U.S. Army

Final Report for Interim Remedial Action at Solid Waste Management Unit 39 Underground Storage Tanks 59 and 60 Fort Stewart, Georgia

IMA

June 2007

Submitted to:
Fort Stewart Directorate of Public Works
Environmental and Natural Resources Division
Environmental Branch

Submitted by:
U.S. Army Corps of Engineers
Savannah District

Prepared by:
Solutions To Environmental Problems, Inc.
1006 Floyd Culler Court
Oak Ridge, Tennessee

Contract No. W912HN-04-D-0019
Delivery Order No. 0011

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for Interim Remedial Action
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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CLP	Contract Laboratory Program
DNR	Department of Natural Resources
DRO	diesel range organic
FSMR	Fort Stewart Military Reservation
ft	foot/feet
GA	Georgia
GDNR	Georgia Department of Natural Resources
GRO	gasoline range organic
GUST	Georgia Underground Storage Tank (regulations)
HOT	heating oil tank
IDW	investigation derived waste
IRA	interim remedial action
J	estimated value
LCS	laboratory control sample
mg/kg	milligram per kilogram
MS	matrix spike
MTBE	methyl tertbutyl ether
NA	not applicable
NL	not listed
NRC	no regulatory criteria
ORC®	Oxygen Release Compound®
PAH	polynuclear aromatic hydrocarbon
ppm	parts per million
psi	pounds per square-inch
RPD	relative percent difference
SAIC	Science Applications International Corporation
STEP	Solutions To Environmental Problems, Inc.
STL	soil threshold level
SWMU	solid waste management unit
TPH	total petroleum hydrocarbons
U	not detected
µg/kg	micrograms per kilogram
USEPA	U.S. Environmental Protection Agency
USACE	U.S. Army Corps of Engineers
UST	underground storage tank
VOC	volatile organic compound

EXECUTIVE SUMMARY

Solutions To Environmental Problems, Inc. (STEP), under contract with the U.S. Army Corps of Engineers, Savannah District, has completed the interim remedial action (IRA) at Former Underground Storage Tanks (USTs) 59 and 60 within Solid Waste Management Unit (SWMU) 39 at Fort Stewart, Georgia. This work was accomplished in accordance with *Final Work Plan for Interim Removal Activities at Solid Waste Management Unit 39, Underground Storage Tanks 59 and 60, Fort Stewart, Georgia* (STEP, January 2007).

SWMU 39 is located in the southwest portion of the garrison area near Building 1160 (Direct Support Maintenance Facility) near the intersection of Stephen Street and West 4th Street. Two former USTs (59 and 60) and their associated heating oil tanks were west of Building 1160 at the tracked vehicle maintenance platform, specifically Building 1161 at Fort Stewart, Georgia. The USTs have been removed; however, subsequent groundwater monitoring of wells near the former USTs has indicated that free-phased product is present in two monitoring wells (G4MW007 and G4MW013). It was decided to excavate the soil surrounding the two wells and install larger diameter pre-pack wells to aid in further remediation of the free product.

The two wells (G4MW007 and G4MW013) were removed by excavation. Concrete surrounding the wells was sized and removed, and the concrete debris was transported to and disposed at Sand Dollar Recycling in Savannah, Georgia. After the concrete was removed, a trackhoe was used to remove the soil to the dimensions required in the approved work plan and to the point at which groundwater was encountered. A sump was excavated to allow the water to collect. The water that accumulated in the sump exhibited an oily-sheen; therefore, it was pumped into 55-gallon drums, taken to the storage area behind the Fort Stewart Hazardous Waste Yard, characterized, and subsequently disposed at the Fort Stewart Industrial Wastewater treatment plant. All excavated soil and well materials were placed in plastic-lined, construction debris roll-off containers, characterized, and properly disposed.

The excavation sidewalls and pit bottom were sampled in accordance with the work plan. After the samples were obtained, STEP used a trackhoe to excavate to the depth required and two new pre-packed wells were installed to replace the excavated wells. Once the wells were installed, a mixture consisting of 1,000 pounds of Oxygen Release Compound® mixed with water was applied to the pit sidewalls and bottom. The pit was backfilled with #57 stone to within 12 inches of the top of the excavation. The remainder of the excavation was finished with concrete to match the surrounding area.

Soil samples obtained from the bottom and the sidewalls of the excavation were shipped to Empirical Laboratory in Nashville, Tennessee for analysis. These samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tertbutyl ether (MTBE), polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH) diesel range organics (DRO), and TPH gasoline range organics (GRO). The data were validated and all measurements required to satisfy the project quality control objectives (precision, accuracy, representativeness, comparability, and completeness) were met. The results of the BTEX and MTBE analyses for the samples from the floor and sidewalls showed the analytes were not detected in any of the samples. The PAH analysis of the samples from the pit bottom and sidewalls reported analyte concentrations that were either not detected or were less than the Georgia Underground Storage Tank (GUST) regulations, estimated laboratory detection limits. All samples reported concentrations of TPH DRO above the GUST-9 estimated laboratory detection limits.

As required in the approved work plan, STEP will collect one groundwater sample from each of the 25 wells at SWMU 39 on a semiannual basis for a period of one year (two sampling events). Within six months of completion of this IRA, STEP will develop the newly installed monitoring wells (Well G4MW007R and G4MW013R) and conduct the first semiannual monitoring event for the groundwater at SWMU 39. The second sampling event will be conducted approximately six months after the first sampling event is completed. The groundwater samples will be analyzed for BTEX and MTBE. Upon completion of the semiannual monitoring, STEP will prepare an annual progress report.

1. INTRODUCTION

Solutions To Environmental Problems, Inc. (STEP), under contract with the U.S. Army Corps of Engineers, Savannah District, has completed the interim remedial action (IRA) at Former Underground Storage Tanks (USTs) 59 and 60 within Solid Waste Management Unit (SWMU) 39 at Fort Stewart, Georgia. This work was accomplished in accordance with *Final Work Plan for Interim Removal Activities at Solid Waste Management Unit 39, Underground Storage Tanks 59 and 60, Fort Stewart, Georgia* (STEP, January 2007), hereinafter referred to as the work plan.

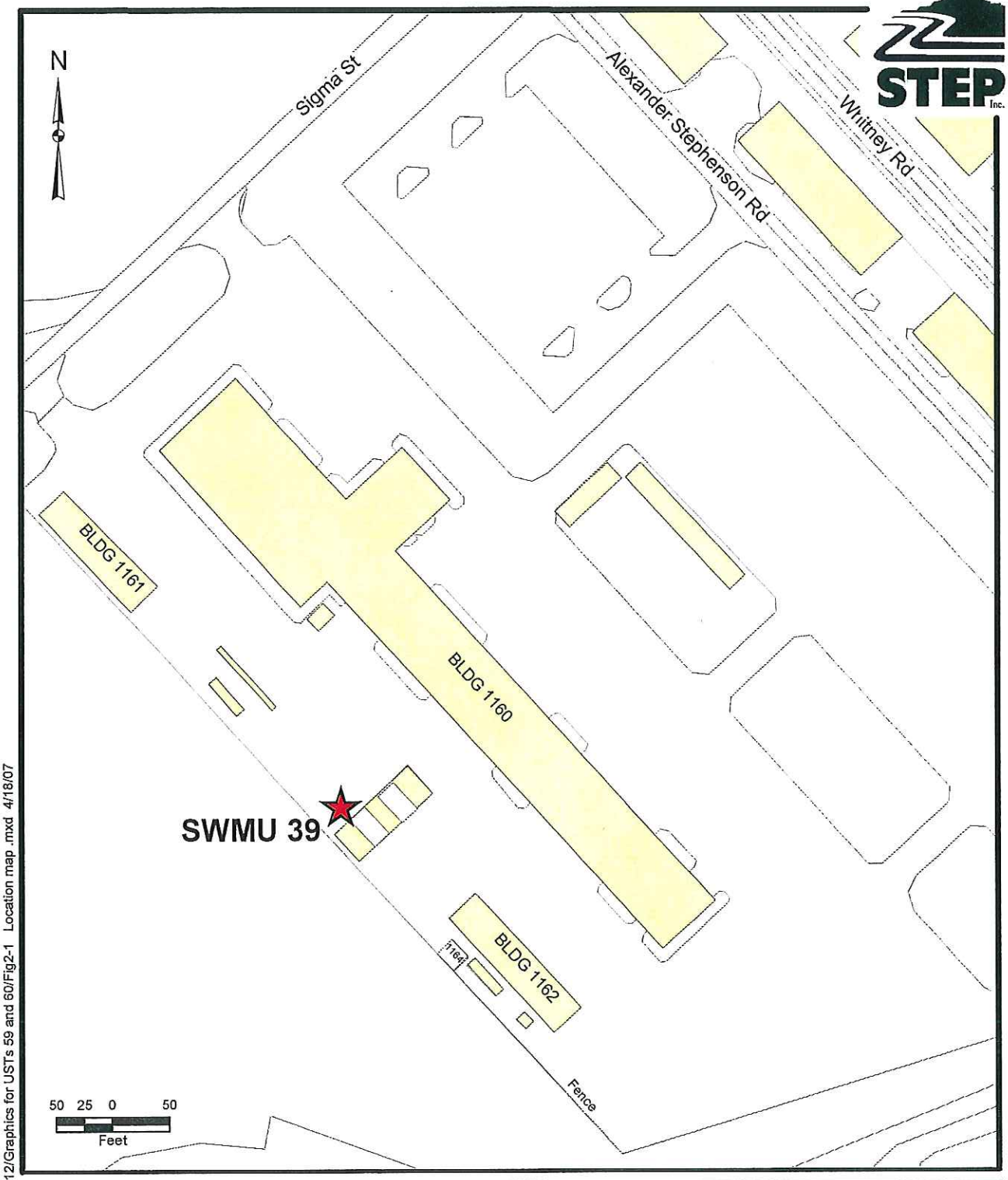
2. SITE BACKGROUND

The Fort Stewart Military Reservation (FSMR) is in portions of Liberty, Bryan, Long, Tattnall, and Evans counties in Georgia, approximately 40 miles southwest of the city of Savannah, Georgia. The garrison area of the FSMR is within Liberty County on the southern boundary of the reservation. The nearest city is Hinesville, approximately 1½ miles to the south.

SWMU 39 is located in the southwest portion of the garrison area near Building 1160 (Direct Support Maintenance Facility) near the intersection of Stephen Street and West 4th Street as shown on Figure 2-1. Two former USTs (59 and 60) and their associated heating oil tanks (HOTs) were west of Building 1160 at the tracked vehicle maintenance platform, specifically Building 1161 at Fort Stewart, Georgia. The USTs have been removed; however, subsequent groundwater monitoring at wells near the former USTs has indicated that free-phased product is present in two monitoring wells (G4MW007 and G4MW013); therefore, implementation of free product remediation was necessary.

3. SITE DESCRIPTION

SWMU 39 is a fenced facility with controlled access that was historically used as a vehicle wash/service rack. The HOTs provided fuel oil to a high-pressure washer at the platform. USTs 59 and 60 were non-regulated flow-through vessels associated with the M60 maintenance platforms and were rarely used. Wells G4MW007 and G4MW013 (See Figure 3-1), which are associated with former USTs 59 and 60, have consistently been found to contain free product. A corrective measures study completed in December 2005 recommended a combination of free product recovery, excavation, and monitored natural attenuation to protect human health and the environment and reduce contaminant levels to below



LEGEND

Source: Ft. Stewart GIS
Job: Draft Report Interim Removal Activities at SWMU 39 USTs 59 and 60 Fort Stewart, Georgia

