VBLK05	48185	8.78	190816	10.64	162140	17.90

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 100% of internal standard area.

AREA LOWER LIMIT = - 50% of internal standard area.

RT UPPER LIMIT = +0.50 minutes of internal standard RT.

RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag values outside QC limits with an asterisk.

* Values outside of QC limits.

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID (Standard): F7032

Date Analyzed: 09/24/96

Instrument ID: MSF

Time Analyzed: 1614

GC Column: RTX-502.2 ID: 0.530(mm)

Heated Purge: (Y/N) Y

	IS1 (BCM)	RT #	IS2 (DFB)	RT #	IS3 (CBZ)	RT #
	AREA #		AREA #		AREA #	
=====	=====	=====	=====	=====	=====	=====
12. HOUR STD	57989	8.81	233560	10.68	188316	17.97
UPPER LIMIT	115978	9.31	467120	11.18	376632	18.47
LOWER LIMIT	28994	8.31	116780	10.18	94158	17.47
=====	=====	=====	=====	=====	=====	=====
EPA SAMPLE NO.						
=====	=====	=====	=====	=====	=====	=====
01 96SEW0911-1	51765	8.80	222897	10.66	188658	17.92
02 96SEW0911-2	53401	8.80	219016	10.67	182099	17.94
03 B1216-S9ASDL	50557	8.83	204557	10.69	165079	17.94
04 B1216-S9CS	20596 *	8.80	58135 *	10.66	26887 *	17.93
05 VSPK02	56526	8.81	230246	10.69	196723	17.96
06 B1216-S9ASDLMS	44116	8.81	176320	10.68	129664	17.96
07 B1216-S9ASDLMD	44001	8.79	176895	10.67	146101	17.93
08 VBLK02	51634	8.82	217779	10.68	181505	17.96

IS1 (BCM) = Bromochloromethane

IS2 (DFB) = 1,4-Difluorobenzene

IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 100% of internal standard area.

AREA LOWER LIMIT = - 50% of internal standard area.

RT UPPER LIMIT = +0.50 minutes of internal standard RT.

RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag values outside QC limits with an asterisk.

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID (Standard): F7053

Date Analyzed: 09/25/96

Instrument ID: MSF

Time Analyzed: 0420

GC Column: RTX-502.2 ID: 0.530(mm)

Heated Purge: (Y/N) Y

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
=====	=====	=====	=====	=====	=====	=====
12 HOUR STD	54624	8.80	220038	10.67	182041	17.94
UPPER LIMIT	109248	9.30	440076	11.17	364082	18.44
LOWER LIMIT	27312	8.30	110019	10.17	91020	17.44
=====	=====	=====	=====	=====	=====	=====
EPA SAMPLE NO.						
=====	=====	=====	=====	=====	=====	=====
01 B1216-BGS	35712	8.79	141572	10.64	114016	17.92
02 B1216-S14-1	46603	8.80	183413	10.66	136717	17.91
03 B1216-S14S	39355	8.78	164255	10.65	133811	17.91
04 B1216-S15-1	35629	8.80	139828	10.66	114681	17.92
05 B1216-S15S	46543	8.79	183379	10.65	146057	17.91
06 B1216-S16S	42608	8.80	167337	10.65	118474	17.91
07 B1216-S17-1	36460	8.80	145533	10.65	113456	17.93
08 B1216-S17S	43126	8.80	163736	10.66	119827	17.92
09 B1216-S9A3	16136 *	8.78	59610 *	10.64	55004 *	17.91
10 B1216-S9BS	38557	8.77	146462	10.63	111581	17.90
11 B1216-S9CSDL	34232	8.79	119171	10.65	81367 *	17.90
12 B1216-S9DS	35547	8.78	115714	10.64	66012 *	17.90
13 B1216-S9DSDL	35174	8.78	126839	10.65	92129	17.91
14 B1216-S9PK03	48080	8.82	198052	10.68	172574	17.95
15 B1216-S17SMS	37492	8.80	145881	10.66	115003	17.93
16 B1216-S17SMD	33748	8.81	128460	10.66	92034	17.92
17 B1216-S17VBLK03	52101	8.81	213570	10.67	181058	17.95

IS1 (BCM) = Bromochloromethane

IS2 (DFB) = 1,4-Difluorobenzene

IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 100% of internal standard area.

AREA LOWER LIMIT = - 50% of internal standard area.

RT UPPER LIMIT = +0.50 minutes of internal standard RT.

RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag values outside QC limits with an asterisk.
Values outside of QC limits.

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

Lab File ID (Standard): F7075

Date Analyzed: 09/25/96

Instrument ID: MSF

Time Analyzed: 1624

GC Column: RTX-502.2 ID: 0.530(mm)

Heated Purge: (Y/N) Y

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
=====	=====	=====	=====	=====	=====	=====
12 HOUR STD	50514	8.80	201545	10.65	169997	17.91
UPPER LIMIT	101028	9.30	403090	11.15	339994	18.41
LOWER LIMIT	25257	8.30	100772	10.15	84998	17.41
=====	=====	=====	=====	=====	=====	=====
EPA SAMPLE NO.						
=====	=====	=====	=====	=====	=====	=====
01 B1216-BG1	34571	8.80	145734	10.67	126645	17.96
02 VSPK04A	49407	8.80	205776	10.66	172355	17.93
03 VSPK04B	48988	8.79	197325	10.65	172389	17.92
04 VBLK04	47755	8.80	200078	10.67	168900	17.94

IS1 (BCM) = Bromochloromethane

IS2 (DFB) = 1,4-Difluorobenzene

IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = + 100% of internal standard area.

AREA LOWER LIMIT = - 50% of internal standard area.

RT UPPER LIMIT = +0.50 minutes of internal standard RT.

RT LOWER LIMIT = -0.50 minutes of internal standard RT.

Column used to flag values outside QC limits with an asterisk.

* Values outside of QC limits.

9A-LCS
VOA SOIL LCS RECOVERY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

EPA Sample No.: VSPK01

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC LIMITS REC.
=====	=====	=====	=====	=====
1,1-Dichloroethene_____	50	70	141	1-234
Trichloroethene_____	50	50	100	71-157
Benzene_____	50	52	104	37-151
Toluene_____	50	46	92	47-150
Chlorobenzene_____	50	51	102	37-160

Column to be used to flag recovery values with an asterisk.

Values outside of QC limits.

Detected.

Not Given. Determined by QC Charting Procedures.

Note: Additional compounds may be spiked whose recoveries are neither calculated nor controlled upon.

9A-LCS
VOA WATER LCS RECOVERY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

EPA Sample No.: VSPK02

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC LIMITS REC.
1,1-Dichloroethene	50	66	132	1-234
Trichloroethene	50	51	101	71-157
Benzene	50	52	104	37-151
Toluene	50	51	102	47-150
Chlorobenzene	50	50	101	37-160

Column to be used to flag recovery values with an asterisk.

* Values outside of QC limits.

D Detected.

NG: Not Given. Determined by QC Charting Procedures.

Note: Additional compounds may be spiked whose recoveries are neither calculated nor controlled upon.

9A-LCS
VOA SOIL LCS RECOVERY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

EPA Sample No.: VSPK03

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC LIMITS REC.
=====	=====	=====	=====	=====
1,1-Dichloroethene	50	67	133	1-234
Trichloroethene	50	51	102	71-157
Benzene	50	52	105	37-151
Toluene	50	48	96	47-150
Chlorobenzene	50	49	98	37-160

Column to be used to flag recovery values with an asterisk.

* Values outside of QC limits.

D Detected.

NG: Not Given. Determined by QC Charting Procedures.

Note: Additional compounds may be spiked whose recoveries are neither calculated nor controlled upon.

9A-LCS
VOA SOIL LCS RECOVERY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

EPA Sample No.: VSPK04A

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC LIMITS REC.
1,1-Dichloroethene	50	66	132	1-234
Trichloroethene	50	51	102	71-157
Benzene	50	52	104	37-151
Toluene	50	47	94	47-150
Chlorobenzene	50	53	106	37-160

Column to be used to flag recovery values with an asterisk.

* Values outside of QC limits.

Detected.

Not Given. Determined by QC Charting Procedures.

Note: Additional compounds may be spiked whose recoveries are neither calculated nor controlled upon.

9A-LCS
VOA SOIL LCS RECOVERY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

EPA Sample No.: VSPK04B

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC LIMITS REC.
=====	=====	=====	=====	=====
1,1-Dichloroethene	50	64	128	1-234
Trichloroethene	50	52	104	71-157
Benzene	50	53	106	37-151
Toluene	50	49	97	47-150
Chlorobenzene	50	51	103	37-160

Column to be used to flag recovery values with an asterisk.

Values outside of QC limits.

Detected.

NG: Not Given. Determined by QC Charting Procedures.

Note: Additional compounds may be spiked whose recoveries are neither calculated nor controlled upon.

9A-LCS
VOA SOIL LCS RECOVERY

Lab Name: QUANTERRA MO

Contract: 625-01

Lab Code: ITMO

Case No.: V18208

SAS No.:

SDG No.: V096

EPA Sample No.: VSPK05

Level: (low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC #	QC LIMITS REC.
=====	=====	=====	=====	=====
1,1-Dichloroethene_____	50	67	134	1-234
Trichloroethene_____	50	49	99	71-157
Benzene_____	50	50	100	37-151
Toluene_____	50	44	88	47-150
Chlorobenzene_____	50	50	99	37-160

Column to be used to flag recovery values with an asterisk.

* Values outside of QC limits.

D Detected.

NG: Not Given. Determined by QC Charting Procedures.

Note: Additional compounds may be spiked whose recoveries are neither calculated nor controlled upon.

**TOTAL
PETROLEUM
HYDROCARBON
RESULTS**

DIESEL/OIL

(HBH = HIGH BOILING HYDROCARBONS)

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

TPHBLK01

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: BLK113753

Sample wt/vol: 20.0 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: _____

% Moisture: not dec. _____ dec. _____

Date Extracted: 09-24-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS: (mg/L or mg/Kg) <u>mg/KG</u>	Q
---------	----------	--	---

DIESEL	25	U
WASTE OIL	25	U

U: Concentration of analyte is less than the value given.

FORM I HBH

000230

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

TPHBLK02

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: BLK113970

Sample wt/vol: 20.0 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: _____

Moisture: not dec. _____ dec. _____

Date Extracted: 09-25-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO. Compound CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/KG Q

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>25</u>	<u>U</u>

U: Concentration of analyte is less than the value given.

FORM I HBH

000234

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

TPHSPK01A

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: SPK113753-1

Sample wt/vol: 20.0 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: _____

% Moisture: not dec. _____ dec. _____

Date Extracted: 09-24-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

EPC Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO. Compound CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/KG Q

<u>DIESEL</u>	<u>110</u>	
<u>WASTE OIL</u>	<u>25</u>	<u>U</u>

U: Concentration of analyte is less than the value given.

FORM I HBH

000252

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

TPHSPK01B

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: SAS No.: SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: SPK113753-2

Sample wt/vol: 20.0 (g/ml) G

Lab File ID:

Level: (low/med) LOW

Date Sampled:

% Moisture: nct dec. dec.

Date Extracted: 09-24-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH:

Dilution Factor: 1

CAS NO.

Compound

CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/KG

Q

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>240</u>	

U: Concentration of analyte is less than the value given.

FORM I HBH

000258

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

TPHSPK02A

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: SPK113970-1

Sample wt/vol: 20.0 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: _____

Moisture: not dec. _____ dec. _____

Date Extracted: 09-25-96

Reaction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS: (mg/L or mg/Kg) <u>mg/KG</u>	Q
---------	----------	--	---

DIESEL	120	
WASTE OIL	25	U

U: Concentration of analyte is less than the value given.

FORM I HBH

000265

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

TPHSPK02B

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: SAS No.: SDG No.: . V096

Matrix : (soil/water) SOIL

Lab Sample ID: SPK113970-2

Sample wt/vol: 20.0 (g/ml) G

Lab File ID:

Level: (low/med) LOW

Date Sampled:

% Moisture: not dec. dec.

