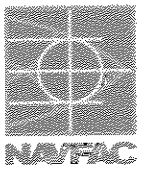
Submitted AT UST Partnering to NCDENR
2/23/06 SAS

ADDITIONAL SAMPLING REPORT WITH SITE CLOSURE REQUEST BUILDING M230

NCDENR Incident Number: 12677
Marine Corps Base
Camp Lejeune, North Carolina

February 16, 2006

Prepared for:



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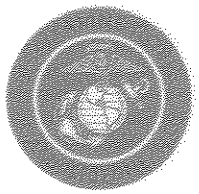

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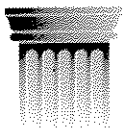

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606 A-1 Thimble Shoals Boulevard
Newport News, VA 23606

Contract Number: N62470-04-D-0205
Task Order: 0008

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LIST OF ACRONYMS

2000 Guidelines	Groundwater Section Guidelines for Investigation and Remediation of Soil and Groundwater
2001 Guidelines	Guidelines for Assessment and Corrective Action, North Carolina Underground Storage Tank Section (Effective July 1, 2001)
2L GWQS	NCAC T15A:02L Groundwater Quality Standards
AS	Air Sparge
AST	Aboveground Storage Tank
BDL	Below Detection Limit
BN	Base/Neutral (extractables)
BNA	Base/Neutral/Acid (extractables)
BQL	Below Quantitation Limit
BLS	Below Land Surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAP	Corrective Action Plan
CFR	Code of Federal Regulations
Cr	Chromium
CSA	Comprehensive Site Assessment
DIPE	Di-isopropyl Ether
DO	Dissolved Oxygen
DOD	Department of Defense
DPT	Direct Push Technology
DWQ	Division of Water Quality
DWM	Division of Waste Management
DTW	Depth to Water
EDB	Ethylene di-bromide
EMD	Environmental Management Division
EPA	Environmental Protection Agency
EPH	Extractable Petroleum Hydrocarbons
EQB	Environmental Quality Branch
Fe	Iron
FID	Flame Ionization Detector
FT	Feet
GCL	Gross Contaminant Level
GIS	Geographic Information System
GPS	Global Positioning System
Guidelines Vol. II	Groundwater Section Guidelines for Investigation and Remediation of Soil and Groundwater, Volume II, Petroleum Underground Storage Tanks (January 2, 1998)
HDPE	High Density Polyethylene
I/C	Industrial/Commercial
ID	Identification
I&E	Installations and Environment Department
IGWQS	Interim Groundwater Quality Standards
IPE	Isopropyl Ether
LSA	Limited Site Assessment
LUST	Leaking Underground Storage Tank
m	Meter
MADEP	Massachusetts Department of Environmental Protection
MCAS	Marine Corps Air Station

MCB	Marine Corps Base
MDL	Method Detection Limit
mg/Kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
MSCC	Maximum Soil Contaminant Concentration
MSL	Mean Sea Level
MTBE	Methyl tertiary butyl ether
µg/Kg	Micrograms per Kilogram
µg/L	Micrograms per Liter
NA	Not Analyzed
N/A	Not Applicable
NAVFAC	Naval Facilities Engineering Command Atlantic
NC	North Carolina
NCAC	North Carolina Administrative Code
NCDENR	North Carolina Department of Environment and Natural Resources
NE	None Established
NM	Not Measured
NMT	No Measurable Thickness
NS	Not Sampled
OVA	Organic Vapor Analyzer
PAH	Polynuclear Aromatic Hydrocarbons
Pb	Lead
PPB	Parts Per Billion
PPM	Parts Per Million
PID	Photo Ionization Detector
PQL	Practical Quantitation Limit
PVC	Polyvinyl chloride
RBCA	Risk-Based Corrective Action
RCRA	Resource Conservation and Recovery Act
Res	Residential
SOW	Scope of Work
STW	Soil-to-water
SVE	Soil Vapor Extraction
SVOC	Semi Volatile Organic Compound
TCLP	Toxicity Characteristic Leaching Procedure
TIC	Tentatively Identified Compound
TOC	Top of Casing
TPH	Total Petroleum Hydrocarbons
US	United States
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
VPH	Volatile Petroleum Hydrocarbons
WiRO	NCDENR Wilmington Regional Office

TABLES (Continued)

APPENDICES

EXECUTIVE SUMMARY

The Building M230 project site is located in the Camp Johnson Area of Marine Corps Base, Camp Lejeune, North Carolina. The building is used for steam generation purposes. The site previously contained two 15,000-gallon fuel oil USTs. A three-inch diameter fuel oil supply line and two-inch diameter return line extended from the USTs to building M-230 in order to supply fuel to three boilers. The installation dates for the tanks are not known. In 1988, the fuel oil supply and return lines were replaced with a two-inch diameter fuel oil supply line and a one-inch diameter fuel oil return line. The USTs were removed by THH Services Limited of Ayden, North Carolina on September 21, 1993.

The North Carolina Department of Environment and Natural Resources (NCDENR) required Marine Corps Base, Camp Lejeune to perform a Phase I Limited Site Assessment (LSA) of the site in a Notice of Regulatory Requirement letter, dated August 6, 2001. Subsequently, Mid Atlantic Associates P.A. (Mid Atlantic) performed the assessment and detailed findings in a report dated August 15, 2002. During the assessment, Mid Atlantic personnel installed a source area monitoring well and collected both soil and groundwater samples for analysis. They also completed a receptor survey, which allowed them to demonstrate that the site meets criteria for low risk classification. NCDENR assigned a residential land use to the site.

Later, Mid Atlantic performed a Soil Assessment in April 2003 to determine the horizontal boundaries of impacted soils. Based on the analytical results from Mid Atlantic's LSA and SAR, two contaminants (benzo(a)pyrene and benzo(b)fluoranthene) were detected at concentrations that exceeded the residential MSCCs. These were detected in the source area soil sample at the 3 to 5 feet interval. Mid Atlantic concluded the contaminated soil was contained horizontally and vertically in the area of the source area well, and they recommended MCB Camp Lejeune excavate a 5 foot radius around the source well to a depth of approximately 8 feet.

Shaw Environmental and Infrastructure, Inc. (Shaw) implemented the recommendations and provided a report detailing the removal action in November 2004. Shaw excavated approximately 95 tons of contaminated soil from the site. The final excavation was 15 feet in diameter at the source well, which was abandoned in the process, and 11 feet deep. Confirmation soil sampling showed all contaminants were removed with the exception of benzo(a)pyrene in the floor sample (11 feet) with a concentration of 0.256 mg/kg as compared to the residential MSCC 0.088 mg/kg. MADEP constituents, specifically the C9-C22 Aromatics, were also detected in confirmation samples. Levels were above the soil-to-water MSCCs, but below the residential MSCCs.

In an effort to address benzo(a)pyrene at the 11 foot depth, MCB Camp Lejeune conducted preliminary soil sampling with the intent of conducting additional excavation of the contaminated soils, if needed. In December 2005, Osage of Virginia Inc. reinstalled the previously abandoned source well and took three split spoon soil samples from the boring. The samples were taken from the 3-5 feet interval, the 5-7 feet interval, and the 11-13 feet interval. They were sent to Paradigm Analytical Laboratories Inc. (Paradigm) in Wilmington, NC (NC Certification Number 481) for laboratory analysis via EPA Method 8270. No semi-volatile compounds were detected above the laboratory quantitation limits except for bis(2-ethylhexyl)phthalate. This contaminant was present in the sample collected from the 3-5 feet

interval at a concentration of 406 µg/kg, as compared to the soil-to-water (STW) MSCC of 5,600 µg/kg and residential MSCC of 46,000 µg/kg. The recent soil sampling shows all previously detected soil contaminants have attenuated to below the applicable residential MSCCs.

In addition, Sovereign Consulting Inc. (Sovereign) conducted groundwater sampling to assess the effects of natural attenuation on the groundwater conditions at the project site. No groundwater contaminants were detected at the site. Based on the previous soil results and the December 2005 groundwater sampling event discussed in this report, soil and groundwater contamination are not present above the residential maximum soil contaminant concentrations or 2L GWQ standards. Given these results, this site qualifies for No Further Action (NFA) status without land use restrictions.

1.0 TITLE PAGE

DATE OF REPORT: February 16, 2006
Facility I.D.: N/A UST Incident Number: 12677
Site Name: Building M230
Site Location: Marine Corps Base Camp Lejeune, North Carolina
Nearest City/Town: Camp Lejeune County: Onslow
Risk Classification: Low Risk Land Use Classification: Residential

UST Owner: Commanding General – MCB Camp Lejeune
I&E/EMD/EQB
PSC Box 20004
Address: MCB Camp Lejeune, NC 28542-0004 Phone: (910) 451-5068

UST Operator: Same as above
Address: Same as above Phone: Same as above

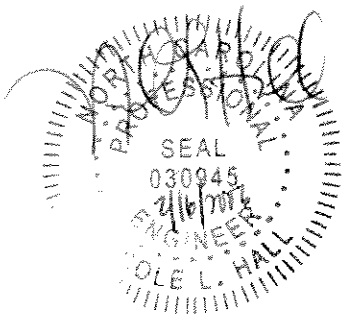
Property Owner: Same as above
Address: Same as above Phone: Same as above

Property Occupant: Same as above
Address: MCB Camp Lejeune, NC Phone: None

Consultant/Contractor: Sovereign Consulting Inc.
Address: 606 A-1 Thimble Shoals Blvd.
Newport News, VA 23606 Phone: (757) 594-0980

Release Information

Date Discovered: October 7, 1993
Latitude: 35" 43'28.4" N (35.7246' N)
Longitude: 77" 24' 46.0" W (77.4120 W)
Estimated Quantity of Release: Unknown
Cause of Release: Leaking underground storage tank system
Source of Release (Piping/UST): UST and piping
Sizes and contents of UST system(s) from which the release occurred: The former system consisted of two 15,000-Gallon fuel oil USTs.



*I, **Nicole L. Hall** a Professional Engineer for Sovereign Consulting Inc., do certify that the information contained in this report is correct and accurate to the best of my knowledge.*

2.0 INTRODUCTION

The purpose of this report is to summarize data from a recent groundwater sampling event at Building M230 located on MCB Camp Lejeune, as well as perform an evaluation for site closure in accordance with the 2001 NCDENR DWM UST Guidelines.

The project's scope of work entailed groundwater monitoring and sampling at one well - USTM230-MW01A. The well was gauged and sampled. The groundwater sample was analyzed for Field redox parameters (oxidation-reduction potential (ORP), pH, dissolved oxygen (DO), dissolved manganese, and dissolved (ferrous) iron). Samples were sent to the laboratory for analysis via Biochemical Oxygen Demand (BOD5-day), Chemical Oxygen Demand (COD), 602 w/ xylenes, 625 plus 10 largest non-target peaks, MADEP VPH and MADEP EPH. Results of the sampling activities are presented in this report.

3.0 SITE HISTORY

The subject site, a steam generation facility for Camp Johnson adjacent to Camp Lejeune, North Carolina, has been the subject of assessment activities since the early 1990's. The site previously contained two 15,000-gallon fuel oil USTs. A three-inch diameter fuel oil supply line and two-inch diameter return line extended from the USTs to building M-230 in order to supply fuel to three boilers. The installation dates for the tanks are not known. In 1988, the supply and return lines were replaced with a two-inch diameter supply line and a one-inch diameter return line.

The USTs were removed by THH Services Limited of Ayden, North Carolina on September 21, 1993. UTTS/Environmental performed the environmental monitoring for THH Services. They also generated a closure report and collected six soil samples from the excavation subsequent to tank removal. These soil samples were obtained from the sidewalls of the excavation pit, reportedly from native soils. The soil samples were shipped to Southern Testing and Research Laboratories in Wilson, NC for testing of TPH by EPA preparation methods 5030 and 3550 with testing method 8015M. Concentrations of fuel oil fuel range TPH (method 3550) were reported at concentrations ranging from 110 mg/kg to 800 mg/kg. The Tank Removal Report states that the UST excavations were backfilled with excavated soils immediately following UST removal at the direction of the NAVFAC representative. Additional clean backfill, consisting of sand, was placed in the excavation to return the excavation to grade.

In 2002, NCDENR required Marine Corps Base, Camp Lejeune to perform a Phase I Limited Site Assessment (LSA) of the site, at which time monitoring well USTM230-MW01 was installed. A Soil Assessment Report was later submitted in April of 2003 for this site.

In May 2004, Shaw Environmental Inc. (Shaw) performed a remedial action at this site by excavating and properly disposing of 95 tons of petroleum impacted soils to address recommendations made by both the Phase I LSA and Soil Assessment Report. At that time they properly abandoned well USTM230-MW01.

Osage of Virginia Inc. (Osage) was tasked to reinstall monitoring well USTM230-MW01 in its original location and collect soil samples for analysis via EPA Method 8270 (SVOCs) in

December 2005. The monitoring well reinstalled at this site was then gauged and sampled on December 9, 2005 by Sovereign Consulting Inc. (Sovereign). Historical sample documentation is included in Appendix A.

4.0 SITE REMEDIATION

The USTs were closed by removal by THH Services Limited of Ayden, North Carolina on September 21, 1993. Subsequently, NCDENR required MCB Camp Lejeune to perform a Phase I LSA of the site in a Notice of Regulatory Requirement letter dated August 6, 2001. This section presents the results of soil and groundwater assessments performed in response to the NCDENR notice through 2005.

4.1 Soil

PHASE I LIMITED SITE ASSESSMENT:

Pursuant to the NCDENR notice, a Phase I LSA was conducted at the site. Mid-Atlantic personnel began sampling activities in June 2002. Nine soil samples (USTM230-SB01 through USTM230-09) were collected by hand auger for laboratory analysis, and a duplicate sample (USTM230SB05D) was also submitted for laboratory analysis. Toluene was detected above laboratory quantitation limits at the site, but concentrations were below the lowest MSCC. All other volatile organic compound sample results were below the laboratory quantitation limits. Semi-volatiles were detected in the soil samples from the project site. Benzo(a)pyrene and benzo(b)fluoranthene exceeded the industrial/commercial MSCC and residential MSCC, respectively. Several semi-VOC TICS were also reported as a result of the library search for EPA Method 8270. MADEP constituents, while detected, were below the lowest maximum soil contaminant concentrations.

SOIL ASSESSMENT REPORT:

LANTDIV and the MCB then authorized Mid-Atlantic to perform a soil assessment in the vicinity of UST M-230-2 where SVOC contamination was detected. Four DPT borings were advanced with a PowerProbe in the vicinity of the former UST location in an effort to assess the extent of SVOC impacted soils previously detected. The soil samples were tested for VOCs using EPA Methods 8260, SVOCs using EPA Method 8270 (including TICS), and VPH and EPH using the MADEP Methods.

Methylene chloride was detected; however, it was not present above the residential limit. No other VOCs were detected above the laboratory quantitation limits. Likewise, semi-volatile constituents were not detected above the applicable residential MSCCs. The laboratory identified the presence of 10 TICS with the total estimated concentrations for the three samples ranging from 8.43 to 11.45 mg/Kg. MADEP VPH and/or EPH compounds were detected in four of the eight soil samples at concentrations below the Residential and STW MSCCs.

Based on the analytical results from Mid Atlantic's LSA and SAR, two contaminants were detected at concentrations that exceeded the residential MSCCs. These were detected in the source area soil sample at the 3 to 5 feet interval. Mid Atlantic concluded the contaminated soil

was contained horizontally and vertically in the area of the source area well, and they recommended MCB Camp Lejeune excavate a 5 foot radius around the source well to a depth of approximately 8 feet.

REMEDIAL ACTION/SOIL EXCAVATION:

Shaw completed a soil removal action at Building M230 in May 2004. At that time monitoring well USTMW230-MW01 was properly abandoned by a North Carolina registered driller on April 30, 2004. Excavation activities removed soil (as well as the abandoned monitoring well) in a 5 foot radius around the monitoring well to a total depth of 8 feet bls. Four sidewall samples and one bottom sample were collected for TPH-DRO/GRO analysis from the excavation.

Based on analytical results exceeding 10 mg/kg in two sidewall samples and the floor sample, the excavation was extended. The final excavation measured 15 feet in diameter and 11 feet deep. At the conclusion of the additional excavation work, two confirmation sidewall samples and one floor soil sample were collected. The samples were analyzed for VOCs (Method 8260), SVOCs (Method 8270), and MADEP EPH/VPH. Only one contaminant was detected above the residential MSCC – benzo(a)pyrene at a concentration of 0.256 mg/kg as compared to the residential MSCC 0.088 mg/kg. This contaminant was detected in the excavation floor sample at a depth of 11 feet. MADEP constituents, specifically the C9-C22 Aromatics, were also detected in the confirmation samples. Concentrations were above the soil-to-water MSCCs, but below the residential MSCCs. The results of these sample analyses are included in Appendix A.

WELL REINSTALLATION:

The well USTMW230-MW01 was reinstalled in December of 2005, and soil samples were collected for analysis via EPA Method 8270. All parameters were listed with non detectable concentrations with the exception of bis(2-ethylhexyl)phthalate in the 3 – 5 feet interval. The contaminant was present at a concentration of 406 μg/kg, which is below the STW MSCC of 5,600 μg/kg, as well as the residential MSCC of 46,000 μg/kg.

4.2 Groundwater

On June 19, 2002, Mid-Atlantic personnel collected a groundwater sample from monitoring well USTM230-MW01. Depth to groundwater, based on previous work conducted at the site, is expected to range from 13.3 to 16.8 feet BLS.

Laboratory analysis completed on the groundwater sample included VOCs by EPA Method 602 (including total xylenes, IPE and MTBE), SVOCs by EPA Method 625 (including TICS), MADEP VPH and MADEP EPH. The groundwater samples were placed in laboratory glassware, labeled, placed immediately on ice in a cooler, and transported under proper chain-of-custody protocol to Paradigm. Analytical results for the groundwater samples collected are summarized below.

<u>EPA Method 602 + IPE + MTBE</u>
The groundwater sample collected from monitoring well USTM230-MW01 did not exhibit VOC concentrations above the applicable laboratory quantitation limits.

EPA Method 625 + TICS

Four EPA Method 625 compounds were detected in USTM230-MW01 above the laboratory quantitation limits. Of the four compounds detected, bis(2-ethylhexyl)phthalate was reported at a concentration above the NCGWQS. The compound is a common field and laboratory contaminant. The laboratory also reported the presence of ten TICS in groundwater sample USTM230-MW01. The total estimated TIC concentration for the compounds was 5,190 µg/L. Mid-Atlantic contacted a chemist at Paradigm in reference to the TICS. Paradigm reviewed the chromatogram and the EPA Method 625 library search result data and stated that the TICS appeared to be petroleum-related.

MADEP VPH/EPH

The C9 to C22 aromatic compounds were detected at a concentration of 240 µg/L, which is in excess of the IGWQS of 210 µg/L.

5.0 POST REMEDIATION SAMPLING

In an effort to address benzo(a)pyrene at the 11 foot depth, MCB Camp Lejeune conducted preliminary soil sampling with the intent of conducting additional excavation of the contaminated soils, if needed. In December 2005, Osage of Virginia Inc. reinstalled the previously abandoned source well and took three split spoon soil samples from the boring. The samples were taken from the 3-5 feet interval, the 5-7 feet interval, and the 11-13 feet interval. They were sent to Paradigm Analytical Laboratories Inc. in Wilmington, NC (NC Certification Number 481) for laboratory analysis via EPA Method 8270. No semi-volatile compounds were detected above the laboratory quantitation limits except for bis(2-ethylhexyl)phthalate. This contaminant was present in the sample collected from the 3-5 feet interval at a concentration of 406 µg/kg, as compared to the STW MSCC of 5,600 µg/kg and the residential MSCC of 46,000 µg/kg. This recent soil sampling event shows all previously detected soil contaminants have attenuated to below the applicable residential MSCCs.

In addition, Sovereign Consulting Inc. (Sovereign) conducted a groundwater sampling event of the newly installed well, USTM230-MW01A. Sovereign gauged and sampled the well on December 9, 2005. The static groundwater depth was 13.25 feet from top of casing, and no free product was detected in the well during the site visit. Sovereign purged and sampled the well, then sent the samples under chain of custody for analysis to Paradigm. The lab tested the groundwater sample for COD, Dissolved Manganese, Ferrous Iron, 602 w/ xylenes, 625 plus 10 largest non-target peaks, MADEP VPH, and MADEP EPH. Laboratory reports and chain of custody documentation are included in Appendix B of this report.

A second groundwater sample was obtained on December 12, 2005. This sample was also sent to Paradigm under chain of custody and analyzed for BOD5-day. Laboratory reports and chain of custody documentation are also included in Appendix B.

All compounds in the 602, 625, and MADEP analyses were below quantitation limits. There was also no ferrous iron detected; however some dissolved manganese was present. Tables 1-5 summarize the data obtained during Sovereign's field activities.

6.0 RECEPTOR SURVEY

Sovereign reassessed site conditions and concluded that the receptor survey previously completed by MidAtlantic in the Phase I LSA still applies. There has been no change in receptor impact, and there have been no changes to land use of the site or the surrounding areas.

7.0 CONCLUSIONS AND PETITION FOR SITE CLOSURE

Based on fieldwork and laboratory analytical data gathered to date, the following conclusions are presented:

1. A soil sample collected during the Phase I LSA and SAR exhibited concentrations of petroleum compounds that exceeded the applicable residential maximum soil contaminant concentrations. This exceedence was in the soil sample collected from 3 to 5 feet in the soil boring advanced for the source area monitoring well (USTM230-MW01).

2. Shaw conducted a soil excavation of the previously identified soil contamination in 2004. Only benzo(a)pyrene was left above the residential MSCC at a depth of 11 feet. MADEP constituents, specifically the C9-C22 Aromatics, were also detected in the confirmation samples. Concentrations were above the soil-to-water MSCCs, but below the residential MSCCs.

3. Osage performed additional soil sampling at the site in December 2005. Analysis showed all previously identified contaminant levels attenuated to below quantitation limits, with the exception of bis(2-ethylhexyl)phthalate. It was present in sample USTM230SB3-5 at a concentration of 406 µg/kg, which is below the soil-to-water and residential MSCCs.

4. Groundwater samples collected during the Phase I LSA contained contaminants above 2L standards; however, levels were below established GCLs.

5. Analysis of the groundwater samples collected by Sovereign in December 2005 showed that all previously detected compounds are below quantitation limits.

Based on the findings of this investigation and previous reports, the Building M230 site qualifies for No Further Action (NFA) status without land use restrictions. Land use restrictions should no longer be required, as soil and groundwater contamination is not present above the applicable residential MSCCs or 2L groundwater quality standards.

8.0 PUBLIC NOTICE REQUIREMENTS

Low risk sites that meet the residential maximum soil contaminant concentrations are eligible for a No Further Action status per NCDENR Regulation 15A NCAC 2L .0115 (h). The soil contamination identified during the Phase I LSA and SAR is present at levels below the

residential maximum soil contaminant concentrations. Some MADEP compounds (Shaw, 2004), however, exist above the soil-to-water MSCCs. As such, if NCDENR grants a No Further Action status for the site, 15A NCAC 2L.0115(k) requires that public notification be made to property owners and occupants within or contiguous to the area containing contamination within 30 days of the grant.

9.0 REFERENCES

Mid Atlantic Associates P.A., *Phase I Limited Site Assessment, Former Underground Storage Tank, Building M230, Camp Johnson Area, Marine Corps Base, Camp Lejeune, North Carolina,* August 15, 2002.

Mid Atlantic Associates P.A., *Soil Assessment Report, Former Underground Storage Tank, BuildingM230, Camp Johnson Area, Marine Corps Base, Camp Lejeune, North Carolina,* April 24, 2003.

Shaw Environmental Inc., *Final POL Impacted Soil Removal Actions, Paradise Point and Camp Johnson, Marine Corps Base, Camp Lejeune, North Carolina,* October 2004.

North Carolina Department of Environment and Natural Resources, Division of Waste Management, Underground Storage Tank Section, *Guidelines for Assessment and Corrective Action*, April 2001.