Figure 2-1 Location Map SWMU 39

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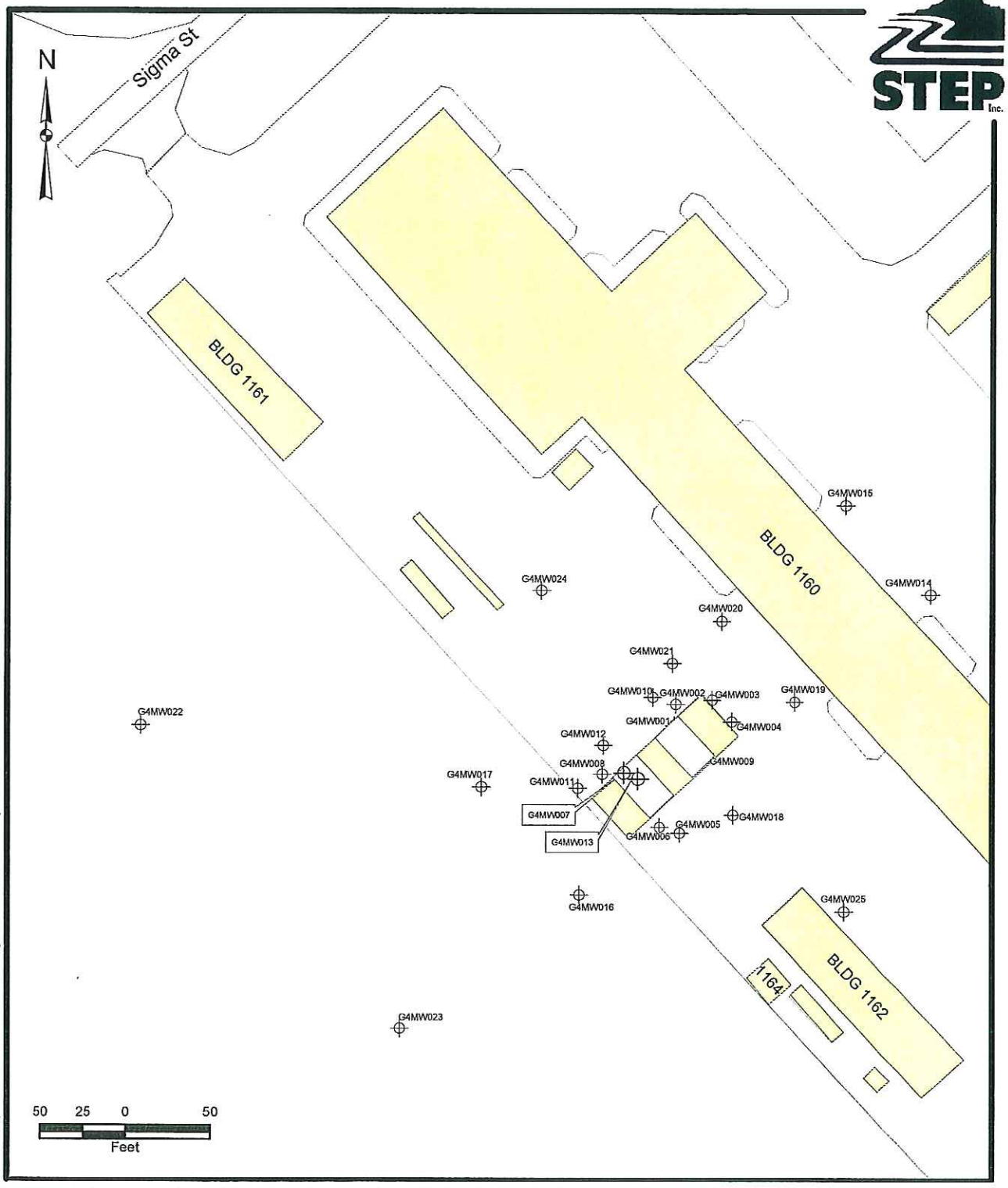
113-131 113-012

05/29/07



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Monitoring Well

Source: Ft. Stewart GIS
Job: Interim Removal Action
Work Plan for SWMU 39
Fort Stewart, Georgia

Figure 3-1 Site Location Map SWMU 39

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regulated levels [Final Resource Conservation and Recovery Act Corrective Measures Study for Solid Waste Management Unit 39 at Fort Stewart Georgia (STEP, December 2005)].

4. INTERIM REMEDIAL ACTION

STEP performed the following tasks for the IRA at the SWMU 39 site.

- Removed monitoring wells G4MW007 and G4MW013
  - cut, removed, and disposed of concrete approximately 26 ft by 16 ft around the wells, and
  - excavated a 24 ft by 14 ft area surrounding the wells to a depth of 8 ft where groundwater was encountered;
- collected soil samples from the four walls of the excavation and the excavation floor;
- submitted the samples to a analytical laboratory for chemical analysis;
- applied Oxygen Release Compound® (ORC®) to the excavation floor and four side walls;
- installed two new the monitoring wells with pre-pack screen; and
- characterized and properly disposed the investigation derived waste (IDW).

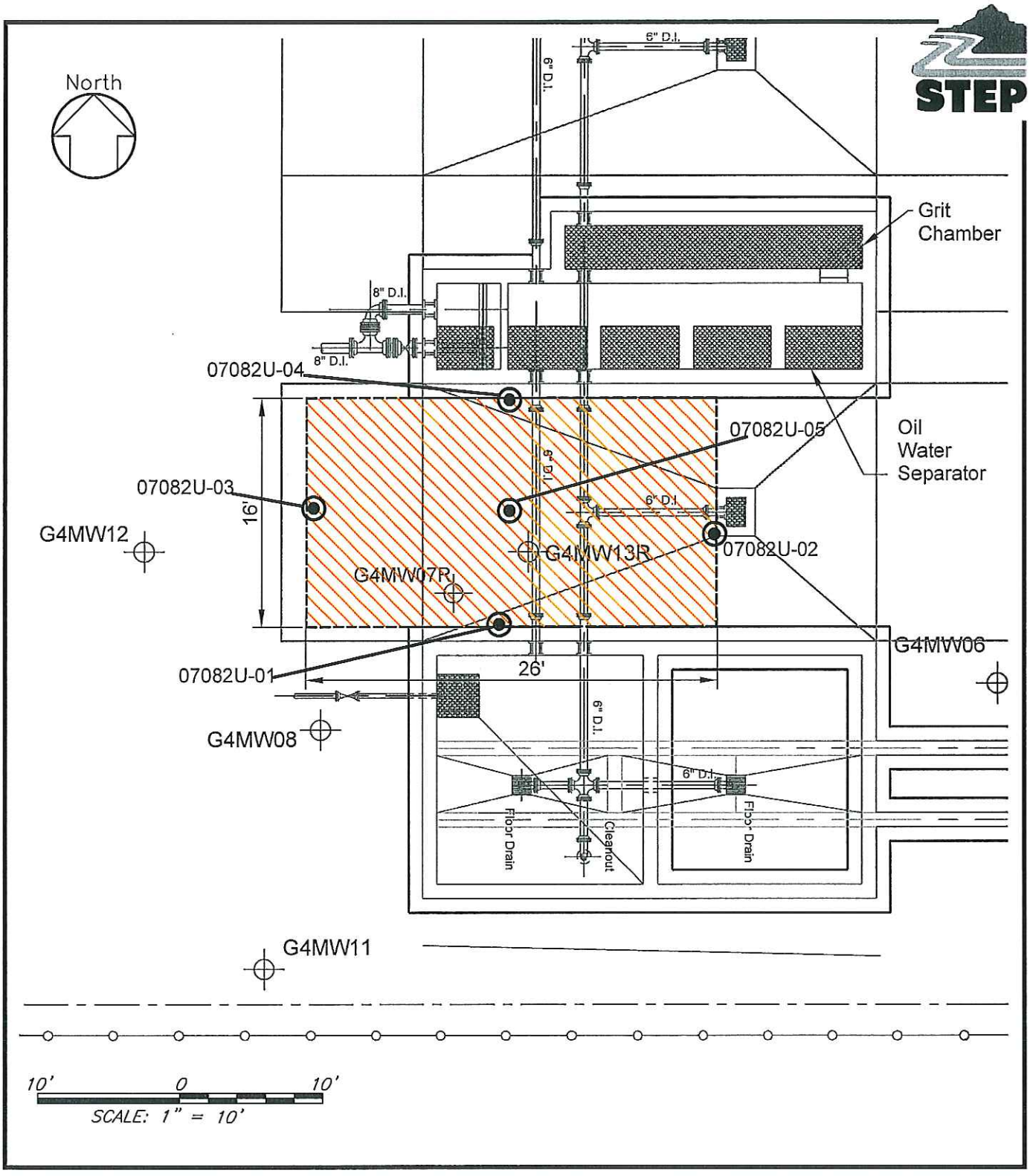
Before excavation began, Fort Stewart personnel obtained utility clearances for the site. Figure 4-1 shows the excavation area.

4.1 IRA AT SWMU 39

STEP conducted IRA field activities at SWMU 39 from 20 March 2007 through 11 April 2007. This IRA centered on two wells (G4MW007 and G4MW013) that have consistently reported free product.

Before excavation and removal activities began, STEP personnel used an interface probe to measure the depth of free product and the water level in each well. The depth measurement to the free product for well G4MW007 was 5.12 feet, and the water level was measured to be 10.0 feet bgs. This translated to a free product thickness of 4.88 feet in the 1-inch diameter well. The depth measurement to the free product for well G4MW013 was 5.10 feet, and the water level was measured to be 6.20 feet bgs. This translated to a free product thickness of 1.1 feet in the 2-inch diameter well.

The wells were in a developed area covered with concrete; therefore, concrete removal was required to gain access to the wells for removal. A 16-ft x 26-ft area centered on the wells was measured, marked, and saw-cut in accordance with the approved work plan. The concrete was sized and then removed with a



Legend			
Excavation Area		Fence	
07082U-01	Sample location	Monitoring Well	

Job Title: Interim Removal Action
Draft Report for SWMU 39
Fort Stewart, Georgia

Figure 4-1 Excavation Area for SWMU 39

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backhoe and skid steer loader. Concrete debris was placed in nearby roll-off containers and then transported to and disposed at Sand Dollar Recycling in Savannah, Georgia.

After the concrete was removed, a trackhoe proceeded to remove grayish black sandy soil down to a depth of 8 feet bgs, where the soil was a very moist, tannish-brown sand, indicating that groundwater had been encountered. The soil was placed in 30-yard construction roll-off containers that were lined with plastic sheeting. The two wells (G4MW007 and G4MW013) were removed by excavating the well riser, screen, sand, and bentonite seal. During excavation of the soil, stormwater piping draining the inlet grate on the east side of the excavation and piping that connected the oil-water separator with the abandoned vault on the south side of the excavation were uncovered. Care was taken not to disturb the piping encountered. Once the soil was removed to the dimensions required in the approved work plan and to the depth at which groundwater was encountered, a sump was excavated to allow the water to collect. Dimensions of the excavation were 24-ft long x 14 ft wide x 8-ft deep.

The water that accumulated in the sump exhibited an oily-sheen and was, therefore, pumped into 55-gallon drums. Approximately 300 gallons of water were removed from the excavation. This water was taken to the storage area behind the Fort Stewart Hazardous Waste Yard, pending sampling, analysis, and disposal. Once the water was removed, the excavation sidewalls and pit bottom were sampled in accordance with the work plan. Figure 4-1 shows the sampling locations. All excavated soil material was placed in plastic-lined, construction debris roll-off containers with the well materials. This material was considered IDW and was characterized and disposed accordingly.

Once the samples were obtained, STEP used a trackhoe to excavate to the depth required and then used a backhoe to excavate a sump near the center of the pit for installation of the new 4-inch diameter wells, well G4MW007R (that replaced G4MW007) and G4MW013R (that replaced G4MW013). The wells, constructed with a 10-foot long pre-packed well screens and riser pipes, were positioned inside the excavation using suitable supports, and then gravel backfill (#57 stone) was carefully placed around the wells to above the well screens. After the wells were installed, a total of 1,000 pounds of ORC® was mixed with water and applied to the pit sidewalls and bottom. The remaining backfill, also #57 stone, was placed to within 12 inches of the surface using the backhoe, and was compacted using the bucket of the backhoe. The remaining 12 inches of the excavation were filled with 3,000 psi strength concrete, reinforced with #5 reinforcing steel placed at 24 inches on-center each-way. The #5 rebar was also doweled into the surrounding concrete surface to a depth of 6 inches and glued with epoxy. Concrete was placed using a vibratory screed to remove the entrained air and achieve full placement around the

reinforcing steel. Finally, the concrete was finished to provide a surface to blend with the surrounding concrete.

Appendix A contains photographic documentation of the IRA activities at SWMU 39.

At the completion of installation, well G4MW007R had a total depth of 14.10 feet below the top of the concrete surface with a bottom cap, 10 feet of screen, and 3.74 feet of riser. The top of the well is an expandable locking cap, and the surface is finished with a flush-mount cover and bolted lid. The well was checked on 15 May 2007; depth to water was 6.27 feet bgs with no free product. The well installation diagram is shown in Figure 4-2.

Well G4MW013R had a total depth of 13.67 feet below the top of the concrete surface with a bottom cap, 10 feet of screen, and 3.13 feet of riser. The top of the well is an expandable locking cap, and the surface is finished with a flush-mount cover and bolted lid. The well was checked on 15 May 2007; depth to water was 6.33 feet bgs with no free product. The well installation diagram is shown in Figure 4-3.