Date Extracted: 09-25-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GC Cleanup: (Y/N) N pH:

Dilution Factor: 1

CAS NO. Compound CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/KG Q

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>260</u>	

U: Concentration of analyte is less than the value given.

FORM I HBH

000272

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-BG1

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: 12183-011

Sample wt/vol: 20.1 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: 09-12-96

% Moisture: not dec. _____ dec. _____

Date Extracted: 09-25-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO.

Compound

CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/KG

Q

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>25</u>	<u>u</u>

U: Concentration of analyte is less than the value given.

FORM I HBH

000108

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.
B1216-BGS

Lab Name: QUANTERRA MO Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL Lab Sample ID: 12183-008

Sample wt/vol: 20.1 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 09-12-96

% Moisture: not dec. _____ dec. _____ Date Extracted: 09-25-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK Date Analyzed: 10-11-96

PC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1

CAS NO. Compound CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/KG Q

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>25</u>	<u>U</u>

U: Concentration of analyte is less than the value given.

FORM I HBH

000089

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S1A3

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: 12182-001

Sample wt/vol: 20.1 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: 09-11-96

% Moisture: not dec. _____ dec. _____

Date Extracted: 09-24-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO.

Compound

CONCENTRATION UNITS:

(mg/L or mg/Kg) mg/KG

Q

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>25</u>	<u>U</u>

U: Concentration of analyte is less than the value given.

FORM I HBH

000009

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S1B3

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: 12182-002

Sample wt/vol: 20.2 (g/ml) G

Lab File ID: _____

vel: (low/med) LOW

Date Sampled: 09-11-96

% Moisture: not dec. _____ dec. _____

Date Extracted: 09-24-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS:	
		(mg/L or mg/Kg) <u>mg/KG</u>	<u>Q</u>
	<u>DIESEL</u>	<u>25</u>	<u>U</u>
	<u>WASTE OIL</u>	<u>25</u>	<u>U</u>

U: Concentration of analyte is less than the value given.

FORM I HBH

000013

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S2A3

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: 12182-004

Sample wt/vol: 20.1 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: 09-11-96

Moisture: not dec. _____ dec. _____

Date Extracted: 09-24-96

Reaction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

leanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO. Compound CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/KG Q

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>25</u>	<u>U</u>

U: Concentration of analyte is less than the value given.

FORM I HBH

000025

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S3A3

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: 12182-005

Sample wt/vol: 20.1 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: 09-11-96

Moisture: not dec. _____ dec. _____

Date Extracted: 09-24-96

Action: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

SPC Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS:		Q
		(mg/L or mg/Kg)	<u>mg/KG</u>	
	<u>DIESEL</u>	<u>25</u>		<u>U</u>
	<u>WASTE OIL</u>	<u>760</u>		

U: Concentration of analyte is less than the value given.

FORM I HBH

000029

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S3B3

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: 12182-006

Sample wt/vol: 20.1 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: 09-11-96

% Moisture: not dec. _____ dec. _____

Date Extracted: 09-24-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS: (mg/L or mg/Kg) <u>mg/KG</u>	Q
---------	----------	--	---

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>25</u>	<u>U</u>

U: Concentration of analyte is less than the value given.

FORM I HBH

000038

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S3C3

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: 12182-003

Sample wt/vol: 20.1 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: 09-11-96

% Moisture: not dec. _____ dec. _____

Date Extracted: 09-24-96

traction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS: (mg/L or mg/Kg) <u>mg/KG</u>	<u>Q</u>
---------	----------	--	----------

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>180</u>	

U: Concentration of analyte is less than the value given.

FORM I HBH

000017

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S6A3

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: 12182-007

Sample wt/vol: 20.1 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: 09-11-96

Moisture: not dec. _____ dec. _____

Date Extracted: 09-24-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS: (mg/L or mg/Kg) <u>mg/KG</u>	Q
---------	----------	--	---

DIESEL	25	U
WASTE OIL	25	U

U: Concentration of analyte is less than the value given.

FORM I HBH

000042

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S9A3

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: 12183-001

Sample wt/vol: 20.1 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: 09-12-96

% Moisture: not dec. _____ dec. _____

Date Extracted: 09-25-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO.

Compound

CONCENTRATION UNITS:

(mg/L or mg/Kg) mg/KG

Q

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>25</u>	<u>U</u>

U: Concentration of analyte is less than the value given.

FORM I HBH

000046

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S13A3

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: SAS No.: SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: 12183-004

Sample wt/vol: 20.2 (g/ml) G

Lab File ID:

Level: (low/med) LOW

Date Sampled: 09-12-96

Moisture: not dec. dec.

Date Extracted: 09-25-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH:

Dilution Factor: 1

CAS NO.

Compound

CONCENTRATION UNITS:

(mg/L, or mg/Kg) mc/KG

Q

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>25</u>	<u>U</u>

U: Concentration of analyte is less than the value given.

FORM I HBH

000063

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S14-1

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: 12183-007

Sample wt/vol: 20.1 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: 09-12-96

Moisture: not dec. _____ dec. _____

Date Extracted: 09-25-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO. Compound CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/KG Q

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>290</u>	

U: Concentration of analyte is less than the value given.

FORM I HBH

000081

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S14S

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: 12183-002

Sample wt/vol: 20.2 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: 09-12-96

Moisture: not dec. _____ dec. _____

Date Extracted: 09-25-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO.

Compound

CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/KG

Q

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>25</u>	

U: Concentration of analyte is less than the value given.

FORM I HBH

000050

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.
B1216-S15-1

Lab Name: QUANTERRA MO Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL Lab Sample ID: 12183-009

Sample wt/vol: 20.2 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 09-12-96

Moisture: not dec. _____ dec. _____ Date Extracted: 09-25-96

Reaction: (SepF/Cont/Sonc/Shak) SHAK Date Analyzed: 10-11-96

C Cleanup: (Y/N) N pH: _____ Dilution Factor: 1

CAS NO. Compound CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/KG Q

<u>DIESEL</u>	<u>36</u>	
<u>WASTE OIL</u>	<u>25</u>	<u>U</u>

U: Concentration of analyte is less than the value given.

FORM I HBH

000894

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S15S

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: SAS No.: SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: 12183-003

Sample wt/vol: 20.1 (g/ml) G

Lab File ID:

Level: (low/med) LOW

Date Sampled: 09-12-96

% Moisture: not dec. dec.

Date Extracted: 09-25-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH:

Dilution Factor: 1

CAS NO. Compound CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/KG Q

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>150</u>	

U: Concentration of analyte is less than the value given.

FORM I HBH

000056

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S16S

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL Lab Sample ID: 12183-005

Sample wt/vol: 20.1 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 09-12-96

% Moisture: not dec. _____ dec. _____ Date Extracted: 09-25-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1

CAS NO. Compound CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/KG Q

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>25</u>	<u>U</u>

U: Concentration of analyte is less than the value given.

FORM I HBH

000067

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S17-1

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: 12183-010

Sample wt/vol: 20.2 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: 09-12-96

% Moisture: not dec. _____ dec. _____

Date Extracted: 09-25-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO.

Compound

CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/KG

Q

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>220</u>	

U: Concentration of analyte is less than the value given.

FORM I HBH

000100

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S17S

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL Lab Sample ID: 12183-006

Sample wt/vol: 20.2 (g/ml) G Lab File ID: _____

el: (low/med) LOW Date Sampled: 09-12-96

Moisture: not dec. _____ dec. _____ Date Extracted: 09-25-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS: (mg/L or mg/Kg) <u>mg/KG</u>	Q
---------	----------	--	---

<u>DIESEL</u>	<u>25</u>	<u>U</u>
<u>WASTE OIL</u>	<u>1100</u>	

U: Concentration of analyte is less than the value given.

FORM I HBH

000072

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S17SMS

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL

Lab Sample ID: 12183-006MS

Sample wt/vol: 20.1 (g/ml) G

Lab File ID: _____

Level: (low/med) LOW

Date Sampled: 09-12-96

% Moisture: not dec. _____ dec. _____

Date Extracted: 09-25-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK

Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH: _____

Dilution Factor: 1

CAS NO.

Compound

CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/KG

Q

<u>DIESEL</u>	<u>55</u>	
<u>WASTE OIL</u>	<u>950</u>	

U: Concentration of analyte is less than the value given.

FORM I HBH

000238

1D
HBH ANALYSIS DATA SHEET

EPA SAMPLE NO.

B1216-S17SMSD

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix : (soil/water) SOIL Lab Sample ID: 12183-006MSD

Sample wt/vol: 20.1 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 09-12-96

Moisture: not dec. _____ dec. _____ Date Extracted: 09-25-96

Extraction: (SepF/Cont/Sonc/Shak) SHAK Date Analyzed: 10-11-96

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1

CAS NO. Compound CONCENTRATION UNITS:
(mg/L or mg/Kg) mg/KG Q

<u>DIESEL</u>	<u>54</u>	
<u>WASTE OIL</u>	<u>1000</u>	

U: Concentration of analyte is less than the value given.

FORM I HBH

000245

3F
SOIL HBH MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: QUANTERRA, MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Matrix Spike - EPA Sample No.: B1216-S17S Level: (low/med) LOW

COMPOUND	SPIKE ADDED (mg/kg)	SAMPLE CONCENTRATION (mg/kg)	MS CONCENTRATION (mg/kg)	MS % REC #	QC LIMITS REC.
Fuel Oil #2	110	0	55	49	34-136

COMPOUND	SPIKE ADDED (mg/kg)	MSD CONCENTRATION (mg/kg)	MSD % REC #	% RPD	QC LIMITS RPD REC.
Fuel Oil #2	110	54	48	2	ND 34-136

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: _____ out of _____ outside limits

Spike Recovery: _____ out of _____ outside limits

COMMENTS: ND: Not determined at this time.

FORM III HBH-2

000002

2E
SOIL HBH SURROGATE RECOVERY

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____

SAS No.: _____ SDG No.: V096

	EPA SAMPLE NO.	S1 C 40 #	S2 OTHER #
1	TPHBLK01	88	
2	TPHSPK01A	77	
3	TPHSPK01B	88	
4	B1216-S1A3	82	
5	B1216-S1B3	79	
6	B1216-S3C3	85	
7	B1216-S2A3	85	
8	B1216-S3A3	82	
9	E1216-S3B3	85	
10	B1216-S6A3	88	
11	TPHBLK02	83	
12	TPHSPK02A	90	
13	TPHSPK02B	90	
14	B1216-S9A3	86	
15	B1216-S14S	85	
16	B1216-S15S	83	
17	B1216-S13A3	92	
18	B1216-S16S	88	
19	B1216-S17S	81	
20	B1216-S17SMS	92	
21	B1216-S17SMSD	88	
22	B1216-S14-1	88	
23	B1216-BGS	89	
24	B1216-S15-1	84	
25	B1216-S17-1	84	
26	B1216-BG1	83	
27			
28			
29			
30			

ADVISORY
QC LIMITS
(10-168)

S1 (C 40) = N-Tetracontane

Column to be used to flag recovery values

* Values outside of QC limits

D Surrogates diluted out

3Q

Contract: 625.01

Lab Code: ITMO

Spike Blank No.:

COMPOUND	SPIKE ADDED (mg/KG)	SPIKE CONCENTRATION (mg/KG)	SPK % REC #	QC LIMITS REC.
FUEL OIL #2	110	110	95	34-136

Column to be used to flag recovery values with an asterisk

Values outside of QC limits

Spike Recovery: 0 out of 1 outside limits

COMMENTS:

000003

30

Contract: 625.01

Lab Code: ITMO

Spike Blank No.:

COMPOUND	SPIKE ADDED (mg/KG)	SPIKE CONCENTRATION (mg/KG)	SPK % REC #	QC LIMITS REC.
=====	=====	=====	=====	=====
WASTE OIL	260	240	87	47-148

Column to be used to flag recovery values with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 1 outside limits

COMMENTS:

3Q
SOIL HBH SPIKE BLANK (LCS) RECOVERY

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Spike Blank No.: SPK 113970-1

COMPOUND	SPIKE ADDED (mg/KG)	SPIKE CONCENTRATION (mg/KG)	SPK % REC #	QC LIMITS REC.
FUEL OIL #2	110	120	108	34-136

Column to be used to flag recovery values with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 1 outside limits