TABLES

TABLE 1
SUMMARY OF GROUNDWATER SAMPLING RESULTS

Date: December 2005
Incident Number and Name: 12677 - Building M230
Facility ID#: N/A

Analytical Method: EPA Method 602

Contaminant of Concern			Benzene	Diisopropyl ether (DIPE)	Ethylbenzene	Methyl-tert butyl ether (MTBE)	Toluene	Total Xylenes
Well ID	**Sample ID**	**Date Collected**						
USTM230-MW01A	USTM230-MW01A	12/9/2005	BQL	BQL	BQL	BQL	BQL	BQL
2L Standard (µg/l)			1	70	550	200	1,000	530
GCL (µg/l)			5,000	70,000	84,500	200,000	257,500	87,500

- All results reported in µg/l
- µg/L =micrograms per liter
- GCL = gross contamination level
- BQL = Below Quantitation Limits

Table 2
SUMMARY OF GROUNDWATER SAMPLING RESULTS

Date: December 2005
Incident Number and Name: 12677 - Building M230
Facility ID#: N/A

Analytical Method: EPA Method 625

Contaminant of Concern			All Compounds
Well ID	**Sample ID**	**Date Collected**	
USTM230-MW01A	USTM230-MW01A	12/9/2005	BQL
2L Standard (µg/l)			Varies
GCL (µg/l)			Varies

- All results reported in µg/l
- µg/L =micrograms per liter
- GCL = gross contamination level
- BQL = Below Quantitation Limits

TABLE 3
SUMMARY OF GROUNDWATER SAMPLING RESULTS

Date: December 2005
Incident Number and Name: 12677 - Building M230
Facility ID#: N/A

Analytical Method: Metals

Contaminant of Concern			Manganese	Ferrous Iron
Well ID	**Sample ID**	**Date Collected**		
USTM230-MW01	USTM230-MW01	12/9/2005	0.0102	BQL
2L Standard (µg/l)			50	300
GCL (µg/l)			--	--

- All results reported in µg/l
- µg/L =micrograms per liter
- GCL = gross contamination level
- BQL = Below Quantitation Limits
- -- = No standard indicated

TABLE 4
SUMMARY OF GROUNDWATER SAMPLING RESULTS

Date: December 2005
Incident Number and Name: 12677 - Building M230
Facility ID#: N/A

Analytical Method: COD and BOD

Contaminant of Concern			COD	BOD
Well ID	**Sample ID**	**Date Collected**		
USTM230-MW01	USTM230-MW01	12/9/2005 and 12/12/05	0.0102	BQL
2L Standard (µg/l)			--	--
GCL (µg/l)			--	--

- All results reported in µg/l
- µg/L =micrograms per liter
- GCL = gross contamination level
- BQL = Below Quantitation Limits
- -- = No standard indicated

TABLE 5
SUMMARY OF GROUNDWATER SAMPLING RESULTS

Date: December 2005
Incident Number and Name: 12677 - Building M230
Facility ID#: N/A

Analytical Method: MADEP VPH/EPH

Contaminant of Concern			C_5-C_8 Aliphatics	C_9-C_{12} Aliphatics	C_9-C_{10} Aromatics	C_9-C_{18} Aliphatics	C_{19}-C_{36} Aliphatics	C_{11}-C_{22} Aromatics
Well ID	**Sample ID**	**Date Collected**						
USTM230-MW01A	USTM230-MW01A	12/9/2005	<100	<100	<100	<100	<100	<100

- All results reported in µg/l
- µg/L =micrograms per liter
- GCL = gross contamination level

TABLE 6
SUMMARY OF GROUNDWATER SAMPLING RESULTS

Date: December 2005
Incident Number and Name: 12677 - Building M230
Facility ID#: N/A

Analytical Method: MADEP Method VPH/EPH as compared to NCDENR 2L Interim GWQS

Contaminant of Concern →			C_5-C_8 Aliphatics	C_9-C_{18} Aliphatics	C_9-C_{22} Aromatics	C_{19}-C_{36} Aliphatics
Well ID	**Sample ID**	**Date Collected**				
USTM230-MW01A	USTM230-MW01A	12/9/2005	<100	<200	<200	<100
2L Interim Standard (µg/l)			420	4,200	210	42,000
GCL (µg/l)			NE	NE	NE	NE

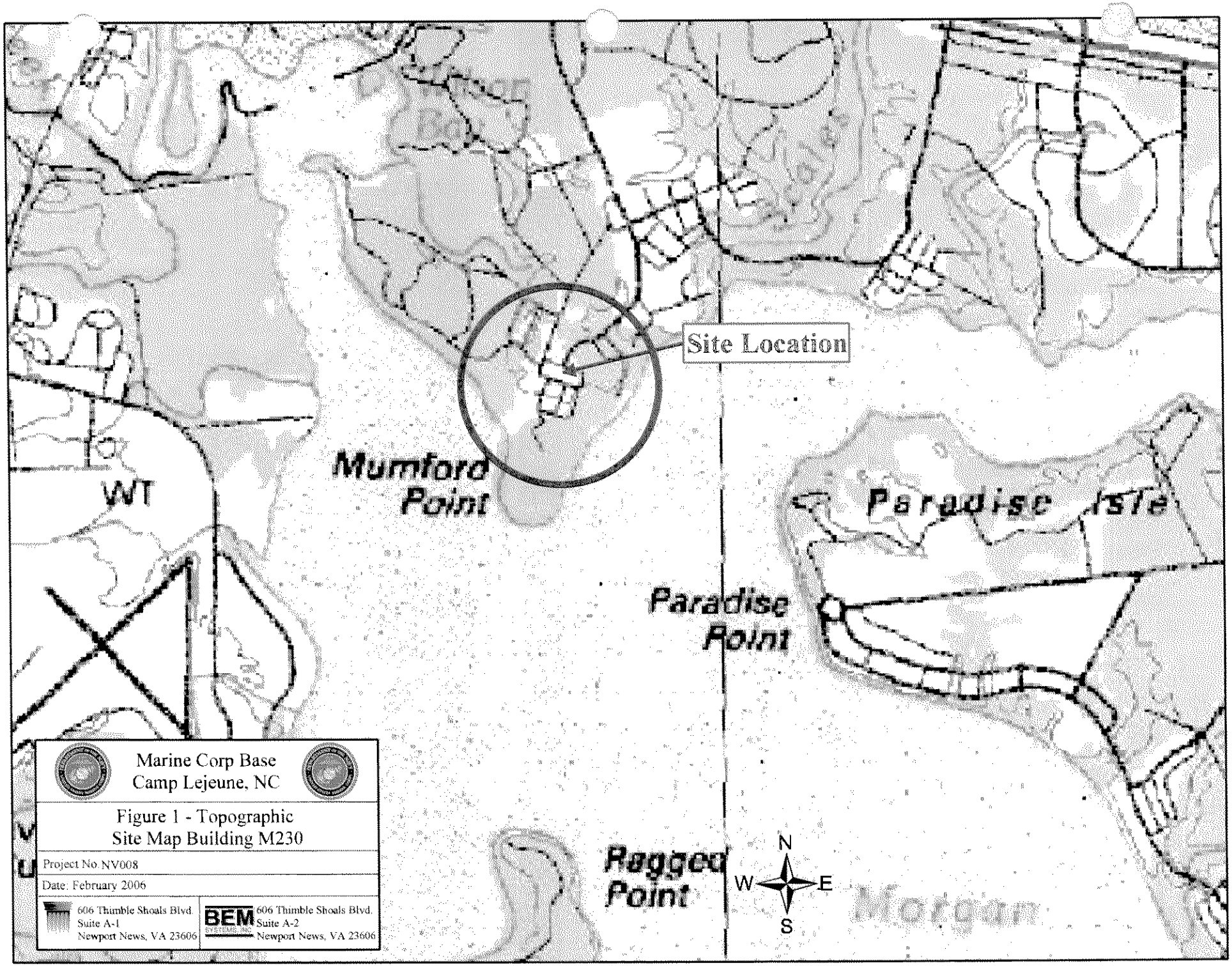
- All results reported in µg/l
- µg/L = micrograms per liter
- GCL = Gross Contaminant Level
- NE = Not Established

TABLE 7
WELL CONSTRUCTION INFORMATION

Date: December 2005
Incident Number and Name: 12677 - Building M230
Facility ID#: N/A

Well ID	Date Installed (mm/dd/yy)	Date Water Level Measured (mm/dd/yy)	Well Casing Depth (ft. BGS)	Screened Interval (x to y ft. BGS)	Bottom of Well (ft. BGS)	Top of Casing Elevation (ft.)	Depth to Water from Top of Casing (ft.)	Free Product Thickness (ft.)	Groundwater Elevation (ft.)
USTM230-MW01A	12/1/2005	12/1/2005	10	10-20	20	N/A	15.0	N/A	Unknown

FIGURES



Marine Corp Base
Camp Lejeune, NC

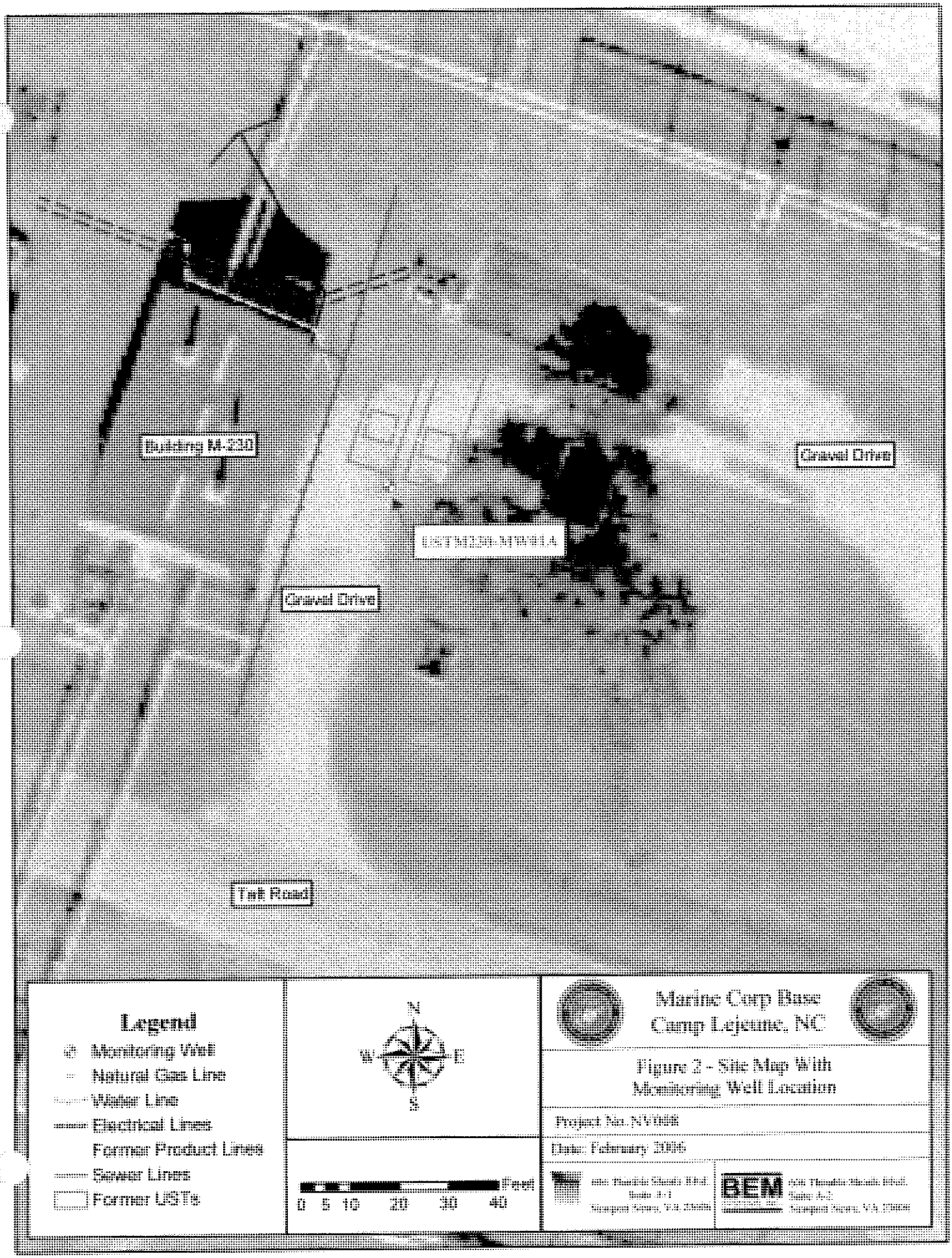
Figure 1 - Topographic
Site Map Building M230

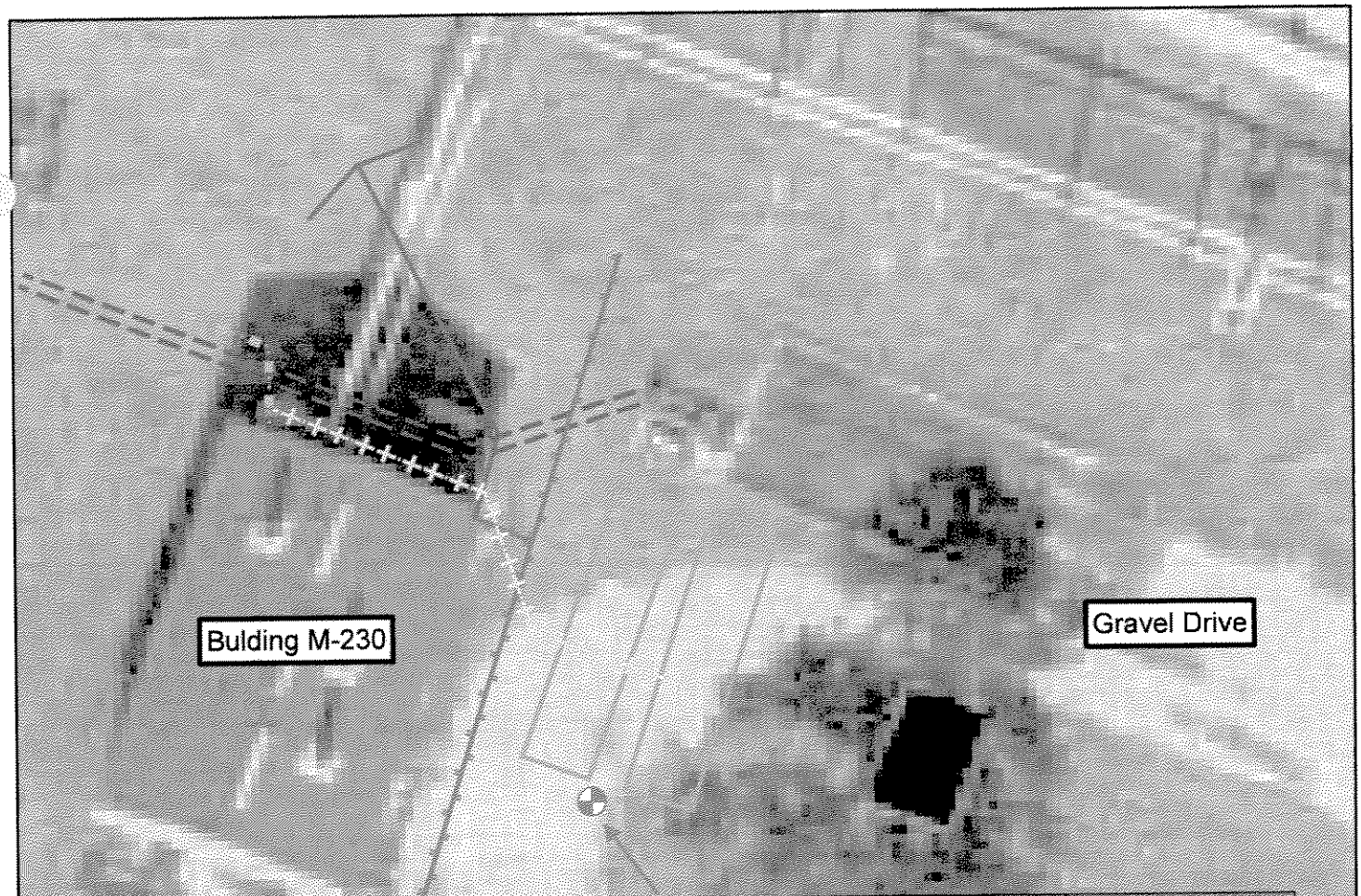
Project No. NV008

Date: February 2006

606 Thimble Shoals Blvd.
Suite A-1
Newport News, VA 23606

BEM SYSTEMS, INC.
606 Thimble Shoals Blvd.
Suite A-2
Newport News, VA 23606


Building M-230
Gravel Drive
UST M230-MW01A
Gravel Drive
Tart Road
Legend
Monitoring Well
Natural Gas Line
Water Line
Electrical Lines
Former Product Lines
Sewer Lines
Former USTs
N
W
E
S
Feet
0 5 10 20 30 40
Marine Corp Base
Camp Lejeune, NC
Figure 2 - Site Map With
Monitoring Well Location
Project No. NV0606
Date: February 2006
BEM



USTM230-MW01A	2L Standard (µg/l)	Results (µg/l)
Benzene	1	BQL
Diisopropyl ether (DIPE)	70	BQL
Ethylbenzene	29	BQL
Methyl-tert butyl ether (MTBE)	200	BQL
Toluene	1,000	BQL
Total Xylenes	530	BQL
Manganese	50	0.0102
Ferrous Iron	300	BQL
COD	--	0.0102
BOD	--	BQL
C_5-C_8 Aliphatics	420	<100
C_9-C_{18} Aliphatics	4,200	<200
C_9-C_{22} Aromatics	210	<200
C_{19}-C_{36} Aliphatics	42,000	<100
All Other Analytes	Varies	BQL

Note: Compounds summarized were analyzed via EPA Methods 602, 625, as well as the MADEP methods.

Legend

- Monitoring Well
- Natural Gas Line
- Water Line
- Electrical Lines
- Former Product Lines
- Sewer Lines
- Former USTs

N
W E
S

0 20
Feet

Marine Corp Base Camp Lejeune, NC

Figure 3- Site Map With Monitoring Well Location And Groundwater Sample Results

Project No. NV008

Date: February 2006

606 Thimble Shoals Blvd. Suite A-1 Newport News, VA 23606

BEM SYSTEMS, INC. 606 Thimble Shoals Blvd. Suite A-2 Newport News, VA 23606

APPENDIX A

HISTORICAL SOIL AND GROUNDWATER DATA AND FIGURES

PHASE I LIMITED SITE ASSESSMENT
AND
SOIL ASSESSMENT REPORT DATA

3.0 RISK CHARACTERIZATION

Limited Site Assessment Risk Classification and Land Use Form

Part I – Groundwater/Surface Water/Vapor Impacts
High Risk

1. *Has the release contaminated any water-supply well including any used for non-drinking purposes?* YES **NO**

   Water supply wells are not located within a 1,500-foot radius of the project site.

2. *Is a water-supply well used for drinking water located within 1,000-feet of the source area of the discharge or release?* YES **NO**

   There are no water-supply wells located within 1,000 feet of the source area.

3. *Is a water-supply well not used for drinking water (e.g., irrigation, washing cars, industrial cooling water, filling swimming pools) located within 250 feet of the source area of the release?* YES **NO**

   There are no water-supply wells located within 250 feet of the source area of the release.

4. *Does groundwater within 500 feet of the source area of the release have the potential for future use (there is no other source of water-supply other than the groundwater)?* YES **NO**

   No. There are an adequate number of locations for additional water-supply wells to be installed on other portions of the base.

5. *Do vapors from the release pose a threat of explosion because of accumulation of the vapors in a confined space or pose any other serious threat to public health, public safety or the environment? If yes, describe.* YES **NO**

   No. No evidence of accumulations were reported in the UST Closure document or during this investigation.

6. *Are there any other factors that would cause the discharge or release to pose an imminent danger to public health, public safety, or the environment? If yes, describe.* YES **NO**

No. Review of available previous environmental reports and data collected during this investigation does not provide evidence to suggest other factors that would cause the discharge or release to pose an imminent danger to public health, public safety, or the environment.

Intermediate Risk

7. *Is a surface water body located within 500 feet of the source area of the discharge or release?* YES **NO**

No. The location of the former tank basin (source area) is greater than 500 feet from surface waters named by the USGS on the Jacksonville South, NC 7.5 Minute Topographic Map (Drawing 1.1). We did not identify deep drainage ditches, with standing water, within 500 feet of the site.

*If **YES**, does the maximum groundwater contaminant concentration exceed the surface water quality standards and criteria found in 15A NCAC 2B.0200 by a factor of 10?*

8. *Is the source area of the discharge or release located within an approved or planned wellhead protection area as defined in 42 USC 300h-7(e)? If YES, describe.* YES **NO**

No. Wellhead protection areas defined by 42 USC 300h-7(**e**) have not, as of this time, been designated by the State for Onslow County. However, MCB Camp LeJeune has identified proposed wellhead protection areas on the base. The site is not located in a proposed wellhead protection area.

9. *Is the release located in the Coastal Plain physiographic region as designated on a map entitled "Geology of North Carolina" published by the Department in 1985?* **YES** NO

As identified in the Geologic Map of North Carolina (North Carolina Geological Survey, 1985), the subject site lies within the Coastal Plain Physiographic Province. Potential impacts to deeper aquifers are unknown.

*If **YES**, is the source area of the release located in an area in which there is recharge to an unconfined or semi-confined deeper aquifer that is being used or may be used as a source of drinking water?* YES **NO**

Aquifers below the surficial aquifer in the area of UST M-230 typically include the Castle Hayne Aquifer, the Beaufort Aquifer, and the Peedee Aquifer, in order of increasing depth. Both the Beaufort and Peedee Aquifers contain saltwater in portions of the MCB and are not generally used for water-supply. The Castle Hayne Aquifer contains freshwater and is the principal aquifer used in the area for water-supply.

While there is likely recharge to the unconfined surficial aquifer at the Base, this aquifer is not used for water supply. Deeper aquifers may obtain a portion of recharge from the surficial aquifer at the Base; however, the amount of recharge provided by the surficial aquifer is expected to be substantially limited due to the presence of confining units.

10. *Do the levels of groundwater contamination for any contaminant exceed the gross contamination levels established by the Department?* YES **NO**

Groundwater sample results were below established GCLs and 2L Standards.

Part II – Land Use

Property Containing Source Area of Release
The questions below pertain to the property containing the source area of the release.

1. *Does the property contain one or more primary or secondary residences (permanent or temporary)? Describe.* YES **NO**

No. The property contains a heating plant for generating steam supplied to nearby buildings at Camp Johnson. An above ground, active fuel unloading/loading facility is also present at the site. Fuel oil supply and return lines lead underground from this facility to two vertical, diesel fuel ASTs located in a tank farm facility to the west of building M-230.

2. *Does the property contain a school, daycare center, hospital, playground, park, recreation area, church, nursing home, or other place of public assembly? Describe.* YES **NO**

   No. The property contains a heating plant. Nearby buildings are used for classrooms and rest rooms as addressed in the surrounding properties section below.

3. *Does the property contain a commercial (e.g., retail, warehouse, office/business space, etc.) or industrial (e.g., manufacturing, utilities, industrial research and development, chemical/petroleum bulk storage, etc.) enterprise, an inactive commercial or industrial enterprise, or is the land undeveloped? Describe.* **YES** NO

   The property is an industrial enterprise as previously mentioned.

4. *Do children visit the property? Explain.* YES **NO**

   No. The immediate site is located in a secured area used for Base training operations. Ingress and egress to the area would be limited to individuals having business at the heating plant and traversing the site to the nearby classroom and instructor office building. Children would not typically be permitted in this area.

   Is access to the property reliably restricted consistent with its use (e.g., by fences, security personnel or both)? Explain. **YES** NO

   The site is located within a restricted area of the base; however fencing does not surround the area. Military personnel frequently traverse the area on their way to nearby buildings.

5. *Do pavement, buildings, or other structures cap the contaminated soil? Describe.* YES **NO**

   No. The majority of the site is located in an area overlain by gravel and grass. A concrete-lined and bermed fuel loading/unloading facility is situated adjacent to boring SB-5, adjacent to the former UST excavation on the north side.

6. *What is the zoning status of the property?*

   The MCB Camp LeJeune is not subject to local or county zoning requirements.

7. *Is the use of the property likely to change in the next 20 years? Explain.*

   YES **NO**

   No. The designated use of the facility on the Base is not likely to change in the foreseeable future.

Property Surrounding Source Area of Release

The questions below pertain to the area within 1,500 feet of the source area of the release (excludes property containing source area of the release):

1. *What is the distance from the source area of the release to the **nearest** primary or secondary residence (permanent or temporary)?*

   Housing barracks for military personnel are located approximately 1,050 southwest of the release. This would be considered a semi-permanent residence facility, the Bachelor Officers' Quarters (BOQ, Building M231 on Drawing 1.1).

2. *What is the distance from the source area of the release to the **nearest** school, daycare center, hospital, playground, park, recreation area, church, nursing home or other place of public assembly?*

   An office building (M-200) for the MCB Personnel Administration School is located approximately 70 feet to the north (Drawing 2.1). School personnel interviewed by Mid-Atlantic stated that buildings M-200 and M-201 contain instructor offices.

3. *What is the zoning status of properties in the surrounding area?*

   As previously stated, MCB Camp LeJeune is not subject to local or county zoning requirements. The surrounding property has been developed for military support purposes.

4. *Briefly characterize the use and activities of the land in the surrounding area?*

The surrounding properties are developed and buildings are used for office space, classrooms, rest-room facilities and storage.