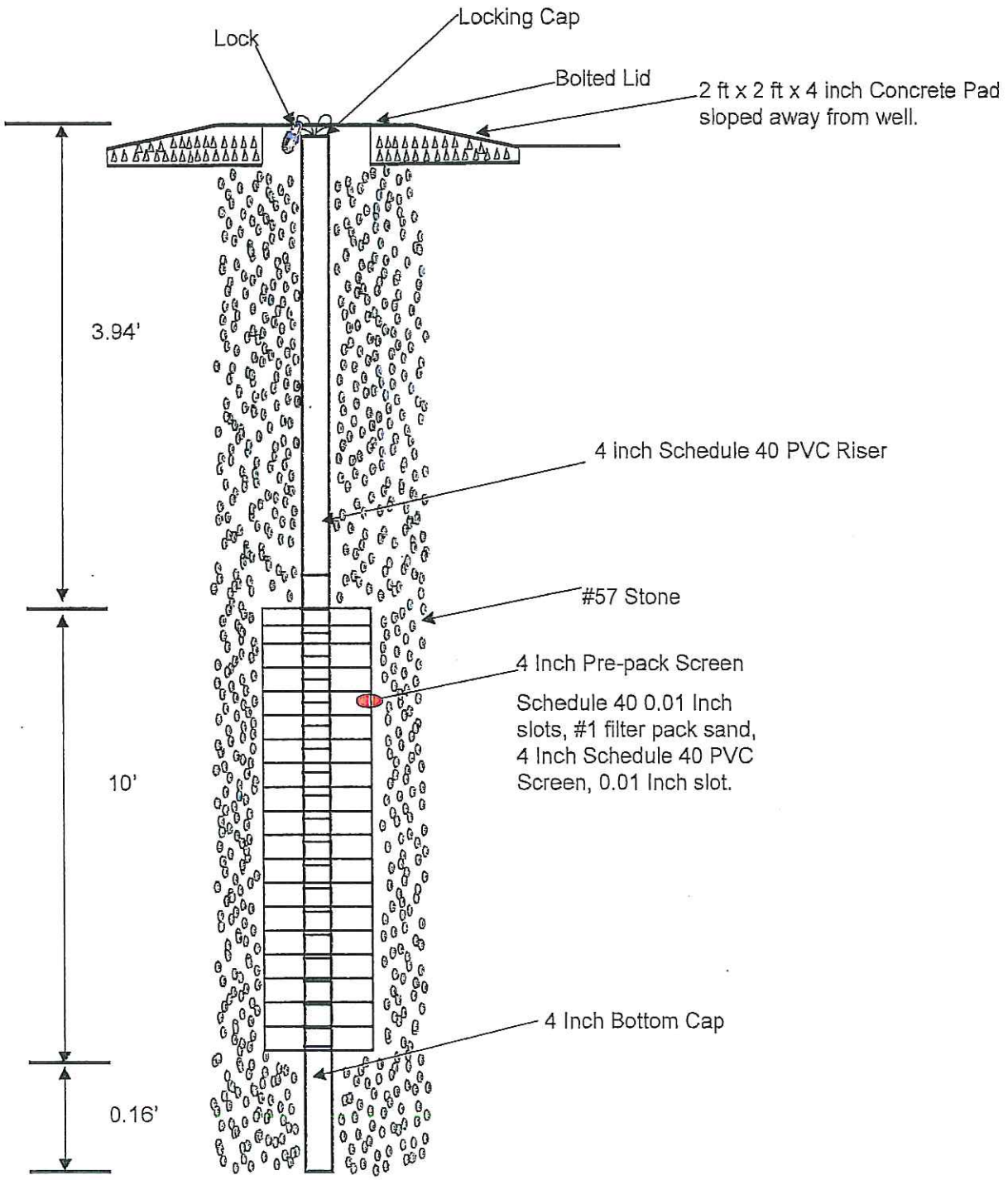
4.2 Disposal of Investigation Derived Waste

All IDW was properly disposed in accordance with state and federal regulations. The soil IDW was stored in four, plastic-lined, roll-off containers. The containers were covered with tarps, and each container was properly labeled. A sample was taken from each of the containers and composited. The sample (designated as 39 TCLP) was shipped to the analytical laboratory for analyses to determine whether it was hazardous or not. It was determined the soil was not hazardous; therefore, the containers were manifested by Public Works Business Center personnel, transported to Superior Landfill in Savannah, Georgia, and disposed. Copies of the waste manifests and waste characterization analytical Form 1s are provided in Appendix B.

The liquid IDW (water) collected from the sump in 55-gallon drums was sampled (Sample WSFTS-01) and characterized for disposal. Copies of the water sample characterization analyses are included in Appendix B. The water was characterized and found to be acceptable for disposal at the Industrial Wastewater Treatment plant at Fort Stewart; therefore, it was transported to and disposed at this facility.

Figure 4-2 Groundwater Monitoring Well

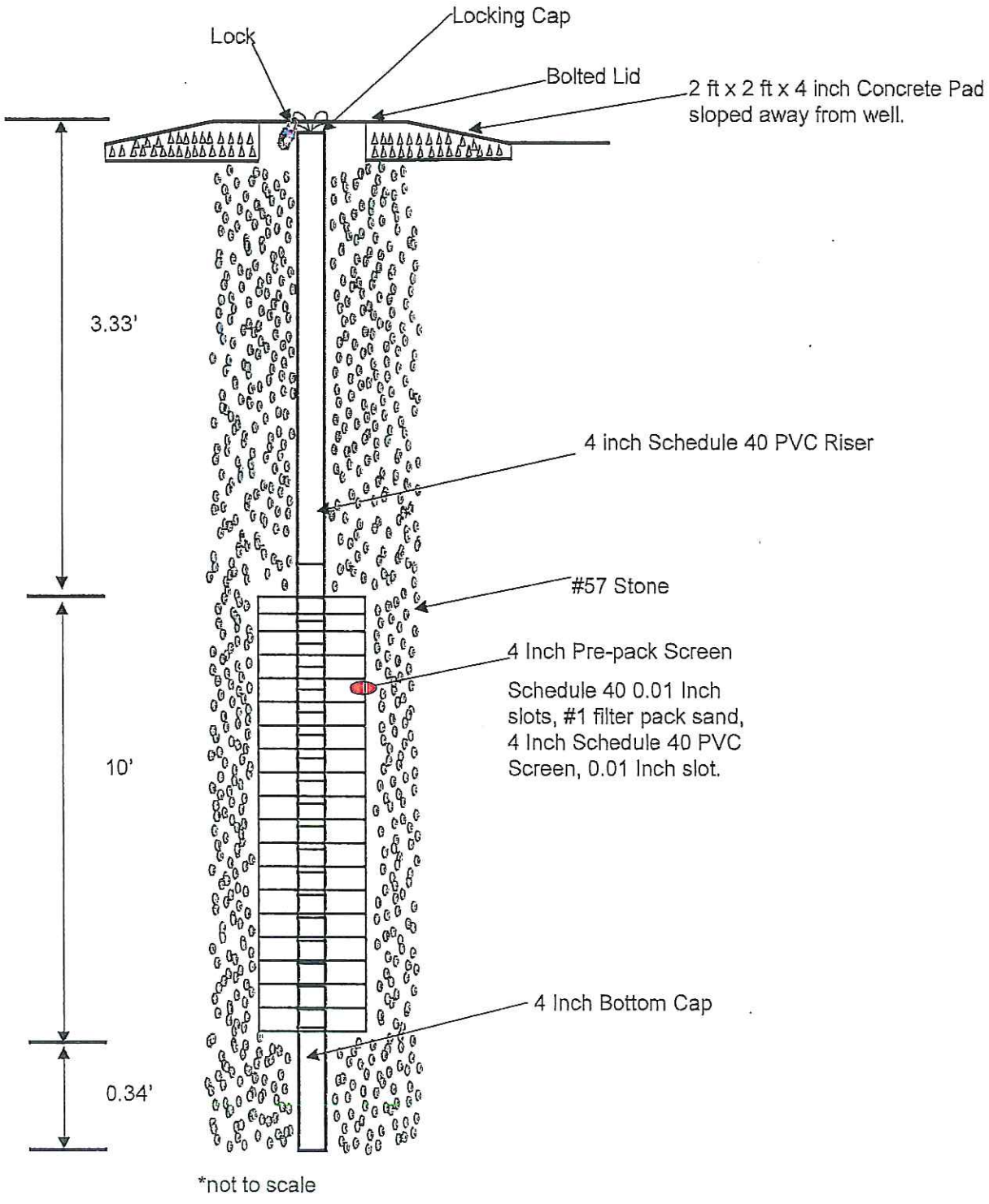
Well Number G4MW007R Date of Installation April 9, 2007



*not to scale

Figure 4-3 Groundwater Monitoring Well

Well Number G4MW013R Date of Installation April 10, 2007



*not to scale

4.3 SAMPLING EFFORTS

As stated previously, when excavation was complete, the bottom of the excavation and the excavation sidewalls were sampled. The samples were field screened using a photoionization detector, and the results of the field screening are presented in Table 4-1.

Table 4-1 Field Screening Results

Sample	Depth (ft-bgs)	Location	Field Screening Result Total VOCs (ppm)
07082U01	8.0	West sidewall	275
07082U02	8.0	South sidewall	425
07082U03	8.0	East sidewall	350
07082U04	8.0	North sidewall	260
07082U05	8.0	Pit Bottom	370

bgs = below ground surface
ft = feet
Field screening conducted with a photoionization detector
ppm = parts per million
VOC = volatile organic compound

The samples were shipped to Empirical Laboratory in Nashville, Tennessee for analysis. These samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tertbutyl ether (MTBE), polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), diesel range organics (DRO), and TPH gasoline range organics (GRO).

4.4 RESULTS OF CONFIRMATORY SAMPLING

4.4.1 Data Validation

DataChek, LLC validated the analytical results in accordance with the approved work plan. The following discussion summarizes their findings.

The sample data were validated following the logic identified in *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, October 1999) for all areas. For those analytical methods not addressed by the Contract Laboratory Program (CLP) guidelines, the validation was based on the method requirements and technical judgment, following the logic of the CLP validation guidelines.

The data validation of six soil samples from SWMU 39, Fort Stewart was completed in April 2007. Level III data validation was performed on all samples collected during the sampling activities. Empirical

Laboratories of Nashville, Tennessee, produced all the analytical data. Overall the data was of good quality, and all measurements required to satisfy the project quality control objectives (precision, accuracy, representativeness, comparability, and completeness) were met. Each of these measures and specific data qualifications are discussed below.

Precision: Precision is a measure of the agreement between duplicate sample measurements of the same quantity and is reflected in the relative percent difference (RPD) between spikes and the RPD for the field duplicate analysis. Precision for SWMU 39 was measured at 100.0 percent.

Accuracy: Accuracy is measured by the results from the recovery of known amounts of compounds or elements from laboratory control samples (LCS), matrix spikes (MS), and surrogate recoveries. The overall measure of accuracy for SWMU 39 was calculated by comparing the number of spike recoveries that exceeded the laboratory limits by the total number of LCS, MS and surrogate spikes. For all analyte groups, accuracy was measured at 92.7 percent.

Representativeness: The measures of representativeness – sample handling, analytical blank analysis, field blanks – were met for all sites. Designated analytical protocols were followed. Holding times were met for all analyses. Overall, no major problems were identified resulting from analytical failure.

Comparability: All data were analyzed using appropriate approved methods of analysis. All data results were reported correctly and in standard units

Completeness: Completeness is the amount of valid data compared to the planned amount and is expressed as a percent of the usable data points divided by the total number of analytes for each parameter analyzed. Out of a total of 150 data points, no data points were rejected, resulting in a completeness of 100 percent.

Several sample results for the semivolatile compounds were assigned "J" qualifiers by the laboratory, which is standard practice, because the concentrations were quantified between the method detection limit and the reporting limit. Due to the uncertainty associated with this region of quantification, the validation reviewer retained the "J" qualifiers assigned by the laboratory to indicate an estimated quantity.

The data validation qualifiers (Table 4-2) applied by the reviewer were recorded in a column adjacent and to the right of the laboratory results, as shown on the validated laboratory Form 1s in Appendix C.

Table 4-2 Data Qualifier Definitions

Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the reported sample quantification limit or the reported analyte value was not detected above 5x or 10x the level reported in laboratory or field blanks.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

A data validation reason code was also added to each of the reviewer's qualifiers to provide the user with a means to identify which results were qualified and the reason for the qualifiers. Data validation reason codes 7A, 10A and 16, defined below, were applied to the reviewer's qualifiers for this data.

- 7A – surrogate recoveries outside the control limits of the sample;
- 10A – Internal standards recovery is outside specified control limits; and
- 16 – multiple results available; alternate analysis preferred internal standards outside specified control limits.

4.4.2 Validated Analytical Results

The results of the BTEX/MTBE, PAH, and TPH analyses are presented in Tables 4-3, 4-4, and 4-5, respectively.

Table 4-3 Analytical Results for BTEX and MTBE Analyses, SWMU 39
Units are micrograms per kilogram (µg/kg)

Analyte	07082U01	07082U02	07082U02D[1]	07082U03	07082U04	07085U05	GUST Estimated Laboratory Detection Limits[2]	GA STL[3]
Benzene	0.44 U	0.50 U	0.47 U	0.49 U	0.47 U	0.47 U	5	8
Toluene	0.81 U	0.91 U	0.86 U	0.90 U	0.85 U	0.87 U	5	6,000
Ethylbenzene	0.71 U	0.79 U	0.75 U	0.78 U	0.74 U	0.76 U	5	10,000
Xylenes (total)	0.66 U	0.74 U	0.70 U	0.73 U	0.69 U	0.71 U	5	700,000
MTBE	0.30 U	0.34 U	0.32 U	0.34 U	0.32 U	0.32 U	NL	NL

[1]Sample 07082U02D was a duplicate sample of sample 07082U02

[2]Estimated laboratory detection limits are from Table 2, "Laboratory Estimated Quantitation Limits for Soil and Groundwater Samples" of GUST-9 (GA DNR, November 2001)

[3]Soil threshold levels from Table A, Column 2 (Average or Higher Groundwater Pollution Susceptibility Area) of Rules of Georgia Department of Natural Resources Environmental Protection Division, Chapter 391-3-15—Underground Storage Tank Management, Section 391-3-15.09, "Release Response and Corrective Action for UST Systems Containing Petroleum, Amended." (GA DNR, October 2001)

BTEX = benzene, toluene, ethylbenzene, and xylenes
DNR = Department of Natural Resources
GA = Georgia
GUST = Georgia Underground Storage Tank (regulations)
J = estimated due to quality control criteria
MTBE = methyl tertbutyl ether
NL = not listed
STL = soil threshold levels
U = not detected at method detection limit shown

The results of the BTEX and MTBE analyses for the samples from the floor and sidewalls show the analytes were not detected in any of the samples.