COMMENTS: _____

3Q
SOIL HBH SPIKE BLANK (LCS) RECOVERY

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Spike Blank No.: SPK 113970-2

COMPOUND	SPIKE ADDED (mg/KG)	SPIKE CONCENTRATION (mg/KG)	SPK % REC #	QC LIMITS REC.
=====	=====	=====	=====	=====
WASTE OIL	260	260	93	47-148

Column to be used to flag recovery values with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 1 outside limits

COMMENTS: _____

4C
HBH METHOD BLANK SUMMARY

Lab Name: QUANTERRA MO Contract: 625.01
 Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096
 Lab Sample ID: BLK 113753 Lab File ID: _____
 Matrix: (soil/water) SOIL Level (low/med) LOW
 Date Extracted : 09-24-96 Extraction: (SepF/Cont/Sonc) SHAK
 Date Analyzed : 10-11-96 Instrument ID : GC F
 Time Analyzed : 06:54 G C Column ID : DB-5MS

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	TPHSPK01A	SPK 113753-1	10-11-96
02	TPHSPK01B	SPK 113753-2	10-11-96
03	B1216-S1A3	12182-001	10-11-96
04	B1216-S1B3	12182-002	10-11-96
05	B1216-S3C3	12182-003	10-11-96
06	B1216-S2A3	12182-004	10-11-96
07	B1216-S3A3	12182-005	10-11-96
08	B1216-S3B3	12182-006	10-11-96
09	B1216-S5A3	12182-007	10-11-96
10			
11			
12			
13			
14			
15			
16			

COMMENTS: _____

4C
HBH METHOD BLANK SUMMARY

Lab Name: QUANTERRA MO Contract: 625.01
 Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096
 Lab Sample ID: BLK 113970 Lab File ID: _____
 Matrix: (soil/water) SOIL Level (low/med) LOW
 Date Extracted : 09-25-96 Extraction: (SepF/Cont/Sonc) SHAK
 Date Analyzed : 10-11-96 Instrument ID : GC F
 Time Analyzed : 13:17 G C Column ID : DB-5MS

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
	=====	=====	=====
01	TPHSPK02A	SPK 113970-1	10-11-96
02	TPHSPK02B	SPK 113970-2	10-11-96
03	B1216-S9A3	12183-001	10-11-96
04	B1216-S14S	12183-002	10-11-96
05	B1216-S15S	12183-003	10-11-96
06	B1216-S13A3	12183-004	10-11-96
07	B1216-S16S	12183-005	10-11-96
08	B1216-S17S	12183-006	10-11-96
09	B1216-S17SMS	12183-006MS	10-11-96
10	B1216-S17MSD	12183-006MSD	10-11-96
11	B1216-S14-1	12183-007	10-11-96
12	B1216-BGS	12183-008	10-11-96
13	B1216-S15-1	12183-009	10-11-96
14	B1216-S17-1	12183-010	10-11-96
15	B1216-BG1	12183-011	10-11-96
16			

COMMENTS: _____

page 1 of 1

FORM IV HBH

000008

6F
HBH INITIAL CALIBRATION DATA

Lab Name: QUANTERRA MO Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Instrument ID: GC F GC Column ID: DB-5MS Injection Vol: 1.0ul

Calibration Date(s): 10-01-96 to 10-01-96

COMPOUND	Conc. FuelOil#2 (ug/ml)	Cal.Fact. FuelOil#2	Conc. Waste Oil (ug/ml)	Cal.Fact. Waste Oil	Conc. C 40 (ug/ml)	Cal.Fact. C 40
Level #1	102	4309833	101	3235178	2.0	4758081
Level #2	256	4049402	253	3498036	4.9	4548785
Level #3	512	3791684	506	3233901	9.9	4445142
Level #4	1023	4148466	1013	3253812	20.0	4295051
Level #5	2559	3936045	2532	3351994	49.0	4268826
Level #6	5118	3835747	5065	3399909	99.0	4073704
Level #7						
Avg.Cal.Fact.		4011863		3328805		4398265
% RSD		5		3		5

AVERAGE CALIBRATION FACTOR, enter the average of the all calibration factors.

The %RSD must be less than 20% for the average calibration factor to be used. If the %RSD is $\geq 20\%$, a point-to-point calibration must be used. In this case, enter "Pt-to-Pt" in AVERAGE CALIBRATION FACTOR instead of the average calibration factor.

8E
HBH SEQUENCE SUMMARY

Lab Name: QUANTERRA MO Contract: 625.01
 Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096
 Instrument ID: GC F GC Column ID: DB-5MS
 Dates of Analyses: 10-11-96 to 10-11-96

	EPA SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED
01	N-PARAFFIN	N-PARAFFIN	10-11-96	05:52
02	FUEL OIL #2 4	FUEL OIL #2 4	10-11-96	06:12
03	WASTE OIL 4	WASTE OIL 4	10-11-96	06:33
04	TPHBLK02	BLK 113753	10-11-96	06:54
05	TPHSPK02A	SPK 113753-1	10-11-96	07:15
06	TPHSPK02B	SPK 113753-2	10-11-96	07:35
07	ZZZZZ	ZZZZZ	10-11-96	07:56
08	ZZZZZ	ZZZZZ	10-11-96	08:17
09	ZZZZZ	ZZZZZ	10-11-96	08:38
10	ZZZZZ	ZZZZZ	10-11-96	08:59
11	B1216-S1A3	12182-001	10-11-96	09:20
12	B1216-S1B3	12182-002	10-11-96	09:41
13	B1216-S3C3	12182-003	10-11-96	10:03
14	FUEL OIL #2 4	FUEL OIL #2 4	10-11-96	10:46
15	B1216-S2A3	12182-004	10-11-96	11:29
16	B1216-S3A3	12182-005	10-11-96	11:50
17	B1216-S3B3	12182-006	10-11-96	12:12
18	B1216-S6A3	12182-007	10-11-96	12:33
19	TPHBLK03	BLK 113970	10-11-96	13:17
20	TPHSPK03A	SPK 113970-1	10-11-96	13:38
21	TPHSPK03B	SPK 113970-2	10-11-96	14:00
22	ZZZZZ	12179-008	10-11-96	14:22
23	ZZZZZ	12179-009	10-11-96	14:43
24	ZZZZZ	12179-010	10-11-96	15:05
25	FUEL OIL #2 4	FUEL OIL #2 4	10-11-96	16:08
26	B1216-S9A3	12183-001	10-11-96	16:29
27	B1216-S14S	12183-002	10-11-96	16:50
28	B1216-S15S	12183-003	10-11-96	17:12
29	B1216-S13A3	12183-004	10-11-96	17:34
30	B1216-S16S	12183-005	10-11-96	17:55
31	B1216-S17S	12183-006	10-11-96	18:17
32	B1216-S17SMS	12183-006MS	10-11-96	18:39
33	B1216-S17SMSD	12183-006MSD	10-11-96	19:00
34	B1216-S14-1	12183-007	10-11-96	19:21
35	B1216-BGS3	12183-008	10-11-96	19:43
36	FUEL OIL #2 4	FUEL OIL #2 4	10-11-96	20:26
37	B1216-S15-1	12182-009	10-11-96	20:48
38	B1216-S17-1	12182-010	10-11-96	21:09
39	B1216-BG1	12182-011	10-11-96	21:31
40	FUEL OIL #2 4	FUEL OIL #2 4	10-11-96	22:14
41				
42				

9
HBH STANDARDS SUMMARY

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Instrument ID: GC F

GC Column ID: DB-5MS

DATE(S) OF FROM: <u>10-01-96</u> ANALYSIS TO: <u>10-01-96</u> TIME(S) OF FROM: <u>11:06</u> ANALYSIS TO: <u>18:21</u>	DATE OF ANALYSIS <u>10-11-96</u> TIME OF ANALYSIS <u>0552-0633</u> EPA SAMPLE NO. (STANDARD) <u>DAILY STDS</u>
--	---

COMPOUND	RT	RT WINDOW		CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
		FROM	TO					
_____	_____	_____	_____	_____	_____	_____	_____	_____
Fuel Oil #2	_____	1.37	10.16	4011863	_____	4412444	Y	10
Waste Oil	_____	1.37	10.16	3328805	_____	3660504	Y	10

Under QNT Y/N: enter Y if quantitation was performed, N if not performed.

%D must be less than or equal to 15% for quantitation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15% criteria.

9
HBH STANDARDS SUMMARY

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Instrument ID: GC F

GC Column ID: DB-5MS

DATE(S) OF FROM: <u>10-01-96</u> ANALYSIS TO: <u>10-01-96</u> TIME(S) OF FROM: <u>11:06</u> ANALYSIS TO: <u>18:21</u>	DATE OF ANALYSIS <u>10-11-96</u> TIME OF ANALYSIS <u>10:46</u> EPA SAMPLE NO. (STANDARD) <u>FUEL OIL #2-4</u>
--	--

COMPOUND	RT	RT WINDOW		CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
		FROM	TO					
Fuel Oil #2		1.37	10.16	4011863		4616859	Y	15
Waste Oil		1.37	10.16	3328805				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed.

%D must be less than or equal to 15% for quantitation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15% criteria.

9
HBH STANDARDS SUMMARY

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Instrument ID: GC F

GC Column ID: DB-5MS

DATE(S) OF FROM: <u>10-01-96</u> ANALYSIS TO: <u>10-01-96</u> TIME(S) OF FROM: <u>11:06</u> ANALYSIS TO: <u>18:21</u>					DATE OF ANALYSIS <u>10-11-96</u> TIME OF ANALYSIS <u>16:08</u> EPA SAMPLE NO. (STANDARD) <u>FUEL OIL #2-4</u>		
COMPOUND	RT	RT WINDOW FROM TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
Fuel Oil #2		1.37 10.16	4011863		4339022	Y	8
Waste Oil		1.37 10.16	3328805				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed.

%D must be less than or equal to 15% for quantitation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15% criteria.

9
HBH STANDARDS SUMMARY

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Instrument ID: GC F

GC Column ID: DB-5MS

DATE(S) OF FROM: <u>10-01-96</u> ANALYSIS TO: <u>10-01-96</u> TIME(S) OF FROM: <u>11:06</u> ANALYSIS TO: <u>18:21</u>				DATE OF ANALYSIS <u>10-11-96</u> TIME OF ANALYSIS <u>20:26</u> EPA SAMPLE NO. _____ (STANDARD) <u>FUEL OIL #2-4</u>				
COMPOUND	RT	RT WINDOW FROM TO		CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
Fuel Oil #2		1.37	10.16	4011863		4161413	Y	4
Waste Oil		1.37	10.16	3328805				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed.

%D must be less than or equal to 15% for quantitation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15% criteria.

9
HBH STANDARDS SUMMARY

Lab Name: QUANTERRA MO

Contract: 625.01

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: V096

Instrument ID: GC F

GC Column ID: DB-5MS

DATE(S) OF FROM: <u>10-01-96</u> ANALYSIS TO: <u>10-01-96</u> TIME(S) OF FROM: <u>11:06</u> ANALYSIS TO: <u>18:21</u>	DATE OF ANALYSIS <u>10-11-96</u> TIME OF ANALYSIS <u>22:14</u> EPA SAMPLE NO. (STANDARD) <u>FUEL OIL #2-4</u>
--	--

COMPOUND	RT	RT WINDOW		CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
		FROM	TO					
Fuel Oil #2		1.37	10.16	4011863		4194052	N	4
Waste Oil		1.37	10.16	3328805				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed.

%D must be less than or equal to 15% for quantitation.

Note: Determining that no compounds were found above the CRDL is a form of quantitation, and therefore at least one column must meet the 15% criteria.