4.0 RECEPTOR INFORMATION

4.1 Water-Supply Wells

There are no public drinking water-supply wells located within 1,500 feet of the source area of the release.

4.2 Public Water Supplies

Public water is provided to buildings within 1,500 feet of the subject site by water mains which carry treated potable water. Potable water is supplied to the site and surrounding areas by the MCB water-supply system. The closest water lines to the site, as marked by PLS, Inc., are situated 11 feet to the west of the source area (Drawing 4.1). Potable water for Camp Johnson is obtained from various water treatment facilities throughout the base. Groundwater obtained from the Castle Hayne Aquifer beneath the MCB is the raw water source for the treatment facilities.

4.3 Surface Water

The closest surface water body is Northeast Creek, located 1,200 feet southeast of the subject site (Drawing 1.1).

4.4 Wellhead Protection Areas

Wellhead protection areas have not, as of this time, been designated by the State for the MCB. However, MCB Camp LeJeune has identified proposed wellhead protection areas on the base. The site is not located in a proposed wellhead protection area.

TABLE 2.1
SITE HISTORY
UST SYSTEM INFORMATION

UST ID Number	Product (gasoline, diesel, jet fuel, etc.)	Capacity (gallons)	Date Installed (m/dd/yy)	Date Permanently Closed (P), or Still in Use* (C) (m/dd/yy)	Was Release Associated With UST System? (Yes / No)
M230-1	Diesel	15,000	Not Known	9/21/93 (P)	Yes
M230-2	Diesel	15,000	Not Known	9/21/93 (P)	Yes

* Still in use means not permanently closed.

TABLE 2.2
SITE HISTORY
UST OWNER/OPERATOR INFORMATION

Dates of Ownership/Operation (m/dd/yy) to (m/dd/yy)	UST ID Number	Name of Owner or Operator (indicate which)	Site Use
Unknown to 9/21/93	UST-M230-1	Marine Corps Base – Owner	Fuel Oil Supply to Boilers

Address	Telephone Number
Commanding General (Attn: I&E/EMD/IRD) Marine Corps Base PSC Box 20004 Camp LeJeune, NC 28542-0004	(910) 451-9610

Dates of Ownership/Operation (m/dd/yy) to (m/dd/yy)	UST ID Number	Name of Owner or Operator (indicate which)	Site Use
Unknown to 9/21/93	UST-M230-2	Marine Corps Base – Owner	Fuel Oil Supply to Boilers

Address	Telephone Number
Commanding General (Attn: AC/S, EMD/IRD) Marine Corps Base PSC Box 20004 Camp LeJeune, NC 28542-0004	(910) 451-9610

TABLE 4.1

BUILDING OCCUPANTS NEAR PROJECT SITE

Date: June 20, 2002 Incident Number/Name: 12677/USTM230-2 Facility ID #: N/A

Building ID (Reference Drawing 2.1)	Building Occupant	Usage of Building
M-200	Headquarters, Personnel Administration School	Offices for Instructors
M-201	Headquarters, Personnel Administration School	Offices for Instructors
M-202	Vacant	Reportedly Used Infrequently for "Young Marines" programs
M-256	Shed	Contains Waste Oil, Used Oil ASTs
M-205 to M-210	MCB Support Buildings	Rest Rooms
M-211 to M-214	Unit Property Office	Issue Point (M-211) and Storage Buildings
M-203, M-255	Warehouses	Warehouses
M-215 to M-229	Personnel Administration School	Classroom Buildings, Office Buildings and Storage

Table 6.1: Summary of Soil Sampling Results (mg/Kg) – UST Closure, UTTS/Environmental

Date: April 2003 Incident Number and Name: 12677, UST M-230-2 Facility ID#: N/A

Analytical Method (e.g., VOC by EPA 8260) →			TPH 3550/ 8015	TPH 5030/ 8015						
Sample ID	Contaminant of Concern →		Semi-Volatile TPH (Diesel Fuel Range)	Volatile TPH (Gasoline Range)						
	Date Collected (m/dd/yy)	Sample Depth (ft BLS)								
1-A	9/21/93	13'	110	<5						
1-B	9/21/93	13'	800	<10						
1-C	9/21/93	13'	630	<10						
2-A	9/21/93	13'	360	<2						
2-B	9/21/93	13'	590	<5						
2-C	9/21/93	13'	220	<5						
TPH Action Level (in effect at sampling date)			40	10						

Notes:

See Appendix D for UST Closure Report Sample Locations
ft. BLS = feet below land surface
mg/kg = milligrams per kilogram

Table 6.2: Summary of Soil Sampling Results (mg/Kg) – Phase 1 LSA Report

Date: April 2003 Incident Number and Name: 12677, UST M-230-2 Facility ID#: N/A

Analytical Method (e.g., VOC by EPA 8260) →			VOC EPA 8260	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	MADEP VPH	MADEP VPH	MADEP EPH	MADEP EPH	MADEP VPH	MADEP EPH
	Contaminant of Concern →																						
Sample ID	Date Collected (mm/dd/yy)	Sample Depth (Ft. BLS)	Toluene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Indeno(1,2,3-c,d)pyrene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene	Total TICs (estimated concentration)	C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C10 Aromatics	C11-C22 Aromatics
MW-1 3-5'	6/18/02	3 – 5'	<.006	.520	.780	**.850**	**1.00**	.59	.47	1.00	1.60	.71	.55	.35	1.20	1.20	10 (4.10)	<10	<10	20	20	<10	28
MW-1 8-10'	6/18/02	8 – 10'	<.006	<.35	<.35	<.35	<.35	<.35	<.35	.42	.72	<.35	.45	<.35	.62	.42	10 (2.59)	<10	<10	<10	<10	<10	<10
MW-1 13-15'	6/18/02	13 – 15'	<.005	<.33	<.33	<.33	<.33	<.33	<.33	<.33	<.33	<.33	.39	<.33	.43	<.33	10 (23.40)	<10	17	16	<10	<10	29
SB-1 4.5-6.3'	6/19/02	4.5 – 6.3'	<.006	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	0	<10	<10	<10	<10	<10	<10
SB-1 2.3-3'	6/18/02	2.3 – 3'	<.006	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	5 (2.26)	<10	12	<10	<10	<10	<10
SB-1 8-9'	6/18/02	8 – 9'	.0089	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	0	<10	<10	<10	<10	<10	<10
Soil-to-Groundwater MSCC (mg/kg)			7	995	.34	.091	1	6,720	12	38	276	3	3	.58	60	284	NA	72	3,255		Immobile	34	
Residential MSCC (mg/kg)			3,200	4,600	.88	.088	.88	469	9	88	620	.88	63	63	469	469	NA	939	9,386		93,660	469	
Industrial/Commercial MSCC (mg/kg)			82,000	12,200	8	.78	8	12,264	78	780	16,400	8	1,635	1,635	12,264	12,264	NA	24,528	245,280		HBL >100%	12,264	

Notes:

Numbers in Bold = Concentrations exceed residential MSCCs.
<.35 = Contaminant Concentration not detected at or above the laboratory practical quantitation limit
Ft. BLS = Feet below land surface
mg/Kg = milligrams per kilogram
HBL = Health-Based Level
MSCC = Maximum Soil Contaminant Concentration
NT = Sample not tested for this parameter
TIC = Tentatively Identified Compound

04/23/03

Table 6.2 (Con't.): Summary of Soil Sampling Results (mg/Kg) – Phase 1 LSA Report

Date: April 2003 Incident Number and Name: 12677, UST M-230-2 Facility ID#: N/A

Analytical Method (e.g., VOC by EPA 8260) →			VOC EPA 6260	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	Semi-VOC EPA 8270	MADEP VPH	MADEP VPH	MADEP EPH	MADEP EPH	MADEP VPH	MADEP EPH
Sample ID	Contaminant of Concern → Date Collected (m/dd/yy)	Sample Depth (ft BGS)	Toluene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Indeno(1,2,3-c,d)pyrene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene	Total TICs (estimated concentration)	C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C10 Aromatics	C11-C22 Aromatics
SB-4 9-10'	6/18/02	9 – 10'	.009	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	<.35	3 (.74)	<10	<10	<10	<10	<10	<10
SB-5 4-5'	6/19/02	4 – 5'	<.006	<.37	<.37	<.37	<.37	<.37	<.37	<.37	<.37	<.37	1.0	.54	.58	<.37	10 (4.83)	<10	<10	<10	<10	<10	14
SB-6 8-10'	6/19/02	8 – 10'	<.006	<.36	<.36	<.36	<.36	<.36	<.36	<.36	<.36	<.36	<.36	<.36	<.36	<.36	1 (.17)	<10	<10	<10	<10	<10	<10
SB-7 8-10'	6/19/02	8 – 10'	<.006	<.35	<.35	<.35	<.35	<.35	<.35	<.35	.56	.35	.57	.38	.61	<.35	10 (2.93)	<10	<10	<10	<10	<10	12
SB-8 2-3'	6/18/02	2 – 3'	<.006	<.34	<.34	<.34	<.34	<.34	<.34	<.34	<.34	<.34	<.34	<.34	<.34	<.34	5 (.84)	<10	<10	<10	<10	<10	<10
SB-9 2.3-3.5'	6/17/02	2.3 – 3.5'	<.006	<.34	<.34	<.34	<.34	<.34	<.34	<.34	<.34	<.34	<.34	<.34	<.34	<.34	0	<10	<10	<10	<10	<10	<10
DUPL SB-5 4-5'		4 – 5'	<.006	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Soil-to-Groundwater MSCC (mg/kg)			7	995	.34	.091	1	6,720	12	38	276	3	3	.58	60	284	NA	72	3,255		Immobile	34	
Residential MSCC (mg/kg)			3,200	4,800	.88	.088	.88	469	9	88	620	.88	63	63	469	469	NA	939	9,386		93,860	469	
Industrial/Commercial MSCC (mg/kg)			82,000	12,200	8	.78	8	12,264	78	780	16,400	8	1,635	1,635	12,264	12,264	NA	24,528	245,260		HBL >100%	12,264	

Notes:

Numbers in Bold = Concentrations exceed residential MSCCs.
<.35 = Contaminant Concentration not detected at or above the laboratory practical quantitation limit
Ft. BLS = Feet below land surface
mg/Kg = milligrams per kilogram
HBL = Health-Based Level
MSCC = Maximum Soil Contaminant Concentration
NT = Sample not tested for this parameter
TIC = Tentatively Identified Compound

Table 6.3: Summary of Soil Sampling Results (mg/Kg) – Soil Assessment Report

Date: April 2003 Incident Number and Name: 12677, UST M-230-2 Facility ID#: N/A

Analytical Method → (e.g., VOC by EPA 8260)			VOC EPA 8260	SVOC EPA 8270	SVOC EPA 8270	SVOC EPA 8270	SVOC EPA 8270	SVOC EPA 8270	SVOC EPA 8270	SVOC EPA 8270	SVOC EPA 8270	MADEP VPH	MADEP VPH	MADEP EPH	MADEP EPH	MADEP VPH	MADEP EPH
Sample ID	Contaminant of Concern → Date Collected (m/dd/yy)	Sample Depth (ft BLS)	Methylene Chloride	Anthracene	Benzo(a)anthracene	Chrysene	Fluoranthene	Fluorene	Phenanthrene	Pyrene	Total TICs [estimated concentration]	C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C10 Aromatics	C11-C22 Aromatics
SB-10 3-4'	3/24/03	3 – 4'	<.023	NT	NT	NT	NT	NT	NT	NT	NT	<10	<10	NT	NT	<10	NT
SB-10 3-5'	3/24/03	3 – 5'	NT	<.36	<.36	<.36	.77	<.36	.82	.64	10 [11.45]	NT	NT	12	14	NT	<10
SB-10 9-10'	3/24/03	9 – 10'	<.022	.35	.35	.39	1.5	.39	1.6	1.2	10 [13.36]	<10	<10	<10	18	<10	21
SB-11 4-5'	3/24/03	4 – 5'	<.023	<.36	<.36	<.36	<.36	<.36	<.36	<.36	2 [1.02]	<10	<10	<10	<10	<10	19
SB-11 9-10'	3/24/03	9 – 10'	<.025	<.39	<.39	<.39	<.39	<.39	<.39	<.39	1 [1.60]	<10	<10	<10	<10	<10	<10
SB-12 4-5'	3/24/03	4 – 5'	<.022	<.34	<.34	<.34	<.34	<.34	<.34	<.34	1 [1.20]	<10	<10	<10	<10	<10	<10
Soil-to-Groundwater MSCC (mg/kg)			.02	995	.34	38	276	44	60	286	NA	72	3,255		Immobile	34	
Residential MSCC (mg/kg)			85	4,600	.88	88	620	620	469	469	NA	939	9,386		93,860	469	
Industrial/Commercial MSCC (mg/kg)			763	12,200	8	780	16,400	16,400	12,264	12,264	NA	24,528	245,280		HBL >100%	12,264	

Notes:

Land usage classification by DENR as Residential, therefore Residential MSCCs apply as cleanup standards
<.36 = Contaminant Concentration not detected at or above the laboratory practical quantitation limit
Ft. BLS = Feet below land surface
mg/Kg = milligrams per kilogram
HBL = Health-Based Level
MSCC = Maximum Soil Contaminant Concentration
NT = Sample not tested for this parameter
TIC = Tentatively Identified Compound

Table 6.3 (Con't.): Summary of Soil Sampling Results (mg/Kg) – Soil Assessment Report

Date: April 2003 Incident Number and Name: 12677, UST M-230-2 Facility ID#: N/A

Analytical Method (e.g., VOC by EPA 8260) →			VOC EPA 8260	SVOC EPA 8270	SVOC EPA 8270	SVOC EPA 8270	SVOC EPA 8270	SVOC EPA 8270	SVOC EPA 8270	SVOC EPA 8270	SVOC EPA 8270	MADEP VPH	MADEP VPH	MADEP EPH	MADEP EPH	MADEP VPH	MADEP EPH
	Contaminant of Concern →		Methylene Chloride	Anthracene	Benzo(a)anthracene	Chrysene	Fluoranthene	Fluorene	Phenanthrene	Pyrene	Total TICs (estimated concentration)	C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C10 Aromatics	C11-C22 Aromatics
Sample ID	Date Collected (m/dd/yy)	Sample Depth (ft BLS)															
SB-12 9-10'	3/24/03	9 – 10'	<.023	<.36	<.36	<.36	<.36	<.36	<.36	<.36	1 (.58)	<10	<10	<10	<10	<10	<10
SB-13 4-5'	3/24/03	4 – 5'	.04	<.37	<.37	<.37	<.37	<.37	.44	<.37	10 (8.43)	<10	<10	<10	<10	<10	26
SB-13 9-10'	3/24/03	9 – 10'	<0.24	<.38	<.38	<.38	<.38	<.38	<.38	<.38	1 (1.5)	<10	<10	<10	<10	<10	<10
Soil-to-Groundwater MSCC (mg/kg)			.02	995	.34	38	276	44	60	286	NA	72	3,255		Immobile	34	
Residential MSCC (mg/kg)			85	4,600	.88	88	620	620	469	469	NA	939	9,386		93,860	469	
Industrial/Commercial MSCC (mg/kg)			763	12,200	8	780	16,400	16,400	12,264	12,264	NA	24,528	245,280		HBL >100%	12,264	

Notes:

Land usage classification by DENR as Residential, therefore Residential MSCCs apply as cleanup standards
<.36 = Contaminant Concentration not detected at or above the laboratory practical quantitation limit
Ft. BLS = Feet below land surface
mg/Kg = milligrams per kilogram
HBL = Health-Based Level
MSCC = Maximum Soil Contaminant Concentration
NT = Sample not tested for this parameter
TIC = Tentatively Identified Compound

TABLE 6.1
SUMMARY OF CHEMICAL CONSTITUENTS DETECTED IN SOIL - SOURCE MONITORING WELL
LEAKING UNDERGROUND STORAGE TANK M230-2
CAMP JOHNSON, MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
SOIL SAMPLES COLLECTED ON JUNE 18, 2002
MID-ATLANTIC JOB NO. 000R1243.03

CHEMICAL CONSTITUENT	SAMPLE CONCENTRATION (mg/Kg)				MAXIMUM SOIL CONTAMINANT CONCENTRATIONS (mg/Kg)		
	MW-1 3 to 5' BLS[1]	MW-1 8 to 10' BLS[1]	MW-1 13 to 15' BLS[1]	Trip Blank	Soil-to-Groundwater	Residential	Industrial/ Commercial
Volatile Organic Compounds, EPA Method 8260B/5035							
Toluene	ND	ND	ND	NA	7	3,200	82,000
Semi-Volatile Organic Compounds (Semi-VOCs), EPA Method 8270							
Anthracene	0.520	ND	ND	NA	995	4600	122,000
Benzo[a]anthracene	0.780	ND	ND	NA	0.34	0.88	8
Benzo[a]pyrene	0.850	ND	ND	NA	0.091	0.088	0.78
Benzo[b]fluoranthene	1.00	ND	ND	NA	1	0.88	8
Benzo[g,h,i]perylene	0.590	ND	ND	NA	6,720	469	12,264
Benzo[k]fluoranthene	0.470	ND	ND	NA	12	9	78
Chrysene	1.00	0.420	ND	NA	38	88	780
Fluoranthene	1.60	0.720	ND	NA	276	620	16,400
Indeno(1,2,3-c,d)pyrene	0.710	ND	ND	NA	3	0.88	8
2-Methylnaphthalene	0.550	0.450	0.390	NA	3	63	1,635
Naphthalene	0.350	ND	ND	NA	0.58	63	1,635
Phenanthrene	1.20	0.620	0.430	NA	60	469	12,264
Pyrene	1.20	0.420	ND	NA	286	469	12,264
LS - No. of known compounds	0	0	0	NA			
LS - No. of unknown compounds	10	10	10	NA			
LS - Estimated concentrations	4.10	2.59	23.40	NA			
MADEP Results, Hydrocarbon Fraction Ranges							
VPH- C5-C8 Aliphatics	ND	ND	ND	ND	72	939	24528
VPH - C9-C12 Aliphatics	ND	ND	17	ND	3255	9386	245280
EPH - C9-C18 Aliphatics	20	ND	16	NA			
EPH - C19-C36 Aliphatics	20	ND	ND	NA	Immobile	93860	Health Based Level >100%
VPH -C9-C10 Aromatics	ND	ND	ND	NA	34	469	12264
EPH -C11-C22 Aromatics	28	ND	29	ND			

Notes:
(1) Depth-to-water measurements for well USTM230-MW01 include 16.6 below land surface (6/19/02).
LS - Library search for 10 largest non-target semi-VOCs, tentatively-identified compounds.
Shaded values indicate concentrations in excess of soil-to-groundwater (S-G) or residential MSCC.
Shaded values in **bold** are in excess of lowest MSCC and lower of residential or industrial/commercial MSCC.
ND - Not detected at or above laboratory practical quantitation limit (PQL). See laboratory reports for PQL's.
NE - Not established. EPA Risk-based concentration also not established (Region III, Region IV)
NA - Laboratory analysis not requested for this sample.

TABLE 6.2 (Page 1 of 2)
SUMMARY OF CHEMICAL CONSTITUENTS DETECTED IN SOIL - HAND AUGER SOIL BORINGS
LEAKING UNDERGROUND STORAGE TANK M230-2
CAMP JOHNSON, MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
SOIL SAMPLES COLLECTED ON JUNE 17 AND 19, 2002
MID-ATLANTIC JOB NO. 000R1243.03

CHEMICAL CONSTITUENT	SAMPLE CONCENTRATION (mg/Kg)					MAXIMUM SOIL CONTAMINANT CONCENTRATIONS (mg/Kg)		
	SB-1 4.5' to 6.3'	SB-2 2.3' to 3'	SB-3 8' to 9'	SB-4 9' to 10'	SB-5 4' to 5'	Soil-to-Groundwater	Residential	Industrial/ Commercial
Volatile Organic Compounds, EPA Method 8260B/5035								
Toluene	ND	ND	0.006	0.009	ND	7	3,200	82,000
Semi-Volatile Organic Compounds (Semi-VOCs), EPA Method 8270								
Fluoranthene	ND	ND	ND	ND	ND	276	620	16,400
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	ND	ND	3	0.88	8
2-Methylnaphthalene	ND	ND	ND	ND	1	3	63	1,635
Naphthalene	ND	ND	ND	ND	0.54	0.58	63	1,635
Phenanthrene	ND	ND	ND	ND	0.58	60	469	12,264
LS - known compounds	0	1	0	0	0			
LS - unknown compounds		4		3	10			
LS - estimated concentration		2.26		0.74	4.83			
MADEP Results, Hydrocarbon Fraction Ranges								
VPH- C5-C8 Aliphatics	ND	ND	ND	ND	ND	72	939	24,528
VPH - C9-C10 Aliphatics	ND	12	ND	ND	ND	3,255	9,386	245,280
EPH - C9-C18 Aliphatics	ND	ND	ND	ND	ND			
VPH -C9-C10 Aromatics	ND	ND	ND	ND	ND	34	469	12,264
EPH - C11-C22 Aromatics	ND	ND	ND	ND	14			

Notes:
Shaded values indicate concentrations in excess of soil-to-groundwater (S-G) MSCCs.
Shaded values in **bold** are in excess of S-G and residential MSCCs.
LS - Library search for 10 largest non-target sei-VOCs, tentatively-identified compounds.
ND - Not detected at or above laboratory practical quantitation limit (PQL). See laboratory reports for PQL's.
NE - Not established. EPA Risk-based concentration also not established (Region III, Region IV)
NA - Laboratory analysis not requested for this sample.

