

**LEAKING UNDERGROUND STORAGE TANK (LUST)
PHASE I LIMITED SITE ASSESSMENT REPORT**

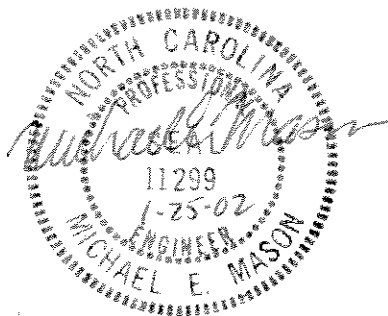
FOR

***BB-52/SBB-70*
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

NCDENR UST INCIDENT NO. PENDING

JANUARY 24, 2002

**CONTRACT NO. N62470-95-D-6009
DELIVERY ORDER NO. 0151
CATLIN PROJECT NO. 201-121-01**



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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
ARO	Asheville Regional Office
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
CATLIN	CATLIN Engineers and Scientists (Formerly RC&A)
CFR	Code of Federal Regulations
Cr	Chromium
CSA	Comprehensive Site Assessment
CNP	Carbon Nitrogen Phosphorous
CPT	Cone Penetrometer Test
DEM	Division of Environmental Management
DIPE	Diisopropyl 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
EAD	Environmental Affairs Department
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
FOD	Foreign Object Debris
FRO	Fayetteville Regional Office
FT	Feet
GCL	Gross Contaminant Level
GIS	Geographic Information System
GPS	Global Positioning System

Guidelines Vol. I	Groundwater Section Guidelines for Investigation and Remediation of Soil and Groundwater, Volume I, Sources Other Than Petroleum Underground Storage Tanks (May 1998)
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
LANTDIV	Atlantic Division
LSA	Limited Site Assessment
LUST	Leaking Underground Storage Tank
m-	meta
m	meter
MADEP	Massachusetts Department of Environmental Protection
MCALF	Marine Corps Auxiliary Landing Field
MCAS	Marine Corps Air Station
MCB	Marine Corps Base
MCOLF	Marine Corps Outlying Landing Field
MDL	Method Detection Limit
mg/Kg	Milligrams per Kilogram
mg/L	Milligrams per Litre
MRO	Mooresville Regional Office
MSCC	Maximum Soil Contaminant Concentration
MSL	Mean Sea Level
MTBE	Methyl tertiary butyl ether
µg/Kg	Micrograms per Kilogram
µg/L	Micrograms per Litre
NA	Not Analyzed
N/A	Not Applicable
NC	North Carolina
NCAC	North Carolina Administrative Code
NCDENR	North Carolina Department of Environment and Natural Resources
NCDOC	North Carolina Department of Corrections
NCDOT	North Carolina Department of Transportation
NCSP	North Carolina State Plane
NCSPA	North Carolina State Ports Authority
NE	None Established
NM	Not Measured
NMT	No Measurable Thickness
NS	Not Sampled
o-	ortho
OVA	Organic Vapor Analyzer
p-	para
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
ROI	Radius of Influence
RRO	Raleigh Regional Office
SOW	Scope of Work
STGW	Soil-to-Groundwater
SVE	Soil Vapor Extraction
SVOC	Semi Volatile Organic Compound
TDHF	Toxicologically Defined Hydrocarbons Fractions
TCLP	Toxicity Characteristic Leaching Procedure
TIC	Tentatively Identified Compound
TKN	Total Kjeldahl Nitrogen
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
WaRO	Washington Regional Office
WiRO	Wilmington Regional Office
WSRO	Winston-Salem Regional Office

PHASE I LIMITED SITE ASSESSMENT REPORT

A. SITE IDENTIFICATION

DATE OF REPORT: January 24, 2002
Facility ID: N/A UST Incident Number (if known): Pending
Site Name: BB-52 / SBB-70
Site Location: Marine Corps Base Camp Lejeune
Nearest City/Town: Jacksonville County: Onslow

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

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

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

Property Occupant: Same as above Phone: Same as above
Address: Same as above

Consultant/Contractor: CATLIN Engineers and Scientists
Address: 220 Old Dairy Road, Wilmington, North Carolina 28405 Phone: (910) 452-5861

Release Information

Date Discovered: February 25, 1993
Longitude: W77° 21' 32" Latitude: 34° 34' 57"
Estimated Quantity of Release: Unknown
Cause of Release: Unknown
Source of Release (e.g. Piping/UST):
USTs and associated piping are suspected

Sizes and contents of UST system(s) from which the release occurred:
1,000-gallon gasoline UST
5,000-gallon diesel UST

I, Michael E. Mason a Professional Engineer/Licensed Geologist (circle one) for
CATLIN Engineers and Scientists, do certify that the information contained in this report is correct and
accurate to the best of my knowledge.

(Please Affix Seal and Signature)



PURPOSE OF INVESTIGATION

The purpose of this investigative document is to provide data to fulfill the initial site assessment and risk characterization requirements in accordance with 15A NCAC 2L .0115(c)(4). This Phase I LSA document has been formatted utilizing the Guidelines for Assessment and Corrective Action effective July 1, 2001 for ease of DENR review. The purpose of the field activities was to collect the necessary information allowing DENR to classify the level of risk resulting from the release.

In order to establish this information and to confirm or deny the presence of petroleum contamination at this site, a receptor survey was performed, one ground water monitoring well was installed in each of the two former UST basins, groundwater samples were collected, and thirteen soil samples were collected in and around the former UST basins and associated piping. CATLIN in accordance with the 2001 Guidelines performed collection of soil samples for testing by analytical methods consistent with the required analysis for contaminated soil.

On February 25, 1993, Environmental & Regulatory Consultants performed UST excavation operations and removed the two USTs. During tank removal, four confirmatory soil samples (S-1 through S-4) were collected two feet directly below the USTs. Soil samples were tested for TPH-Diesel and TPH-Gasoline per EPA Methods 3550 and 5030. Laboratory analyses were reported as above State action levels for TPH gasoline in the former 1,000-gallon gasoline UST basin and for TPH diesel in the former 5,000-gallon diesel UST basin.

The Tank Removal Report state that the UST excavations were backfilled with excavated soils immediately following UST removal at the direction of NAVFAC due to the apparent proximity to groundwater and safety considerations at the site.

B. 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

According to I&E/EMD/EQB, the MCB samples the raw water supply wells semi-annually and no contaminants were reported in the latest sampling event. No information provided indicates a water supply well has been contaminated as a result of the release. There are no water supply wells located within a 1,000 foot radius of the subject 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. Water supply wells PSWBB44 and PSWBB47 are located approximately 1,000 and 1,100 feet from the source area, respectively.

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 1,000 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?* YES NO
If YES describe.

No. No evidence of accumulations have been reported in the reference 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? YES NO
If YES describe.

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 named surface waters.

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? YES NO

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)? YES NO
If YES describe.

No. Wellhead protection areas defined by 42 USC 300h-7(e) have not, as of this time, been designated by the State. 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 of Natural Resources and Community Development 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
If YES describe

Aquifers below the surficial aquifer in the area of BB-52/SBB-70 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 well 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 vacant lot with an adjacent Marine Corps boat building school.

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

Yes. Adjacent to the site is a Marine Corps boat repair training facility. The subject site and vicinity are used as a military training facility. There are athletic field approximately 750 feet from the source area.

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

As previously mentioned, the subject property and vicinity are used as part of a military training facility. Specifically the site is adjacent to a boat building school. The immediate vicinity of the former tank basin is located within a grassed common area.

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 complex. 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

Yes. While there are no fences physically surrounding the former tank basin, the site is located within a restricted area of the base. Unauthorized personnel are not permitted access to the former tank basin. Due to the nature of site activities minimal pedestrian traffic would be present.

5. *Do pavement, buildings, or other structures cap the contaminated soil?*
Describe.

YES NO

No. The site is located in a grassy area.

If YES, what mechanisms are in place or can be put into place to ensure that the contaminated soil will remain capped in the foreseeable future?

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 1500 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 1,500 feet west of the release. These barracks would be considered a semi-permanent residence.

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?*

A Marine Corps boat repair training facility is adjacent to the subject site. There are athletic fields located approximately 750 feet from the source area. A recreation center is located approximately 1,000 feet from the source area. (See Figure 2.)

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 used as office space, warehouse/industrial space, military barracks and support for the MCB.

C. RECEPTOR INFORMATION

1. Water Supply Wells

(Refer to Table 5 and Figure 1)

As shown on Figure 1 and Table 5, there are two public drinking water supply wells located within 1,500 feet of the source area of the release. Well PSWBB-44 is located approximately 1,000 feet northwest of subject site. Well PSWBB-47 is located approximately 1,100 west of subject site. Current analytical data supplied by the MCB indicates contaminants are not present in either well.

2. Public Water Supplies

Are public water supplies available within 1,500 feet of the source area of the release?

YES NO

If YES, where is the location of the nearest public water lines and the source(s) of the public water supply (indicate on map). Describe.

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. 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.

3. Surface Water

There were no surface bodies of water identified within 1,500 feet of the subject site.

4. Wellhead Protection Areas

Wellhead protection areas defined by 42 USC 300h-7(e) have not, as of this time, been designated by the State. However, MCB Camp Lejeune has identified proposed wellhead protection areas on the base. The site is not located in a proposed wellhead protection area.

5. Deep Aquifers in the Coastal Plain Physiographic Region

As identified in the Geologic Map of North Carolina (North Carolina of Natural Resources and Community Development 1985), the subject site lies within the Coastal Plain Physiographic Province. Potential impacts to deeper aquifers are unknown, though; minimal impact to surficial groundwater was revealed.

To some degree seven of the ten aquifers identified to date in the North Carolina Coastal Plain are typically present beneath portions of the MCB. In order of increasing depth, these aquifers include the surficial, Castle Hayne, Beaufort, Peedee, Black Creek, and upper and lower Cape Fear aquifers.

Aquifers below the surficial aquifer in the area of BB-52/SBB-70 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.

6. Subsurface Structures

(Refer to Figure 3)

Drainage ditches are located to the south and west of the former tank basin. Numerous underground utilities may be present throughout the subject but were not encountered during this investigation. Known utilities are illustrated in Figure 3.