**SUPPORTING
DATA**

ATA PACKAGE REVIEW CHECKLIST

SAMPLE DELIVERY GROUP: V096

CLIENT: RP - JERRY BONN

LABORATORY: QUANTERRA

FINAL REPORT RECEIVED: 10/17/96

DATE REVIEWED: 10/22/96

REVIEWED BY:

VOLATILES:

MATRIX: SOIL

ARE TCLP VOA DATA ACCEPTABLE: YES

	<u>SAMPLE ID</u>	<u>INSTRUMENT ID</u>	<u>DATE</u>	<u>TIME</u>	<u>ACCEPTABLE?</u>
1. TUNE	<u>BFB</u>	<u>MSF</u>	<u>9/22/96</u>	<u>0828</u>	<u>YES</u>
	<u>BFB</u>	<u>MSF</u>	<u>9/23/96</u>	<u>1527</u>	<u>YES</u>
	<u>BFB</u>	<u>MSF</u>	<u>9/25/96</u>	<u>0352</u>	<u>YES</u>
	<u>BFB</u>	<u>MSF</u>	<u>9/25/96</u>	<u>1612</u>	<u>YES</u>
2. CALIBRATION	<u>INITIAL</u>	<u>MSF</u>	<u>9/22/96</u>		<u>YES</u>
	<u>VSTD050</u>	<u>MSF</u>	<u>9/23/96</u>	<u>1543</u>	<u>YES</u>
	<u>VSTD050</u>	<u>MSF</u>	<u>9/24/96</u>	<u>0356</u>	<u>YES</u>
	<u>VSTD050</u>	<u>MSF</u>	<u>9/24/96</u>	<u>1601</u>	<u>YES</u>
	<u>VSTD050</u>	<u>MSF</u>	<u>9/25/96</u>	<u>0420</u>	<u>YES</u>
	<u>VSTD050</u>	<u>MSF</u>	<u>9/25/96</u>	<u>1624</u>	<u>YES</u>
3. METHOD BLANK	<u>QCBLK113734</u>	<u>MSF</u>	<u>9/23/96</u>	<u>1629</u>	<u>YES</u>
	<u>QCBLK113778</u>	<u>MSF</u>	<u>9/24/96</u>	<u>0726</u>	<u>YES</u>
	<u>QCBLK113987</u>	<u>MSF</u>	<u>9/24/96</u>	<u>1700</u>	<u>YES</u>
	<u>QCBLK114130</u>	<u>MSF</u>	<u>9/25/96</u>	<u>0505</u>	<u>YES</u>
	<u>QCBLK114142</u>	<u>MSF</u>	<u>9/25/96</u>	<u>1711</u>	<u>YES</u>
4. EXT. BLANK	<u>N/A</u>				<u>N/A</u>
5. LAB CONTROL	<u>QCSPK113734</u>	<u>MSF</u>	<u>9/23/96</u>	<u>1720</u>	<u>YES</u>
	<u>QCSPK113778</u>	<u>MSF</u>	<u>9/24/96</u>	<u>0811</u>	<u>YES</u>
	<u>QCSPK113987</u>	<u>MSF</u>	<u>9/24/96</u>	<u>1745</u>	<u>YES</u>
	<u>QCSPK114130</u>	<u>MSF</u>	<u>9/25/96</u>	<u>0548</u>	<u>YES</u>
	<u>QCSPK114142-1</u>	<u>MSF</u>	<u>9/25/96</u>	<u>1755</u>	<u>YES</u>
	<u>QCSPK114142-2</u>	<u>MSF</u>	<u>9/25/96</u>	<u>1826</u>	<u>YES</u>
6. TRIP BLANK	<u>96SEW0911-1</u>	<u>MSF</u>	<u>9/24/96</u>	<u>2225</u>	<u>YES</u>
	<u>96SEW0911-2</u>	<u>MSF</u>	<u>9/24/96</u>	<u>2255</u>	<u>YES</u>
7. SAMPLES	<u>B1216-S4AS</u>	<u>MSF</u>	<u>9/24/96</u>	<u>0137</u>	<u>YES</u>
	<u>B1216-S4BS</u>	<u>MSF</u>	<u>9/24/96</u>	<u>0208</u>	<u>YES</u>
	<u>B1216-S4CS</u>	<u>MSF</u>	<u>9/24/96</u>	<u>0239</u>	<u>YES</u>
	<u>B1216-S9AS</u>	<u>MSF</u>	<u>9/24/96</u>	<u>1423</u>	<u>YES</u>
	<u>B1216-S9ASMS</u>	<u>MSF</u>	<u>9/24/96</u>	<u>1453</u>	<u>YES</u>
	<u>B1216-S9ASMSD</u>	<u>MSF</u>	<u>9/24/96</u>	<u>1524</u>	<u>YES</u>
	<u>B1216-S9ASDL</u>	<u>MSF</u>	<u>9/24/96</u>	<u>1816</u>	<u>YES</u>
	<u>B1216-S9ASDLMS</u>	<u>MSF</u>	<u>9/24/96</u>	<u>1951</u>	<u>YES</u>
	<u>B1216-S9ASDLMSD</u>	<u>MSF</u>	<u>9/24/96</u>	<u>2022</u>	<u>YES</u>
	<u>B1216-S9CS</u>	<u>MSF</u>	<u>9/24/96</u>	<u>2123</u>	<u>YES</u>
	<u>B1216-S9BS</u>	<u>MSF</u>	<u>9/25/96</u>	<u>0650</u>	<u>YES</u>
	<u>B1216-S9CSDL</u>	<u>MSF</u>	<u>9/25/96</u>	<u>0720</u>	<u>YES</u>
	<u>B1216-S9DS</u>	<u>MSF</u>	<u>9/25/96</u>	<u>0751</u>	<u>YES</u>
	<u>B1216-S9DSDL</u>	<u>MSF</u>	<u>9/25/96</u>	<u>0955</u>	<u>YES</u>
	<u>B1216-S9A3</u>	<u>MSF</u>	<u>9/25/96</u>	<u>1026</u>	<u>YES</u>
	<u>B1216-S14S</u>	<u>MSF</u>	<u>9/25/96</u>	<u>1056</u>	<u>YES</u>

DATA PACKAGE REVIEW CHECKLIST

SAMPLE ID	INSTRUMENT ID	DATE	TIME	ACCEPTABLE?
B1216-S15S	MSF	9/25/96	1127	YES
B1216-S16S	MSF	9/25/96	1158	YES
B1216-S17S	MSF	9/25/96	1229	YES
B1216-S17SMS	MSF	9/25/96	1300	YES
B1216-S17SMSD	MSF	9/25/96	1331	YES
B1216-S14-1	MSF	9/25/96	1402	YES
B1216-BGS	MSF	9/25/96	1433	YES
B1216-S15-1	MSF	9/25/96	1504	YES
B1216-S17-1	MSF	9/25/96	1535	YES
B1216-BG1	MSF	9/26/96	0124	YES

8. SURROGATE RECOVERY ACCEPTABLE: YES
9. MS/MSD RECOVERY ACCEPTABLE: YES
10. METHOD BLANK ACCEPTABLE: YES
11. HOLDING TIMES ACCEPTABLE: YES

		# DAYS	ACCEPTABLE
a. Date Sampled	9/11/96	0	0
b. Date ASL Received:	9/12/96	1	1
c. Date Contract Lab Received:	9/17/96	6	5
d. Date Extracted:	N/A	N/A	N/A
e. Date Analyzed:	9/24 - 26/96	13 - 14	14

12. Correct Conc units used: YES
13. CALCULATIONS ACCEPTABLE: YES
14. ARE AREAS ACCEPTABLE: YES
15. RRT IS ACCEPTABLE: YES
16. FORMS ACCEPTABLE: YES
17. Chain-of-Custody agrees: YES

SAMPLE: BFB TUNE Analyzed: 9/25/96 @ 0352

Mass	Ion abundance criteria	% Relative Abundance	ACCEPTABLE?
50	15 - 40 % of mass 95	20.6	YES
75	30 - 60 % of mass 95	49.7	YES
95	Base peak, 100% relative abundance	100.0	YES
96	5 - 9% of mass 95	7.6	YES
173	less than 2% of mass 174	0.0 (0.0 of 174)	YES
174	greater than 50% of mass 95	69.7	YES
175	5 - 9% of mass 174	5.6 (8.1 of 174)	YES
176	95% < abundance < 101% of mass 174	67.1 (96.3 of 174)	YES
177	5 - 9% of mass 176	5.7 (8.5 of 176)	YES

SAMPLE: Continuing Calibration (VSTD050) Analyzed: 9/25/96 @ 0420

SPCC	AREA	IS AREA	RRF	Minimum RRF	ACCEPTABLE?
Chloromethane	41063	54624	0.752	0.300	YES
1,1-Dichloroethane	140531	54624	2.573	0.300	YES

ATA PACKAGE REVIEW CHECKOUT

SPCC	AREA	IS AREA	RRF	Minimum RRF	ACCEPTABLE?
Bromoform	105008	182041	0.577	0.100	<u>YES</u>
1,1,2,2-Tetrachloroethane	150478	182041	0.827	0.300	<u>YES</u>
Chlorobenzene	171948	182041	0.945	0.300	<u>YES</u>
CCC	True Conc.	Analyzed Conc.	% Difference	ACCEPTABLE? (w/in $\pm 20\%$)	
Vinyl chloride	50.0	48.8	-2.4	<u>YES</u>	
1,1-Dichloroethene	50.0	50.3	0.6	<u>YES</u>	
Chloroform	50.0	51.5	2.9	<u>YES</u>	
1,2-Dichloropropane	50.0	49.1	-1.9	<u>YES</u>	
Toluene	50.0	50.7	1.4	<u>YES</u>	
Ethylbenzene	50.0	50.8	1.7	<u>YES</u>	

COMMENTS: Method associated quality assurance and control criteria were met. Results qualified with a "J" indicate the component was detected below the method detection limit. Sample results qualified with a "B" indicate the component was detected in the associated method blank. Results qualified with a "D" indicate the associated component concentration was acquired from analysis of a dilution. Analysis of samples B1216-S4AS and B1216-S9A3 produced internal standard recoveries outside control limits (low). Sample B1216-S9AS, as well as its MS and MSD, was analyzed diluted and undiluted. The undiluted analysis resulted in several QC outliers including surrogate and internal standard recoveries and the RPD for trichloroethene and toluene in the MS and MSD. Also, levels of acetone, 2-butanone, 4-methyl-2-pentanone, and 2-hexanone were outside calibration range. Reanalysis was undertaken using 1 g aliquots. QC criteria were met, however, the levels of the over-range components were not consistent with those expected when considering the dilution factor. The laboratory reported that the cause was unknown, but was reproducible in that the 1 gram aliquots gave consistent levels of the components. Analysis of sample B1216-S9CS resulted in recoveries for the toluene-d8 and 1,2-dichloroethane-d4 surrogates and all internal standards outside control limits. Re-analysis of a dilution gave an acceptable toluene-d8 recovery, but not for 1,2-dichloroethane-d4 or the internal standard chlorobenzene-d5. Analysis of sample B1216-S9DS gave a high recovery for the 1,2-dichloroethane-d4 surrogate and low recovery for internal standard chlorobenzene-d5. Re-analysis of a dilution gave acceptable recoveries for the internal standards, however, recovery for the surrogate was still high. Also, the result for acetone (outside calibration when analyzed undiluted) did not compare with that of the undiluted analysis when factoring in the dilution.

EFRE-2258 (03/93)

DATA PACKAGE REVIEW CHECKLIST

SAMPLE DELIVERY GROUP: V096

CLIENT: RP - JERRY BONN

LABORATORY: QUANTERRA

FINAL REPORT RECEIVED: 10/17/96

DATE REVIEWED: 10/22/96

REVIEWED BY:

TPH - DIESEL / OIL:

MATRIX: SOIL

ARE TPH DIESEL/OIL DATA ACCEPTABLE: YES

ARE CRITERIA MET

1. QC SAMPLES ACCEPTABLE	<u>YES</u>
2. MATRIX SPIKE ACCEPTABLE	<u>N/A</u>
3. METHOD BLANK ACCEPTABLE	<u>YES</u>
4. HOLDING TIMES ACCEPTABLE	<u>YES</u>

		<u># DAYS</u>	<u>ACCEPTABLE</u>
a. Date Sampled:	<u>9/11/96</u>	<u>0</u>	<u>0</u>
b. Date ASL Received:	<u>9/12/96</u>	<u>1</u>	<u>1</u>
c. Date Contract Lab Received:	<u>9/17/96</u>	<u>6</u>	<u>5</u>
d. Date Extracted:	<u>9/24/96</u>	<u>13</u>	<u>14</u>
e. Date Analyzed:	<u>10/11/96</u>	<u>17</u>	<u>40</u>
5. CALCULATIONS ACCEPTABLE:	<u>YES</u>		
6. CORRECT CONC. UNITS USED:	<u>YES</u>		
7. FORMS ACCEPTABLE:	<u>YES</u>		
8. CHAIN-OF-CUSTODY AGREES:	<u>YES</u>		

COMMENTS: Method associated quality assurance and control criteria were met.