TABLE 6.2 (Page 2 of 2)
SUMMARY OF CHEMICAL CONSTITUENTS DETECTED IN SOIL - HAND AUGER SOIL BORINGS
LEAKING UNDERGROUND STORAGE TANK M230-2
CAMP JOHNSON, MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
SOIL SAMPLES COLLECTED ON JUNE 17 AND 19, 2002
MID-ATLANTIC JOB NO. 000R1243.03

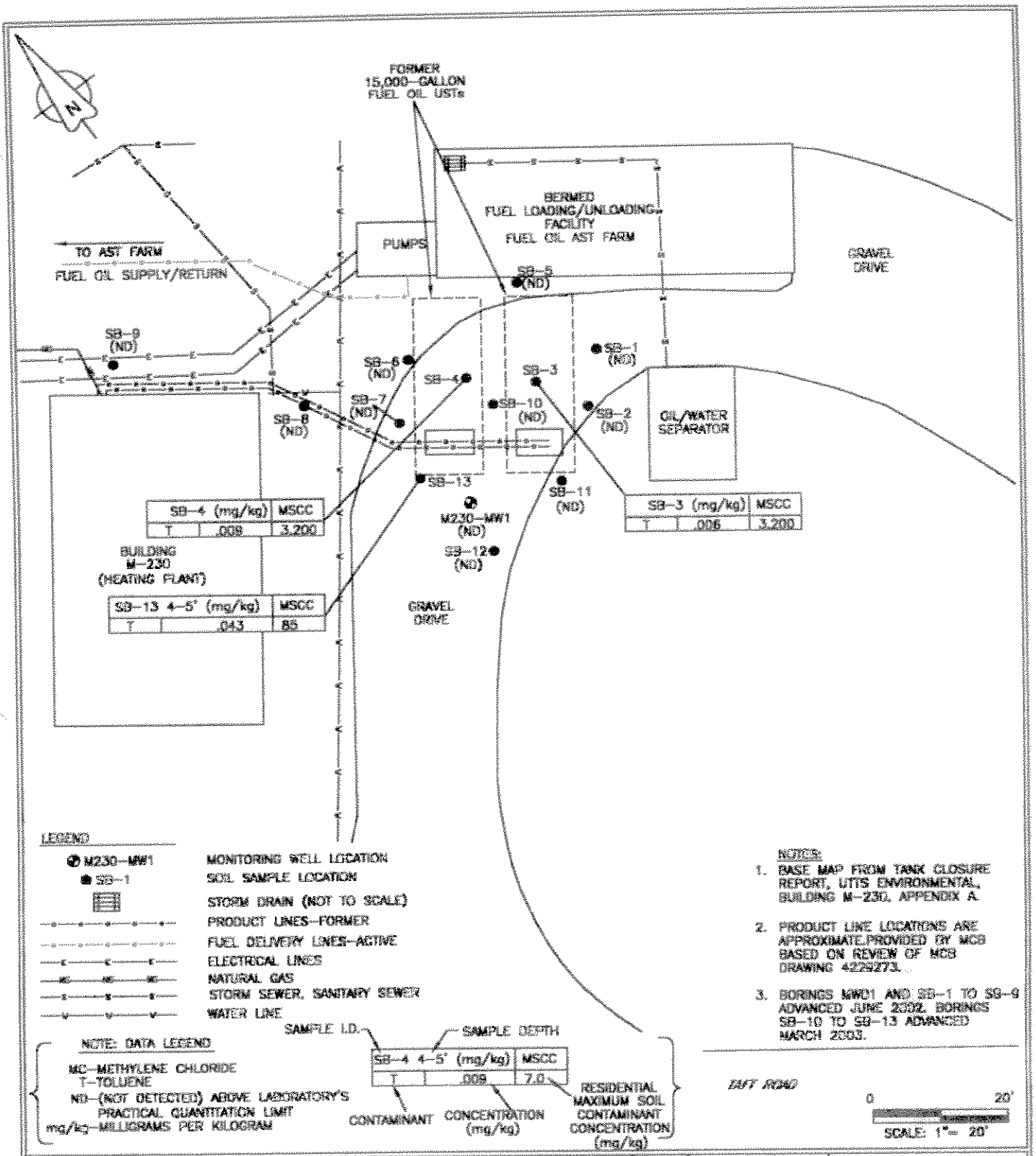
CHEMICAL CONSTITUENT	SAMPLE CONCENTRATION (mg/Kg)					MAXIMUM SOIL CONTAMINANT CONCENTRATIONS (mg/Kg)		
	SB-6 8' to 10'	SB-7 8' to 10'	SB-8 2' to 3'	SB-9 2.3' to 3.5'	Duplicate SB-5 4' to 5'	Soil-to-Groundwater	Residential	Industrial/ Commercial
Volatile Organic Compounds, EPA Method 8260B/5035								
Toluene	ND	ND	ND	ND	ND	7	3,200	82,000
Semi-Volatile Organic Compounds (Semi-VOCs), EPA Method 8270								
Fluoranthene	ND	0.56	ND	ND	NA	276	620	16,400
Indeno(1,2,3-c,d)pyrene	ND	0.35	ND	ND	NA	3	0.88	8
2-Methylnaphthalene	ND	0.57	ND	ND	NA	3	63	1,635
Naphthalene	ND	0.38	ND	ND	NA	0.58	63	1,635
Phenanthrene	ND	0.61	ND	ND	NA	60	469	12,264
LS - known compounds	0	0	0	0	NA			
LS - unknown compounds	1	10	5	0	NA			
LS - estimated concentration	0.17	2.93	0.84		NA			
MADEP Results, Hydrocarbon Fraction Ranges								
VPH- C5-C8 Aliphatics	ND	ND	ND	ND	NA	72	939	24,528
VPH - C9-C12 Aliphatics	ND	ND	ND	ND	NA	3,255	9,386	245,280
EPH - C9-C18 Aliphatics	ND	ND	ND	ND	NA			
VPH -C9-C10 Aromatics	ND	ND	ND	ND	NA	34	469	12,264
EPH - C11-C22 Aromatics	ND	12	ND	ND	NA			

Notes:
Shaded values indicate concentrations in excess of soil-to-groundwater (S-G) MSCCs.
Shaded values in **bold** are in excess of S-G and residential MSCCs.
LS - Library search for 10 largest non-target semi-VOCs, tentatively-identified compounds.
ND - Not detected at or above laboratory practical quantitation limit (PQL). See laboratory reports for PQL's.
NE - Not established. EPA Risk-based concentration also not established (Region III, Region IV)
NA - Laboratory analysis not requested for this sample.

TABLE 6.3
SUMMARY OF CHEMICAL CONSTITUENTS DETECTED IN GROUNDWATER
LEAKING UNDERGROUND STORAGE TANK M230-2
CAMP JOHNSON, MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
MID-ATLANTIC JOB NO. 000R1243.03

CHEMICAL CONSTITUENT	ANALYTICAL METHOD	GROUNDWATER SAMPLE CONCENTRATIONS (UG/L)	GROUNDWATER STANDARD (UG/L) 15A NCAC 2L	GROSS CONTAMINANT LEVELS (UG/L)
Groundwater Sample ID and Collection Date		MW-1 06/19/02		
Well Screen Depth (Feet)		7.3 - 17.3		
Benzene	EPA 602	ND	1	5,000
Toluene	EPA 602	ND	1,000	257,500
Ethylbenzene	EPA 602	ND	29	29,000
Total Xylenes	EPA 602	ND	530	87,500
Total BTEX			Not Applicable	Not Applicable
Bis(2-ethylhexyl)phthalate	EPA 625	13	3	*
Fluorene	EPA 625	14	280	950
Naphthalene	EPA 625	14	21	15,500
Phenanthrene	EPA 625	12	210	410
C5-C8 Aliphatics	MADEP VPH	ND	70	6,900
C9-C18 Aliphatics	MADEP VPH (C9-C12)	170	4,200(I)	*
C9-C18 Aliphatics	MADEP EPH (C9-C18)	130		
C9-C22 Aromatics	MADEP VPH (C9-C10)	ND	210(I)	*
C9-C22 Aromatics	MADEP EPH (C11-C22)	240		

Notes:
(1) Interim Groundwater Quality Standard
Shaded values indicate concentrations in excess of State groundwater standards.
ND = Not detected at or above laboratory practical quantitation limit (PQL). See laboratory reports for PQL's.
* - Gross contamination level not established



LEGEND

M230-MW1	MONITORING WELL LOCATION
SB-1	SOIL SAMPLE LOCATION
	STORM DRAIN (NOT TO SCALE)
	PRODUCT LINES-FORMER
	FUEL DELIVERY LINES-ACTIVE
	ELECTRICAL LINES
	NATURAL GAS
	STORM SEWER, SANITARY SEWER
	WATER LINE

NOTE: DATA LEGEND

MC-METHYLENE CHLORIDE
T-TOLUENE
ND-(NOT DETECTED) ABOVE LABORATORY'S PRACTICAL QUANTITATION LIMIT
mg/kg-MILLIGRAMS PER KILOGRAM

SAMPLE I.D. — SAMPLE DEPTH

SB-4 4-5' (mg/kg)	MSCC
T	.009	7.0

CONTAMINANT — CONCENTRATION (mg/kg) — RESIDENTIAL MAXIMUM SOIL CONTAMINANT CONCENTRATION (mg/kg)

NOTES:

1. BASE MAP FROM TANK CLOSURE REPORT, UTIS ENVIRONMENTAL, BUILDING M-230, APPENDIX A.
2. PRODUCT LINE LOCATIONS ARE APPROXIMATE.PROVIDED BY MCB BASED ON REVIEW OF MCB DRAWING 4229273.
3. BORINGS MW01 AND SB-1 TO SB-9 ADVANCED JUNE 2002. BORINGS SB-10 TO SB-13 ADVANCED MARCH 2003.

BAT ROAD

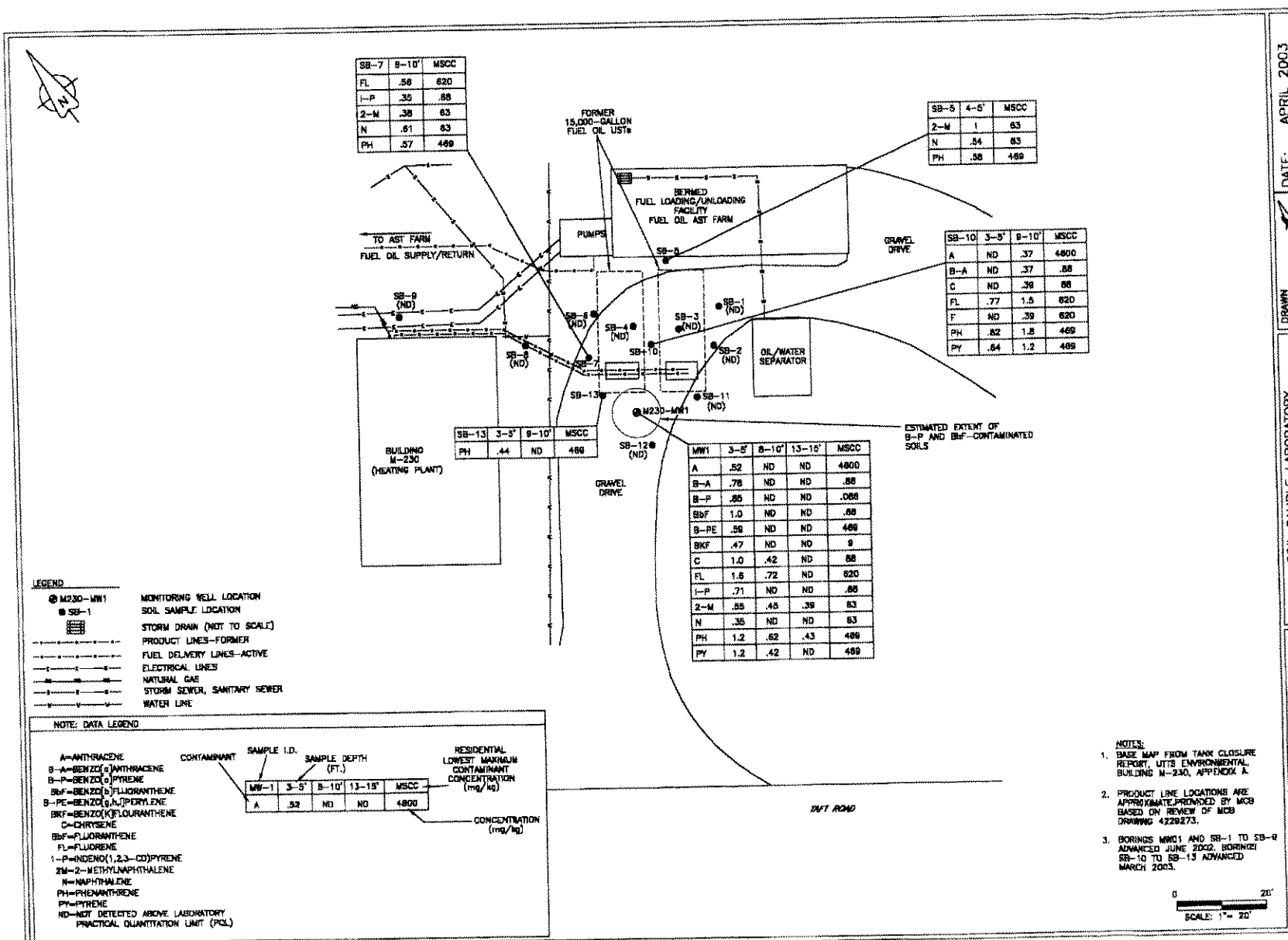
0 20'
SCALE: 1"= 20'

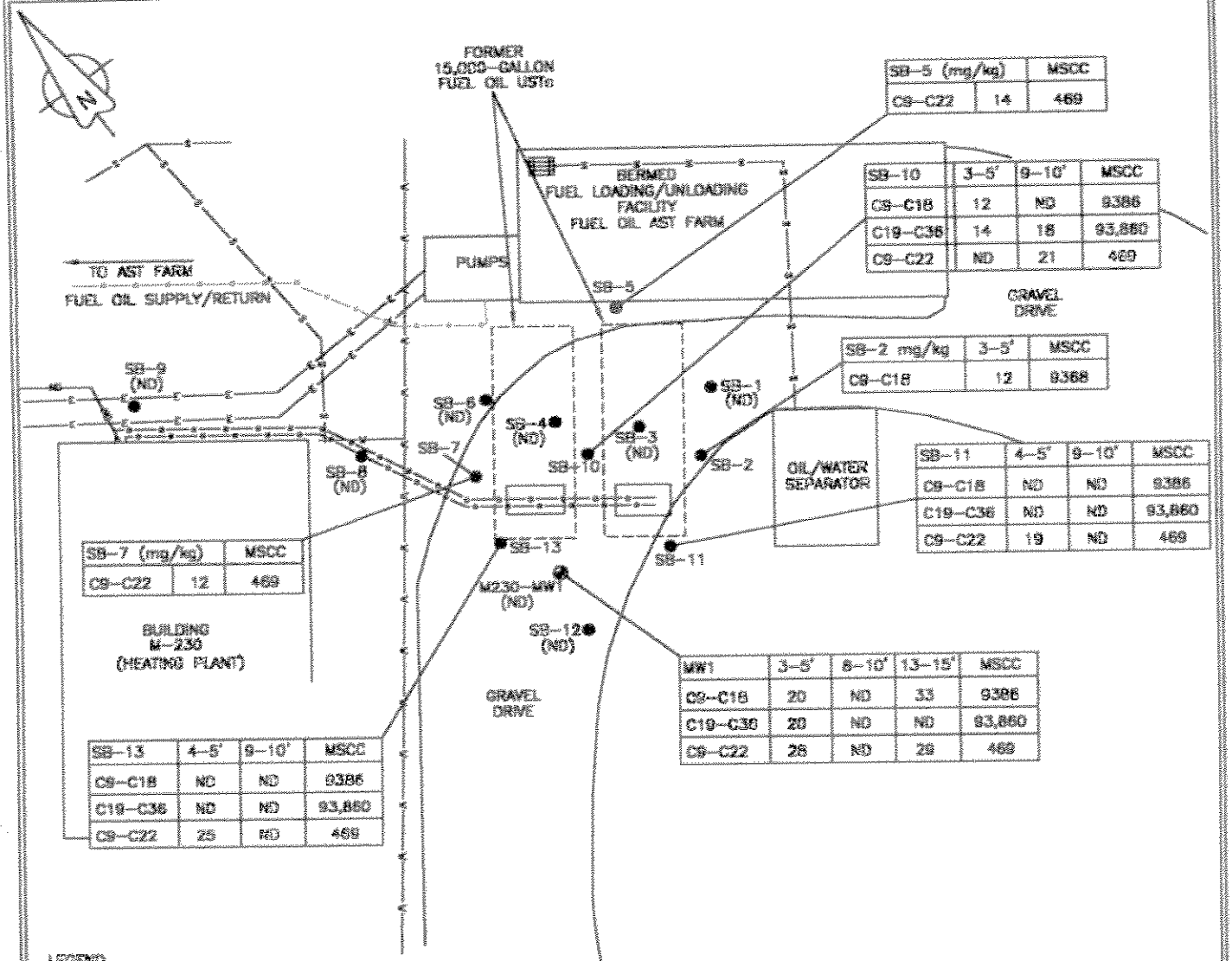
MID-ATLANTIC ASSOCIATES, P.A.
Engineering & Environmental Solutions

SOIL SAMPLE LABORATORY RESULTS-EPA METHOD 8260B
LUST M-230-2
CAMP JOHNSON
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

DRAWN BY:		DATE:	APRIL 2003
DRAFT CHECK:		JOB NO:	000R1243.55
ENG CHECK:		CAD NO:	01-124305-55
APPROVAL:		DWG NO:	6.1

REFERENCE:


SB-7 | 8-10' | MSCC
FL | .56 | 620
1-P | .35 | .88
2-M | .38 | 63
N | .61 | 63
PH | .57 | 469
FORMER 15,000-GALLON FUEL OIL USTs
BERMED FUEL LOADING/UNLOADING FACILITY
FUEL OIL AST FARM
PUMPS
TO AST FARM
FUEL OIL SUPPLY/RETURN
SB-5
SB-5 | 4-5' | MSCC
2-M | 1 | 63
N | .54 | 63
PH | .58 | 469
GRAVEL DRIVE
SB-10 | 3-5' | 8-10' | MSCC
A | ND | .37 | 4800
B-A | ND | .37 | .88
C | ND | .38 | 88
FL | .77 | 1.5 | 620
F | ND | .39 | 620
PH | .82 | 1.8 | 469
PY | .84 | 1.2 | 469
SB-9 (ND)
SB-6 (ND)
SB-4 (ND)
SB-3 (ND)
SB-1 (ND)
SB-8 (ND)
SB-10
SB-7
SB-2 (ND)
OIL/WATER SEPARATOR
SB-13
SB-11 (ND)
M230-MW1
SB-13 | 3-5' | 9-10' | MSCC
PH | .44 | ND | 469
BUILDING M-230 (HEATING PLANT)
SB-12 (ND)
GRAVEL DRIVE
ESTIMATED EXTENT OF B-P AND BbF-CONTAMINATED SOILS
MW1 | 3-5' | 8-10' | 13-15' | MSCC
A | .52 | ND | ND | 4800
B-A | .76 | ND | ND | .88
B-P | .85 | ND | ND | .088
BbF | 1.0 | ND | ND | .88
B-PE | .59 | ND | ND | 469
BKF | .47 | ND | ND | 9
C | 1.0 | .42 | ND | 88
FL | 1.6 | .72 | ND | 620
1-P | .71 | ND | ND | .88
2-M | .55 | .45 | .39 | 63
N | .35 | ND | ND | 63
PH | 1.2 | .62 | .43 | 469
PY | 1.2 | .42 | ND | 469
LEGEND
M230-MW1 MONITORING WELL LOCATION
SB-1 SOIL SAMPLE LOCATION
STORM DRAIN (NOT TO SCALE)
PRODUCT LINES-FORMER
FUEL DELIVERY LINES-ACTIVE
ELECTRICAL LINES
NATURAL GAS
STORM SEWER, SANITARY SEWER
WATER LINE
NOTE: DATA LEGEND
A=ANTHRACENE
B-A=BENZO[a]ANTHRACENE
B-P=BENZO[a]PYRENE
BbF=BENZO[b]FLUORANTHENE
B-PE=BENZO[g,h,i]PERYLENE
BKF=BENZO[K]FLOURANTHENE
C=CHRYSENE
BbF=FLUORANTHENE
FL=FLUORENE
1-P=INDENO(1,2,3-CD)PYRENE
2M-2-METHYLNAPHTHALENE
N=NAPHTHALENE
PH=PHENANTHRENE
PY=PYRENE
ND=NOT DETECTED ABOVE LABORATORY PRACTICAL QUANTITATION LIMIT (PQL)
CONTAMINANT
SAMPLE I.D.
SAMPLE DEPTH (FT.)
RESIDENTIAL LOWEST MAXIMUM CONTAMINANT CONCENTRATION (mg/kg)
MW-1 | 3-5' | 8-10' | 13-15' | MSCC
A | .52 | ND | ND | 4800
CONCENTRATION (mg/kg)
DIRT ROAD
NOTES:
1. BASE MAP FROM TANK CLOSURE REPORT, UTTS ENVIRONMENTAL, BUILDING M-230, APPENDIX A.
2. PRODUCT LINE LOCATIONS ARE APPROXIMATE,PROVIDED BY MCB BASED ON REVIEW OF MCB DRAWING 4229273.
3. BORINGS MW01 AND SB-1 TO SB-9 ADVANCED JUNE 2002. BORINGS SB-10 TO SB-13 ADVANCED MARCH 2003.
0 20'
SCALE: 1"= 20'
SOIL SAMPLE LABORATORY RESULTS-EPA METHOD 8270
LUST M-230-2
CAMP JOHNSON
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA
DRAWN BY:
DRAFTING CHECK BY:
ENGINEER CHECK BY:
APPROVED BY:
DATE: APRIL 2003
JOB NO: 000124355
CAD # 01-124306-55
DWG NO: 6.2
MID-ATLANTIC ASSOCIATES, INC.
Engineering & Environmental Solutions
REFERENCE:



SB-5 (mg/kg)		MSCC
C9-C22	14	469

SB-10	3-5'	9-10'	MSCC
C9-C18	12	ND	9386
C19-C36	14	18	93,860
C9-C22	ND	21	469

SB-2 mg/kg	3-5'	MSCC
C9-C18	12	9368

SB-11	4-5'	9-10'	MSCC
C9-C18	ND	ND	9386
C19-C36	ND	ND	93,860
C9-C22	19	ND	469

SB-7 (mg/kg)		MSCC
C9-C22	12	469

MW1	3-5'	8-10'	13-15'	MSCC
C9-C18	20	ND	33	9386
C19-C36	20	ND	ND	93,860
C9-C22	28	ND	29	469

SB-13	4-5'	9-10'	MSCC
C9-C18	ND	ND	9386
C19-C36	ND	ND	93,860
C9-C22	25	ND	469

LEGEND

M230-MW1	MONITORING WELL LOCATION
SB-1	SOIL SAMPLE LOCATION
	STORM DRAIN (NOT TO SCALE)
	PRODUCT LINES-FORMER
	FUEL DELIVERY LINES-ACTIVE
	ELECTRICAL LINES
	NATURAL GAS
	STORM SEWER, SANITARY SEWER
	WATER LINE

NOTE: DATA LEGEND

C5-C8=C5-C8 ALIPHATICS
C9-C18=C9-C18 ALIPHATICS
C19-C36=C19-C36 ALIPHATICS
C9-C22=C9-C22 AROMATICS
ND-(NOT DETECTED) MADEP VPH AND EPH NOT DETECTED
mg/kg-MILLIGRAMS PER KILOGRAM

SAMPLE I.D. — SAMPLE DEPTH

SB-7 (mg/kg)	3-5'	MSCC
C9-C22	12	469

CONTAMINANT — CONCENTRATION (mg/kg) — RESIDENTIAL LOWEST MAXIMUM SOIL CONTAMINANT CONCENTRATION

NOTES:

1. BASE MAP FROM TANK CLOSURE REPORT, UTS ENVIRONMENTAL, BUILDING M-230, APPENDIX A.
2. PRODUCT LINE LOCATIONS ARE APPROXIMATE.PROVIDED BY MCB BASED ON REVIEW OF MCB DRAWING 4220273.
3. BORINGS MW01 AND SB-1 TO SB-9 ADVANCED JUNE 2002. BORINGS SB-10 TO SB-13 ADVANCED MARCH 2003.

DRAFT ROAD

0 20'

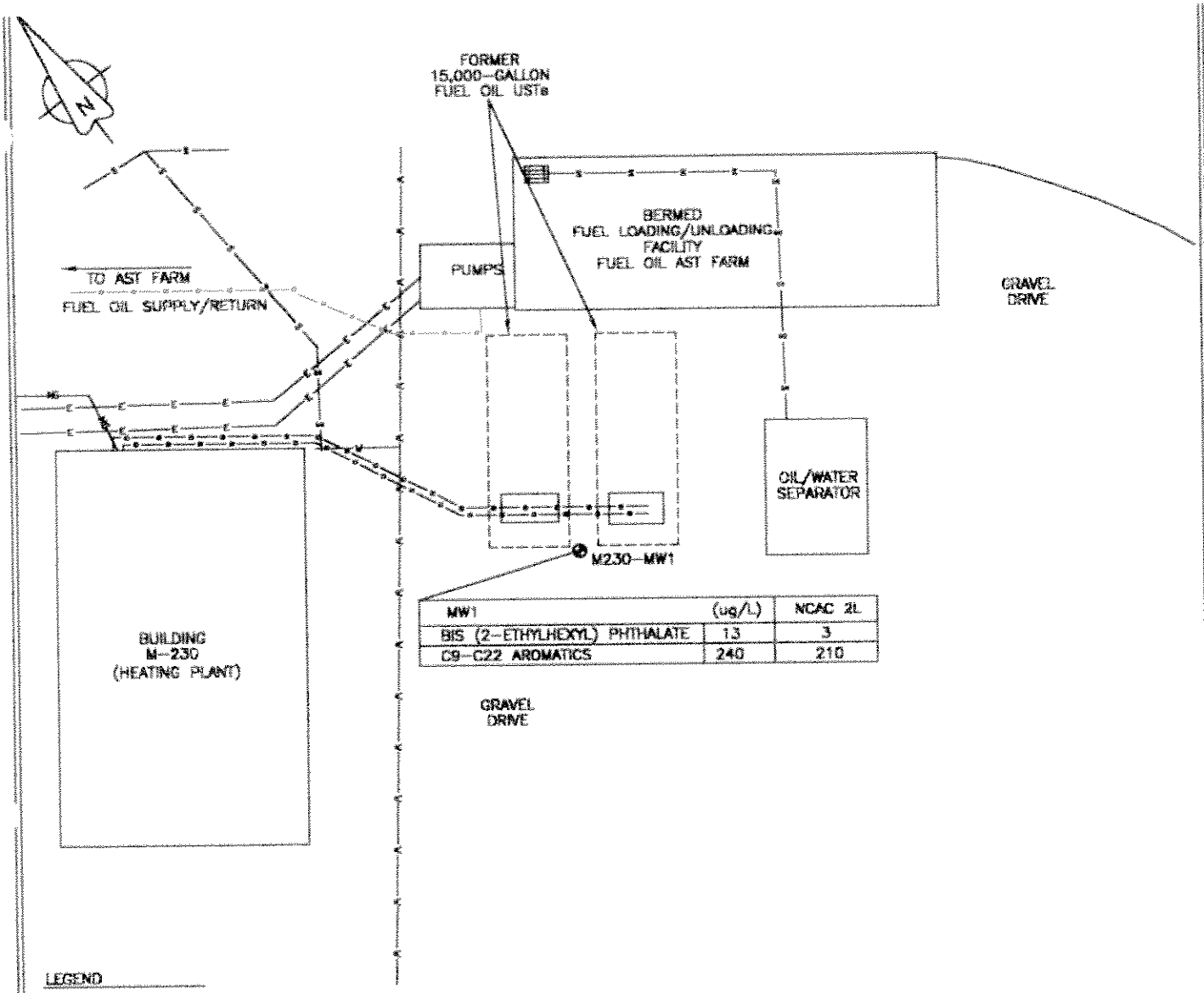
SCALE: 1"= 20'

MID-ATLANTIC ASSOCIATES, P.A.
Engineering & Environmental Solutions

SOIL SAMPLE LABORATORY RESULTS-MADEP VPH AND EPH LUST M-230-2 CAMP JOHNSON MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA

DRAWN BY:		DATE:	APRIL 2003
DRAFT CHECK:		JOB NO:	000R1243.55
ENG CHECK:		CAD NO:	01-124307-55
APPROVAL:		DWG NO:	6.3

REFERENCE:



MW1	(ug/L)	NCAC 2L
BIS (2-ETHYLHEXYL) PHTHALATE	13	3
C9-C22 AROMATICS	240	210

LEGEND

M230-MW1	MONITORING WELL LOCATION
	STORM DRAIN (NOT TO SCALE)
	PRODUCT LINES-FORMER
	FUEL DELIVERY LINES-ACTIVE
	ELECTRICAL LINES
	NATURAL GAS
	STORM SEWER, SANITARY SEWER
	WATER LINE

NOTES:

1. BASE MAP FROM TANK CLOSURE REPORT, UTTS ENVIRONMENTAL, BUILDING M-230, APPENDIX A.
2. PRODUCT LINE LOCATIONS ARE APPROXIMATE.PROVIDED BY MCB BASED ON REVIEW OF MCB DRAWING 4229273.