Table 4-4 Analytical Results for PAH Analyses, SWMU 39
Units are micrograms per kilogram (µg/kg)

Analyte	07082U01	07082U02	07082U02D[1]	07082U03	07082U04	07085U05	GUST Estimated Laboratory Detection Limits[2]	GA STL[3]
Acenaphthene	15 U	15 U	15 U	14 UJ	14 U	15 U	660	NA
Acenaphthylene	11 U	11 U	11 U	11 U	10 U	11 U	660	NA
Anthracene	15 U	16 U	15 U	15 U	140	15 U	660	NA
Benzo(a)anthracene	20 U	21 U	20 U	20 U	48 J	20 U	660	NA
Benzo(b)fluoranthene	18 U	18 U	18 U	25 J	60 J	18 U	660	NA
Benzo(k)fluoranthene	22 U	23 U	22 U	21UJ	59 J	22 U	660	NA
Benzo(g,h,i)perylene	40 U	40 U	40 U	38 UJ	38 U	39 U	660	NA
Benzo(a)pyrene	13 U	13 U	13 U	19 J	12 U	13 U	660	NA
Chrysene	17 U	18 U	17 U	21 J	41 J	17 U	660	NA
Dibenz(a,h)anthracene	34 U	35 U	34 U	33 UJ	32 U	34 U	660	NA
Fluoranthene	30 U	31 U	30 U	29 UJ	78 J	30 U	660	NA
Fluorene	15 U	15 U	15 U	14 UJ	14 U	14 U	660	NA
Indeno(1,2,3-cd)pyrene	26 U	26 U	26 U	25 UJ	24 U	26 U	660	NA
Naphthalene	18 U	19 J	19 J	33 J	40 J	70 J	660	NA
Phenanthrene	13 U	37 J	40 J	47 J	67 J	120	660	NA
Pyrene	22 U	23 UJ	22 U	22 J	56 J	33 J	660	NA
2-Methylnaphthalene	20 U	35 J	36 J	57 J	120	230	Not Listed	Not Listed
1-Methylnaphthalene	56 U	58 UJ	56 U	54 UJ	94 J	140	Not Listed	Not Listed

[1]Sample 07082U02D was a duplicate sample of sample 07082U02

[2]Estimated laboratory detection limits are from Table 2, "Laboratory Estimated Quantitation Limits for Soil and Groundwater Samples" of GUST-9 (GA DNR, November 2001)

[3]Soil threshold levels from Table A, Column 2 (Average or Higher Groundwater Pollution Susceptibility Area) of Rules of Georgia Department of Natural Resources Environmental Protection Division, Chapter 391-3-15—Underground Storage Tank Management, Section 391-3-15.09, "Release Response and Corrective Action for UST Systems Containing Petroleum, Amended." (GA DNR, October 2001)

DNR = Department of Natural Resources
GA = Georgia
GUST = Georgia Underground Storage Tank (regulations)
J = estimated due to quality control criteria
NA = Not applicable. The health-based threshold level exceeds the expected soil concentration under free product conditions.
PAH = polynuclear aromatic hydrocarbon
STL = soil threshold level
U = not detected at method detection limit shown

As Table 4-4 shows, the samples from the pit bottom and sidewalls all reported PAH analyte concentrations that were either not detected or were less than the GUST estimated laboratory detection limits.

Table 4-5 Analytical Results for TPH Analyses, SWMU 39
Units are milligrams per kilogram (mg/kg).

Analyte	07082U01	07082U02	07082U02D[1]	07082U03	07082U04	07085U05	GUST Estimated Laboratory Detection Limits[2]	GA STL[3]
TPH-DRO	5.7	14	14	8.3	370	520	10	NRC
TPH-GRO	2.8 U	2.7 U	2.7 U	2.7 U	2.7 U	2.8 U	10	NRC
Total TPH	5.7	14	14	8.3	370	520	10	NRC

[1]Sample 07082U02D was a duplicate sample of sample 07082U02

[2]Estimated laboratory detection limits are from Table 2, "Laboratory Estimated Quantitation Limits for Soil and Groundwater Samples" of GUST-9 (GA DNR, November 2001)

[3]Soil threshold levels from Table A, Column 2 (Average or Higher Groundwater Pollution Susceptibility Area) of Rules of Georgia Department of Natural Resources Environmental Protection Division, Chapter 391-3-15—Underground Storage Tank Management, Section 391-3-15.09, "Release Response and Corrective Action for UST Systems Containing Petroleum, amended." (GA DNR, October 2001)

DRO = diesel range organics
GA = Georgia
GRO = gasoline range organic
GUST = Georgia Underground Storage Tank (regulations)
J = estimated due to quality control criteria
NRC = no regulatory criteria
STL = soil threshold level
TPH = total petroleum hydrocarbon
U = not detected at method detection limit shown

As Table 4-5 shows, all samples reported concentrations of TPH DRO above the GUST-9 estimated laboratory detection limits.

5. CONCLUSIONS

The soil layer that potentially contained free product, which surrounded wells G4MW007 and G4MW013, has been removed; however, soil samples collected after the removal effort was complete reported concentrations of TPH DRO in the soil above the GUST estimated laboratory detection limit. Since the results of the BTEX and MTBE analyses showed that these analytes were not detected in any of the samples and the results of the PAH analysis reported analyte concentrations that were either not detected or were less than the GUST estimated laboratory detection limits, no further action relative to soils at this site is recommended. However, because TPH remains at concentrations above the GUST estimated laboratory detection limit, groundwater monitoring is recommended to determine if the groundwater is still impacted.

In accordance with the requirements contained in the approved work plan, STEP will collect one groundwater sample from each of the 25 wells at SWMU 39 on a semiannual basis for a period of one

year (two sampling events). Within six months of completion of this IRA, STEP will develop the newly installed monitoring wells (Well G4MW007R and G4MW013R) and conduct the first semiannual monitoring event for the groundwater at SWMU 39. The second sampling event will be conducted approximately six months after the first sampling event is completed. Groundwater samples collected during these monitoring events will be analyzed for BTEX and MTBE. Upon completion of the semiannual monitoring, STEP will prepare an annual progress report.

6. REFERENCES

USEPA (U.S. Environmental Protection Agency), October 1999. *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review.*

GA DNR (Georgia Department of Natural Resources, Environmental Protection Division), November 2001. *Underground Storage Tank (UST) Closure Guidance Document, Petroleum Releases.*

GA DNR, October 2001. "Release Response and Corrective Action for UST Systems Containing Petroleum. Amended." *Rules of the Georgia Department of Natural Resources* 391-3-15.09.

STEP (Solutions To Environmental Problems, Inc., December 2005. *Final Resource Conservation and Recovery Act Corrective Measures Study for Solid Waste Management Unit 39 at Fort Stewart Georgia.*

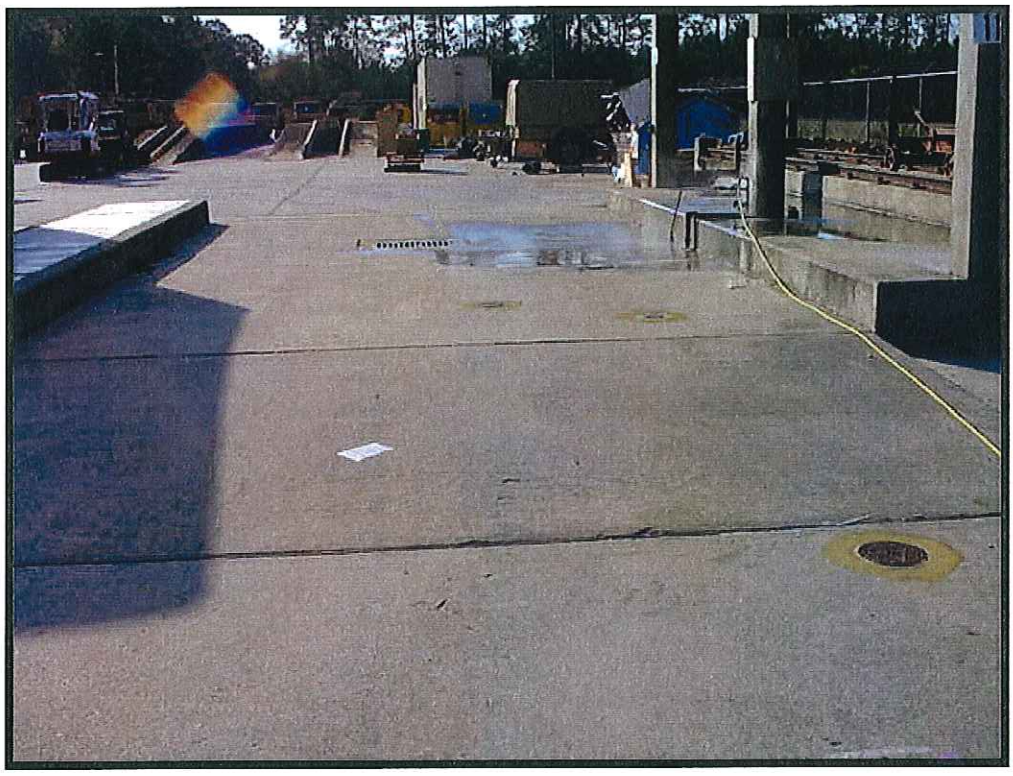
STEP, January 2007. *Final Work Plan for Interim Removal Activities at Solid Waste Management Unit 39, Underground Storage Tanks 59 and 60, Fort Stewart, Georgia.*

USACE (U.S. Army Corps of Engineers) Savannah District, January 2006. *Scope of Work, Interim Removal Activities at Underground Storage Tank 61, Facility ID #9-089104, Building 1161 and Underground Storage Tank 82, Facility ID #9-089029, Building 1281, and SWMU 39, Underground Storage Tanks 59 & 60 at Fort Stewart Georgia.*

APPENDIX A

Photographs

SWMU 39 – USTs 59 and 60



SWMU 39 site before activities

SWMU 39 site before activities

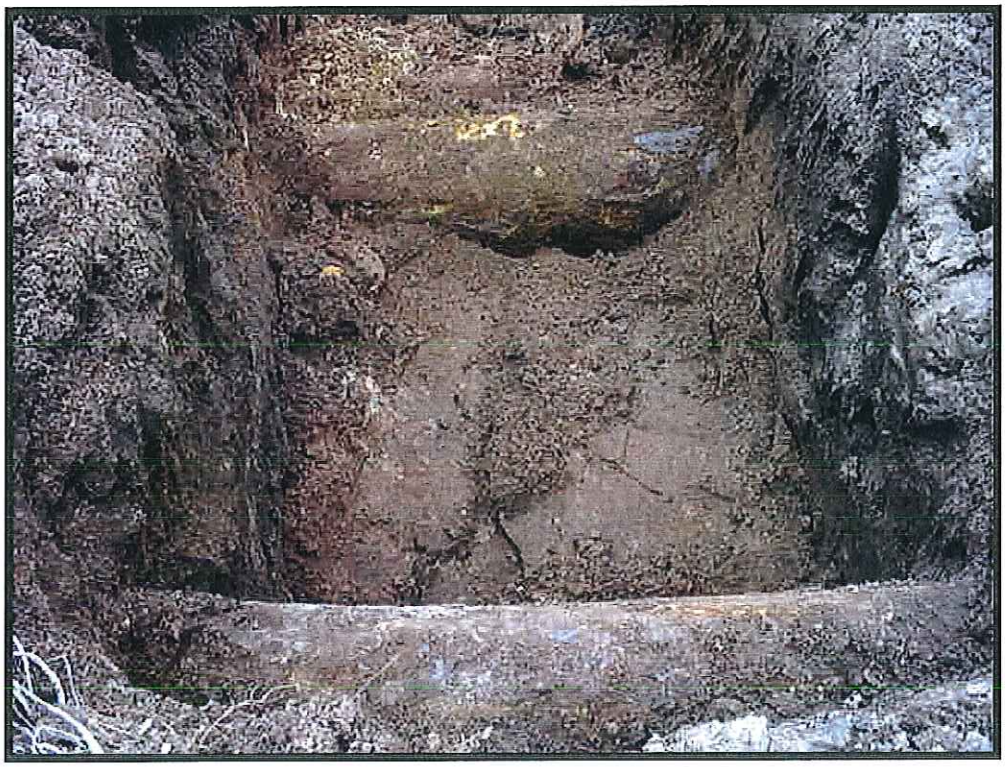
SWMU 39 – USTs 59 and 60

SWMU 39, cutting concrete

Staging concrete in construction "roll-off"