EFRE-2261 (03/93)

JOB#: _____

BECHTEL NEVADA CORPORATION

TODAY'S DATE: 9-11-96

PAGE 1
1 of 2
REV 6/18/96

ANALYTICAL SERVICES LABORATORY SERVICES REQUEST AND CHAIN OF CUSTODY

PROJECT INFORMATION

ORG #: E110 Charge #: A9k3smPz

Project #: A9k35mp2 Funded by: ☐ EM
☒ DP

Project Manager: STEVE NACHT / JERRY BOWEN

Phone: 5-7341 M/S: NTS 306

REPORT INFORMATION

*DATE DUE: 10-14-96 PRELIMINARY ☒ Yes
REPORT: ☐ No

*There may be additional charges for reports due in less than the standard turnaround time. See back

Send report to: J. Bonn M/S: NTS 306

Phone: 5-2341 Fax: 5-7761

LAB USE ONLY

SDG #: V096 Packet #: W1104

SDG #: T608 Packet #: G3230

Is the radioactivity level in any of these samples expected to be above typical environmental or bioassay levels? Yes No (circle)

REQUESTER'S SIGNATURE:

DATE: 9-11-86

NON-RAD ANALYSIS CODES

RCRA	TF = TPH - Full	PH = pH
V = VOA	TG = TPH - Gas	<u>IND HYG</u>
TV = TCLP VOA	TD = TPH - Diesel	APC = Asb/PCM
B = BNA	TO = TPH - Oil	APL = Asb/PLM
BT = TCLP BNA	M = Metals	AT = Asb/TEM
PS = Pesticide	TM = TCLP Metals	PBF = Pb/Filter
P = PCB	C = Chlor-d-lect	G = Gravimetric
PSP = PEST & PCB	F = Flashpoint	OTHERS - SEE BACK

RAD ANALYSIS CODES

01 = TRITIUM	11 = PU	OTHERS - SEE BACK
02 = GROSS ALPHA	13 = TH	
03 = GROSS BETA	22 = SR-89	
04 = GAMMA (20 min)	23 = SR-90	
05 = GFP	31 = GAMMA (1000 min)	
07 = ISO U	33 = GAMMA (300 min)	
08 = AM	93 = U NAT (KPA)	

RAD MATRIX CODES (RAD MC)

SEE BACK

SAMPLE COLLECTION LOCATION

AREA 12 FLEET OPERATIONS
BLDG 1216

ITEM	ID/DESCRIPTION	RAD MC	ANALYSIS CODES								SAMPLING		MATRIX	COMMENTS	
											DATE	TIME		PRESERVATIVE, SAMPLE SIZE/VOLUME, SPECIAL ANALYSIS, COUNT TIME	
0	B1216-S1A3.		TO							9-11-96	1540	Soil	TPH as oil 120ml		
1	B1216-S1B3.		↓							}	1605	}	}		
2	B1216-S1C3.										1415				
3	B1216-S2A3.										1505				
4	B1216-S3A3.										1210				
5	B1216-S3B3.										1340				
6	B1216-S4A5.		V							}	1500	}	VOA only 2-120ml		
7	B1216-S4A3.		↓												
8	B1216-S4B5.			V									1510		
9	B1216-S4C5.		↓							↓	1515	↓			
NON-RAD SAMPLES SAMPLED/RELINQUISHED BY(SIG)			DATE / TIME		RECEIVED BY (SIG):				RAD SAMPLES SAMPLED/RELINQUISHED BY(SIG)			DATE / TIME		RECEIVED BY (SIG):
CD Castaneda			9-11-96/1715 9/16/96 9/14		CD Castaneda FED EX #0981060931							9/17/96 10:30		Karrison Alton	

JOB#:

BECHTEL NEVADA CORPORATION

TODAY'S DATE: 9-11-96 PAGE 1
2 of 2
REV 6/18/96

ANALYTICAL SERVICES LABORATORY SERVICES REQUEST AND CHAIN OF CUSTODY

PROJECT INFORMATION

ORG #: E110 Charge #: A9H3 Smpl
Project #: Funded by: ☐ OEM
☒ DP
Project Manager: STEVE NIKS/T. BARR
Phone: M/S:

REPORT INFORMATION

*DATE DUE: PRELIMINARY ☒ Yes
REPORT: ☐ No
*There may be additional charges for reports due in less than the
standard turnaround time. See back
Send report to: JERRY BARR M/S: 326
Phone: 5-7341 Fax:

LAB USE ONLY

SDG #: V096 Packet #: W1104
SDG #: T608 Packet #: 3230
Is the radioactivity level in any of these samples expected to be
above typical environmental or bioassay levels? Yes No (circle)
REQUESTER'S SIGNATURE: DATE: 9-11-96

NON-RAD ANALYSIS CODES

RCRA
V = VOA
TV = TCLP VOA
B = BNA
TB = TCLP BNA
PS = Pesticide
P = PCB
PSP = PEST & PCB
TF = TPH - Full
TG = TPH - Gas
TD = TPH - Diesel
TO = TPH - Oil
M = Metals
TM = TCLP Metals
C = Chlor-d-lect
F = Flashpoint
PH = pH
IND HYG
APC = Asb/PCM
APL = Asb/PLM
AT = Asb/TEM
PBF = Pb/Filter
G = Gravimetric
OTHERS - SEE
BACK

RAD ANALYSIS CODES

01 = TRITIUM
02 = GROSS ALPHA
03 = GROSS BETA
04 = GAMMA (20 min)
05 = GFP
07 = ISO U
08 = AM
11 = PU
13 = TH
22 = SR-89
23 = SR-90
31 = GAMMA (1000 min)
33 = GAMMA (300 min)
93 = U NAT (KPA)
OTHERS - SEE
BACK

RAD MATRIX CODES (RAD MC)

SEE BACK

SAMPLE COLLECTION LOCATION

AREA 12 FERT OPERATIONS

ITEM	ID/DESCRIPTION	RAD MC	ANALYSIS CODES	SAMPLING			COMMENTS
				DATE	TIME	MATRIX	
0	B1216-56A3		TD	9-11-96	1040	Soil	TPH Asb
1	B1216-59A5		V		1325		MS/MSD VOA
2	B1216-59B5		V		1335		VOA
3	B1216-59C5		V		1355		
4	B1216-59D5		V		1410		
5	96SEW0911-1		V		0700	WATER	TRIP BLANK 2X40 ml
6							
7							
8							
9							

NON-RAD SAMPLES	DATE / TIME	RECEIVED BY (SIG):	RAD SAMPLES	DATE / TIME	RECEIVED BY (SIG):
SAMPLED/RELINQUISHED BY(SIG)			SAMPLED/RELINQUISHED BY(SIG)		
	9-11-96/1715	CD Castaneda		9-11-96/0900	Jerry W Byrd
	9-16-96/1330	FED EX # 0981060931			

10303

JOB#:

BECHTEL NEVADA CORPORATION

TODAY'S DATE: 9-12-96

PAGE 1
of 2
REV 6/18/96

ANALYTICAL SERVICES LABORATORY SERVICES REQUEST AND CHAIN OF CUSTODY

PROJECT INFORMATION

ORG #: _____ Charge #: A9K35ml2
 Project #: _____ Funded by: ☐ OEM
☒ DP
 Project Manager: STEVE NASAT / J. Bunn
 Phone: 5-2341 M/S: NT306

REPORT INFORMATION

*DATE DUE: 10-21-96 PRELIMINARY ☒ Yes
 REPORT: ☐ No
 *There may be additional charges for reports due in less than the
 standard turnaround time. See back
 Send report to: J. Bunn M/S: NT306
 Phone: 5-2341 Fax: 5-2741

LAB USE ONLY

SDG #: VD96 Packet #: W1105
 SDG #: _____ Packet #: _____

Is the radioactivity level in any of these samples expected to be
 above typical environmental or bioassay levels? Yes No (circle)

REQUESTER'S SIGNATURE:

DATE: 9-12-96

NON-RAD ANALYSIS CODES

RCRA
 V = VOA
 TV = TCLP VOA
 B = BNA
 TB = TCLP BNA
 PS = Pesticide
 P = PCB
 PSP = PEST & PCB
 F = Flashpoint

TF = TPH - Full
 TG = TPH - Gas
 TD = TPH - Diesel
 TO = TPH - Oil
 M = Metals
 TM = TCLP Metals
 C = Chlor-d-lect

PH = pH
 IND HYG
 APC = Asb/PCM
 APL = Asb/PLM
 AT = Asb/TEM
 PBF = Pb/Filter
 G = Gravimetric
 OTHERS - SEE
 BACK

RAD ANALYSIS CODES

01 = TRITIUM
 02 = GROSS ALPHA
 03 = GROSS BETA
 04 = GAMMA (20 min)
 05 = GFP
 07 = ISO U
 08 = AM

11 = PU
 13 = TH
 22 = SR-89
 23 = SR-90
 31 = GAMMA (1000 min)
 33 = GAMMA (300 min)
 93 = U NAT (KPA)

OTHERS - SEE
 BACK

RAD MATRIX CODES (RAD MC)

SEE BACK

SAMPLE COLLECTION LOCATION

Area 12 Fleet Operations
BLDG 1216

ITEM	ID/DESCRIPTION	RAD MC	ANALYSIS CODES								SAMPLING			COMMENTS
			DATE	TIME	MATRIX	PRESERVATIVE, SAMPLE SIZE/VOLUME, SPECIAL ANALYSIS, COUNT TIME								
0	B1216-S9A3		TO	V							9-12-96	1025	SOIL	TPH OIL & VOC 120ml
1	B1216-S145		TD	TO	V							1150		TPH DIESEL OIL & VOC
2	B1216-S155		TD	TO	V							1205		↓
3	B1216-S13A3		TO	X ⁹⁰								1253		TPH OIL & VOC * 1 X 120ml
4	B1216-S165		TD	TO	V							1315		TPH DIESEL OIL & VOC
5	B1216-S125		TD	TO	V							1330		MS+MSD
6	B1216-S14-1		TD	TO	V							1345		
7	B1216-BGS		TD	TO	V							1400		
8	B1216-S15-1		TD	TO	V							1420		
9	B1216-S17-1		TD	TO	V							1430		
NON-RAD SAMPLES SAMPLED/RELINQUISHED BY(SIG)			DATE / TIME		RECEIVED BY (SIG):		RAD SAMPLES SAMPLED/RELINQUISHED BY(SIG)			DATE / TIME		RECEIVED BY (SIG):		
<u>[Signature]</u>			9/12/96/1630		<u>C. Cantalera</u>		<u>[Signature]</u>			9/17/96 0900		<u>Dan W. Byle</u>		
<u>C. Cantalera</u>			9/14/96/1130		FED EX #0981060931									