NOTE: DATA LEGEND

BIS=(2-ETHYLHEXYL) PHTHALATE
C9-C22=C9-C22 AROMATICS
ND-(NOT DETECTED) MADEP VPH AND EPH NOT DETECTED
ug/L-MILLIGRAMS PER LITER

MW1	(ug/L)	NCAC 2L
BIS (2-ETHYLHEXYL) PHTHALATE	13	3
C9-C22 AROMATICS	240	210

CONTAMINANT — CONCENTRATION (ug/L) — NORTH CAROLINA GROUNDWATER STANDARD 15A NCAC 2L, ug/L

TAFT ROAD

0 20'

SCALE: 1"= 20'

MID-ATLANTIC ASSOCIATES, P.A.
Engineering & Environmental Solutions

GROUNDWATER SAMPLE LABORATORY RESULTS ABOVE NCAC 2L STANDARDS LUST M-230-2 CAMP JOHNSON, CAMP LEJEUNE, NORTH CAROLINA

DRAWN BY:		DATE:	AUGUST 2002
DRAFT CHECK:		JOB NO:	000R1243.03
ENG CHECK:	DHW	CAD NO:	01-124310-03
APPROVAL:		DWG NO:	6.4

REFERENCE:

SHAW ENVIRONMENTAL INC.
FINAL POL IMPACTED REMOVAL ACTION REPORT DATA

Camp Lejeune, NC
Paradise Point

Table 3-1
TPH-GRO/DRO Soil Sampling Results

Project 102420

	Sample ID	M230-NW-001	M230-SW-002	M230-EW-003	M230-WW-004	M230-F-005
	M230 Sample Location	Excavation North Wall	Excavation South Wall	Excavation East Wall	Excavation West Wall	Excavation Floor
Contaminant of Concern	Units					
TPH - GRO (C6-C10)	ppm (mg/kg)	<5.5	<5.6	<5.9	<5.5	<5.5
TPH - DRO (C10-C28)	ppm (mg/kg)	71.1	<9.4	<9.2	**63**	**341**

	Sample ID	3326-NW-001	3326-SW-002	3326-EW-003	3326-WW-004
	3326 Sample Location	Excavation North Wall	Excavation South Wall	Excavation East Wall	Excavation West Wall
Contaminant of Concern	Units				
TPH - GRO (C6-C10)	ppm (mg/kg)	**676**	<4.8	<5.6	<5.6
TPH - DRO (C10-C28)	ppm (mg/kg)	**30700**	<8.6	**61.7**	<9.1

	Sample ID	3330-NW-001	3330-SW-002	3330-EW-003	3330-WW-004	3330-F-005
	3330 Sample Location	Excavation North Wall	Excavation South Wall	Excavation East Wall	Excavation West Wall	Excavation Floor
Contaminant of Concern	Units					
TPH - GRO (C6-C10)	ppm (mg/kg)	<6.2	<5.8	<6.0	<6.4	**99.5**
TPH - DRO (C10-C28)	ppm (mg/kg)	**78.9**	**4970**	<9.6	<9.6	**16200**

	Sample ID	3332-NW-001	3332-SW-002	3332-EW-003	3332-WW-004	3332-F-005
	3332 Sample Location	Excavation North Wall	Excavation South Wall	Excavation East Wall	Excavation West Wall	Excavation Floor
Contaminant of Concern	Units					
TPH - GRO (C6-C10)	ppm (mg/kg)	<6.0	<5.8	<5.8	<5.8	**130**
TPH - DRO (C10-C28)	ppm (mg/kg)	**16.1**	**3720**	<9.4	**17.4**	**13500**

	Sample ID	3350-NW-001	3350-SW-002	3350-EW-003	3350-WW-004	3350-F-005
	3350 Sample Location	Excavation North Wall	Excavation South Wall	Excavation East Wall	Excavation West Wall	Excavation Floor
Contaminant of Concern	Units					
TPH - GRO (C6-C10)	ppm (mg/kg)	<6.0	<5.9	<6.1	<5.8	<5.8
TPH - DRO (C10-C28)	ppm (mg/kg)	<10	<10	**83.3**	**68.8**	**16800**

Table 3-10
Paradise Point Monitoring Well M230
VOC and SVOC Confirmation Soil Sample Analytical Results

Date:	10/27/2004	Incident Number and Name:	102420 Paradise Point Monitoring Well M230																	
Analytical Method:			8270C																	
Contaminant of Concern			Benzoic acid	2-Chlorophenol	4-Chloro-3-methylphenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	4,6-Dinitro-o-cresol	2-Methylphenol	3&4-Methylphenol	2-Nitrophenol	4-Nitrophenol	Pentachlorophenol	Phenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	Acenaphthene	Acenaphthylene
Sample ID	Date Collected	Sample Depth (ft bgs)																		
Excavation North Wall M230-NW-001	5/21/2004	NA	<0.93	<0.19	<0.19	<0.19	<0.19	<0.93	<0.37	<0.19	<0.19	<0.19	<0.93	<0.93	<0.19	<0.19	<0.19	<0.19	<0.19	
Excavation West Wall M230-WW-004	5/21/2004	NA	<0.91	<0.18	<0.18	<0.18	<0.18	<0.91	<0.36	<0.18	<0.18	<0.18	<0.91	<0.91	<0.18	<0.18	<0.18	<0.18	<0.18	
Excavation Floor M230-F-005	5/21/2004	NA	<0.89	<0.18	<0.18	<0.18	<0.18	<0.89	<0.36	<0.18	<0.18	<0.18	<0.89	<0.89	<0.18	<0.18	<0.18	<0.18	<0.18	
Soil to Groundwater MSCC (mg/kg)			NS	NS	NS	NS	0.9	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	8	11	
Residential MSCC (mg/kg)			NS	NS	NS	NS	312	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	940	469	
Industrial/Commercial MSCC (mg/kg)			NS	NS	NS	NS	8176	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	24000	12284	

Indicates method detection limit for contaminants when analyzed but not detected (i.e., <1.0)
List any contaminant detected above the method detection limit
MSCC = Maximum Soil Contamination Concentration
ft bgs = feet below ground surface
Results must be reported in mg/kg
mg/kg = milligrams per kilogram
NA = not applicable
NS = no standard

Date:	10/27/2004	Incident Number and Name:	102420 Paradise Point Monitoring Well M230																	
Analytical Method:			8270C																	
Contaminant of Concern			4-Chlorophenyl phenyl ether	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	3,3'-Dichlorobenzidine	Dibenz(a,h)anthracene	Dibenzofuran	Di-n-butyl phthalate	Di-n-octyl phthalate	Diethyl phthalate	Dimethyl phthalate	Bis(2-ethylhexyl)phthalate	Fluoranthene	Fluorene	Hexachlorobenzene
Sample ID	Date Collected	Sample Depth (ft bgs)																		
Excavation North Wall M230-NW-001	5/21/2004	NA	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.37	<0.19	<0.19	<0.37	<0.37	<0.37	<0.37	<0.37	0.195	<0.19	<0.19	
Excavation West Wall M230-WW-004	5/21/2004	NA	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.35	<0.18	<0.18	<0.36	<0.36	<0.36	<0.36	<0.36	<0.18	<0.18	<0.18	
Excavation Floor M230-F-005	5/21/2004	NA	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.36	<0.18	<0.18	<0.36	<0.36	<0.36	<0.36	<0.36	0.48	0.0512 J	<0.18	
Soil to Groundwater MSCC (mg/kg)			NS	7	24	1	NS	NS	NS	0.17	4.7	NS	NS	NS	NS	NS	5.67	276	44	NS
Residential MSCC (mg/kg)			NS	1400	1400	27	NS	NS	NS	0.088	62	NS	NS	NS	NS	NS	46	620	620	NS
Industrial/Commercial MSCC (mg/kg)			NS	36000	36000	240	NS	NS	NS	0.78	1635	NS	NS	NS	NS	NS	410	16400	16400	NS

Indicates method detection limit for contaminants when analyzed but not detected (i.e., <1.0)
List any contaminant detected above the method detection limit
MSCC = Maximum Soil Contamination Concentration
ft bgs = feet below ground surface
Results must be reported in mg/kg
mg/kg = milligrams per kilogram
NA = not applicable
NS = no standard

Table 3-10
Paradise Point Monitoring Well M230
VOC and SVOC Confirmation Soil Sample Analytical Results

Date: 10/27/2004			Incident Number and Name: 102420 Paradise Point Monitoring Well M230																
Analytical Method:			8270C																
Contaminant of Concern			Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	4-Bromophenyl phenyl ether	Butyl benzyl phthalate	Benzyl alcohol	2-Chloronaphthalene	4-Chloroaniline	Carbazole	Chrysene	Bis(2-chloroethoxy)methane	Bis(2-chloroethyl)ether	Bis(2-chloroisopropyl)ether
Sample ID	Date Collected	Sample Depth (ft bgs)																	
Excavation North Wall M230-NW-001	5/21/2004	NA	0.042 J	0.0807 J	0.0773 J	0.0971 J	0.0785 J	0.0468 J	<0.19	<0.37	<0.19	<0.19	<0.75	<0.19	0.0762 J	<0.19	<0.19	<0.19
Excavation West Wall M230-WW-004	5/21/2004	NA	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.36	<0.18	<0.18	<0.73	<0.18	<0.18	<0.18	<0.18	<0.18
Excavation Floor M230-F-005	5/21/2004	NA	0.0527 J	0.204	0.258	0.302	0.122 J	0.17 J	<0.18	<0.36	<0.18	<0.18	<0.71	0.0692 J	0.248	<0.18	<0.18	<0.18
Soil to Groundwater MSCC (mg/kg)			995	0.34	0.091	1	6720	12	NS	NS	NS	NS	NS	NS	38	NS	0.0002	NS
Residential MSCC (mg/kg)			4600	0.88	0.088	0.88	469	9	NS	NS	NS	NS	NS	NS	88	NS	0.58	NS
Industrial/Commercial MSCC (mg/kg)			122000	8	0.78	8	12264	78	NS	NS	NS	NS	NS	NS	780	NS	5.2	NS

Indicate method detection limit for contaminants when analyzed but not detected (i.e., <1.0)
List any contaminant detected above the method detection limit
MSCC = Maximum Soil Contamination Concentration
ft bgs = feet below ground surface
Results must be reported in mg/kg
mg/kg = milligrams per kilogram
NA = not applicable
NS = no standard

Date: 10/27/2004			Incident Number and Name: 102420 Paradise Point Monitoring Well M230																
Analytical Method:			8270C																
Contaminant of Concern			Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-cd)pyrene	Isophorone	2-Methylnaphthalene	2-Nitroaniline	3-Nitroaniline	4-Nitroaniline	Naphthalene	Nitrobenzene	N-Nitroso-di-n-propylamine	N-Nitrosodiphenylamine	Phenanthrene	Pyrene	1,2,4-Trichlorobenzene
Sample ID	Date Collected	Sample Depth (ft bgs)																	
Excavation North Wall M230-NW-001	5/21/2004	NA	<0.19	<0.19	<0.19	0.0789	<0.19	0.0543	<0.37	<0.37	<0.37	<0.19	<0.19	<0.19	<0.19	0.0809	0.0949	<0.19
Excavation West Wall M230-WW-004	5/21/2004	NA	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.36	<0.36	<0.36	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Excavation Floor M230-F-005	5/21/2004	NA	<0.18	<0.18	<0.18	0.137 J	<0.18	0.0511 J	<0.36	<0.36	<0.36	<0.18	<0.18	<0.18	<0.18	0.285	0.743	<0.18
Soil to Groundwater MSCC (mg/kg)			0.26	NS	NS	3	NS	3	NS	NS	NS	0.56	NS	NS	NS	60	286	2.6
Residential MSCC (mg/kg)			3.1	NS	NS	0.88	NS	63	NS	NS	NS	63	NS	NS	NS	469	469	156
Industrial/Commercial MSCC (mg/kg)			73	NS	NS	8	NS	1635	NS	NS	NS	1635	NS	NS	NS	12264	12264	4068

Indicate method detection limit for contaminants when analyzed but not detected (i.e., <1.0)
List any contaminant detected above the method detection limit
MSCC = Maximum Soil Contamination Concentration
ft bgs = feet below ground surface
Results must be reported in mg/kg
mg/kg = milligrams per kilogram
NA = not applicable
NS = no standard

Table 3-11 Summary of Analytical Results: MADEP-EPH/VPH (Building M-230)

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Shaw E & I, Inc.
Project Name: Camp Lejeune-Paradise Point M230
Site Location: _____

Laboratory Name: Accutest Southeast
NC Certification # (Lab): 573
Sample Matrix : Soil

Sample Information and Analytical Results

Method for Ranges: MADEP-EPH-98-1
EPH Surrogate Standards
Aliphatic: 1-Chlorooctadecane
Aromatic: o-Terphenyl
EPH Fractionation Surrogates
#1: 2-Fluorobiphenyl
#2: 2-Bromonaphthalene

Sample Identification					M230-NW-001			
Date Collected					05/21/2004			
Date Received					05/22/2004			
Date Extracted					05/25/2004			
Date Analyzed					05/28/2004			
% Dry Solids					89.3			
Dilution Factor					1			
Hydrocarbon Ranges	**Units of Measure**	**MDL**	**RL**	**BLANK**				
C9-C18 Aliphatics	ug/kg	7500	7500	ND	33500			
C19-C36 Aliphatics	ug/kg	7500	7500	ND	43700			
C11-C22 Aromatics (Unadj.)	ug/kg	7500	7500	ND	34500			
Sample Surrogate Acceptance Range				**40-140**	**40-140**			
Aliphatic Surrogate % Recovery				55	49			
Aromatic Surrogate % Recovery				76	78			
Fractionation Surrogate Acceptance Range								
Fractionation Surrogate #1 % Recovery				81	88			
Fractionation Surrogate #2 % Recovery				82	82			

* Unadjusted value. Should exclude the concentration of any surrogate(s), internal standards, and/or concentrations of other ranges that elute within the specified range.
MDL = Method Detection Limit RL = Reporting Limit

EPH rev. 11/00

Were all performance/acceptance standards for required QA/QC procedures achieved? Yes
Was blank correction applied as a significant modification of the method? Yes
Were any significant modifications to the eph method made? No

Table 3-11 (cont.) Summary of Analytical Results: MADEP-EPH/VPH (Building M-230)

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Shaw E & I, Inc.
Project Name: Camp Lejeune-Paradise Point M230
Site Location: _____

Laboratory Name: Accutest Southeast
NC Certification # (Lab): 573
Sample Matrix : Soil

Sample Information and Analytical Results

Method for Ranges: MADEP VPH

VPH Surrogate Standards
Aliphatic: BFB
Aromatic: BFB

Sample Identification					M230-NW-001			
Collection Option (for soil)*					1			
Date Collected					05/21/2004			
Date Received					05/22/2004			
Date Extracted					05/22/2004			
Date Analyzed					05/25/2004			
% Dry Solids					89.3			
Dilution Factor					1			
Hydrocarbon Ranges	**Units of Measure**	**MDL**	**RL**	**BLANK**				
C5- C8 Aliphatics (Unadj.)	**ug/kg**	2000	3700	ND	ND			
C9- C12 Aliphatics (Unadj.)	**ug/kg**	1500	2700	ND	ND			
C9- C10 Aromatics (Unadj.)	**ug/kg**	500	990	ND	ND			
Sample Surrogate Acceptance Range				**70-130%**	**70-130%**			
Aliphatic Surrogate % Recovery - FID				109	97			
Aromatic Surrogate % Recovery - PID				109	96			

* Option 1 = Established fill line on vial Option 2 = Sampling Device (indicate brand, e.g. EnCoreTM) Option 3 = Field weight of soil

** Unadjusted value. Should exclude the concentration of any surrogate(s), internal standards, and/or concentrations of other ranges that elute within the specified range.

MDL = Method Detection Limit RL = Reporting Limit

VPH rev. 11/00

Were all performance/acceptance standards for required QA/QC procedures achieved? Yes

Were any significant modifications to the VPH method made? No

Table 3-11 (cont.) Summary of Analytical Results: MADEP-EPH/VPH (Building M-230)

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Shaw E & I, Inc.
Project Name: Camp Lejeune-Paradise Point M230
Site Location: _____

Laboratory Name: Accutest Southeast
NC Certification # (Lab): 573
Sample Matrix : Soil

Sample Information and Analytical Results

Method for Ranges: MADEP-EPH-98-1
EPH Surrogate Standards
Aliphatic: 1-Chlorooctadecane
Aromatic: o-Terphenyl
EPH Fractionation Surrogates
#1: 2-Fluorobiphenyl
#2: 2-Bromonaphthalene

Sample Identification					M230-WW-004			
Date Collected					05/21/2004			
Date Received					05/22/2004			
Date Extracted					05/25/2004			
Date Analyzed					05/28/2004			
% Dry Solids					91.8			
Dilution Factor					1			
Hydrocarbon Ranges	**Units of Measure**	**MDL**	**RL**	**BLANK**				
C9-C18 Aliphatics	ug/kg	7200	7200	ND	ND			
C19-C36 Aliphatics	ug/kg	7200	7200	ND	ND			
C11-C22 Aromatics (Unadj.)	ug/kg	7200	7200	ND	ND			
Sample Surrogate Acceptance Range				**40-140**	**40-140**			
Aliphatic Surrogate % Recovery				55	46			
Aromatic Surrogate % Recovery				76	74			
Fractionation Surrogate Acceptance Range								
Fractionation Surrogate #1 % Recovery				81	86			
Fractionation Surrogate #2 % Recovery				82	84			

* Unadjusted value. Should exclude the concentration of any surrogate(s), internal standards, and/or concentrations of other ranges that elute within the specified range.
MDL = Method Detection Limit RL = Reporting Limit

EPH rev. 11/00

Were all performance/acceptance standards for required QA/QC procedures achieved? Yes
Was blank correction applied as a significant modification of the method? Yes
Were any significant modifications to the eph method made? No

Table 3-11 (cont.) Summary of Analytical Results: MADEP-EPH/VPH (Building M-230)

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Shaw E & I, Inc.
Project Name: Camp Lejeune-Paradise Point M230
Site Location: _____

Laboratory Name: Accutest Southeast
NC Certification # (Lab): 573
Sample Matrix : Soil

Sample Information and Analytical Results

Method for Ranges: MADEP VPH

VPH Surrogate Standards
Aliphatic: BFB
Aromatic: BFB

Sample Identification					M230-WW-004			
Collection Option (for soil)*					1			
Date Collected					05/21/2004			
Date Received					05/22/2004			
Date Extracted					05/22/2004			
Date Analyzed					05/25/2004			
% Dry Solids					91.8			
Dilution Factor					1			
Hydrocarbon Ranges	**Units of Measure**	**MDL**	**RL**	**BLANK**				
C5- C8 Aliphatics (Unadj.)	**ug/kg**	2200	4100	ND	ND			
C9- C12 Aliphatics (Unadj.)	**ug/kg**	1600	3000	ND	ND			
C9- C10 Aromatics (Unadj.)	**ug/kg**	540	1100	ND	ND			
Sample Surrogate Acceptance Range				**70-130%**	**70-130%**			
Aliphatic Surrogate % Recovery - FID				109	102			
Aromatic Surrogate % Recovery - PID				109	101			

* Option 1 = Established fill line on vial Option 2 = Sampling Device (indicate brand, e.g. EnCoreTM) Option 3 = Field weight of soil

** Unadjusted value. Should exclude the concentration of any surrogate(s), internal standards, and/or concentrations of other ranges that elute within the specified range.

MDL = Method Detection Limit RL = Reporting Limit

VPH rev. 11/00

Were all performance/acceptance standards for required QA/QC procedures achieved? Yes

Were any significant modifications to the VPH method made? No

Table 3-11 (cont.) Summary of Analytical Results: MADEP-EPH/VPH (Building M-230)

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Shaw E & I, Inc.
Project Name: Camp Lejeune-Paradise Point M230
Site Location: _____

Laboratory Name: Accutest Southeast
NC Certification # (Lab): 573
Sample Matrix : Soil

Sample Information and Analytical Results									
Method for Ranges: MADEP-EPH-98-1		**Sample Identification**			M230-F-005				
EPH Surrogate Standards		**Date Collected**			05/21/2004				
Aliphatic: 1-Chlorooctadecane		**Date Received**			05/22/2004				
Aromatic: o-Terphenyl		**Date Extracted**			05/25/2004				
EPH Fractionation Surrogates		**Date Analyzed**			05/28/2004				
#1: 2-Fluorobiphenyl		**% Dry Solids**			91.3				
#2: 2-Bromonaphthalene		**Dilution Factor**			1				
Hydrocarbon Ranges	**Units of Measure**	**MDL**	**RL**	**BLANK**					
C9-C18 Aliphatics	ug/kg	7300	7300	ND	83800				
C19-C36 Aliphatics	ug/kg	7300	7300	ND	49200				
C11-C22 Aromatics (Unadj.)	ug/kg	7300	7300	ND	42400				
Sample Surrogate Acceptance Range				**40-140**	**40-140**				
Aliphatic Surrogate % Recovery				55	66				
Aromatic Surrogate % Recovery				76	84				
Fractionation Surrogate Acceptance Range									
Fractionation Surrogate #1 % Recovery				81	86				
Fractionation Surrogate #2 % Recovery				82	85				

* Unadjusted value. Should exclude the concentration of any surrogate(s), internal standards, and/or concentrations of other ranges that elute within the specified range.
MDL = Method Detection Limit RL = Reporting Limit

EPH rev. 11/00

Were all performance/acceptance standards for required QA/QC procedures achieved? Yes
Was blank correction applied as a significant modification of the method? Yes
Were any significant modifications to the eph method made? No

Table 3-11 (cont.) Summary of Analytical Results: MADEP-EPH/VPH (Building M-230)

EPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Shaw E & I, Inc.
Project Name: Camp Lejeune-Paradise Point M230
Site Location: _____

Laboratory Name: Accutest Southeast
NC Certification # (Lab): 573
Sample Matrix : Soil

Sample Information and Analytical Results

Method for Ranges: MADEP VPH

VPH Surrogate Standards
Aliphatic: BFB
Aromatic: BFB

Sample Identification					M230-F-005			
Collection Option (for soil)*					1			
Date Collected					05/21/2004			
Date Received					05/22/2004			
Date Extracted					05/22/2004			
Date Analyzed					05/25/2004			
% Dry Solids					91.3			
Dilution Factor					1			
Hydrocarbon Ranges	**Units of Measure**	**MDL**	**RL**	**BLANK**				
C5- C8 Aliphatics (Unadj.)	**ug/kg**	2200	4200	ND	ND			
C9- C12 Aliphatics (Unadj.)	**ug/kg**	1700	3100	ND	ND			
C9- C10 Aromatics (Unadj.)	**ug/kg**	560	1100	ND	ND			
Sample Surrogate Acceptance Range				**70-130%**	**70-130%**			
Aliphatic Surrogate % Recovery - FID				109	97			
Aromatic Surrogate % Recovery - PID				109	95			

* Option 1 = Established fill line on vial Option 2 = Sampling Device (indicate brand, e.g. EnCoreTM) Option 3 = Field weight of soil

** Unadjusted value. Should exclude the concentration of any surrogate(s), internal standards, and/or concentrations of other ranges that elute within the specified range.