7. Property Owners and Occupants

(Refer to Table 6)

Refer to Table 6 for a list of property owners/occupants.

D. SITE GEOLOGY AND HYDROGEOLOGY

According to the Geologic Map of North Carolina (North Carolina Department of Natural Resources and Community Development (1985)) the site lies within the Coastal Plain Physiographic Province.

Field observations noted during hand auger soil boring advancement indicates site geology to be comprised of silty/clayey, very fine to fine sands with interbedded clay layers to a depth

of six feet below ground surface. Split spoons samples collected during monitoring well USTBB52/SBB70-MW02 boring advancement revealed silty sands to a depth of 20 feet below ground surface with a clay layer at nine to eleven feet below ground surface. Drill cuttings observed during monitoring well USTBB52/SBB70-MW01 boring advancement indicated a possible clay layer at eleven to twelve feet below ground surface.

The split spoons collected from nine to eleven feet below ground surface during advancement of monitoring well borings were saturated at approximately ten feet below ground surface. Groundwater depths as measured in the monitoring wells ranged from 11.0 to 11.5 feet below ground surface.

Due to the low contaminant concentrations observed, rapid degradation of contamination is not expected. Attenuation may occur mainly due to adsorption and dispersion.

E. SAMPLING RESULTS

1. Soil Sampling

(Refer to Tables 3A-3D, Figures 4A-4C, and Appendices D and E)

As detailed in the Site History section, soil samples were obtained during the tank closure. Laboratory analyses of these samples were above State action levels for TPH diesel and gasoline range organics. Soils were used as backfill and no groundwater samples were collected, therefore a Phase I LSA was required.

CATLIN personnel began soil sampling activities on November 1, 2001. Split spoon soil samples were collected at five-foot intervals during monitoring well boring advancement. One soil sample was selected from each monitoring well boring from four to six feet below ground surface for laboratory analysis. Samples were labeled USTBB52/SBB70-MW01 and USTBB52/SBB70-MW02. Sample identifications were abbreviated for field notation as shown on the laboratory reports and chain-of-custody included in Appendix E. All sampling was conducted in accordance with CATLIN's Standard Procedures included in Appendix D.

Eleven soil samples (USTBB52/SBB70-SB01 through USTBB52/SBB70-SB08 and USTBB52/SBB70-SB10 through USTBB52/SBB70-SB12) were collected by hand auger method for laboratory analysis. Duplicate samples (USTBB52/SBB70-SB02D and USTBB52/SBB70-SB08D) were also submitted for laboratory analysis.

Hand auger soil samples were collected near the former fuel lines (USTBB52/SBB70-SB01, USTBB52/SBB70-SB02, and USTBB52/SBB70-SB10) at two to three, zero to one, and one to two feet bls respectively. Soil sample USTBB52/SBB70-SB12 was collected from the former dispenser island at a depth of five to six feet bls. All other hand auger soil samples were taken from the sidewalls of the former tank basin.

The soil 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 Laboratories of Wilmington, North Carolina.

Analytical results for the soil samples are included in Appendix E and are as follows:

EPA Method 8260B (includes DIPE +MTBE)

As indicated in Table 3A and illustrated in Figure 4A, acetone was detected above laboratory PQLs in USTBB52/SBB70-SB01 but well below the lowest MSCC (Result = 0.063 mg/Kg, STGW MSCC = 3 mg/Kg). Methylene chloride was revealed above laboratory PQLs and the lowest corresponding MSCC in USTBB52/SBB70-02 (Result = 0.031, STGW MSCC = 0.02). The duplicate sample USTBB52/SBB70-SB02D, however, revealed results below the PQL for methylene chloride. The laboratory PQL for methylene chloride (0.023) is higher than the STGW MSCC (0.02 mg/Kg). Methylene chloride is normally not associated with petroleum and was likely introduced in the laboratory. Toluene was detected in USTBB52/SBB70-SB02, USTBB52/SBB70-SB02D, and USTBB52/SBB70-SB12 at 0.012 mg/Kg, 0.0087 mg/Kg, and 0.0064 mg/Kg, respectively. These results are well below the lowest MSCC of 7 mg/Kg for toluene. All other sample results were below the laboratory PQLs.

EPA Method 8270

As indicated in Table 3B and illustrated in Figure 4B, the USTBB52/SBB70-SB10 soil sample revealed 0.48 mg/Kg naphthalene (STGW MSCC = 0.58 mg/Kg). All other analytes and sample results were below laboratory PQLs.

MADEP VPH/EPH

As indicated in Tables 3C-3D and illustrated in Figure 4C, all sample results were below laboratory PQLs except USTBB52/SBB70-SB10, which revealed 15 mg/Kg C₁₉-C₃₆ Aliphatics (STGW MSCC = Considered Immobile) and less than 21 mg/Kg C₉-C₂₂ Aromatics (STGW MSCC = 34 mg/Kg). The C₉-C₂₂ Aromatics result represents the sum of the reported practical quantitation limit of one fraction and the detected concentration of the other fraction.

2. Groundwater Sampling

(Refer to Tables 4A-4E, Figures 5A-5D, and Appendices D and E)

On November 5, 2001 CATLIN personnel sampled monitoring well USTBB52/SBB70-MW01 and USTBB52/SBB70-MW02 for laboratory analysis per MADEP VPH. Additionally, samples were collected at monitoring well USTBB52/SBB70-MW02 for laboratory analysis per EPA Methods 6210D, 625 + tics, MADEP EPH, and Standard Method 3030C. A duplicate sample, USTBB52/SBB70-MW02D was collected for laboratory analysis per EPA Method 6210D. Monitoring

well USTBB52/SBB70-MW01 was resampled on December 7, 2001 by CATLIN personnel for laboratory analysis per EPA Method 6210D and Standard Method 3030C.

Groundwater samples were collected in accordance with CATLIN's Standard Methods and Procedures in Appendix D. 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 Laboratories of Wilmington, North Carolina.

Analytical results for the groundwater samples collected are included in Appendix E and are as follows:

EPA METHOD 6210D + IPE + MTBE

As indicated in Table 4A and illustrated on Figure 5A, the groundwater sample collected from monitoring well USTBB52/SBB70-MW01 revealed 1 µg/L sec-Butylbenzene (2L GWQS = 70), 0.7 µg/L 4-Isopropyltoluene (no 2L GWQS is currently established), and 0.6 µg/L naphthalene (2L GWQS = 21). All other 6210D analytes were below laboratory PQLs. All EPA Method 6210D analyte results for USTBB52/SBB70-MW02 and USTBB52/SBB70-MW02D were below laboratory PQLs.

EPA METHOD 625 + tics

As shown on Table 4B and illustrated on Figure 5B, there were no EPA Method 625 analytes detected in USTBB52/SBB70-MW02 above the laboratory PQLs.

MADEP VPH/EPH

As shown of Tables 4C and 4D and illustrated on Figure 5C, there were no toxicologically defined hydrocarbon fractions detected above the IGWQS. Volatile petroleum toxicologically defined hydrocarbon fractions C₉ – C₁₂ Aliphatics were detected in USTBB52/SBB70-MW01 at 110 µg/L, however this is well below the C₉ – C₁₈ Aliphatics IGWQS of 4,200 µg/L (EPH fraction not analyzed).

Standard Method 3030C (Lead)

As indicated on Table 4E and illustrated on Figure 5D, laboratory analysis of the groundwater samples collected from USTBB52/SBB70-MW01 and USTBB52/SBB70-MW02 revealed no lead concentrations above the laboratory method detection limit.

3. **Monitoring Well Construction Information** (Refer to Table 7 and Appendices A and B)

On November 1, 2001 CATLIN personnel installed two Type II monitoring well (USTBB52/SBB70-MW01, and USTBB52/SBB70-MW02) for groundwater sampling.

Monitoring well USTBB52/SBB70-MW01 and USTBB52/SBB70-MW02 were constructed to a depth of 18.0 feet using 10 feet of 2-inch diameter, 0.010 inch slotted schedule 40 PVC well screen and 8 feet of 2-inch diameter schedule 40 PVC riser. The annular space between the wells and boring walls were filled with medium sand pack to 2 feet above the well screens. One and one-half feet of bentonite was placed on top of the sand pack and hydrated. The wells were capped with 4.5 feet of grout and finished with flush mount, steel wellheads and locking caps.

Refer to Table 7 for well construction data and Appendices A and B for Boring logs, As-built details and North Carolina Well Construction Records.

F. CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of this Phase I LSA, CATLIN concludes that the subject site at BB52/SBB70 meets the criteria for classification as Low Risk and should be considered as a candidate for closure.

The soil sample TPH concentrations revealed during UST removal activities appears to have been very localized and/or degraded through natural attenuation and biodegradation.

Although multiple compounds were detected above the laboratory PQLs in soil samples USTBB52/SBB70-SB01, USTBB52/SBB70-SB02, USTBB52/SBB70-SB02D, USTBB52/SBB70-SB10, and USTBB52/SBB70-SB12 all individual analyte results were below the lowest corresponding MSCCs except methylene chloride. Soil sample USTBB52/SBB70-SB02 revealed methylene chloride above the STGW MSCC but well below the Residential MSCC. This result was not replicated in the duplicate sample USTBB52/SBB70-SB02D.

Groundwater sample results from monitoring well USTBB52/SBB70-MW02 were below laboratory PQLs for all analyzed compounds. Sec-Butylbenzene, naphthalene, and C₉-C₁₂ Aliphatics were detected at minor concentrations in the USTBB52/SBB70-MW01 groundwater sample, well below their corresponding groundwater quality standards. Minor concentrations of 4-Isopropyltoluene were also revealed in the USTBB52/SBB70-MW01 groundwater sample. No groundwater quality standard has been established for this compound.

G. FREE PRODUCT INVESTIGATION/RECOVERY

Free product accumulations have not been documented or observed during tank removal activities or this investigation.