JOB# _____

BECHTEL NEVADA CORPORATION

TODAY'S DATE: 9-12-96PAGE 1
2 of 2
REV 6/18/96

ANALYTICAL SERVICES LABORATORY SERVICES REQUEST AND CHAIN OF CUSTODY

PROJECT INFORMATION		REPORT INFORMATION		LAB USE ONLY			
ORG # _____	Charge # <u>AK35012</u>	DATE DUE: _____	PRELIMINARY REPORT: ☐ Yes ☐ No	SDG #: <u>1096</u>	Packet #: <u>11105</u>		
Project #: _____	Funded by: ☐ OEM ☒ DP	*There may be additional charges for reports due in less than the standard turnaround time. See back		Is the radioactivity level in any of these samples expected to be above typical environmental or bioassay levels? Yes No (circle)			
Project Manager: _____		Send report to: _____ M/S: _____		REQUESTER'S SIGNATURE: _____ DATE: <u>9-12-96</u>			
Phone: _____	M/S: _____	Phone: _____	Fax: _____	RAD MATRIX CODES (RAD MC) SEE BACK			
NON-RAD ANALYSIS CODES		RAD ANALYSIS CODES		SAMPLE COLLECTION LOCATION			
RCRA V = VOA TV = TCLP VOA B = BNA TB = TCLP BNA PS = Pesticide P = PCB PSP = PEST & PCB		TF = TPH - Full TG = TPH - Gas TD = TPH - Diesel TO = TPH - Oil M = Metals TM = TCLP Metals C = Chlor-d-lect F = Flashpoint PH = pH IND HYG APC = Asb/PCM APL = Asb/PLM AT = Asb/TEM PBF = Pb/Filter G = Gravimetric OTHERS - SEE BACK		01 = TRITIUM 02 = GROSS ALPHA 03 = GROSS BETA 04 = GAMMA (20 min) 05 = GFP 07 = ISO U 08 = AM 11 = PU 13 = TH 22 = SR-89 23 = SR-90 31 = GAMMA (1000 min) 33 = GAMMA (300 min) 93 = U NAT (KPA) OTHERS - SEE BACK		AREA 12 FERT OPERATIONS	

ITEM	ID/DESCRIPTION	RAD MC	ANALYSIS CODES										SAMPLING		MATRIX	COMMENTS PRESERVATIVE, SAMPLE SIZE/VOLUME, SPECIAL ANALYSIS, COUNT TIME
													DATE	TIME		
0	B1216-BG1		TD	TO	V								9-12-96	1505	Soil	TPH Diesel, Oil & VOC
1	96SE120911-2		V										9-11-96	0700	WATER	TRIP BLANK - 1 VOA ONLY
2																
3																
4																
5																
6																
7																
8																
9																

NON-RAD SAMPLES			RAD SAMPLES		
SAMPLED/RELINQUISHED BY(SIG)	DATE / TIME	RECEIVED BY (SIG):	SAMPLED/RELINQUISHED BY(SIG)	DATE / TIME	RECEIVED BY (SIG):
<u>[Signature]</u>	9/14/96/1630	CD Castaneda		9/17/96 00	Dany w Byrd
CD Castaneda	9/14/96/1330	FED EX 0981060931			

000010

Chain of Custody Record

SDG #: VU16
W1104

QHA 4124

Client Bechtel Nevada Corp.		Project Manager Ted Redding		Date 09/12/96	Chain Of Custody Number 12356
Address P.O. Box 98521, M/S NTS273		Telephone Number (Area Code)/Fax Number (702) 295-7220 Fax (702) 295-7996		Lab Number	Page 1 of 1
City Las Vegas	State NV	Zip Code 89193-8521	Site Contact	Analysis	
Project Name			Carrier/Waybill Number		
Contract/Purchase Order/Quote No. 2668					

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers		Preservative	Condition on Receipt	Total Vol (Cell only)	VOA	VOA HS/HSD	Analysis
					Type	No.						
B1216-S1A3	1540	09/11/96	soil	120 ml		1			X			X
B1216-S1B3	1605					1						
B1216-S3C3	1445					1						
B1216-S2A3	15:45					1						
B1216-S3A3	N/A					1						
B1216-S3B3	1340					1						
B1216-S4AS	1500			2(120ml)		2				X		
B1216-S4BS	1510					2						
B1216-S4CS	1515					2						
B1216-S6A3	1040			120 ml		1			X			
B1216-S9AS	10:40			2(120ml)		2				X		
B1216-S9AS	1325			2(120ml)		2					X	
B1216-S9BS	1335					2				X		
B1216-S9CS	1355					2						
B1216-S9DS	1400					2						
96SEW0911-1	0700	✓	Blank	2(40ml)		2			X			X

Special Instructions

*Please sign Chain-of-Custody received from Federal Express.

Possible Hazard Identification			Sample Disposal		
☐ Non-Hazard	☐ Flammable	☐ Skin Irritant	☐ Poison B	☐ Unknown	☐ Return To Client
Turn Around Time Required			Disposal By Lab		
☐ Normal	☐ Rush	10/14/96	Archive For _____ Months		
QC Level			Project Specific (Specify)		
☐ I. ☐ II. ☐ III.					
1. Relinquished By			1. Received By		
ED Castaneda			Federal Express Tracking #0981060931		
Date			Date		
09/16/96			09/16/96		
Time			Time		
13:30			13:30		
2. Relinquished By			2. Received By		
			Karrin alba		
Date			Date		
			9/17/96		
Time			Time		
			10:45		
3. Relinquished By			3. Received By		
Date			Date		
Time			Time		

Comments

(SIA 4124

Quanterra
Environmental
Services

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers		Preservative	Condition on Receipt	TYPH Coli CFU/g	TYPH Coli CFU/ml	VOT							
					Type	No.												
B1216-S9A3	09/12/96	1100	soil	120 ml		1			X									100
↓ B1216-S14S		1100		2(120ml) 120ml		2 1				X		X						
↓ B1216-S15S				↓ 2(120ml) 120ml		2 1			X			X						
↓ B1216-S13A3				↓ 2(120ml) 120ml		2 1			X			X						
↓ B12-S16S				2(120ml) 120ml		1			X			X						missing sample
↓ B1216-S17S				↓ 2(120ml) 120ml		2 1			X			X						
↓				↓ 2(120ml)		2			X			X						

Special Instructions

*Please sign Chain-of-Custody received from Federal Express.

Possible Hazard Identification

☒ Non-Hazard ☒ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

1 um Around Time Required

Normal ☐ Rush 10/14/96

QC Level

☐ I. ☐ II. ☐ III.

1 Relinquished By

Date	Time
09/16/96	13:30

2 Relinquished By

Date *Time*

3 Relinquished By

Date _____ Time _____

Sample Disposal

☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Project Specific (Specify)

1. Received By

Federal Express Tracking #0981060931

Date	Time
09/16/96	13:30

2. Received By

3. Received By

Date	Time
4/11/96	09:00
Date	Time

Comments

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

SDG #: V096
W1105

PCIA 4124

Client	Bechtel Nevada Corp.						Project Manager	Ted Redding	Date	09/16/96	Chain Of Custody Number	12338
Address	P.O. Box 98521, M/S NTS273						Telephone Number (Area Code)/Fax Number		(702) 295-7220 Fax (702) 295-7996			
City	Las Vegas		State	NV	Zip Code	89193-8521	Site Contact					
Project Name							Carrier/Waybill Number					
							Analysis					
							Page		2	of	2	

Contract/Purchase Order/Quote No.

2668

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers		Preservative	Condition on Receipt	TSS (mg/L)	DO (mg/L)	VOR	VOR/
					Type	No.						
B1216-S14-1	09/12/96		soil	120ml ↓	1	1			X	X		
B1216-BGS				2(120ml) 120ml ↓	2	1			X	X	X	
B1216-S15-1				2(120ml) 120ml ↓	2	1			X	X	X	
B1216-S17-1				2(120ml) 120ml ↓	2	1			X	X	X	
B1216-BG1				2(120ml) 120ml ↓	2	1			X	X	X	
96SEW0911-2	09/11/96		BLANK	2(120ml) 40ml	2	1			X	X	X	

*Please sign Chain-of-Custody received from Federal Express.

Possible Hazard Identification				Sample Disposal		Project Specific (Specify)		Time	
Non-Hazard	Flammable	Skin Irritant	Poison B	Unknown	Return To Client	Disposal By Lab	Archive For	Date	Time
☐	☐	☐	☐	☐	☐	☐	☐	09/16/96	13:30
Turn Around Time Required				OC Level	Project Specific (Specify)			Date	Time
☐	☐	☐	☐	☐	☐	☐	☐	09/16/96	13:30
Relinquished By				☐	☐	☐	☐	Date	Time
Relinquished By				☐	☐	☐	☐	09/16/96	13:30
Relinquished By				☐	☐	☐	☐	09/16/96	13:30

Comments:

DISTRIBUTION: WHITE - Stays with Sample, CANARY - Returned to Client with Report; PINK - Field Copy

Quanterra September 18, 1996 11:46 am
 Account: 11113 Project: 625.01 Bechtel Nevada QAS No. 625.01 Rev. 10
 Master Sample Login: 12182

Project Manager: A. Field

Draft: Final:

Entered and Reviewed by: S. Lauer

PM Review: Allen M. Field

Sample Header Template:

Sample No. # Comments Container Type	Client ID	C-Matrix Analysis	Date: Collected Class Preservative	Received Anal. Due Date	Due Hold Date Site	Shipper	Rad Category (Container Numbers:X Filled)	Rad Sample No.
12182-001 TPH = OIL ONLY.	B1216-S1A3	Soil	11-SEP-96 15:40	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/Q4	S COLD	07-OCT-96	25-SEP-96	S5H	(251331:100)	
12182-002 TPH = OIL ONLY.	B1216-S1B3	Soil	11-SEP-96 16:05	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/Q4	S COLD	07-OCT-96	25-SEP-96	S5H	(251332:100)	
12182-003 TPH = OIL ONLY.	B1216-S3C3	Soil	11-SEP-96 14:15	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/Q4	S COLD	07-OCT-96	25-SEP-96	S5H	(251333:100)	
12182-004 TPH = OIL ONLY.	B1216-S2A3	Soil	11-SEP-96 15:05	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/Q4	S COLD	07-OCT-96	25-SEP-96	S5H	(251334:100)	
12182-005 TPH = OIL ONLY.	B1216-S3A3	Soil	11-SEP-96 12:10	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/Q4	S COLD	07-OCT-96	25-SEP-96	S5H	(251335:100)	
12182-006 TPH = OIL ONLY.	B1216-S3B3	Soil	11-SEP-96 13:40	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/Q4	S COLD	07-OCT-96	25-SEP-96	S5H	(251336:100)	
12182-007 TPH = OIL ONLY.	B1216-S6A3	Soil	11-SEP-96 10:40	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/Q4	S COLD	07-OCT-96	25-SEP-96	S5H	(251337:100)	
12182-008	B1216-S4A5	Soil	11-SEP-96 15:00	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
2 GN - Glass Jar-120ML		VOA/8240/Q4	S COLD	07-OCT-96	25-SEP-96	109T	(251338:100 251339:99)	
12182-009	B1216-S4B5	Soil	11-SEP-96 15:10	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required

*=Sample has not been rad screened.

662009

Quanterra September 18, 1996 11:46 am
 Account: 11113 Project: 625.01 Bechtel Nevada QAS No. 625.01 Rev. 10
 Master Sample Login: 12182

Project Manager: A. Field

Draft: Final: Entered and Reviewed by: PM Review:

Sample Header Template:

Sample No.	Client ID	C-Matrix	Date Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
#	Comments							
#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date Site	(Container Numbers:X Filled)	
2	GN - Glass Jar-120ML	VOA/8240/Q4	S	COLD	07-OCT-96	25-SEP-96 109T	(251340:100 251341:99)	
12182-010	B1216-S4CS	Soil	11-SEP-96 15:15	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
2	GN - Glass Jar-120ML	VOA/8240/Q4	S	COLD	07-OCT-96	25-SEP-96 109T	(251342:100 251343:99)	
12182-011	B1216-S9AS	Soil	11-SEP-96 10:40	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
4	GN - Glass Jar-120ML	VOA/8240/Q4	S	COLD	07-OCT-96	25-SEP-96 109T	(251344:100 251345:99 251346:98 251347:97)	
12182-011WS	B1216-S9AS	Soil	11-SEP-96 10:40	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
4	GN - Glass Jar-120ML	VOA/8240/Q4	S	COLD	07-OCT-96	25-SEP-96 109T	(251344:100 251345:99 251346:98 251347:97)	
12182-011WSO	B1216-S9AS	Soil	11-SEP-96 10:40	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
4	GN - Glass Jar-120ML	VOA/8240/Q4	S	COLD	07-OCT-96	25-SEP-96 109T	(251344:100 251345:99 251346:98 251347:97)	
12182-012	B1216-S9BS	Soil	11-SEP-96 13:35	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
2	GN - Glass Jar-120ML	VOA/8240/Q4	S	COLD	07-OCT-96	25-SEP-96 109T	(251348:100 251349:99)	
12182-013	B1216-S9CS	Soil	11-SEP-96 13:55	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
2	GN - Glass Jar-120ML	VOA/8240/Q4	S	COLD	07-OCT-96	25-SEP-96 109T	(251350:100 251351:99)	
12182-014	B1216-S9DS	Soil	11-SEP-96 14:10	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
2	GN - Glass Jar-120ML	VOA/8240/Q4	S	COLD	07-OCT-96	25-SEP-96 109T	(251352:100 251353:99)	
12182-015	96SEW0911-1	Water	11-SEP-96 09:00	17-SEP-96 10:45	14-OCT-96	FED EX	1	Screening not Required
	TRIP BLANK							
2	VI - Vial-40ml	VOA/8240/Q4	S	COLD	07-OCT-96	25-SEP-96 109T	(251354:100 251355:99)	

3**Sample has not been rad screened.