MDL = Method Detection Limit RL = Reporting Limit

VPH rev. 11/00

Were all performance/acceptance standards for required QA/QC procedures achieved? **Yes**

Were any significant modifications to the VPH method made? **No**

Table 3-13 Summary of MADEP-EPH/VPH Analytical Results

Client Name: Shaw E & I, Inc
Project Name: Camp Lejeune-Paradise Point 335
Site Location: _____

Laboratory Name: Accutest Southeas
NC Certification # (Lab): 573
Sample Matrix : Soil

Sample Information and Analytical Results House PP-3326

Method for Ranges: MADEP-EPH/VPH		Sample Identification			3326-NW-001	3326-SW-002	3326-EW-003	3326-WW-004	
Hydrocarbon Ranges	Units of Measure	Residential	Industrial	Soil to Water					
C9-C18 Aliphatics	mg/kg	9,386	245,280	3,255	4,220	11.6	<8.3	8,100	
C19-C36 Aliphatics	mg/kg	93,860	#	#	765	8.6	<8.3	3,170	
C9-C22 Aromatics (Unadj.)	mg/kg	469	12,264	34	3,425	<8.2	<8.3	4,493	
C5-C8 Aliphatics	mg/kg	939	24,528	72	<220	<4.3	<4.4	<450	

Sample Information and Analytical Results House PP-3330

Method for Ranges: MADEP-EPH/VPH		Sample Identification			3330-NW-001	3330-SW-002	3330-EW-003	3330-WW-004	3330-F-005
Hydrocarbon Ranges	Units of Measure	Residential	Industrial	Soil to Water					
C9-C18 Aliphatics	mg/kg	9,386	245,280	3,255	1,910	<8.4	<8.9	11,400	415
C19-C36 Aliphatics	mg/kg	93,860	#	#	695	<8.4	<8.9	2,110	108
C9-C22 Aromatics (Unadj.)	mg/kg	469	12,264	34	769	<8.4	<8.9	3,120	149
C5-C8 Aliphatics	mg/kg	939	24,528	72	<6.9	<4.5	<4.8	<450	<8.9

Sample Information and Analytical Results House PP-3332

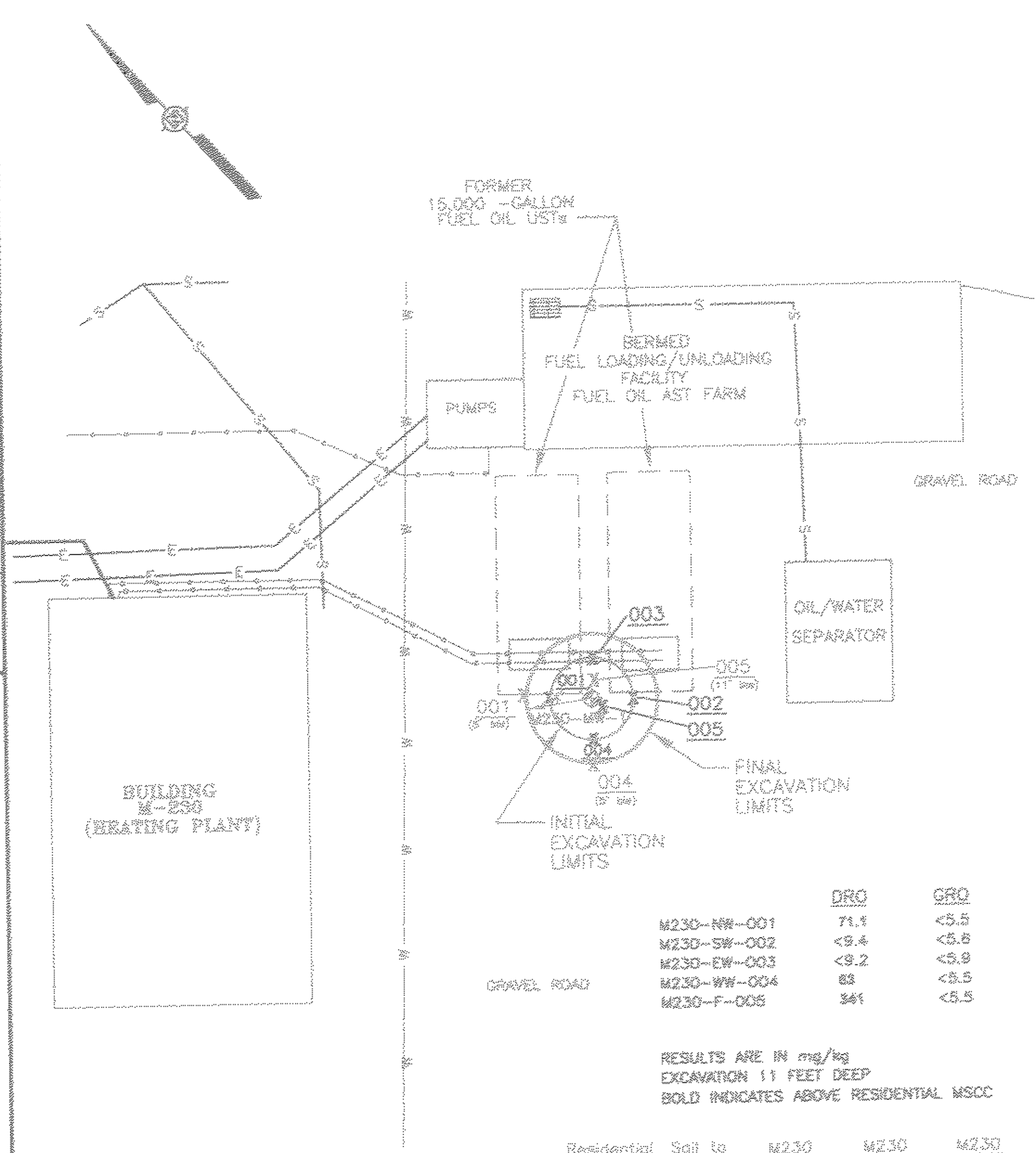
Method for Ranges: MADEP-EPH/VPH		Sample Identification			3332-NW-001	3332-SW-002	3332-EW-003	3332-WW-004	3332-F-005
Hydrocarbon Ranges	Units of Measure	Residential	Industrial	Soil to Water					
C9-C18 Aliphatics	mg/kg	9,386	245,280	3,255	14,600	7,180	<7.9	988	2,850
C19-C36 Aliphatics	mg/kg	93,860	#	#	2,510	1,300	<7.9	354	612
C9-C22 Aromatics (Unadj.)	mg/kg	469	12,264	34	5,435	1,805	<7.9	396	1,232
C5-C8 Aliphatics	mg/kg	939	24,528	72	<410	<90	<4.3	<9.3	<420

Sample Information and Analytical Results House PP-3350

Method for Ranges: MADEP-EPH/VPH		Sample Identification			3350-NW-001	3350-SW-002	3350-EW-003	3350-WW-004	3350-F-005
Hydrocarbon Ranges	Units of Measure	Residential	Industrial	Soil to Water					
C9-C18 Aliphatics	mg/kg	9,386	245,280	3,255	717	2,000	<8.2	29.2	2,210
C19-C36 Aliphatics	mg/kg	93,860	#	#	108	<400	<8.2	11.9	325
C9-C22 Aromatics (Unadj.)	mg/kg	469	12,264	34	542	4,297	4.8	8.7	2,850
C5-C8 Aliphatics	mg/kg	939	24,528	72	<19	<280	<4.3	<3.8	<470

Sample Information and Analytical Results Building M-230

Method for Ranges: MADEP-EPH/VPH		Sample Identification			M230-NW-001	M230-WW-004	M230-F-005		
Hydrocarbon Ranges	Units of Measure	Residential	Industrial	Soil to Water					
C9-C18 Aliphatics	mg/kg	9,386	245,280	3,255	33.5	<7.2	83.8		
C19-C36 Aliphatics	mg/kg	93,860	#	#	43.7	<7.2	49.2		
C9-C22 Aromatics (Unadj.)	mg/kg	469	12,264	34	34.5	<7.2	42.4		
C5-C8 Aliphatics	mg/kg	939	24,528	72	<3.7	<4.1	<4.2		



	DRO	GRO
M230-NW-001	71.1	<5.5
M230-SW-002	<9.4	<5.6
M230-EW-003	<9.2	<5.9
M230-WW-004	83	<5.5
M230-F-005	341	<5.5

RESULTS ARE IN mg/kg
EXCAVATION 11 FEET DEEP
BOLD INDICATES ABOVE RESIDENTIAL MSCC

	Residential SCL	Soil to GW MCC	M230 NW-001	M230 WW-004	M230 F-005
C9-C18 ALIPHATICS	9,386	3,255	33.5	<7.2	83.8
C19-C36 ALIPHATICS	93,880	#	43.7	<7.2	49.2
C9-C22 AROMATICS	469	34	34.5	<7.2	42.4
C5-C8 ALIPHATICS	939	72	<3.7	<4.1	<4.2

HEALTH BASED LEVEL >100% SOLUBILITY

LEGEND

MONITORING WELL LOCATION

STORM DRAIN

PRODUCT LINES-FORMER

FUEL DELIVERY LINES-ACTIVE

E — ELECTRICAL LINES

SS — SANITARY SEWER

NG — NATURAL GAS

W — WATER LINE

SCALE
0 10 20 FEET

MAP ADAPTED FROM MMID-ATLANTIC ASSOCIATES, P.A., DATED AUGUST, 2002.

PLOT DATE: 7/1/98
FORMAT REVISION 3/11/04

IMAGE	X-REF	OFFICE	DRAWING NUMBER
		Alpharetta, GA	102420-FIG2.5R

REVISIONS

REV	DATE	BY	CHK'D/APP'D	DESCRIPTION/ISSUE

Shaw Environmental, Inc.
DESIGNED BY | CHECKED BY | PROJECT NO. 102420
DRAWN BY | APPROVED BY

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
NAVAL STATION NORFOLK, VIRGINIA
NAVAL FLEET & INDUSTRIAL SUPPLY CENTER YORKTOWN, VIRGINIA
PARADISE POINT-BUILDING M-230
M-230-2
SITE MAP

SCALE: AS SHOWN
SIZE: A
DELIVERY ORDER NO. 005
CONSTR. CONTRACT NO. N62470-02-D-3260
NAVFAC DRAWING NO. 7
SHEET I.D. 2.5

DECEMBER 2005 SOIL SAMPLING EVENT DATA

February 14, 2006

Commanding General
I&E/EMD/EQB (Attn.: Mr. Andrew Smith)
PSC Box 20004
Marine Corps Base
Camp Lejeune, North Carolina 28542-0004

Re: FINAL – Letter Report of Findings and Request for No Further Action
Building M230 Groundwater Monitoring Well Installation and Split-Spoon Soil Sample Collection
Marine Corps Base
Camp Lejeune, North Carolina

Dear Mr. Smith:

Sovereign Consulting, Inc. (Sovereign) is pleased to submit this summary report for groundwater monitoring well installation and split-spoon soil sample collection performed at Building M230, located aboard MCB Camp Lejeune. Sovereign and Osage of Virginia Inc. partnered to perform this work under Navy Contract Number: N62470-04-D-1753 - Task Order Number: 0002. Based on the results of this sampling event, the soil at this site does not contain soil contamination in excess of the applicable residential maximum soil contaminant concentrations. To support this statement, a description of the scope of work, field activities, and sample analytical results is presented below.

Background and Purpose of Investigation

In 2002, NCDENR required MCB Camp Lejeune to perform a Phase I Limited Site Assessment (LSA) of the site, at which time monitoring well USTM230-MW01 was installed. A Soil Assessment Report was later submitted in April of 2003 for this site.

In May of 2004, Shaw Environmental Inc. (Shaw) performed a remedial action at this site by excavating and properly disposing of 95 tons of petroleum impacted soils to address recommendations made by both the Phase 1 LSA and Soil Assessment Report. At that time they properly abandoned well USTM230-MW01. This well eventually needed to be replaced, which resulted in Sovereign and Osage being tasked to do so.

Field Activities

On Thursday, December 1, 2005, monitoring well USTM230-MW01 was reinstalled in its original location. The well was labeled USTM230-MW01A. During well installation, field personnel collected three (3) split-spoon soil samples for analysis of semi-volatile constituents per EPA Method 8270 (SVOCs). The three (3) split-spoon soil samples were collected from the 3-5', 5-7' and 11-13' intervals below ground surface (bgs).

The soil samples were packed into appropriately labeled laboratory glassware, placed on ice in an insulated cooler, and shipped to Paradigm Analytical Laboratories Inc. in Wilmington, NC (NC Certification Number 481) using proper chain-of-custody documentation. The samples were then analyzed for the presence of semi-volatile constituents per EPA Method 8270 (SVOCs).

Results

Analysis per EPA Method 8270 reported a concentration of 406 ug/kg of bis(2-ethylhexyl)phthalate from the split-spoon soil sample collected from the 3'-5' interval bgs. No other constituents were reported above the laboratory quantitation limits. The laboratory analytical results are attached.

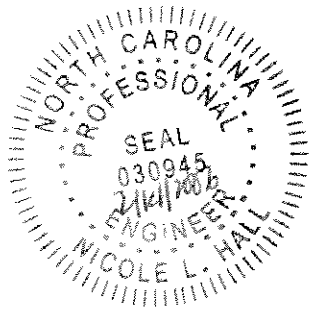
Summary and Conclusions

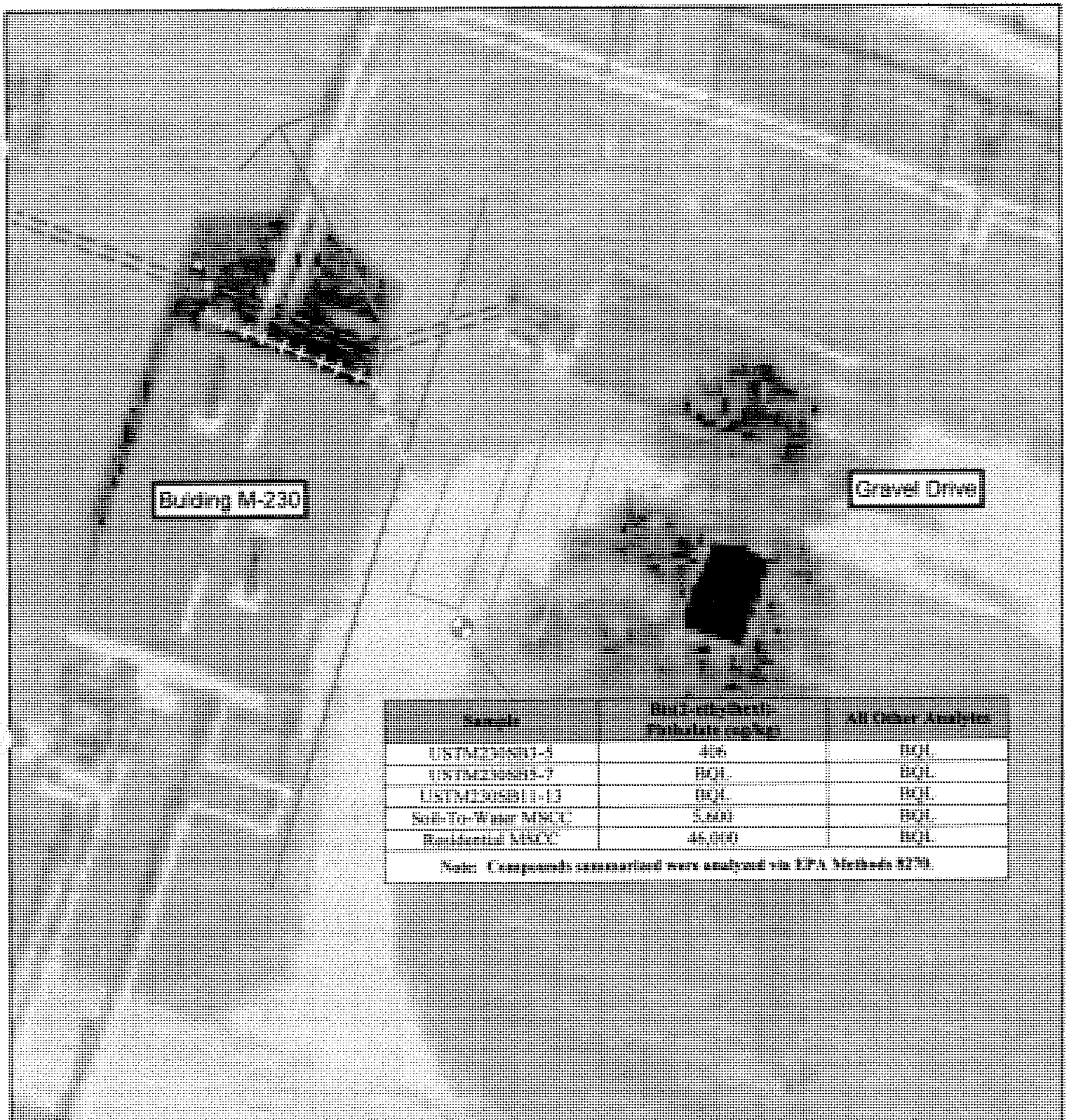
Shaw conducted a soil removal action in 2004. The only contaminant that remained was benzo(a)pyrene at a depth of 11 feet and a concentration of 0.256 mg/kg. In order to address this contaminant, MCB Camp Lejeune conducted additional soil sampling at the site. Three soil samples were collected and sent to the laboratory for analysis via EPA Method 8270. Bis(2-ethylhexyl)phthalate was detected in the 3'-5' interval sample at a concentration of 406 ug/kg. This is less than both the soil to groundwater (5.6 mg/kg) and residential (46 mg/kg) MSCCs. No other constituents were reported above the laboratory quantitation limits.

Based on the December 2005 data, the previously identified soil contamination has attenuated to below applicable MSCCs. No additional soil removal is necessary at the site. If you have further questions or need additional information, please feel free to contact us at your convenience.

Sincerely,
Sovereign Consulting Inc.

Nicole L. Hall, P.E.
Senior Engineer





Sample	Bis(2-ethylhexyl)-Phthalate mg/kg	All Other Analytes
USTM230SB3-5	406	BQL
USTM230SB5-7	BQL	BQL
USTM230SB11-13	BQL	BQL
Soil-To-Water MSCC	5,600	BQL
Residential MSCC	46,000	BQL
Note: Compounds summarized were analyzed via EPA Methods 8270.		

Legend

- Monitoring Well
- Natural Gas Line
- Water Line
- Electrical Lines
- Former Product Lines
- Sewer Lines
- Former USTs

N
W E
S

0 20
Feet

Marine Corp Base
Camp Lejeune, NC

Figure- Site Map With
Soil Sampling Results

Project No. N[illegible]

Date: February 2006

Mr. Mike Cree
Osage of Virginia
4800A Colley Avenue
Norfolk VA 23508-2037

Report Number: G649-5

Client Project: M230

Dear Mr. Cree:

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call Paradigm at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,
Paradigm Analytical Laboratories, Inc.

12/9/2005
Laboratory Director Date
J. Patrick Weaver

Results for Semivolatiles by GCMS 8270

Client Sample ID: USTM230SB3-5
Client Project ID: M230
Lab Sample ID: G649-5-1B
Lab Project ID: G649-5
Report Basis: Dry weight

Analyzed By: MRC
Date Collected: 12/1/2005 15:25
Date Received: 12/2/2005
Date Extracted: 12/5/2005
Matrix: Soil
% Solids: 89.66

Compound	Result ug/Kg	Quantitation Limit ug/Kg	Dilution Factor	Date Analyzed
Acenaphthene	BQL	344	1	12/8/2005
Acenaphthylene	BQL	344	1	12/8/2005
Anthracene	BQL	344	1	12/8/2005
Benzo[a]anthracene	BQL	344	1	12/8/2005
Benzo[a]pyrene	BQL	344	1	12/8/2005
Benzo[b]fluoranthene	BQL	344	1	12/8/2005
Benzo[g,h,i]perylene	BQL	344	1	12/8/2005
Benzo[k]fluoranthene	BQL	344	1	12/8/2005
Benzoic Acid	BQL	687	1	12/8/2005
Bis(2-chloroethoxy)methane	BQL	344	1	12/8/2005
Bis(2-chloroethyl)ether	BQL	344	1	12/8/2005
Bis(2-chloroisopropyl)ether	BQL	344	1	12/8/2005
Bis(2-ethylhexyl)phthalate	406	344	1	12/8/2005
4-bromophenyl phenyl ether	BQL	344	1	12/8/2005
Butylbenzylphthalate	BQL	344	1	12/8/2005
2-Chloronaphthalene	BQL	344	1	12/8/2005
2-Chlorophenol	BQL	344	1	12/8/2005
4-Chloro-3-methylphenol	BQL	344	1	12/8/2005
4-Chloroaniline	BQL	1720	1	12/8/2005
4-Chlorophenyl phenyl ether	BQL	344	1	12/8/2005
Chrysene	BQL	344	1	12/8/2005
Dibenzo[a,h]anthracene	BQL	344	1	12/8/2005
Dibenzofuran	BQL	344	1	12/8/2005
Di-n-Butylphthalate	BQL	344	1	12/8/2005
1,2-Dichlorobenzene	BQL	344	1	12/8/2005
1,3-Dichlorobenzene	BQL	344	1	12/8/2005
1,4-Dichlorobenzene	BQL	344	1	12/8/2005
3,3'-Dichlorobenzidine	BQL	687	1	12/8/2005
2,4-Dichlorophenol	BQL	344	1	12/8/2005
Diethylphthalate	BQL	344	1	12/8/2005
Dimethylphthalate	BQL	344	1	12/8/2005
2,4-Dimethylphenol	BQL	344	1	12/8/2005
Di-n-octylphthalate	BQL	344	1	12/8/2005
4,6-Dinitro-2-methylphenol	BQL	1720	1	12/8/2005
2,4-Dinitrophenol	BQL	1720	1	12/8/2005
2,4-Dinitrotoluene	BQL	344	1	12/8/2005
2,6-Dinitrotoluene	BQL	344	1	12/8/2005
Diphenylamine *	BQL	344	1	12/8/2005
Fluoranthene	BQL	344	1	12/8/2005
Fluorene	BQL	344	1	12/8/2005
Hexachlorobenzene	BQL	344	1	12/8/2005
Hexachlorobutadiene	BQL	344	1	12/8/2005

Results for Semivolatiles by GCMS 8270

Client Sample ID: USTM230SB3-5
Client Project ID: M230
Lab Sample ID: G649-5-1B
Lab Project ID: G649-5
Report Basis: Dry weight

Analyzed By: MRC
Date Collected: 12/1/2005 15:25
Date Received: 12/2/2005
Date Extracted: 12/5/2005
Matrix: Soil
% Solids: 89.66

Compound	Result ug/Kg	Quantitation Limit ug/Kg	Dilution Factor	Date Analyzed
Hexachlorocyclopentadiene	BQL	687	1	12/8/2005
Hexachloroethane	BQL	344	1	12/8/2005
Indeno(1,2,3-c,d)pyrene	BQL	344	1	12/8/2005
Isophorone	BQL	344	1	12/8/2005
2-Methylnaphthalene	BQL	344	1	12/8/2005
2-Methylphenol	BQL	344	1	12/8/2005
3- & 4-Methylphenol	BQL	344	1	12/8/2005
Naphthalene	BQL	344	1	12/8/2005
2-Nitroaniline	BQL	344	1	12/8/2005
3-Nitroaniline	BQL	1720	1	12/8/2005
4-Nitroaniline	BQL	1720	1	12/8/2005
Nitrobenzene	BQL	344	1	12/8/2005
2-Nitrophenol	BQL	344	1	12/8/2005
4-Nitrophenol	BQL	1720	1	12/8/2005
N-Nitrosodi-n-propylamine	BQL	344	1	12/8/2005
Pentachlorophenol	BQL	1720	1	12/8/2005
Phenanthrene	BQL	344	1	12/8/2005
Phenol	BQL	344	1	12/8/2005
Pyrene	BQL	344	1	12/8/2005
1,2,4-Trichlorobenzene	BQL	344	1	12/8/2005
2,4,5-Trichlorophenol	BQL	344	1	12/8/2005
2,4,6-Trichlorophenol	BQL	344	1	12/8/2005

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	10.4	104
2-Fluorophenol	10	9.7	97
Nitrobenzene-d5	10	9.4	94
Phenol-d6	10	9.5	95
2,4,6-Tribromophenol	10	8.4	84
4-Terphenyl-d14	10	11	110

Comments:

* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

Flags:

BQL = Below Quantitation Limits.