SWMU 39 – USTs 59 and 60

Concrete removed



Drain pipes exposed

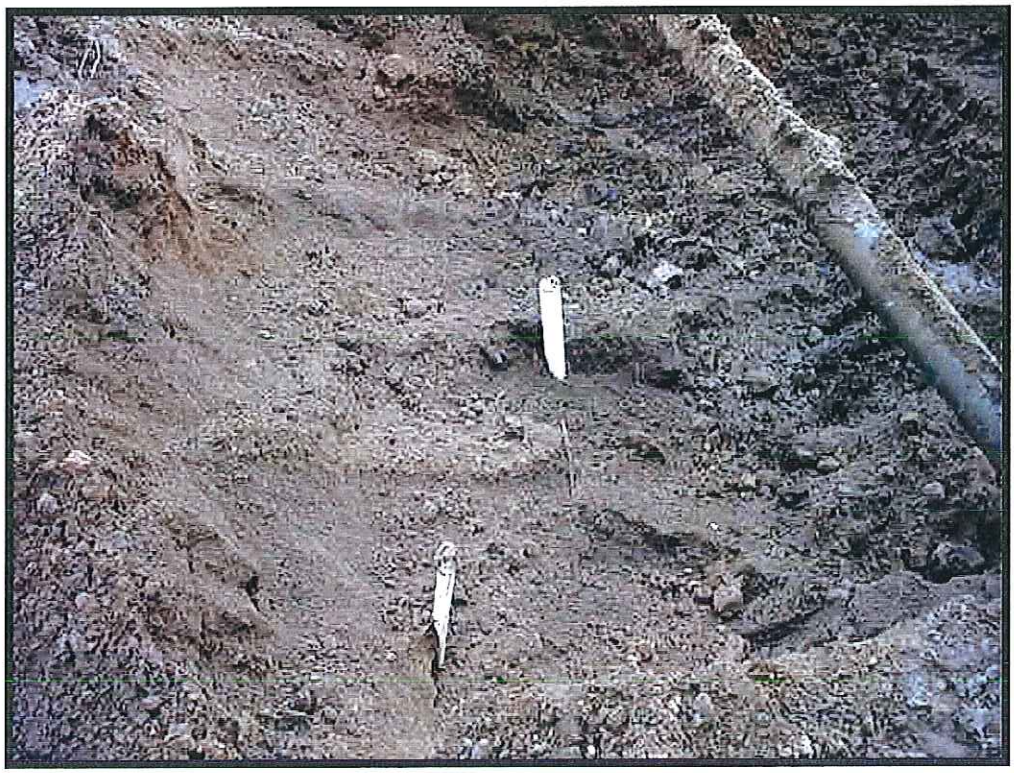
SWMU 39 – USTs 59 and 60

"Roll-off" secured/staged

Temporary supports for drain pipes

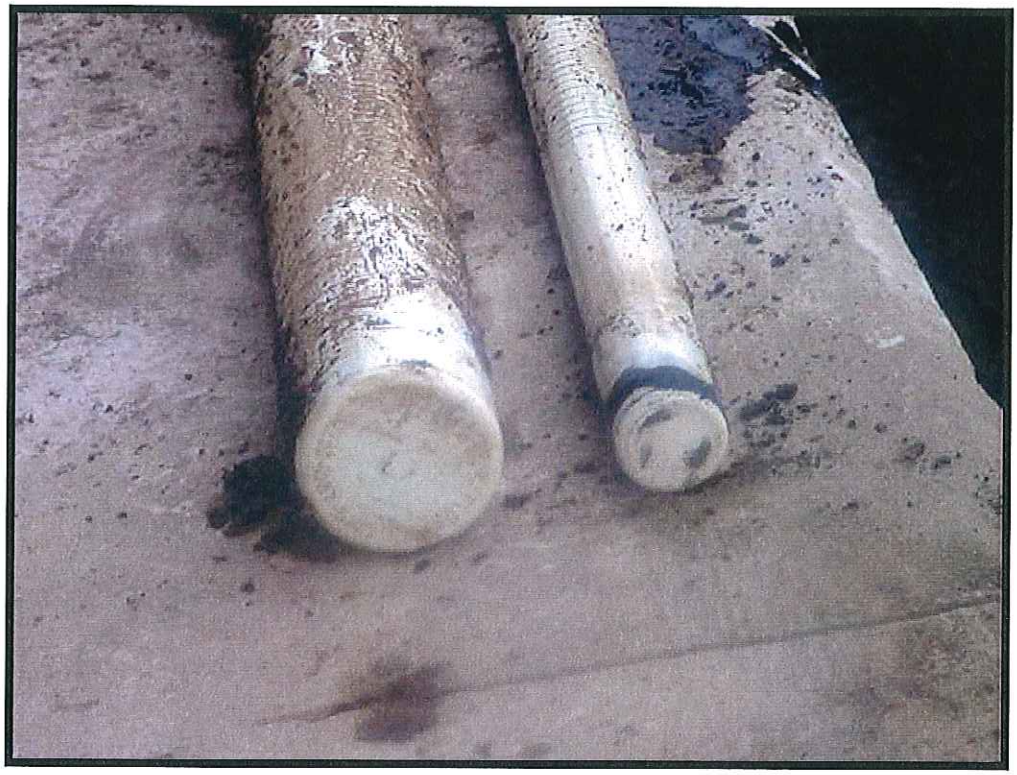
SWMU 39 – USTs 59 and 60

Excavating around piping



Wells exposed

SWMU 39 – USTs 59 and 60



Wells removed – note bottom caps

Pumping groundwater from excavation

SWMU 39 – USTs 59 and 60

"ORC" applied to excavation

SWMU 39 – Well installations

SWMU 39 – USTs 59 and 60

Reinforcement installed

Spreading concrete

SWMU 39 – USTs 59 and 60

Site restored

APPENDIX B

Waste Characterization and Waste Manifests

SES

Environmental and Construction Services
An 8(a) Alaska Native Company

May 4, 2007

Ms. Theresa Curtis
Atlantic Waste Services
125 B, Pine Meadow Drive
Pooler, Georgia 31322

Re: Waste Profile for "Petroleum Contaminated soil," STEP / SES, Fort Stewart Georgia

Dear Ms. Curtis:

Attached is one waste profile sheet for petroleum contaminated soil generated from the clean-up of two separate removal actions conducted recently. One site is at Fort Stewart, Georgia and one site is at the Hunter Army Airfield, Savannah, Georgia. The contaminated soil was placed into waste roll-off containers provided by Atlantic Waste Services.

We have attached the soil laboratory analysis that represents the containers at each site. Sample 39 TCLP is a composite sample of the containers from the UST site at Fort Stewart and Sample TCLP01 is a composite sample of the containers from the UST site at Hunter Army Airfield. The attached analysis indicates the soil to be non-hazardous.

The "Generator's Nonhazardous Waste Profile Sheet" from Waste Management has been filled out and signed by the proper official for the generator (US Army).

Once the landfill approves the waste, we hope to have Atlantic Waste to transport the containers to the landfill as soon as possible. If things work out, we are looking at the week of May 14th. As before, we are requesting the landfill billing the cost to Atlantic Waste, and Atlantic Waste billing us with the bill for the remainder of the cost for the roll-off containers. Please let me know when the landfill approves accepting the waste so we can make arrangements for someone to be down there to coordinate the necessary waste manifesting. Thank you.

Sincerely,
SES, LLC

Jeffrey C. Williams, PE
Project Manager

Attachments

cc: Project Files

Reader File

1006 Floyd Culler Court ▪ Oak Ridge, TN 37830 ▪ 865-481-7837 ▪ Fax 865-481-0290 ▪ www.sescorp.com

Generator's Nonhazardous Waste Profile Sheet

WM WASTE MANAGEMENT

Requested Disposal Facility _____ Profile Number

☐ Renewal for Profile Number _____ Waste Approval Expiration Date _____

A. Waste Generator Facility Information (must reflect location of waste generation/origin)

1. Generator Name: US ARMY FORT STEWART
2. Site Address: 1550 FRANK COCHRAN DRIVE
3. City/ZIP: FORT STEWART / 31314-4927
4. State: GEORGIA
5. County: LIBERTY
6. Contact Name/Title: RANDY POWELL-JONES / ENV. SPEC
7. Email Address: RANDY.POWELL-JONES@STEWART.ARMY.MIL
8. Phone: 912-315-5109 9. FAX: 912-315-5148
10. NAICS Code: _____
11. Generator USEPA ID #: GA9216020872
12. State ID# (if applicable): _____

B. Customer Information ☐ same as above

P. O. Number: _____

1. Customer Name: ATLANTIC WASTE SERVICES
2. Billing Address: 125B Pine Meadow DR.
3. City, State and ZIP: Pooler, GA 31322
4. Contact Name: THERESA CURTIS
5. Contact Email: _____
6. Phone: 912-964-2000 FAX: 912-964-2009
7. Transporter Name: ATLANTIC WASTE SERVICES
8. Transporter ID # (if appl.): _____
9. Transporter Address: 125B Pine Meadow DR.
10. City, State and ZIP: Pooler GA 31322

C. Waste Stream Information

1. DESCRIPTION

a. Common Waste Name: DIESEL Fuel Contaminated Soil & cleanup Debris State Waste Code(s): _____

b. Describe Process Generating Waste or Source of Contamination:

Cleanup of DIESEL in Soil

c. Typical Color(s): GRAY / BROWN / BLACK

d. Strong Odor? ☐ Yes ☒ No Describe: _____

e. Physical State at 70°F: ☒ Solid ☐ Liquid ☐ Powder ☐ Semi-Solid or Sludge ☐ Other: _____

f. Layers? ☐ Single layer. ☐ Multi- layer ☒ NA

g. Water Reactive? ☐ Yes ☒ No If Yes, Describe: _____

h. Free Liquid Range (%): _____ to _____ ☒ NA(solid)

i. pH Range: ☐ ≤2 ☐ 2.1-12.4 ☐ ≥12.5 ☒ NA(solid) ☐ Actual: _____

j. Liquid Flash Point: ☐ < 140°F ☐ ≥ 140°F ☒ NA(solid) ☐ Actual: _____

k. Flammable Solid: ☐ Yes ☒ No

L Physical Constituents: List all constituents of waste stream - (e.g. Soil 0-80%, Wood 0-20%): ☐ (See Attached)

Constituents (Total Composition Must be ≥ 100%)	Concentration %	Constituents (Total Composition Must be ≥ 100%)	Concentration %
1. Soil	90-100	4.	
2. diesel Fuel	1-10	5.	
3. debris	1-5	6.	

2. ESTIMATED QUANTITY OF WASTE AND SHIPPING INFORMATION

a. ☒ Event ☐ Base/Ongoing (Check One)

b. Estimated Annual Quantity: 200 ☐ Tons ☒ Cubic Yards ☐ Drums ☐ Gallons ☐ Other (specify): _____

c. Shipping Frequency: _____ Units per ☐ Month ☐ Quarter ☐ Year ☒ One Time ☐ Other

d. Is this a U.S. Department of Transportation (USDOT) Hazardous Material? (If yes, answer e.) ☐ Yes ☒ No

e. USDOT Shipping Description (if applicable): _____

3. SAFETY REQUIREMENTS (Handling, PPE, etc.): NORMAL LANDFILL PPE

Generator's Nonhazardous Waste Profile Sheet

D. Regulatory Status (Please check appropriate responses)

1. Is this a USEPA (40 CFR Part 261)/State hazardous waste? If yes, contact your sales representative. ☐ Yes ☒ No
2. Is this waste included in one or more of categories below (Check all that apply)? If yes, attach supporting documentation. ☐ Yes ☒ No
   - ☐ Delisted Hazardous Waste
   - ☐ Excluded Wastes Under 40 CFR 261.4
   - ☐ Treated Hazardous Waste Debris
   - ☐ Treated Characteristic Hazardous Waste
3. Is the waste from a Federal (40 CFR 300, Appendix B) or state mandated clean-up? If yes, see instructions. ☐ Yes ☒ No
4. Does the waste represented by this waste profile sheet contain radioactive material? ☐ Yes ☒ No
   a. If yes, is disposal regulated by the Nuclear Regulatory Commission? ☐ Yes ☒ No
   b. If yes, is disposal regulated by a State Agency for radioactive waste/NORM? ☐ Yes ☒ No
5. Does the waste represented by this waste profile sheet contain concentrations of regulated Polychlorinated Biphenyls (PCBs)? ☐ Yes ☒ No
   a. If yes, is disposal regulated under TSCA? ☐ Yes ☒ No
6. Does the waste contain untreated, regulated, medical or infectious waste? ☐ Yes ☒ No
7. Does the waste contain asbestos? ☐ Yes ☒ No If Yes, ☐ Friable ☐ Non Friable
8. Is this profile for remediation waste from a facility that is a major source of Hazardous Air Pollutants (Site Remediation NESHAP, 40 CFR 63 subpart GGGGG)? ☐ Yes ☒ No
   If yes, does the waste contain <500 ppmw VOHAPs at the point of determination? ☐ Yes ☐ No

E. Generator Certification (Please read and certify by signature below)

By signing this Generator's Waste Profile Sheet, I hereby certify that all:

1. Information submitted in this profile and all attached documents contain true and accurate descriptions of the waste material;
2. Relevant information within the possession of the Generator regarding known or suspected hazards pertaining to this waste has been disclosed to WM/the Contractor;
3. Analytical data attached pertaining to the profiled waste was derived from testing a representative sample in accordance with 40 CFR 261.20(c) or equivalent rules; and
4. Changes that occur in the character of the waste (i.e. changes in the process or new analytical) will be identified by the Generator and disclosed to WM (and the Contractor if applicable) prior to providing the waste to WM (and the Contractor if applicable).
5. Check all that apply:
   - ☒ Attached analytical pertains to the waste. Identify laboratory & sample ID #'s and parameters tested: SAMPLE TCLP01 AND 39TCLP (FULL TCLP, RCI) # Pages: 11
   - ☐ Only the analyses identified on the attachment pertain to the waste (identify by laboratory & sample ID #'s and parameters tested). Attachment #: ____
   - ☐ Additional information necessary to characterize the profiled waste has been attached (other than analytical). Indicate the number of attached pages: ____
   - ☐ I am an agent signing on behalf of the Generator, and the delegation of authority to me from the Generator for this signature is available upon request.
   - ☐ By Generator process knowledge, the following waste is not a listed waste and is below all TCLP regulatory limits. ____

Certification Signature: [signature] Title: Envir. Prot. Specialist

Company Name: U.S. ARMY Name (Print): RANDY Powell-Jones

Date: 5/3/07

FOR WM USE ONLY

Management Method: ☐ Landfill ☐ Bioremediation ☐ Non-hazardous solidification ☐ Other: ____

Approval Decision: ☐ Approved ☐ Not Approved

Waste Approval Expiration Date: ____

Management Facility Precautions, Special Handling Procedures or Limitation on approval: ____

- ☐ Shall not contain free liquid
- ☐ Shipment must be scheduled into disposal facility
- ☐ Approval Number must accompany each shipment
- ☐ Waste Manifest must accompany load

WM Authorization Name / Title: ____ Date: ____

State Authorization (if Required): ____ Date: ____

Empirical Laboratories

ANALYTICAL REPORT NOTES, TERMS AND QUALIFIERS (INORGANIC)

Notes:

The metals and cyanide reporting limits (RLs) have been statistically determined to be no less than three standard deviations as defined in 40 CFR 136, Appendix B, Revision 1.11. All other reporting limits are referenced from the specific analytical method.