UNCLAS

Project Manager: A. Field

Draft: Final:

Entered and Reviewed by: S. Lauer

PM Review: Alan M. Field

Sample Header Template:

Sample No. # Comments Container Type Date:	Client ID	C-Matrix Analysis	Date: Collected Class	Received Preservative	Due Anal. Due Date	Shipper Hold Date Site	Rad Category Rad Sample No. (Container Numbers: % Filled)
12183-001 TPH OIL ONLY	B1216-S9A3	Soil	12-SEP-96 11:00	17-SEP-96 09:00	14-OCT-96	FED EX 1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/Q4	S COLD	07-OCT-96	26-SEP-96 \$5H		(251364:100)
2		VOA/8240/Q4	S COLD	07-OCT-96	26-SEP-96 109T		(251365:99 251366:98)
12183-002 TPH = DIESEL AND OIL.	B1216-S14S	Soil	12-SEP-96 11:50	17-SEP-96 09:00	14-OCT-96	FED EX 1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/Q4	S COLD	07-OCT-96	26-SEP-96 \$5H		(251368:100)
2		VOA/8240/Q4	S COLD	07-OCT-96	26-SEP-96 109T		(251369:99 251370:98)
12183-003 TPH = DIESEL AND OIL.	B1216-S15S	Soil	12-SEP-96 12:05	17-SEP-96 09:00	14-OCT-96	FED EX 1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/Q4	S COLD	07-OCT-96	26-SEP-96 \$5H		(251371:100)
2		VOA/8240/Q4	S COLD	07-OCT-96	26-SEP-96 109T		(251372:99 251373:98)
12183-004 TPH = OIL ONLY.	B1216-S13A3	Soil	12-SEP-96 12:55	17-SEP-96 09:00	14-OCT-96	FED EX 1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/Q4	S COLD	07-OCT-96	26-SEP-96 \$5H		(251377:100)
12183-005 TPH = DIESEL AND OIL.	B1216-S16S	Soil	12-SEP-96 13:15	17-SEP-96 09:00	14-OCT-96	FED EX 1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/Q4	S COLD	07-OCT-96	26-SEP-96 \$5H		(251378:100)
2		VOA/8240/Q4	S COLD	07-OCT-96	26-SEP-96 109T		(251379:99 251380:98)
12183-006 TPH = DIESEL AND OIL.	B1216-S17S	Soil	12-SEP-96 13:30	17-SEP-96 09:00	14-OCT-96	FED EX 1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/Q4	S COLD	07-OCT-96	26-SEP-96 \$5H		(251381:100)
4		VOA/8240/Q4	S COLD	07-OCT-96	26-SEP-96 109T		(251382:99 251383:98 251414:97 251415:96)
12183-006MS TPH = DIESEL AND OIL.	B1216-S17S	Soil	12-SEP-96 13:30	17-SEP-96 09:00	14-OCT-96	FED EX 1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/Q4	S COLD	07-OCT-96	26-SEP-96 \$5H		(251381:100)
		VOA/8240/Q4	S COLD	07-OCT-96	26-SEP-96 109T		(251382:99 251383:98 251414:97 251415:96)

Sample has not been rad screened.

000316

Project Manager: A. Field

Draft: Final: Entered and Reviewed by: PM Review:

Sample Header Template:

Sample No. # Comments Container Type Data:	Client ID	C-Matrix	Date Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
		Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
12183-006MSD TPH = DIESEL AND OIL.	B1216-S17S	Soil	12-SEP-96 13:30	17-SEP-96 09:00	14-OCT-96	FED EX	1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/04	S	COLD	07-OCT-96	26-SEP-96 \$5H		(251381:100)
4		VOA/8240/04	S	COLD	07-OCT-96	26-SEP-96 109T		(251382:99 251383:98 251414:97 251415:96)
12183-007 TPH = DIESEL AND OIL.	B1216-S14-1	Soil	12-SEP-96 13:45	17-SEP-96 09:00	14-OCT-96	FED EX	1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/04	S	COLD	07-OCT-96	26-SEP-96 \$5H		(251384:100)
2		VOA/8240/04	S	COLD	07-OCT-96	26-SEP-96 109T		(251385:99 251386:98)
12183-008 TPH = DIESEL AND OIL.	B1216-BGS	Soil	12-SEP-96 14:00	17-SEP-96 09:00	14-OCT-96	FED EX	1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/04	S	COLD	07-OCT-96	26-SEP-96 \$5H		(251387:100)
2		VOA/8240/04	S	COLD	07-OCT-96	26-SEP-96 109T		(251388:99 251389:98)
12183-009 TPH = DIESEL AND OIL.	B1216-S15-1	Soil	12-SEP-96 14:20	17-SEP-96 09:00	14-OCT-96	FED EX	1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/04	S	COLD	07-OCT-96	26-SEP-96 \$5H		(251390:100)
2		VOA/8240/04	S	COLD	07-OCT-96	26-SEP-96 109T		(251391:99 251392:98)
12183-010 TPH = DIESEL AND OIL.	B1216-S17-1	Soil	12-SEP-96 14:30	17-SEP-96 09:00	14-OCT-96	FED EX	1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/04	S	COLD	07-OCT-96	26-SEP-96 \$5H		(251393:100)
2		VOA/8240/04	S	COLD	07-OCT-96	26-SEP-96 109T		(251394:99 251395:98)
12183-011 TPH = DIESEL AND OIL.	B1216-BQ1	Soil	12-SEP-96 15:05	17-SEP-96 09:00	14-OCT-96	FED EX	1	Screening not Required
1 GN - Glass Jar-120ML		TPH/8015/04	S	COLD	07-OCT-96	26-SEP-96 \$5H		(251396:100)
		VOA/8240/04	S	COLD	07-OCT-96	26-SEP-96 109T		(251397:99 251398:98)
12183-012 TRIP BLANK	96SEW0911-2	Water	11-SEP-96 07:00	17-SEP-96 09:00	14-OCT-96	FED EX	1	Screening not Required
VI - Vial-40ml		VOA/8240/04	S	COLD	07-OCT-96	25-SEP-96 109T		(251399:100)

3*=Sample has not been rad screened.

?2H I P P I N G S Y S T E M *****

Run Date: 9/16/1996 MATERIALS/EQUIPMENT MOVEMENT
Run Time: 11:28 REQUEST
EFF. Date: 9/16/1996

Page 1

NON HAZARDOUS
Request #: NTS 057089 Movement to a non BN location

From: CASTANEDA, C
ORGN/MS: F140 / NTS273
BLDG/RM: 650 141
PHONE: 295-7884

To: QUANTERRA
13715 RIDER TRAIL NORTH

EARTH CITY
MO 63045
ALLEN FIELD
(314)298-8566

Item	PROP #	Serial #	QTY	U/M	ACCT	Job/ISO/ACT	ORGN
1			56	EA	6311	A9K3SMP2	E110
SOIL SAMPLES Not a Hazardous Material							

Creation Date:	9/16/1996	Transmit Date:	9/16/1996
Required at DESTN:	9/17/1996	Return Date:	
Reason for Shipment:	LAB ANALYSIS P.O. #2668		
Method of Shipment:	Air Service Requested/Hand Carry To Whse		
Stores Request NBR:		OLD PO:	
Warehouse Response:		PR:	
WHSE Response date:		PO:	
Delivery Date:		BUYER:	
Number of pieces:	1	Buyer Approval Date:	
Date Shipped:		RMA #	

Department managers signature required
on AIR SHIPMENTS and TRANSFERS.

	_____	Date	_____
Released By	<u>CS Castaneda</u>	Date	<u>09/16/96</u>
Received By	_____	Date	_____

***** END OF REQUEST *****

Federal Express Tracking #0981060931

63 lbs.

000332

BW4 AF
01/17/96
10:30
KA

Login No.: 12183

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: Reeco

Date: 9-17-96 Time: 0900

Project No: 625.01

Initiated by: K. Albar

Shipper/No: Fed Ex 098 1060931

RFA/COC Numbers: 12357

Condition/Variance (Check all that apply):

1. ☒ Sample received <u>broken</u> /leaking.	8. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
2. ☐ Sample received without proper preservative. ☐ Cooler temperature not within $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$ Record temperature: _____ ☐ pH _____ ☐ other: _____	9. ☐ All coolers on airbill not received with shipment.
3. ☐ Sample received in improper container.	10. ☐ Other (explain below): _____
4. ☐ Sample received without proper paperwork. Explain: _____	
5. ☒ Paperwork received without sample.	
6. ☐ No sample ID on sample container.	
7. ☐ Custody tape disturbed/broken/missing.	

☒ No variances were noted during sample receipt.

Cooler Temperature Upon Receipt: 6°C

Notes: RECEIVED ONLY 1X 120ml FOR SAMPLE # B1216-S1343
(TPH oil only) NO VOA Samples Received
SAMPLE B1216-S15-1 TPH Diesel WAS RECEIVED BROKEN.

Corrective Action:

- ☐ Client's Name: _____ Informed verbally on: _____ By: _____
- ☐ Client's Name: _____ Informed in writing on: _____ By: _____
- ☐ Sample(s) processed "as is". _____
- ☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: (or designate) [Signature] Date: 9-17-96

Project Management Review: _____ Date: _____

DATE: 9-12-96 NO. A 5853

Reynolds Electrical & Engineering Co., Inc.
Radiological Control Department-Ramatrol

Material Clearance

MONITOR: McCloskey
ORGANIZATION: BN RP
SURVEY LOCATION: A-12
FROM: A-12
TO: A-23

☒ UNRESTRICTED

☐ OFF-SITE

☒ ON-SITE

☐ SALVAGE

☐ EXCESS

THIS MATERIAL HAS BEEN SURVEYED FOR
RADIOACTIVITY AND MEETS DOE
STANDARDS FOR RELEASE TO PUBLIC
USE

INITIAL

CFM

☐ CONTROLLED

DESCRIPTION: _____

23 MISC Soil
samples

REMARKS: Exp - 9-15-96

DATE: 9-12-96 NO. A 5847

Reynolds Electrical & Engineering Co., Inc.
Radiological Control Department-Ramatrol

Material Clearance

MONITOR: Mc Closkey

ORGANIZATION: BN RP

SURVEY LOCATION: A-12

FROM: A-12

TO: A-23

☒ UNRESTRICTED

☒ OFF-SITE

☐ ON-SITE

☐ SALVAGE

☐ EXCESS

THIS MATERIAL HAS BEEN SURVEYED FOR
RADIOACTIVITY AND MEETS DOE
STANDARDS FOR RELEASE TO PUBLIC
USE

INITIAL

GJR

☐ CONTROLLED

DESCRIPTION: _____

41 ea misc containers
of soil samples

REMARKS: Exp 9-16-96

ATTACHMENT D
A THROUGH K ANALYSIS

The following is the Nevada Administrative Code "A through K" Analysis which addresses primary factors affecting the selection of closure and post closure strategies for the Area 12 steam cleaning discharge area.

Federal and State Regulatory requirements - Federal requirements are addressed under the Code of Federal Regulations (40 CFR 261.31) Resource Conservation and Recovery Act (RCRA) Hazardous Wastes From Non-Specific Sources. The State regulatory requirement affecting the closure of the discharge area is the requirement of the Nevada Administrative Code 459.9973, Action by Division When Excessive Petroleum Is Present in Soil, referred to as "A through K".