H. SITE HISTORY

(Refer to Tables 1 and 2)

The site previously contained one 1,000-gallon gasoline UST and one 5,000-gallon diesel UST. Dispenser islands were located adjacent to UST basins. The fuel was used for military vehicles and equipment. The tanks, associated piping and dispenser were closed by removal by Environmental & Regulatory Consultants, Inc. on February 25, 1993. No soil was removed from the site during closure activities. Soil samples were collected from beneath each tank for laboratory TPH analysis following UST removal. Laboratory results revealed TPH concentrations in excess of state action levels. UST history and owner information is included on Tables 1 and 2.

I. REFERENCES

Cardinell, A.P. and Others, 1993, *Hydrogeologic Framework of U.S. Marine Corps Base at Camp Lejeune, North Carolina; U.S. Geological Survey Water-Resources Investigation Report 93-4049*; U.S. Geological Survey, Raleigh, North Carolina.

Environmental & Regulatory Consultants, Inc. *Tank Removal Report Marine Corp Base Building SBB-70, MCB Camp Lejeune, NC*, February 1993.

North Carolina Department of Environment and Natural Resources, *Guidelines for Assessment and Corrective Action, North Carolina Underground Storage Tank Section* (Effective July 1, 2001)

Stuckey, J.L., 1965, *North Carolina- It's Geology and Mineral Resources*, Raleigh, North Carolina: Department of Conservation and Development, 550 p.

Winner, M.D., Jr., and Coble, R.W., 1989, *Hydrogeologic Framework of the North Carolina Coastal Plain Aquifer System: U.S. Geological Survey Open-File Report 87-690*, 155 p.

TABLES

TABLE 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)
UST BB- 52/SBB-70	Gasoline	1,000	Unknown	(P) 2/25/93	Yes
UST BB- 52/SBB-70	Diesel	5,000	Unknown	(P) 2/25/93	Yes

TABLE 2
SITE HISTORY
UST OWNER/OPERATOR INFORMATION

UST ID Number	Name of Owner or Operator	Dates of Ownership/Operation (m/dd/yy) to (m/dd/yy)	Owner or Operator?
UST BB-52/SBB-70	Commanding General Marine Corp Base Camp Lejeune, NC	Unknown to 2/25/93	Owner and Operator
Address		Telephone Number	
I&E/EMD/EQB PSC 20004 Marine Corp Base, Camp Lejeune, NC 28542		910-451-5068	

TABLE 3A

**SUMMARY OF SOIL LABORATORY RESULTS
EPA METHOD 8260B**

**BB-52/SBB-70
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

ANALYTE	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification, Depth and Date Sampled			
		USTBB52/ SBB70-SB01 (2-3) 11/2/01	USTBB52/ SBB70-SB02 (0-1) 11/6/01	USTBB52/ SBB70-SB02D (0-1) 11/6/01	USTBB52/ SBB70-SB03 (5-6) 11/2/01
Acetone	1,564 40,880 3	0.063	<0.057	<0.057	<0.058
Methylene Chloride	85 763 0.02	<0.024*	0.031	<0.023*	<0.023*
Toluene	3,200 82,000 7	<0.006	0.012	0.0087	<0.0058
All Other Analytes	Varies Varies Varies	BQL	BQL	BQL	BQL

() = Sample depth in feet below land surface

Shaded areas indicate concentrations above the lowest MSCC.

< = Less than the laboratory practical quantitation limit.

* = Laboratory practical quantitation limit is higher than the lowest MSCC.

TABLE 3A

**SUMMARY OF SOIL LABORATORY RESULTS
EPA METHOD 8260B**

**BB-52/SBB-70
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

ANALYTE	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification, Depth and Date Sampled			
		USTBB52/ SBB70-SB04 (5-6) 11/2/01	USTBB52/ SBB70-SB05 (5-6) 11/2/01	USTBB52/ SBB70-SB06 (5-6) 11/2/01	USTBB52/ SBB70-SB07 (5-6) 11/2/01
Acetone	1,564 40,880 3	<0.057	<0.06	<0.063	<0.06
Methylene Chloride	85 763 0.02	<0.023*	<0.024*	<0.025*	<0.024*
Toluene	3,200 82,000 7	<0.0057	<0.006	<0.0063	<0.006
All Other Analytes	Varies Varies Varies	BQL	BQL	BQL	BQL

() = Sample depth in feet below land surface

< = Less than the laboratory practical quantitation limit.

* = Laboratory practical quantitation limit is higher than the lowest MSCC.

TABLE 3A

**SUMMARY OF SOIL LABORATORY RESULTS
EPA METHOD 8260B**

**BB-52/SBB-70
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

ANALYTE	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification, Depth and Date Sampled			
		USTBB52/ SBB70-SB08 (5-6) 11/2/01	USTBB52/ SBB70-SB08 DUP (5-6) 11/2/01	USTBB52/ SBB70-SB10 (1-2) 11/6/01	USTBB52/ SBB70-SB11 (5-6) 11/6/01
Acetone	1,564 40,880 3	<0.061	<0.062	<0.056	<0.053
Methylene Chloride	85 763 0.02	<0.024*	<0.025*	<0.022*	<0.021*
Toluene	3,200 82,000 7	<0.0061	<0.0062	<0.0056	<0.0053
All Other Analytes	Varies Varies Varies	BQL	BQL	BQL	BQL

() = Sample depth in feet below land surface

< = Less than the laboratory practical quantitation limit.

* = Laboratory practical quantitation limit is higher than the lowest MSCC.

TABLE 3A

**SUMMARY OF SOIL LABORATORY RESULTS
EPA METHOD 8260B**

**BB-52/SBB-70
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

ANALYTE	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification, Depth and Date Sampled			
		USTBB52/ SBB70-SB12 (5-6) 11/6/01	USTBB52/ SBB70-MW01 (4-6) 11/2/01	USTBB52/ SBB70-MW02 (4-6) 11/2/01	
Acetone	1,564 40,880 3	<0.058	<0.065	<0.059	
Methylene Chloride	85 763 0.02	<0.023*	<0.026*	<0.024*	
Toluene	3,200 82,000 7	0.0064	<0.0065	<0.0059	
All Other Analytes	Varies Varies Varies	BQL	BQL	BQL	

() = Sample depth in feet below land surface

< = Less than the laboratory practical quantitation limit.

* = Laboratory practical quantitation limit is bigger than the lowest MSCC.

TABLE 3B SUMMARY OF SOIL LABORATORY RESULTS EPA METHOD 8270 BB-52/SBB-70 MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA					
ANALYTE	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification, Depth and Date Sampled			
		USTBB52/ SBB70-SB01 (2-3) 11/2/01	USTBB52/ SBB70-SB02 (0-1) 11/6/01	USTBB52/ SBB70-SB03 (5-6) 11/2/01	USTBB52/ SBB70-SB04 (5-6) 11/2/01
Naphthalene	63 1,635 0.58	<0.390	<0.360	<0.360	<0.350
All Other Analytes	Varies Varies Varies	BQL	BQL	BQL	BQL

ANALYTE	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification, Depth and Date Sampled			
		USTBB52/ SBB70-SB05 (5-6) 11/2/01	USTBB52/ SBB70-SB06 (5-6) 11/2/01	USTBB52/ SBB70-SB07 (5-6) 11/2/01	USTBB52/ SBB70-SB08 (5-6) 11/2/01
Naphthalene	63 1,635 0.58	<0.360	<0.390	<0.400	<0.380
All Other Analytes	Varies Varies Varies	BQL	BQL	BQL	BQL

() = Sample depth in feet below land surface

< = Less than the laboratory practical quantitation limit.

TABLE 3B

**SUMMARY OF SOIL LABORATORY RESULTS
EPA METHOD 8270**

**BB-52/SBB-70
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

ANALYTE	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification, Depth and Date Sampled			
		USTBB52/ SBB70-SB10 (1-2) 11/6/01	USTBB52/ SBB70-SB11 (5-6) 11/6/01	USTBB52/ SBB70-SB12 (5-6) 11/6/01	USTBB52/ SBB70-MW01 (4-6) 11/2/01
Naphthalene	63 1,635 0.58	0.48	<0.320	<0.350	<0.370
All Other Analytes	Varies Varies Varies	BQL	BQL	BQL	BQL

ANALYTE	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification, Depth and Date Sampled			
		USTBB52/ SBB70-MW02 (4-6) 11/2/01			
Naphthalene	63 1,635 0.58	<0.350			
All Other Analytes	Varies Varies Varies	BQL			

() = Sample depth in feet below land surface

< = Less than the laboratory practical quantitation limit.

TABLE 3C SUMMARY OF SOIL LABORATORY RESULTS MADEP VPH/EPH BB-52/SBB-70 MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA				
ANALYTICAL FRACTION	Sample Identification, Depth and Date Sampled			
	USTBB52/ SBB70-SB01 (2-3) 11/2/01	USTBB52/ SBB70-SB02 (0-1) 11/6/01	USTBB52/ SBB70-SB03 (5-6) 11/2/01	USTBB52/ SBB70-SB04 (5-6) 11/2/01
VPH (mg/Kg)				
C ₅ -C ₈ Aliphatics	<10	<10	<10	<10
C ₉ -C ₁₂ Aliphatics	<10	<10	<10	<10
C ₉ -C ₁₀ Aromatics	<10	<10	<10	<10
EPH (mg/Kg)				
C ₉ -C ₁₈ Aliphatics	<10	<10	<10	<10
C ₁₉ -C ₃₆ Aliphatics	<10	<10	<10	<10
C ₁₁ -C ₂₂ Aromatics	<10	<10	<10	<10

() = Sample depth in feet below land surface

< = Less than the laboratory practical quantitation limit.

TABLE 3C SUMMARY OF SOIL LABORATORY RESULTS MADEP VPH/EPH BB-52/SBB-70 MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA				
ANALYTICAL FRACTION	Sample Identification, Depth and Date Sampled			
	USTBB52/ SBB70-SB05 (5-6) 11/2/01	USTBB52/ SBB70-SB06 (5-6) 11/2/01	USTBB52/ SBB70-SB07 (5-6) 11/2/01	USTBB52/ SBB70-SB08 (5-6) 11/2/01
VPH (mg/Kg)				
C ₅ -C ₈ Aliphatics	<10	<10	<10	<10
C ₉ -C ₁₂ Aliphatics	<10	<10	<10	<10
C ₉ -C ₁₀ Aromatics	<10	<10	<10	<10
EPH (mg/Kg)				
C ₉ -C ₁₈ Aliphatics	<10	<10	<10	<10
C ₁₉ -C ₃₆ Aliphatics	<10	<10	<10	<10
C ₁₁ -C ₂₂ Aromatics	<10	<10	<10	<10

() = Sample depth in feet below land surface

< = Less than the laboratory practical quantitation limit.