Terms:

NA Not Applicable

NR Not Requested

Qualifiers:

B The reported value is less than the practical quantitation limit (PQL, project defined) but greater than or equal to the MDL.

E The reported value is estimated due to the presence of matrix interference.

N Predigested spike recovery not within control limits.

* RPD or absolute difference for Duplicate analysis not within control limits.

** Reference Standard Methods 19th edition.

(1) pH analyzed outside USEPA specified holding time. pH must be measured immediately after sample collection.

(2) The sample pH did not meet the preservation guidelines. Therefore the pH was adjusted upon receipt.

(3) Reference Standard Methods 17th edition for the distillation method.

(4) The sample was analyzed out of the USEPA holding time.

(5) The sample was received in the laboratory out of the USEPA holding time.

(6) The shipping cooler temperature exceeded 6°C upon receipt to Empirical Laboratories.

(7) Analysis was subcontracted

227 French Landing Drive ▪ Suite 550 ▪ Nashville, TN 37228 ▪ Tel (615) 345-1115 ▪ Fax (615) 846-5426

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TCLP 01

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: ELABN Case No.: NA SAS No.: NA SDG No.: STE.V04096

Matrix: (soil/water) WATER Lab Sample ID: 0704096-01

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0409601T

Level: (low/med) LOW Date Sampled: 04/10/07 11:05

% Moisture: not dec. _____ Date Analyzed: 04/19/07 01:57

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/L

CAS NO.	COMPOUND	EQL	TCLP Regulatory Limit	CONC	Q
71-43-2	Benzene	0.010	0.50	<0.010	U
78-93-3	2-Butanone	0.10	200	<0.10	U
56-23-5	Carbon tetrachloride	0.010	0.50	<0.010	U
108-90-7	Chlorobenzene	0.010	100	<0.010	U
67-66-3	Chloroform	0.010	6.0	<0.010	U
106-46-7	1,4-Dichlorobenzene	0.010	7.5	<0.010	U
107-06-2	1,2-Dichloroethane	0.010	0.50	<0.010	U
75-35-4	1,1-Dichloroethene	0.010	0.70	<0.010	U
127-18-4	Tetrachloroethene	0.010	0.70	<0.010	U
79-01-6	Trichloroethene	0.010	0.50	<0.010	U
75-01-4	Vinyl chloride	0.020	0.20	<0.020	U

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TCLP 01

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: ELABN Case No.: NA SAS No.: NA SDG No.: STE.B04096

Matrix: (soil/water) WATER Lab Sample ID: 0704096-01

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: 0409601T

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 04/10/07 11:05

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 04/13/07

Concentrated Extract Volume: 1000.0(uL) Date Analyzed: 04/18/07 20:56

Injection Volume: 0.5(uL) Dilution Factor: 1.0

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

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/L

CAS NO.	COMPOUND	EQL	TCLP Regulatory Limit	CONC	Q
121-14-2	2,4-Dinitrotoluene	0.050	0.13	<0.050	U
118-74-1	Hexachlorobenzene	0.050	0.13	<0.050	U
87-68-3	Hexachlorobutadiene	0.050	0.50	<0.050	U
67-72-1	Hexachloroethane	0.050	3.0	<0.050	U
108-39-4	3-Methylphenol	0.050	200	<0.050	U
106-44-5	4-Methylphenol	0.050	200	<0.050	U
95-48-7	2-Methylphenol	0.050	200	<0.050	U
98-95-3	Nitrobenzene	0.050	2.0	<0.050	U
87-86-5	Pentachlorophenol	0.20	100	<0.20	U
110-86-1	Pyridine	0.20	5.0	<0.20	U
95-95-4	2,4,5-Trichlorophenol	0.050	400	<0.050	U
88-06-2	2,4,6-Trichlorophenol	0.050	2.0	<0.050	U

FORM 1
PESTA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TCLP 01

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 4096 SAS No.: NA SDG No.: STE.P04096

Matrix: (soil/water) TCLP Lab Sample ID: 0704096-01

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: 014F1401

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 04/10/07 11:05

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:04/17/07

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 04/18/07 17:22

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/L

CAS NO.	COMPOUND	EQL	TCLP Regulatory Limit	CONC	Q
57-74-9	Chlordane	0.00050	0.030	<0.00050	U
72-20-8	Endrin	0.00010	0.020	<0.00010	U
58-89-9	Gamma-BHC	0.00010	0.40	<0.00010	U
76-44-8	Heptachlor	0.00010	0.0080	<0.00010	U
1024-57-3	Heptachlor Epoxide	0.00010	0.0080	<0.00010	U
72-43-5	Methoxychlor	0.00010	10	<0.00010	U
8001-35-2	Toxaphene	0.010	0.50	<0.010	U

FORM 1
HERB ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TCLP 01

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 4096 SAS No.: NA SDG No.: STE.H04096

Matrix: (soil/water) TCLP Lab Sample ID: 0704096-01

Sample wt/vol: 100.0 (g/mL) ML Lab File ID: 006R0201

% Moisture: _____ decanted: (Y/N)___ Date Sampled: 04/10/07 11:05

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:04/17/07

Concentrated Extract Volume: 10.0(mL) Date Analyzed: 04/23/07 20:14

Injection Volume: 2.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
94-75-7	2,4-D	0.0025	0.0050		U
93-72-1	2,4,5-TP (Silvex)	0.00025	0.00050		U

Empirical Laboratories

CLIENT: SES LLC
DATE RECEIVED: 04/11/07
DATE REPORTED: 04/30/07

EMPIRICAL LABORATORIES SAMPLE NUMBER					0704096-01
CLIENT SAMPLE DESCRIPTION/SAMPLING DATE					TCLP 01 04/10/07 11:05:00 AM
ANALYTES	REGULATORY LIMITS	REPORTING LIMITS	USEPA METHOD	UNITS	CONC
Arsenic-TCLP	5.0	0.030	1311/6010B	mg/L	<0.030
Barium-TCLP	100	0.050	1311/6010B	mg/L	0.346
Cadmium-TCLP	1.0	0.010	1311/6010B	mg/L	<0.010
Chromium-TCLP	5.0	0.020	1311/6010B	mg/L	<0.020
Lead-TCLP	5.0	0.015	1311/6010B	mg/L	0.0267
Mercury-TCLP	0.20	0.00080	1311/7470A	mg/L	<0.00080
Selenium-TCLP	1.0	0.030	1311/6010B	mg/L	<0.030
Silver-TCLP	5.0	0.010	1311/6010B	mg/L	<0.010
Initial pH - TCLP	NA	NA	1311	Units	8.4
Final pH - TCLP	NA	NA	1311	Units	4.9
Cyanide	250	0.13	9012A	mg/kg (as Rec'd)	<0.13
Ignitability	<140	NA	1010	°F	>158
pH- Laboratory (1)	<2/>12.5	NA	9045B	Units	7.8 @ 21°C
Reactive Sulfide	500	19	Chap.7.3.4.2	mg/kg (as Rec'd)	<19

See attached page for definitions of terms and qualifiers.

EMPIRICAL LABORATORIES

D. Rick Davis
Vice President

227 French Landing Drive ▪ Suite 550 ▪ Nashville, TN 37228 ▪ Tel (615) 345-1115 ▪ Fax (615) 846-5426

Empirical Laboratories

CLIENT: STEP, Inc.
DATE RECEIVED: 03/24/07
DATE REPORTED: 04/09/07

EMPIRICAL LABORATORIES SAMPLE NUMBER					0703252-09
CLIENT SAMPLE DESCRIPTION/SAMPLING DATE					39TCLP 03/23/07 12:25:00 PM
ANALYTES	REGULATORY LIMITS	REPORTING LIMITS	USEPA METHOD	UNITS	CONC
Arsenic-TCLP	5.0	0.030	1311/6010B	mg/L	<0.030
Barium-TCLP	100	0.050	1311/6010B	mg/L	0.202
Cadmium-TCLP	1.0	0.010	1311/6010B	mg/L	<0.010
Chromium-TCLP	5.0	0.020	1311/6010B	mg/L	<0.020
Lead-TCLP	5.0	0.015	1311/6010B	mg/L	0.0799
Mercury-TCLP	0.20	0.00080	1311/7470A	mg/L	<0.00080
Selenium-TCLP	1.0	0.030	1311/6010B	mg/L	<0.030
Silver-TCLP	5.0	0.010	1311/6010B	mg/L	<0.010
Initial pH - TCLP	NA	NA	1311	Units	7.8
Final pH - TCLP	NA	NA	1311	Units	5.8
Cyanide	250	0.13	9012A	mg/kg (as Rec'd)	<0.13
Ignitability	<140	NA	1010	°F	>158
pH- Laboratory (1)	<2/>12.5	NA	9045B	Units	6.4 @ 22°C
Reactive Sulfide	500	19	Chap.7.3.4.2	mg/kg (as Rec'd)	<19

See attached page for definitions of terms and qualifiers.

EMPIRICAL LABORATORIES

Betty DeVille for

D. Rick Davis
Vice President

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

39TCLP

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: ELABN Case No.: NA SAS No.: NA SDG No.: STE.V03252

Matrix: (soil/water) WATER Lab Sample ID: 0703252-09

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0325209T

Level: (low/med) LOW Date Sampled: 03/23/07 12:25

% Moisture: not dec. _____ Date Analyzed: 03/28/07 09:00

GC Column: DB-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) MG/L

CAS NO.	COMPOUND	EQL	TCLP Regulatory Limit	CONC	Q
71-43-2	Benzene	0.010	0.50	<0.010	U
78-93-3	2-Butanone	0.10	200	<0.10	U
56-23-5	Carbon tetrachloride	0.010	0.50	<0.010	U
108-90-7	Chlorobenzene	0.010	100	<0.010	U
67-66-3	Chloroform	0.010	6.0	0.0017	JB
106-46-7	1,4-Dichlorobenzene	0.010	7.5	<0.010	U
107-06-2	1,2-Dichloroethane	0.010	0.50	<0.010	U
75-35-4	1,1-Dichloroethene	0.010	0.70	<0.010	U
127-18-4	Tetrachloroethene	0.010	0.70	<0.010	U
79-01-6	Trichloroethene	0.010	0.50	0.0054	J
75-01-4	Vinyl chloride	0.020	0.20	<0.020	U

SDG: 0703252 Project: Ft. Stewart-SWMU-39

Method: Semivolatiles - PAHs 8270 C Matrix/No. Samples: - Soil - 6

Validation Samples: 07082401 07082403
07082402 07082404
07082402D 07082405

Data Validation Report Summary

		Status Code	Comments
1.	Sample Preservation, Handling, and Transport	A	
2.	Chain of Custody	A	
3.	Holding Times	A	
4.	GC/MS Tune/Inst Perf	A	
5.	Calibrations	A	
6.	Blanks	A	
7.	Blank Spike/LCS	A	
8.	Matrix Spike	A	
9.	Surrogates	X	
10.	Internal Standards	X	
11.	Compound Identification	A	
12.	System Performance	A	
13.	Field QC Samples	A	
14.	Overall Assessment	X	

Status Codes.
A = Acceptable
R = Data Rejected
X = Data acceptable but qualified due to problems

Qualifications:

7a • A low terphenyl-d14 surrogate recovery for samples ...82402 and ...82403 resulted in "UJ/J" qualifiers for all compounds.