Depth of groundwater (A) - Water for the site is obtained from Well Number 8 (the closest well), which is located approximately 12 kilometers (7.5 miles) west of the site. Based on available hydrogeologic data (RSN, 1986), the groundwater level at Well Number 8 is estimated to be at a depth of 326 meters (1,068 feet) below ground surface (bgs).

Distance to irrigation or drinking water wells (B) - refer to "Depth of groundwater" section above.

Type of soil (C) - Soils identified at the site are typical of alluvial soils and predominantly consist of silty sand with fine to coarse gravels. Soils are light to medium brown in color, and dry. Cobbles and boulders are visible at the surface and were encountered in each of the Geoprobe® boreholes sampled on September 11 and September 12, 1996.

Annual precipitation (D) - Annual rainfall over a five-year period (1990 to 1995) was provided by the NTS weather service. The average, over the five-year period, for the Area 12, Rainier Mesa region was 32.4 centimeters (cm) (12.75 inches) per year.

Type of regulated substance released (E) - Volatile organic compounds (VOCs) and total petroleum hydrocarbons (TPH) as oil are the identified constituents of concern (COCs). The VOCs identified in the Phase 2 Investigation, along with the maximum concentrations detected, are; methylene chloride at 0.056 milligrams per kilogram (mg/kg), acetone at 1.2 mg/kg, 2-butanone (MEK) at 0.550 mg/kg, 4-methyl-2-pentanone (MIBK) at 0.061 mg/kg, 2-hexanone at 0.360 mg/kg, and toluene at 0.024 mg/kg. Based on the knowledge that solvents were used at the site, the acetone, MEK, and MIBK are considered to be "F Listed" wastes and are regulated under RCRA. VOCs were identified with similar concentrations in the Preliminary Phase 1 Investigation. The detection of methylene chloride and toluene are attributed to laboratory contamination as they were identified in the associated method blanks. The sample locations and analytical concentrations of the impacted areas are shown on Figures 6 and 7 within the characterization report. TPH as oil was detected in the Phase 1 and Phase 2 site investigations at concentrations ranging from nondetected (<25 mg/kg) to 8,600 mg/kg.

Extent of contamination (F) - The estimated volume of VOC contaminated soil is approximately 19 cubic meters (25 cubic yards). This estimate is based on the dimensions of three sample areas identified as impacted by VOCs. The combined area dimensions are estimated at 4.6 meters by 4.6 meters (15 feet by 15 feet) by a maximum depth of 0.9 meters (3.0 feet).

The extent of TPH as oil contamination is estimated based upon the variable surface dimensions of the discolored surface flow areas impacted from the effluent discharge line and the overspill area of the sand/oil interceptor. For estimation purposes the depth of impact was averaged at a thickness of 0.9 meters (3.0 feet). The extent of impact in the effluent discharge area is estimated at 3,041 cubic meters (3,978 cubic yards). The extent of TPH impact in the sand/oil interceptor overspill area is estimated at 561 cubic meters (733 cubic yards). Although the lateral extent of contamination covers a large area, the vertical extent is relatively limited based upon the analytical results and consideration of the fact that discharges may have occurred over a 25 year period. The sample locations and analytical concentrations of the impacted areas are shown on Figures 1 and 2.

Present and potential land use (G) - Physical site boundaries include the Rainier Mesa Road to the south, a helicopter pad to the east, a natural erosional channel (arroyo) to the north, and a topographic high to the west. Surface flow from, the sand/oil interceptor, the steam cleaning effluent discharge pipe, and other Fleet Maintenance Operations appears to follow the native topography which slopes predominantly to the east and northeast.

The area immediately to the east of the sand/oil interceptor does not contain any permanent structures and was previously used as a vehicle parking/storage area. The discharge pipe effluent area is not or was not used for any structural development. The area remains as a natural drainage pathway towards a down gradient arroyo. The only modification to the area is a soil berm constructed in the past to prevent the effluent from discharging into the arroyo. Vegetation continues to grow within the discharge area with exception of a discolored section in vicinity of Sample Area B1216-S9.

The reduced mission at the NTS resulted in the closure of Building 12-16 on January 4, 1993. The reduced mission also resulted in the closure of most facilities and services once available in the Area 12 Camp. However, Building 12-16 is still in place and is capable of becoming operational if needed, but it is highly unlikely that the area impacted by the discharge from the building would be developed for any future use.

Preferred routes of migration/exposure pathways of concern (H) - Surface flow east of Building 12-16 appears to follow the native topography which slopes predominantly to the east and northeast.

The exposure pathways of concern are through ingestion, inhalation, and dermal contact. The exposure pathways would likely be due to dust or volatile emissions from the exposed impacted area. However, due to the heavy hydrocarbons present and the surrounding vegetation, the hydrocarbon impacted soil does not readily become airborne in windy conditions. The most likely potential for ingestion or inhalation would be during excavation activities. Excavation for remedial activities will be completed following an approved health and safety plan. It is recommended that any subsequent excavation or soil disturbance be mitigated by placing "T Post" fencing with sign postings identifying the hydrocarbon impacted area. The fencing and sign postings have been recommended to be placed in the area east of the discharge line and west of the soil berm.

Infiltration to groundwater, located at approximately 326 meters (1,068 feet) bgs is not a likely pathway of concern. Exposure through dermal contact is potential if an individual disturbs the upper impacted soils without protective gloves. The VOC compounds identified are at very small concentrations and would not pose a threat to human health, the local animal population, or the environment. In addition, the VOC impacted soil has been recommended for removal due to its constituents being RCRA "F Listed" wastes. Therefore, once removed, exposure from the VOCs is not an issue of concern.

Location of structures or impediments (I) - There are no permanent structures on the discharge area. Only a temporary sandbag barrier exists around the discharge line and a soil berm preventing additional discharge from running off into the down gradient arroyo. The sandbag berm is recommended to be removed as part of the site closure activity and used in area grading and backfill. The soil berm should remain in place to prevent lateral migration of the hydrocarbon impacted soil into the arroyo. The only fixed structures in the vicinity are Building 12-16 to the west and a helicopter pad to the east, both are currently not in use but could be utilized in the future.

Potential for hazard related to fire, vapor, or explosion (J) - The potential hazard related to fire is from the natural brush growth which becomes a fire hazard during the drier months (as in most areas of the NTS). Due to the nature of the heavy oil hydrocarbons, the potential for an increased chance for fire, vapor ignition, or explosion at the site is extremely low. In addition, since the depth of hydrocarbon impact is very shallow, the chance for the accumulation of vapors does not exist.

Other factors specific to the site (K) - The following are additional factors specific to the site which should be considered in the evaluation for closure options;

- The site is located in the northern portion of federal land occupied by the NTS and is approximately 35.5 kilometers (22 miles) from public land.

- The discharge area is in an undeveloped section of the predominantly vacant Area 12 Camp. The likelihood that future development should be required to occur at the site is very minimal.
- It is recommended to fence the hydrocarbon impacted area east of the effluent discharge line and west of the soil berm. Sign postings are also recommended to be placed identifying the area as having hydrocarbon impacted soils.
- The soil berm, located east of the effluent line, mitigates surface flow discharge into the downgradient arroyo.
- The discharge effluent has marginally inhibited vegetation growth in limited areas of the site (Sample Area B1216-S9). As the hydrocarbons degrade naturally over time, vegetation growth would be expected to return to normal. Based on field observations, it could not be determined if the impacted soils have affected the local animal population. Very few rodents or burrows were observed in the vicinity of impacted and nonimpacted areas. Wild horses and deer were not observed but are known to inhabit the area. Fencing will be placed in an effort to deter the grazing of horses and deer in the area.

ATTACHMENT E

RINSATE WASTE MANIFEST

Manifest
Document
No.:

9170116

Bechtel Nevada

Page 1 of 1

NTS ONSITE WASTE TRANSPORT MANIFEST

1. Generator's Name, Organization, and Location: (If Bechtel Nevada, include department no.) (Please Print) JERRY BONAI REMEDIAL PROJECTS, E110 AREA 12, FLEET OPS, NTS Generator's Phone: (702) 295-7341		2. Date of Accumulation or Transport: DEC 3, 1996		
3.a Transporter Name: (Please Print) BN/WMP/NWO DARYL DENISON		3.b Vehicle I.D. No.: 83832		
4. U.S. D.O.T. Description. Include: EPA Waste Code and Waste Stream; and Package Identification Numbers. H.C.S. HM HAZARDOUS WASTE LIQUIDS, 9, NAB082, PGIII (RINSE WATER W/ <1 ppm MEK, F005) 12-0592-052-XX-96-001		5. Containers No. Type	6. Total Quantity	7. Unit Wt./Vol.
a	XX	1 DF	1	G
b				
c				
d				
Use continuation pages for additional items, as necessary.				
8. Special Handling Instructions and Additional Information: ER # 295-6400 A) 97120 BRADY # 592-508				
9. Generator's Certification: I hereby certify that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for highway transport according to applicable regulations. I further certify that the contents information above is true and correct to the best of my knowledge through process knowledge or laboratory analysis. I certify that, where applicable, I have appropriately segregated wastes and have made a good-faith effort to minimize the amount of waste generated at work locations under my purview.				
10. Generator's Signature:		Date: 12-3-96		
11. Transporter's Signature:		Date: 12-3-96		
12. Discrepancy Indication:				
13. Disposal/Accumulation Site Signature (Acknowledges acceptance of waste)		Date: 12-3-96		

Bechtel Nevada

HAZARDOUS WASTE CERTIFICATION

97016

Associated Onsite Manifest

1. Is this waste considered abandoned? ☐ Yes ☒ No
2. Has any of the waste listed on the attached manifest been used or stored in a Controlled Waste Management Area (CWMA) as defined below?

A CWMA is "an area in which the potential exists for contamination due to presence of unencapsulated or unconfined radioactive material or an area that is exposed to beams or other sources of particles capable of causing activation, i.e. neutrons, protons, etc."
☒ Yes ☐ No
3. Has any of the waste listed on the attached manifest been used or stored in any other posted or suspected radiological control area? ☐ Yes ☒ No
4. Has any of the waste listed on the attached manifest commingled with any radioactive mixed waste? ☐ Yes ☒ No
5. Has any of the waste listed on the attached manifest commingled with loose radioactive contamination? ☐ Yes ☒ No
6. Has any of the waste listed on the attached manifest commingled with fixed radioactive contamination? ☐ Yes ☒ No

1. Generator able to certify waste as nonradioactive:

Based upon the knowledge of the origin, storage, use and potential exposure of the waste, I CERTIFY THAT **NO RADIOACTIVITY HAS BEEN ADDED TO THE WASTE LISTED ON THE ATTACHED MANIFEST.**

[Signature]
Signature of Certifier

12-3-96
Date

2. To be completed by Waste Management personnel only:

☒ No further analysis required, all process knowledge is present and documented, and the waste listed on the attached manifest is fully characterized.

[Signature]
Signature of Waste Management Specialist

11-25-96
Date

IF ANY OF THE ABOVE QUESTIONS ARE ANSWERED "YES," THE WASTE WILL REQUIRE ONE OF THE FOLLOWING:

1. DOCUMENTATION DEMONSTRATING THAT NO POTENTIAL FOR INTERNAL CONTAMINATION EXISTS (PROCESS KNOWLEDGE); OR
2. RESULTS OF RADIOANALYSES PERFORMED ON THE WASTE.

* SEE ATTACHED ANALYTICAL REPORTS

DISTRIBUTION LIST

DISTRIBUTION LIST

Copies

U. S. Department of Energy, Nevada Operations Office

P. O. Box 98518

Las Vegas, NV 89193-8518

J. Appenzeller-Wing

1

C. W. Barrow

6

K. A. Hoar

1

Public Reading Room

1

Technical Information Resource Center

1

U.S. Department of Energy

2

Office of Scientific and Technical Information

175 Oak Ridge Turnpike

P.O. Box 62

Oak Ridge, Tennessee 37831

Bechtel Nevada

P. O. Box 98521

Las Vegas, NV 89193-8521

J. F. Bonn

1

R. L. Dodge

1

J. R. Kannard

1

D. D. Madsen

1

S. J. Nacht

1

M. D. Shotton

1

S. R. Weil

1