TABLE 3C SUMMARY OF SOIL LABORATORY RESULTS MADEP VPH/EPH BB-52/SBB-70 MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA				
ANALYTICAL FRACTION	Sample Identification, Depth and Date Sampled			
	USTBB52/ SBB70-SB10 (1-2) 11/6/01	USTBB52/ SBB70-SB11 (5-6) 11/6/01	USTBB52/ SBB70-SB12 (5-6) 11/6/01	USTBB52/ SBB70-MW01 (4-6) 11/2/01
VPH (mg/Kg)				
C ₅ -C ₈ Aliphatics	<10	<10	<10	<10
C ₉ -C ₁₂ Aliphatics	<10	<10	<10	<10
C ₉ -C ₁₀ Aromatics	<10	<10	<10	<10
EPH (mg/Kg)				
C ₉ -C ₁₈ Aliphatics	<10	<10	<10	<10
C ₁₉ -C ₃₆ Aliphatics	15	<10	<10	<10
C ₁₁ -C ₂₂ Aromatics	11	<10	<10	<10

() = Sample depth in feet below land surface

< = Less than the laboratory practical quantitation limit.

TABLE 3C SUMMARY OF SOIL LABORATORY RESULTS MADEP VPH/EPH BB-52/SBB-70 MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA				
ANALYTICAL FRACTION	Sample Identification, Depth and Date Sampled			
	USTBB52/ SBB70-MW02 (4-6) 11/2/01			
VPH (mg/Kg)				
C ₅ -C ₈ Aliphatics	<10			
C ₉ -C ₁₂ Aliphatics	<10			
C ₉ -C ₁₀ Aromatics	<10			
EPH (mg/Kg)				
C ₉ -C ₁₈ Aliphatics	<10			
C ₁₉ -C ₃₆ Aliphatics	<10			
C ₁₁ -C ₂₂ Aromatics	<10			

() = Sample depth in feet below land surface

< = Less than the laboratory practical quantitation limit.

TABLE 3D

**SUMMARY OF SOIL LABORATORY RESULTS
MADEP VPH/EPH
AS COMPARED TO NCDENR MSCCs**

**BB-52/SBB-70
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

ANALYTICAL FRACTION	Toxicologically Defined Hydrocarbon Fraction	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification, Depth and Date Sampled			
			USTBB52/ SBB70-SB01 (2-3) 11/2/01	USTBB52/ SBB70-SB02 (0-1) 11/6/01	USTBB52/ SBB70-SB03 (5-6) 11/2/01	USTBB52/ SBB70-SB04 (5-6) 11/2/01
C ₅ -C ₈ Aliphatics	C ₅ -C ₈ Aliphatics	939 24,528 72	<10	<10	<10	<10
C ₉ -C ₁₂ Aliphatics C ₉ -C ₁₈ Aliphatics	C ₉ -C ₁₈ Aliphatics	9,386 245,280 3,255	<20	<20	<20	<20
C ₁₉ -C ₃₆ Aliphatics	C ₁₉ -C ₃₆ Aliphatics	93,860 ----- Health-Based Level (>100%) ----- Considered Immobile	<10	<10	<10	<10
C ₉ -C ₁₀ Aromatics C ₁₁ -C ₂₂ Aromatics	C ₉ -C ₂₂ Aromatics	469 12,264 34	<20	<20	<20	<20

() = Sample depth in feet below land surface

TABLE 3D

**SUMMARY OF SOIL LABORATORY RESULTS
MADEP VPH/EPH
AS COMPARED TO NCDENR MSCCs**

**BB-52/SBB-70
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

ANALYTICAL FRACTION	Toxicologically Defined Hydrocarbon Fraction	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification, Depth and Date Sampled			
			USTBB52/ SBB70-SB05 (5-6) 11/2/01	USTBB52/ SBB70-SB06 (5-6) 11/2/01	USTBB52/ SBB70-SB07 (5-6) 11/2/01	USTBB52/ SBB70-SB08 (5-6) 11/2/01
C ₅ -C ₈ Aliphatics	C ₅ -C ₈ Aliphatics	939 24,528 72	<10	<10	<10	<10
C ₉ -C ₁₂ Aliphatics C ₉ -C ₁₈ Aliphatics	C ₉ -C ₁₈ Aliphatics	9,386 245,280 3,255	<20	<20	<20	<20
C ₁₉ -C ₃₆ Aliphatics	C ₁₉ -C ₃₆ Aliphatics	93,860 ----- Health-Based Level (>100%) ----- Considered Immobile	<10	<10	<10	<10
C ₉ -C ₁₀ Aromatics C ₁₁ -C ₂₂ Aromatics	C ₉ -C ₂₂ Aromatics	469 12,264 34	<20	<20	<20	<20

() = Sample depth in feet below land surface

TABLE 3D

**SUMMARY OF SOIL LABORATORY RESULTS
MADEP VPH/EPH
AS COMPARED TO NCDENR MSCCs**

**BB-52/SBB-70
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

ANALYTICAL FRACTION	Toxicologically Defined Hydrocarbon Fraction	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification, Depth and Date Sampled			
			USTBB52/ SBB70-SB10 (1-2) 11/6/01	USTBB52/ SBB70-SB11 (5-6) 11/6/01	USTBB52/ SBB70-SB12 (5-6) 11/6/01	USTBB52/ SBB70-MW01 (4-6) 11/2/01
C ₅ -C ₈ Aliphatics	C ₅ -C ₈ Aliphatics	939 24,528 72	<10	<10	<10	<10
C ₉ -C ₁₂ Aliphatics C ₉ -C ₁₈ Aliphatics	C ₉ -C ₁₈ Aliphatics	9,386 245,280 3,255	<20	<20	<20	<20
C ₁₉ -C ₃₆ Aliphatics	C ₁₉ -C ₃₆ Aliphatics	93,860 ----- Health-Based Level (>100%) ----- Considered Immobile	15	<10	<10	<10
C ₉ -C ₁₀ Aromatics C ₁₁ -C ₂₂ Aromatics	C ₉ -C ₂₂ Aromatics	469 12,264 34	<21*	<20	<20	<20

* The value represents the sum of the reported practical quantitation limit of one fraction and the detected concentration of the other fraction.

() = Sample depth in feet below land surface

TABLE 3D

**SUMMARY OF SOIL LABORATORY RESULTS
MADEP VPH/EPH
AS COMPARED TO NCDENR MSCCs**

**BB-52/SBB-70
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

ANALYTICAL FRACTION	Toxicologically Defined Hydrocarbon Fraction	Res. MSCC I/C MSCC STGW MSCC (mg/Kg)	Sample Identification, Depth and Date Sampled			
			USTBB52/ SBB70-MW02 (4-6) 11/2/01			
C ₅ -C ₈ Aliphatics	C ₅ -C ₈ Aliphatics	939 24,528 72	<10			
C ₉ -C ₁₂ Aliphatics C ₉ -C ₁₈ Aliphatics	C ₉ -C ₁₈ Aliphatics	9,386 245,280 3,255	<20			
C ₁₉ -C ₃₆ Aliphatics	C ₁₉ -C ₃₆ Aliphatics	93,860 ----- Health-Based Level (>100%) ----- Considered Immobile	<10			
C ₉ -C ₁₀ Aromatics C ₁₁ -C ₂₂ Aromatics	C ₉ -C ₂₂ Aromatics	469 12,264 34	<20			

() = Sample depth in feet below land surface

TABLE 4A

**SUMMARY OF GROUNDWATER LABORATORY RESULTS
EPA METHOD 6210D + IPE + MTBE**

**BB-52/SBB-70
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

ANALYTE	GCL 2L GWQS (µg/L)	Sample Identification and Date Sampled		
		USTBB52/ SBB70-MW01 12/7/01	USTBB52/ SBB70-MW02 11/5/01	USTBB52/ SBB70-MW02D 11/5/01
sec-Butylbenzene	8,500 70	1	<0.5	<0.5
4-Isopropyltoluene	NE NE	0.7	<0.5	<0.5
Naphthalene	15,500 21	0.6	<0.5	<0.5
All other 6210D Analytes	Varies Varies	BQL	BQL	BQL

< = Less than laboratory practical quantitation limit

TABLE 4B

**SUMMARY OF GROUNDWATER LABORATORY RESULTS
EPA METHOD 625 + TICS**

**BB-52/SBB-70
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

ANALYTE	GCL 2L GWQS (µg/L)	Sample Identification and Date Sampled
		USTBB52/SBB70-MW02 11/5/01
All 625 Analytes	Varies Varies	BQL

TABLE 4C

**SUMMARY OF GROUNDWATER LABORATORY RESULTS
MADEP VPH/EPH**

**BB-52/SBB-70
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

ANALYTICAL FRACTION	Sample Identification and Date Sampled		
	USTBB52/ SBB70-MW01 11/5/01	USTBB52/ SBB70-MW02 11/5/01	TRIP BLANK 11/5/01
VPH (µg/L)			
C ₅ -C ₈ Aliphatics	<100	<100	<100
C ₉ -C ₁₂ Aliphatics	110	<100	<100
C ₉ -C ₁₀ Aromatics	<100	<100	<100
EPH (µg/L)			
C ₉ -C ₁₈ Aliphatics	NA	<100	NA
C ₁₉ -C ₃₆ Aliphatics	NA	<100	NA
C ₁₁ -C ₂₂ Aromatics	NA	<100	NA

TABLE 4D

**SUMMARY OF GROUNDWATER LABORATORY RESULTS
MADEP VPH/EPH
AS COMPARED TO NCDENR IGWQS**

**BB-52/SBB-70
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

ANALYTICAL FRACTION	Toxicologically Defined Hydrocarbon Fraction	IGWQS (µg/L)	Sample Identification and Date Sampled		
			USTBB52/ SBB70-MW01 11/5/01	USTBB52/ SBB70-MW02 11/5/01	TRIP BLANK 11/5/01
C ₅ -C ₈ Aliphatics	C ₅ -C ₈ Aliphatics	420	<100	<100	<100
C ₉ -C ₁₂ Aliphatics C ₉ -C ₁₈ Aliphatics	C ₉ -C ₁₈ Aliphatics	4,200	110*	<200	<100*
C ₁₉ -C ₃₆ Aliphatics	C ₁₉ -C ₃₆ Aliphatics	42,000	NA	<100	NA
C ₉ -C ₁₀ Aromatics C ₁₁ -C ₂₂ Aromatics	C ₉ -C ₂₂ Aromatics	210	<100*	<200	<100*

* Partial fraction, EPH not analyzed.