10a • A high perylene IS for samples ...82403 resulted in a "J" qualifier for benzo(b)fluoranthene and benzo(a)pyrene results for that samples the

Significant Findings/Recommendations:

Overall Data Quality:

Acceptable as qualified

Validator's Signature: [signature] Date: 4/16/2007

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U01

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: ELABN Case No.: NA SAS No.: NA SDG No.: STE.B03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-01

Sample wt/vol: 15.2 (g/mL) G Lab File ID: 0325201

% Moisture: 12 decanted: (Y/N) N Date Sampled: 03/23/07 08:00

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted: 03/28/07

Concentrated Extract Volume: 500.0(uL) Date Analyzed: 03/30/07 20:44

Injection Volume: 0.5(uL) Dilution Factor: 1.0

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

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q
83-32-9	Acenaphthene	15	110		U
208-96-8	Acenaphthylene	11	110		U
120-12-7	Anthracene	15	110		U
56-55-3	Benzo(a)anthracene	20	110		U
205-99-2	Benzo(b)fluoranthene	18	110		U
207-08-9	Benzo(k)fluoranthene	22	110		U
191-24-2	Benzo(g,h,i)perylene	40	110		U
50-32-8	Benzo(a)pyrene	13	110		U
218-01-9	Chrysene	17	110		U
53-70-3	Dibenz(a,h)anthracene	34	110		U
206-44-0	Fluoranthene	30	110		U
86-73-7	Fluorene	15	110		U
193-39-5	Indeno(1,2,3-cd)pyrene	26	110		U
91-57-6	2-Methylnaphthalene	20	110		U
90-12-0	1-Methylnaphthalene	56	110		U
91-20-3	Naphthalene	18	110		U
85-01-8	Phenanthrene	13	110		U
129-00-0	Pyrene	22	110		U

Raw Qual

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U02

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: ELABN Case No.: NA SAS No.: NA SDG No.: STE.B03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-02

Sample wt/vol: 15.2 (g/mL) G Lab File ID: 0325202

% Moisture: 14 decanted: (Y/N) N Date Sampled: 03/23/07 08:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted: 03/28/07

Concentrated Extract Volume: 500.0(uL) Date Analyzed: 03/30/07 21:19

Injection Volume: 0.5(uL) Dilution Factor: 1.0

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

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q	Rev Qual
83-32-9	Acenaphthene	15	120		U	UJ
208-96-8	Acenaphthylene	11	120		U	
120-12-7	Anthracene	16	120		U	
56-55-3	Benzo(a)anthracene	21	120		U	
205-99-2	Benzo(b)fluoranthene	18	120		U	
207-08-9	Benzo(k)fluoranthene	23	120		U	
191-24-2	Benzo(g,h,i)perylene	40	120		U	
50-32-8	Benzo(a)pyrene	13	120		U	
218-01-9	Chrysene	18	120		U	
53-70-3	Dibenz(a,h)anthracene	35	120		U	
206-44-0	Fluoranthene	31	120		U	
86-73-7	Fluorene	15	120		U	
193-39-5	Indeno(1,2,3-cd)pyrene	26	120		U	
91-57-6	2-Methylnaphthalene	20	120	35	J	J
90-12-0	1-Methylnaphthalene	58	120		U	UJ
91-20-3	Naphthalene	19	120	19	J	J
85-01-8	Phenanthrene	13	120	37	J	J
129-00-0	Pyrene	23	120		U	UJ

7a

Empirical Laboratories

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U02D

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: ELABN Case No.: NA SAS No.: NA SDG No.: STE.B03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-03

Sample wt/vol: 15.2 (g/mL) G Lab File ID: 0325203

% Moisture: 12 decanted: (Y/N) N Date Sampled: 03/23/07 08:05

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted: 03/28/07

Concentrated Extract Volume: 500.0(uL) Date Analyzed: 03/30/07 21:55

Injection Volume: 0.5(uL) Dilution Factor: 1.0

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

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q	Raw Qual
83-32-9	Acenaphthene	15	110		U	U
208-96-8	Acenaphthylene	11	110		U	
120-12-7	Anthracene	15	110		U	
56-55-3	Benzo(a)anthracene	20	110		U	
205-99-2	Benzo(b)fluoranthene	18	110		U	
207-08-9	Benzo(k)fluoranthene	22	110		U	
191-24-2	Benzo(g,h,i)perylene	40	110		U	
50-32-8	Benzo(a)pyrene	13	110		U	
218-01-9	Chrysene	17	110		U	
53-70-3	Dibenz(a,h)anthracene	34	110		U	
206-44-0	Fluoranthene	30	110		U	
86-73-7	Fluorene	15	110		U	
193-39-5	Indeno(1,2,3-cd)pyrene	26	110		U	
91-57-6	2-Methylnaphthalene	20	110	36	J	J
90-12-0	1-Methylnaphthalene	56	110		U	
91-20-3	Naphthalene	18	110	19	J	J
85-01-8	Phenanthrene	13	110	40	J	J
129-00-0	Pyrene	22	110		U	U

Empirical Laboratories

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U03

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: ELABN Case No.: NA SAS No.: NA SDG No.: STE.B03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-04

Sample wt/vol: 15.3 (g/mL) G Lab File ID: 0325204

% Moisture: 10 decanted: (Y/N) N Date Sampled: 03/23/07 08:07

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted: 03/28/07

Concentrated Extract Volume: 500.0(uL) Date Analyzed: 03/30/07 22:30

Injection Volume: 0.5(uL) Dilution Factor: 1.0

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

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q	Rev Qual
83-32-9	Acenaphthene	14	110		U	UJ
208-96-8	Acenaphthylene	11	110		U	
120-12-7	Anthracene	15	110		U	
56-55-3	Benzo(a)anthracene	20	110		U	J
205-99-2	Benzo(b)fluoranthene	17	110	25	J	J
207-08-9	Benzo(k)fluoranthene	21	110		U	UJ
191-24-2	Benzo(g,h,i)perylene	38	110		U	UJ
50-32-8	Benzo(a)pyrene	12	110	19	J	J
218-01-9	Chrysene	17	110	21	J	J
53-70-3	Dibenz(a,h)anthracene	33	110		U	UJ
206-44-0	Fluoranthene	29	110		U	
86-73-7	Fluorene	14	110		U	
193-39-5	Indeno(1,2,3-cd)pyrene	25	110		U	
91-57-6	2-Methylnaphthalene	19	110	57	J	J
90-12-0	1-Methylnaphthalene	54	110		U	UJ
91-20-3	Naphthalene	18	110	33	J	J
85-01-8	Phenanthrene	12	110	47	J	J
129-00-0	Pyrene	22	110	22	J	J

7a

10d, 7a

7a

10d, 7a

Empirical Laboratories

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U04

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: ELABN Case No.: NA SAS No.: NA SDG No.: STE.B03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-05

Sample wt/vol: 15.4 (g/mL) G Lab File ID: 0325205

% Moisture: 8 decanted: (Y/N) N Date Sampled: 03/23/07 08:10

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted: 03/28/07

Concentrated Extract Volume: 500.0(uL) Date Analyzed: 03/30/07 23:05

Injection Volume: 0.5(uL) Dilution Factor: 1.0

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

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q	Re Qual
83-32-9	Acenaphthene	14	110		U	U
208-96-8	Acenaphthylene	10	110		U	U
120-12-7	Anthracene	14	110	140		
56-55-3	Benzo(a)anthracene	19	110	48	J	J
205-99-2	Benzo(b)fluoranthene	17	110	60	J	↓
207-08-9	Benzo(k)fluoranthene	21	110	59	J	↓
191-24-2	Benzo(g,h,i)perylene	38	110		U	U
50-32-8	Benzo(a)pyrene	12	110		U	U
218-01-9	Chrysene	16	110	41	J	J
53-70-3	Dibenz(a,h)anthracene	32	110		U	U
206-44-0	Fluoranthene	28	110	78	J	J
86-73-7	Fluorene	14	110		U	U
193-39-5	Indeno(1,2,3-cd)pyrene	24	110		U	U
91-57-6	2-Methylnaphthalene	18	110	120		
90-12-0	1-Methylnaphthalene	53	110	94	J	J
91-20-3	Naphthalene	17	110	40	J	↓
85-01-8	Phenanthrene	12	110	67	J	↓
129-00-0	Pyrene	21	110	56	J	↓

FORM 1
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U05

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: ELABN Case No.: NA SAS No.: NA SDG No.: STE.B03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-06

Sample wt/vol: 15.2 (g/mL) G Lab File ID: 0325206

% Moisture: 12 decanted: (Y/N) N Date Sampled: 03/23/07 08:15

Extraction: (SepF/Cont/Sonc/Soxh) SOXH Date Extracted: 03/28/07

Concentrated Extract Volume: 500.0(uL) Date Analyzed: 03/30/07 23:40

Injection Volume: 0.5(uL) Dilution Factor: 1.0

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

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q	Rev Qual
83-32-9	Acenaphthene	15	110		U	U
208-96-8	Acenaphthylene	11	110		U	
120-12-7	Anthracene	15	110		U	
56-55-3	Benzo(a)anthracene	20	110		U	
205-99-2	Benzo(b)fluoranthene	18	110		U	
207-08-9	Benzo(k)fluoranthene	22	110		U	
191-24-2	Benzo(g,h,i)perylene	39	110		U	
50-32-8	Benzo(a)pyrene	13	110		U	
218-01-9	Chrysene	17	110		U	
53-70-3	Dibenz(a,h)anthracene	34	110		U	
206-44-0	Fluoranthene	30	110		U	
86-73-7	Fluorene	14	110		U	
193-39-5	Indeno(1,2,3-cd)pyrene	26	110		U	
91-57-6	2-Methylnaphthalene	19	110	230		
90-12-0	1-Methylnaphthalene	56	110	140		
91-20-3	Naphthalene	18	110	70	J	J
85-01-8	Phenanthrene	13	110	120		
129-00-0	Pyrene	22	110	33	J	J

DATA VALIDATION WORKSHEETS
SEMIVOLATILE ORGANICS

Reviewer: Kitchings Date: 4/16

Project: SWMU -39 SDG: 0703282 Matrix/No. Samples: S-6

I. Technical Holding Times			
A. Sample Preservation, Handling and Transport			
1. Have all samples been preserved correctly?	(Yes)	No	N/A
2. Have sample temperatures been kept at 4° C (+ or - 2°)?	(Yes)	No	N/A
3. Were all samples received in proper condition?	(Yes)	No	N/A
4. Were any qualifications required based on this information?	Yes	(No)	N/A
Coolers @ 2.5°C.			
B. Chain of Custody			
1. Were all samples properly recorded on COC's?	(Yes)	No	N/A
2. Were correct analyses performed on samples?	(Yes)	No	N/A
C. Holding Times			
1. Were samples extracted and analyzed within acceptable holding times?	(Yes)	No	N/A
2. Were any qualifications required based on this information?	Yes	(No)	N/A

SAMPLED	PREPPED	ANALYZED
3/23	3/28	3/30

II. GC/MS Instrument Performance Check			
1. Were instrument performance check samples run for each analysis period?	(Yes)	No	N/A
2. Were ion abundance criteria met for DFTPP analysis?	(Yes)	No	N/A
3. Do laboratory forms match raw data?	Yes	No	(N/A)
4. Were any qualifications required based on this information?	Yes	(No)	N/A

Comments/Qualifications:

ICAL
2/8@ 8:43
198 base
all criteria met.

CCAL
3/30@ 19:49
198 base

DATA VALIDATION WORKSHEETS
SEMIVOLATILE ORGANICS

Reviewer: Kitchings Date: 4/16

Project: SWMU-39 SDG: 0703282 Matrix/No. Samples: S-6

III.	Initial Calibration			
	1. Were correct concentrations of standards used for initial calibration? Were samples analyzed within 12 hours of associated instrument performance check?	(Yes)	No	N/A
	2. Were initial calibration RRFs for all volatile target compounds and system monitoring compounds >or = 0.05? Do recalculations for RRFs agree with reported values?	(Yes)	No	N/A
	3. Were %RSDs < or = 30% for all volatile target compounds? Do recalculations for RSDs agree with reported values?	(Yes)	No	N/A
	4. Were any qualifications required based on this information?	Yes	(No)	N/A

Comments/Qualifications:

2/8 @ 9:03 b(k)f. RSDs <14% RRFs >0.05

1.208, 1.162, 1.292, 1.338, 1.364, 1.339, 1.292, 1.192, 1.257, 1.311, 1.252, 1.223 — 15.23 / 13 = 1.172

.00130, 10, 1440, 2756, 3686, 2789, .01440, 40, 723, 1932, 640, 260 — √(.15846/12)

9.8% = .1149 / 1.172

Pyrene. 2.509, 2.070, 2.180, 1.699, 1.739, 1.495, 1.602, 1.625, 1.472, 1.565, 1.532, 1.618 — 21.106 / 12 = 1.759

.56250, .09672, .17724, 360, 40, 6970, 2465, 1796, 8237, 3764 — √(1.07278/11)

.3123 / 1.759 = 17.8%

IV.	Continuing Calibration			
	1. Were continuing calibration samples run at the required frequency and compared to the correct initial calibration?	(Yes)	No	N/A
	2. Did calculations from raw data agree with laboratory reported values for RRF and %D?	Yes	No	(N/A)
	3. Were continuing calibration RRFs for volatile organic compounds and system monitoring compounds (surrogates) > or = 0.05?	(Yes)	No	N/A
	4. Were %D between initial calibration RRF and the continuing calibration RRFs within + or - 25%?	(Yes)	No	N/A
	5. Were any qualifications required based on this information?	Yes	(No)	N/A

Comments/Qualifications:

3/30 @ 20:09

b(ghi)p. (.803 − .673) / .803 = 16.2%

all %Ds <25%

naphth. (0.966 − .933) / .966 = 3.4%

pyrene. (1.862 − 1.663) / 1.663 = 12.0%

DATA VALIDATION WORKSHEETS
SEMIVOLATILE ORGANICS

Reviewer: Kitchings Date: 4/16

Project: SWMU 39 SDG: 0703282 Matrix/No. Samples: S - 6

V.	Blanks			
	1. Were any target or non-target compounds reported in laboratory prep or calibration blanks?	Yes	(No)	N/A
	2. Were method blank analyses performed at required frequency, and for each GC/MS system used to analyze samples for each type of analysis (i.e., matrix)?	(Yes)	No	N/A
	3. Were any qualifications required based on this information?	Yes	(No)	N/A

Comments/Qualifications:

328BS1
3/30 @16:13
— all u's

VI.	System Monitoring Compounds (Surrogate Spikes)			
	1. Were laboratory surrogate recoveries calculated and reported correctly?	(Yes)	No	N/A
	2. Were surrogate recoveries within acceptable limits?	Yes	(No)	N/A
	3. Were any qualifications required based on surrogate spike QC information?	(Yes)	No	N/A

16-2 **Comments/Qualifications:**

1: 63-89 2: 52-78 3: 48,51 — 70 low

82402 - tph - low
82403 - tph - low
] (uJ/J)