Reviewed By: _____

Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTM230SB5-7
Client Project ID: M230
Lab Sample ID: G649-5-2B
Lab Project ID: G649-5
Report Basis: Dry weight

Analyzed By: MRC
Date Collected: 12/1/2005 15:30
Date Received: 12/2/2005
Date Extracted: 12/5/2005
Matrix: Soil
% Solids: 84.29

Compound	Result ug/Kg	Quantitation Limit ug/Kg	Dilution Factor	Date Analyzed
Acenaphthene	BQL	367	1	12/8/2005
Acenaphthylene	BQL	367	1	12/8/2005
Anthracene	BQL	367	1	12/8/2005
Benzo[a]anthracene	BQL	367	1	12/8/2005
Benzo[a]pyrene	BQL	367	1	12/8/2005
Benzo[b]fluoranthene	BQL	367	1	12/8/2005
Benzo[g,h,i]perylene	BQL	367	1	12/8/2005
Benzo[k]fluoranthene	BQL	367	1	12/8/2005
Benzoic Acid	BQL	734	1	12/8/2005
Bis(2-chloroethoxy)methane	BQL	367	1	12/8/2005
Bis(2-chloroethyl)ether	BQL	367	1	12/8/2005
Bis(2-chloroisopropyl)ether	BQL	367	1	12/8/2005
Bis(2-ethylhexyl)phthalate	BQL	367	1	12/8/2005
4-bromophenyl phenyl ether	BQL	367	1	12/8/2005
Butylbenzylphthalate	BQL	367	1	12/8/2005
2-Chloronaphthalene	BQL	367	1	12/8/2005
2-Chlorophenol	BQL	367	1	12/8/2005
4-Chloro-3-methylphenol	BQL	367	1	12/8/2005
4-Chloroaniline	BQL	1840	1	12/8/2005
4-Chlorophenyl phenyl ether	BQL	367	1	12/8/2005
Chrysene	BQL	367	1	12/8/2005
Dibenzo[a,h]anthracene	BQL	367	1	12/8/2005
Dibenzofuran	BQL	367	1	12/8/2005
Di-n-Butylphthalate	BQL	367	1	12/8/2005
1,2-Dichlorobenzene	BQL	367	1	12/8/2005
1,3-Dichlorobenzene	BQL	367	1	12/8/2005
1,4-Dichlorobenzene	BQL	367	1	12/8/2005
3,3'-Dichlorobenzidine	BQL	734	1	12/8/2005
2,4-Dichlorophenol	BQL	367	1	12/8/2005
Diethylphthalate	BQL	367	1	12/8/2005
Dimethylphthalate	BQL	367	1	12/8/2005
2,4-Dimethylphenol	BQL	367	1	12/8/2005
Di-n-octylphthalate	BQL	367	1	12/8/2005
4,6-Dinitro-2-methylphenol	BQL	1840	1	12/8/2005
2,4-Dinitrophenol	BQL	1840	1	12/8/2005
2,4-Dinitrotoluene	BQL	367	1	12/8/2005
2,6-Dinitrotoluene	BQL	367	1	12/8/2005
Diphenylamine *	BQL	367	1	12/8/2005
Fluoranthene	BQL	367	1	12/8/2005
Fluorene	BQL	367	1	12/8/2005
Hexachlorobenzene	BQL	367	1	12/8/2005
Hexachlorobutadiene	BQL	367	1	12/8/2005

Results for Semivolatiles by GCMS 8270

Client Sample ID: USTM230SB5-7
Client Project ID: M230
Lab Sample ID: G649-5-2B
Lab Project ID: G649-5
Report Basis: Dry weight

Analyzed By: MRC
Date Collected: 12/1/2005 15:30
Date Received: 12/2/2005
Date Extracted: 12/5/2005
Matrix: Soil
% Solids: 84.29

Compound	Result ug/Kg	Quantitation Limit ug/Kg	Dilution Factor	Date Analyzed
Hexachlorocyclopentadiene	BQL	734	1	12/8/2005
Hexachloroethane	BQL	367	1	12/8/2005
Indeno(1,2,3-c,d)pyrene	BQL	367	1	12/8/2005
Isophorone	BQL	367	1	12/8/2005
2-Methylnaphthalene	BQL	367	1	12/8/2005
2-Methylphenol	BQL	367	1	12/8/2005
3- & 4-Methylphenol	BQL	367	1	12/8/2005
Naphthalene	BQL	367	1	12/8/2005
2-Nitroaniline	BQL	367	1	12/8/2005
3-Nitroaniline	BQL	1840	1	12/8/2005
4-Nitroaniline	BQL	1840	1	12/8/2005
Nitrobenzene	BQL	367	1	12/8/2005
2-Nitrophenol	BQL	367	1	12/8/2005
4-Nitrophenol	BQL	1840	1	12/8/2005
N-Nitrosodi-n-propylamine	BQL	367	1	12/8/2005
Pentachlorophenol	BQL	1840	1	12/8/2005
Phenanthrene	BQL	367	1	12/8/2005
Phenol	BQL	367	1	12/8/2005
Pyrene	BQL	367	1	12/8/2005
1,2,4-Trichlorobenzene	BQL	367	1	12/8/2005
2,4,5-Trichlorophenol	BQL	367	1	12/8/2005
2,4,6-Trichlorophenol	BQL	367	1	12/8/2005

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	10.6	106
2-Fluorophenol	10	10	100
Nitrobenzene-d5	10	9.6	96
Phenol-d6	10	9.6	96
2,4,6-Tribromophenol	10	7.2	72
4-Terphenyl-d14	10	11	110

Comments:

* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

Flags:

BQL = Below Quantitation Limits.

Reviewed By: _____

Results for Semivolatiles
by GCMS 8270

Client Sample ID: USTM230SB11-13
Client Project ID: M230
Lab Sample ID: G649-5-3B
Lab Project ID: G649-5
Report Basis: Dry weight

Analyzed By: MRC
Date Collected: 12/1/2005 15:45
Date Received: 12/2/2005
Date Extracted: 12/5/2005
Matrix: Soil
% Solids: 85.45

Compound	Result ug/Kg	Quantitation Limit ug/Kg	Dilution Factor	Date Analyzed
Acenaphthene	BQL	356	1	12/8/2005
Acenaphthylene	BQL	356	1	12/8/2005
Anthracene	BQL	356	1	12/8/2005
Benzo[a]anthracene	BQL	356	1	12/8/2005
Benzo[a]pyrene	BQL	356	1	12/8/2005
Benzo[b]fluoranthene	BQL	356	1	12/8/2005
Benzo[g,h,i]perylene	BQL	356	1	12/8/2005
Benzo[k]fluoranthene	BQL	356	1	12/8/2005
Benzoic Acid	BQL	712	1	12/8/2005
Bis(2-chloroethoxy)methane	BQL	356	1	12/8/2005
Bis(2-chloroethyl)ether	BQL	356	1	12/8/2005
Bis(2-chloroisopropyl)ether	BQL	356	1	12/8/2005
Bis(2-ethylhexyl)phthalate	BQL	356	1	12/8/2005
4-bromophenyl phenyl ether	BQL	356	1	12/8/2005
Butylbenzylphthalate	BQL	356	1	12/8/2005
2-Chloronaphthalene	BQL	356	1	12/8/2005
2-Chlorophenol	BQL	356	1	12/8/2005
4-Chloro-3-methylphenol	BQL	356	1	12/8/2005
4-Chloroaniline	BQL	1780	1	12/8/2005
4-Chlorophenyl phenyl ether	BQL	356	1	12/8/2005
Chrysene	BQL	356	1	12/8/2005
Dibenzo[a,h]anthracene	BQL	356	1	12/8/2005
Dibenzofuran	BQL	356	1	12/8/2005
Di-n-Butylphthalate	BQL	356	1	12/8/2005
1,2-Dichlorobenzene	BQL	356	1	12/8/2005
1,3-Dichlorobenzene	BQL	356	1	12/8/2005
1,4-Dichlorobenzene	BQL	356	1	12/8/2005
3,3'-Dichlorobenzidine	BQL	712	1	12/8/2005
2,4-Dichlorophenol	BQL	356	1	12/8/2005
Diethylphthalate	BQL	356	1	12/8/2005
Dimethylphthalate	BQL	356	1	12/8/2005
2,4-Dimethylphenol	BQL	356	1	12/8/2005
Di-n-octylphthalate	BQL	356	1	12/8/2005
4,6-Dinitro-2-methylphenol	BQL	1780	1	12/8/2005
2,4-Dinitrophenol	BQL	1780	1	12/8/2005
2,4-Dinitrotoluene	BQL	356	1	12/8/2005
2,6-Dinitrotoluene	BQL	356	1	12/8/2005
Diphenylamine *	BQL	356	1	12/8/2005
Fluoranthene	BQL	356	1	12/8/2005
Fluorene	BQL	356	1	12/8/2005
Hexachlorobenzene	BQL	356	1	12/8/2005
Hexachlorobutadiene	BQL	356	1	12/8/2005

Results for Semivolatiles by GCMS 8270

Client Sample ID: USTM230SB11-13
Client Project ID: M230
Lab Sample ID: G649-5-3B
Lab Project ID: G649-5
Report Basis: Dry weight

Analyzed By: MRC
Date Collected: 12/1/2005 15:45
Date Received: 12/2/2005
Date Extracted: 12/5/2005
Matrix: Soil
% Solids: 85.45

Compound	Result ug/Kg	Quantitation Limit ug/Kg	Dilution Factor	Date Analyzed
Hexachlorocyclopentadiene	BQL	712	1	12/8/2005
Hexachloroethane	BQL	356	1	12/8/2005
Indeno(1,2,3-c,d)pyrene	BQL	356	1	12/8/2005
Isophorone	BQL	356	1	12/8/2005
2-Methylnaphthalene	BQL	356	1	12/8/2005
2-Methylphenol	BQL	356	1	12/8/2005
3- & 4-Methylphenol	BQL	356	1	12/8/2005
Naphthalene	BQL	356	1	12/8/2005
2-Nitroaniline	BQL	356	1	12/8/2005
3-Nitroaniline	BQL	1780	1	12/8/2005
4-Nitroaniline	BQL	1780	1	12/8/2005
Nitrobenzene	BQL	356	1	12/8/2005
2-Nitrophenol	BQL	356	1	12/8/2005
4-Nitrophenol	BQL	1780	1	12/8/2005
N-Nitrosodi-n-propylamine	BQL	356	1	12/8/2005
Pentachlorophenol	BQL	1780	1	12/8/2005
Phenanthrene	BQL	356	1	12/8/2005
Phenol	BQL	356	1	12/8/2005
Pyrene	BQL	356	1	12/8/2005
1,2,4-Trichlorobenzene	BQL	356	1	12/8/2005
2,4,5-Trichlorophenol	BQL	356	1	12/8/2005
2,4,6-Trichlorophenol	BQL	356	1	12/8/2005

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	10.8	108
2-Fluorophenol	10	10.1	101
Nitrobenzene-d5	10	9.9	99
Phenol-d6	10	9.9	99
2,4,6-Tribromophenol	10	8.8	88
4-Terphenyl-d14	10	11	110

Comments:

* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

Flags:

BQL = Below Quantitation Limits.

Reviewed By: _____

List of Reporting Abbreviations and Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantitation Limit

DF = Dilution Factor

Dup = Duplicate

D = Detected, but RPD is > 40% between results in dual column method.

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL = Reporting Limit

RPD = Relative Percent Difference

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% soilds = Percent Solids

Special Notes:

1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.

2) Uncertainty for all reported data is less than or equal to 30 percent.

MI34.092205.2

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 52715

Page 1 of 1

9 of 9

Client: DAMES & MOORE VA | Project ID: M230 | Date: 12-1-05 | Report To: MIKE CROCE
Address: 4800 A COLLEY AVE | Contact: MIKE CROCE | Turnaround: NTT
Address: NORFOLK, VA 23508 | Phone: 757 440 0100 | Job Number:
Quote #: | Fax: 757 440-0411 | P.O. Number: | Invoice To:

Sample ID	Date	Time	Matrix	Preservatives	Analyses: 8270	Comments: Please specify any special reporting requirements
UST M230 SB 3-5	12-1-05	1525	S		✓	
UST M230 SB 5-7	1	1530	S		✓	G649-5
UST M230 SB 11-13	12-1-05	1545	S		✓	

Relinquished By	Date	Time	Received By	Date	Time	Temperature	State Certification Requested
[signature]	12-1-05	1600	[signature]	12/2/05	0940	4.1°C	NC ____ SC ____ Other ____

SEE REVERSE FOR TERMS AND CONDITIONS

OFFICIAL

PARADIGM ANALYTICAL LABORATORIES, INC.

N.C. CERTIFICATION #481

APPENDIX B

LABORATORY REPORTS AND CHAIN OF CUSTODY DOCUMENTATION FROM DECEMBER 2005 GROUNDWATER SAMPLING EVENT

Mr. Chris Murray
Sovereign Consulting
606 Thimble Shoals Rd.
Suite A1
Newport-News VA 23606
Report Number: G650-12

Client Project: M230

Dear Mr. Murray:

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call Paradigm at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,
Paradigm Analytical Laboratories, Inc.

12/22/05

Laboratory Director
J. Patrick Weaver

Date

Results for Volatiles
by GC 602

Client Sample ID: USTM230-MW01A
Client Project ID: M230
Lab Sample ID: G650-12-1A
Lab Project ID: G650-12

Analyzed By: MJC
Date Collected: 12/9/05 14:00
Date Received: 12/9/05
Matrix: Water

Analyte	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Benzene	BQL	1.00	1	12/15/05
Diisopropyl ether (DIPE)	BQL	1.00	1	12/15/05
Ethylbenzene	BQL	1.00	1	12/15/05
Methyl-tert butyl ether (MTBE)	BQL	2.00	1	12/15/05
Toluene	BQL	1.00	1	12/15/05
m/p-Xylene	BQL	2.00	1	12/15/05
o-Xylene	BQL	2.00	1	12/15/05

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	39.7	99.3

Comments:
All values corrected for dilution.
BQL = Below quantitation limit.

Reviewed By: _____

Results for Volatiles
by GC 602

Client Sample ID: Method Blank
Client Project ID:
Lab Sample ID: VBLK3121405B
Lab Project ID:

Analyzed By: MJC
Date Collected:
Date Received:
Matrix: Water

Analyte	Result ug/L	RL ug/L	Dilution Factor	Date Analyzed
Benzene	BQL	1.00	1	12/14/05
Diisopropyl ether (DIPE)	BQL	1.00	1	12/14/05
Ethylbenzene	BQL	1.00	1	12/14/05
Methyl-tert butyl ether (MTBE)	BQL	2.00	1	12/14/05
Toluene	BQL	1.00	1	12/14/05
m/p-Xylene	BQL	2.00	1	12/14/05
o-Xylene	BQL	2.00	1	12/14/05

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovery
Trifluorotoluene	40	39.7	99.1

Comments:
All values corrected for dilution.
BQL = Below quantitation limit.

Reviewed By: _____

Control Limits for QC Check / Laboratory Control Spike

Method: 602 **Spike[ppb] :** 10
Instrument : gc3
Filename : 121405\023r0101.txt

				QC Limits			LCS Limits	
	Compound	ppb	Q(%)	Lower	Upper	P_s(%)	Lower	Upper
	Benzene	10.6	105.9	77.0	123.0	106	39	150
	Chlorobenzene	10.3	102.9	80.5	119.5	103	55	135
	1,2-Dichlorobenzene	10.2	101.8	68.0	132.0	102	37	154
	1,3-Dichlorobenzene	10.2	101.6	72.5	127.5	102	60	141
	1,4-Dichlorobenzene	10.3	102.7	69.5	130.5	103	42	143
•	Diisopropyl ether	10.1	100.8	43.1	156.9	101	30	170
	Ethylbenzene	10.6	106.5	63.0	137.0	106	32	160
•	MTBE	10.3	103.3	46.8	153.2	103	35	165
	Toluene	10.5	105.3	77.5	127.0	105	46	148
•	m,p-Xylene	21.3	106.6	11.2	188.8	107	D	239
•	o-Xylene	10.5	104.7	47.6	152.4	105	36	164

Flags :

+ = out of QC limits.
• = lab generated limits.
D = Detected

Reviewed by: _____

Control Limits for MS-MSD

Method: 602 **Spike[ppb]:** 10
Instrument: gc3
Sample: 121405\040r0101.txt
MS: 121405\041r0101.txt
MSD: 121405\042r0101.txt

		µg/L		P(%)		P Limits	
Compound	Sam.	MS	MSD	MS	MSD	Lower	Upper
Benzene	4.5	15.4	15.3	110	108	39	150
Chlorobenzene	ND	10.2	10.2	102	102	65	135
1,2-Dichlorobenzene	ND	9.5	9.9	95	99	37	154
1,3-Dichlorobenzene	ND	9.6	9.9	96	99	60	141
1,4-Dichlorobenzene	ND	9.6	9.8	96	98	42	143
• Diisopropyl ether	ND	10.7	10.6	107	106	30	170
Ethylbenzene	2.4	13.6	13.6	113	113	32	160
• MTBE	ND	10.3	10.2	103	102	35	165
Toluene	ND	11.0	10.9	108	108	46	148
• m,p-Xylene	2.7	24.8	25.0	111	111	D	239
• o-Xylene	ND	10.5	10.5	105	105	36	164

Flags :

+ = out of QC limits.
• = lab generated limits.
D = Detected
ND = None Detected

Reviewed by: _____

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Sovereign Consulting

Project Name: M230

Sample Information and Analytical Results	
Sample Identification	USTM230-MW01A
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	12/09/05
Date Received	12/09/05
Date Extracted	12/14/05
Date Analyzed	12/14/05
Dry Weight	
Dilution Factor	1
C_5-C_8 Aliphatics**	< 100 (µg/L)
C_9-C_{12} Aliphatics**	< 100 (µg/L)
C_9-C_{10} Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	100
Surrogate % Recovery - FID	100

* = Option 1 = Established fill line on vial, Option 2 = Sampling Device/Brand, or Option 3 = Field weight of soil.

** = Excludes any surrogates or internal standards.

Lab Info: g650-12-1d

Reviewed By: _____

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 10/31/05 PID Initial Calibration Date: 10/31/05

Calibration Ranges and Limits

Range	MDL (07/15/2004) (µg/L)	ML (µg/L)	RL (µg/L)	RL (mg/Kg)
C_5-C_8 Aliphatics	4.4	14	100	10
C_9-C_{12} Aliphatics	3.4	11	100	10
C_9-C_{10} Aromatics	0.13	0.41	100	10

Calibration Concentration Levels

Range	Levels (µg/L)	%RSD or CCC	Method of Quantitation
C_5-C_8 Aliphatics	40	7.9	Calibration Factor
	1000		
	2000		
	3000		
	4000		
C_9-C_{12} Aliphatics	10	1.00	Linear Regression
	250		
	500		
	750		
	1000		
C_9-C_{10} Aromatics	10	16.20	Calibration Factor
	250		
	500		
	750		
	1000		

Calibration Check Date: 12/13/05

Calibration Check

Range	Levels (µg/L)	Levels (mg/Kg)	RPD
C_5-C_8 Aliphatics	2000	200	3.8
C_9-C_{12} Aliphatics	500	50	-6.3
C_9-C_{10} Aromatics	500	50	5.7

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit

RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Sovereign Consulting

Project Name: M230

Sample Information and Analytical Results	
Sample Identification	USTM230-MW01A
Sample Matrix	Water
Date Collected	12/09/05
Date Received	12/09/05
Date Extracted	12/12/05
Date Analyzed	12/29/05
Dry Weight	
Dilution Factor	1:1
C_9-C_{18} Aliphatics*	< 100 (ug/L)
C_{19}-C_{36} Aliphatics*	< 100 (ug/L)
C_{11}-C_{22} Aromatics*	< 100 (ug/L)
Aliphatic Surrogate % Recovery	100
Aromatic Surrogate % Recovery	74
Fractionation Surrogate 1 % Recovery	98

Comments:

* = Excludes any surrogates or internal standards.

Lab info: G650-12-1J

Reviewed By: [signature]

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 12/28/05

Calibration Ranges and Limits

Range	MDL (2/2004) (µg/L)	ML (µg/L)	RL (µg/L)	RL (mg/Kg)
C_9-C_{18} Aliphatics	3.84	12.2	100	10
C_{19}-C_{36} Aliphatics	0.57	1.8	100	10
C_{11}-C_{22} Aromatics	4.54	14.4	100	10

Calibration Concentration Levels

Range	Levels (µg/mL)	%RSD or CCC	Method of Quantitation
C_9-C_{18} Aliphatics	6	24.90	Calibration Factor
	30		
	60		
	120		
	240		
C_{19}-C_{36} Aliphatics	8	15.4	Calibration Factor
	40		
	80		
	160		
	320		
C_{11}-C_{22} Aromatics	17	9.7	Calibration Factor
	85		
	170		
	340		
	680		

Calibration Check Date: 12/29/05

Calibration Check

Range	Levels (µg/mL)	RPD
C_9-C_{18} Aliphatics	120	18.7
C_{19}-C_{36} Aliphatics	160	10.7
C_{11}-C_{22} Aromatics	340	7.7

MDL = Method Detection Limit
ML = Minimum Limit
RL = Reportable Limit

RPD = Relative Percent Difference
%RSD = Percent Relative Standard Deviation
CCC = Correlation Coefficient of Curve

Results for Semivolatiles by GCMS 625

Client Sample ID: USTM230-MW01A
Client Project ID: M230
Lab Sample ID: G650-12-1K
Lab Project ID: G650-12

Analyzed By: MRC
Date Collected: 12/9/2005 14:00
Date Received: 12/9/2005
Date Extracted: 12/12/2005
Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	10.0	1.22	1	12/14/2005	
Acenaphthylene	BQL	10.0	1.12	1	12/14/2005	
Anthracene	BQL	10.0	1.75	1	12/14/2005	
Benzo[a]anthracene	BQL	10.0	1.36	1	12/14/2005	
Benzo[a]pyrene	BQL	10.0	1.27	1	12/14/2005	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	12/14/2005	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	12/14/2005	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	12/14/2005	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	12/14/2005	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	12/14/2005	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	12/14/2005	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	12/14/2005	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	12/14/2005	
Butylbenzylphthalate	BQL	10.0	1.53	1	12/14/2005	
2-Chloronaphthalene	BQL	10.0	1.25	1	12/14/2005	
2-Chlorophenol	BQL	10.0	4.22	1	12/14/2005	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	12/14/2005	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	12/14/2005	
Chrysene	BQL	10.0	1.11	1	12/14/2005	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	12/14/2005	
Di-n-Butylphthalate	BQL	10.0	1.65	1	12/14/2005	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	12/14/2005	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	12/14/2005	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	12/14/2005	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	12/14/2005	
2,4-Dichlorophenol	BQL	10.0	3.75	1	12/14/2005	
Diethylphthalate	BQL	10.0	1.48	1	12/14/2005	
Dimethylphthalate	BQL	10.0	1.04	1	12/14/2005	
2,4-Dimethylphenol	BQL	10.0	9.25	1	12/14/2005	
Di-n-octylphthalate	BQL	10.0	1.16	1	12/14/2005	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	12/14/2005	
2,4-Dinitrophenol	BQL	50.0	4.20	1	12/14/2005	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	12/14/2005	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	12/14/2005	
Diphenylamine *	BQL	10.0	1.53	1	12/14/2005	
Fluoranthene	BQL	10.0	1.41	1	12/14/2005	
Fluorene	BQL	10.0	1.22	1	12/14/2005	
Hexachlorobenzene	BQL	10.0	1.22	1	12/14/2005	
Hexachlorobutadiene	BQL	10.0	1.58	1	12/14/2005	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	12/14/2005	
Hexachloroethane	BQL	10.0	1.58	1	12/14/2005	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	12/14/2005	

Results for Semivolatiles
by GCMS 625

Client Sample ID: USTM230-MW01A
Client Project ID: M230
Lab Sample ID: G650-12-1K
Lab Project ID: G650-12

Analyzed By: MRC
Date Collected: 12/9/2005 14:00
Date Received: 12/9/2005
Date Extracted: 12/12/2005
Matrix: Water

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Isophorone	BQL	10.0	1.27	1	12/14/2005	
Naphthalene	BQL	10.0	1.08	1	12/14/2005	
Nitrobenzene	BQL	10.0	1.32	1	12/14/2005	
2-Nitrophenol	BQL	10.0	3.52	1	12/14/2005	
4-Nitrophenol	BQL	50.0	3.17	1	12/14/2005	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	12/14/2005	
Pentachlorophenol	BQL	50.0	2.83	1	12/14/2005	
Phenanthrene	BQL	10.0	1.38	1	12/14/2005	
Phenol	BQL	10.0	3.38	1	12/14/2005	
Pyrene	BQL	10.0	2.08	1	12/14/2005	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	12/14/2005	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	12/14/2005	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.3	83
2-Fluorophenol	10	7.6	76
Nitrobenzene-d5	10	7.6	76
Phenol-d6	10	7.4	74
2,4,6-Tribromophenol	10	7	70
4-Terphenyl-d14	10	10.9	109

Comments:

* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

Flags:

BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results of Library Search for Semivolatile Compounds

by GCMS

Client Sample ID: USTM230-MW01A
Client Project ID: M230
Lab Sample ID: G650-12-1K
Lab Project ID: G650-12
Sample Wt/Vol: 500 ML
Dilution: 1

Analyzed By: MRC
Date Collected: 12/9/2005 14:00
Date Received: 12/9/2005
Date Extracted: 12/12/2005
Date Analyzed: 12/14/2005
Matrix: Water

No.	Compound	Retention Time	CAS#	Match Probability	Result (ug/L)
1	No library search compounds detected.				
2					
3					
4					
5					
6					
7					
8					
9					
10					

Comment:

Tentatively Identified Compound (TIC) refers to substances which are not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist.