TABLE 4E

**SUMMARY OF GROUNDWATER LABORATORY RESULTS
STANDARD METHOD 3030C**

BB-52/SBB-70

**MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA**

ANALYTE	GCL 2L GWQS (µg/L)	Sample Identification and Date Sampled	
		USTBB52/SBB70- MW01 12/7/01	USTBB52/SBB70- MW02 11/5/01
Lead	15,000 15	<5.00	<5.00

TABLE 5									
WATER SUPPLY WELL INFORMATION									
Date: 12/13/2001		Incident Number and Name: BB-52/SBB-70			Facility ID#: N/A				
Well ID#	Well Owner/User (indicate which)	Address	Phone Number	Well Use	Well Depth (ft. BGS)	Type of Well	Well Casing Depth (ft. BGS)	Well Screen Interval (x to y ft. BGS)	Distance from source from source area of release (ft.)
PSWBB-44	Commanding General Marine Corp Base Camp Lejeune, NC	I&E/EMD/EOB PSC 20004 Marine Corp Base, Camp Lejeune, NC 28542	910-451-5068	Public Supply	62	8"	32	32 to 62	1,025
PSWBB-47	Commanding General Marine Corp Base Camp Lejeune, NC	I&E/EMD/EOB PSC 20004 Marine Corp Base, Camp Lejeune, NC 28542	910-451-5068	Public Supply	200	8"	Unknown	Unknown	1,057

TABLE 6**PROPERTY OWNERS/OCCUPANTS**Date: 12/5/2001 Incident No. and Name: BB-52/SBB-70 Facility ID#: N/A

Tax Parcel Number/Map ID	Owner/Occupant Name (Last, First MI)	Address
The entire surrounding area is used as a military training facility.	Commanding General Marine Corps Base Camp Lejeune, NC	I&E/EMD/EQB PSC 20004 Marine Corps Base, Camp Lejeune, NC 28542

TABLE 7

WELL CONSTRUCTION INFORMATION

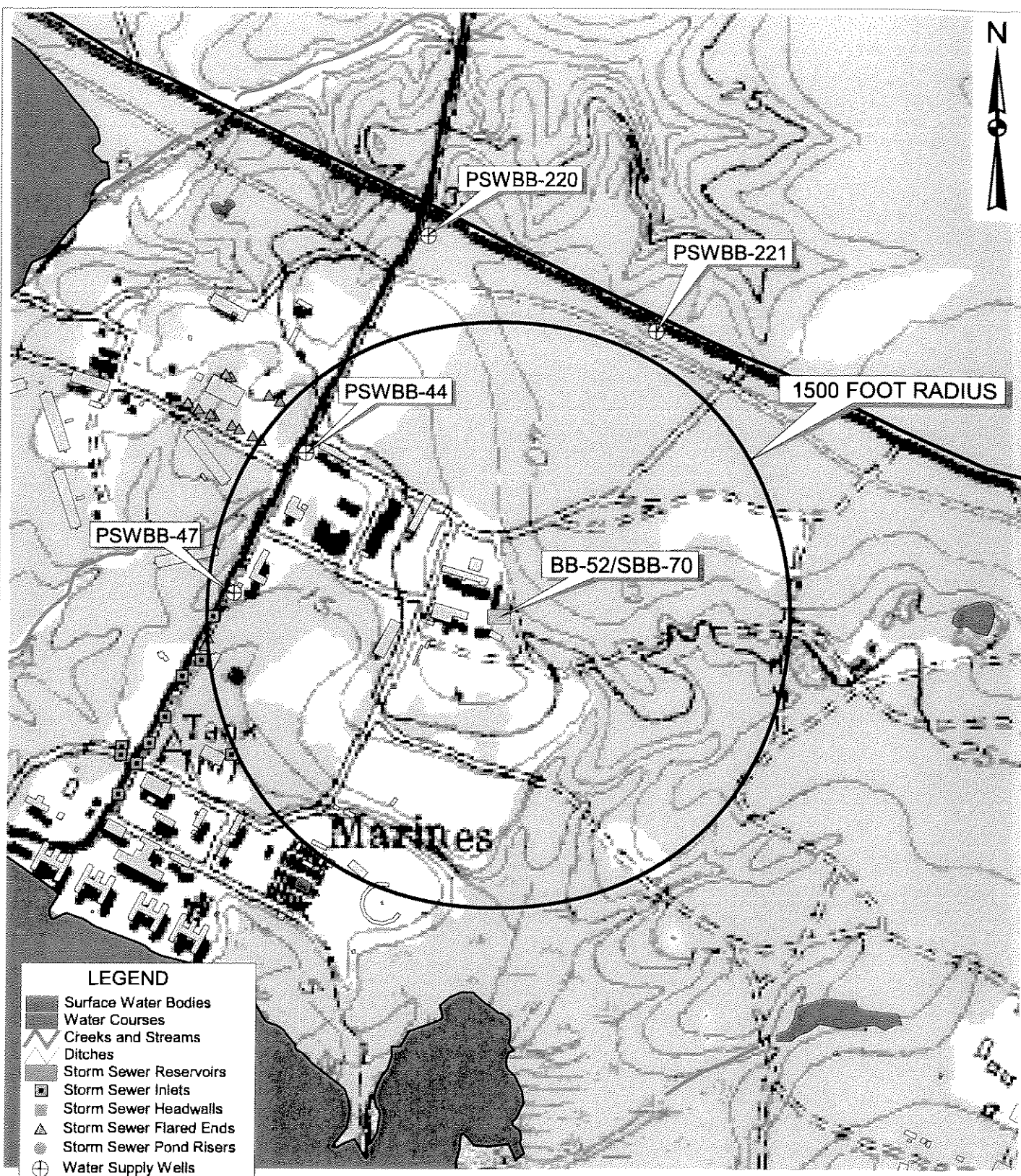
TABLE 7										
WELL CONSTRUCTION INFORMATION										
Date: 12/13/2001		Incident Number and Name: Pending - BB-52/SBB-70				Facility ID#: N/A				
Well ID	Date Installed (m/dd/yy)	Date Water Level Measured (m/dd/yy)	Well Casing Depth (ft. BGS)	Screened Interval (x to y ft. BGS)	Bottom of Well (ft. BGS)	Top of Casing Elevation (ft.)	Depth to Water from Top of Casing (ft.)	Free Product Thickness** (ft.)	Ground Water Elevation* (ft.)	Comments
USTBB52/SBB70-MW01	11/01/2001	11/05/2001	8	8 TO 18	18	Not Measured	11.0	0.00	Not Measured	
USTBB52/SBB70-MW02	11/01/2001	11/05/2001	8	8 TO 18	18	Not Measured	11.5	0.00	Not Measured	

* Reference Point for Elevation Measurements ft., Assumed Elevation: ft.

** If free product is present in a well, ground water elevation should be calculated by: [Top of Casing Elevation - Depth to Water] + [free product thickness x 0.8581]

ft BGS = feet below ground surface

FIGURES



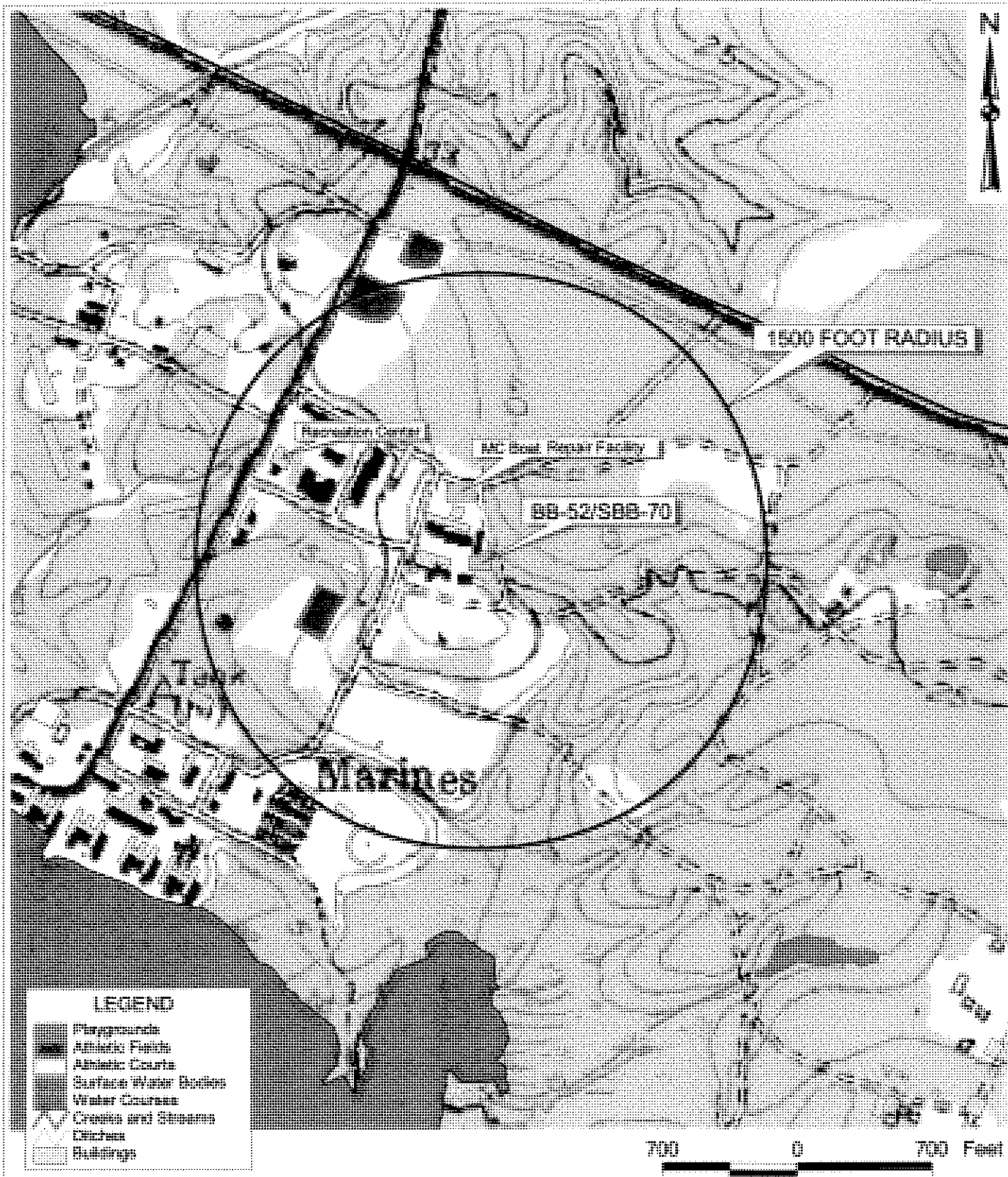
- LEGEND**
- Surface Water Bodies
 - Water Courses
 - Creeks and Streams
 - Ditches
 - Storm Sewer Reservoirs
 - Storm Sewer Inlets
 - Storm Sewer Headwalls
 - Storm Sewer Flared Ends
 - Storm Sewer Pond Risers
 - Water Supply Wells
 - Buildings