VII.	Matrix Spikes/Matrix Spike Duplicates			
	1. Were MS/MSD samples analyzed at required frequency for each ample matrix?	(Yes)	No	N/A
	2. Were MS/MSD results for recovery and RPD within advisory limits?	(Yes)	No	N/A
	3. Were Samples used for MS/MSD field blanks?	Yes	(No)	N/A
	4. Were laboratory reported results correctly calculated from raw data?	Yes	No	(N/A)
	5. Were any qualifications required, based on results of MS/MSD samples in conjunction with other QC information?	Yes	(No)	N/A

Comments/Qualifications:

36-0 / 18-6

82402 MS 58-84
MSD 66-100
RPD 2-18

dibenz. 1556/1892 = 82.2%
1645/1880 = 87.5%

RPD. 89/1600.5 = 5.62%

DATA VALIDATION WORKSHEETS
SEMIVOLATILE ORGANICS

Reviewer: Kitchings Date: 4/16

Project: SWMU-39 SDG: 0703282 Matrix/No. Samples: S-6

VIII. Laboratory Control Sample (LCS)			
1. Were LCS samples run at correct frequency for each matrix samples?	(Yes)	No	N/A
2. Were LCS calculations performed correctly, and did laboratory reported values match raw data? Were recoveries within laboratory QC limits?	(Yes)	No	N/A
4. Were any qualifications required based on LCS data in conjunction with other QC information?	Yes	(No)	N/A

Comments/Qualifications:

18-0 benzo(b)f. $\frac{1056}{1667} = 63.3\%$

Page 5 of 8

IX. Internal Standards			
1. Were standard area counts within a factor of two (-50% to +100%) from associated calibration standard?	Yes	(No)	N/A
2. Were retention times of internal standard within + or - 30 seconds of retention time of associated calibration check?	(Yes)	No	N/A
3. Were any qualifications required based on internal standard results?	(Yes)	No	N/A

Comments/Qualifications:

IS6 perylene high. ← U03 IS 3 $\frac{1383705}{1270223} = 108.9\%$ $\frac{8.23}{8.23}$

benzo(b)fluoranthene U01 IS 5 $\frac{729361}{501315} = 145.5\%$ $\frac{23.09}{23.08}$

benzo(g)perylene (J)

X. Target Compound Identification			
1. Are relative retention times (RRTs) within + or - 0.06 RRT units of standard RRT?	Yes	No	(N/A)
2. Do sample compound spectra meet specified criteria in relation to laboratory standard spectra?	Yes	No	N/A
3. Were all compounds accounted for on chromatogram?	Yes	No	N/A

Comments/Qualifications:

No raw data - level IIA

DATA VALIDATION WORKSHEETS
SEMIVOLATILE ORGANICS

Reviewer: Kitchings Date: 4/16

Project: ~~0703~~ SWMU 39 SDG: 0703282 Matrix/No. Samples: S-6

XI. Compound Quantitation and Reported Contract Required Quantitation Limits (CRQLs)			
1. Were sample results correctly calculated and reported by laboratory?	(Yes)	No	N/A
2. Were correct internal standard quantitation ion and RRF used to quantify all compounds for all samples?	Yes	No	(N/A)
3. Were CRQLs adjusted to reflect sample dilutions and dry weight factors not accounted for by the method?	Yes	No	N/A
4. Were any laboratory QA/QC sample results calculated from peaks derived using manual integration?	Yes	No	N/A
5. Were any qualifications required based on this information?	Yes	(No)	N/A

Comments/Qualifications:

108-0 No raw data - level II

XII. Field QC			
1. Were any Field Duplicates associated with this SDG?	(Yes)	No	N/A
a. If Yes, were RPDs acceptable (50% for water samples, 100% for soil samples)?	Yes	No	N/A
2. Were any field blanks or equipment rinsates associated with this SDG?	(Yes)	No	N/A
a. If yes, were any compounds reported in samples >IDL?	Yes	(No)	N/A
b. Were any qualifications required based on this information?	Yes	(No)	N/A

Comments/Qualifications:

18-0 1/35.5 = 2.8% 35 Zmn 36 U02 U02 D

19 Naphth. 19 - 3U0

3/38.5 = 7.8% — 37 Phena. 40

@CFS01 - all U's.

@CRS01 - all U's.

XIII. Overall Assessment of Data			
1. Are there any specific concerns or limitations regarding the data in this SDG?	Yes	(No)	N/A

Comments/Qualifications:

SDG: 0703252 Project: Ft Stewart - SWMU 39

Method: Volatiles GRO - 8015B DRO - 8015B Matrix/No. Samples: Soil GRO - 5 DRO - 5

Validation Samples: 07082401 07082403
07082402 07082404
07082420 07082405

Data Validation Report Summary

		Status Code	Comments
1.	Sample Preservation, Handling, and Transport	A	
2.	Chain of Custody	A	
3.	Holding Times	A	
4.	GC/MS Tune/Inst Perf	N/A	
5.	Calibrations	A	
6.	Blanks	A	
7.	Blank Spike/LCS	A	
8.	Matrix Spike	A	
9.	Surrogates	A	See #1
10.	Internal Standards	N/A	
11.	Compound Identification	X	
12.	System Performance	A	
13.	Field QC Samples	A	
14.	Overall Assessment	X	

Status Codes.
A = Acceptable
R = Data Rejected
X = Data acceptable but qualified due to problems

Qualifications:

16 • The results for samples ...82U04 and ...82U05 exceeded the instrument calibration limits and dilutions were analyzed – the original results were rejected and the dilution result accepted.

Significant Findings/Recommendations

#1 • The lab reported a shift in the RT for the surrogate result associated with sample ...82U05, since the dilution result (original DRO) was used there was no requirement for a qualifier.

Overall Data Quality:

Acceptable as qualified.

Validator's Signature: J. Thomas Hastings Date: 4/17/2007

FORM 1
ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U01

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 3252 SAS No.: NA SDG No.: STE.G03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-01

Sample wt/vol: 5.1 (g/mL) G Lab File ID: 006F0101

Level: (low/med) HIGH Date Sampled: 03/23/07 08:00

% Moisture: not dec. 12 Date Analyzed: 03/30/07 14:01

GC Column: RTX 502.2 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: 5000(ul) Soil Aliquot Volume: 100(ul)

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q Raw Qual
8006-61-9	Gasoline Range Organics	2.8	5.6		U

Empirical Laboratories

FORM 1
ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U02

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 3252 SAS No.: NA SDG No.: STE.G03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-02

Sample wt/vol: 5.4 (g/mL) G Lab File ID: 007F0101

Level: (low/med) HIGH Date Sampled: 03/23/07 08:05

% Moisture: not dec. 14 Date Analyzed: 03/30/07 14:40

GC Column: RTX 502.2 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: 5000(ul) Soil Aliquot Volume: 100(ul)

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q	
8006-61-9	Gasoline Range Organics	2.7	5.4		U	U Rev 2nd

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FORM 1
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CLIENT SAMPLE NO.

07082U02D

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 3252 SAS No.: NA SDG No.: STE.G03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-03

Sample wt/vol: 5.2 (g/mL) G Lab File ID: 010F0101

Level: (low/med) HIGH Date Sampled: 03/23/07 08:05

% Moisture: not dec. 12 Date Analyzed: 03/30/07 16:38

GC Column: RTX 502.2 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: 5000(ul) Soil Aliquot Volume: 100(ul)

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q	Rev Qual
8006-61-9	Gasoline Range Organics	2.7	5.5		U	u

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FORM 1
ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U03

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 3252 SAS No.: NA SDG No.: STE.G03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-04

Sample wt/vol: 5.2 (g/mL) G Lab File ID: 011F0101

Level: (low/med) HIGH Date Sampled: 03/23/07 08:07

% Moisture: not dec. 10 Date Analyzed: 03/30/07 17:17

GC Column: RTX 502.2 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: 5000(ul) Soil Aliquot Volume: 100(ul)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) MG/KG MDL	RL	CONC	Q Rev Qual
8006-61-9	Gasoline Range Organics	2.7	5.4		U u

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FORM 1
ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U04

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 3252 SAS No.: NA SDG No.: STE.G03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-05

Sample wt/vol: 5.1 (g/mL) G Lab File ID: 012F0101

Level: (low/med) HIGH Date Sampled: 03/23/07 08:10

% Moisture: not dec. 8 Date Analyzed: 03/30/07 17:56

GC Column: RTX 502.2 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: 5000(ul) Soil Aliquot Volume: 100(ul)

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q	Rev Qual
8006-61-9	Gasoline Range Organics	2.7	5.3		U	U

FORM I

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FORM 1
ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U05

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 3252 SAS No.: NA SDG No.: STE.G03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-06

Sample wt/vol: 5.1 (g/mL) G Lab File ID: 013F0101

Level: (low/med) HIGH Date Sampled: 03/23/07 08:15

% Moisture: not dec. 12 Date Analyzed: 03/30/07 18:35

GC Column: RTX 502.2 ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: 5000(ul) Soil Aliquot Volume: 100(ul)

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q	Rev Qual
8006-61-9	Gasoline Range Organics	2.8	5.5		U	u

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FORM 1
DRO ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U01

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 3252 SAS No.: NA SDG No.: STE.D03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-01

Sample wt/vol: 25.3 (g/mL) G Lab File ID: 016R0201

% Moisture: 12 decanted: (Y/N) N Date Sampled: 03/23/07 08:00

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:03/27/07

Concentrated Extract Volume: 1.0(mL) Date Analyzed: 03/28/07 20:11

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q
11-84-7-------	Diesel Range Organics	4.5	4.5	5.7	

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FORM 1
DRO ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U02

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 3252 SAS No.: NA SDG No.: STE.D03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-02

Sample wt/vol: 25.4 (g/mL) G Lab File ID: 017R0201

% Moisture: 14 decanted: (Y/N) N Date Sampled: 03/23/07 08:05

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:03/27/07

Concentrated Extract Volume: 1.0(mL) Date Analyzed: 03/28/07 20:55

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q
11-84-7	-------Diesel Range Organics_____	4.6	4.6	14	

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FORM 1
DRO ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U02D

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 3252 SAS No.: NA SDG No.: STE.D03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-03

Sample wt/vol: 25.3 (g/mL) G Lab File ID: 020R0201

% Moisture: 12 decanted: (Y/N) N Date Sampled: 03/23/07 08:05

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted: 03/27/07

Concentrated Extract Volume: 1.0 (mL) Date Analyzed: 03/28/07 23:05

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q
11-84-7	-------Diesel Range Organics	4.5	4.5	14	

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CLIENT SAMPLE NO.

07082U03

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 3252 SAS No.: NA SDG No.: STE.D03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-04

Sample wt/vol: 25.2 (g/mL) G Lab File ID: 021R0201

% Moisture: 10 decanted: (Y/N) N Date Sampled: 03/23/07 08:07

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:03/27/07

Concentrated Extract Volume: 1.0(mL) Date Analyzed: 03/28/07 23:48

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q Re Qual
11-84-7	-------Diesel Range Organics	4.4	4.4	8.3	

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CLIENT SAMPLE NO.

07082U04

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 3252 SAS No.: NA SDG No.: STE.D03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-05

Sample wt/vol: 25.3 (g/mL) G Lab File ID: 022R0201

% Moisture: 8 decanted: (Y/N) N Date Sampled: 03/23/07 08:10

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:03/27/07

Concentrated Extract Volume: 1.0(mL) Date Analyzed: 03/29/07 00:32

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q	Rev 2nd	
11-84-7--------	Diesel Range Organics	4.3	4.3	260	E	R	16

FORM 1
DRO ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U04DL

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 3252 SAS No.: NA SDG No.: STE.D03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-05DL

Sample wt/vol: 25.3 (g/mL) G Lab File ID: 004R0201

% Moisture: 8 decanted: (Y/N) N Date Sampled: 03/23/07 08:10

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:03/27/07

Concentrated Extract Volume: 1.0(mL) Date Analyzed: 03/31/07 15:30

Injection Volume: 1.0(uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q
11-84-7	-------Diesel Range Organics_____	22	22	370	D

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FORM 1
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CLIENT SAMPLE NO.

07082U05

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 3252 SAS No.: NA SDG No.: STE.D03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-06

Sample wt/vol: 25.2 (g/mL) G Lab File ID: 023R0201

% Moisture: 12 decanted: (Y/N) N Date Sampled: 03/23/07 08:15

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted:03/27/07

Concentrated Extract Volume: 1.0(mL) Date Analyzed: 03/29/07 01:15

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q	Rev Qual	
11-84-7	-------Diesel Range Organics_____	4.5	4.5	390	E	R	16

FORM 1
DRO ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07082U05DL

Lab Name: EMPIRICAL LABS Contract: STEP

Lab Code: Case No.: 3252 SAS No.: NA SDG No.: STE.D03252

Matrix: (soil/water) SOIL Lab Sample ID: 0703252-06DL

Sample wt/vol: 25.2 (g/mL) G Lab File ID: 005R0201

% Moisture: 12 decanted: (Y/N) N Date Sampled: 03/23/07 08:15

Extraction: (SepF/Cont/Sonc/Soxh) SONC Date Extracted: 03/27/07

Concentrated Extract Volume: 1.0(mL) Date Analyzed: 03/31/07 16:13

Injection Volume: 1.0(uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: NA Sulfur Cleanup: (Y/N) N

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

CAS NO.	COMPOUND	MDL	RL	CONC	Q Rev Qual
11-84-7	-------Diesel Range Organics	45	45	520	D