Quantitation is accomplished by relative peak area of the compound compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Reviewed by: _____

Results for Semivolatiles by GCMS 625

Client Sample ID: Method Blank
Client Project ID:
Lab Sample ID: PB4157
Lab Project ID:

Analyzed By: MRC
Date Collected:
Date Received:
Date Extracted: 12/12/2005
Matrix: WATER

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Acenaphthene	BQL	10.0	1.22	1	12/14/2005	
Acenaphthylene	BQL	10.0	1.12	1	12/14/2005	
Anthracene	BQL	10.0	1.75	1	12/14/2005	
Benzo[a]anthracene	BQL	10.0	1.36	1	12/14/2005	
Benzo[a]pyrene	BQL	10.0	1.27	1	12/14/2005	
Benzo[b]fluoranthene	BQL	10.0	1.43	1	12/14/2005	
Benzo[g,h,i]perylene	BQL	10.0	4.57	1	12/14/2005	
Benzo[k]fluoranthene	BQL	10.0	1.09	1	12/14/2005	
Bis(2-chloroethoxy)methane	BQL	10.0	1.11	1	12/14/2005	
Bis(2-chloroethyl)ether	BQL	10.0	1.09	1	12/14/2005	
Bis(2-chloroisopropyl)ether	BQL	10.0	1.57	1	12/14/2005	
Bis(2-ethylhexyl)phthalate	BQL	10.0	1.33	1	12/14/2005	
4-bromophenyl phenyl ether	BQL	10.0	1.99	1	12/14/2005	
Butylbenzylphthalate	BQL	10.0	1.53	1	12/14/2005	
2-Chloronaphthalene	BQL	10.0	1.25	1	12/14/2005	
2-Chlorophenol	BQL	10.0	4.22	1	12/14/2005	
4-Chloro-3-methylphenol	BQL	10.0	3.26	1	12/14/2005	
4-Chlorophenyl phenyl ether	BQL	10.0	1.42	1	12/14/2005	
Chrysene	BQL	10.0	1.11	1	12/14/2005	
Dibenzo[a,h]anthracene	BQL	10.0	4.87	1	12/14/2005	
Di-n-Butylphthalate	BQL	10.0	1.65	1	12/14/2005	
1,2-Dichlorobenzene	BQL	10.0	1.25	1	12/14/2005	
1,3-Dichlorobenzene	BQL	10.0	1.24	1	12/14/2005	
1,4-Dichlorobenzene	BQL	10.0	1.20	1	12/14/2005	
3,3'-Dichlorobenzidine	BQL	20.0	4.10	1	12/14/2005	
2,4-Dichlorophenol	BQL	10.0	3.75	1	12/14/2005	
Diethylphthalate	BQL	10.0	1.48	1	12/14/2005	
Dimethylphthalate	BQL	10.0	1.04	1	12/14/2005	
2,4-Dimethylphenol	BQL	10.0	9.25	1	12/14/2005	
Di-n-octylphthalate	BQL	10.0	1.16	1	12/14/2005	
4,6-Dinitro-2-methylphenol	BQL	50.0	3.71	1	12/14/2005	
2,4-Dinitrophenol	BQL	50.0	4.20	1	12/14/2005	
2,4-Dinitrotoluene	BQL	10.0	1.52	1	12/14/2005	
2,6-Dinitrotoluene	BQL	10.0	1.41	1	12/14/2005	
Diphenylamine *	BQL	10.0	1.53	1	12/14/2005	
Fluoranthene	BQL	10.0	1.41	1	12/14/2005	
Fluorene	BQL	10.0	1.22	1	12/14/2005	
Hexachlorobenzene	BQL	10.0	1.22	1	12/14/2005	
Hexachlorobutadiene	BQL	10.0	1.58	1	12/14/2005	
Hexachlorocyclopentadiene	BQL	20.0	20.0	1	12/14/2005	
Hexachloroethane	BQL	10.0	1.58	1	12/14/2005	
Indeno(1,2,3-c,d)pyrene	BQL	10.0	4.57	1	12/14/2005	

Results for Semivolatiles by GCMS 625

Client Sample ID: Method Blank
Client Project ID:
Lab Sample ID: PB4157
Lab Project ID:

Analyzed By: MRC
Date Collected:
Date Received:
Date Extracted: 12/12/2005
Matrix: WATER

Compound	Result ug/L	Quantitation Limit ug/L	MDL ug/L	Dilution Factor	Date Analyzed	Flag
Isophorone	BQL	10.0	1.27	1	12/14/2005	
Naphthalene	BQL	10.0	1.08	1	12/14/2005	
Nitrobenzene	BQL	10.0	1.32	1	12/14/2005	
2-Nitrophenol	BQL	10.0	3.52	1	12/14/2005	
4-Nitrophenol	BQL	50.0	3.17	1	12/14/2005	
N-Nitrosodi-n-propylamine	BQL	10.0	1.87	1	12/14/2005	
Pentachlorophenol	BQL	50.0	2.83	1	12/14/2005	
Phenanthrene	BQL	10.0	1.38	1	12/14/2005	
Phenol	BQL	10.0	3.38	1	12/14/2005	
Pyrene	BQL	10.0	2.08	1	12/14/2005	
1,2,4-Trichlorobenzene	BQL	10.0	1.33	1	12/14/2005	
2,4,6-Trichlorophenol	BQL	10.0	2.92	1	12/14/2005	

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	6.7	67
2-Fluorophenol	10	6.6	66
Nitrobenzene-d5	10	6.8	68
Phenol-d6	10	6.7	67
2,4,6-Tribromophenol	10	6.8	68
4-Terphenyl-d14	10	8.7	87

Comments:

* N-Nitrosodiphenylamine is reported as the breakdown product Diphenylamine.

Flags:

BQL = Below Quantitation Limits.
J = Detected below the quantitation limit.

Reviewed By: _____

Results For Matrix Spike / Matrix Spike Duplicate and Laboratory Control Standard (MS/MSD/LCS)
by GCMS

Client Sample ID: Batch QC
Client Sample ID:
Lab Sample ID: Batch-4157-MS/MSD/LCS
Lab Project ID:
Matrix: WATER
Prep Method: 3520

Date Collected:
Date Received:
Date Extracted: 12/12/05
Date Analyzed: 12/14/05
Analyzed By: MRC
Dilution: 1

	Sample Amount (µg/L)	MS Spike (µg/L)	MS Conc. (µg/L)	MS Spike % Rec.	MSD Spike (µg/L)	MSD Conc. (µg/L)	MSD Conc. % Rec.	RPD	QC Limits RPD	QC Limits % Rec.
Acenaphthylene	BQL	200	170	85.1	200	201	101.0	16.8	30	62.0-119
4-Chloro-3-methylphenol	BQL	200	129	64.5*	200	162	80.8	22.4	30	67.0-109
2-Chlorophenol	BQL	200	121	60.6	200	145	72.6	18.0	30	59.0-95.0
1,4-Dichlorobenzene	BQL	200	103	51.7	200	114	57.3	10.3	30	29.0-86.0
2,4-Dinitrotoluene	BQL	200	145	72.6	200	183	91.5	23.0	30	63.0-103
N-Nitrosodi-n-propylamine	BQL	200	115	57.4*	200	138	68.9	18.2	30	67.0-107
4-Nitrophenol	BQL	200	131	65.4	200	143	71.4	8.77	30	49.0-146
Pentachlorophenol	BQL	200	114	56.9	200	149	74.3	26.5	30	43.0-106
Phenol	BQL	200	125	62.4	200	151	75.3	18.7	30	61.0-100
Pyrene	BQL	200	167	83.3	200	170	85.1	2.14	30	41.0-123
1,2,4-Trichlorobenzene	BQL	200	118	58.8	200	143	71.4	19.4	30	41.0-96.0

	Spiked Amount (µg/L)	LCS Conc. (µg/L)	LCS Spike %	QC Limits % Rec.
Acenaphthylene	100	88.8	88.8	66.1-116
4-Chloro-3-methylphenol	100	70.7	70.7	64.3-128
2-Chlorophenol	100	86.2	86.2	56.9-93.4
1,4-Dichlorobenzene	100	39.0	39.0	20.6-82.8
2,4-Dinitrotoluene	100	78.3	78.3	63.7-116
N-Nitrosodi-n-propylamine	100	72.5	72.5	62.6-108
4-Nitrophenol	100	85.6	85.6	53.7-143
Pentachlorophenol	100	67.9	67.9	31.0-102
Phenol	100	58.9	58.9	57.4-99.5
Pyrene	100	80.7	80.7	44.1-124
1,2,4-Trichlorobenzene	100	54.6	54.6	37.6-97.9

Comments:

Concentrations reflect the spiked sample amounts.

Flags:

* = Out of limits.
NA = Not applicable.

Reviewed By: _____

Results for Metals

Client Sample ID:	USTM230-MW01A (dissolved)	Analyzed By:	PSW
Client Project ID:	M230	Date Collected:	12/9/2005 00:00
Lab Sample ID:	G650-12-2	Date Received:	12/9/05
Lab Project ID:	G650-12	Matrix:	WATER
Batch ID:	4161		

Metals	Result	RL	MDL	DF	Units	Method	Date Analyzed	Flags
Manganese	**0.0102**	0.0100	0.000410	1	MG/L	6010B	12/14/05	B

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL
B= Amount in Prep Blank > MDL

Reviewed By: _____
MET_LIMS_3 9b

Results for Metals

Client Sample ID:	Lab Blank	Analyzed By:	PSW
Client Project ID:		Date Collected:	
Lab Sample ID:	pb4161	Date Received:	
Lab Project ID:		Matrix:	WATER
Batch ID:	4161		

Metals	Result	RL	MDL	DF	Units	Method	Date Analyzed	Flags
Manganese	**0.000600**	0.0100	0.000410	1	MG/L	6010B	12/14/05	JB

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Between MDL and RL
B= Amount in Prep Blank > RL

Reviewed By: _____
PrepBlank

MS/MSD Results for METALS

Lab ID: G211-1868-1
MS Lab ID: G211-1868-1
MSD Lab ID: G211-1868-1
ICP Batch: 4161
HG Batch:
Other:

Analyzed By: PSW
Matrix: Water
Units: MG/L

Analyte	Sample Result	SA MS	MS Result	MS %REC		SA MSD	MSD Result	MSD %REC		Limit Lower	Limit Upper	RPD		RPD Limit
Manganese	0.787	0.400	0.931	36.0	*	0.400	0.854	16.7	*	75	125	8.63		20

Comments

*=Out of Limits
NA = Not applicable, due to sample concentration greater than three times spike concentration

Reviewed By: _____

METALS Results for LCS/LCD

ICP Batch: 4161
HG Batch:
Other:

Matrix: WATER
Units: MG/L

Analyte	TRUE Value	LCS	LCS %REC	LCD	LCD %REC	Limit Lower	Limit Upper	RPD	RPD Limit
Manganese	0.400	0.383	95.8	0.372	93.0	80	120	2.91	20

Reviewed By: _____

Results for Metals

Client Sample ID:	USTM230-MW01A	Analyzed By:	RML
Client Project ID:	M230	Date Collected:	12/9/2005 14:00
Lab Sample ID:	G650-12-1_	Date Received:	12/9/05
Lab Project ID:	G650-12	Matrix:	Water

Metals	Result	Report Limit	MDL	DF	Units	Method	Date Analyzed	Flags
Ferrous Iron	BQL	0.200	0.0250	1.00	MG/L	SM3500-Fe	12/22/05	

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Value between MDL and Report Limit

Reviewed By: _____
PE2_LIMS_v0.2

Results for Metals

Client Sample ID:
Client Project ID:
Lab Sample ID: pb4226
Lab Project ID:

Analyzed By: RML
Date Collected:
Date Received:
Matrix: Water

Metals	Result	Report Limit	MDL	DF	Units	Method	Date Analyzed	Flags
Ferrous Iron	BQL	0.200	0.0250	1.00	MG/L	SM3500-Fe	12/22/05	

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
J = Value between MDL and Report Limit

Reviewed By: _____
FE2_LIMS_v0.2

METALS Results for LCS/LCD

ICP Batch:
HG Batch:
Other: 4226

Matrix: WATER
Units: MG/L

Analyte	TRUE Value	LCS	LCS %REC		LCD	LCD %REC		Limit Lower	Limit Upper	RPD		RPD Limit
Ferrous Iron	2.00	1.95	97.5		2.01	101		80	120	3.03		20

Reviewed By: _____

MS/MSD Results for METALS

Lab ID: G650-12-1
MS Lab ID: G650-12-1
MSD Lab ID: G650-12-1
ICP Batch:
HG Batch:
Other: 4226

Analyzed By: PSW
Matrix: Water
Units: MG/L

Analyte	Sample Result	SA MS	MS Result	MS %REC	SA MSD	MSD Result	MSD %REC	Limit Lower	Limit Upper	RPD	RPD Limit
Ferrous Iron	BQL	2.00	1.95	97.5	2.00	1.96	98.0	75	125	0.51	20

Comments

*=Out of Limits
NA = Not applicable, due to sample concentration greater than three times spike concentration

Reviewed By: _____

Analytical Results

Client Sample ID: USTM230-MW01A
Client Project ID: M230
Lab Sample ID: G650-12-1
Lab Project ID: G650-12

Date Collected: 12/9/2005
Date Received: 12/9/2005
Matrix: Water

Analyte	Result	RL	Units	Method	Date Analyzed	Analyst
COD	**13**	5.0	mg/l	SM5220	12/19/2005	Envirochem

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
RL = Report Limit

Reviewed By: _____
subout_LIMS_v1.2

List of Reporting Abbreviations and Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantitation Limit

DF = Dilution Factor

Dup = Duplicate

D = Detected, but RPD is > 40% between results in dual column method.

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL = Reporting Limit

RPD = Relative Percent Difference

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% soilds = Percent Solids

Special Notes:

1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.

2) Uncertainty for all reported data is less than or equal to 30 percent.

MI34.092205.2

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 52946

Page 1 of 1

Client: Sovereign Consulting Project ID: ~~NY008~~ M230 Date: 12/9/05 Report To: Chris Murray
Address: 606 A-1 Trimble Shores Rd Contact: Chris Murray Turnaround: Standard
Address: Newport News VA 23606 Phone (757) 777-8982 Job Number: NY008
Quote #: Fax: (757) 794-9227 P.O. Number: Invoice To: Chris Murray

Sample ID	Date	Time	Matrix	Preservatives: HCL	H2SO4	NONE		Analyses: 602	VPH	EPH	625 +10 TICs	Disolved Manganese	Ferrous Iron	~~BOD~~	COD			Comments: Please specify any special reporting requirements
																		G650-12
UST M230-MW04	12/9/05	1400	W	x 6	x 1	x 4		3	2	1	1	1	1	~~1~~	1			EMAIL RESULTS TO cmurray@sovcon.com USE "EDD" FORMAT
																		BOD resampled at later date 12/20/05

Relinquished By	Date	Time	Received By	Date	Time	Temperature
[signature]	12/9/05	1705	[signature]	12/9/05	1705	on ice 2.3°C

State Certification Requested
NC ____ SC ____ Other ____

SEE REVERSE FOR TERMS AND CONDITIONS

Mr. Chris Murray
Sovereign Consulting
606 Thimble Shoals Rd.
Suite A1
Newport-News VA 23606
Report Number: G650-13

Client Project: M230

Dear Mr. Murray:

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call Paradigm at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,
Paradigm Analytical Laboratories, Inc.

12/28/05
Laboratory Director Date
J. Patrick Weaver

Analytical Results

Client Sample ID: USTM230-MW01A
Client Project ID: M230
Lab Sample ID: G650-13-1
Lab Project ID: G650-13

Date Collected: 12/12/2005
Date Received: 12/13/2005
Matrix: Water

Analyte	Result	RL	Units	Method	Date Analyzed	Analyst
BOD	BQL	2.0	mg/l	405.1	12/13/2005	Envirochem

Comments
BQL = Below Quantitation Limits
DF = Dilution Factor
RL = Report Limit

Reviewed By:
subout_LIMS_v1.2

List of Reporting Abbreviations and Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantitation Limit

DF = Dilution Factor

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E = Estimated concentration, exceeds calibration range.

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MDL = Method Detection Limit

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RL = Reporting Limit

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mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% soilds = Percent Solids

Special Notes:

1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.

2) Uncertainty for all reported data is less than or equal to 30 percent.

MI34.092205.2

PARADIGM ANALYTICAL LABORATORIES, INC.
5500 Business Drive, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC# 52964

Page 1 of 1

4 of 4

Client: Sovereign Consulting Project ID: N230 Date: 12/12/05 Report To: Chris Murray "Client Address"

Address: 606 A-1 Thimble Shoals Blvd Contact: Chris Murray Turnaround: STANDARD

Address: Newport News VA 23606 Phone (757) 777-8982 Job Number: NV008

Quote #: Fax (757) 794-9329 P.O. Number: Invoice To: Chris Murray

PARADIGM ANALYTICAL LABORATORIES, INC.

Sample ID	Date	Time	Matrix	Preservatives: None	Analyses: EDD	Comments: Please specify any special reporting requirements
						6650-13
USTN230-MW01A	12/12/05	1300	W	X	X	*EMAIL RESULTS IN "EDD" Format To: cmurray@sovcon.com

NC CERTIFICATION #481

Relinquished By	Date	Time	Received By	Date	Time	Temperature	State Certification Requested
[signature]	12/12/05	1600	[signature]	12/13/05	1020	0.4°C	NC ____ SC ____ Other ____
							SEE REVERSE FOR TERMS AND CONDITIONS

ORIGINAL

APPENDIX C

WELL CONSTRUCTION RECORD AND FIELD BORING LOG

NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3367

1. WELL CONTRACTOR:

GARY ELLINGWORTH
Well Contractor (Individual) Name

PARRATT-WOLFF, INC.
Well Contractor Company Name

STREET ADDRESS 501 MILLSTONE DRIVE

HILLSBOROUGH, NC 27278
City or Town State Zip Code

(919)- 644-2814
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) UST M230 MW01A

STATE WELL PERMIT#(if applicable)

DWQ or OTHER PERMIT #(if applicable)

WELL USE (Check Applicable Box) Monitoring ☒ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☐ (list use)

DATE DRILLED 12/1/05

TIME COMPLETED AM ☐ PM ☐

3. WELL LOCATION:

CITY: JACKSONVILLE COUNTY ONSLOW

MCB CAMP LEJEUNE
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☐ Flat ☐ Ridge ☐ Other
(check appropriate box)

LATITUDE 3 34 44.651'

LONGITUDE 77 25.039'

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source: ☐ GPS ☒ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable)

NAME OF FACILITY MARINE CORPS BASE

STREET ADDRESS CAMP LEJEUNE

JACKSONVILLE, NC 28542
City or Town State Zip Code

CONTACT PERSON

MAILING ADDRESS

City or Town State Zip Code

( )-
Area code - Phone number

5. WELL DETAILS:

a. **TOTAL DEPTH:** 20.0'

b. **DOES WELL REPLACE EXISTING WELL?** YES ☐ NO ☒

c. **WATER LEVEL** Below Top of Casing: 15.0 FT.
(Use "+" if Above Top of Casing)

d. **TOP OF CASING IS** 0 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. **YIELD (gpm):** N/A **METHOD OF TEST** N/A

f. **DISINFECTION: Type** N/A **Amount** N/A

g. **WATER ZONES** (depth):

From N/A To From To
From To From To
From To From To

6. CASING:

	Depth		Diameter	Thickness/ Weight	Material
From 0	To 10	Ft. 2"		SCH40	PVC
From	To	Ft.			
From	To	Ft.			

7. GROUT:

	Depth		Material	Method
From 0	To 6	Ft.	PORTLAND	TREMIE
From 6	To 8	Ft.	BENTONITE	TREMIE
From	To	Ft.		

8. SCREEN:

	Depth		Diameter		Slot Size		Material
From 10	To 20	Ft. 2	in.	.010	in.	PVC
From	To	Ft.	in.		in.	
From	To	Ft.	in.		in.	

9. SAND/GRAVEL PACK:

	Depth		Size	Material
From 8	To 20	Ft.	#1	SAND
From	To	Ft.		
From	To	Ft.		

10. DRILLING LOG

From	To	Formation Description
0	15.0'	Brown, moist, medium dense to dense, fine to medium SAND; trace silt
15.0	20.0	Brown, wet, soft SILT; little clay and fine sand

11. REMARKS:

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 12/21/05

PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit the original to the Division of Water Quality within 30 days. Attn: Information Mgt., 1617 Mail Service Center – Raleigh, NC 27699-1617 Phone No. (919) 733-7015 ext 568.

Form GW-1b
Rev. 7/05

parratt wolff inc

TEST BORING LOG

501 MILLSTONE DRIVE
HILLSBOROUGH, NC 27278

PROJECT M-230
LOCATION MCB Camp Lejeune
DATE STARTED 12-1-05 DATE COMPLETED

HOLE NO. 05TM230 MW01A
SURF. EL.
JOB NO. 05628A
GROUND WATER DEPTH WHILE DRILLING 15'
BEFORE CASING REMOVED Installed well
AFTER CASING REMOVED

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING "/OR — % CORE RECOVERY

CASING TYPE 4 1/4" HSA – DPT macro core samples

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
5	2.0'-7.0'	1				Brown [illegible] med/[illegible] fine Sand, trace silt	
10	7.0'-11.0'	2					
15	11.0'-15.0'	3					15'
20						Brown wet silt [illegible] clay & f/sand	20' EOB
25						Installed well @ 20' used 10' slotted 2" PVC/10 slot used 10' of solid 2" PVC riser used [illegible] bags #1 sand (20'-8') used 1 1/2 bags [illegible] plug [illegible] [illegible] [illegible] [illegible]	

SOVEREIGN CONSULTING INC.

February 14, 2006

Mr. David T. Cleland, P.G.
NAVFAC Mid-Atlantic, Code: OPCEV4
Marine Corps North Carolina IPT
6506 Hampton Boulevard
Norfolk, VA 23508-1278

Re: FINAL Additional Sampling Report with Site Closure Request
Building M-230
Marine Corps Base
Camp Lejeune, North Carolina

Dear Mr. Cleland:

Sovereign Consulting Inc. (Sovereign) is pleased to submit the FINAL Additional Sampling Report with Site Closure Request for the subject site. We have reviewed the comments to the referenced draft report and offer the following responses to the comments and concerns offered by yourself and Mr. Smith of the Camp Lejeune Environmental Management Division.

Comment #1
The only thing I saw was numbering in 7.0 CONCLUSIONS AND PETITION FOR SITE CLOSURE needs to be corrected.

Acknowledged. Numbering has been corrected.

Mr. Smith's comments:
Comment #1
Section 3.0 Site History - I'm not sure what "UTTS/E" is as it is not referenced anywhere else within the report.

Acknowledged. Further explanation has been added. The sentence now reads as follows: "UTTS/Environmental performed the environmental monitoring for THH Services. They also generated a closure report and collected six soil samples from the excavation subsequent to tank removal."

Comment #2
Section 4.0 Site Remediation - (Second sentence) please correct date as appropriate "Subequently, in 200, NCDENR required...." I'm assuming 2001...

Acknowledged. Text has been changed.

606 A-1 Thimble Shoals Blvd. • Newport News, VA 23606 • Tel: 757-594-0980 • Fax: 757-594-9227

Sovereign appreciates the opportunity to assist NAVFAC Mid-Atlantic and MCB Camp Lejeune in your environmental projects. Please contact me at 757-594-0980 or 757-777-8982 if you require additional assistance with regard to the M-230 submittal.

Sincerely,

Christopher Murray
Sovereign Consulting Inc., Project Manager

Attachments: M-230 Monitoring Report and Request for No Further Action

Cc: Mr. Andrew Smith, I&E/EMD/EQB (2 copies)