ADAPTED FROM: USGS NEW RIVER INLET, N.C. TOPOGRAPHIC QUADRANGLE DATED 1952, PHOTOREVISED 1971

SCALE

 CAELIN ENGINEERS and SCIENTISTS	PROJECT BB-52/SBB-70 MARINE CORPS BASE CAMP LEJEUNE, N.C.	TITLE SITE LOCATION AND WATER SURVEY			FIGURE
					1
JOB NO: 201121-01	DATE: NOV 2001	SCALE: AS SHOWN	DRAWN BY: SAC	CHECKED BY: TWL	



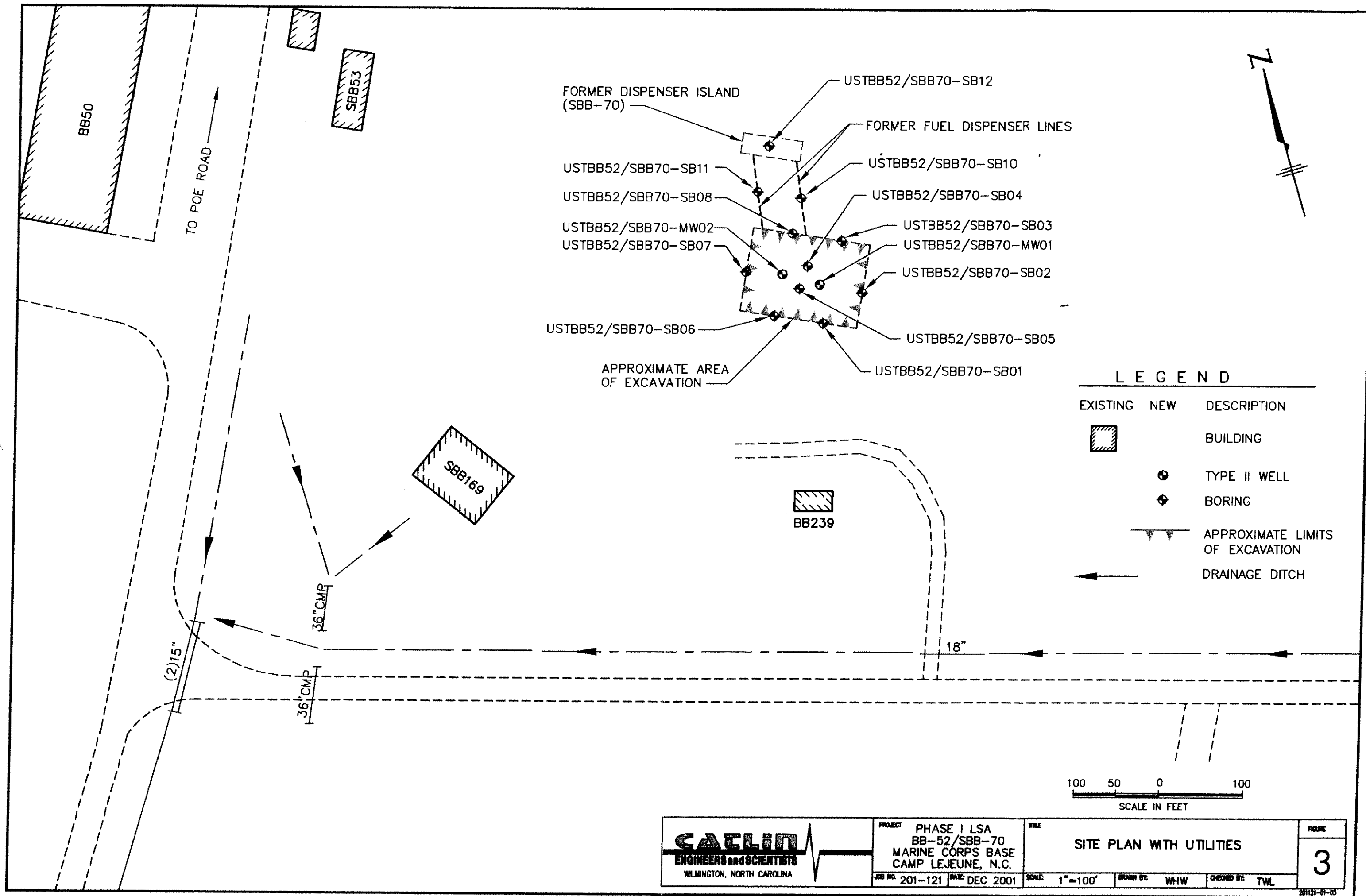
LEGEND

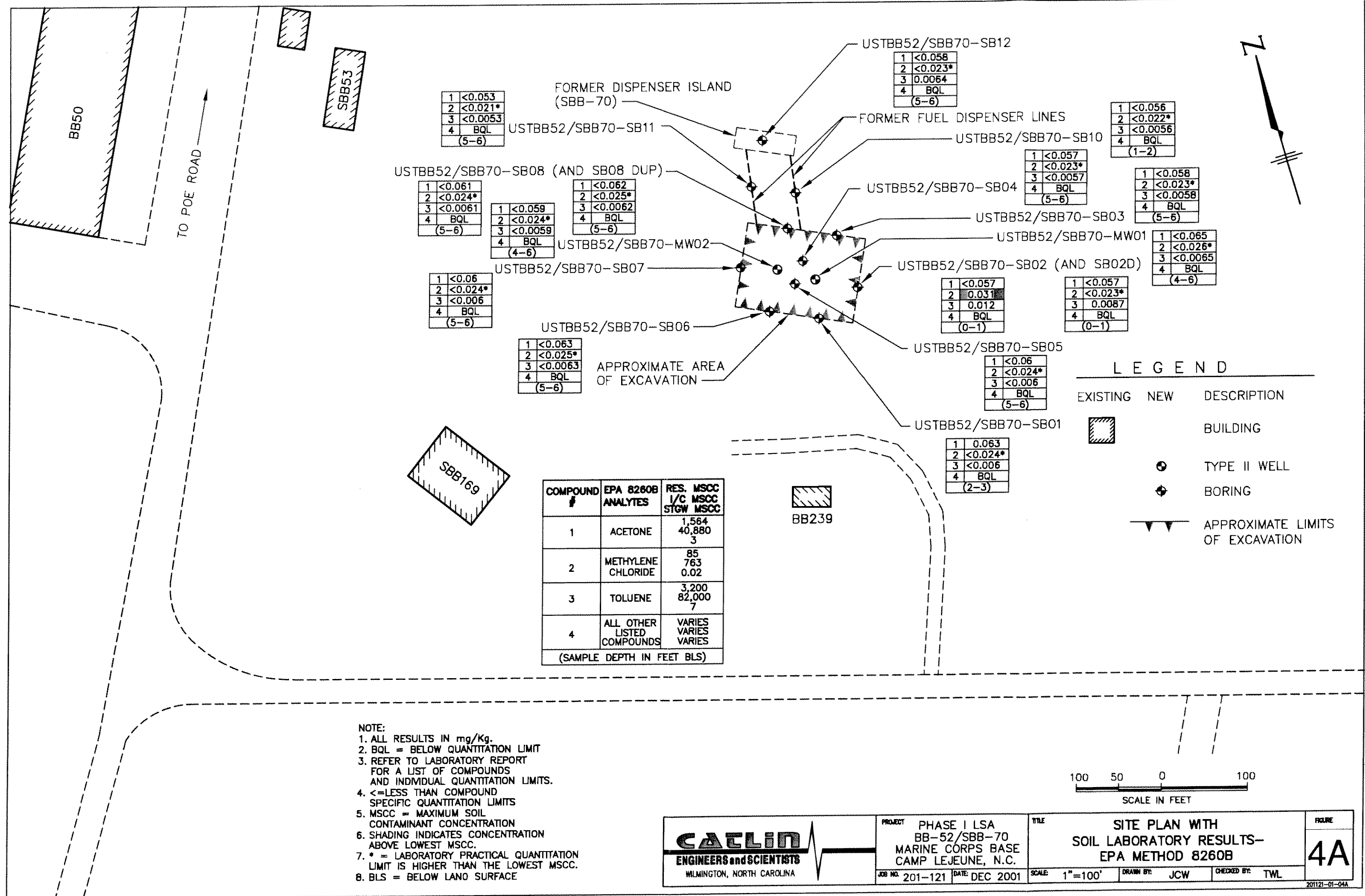
- Playgrounds
- Athletic Fields
- Athletic Courts
- Surface Water Bodies
- Water Courses
- Creeks and Streams
- Ditches
- Buildings

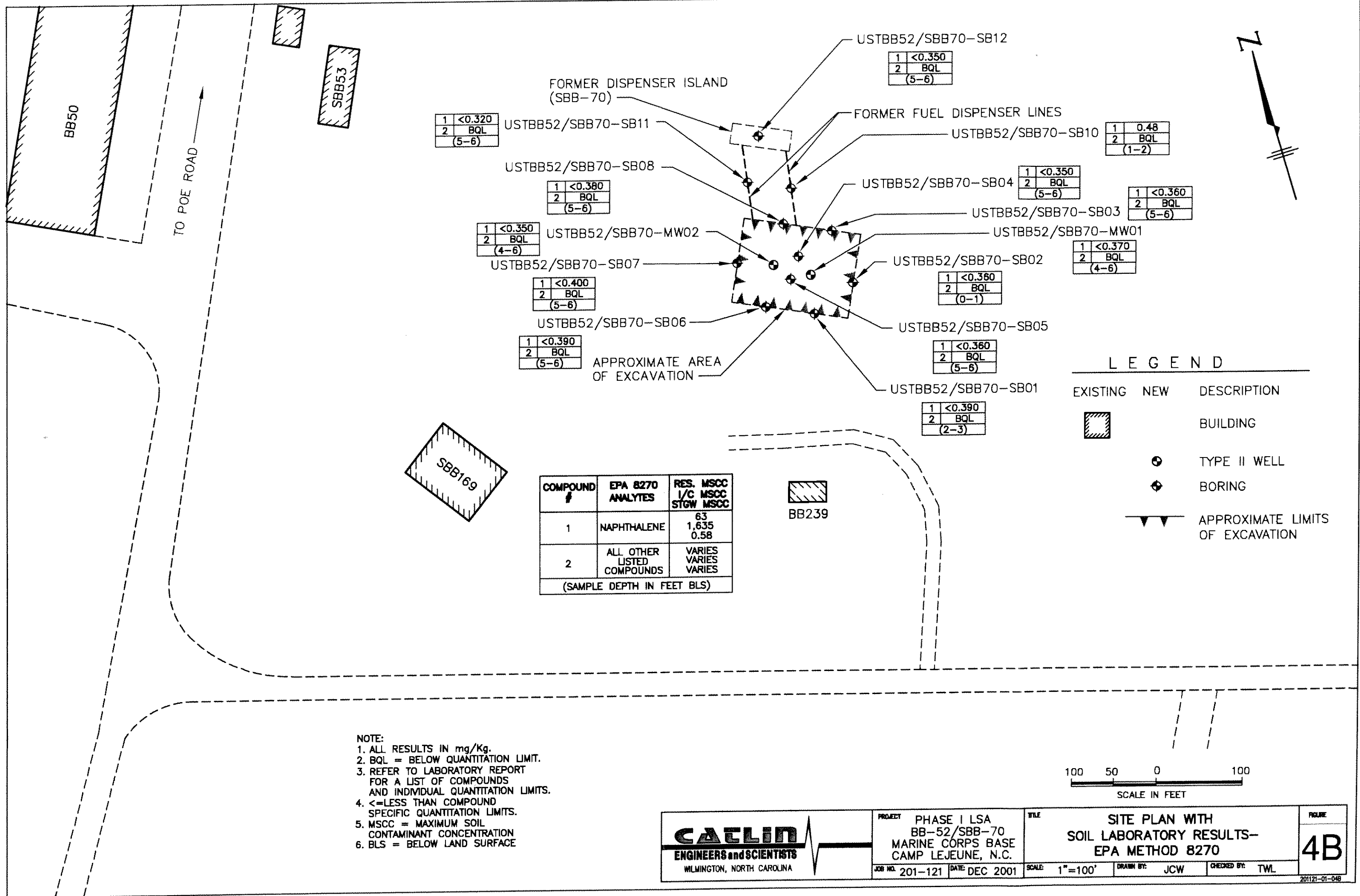
700 0 700 Feet
SCALE

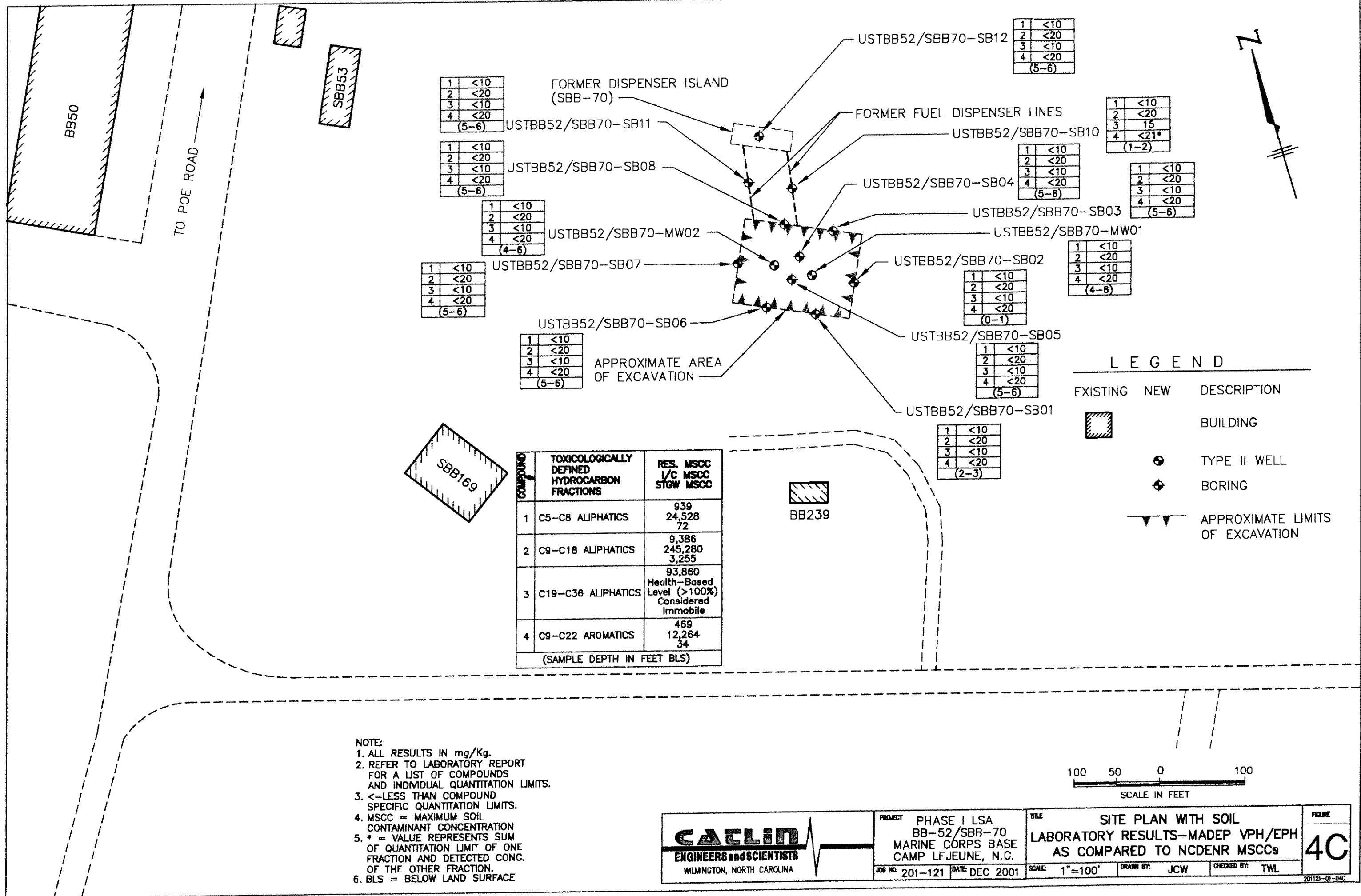
ADAPTED FROM: USGS NEW RIVER INLET, N.C. TOPOGRAPHIC CHART/ANALOG DATED 1982, PHOTO NUMBER 1911

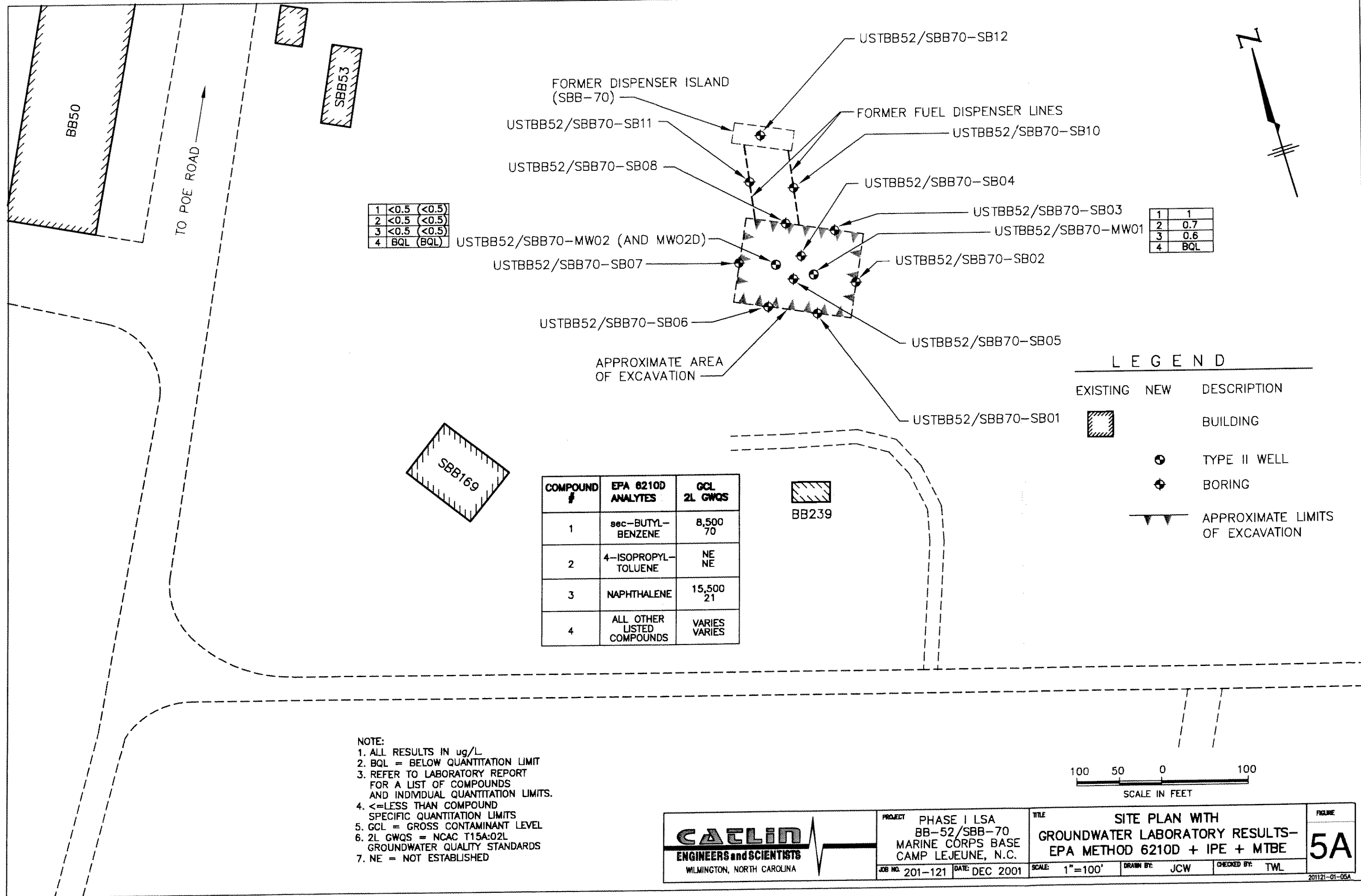
 CAELIN ENGINEERS and SCIENTISTS	PROJECT BB-52/SBB-70 MARINE CORPS BASE CAMP LEJEUNE, N.C.	TITLE SITE LOCATION WITH PLACES OF PUBLIC ASSEMBLY	FIGURE 2	
	DATE 2/15/21	DATE NOV 2021	SCALE AS SHOWN	DESIGNED BY JAC

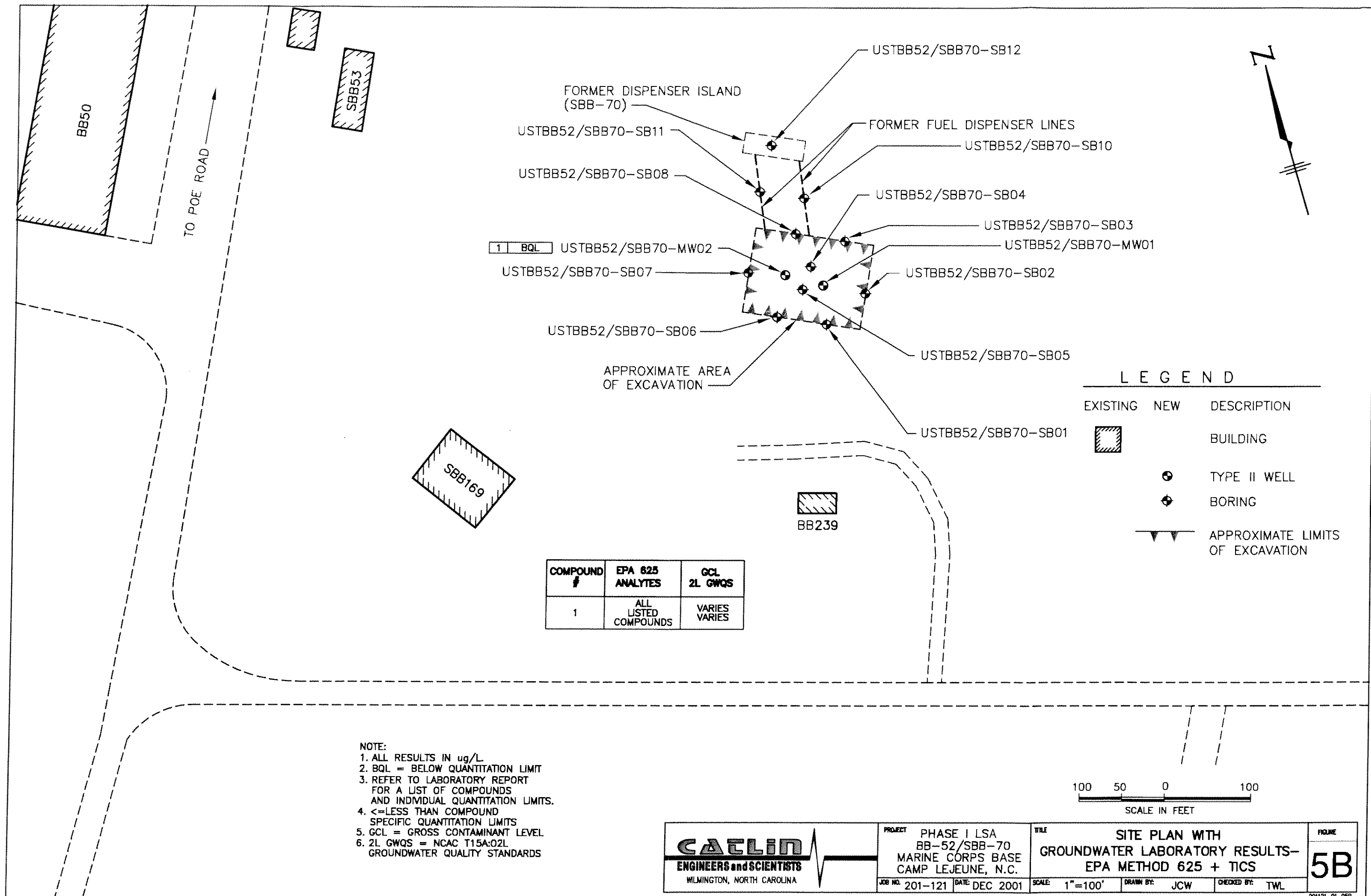


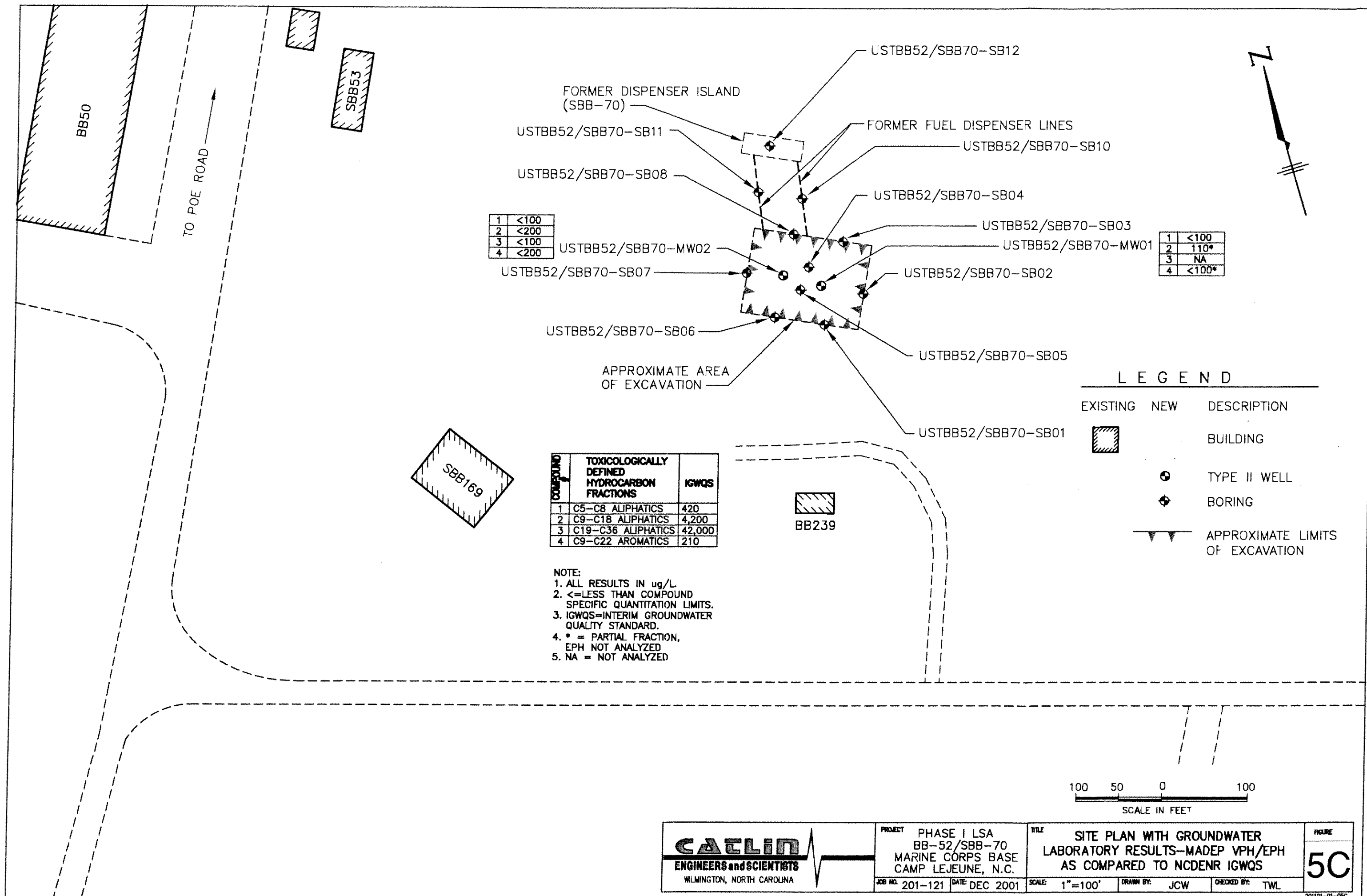


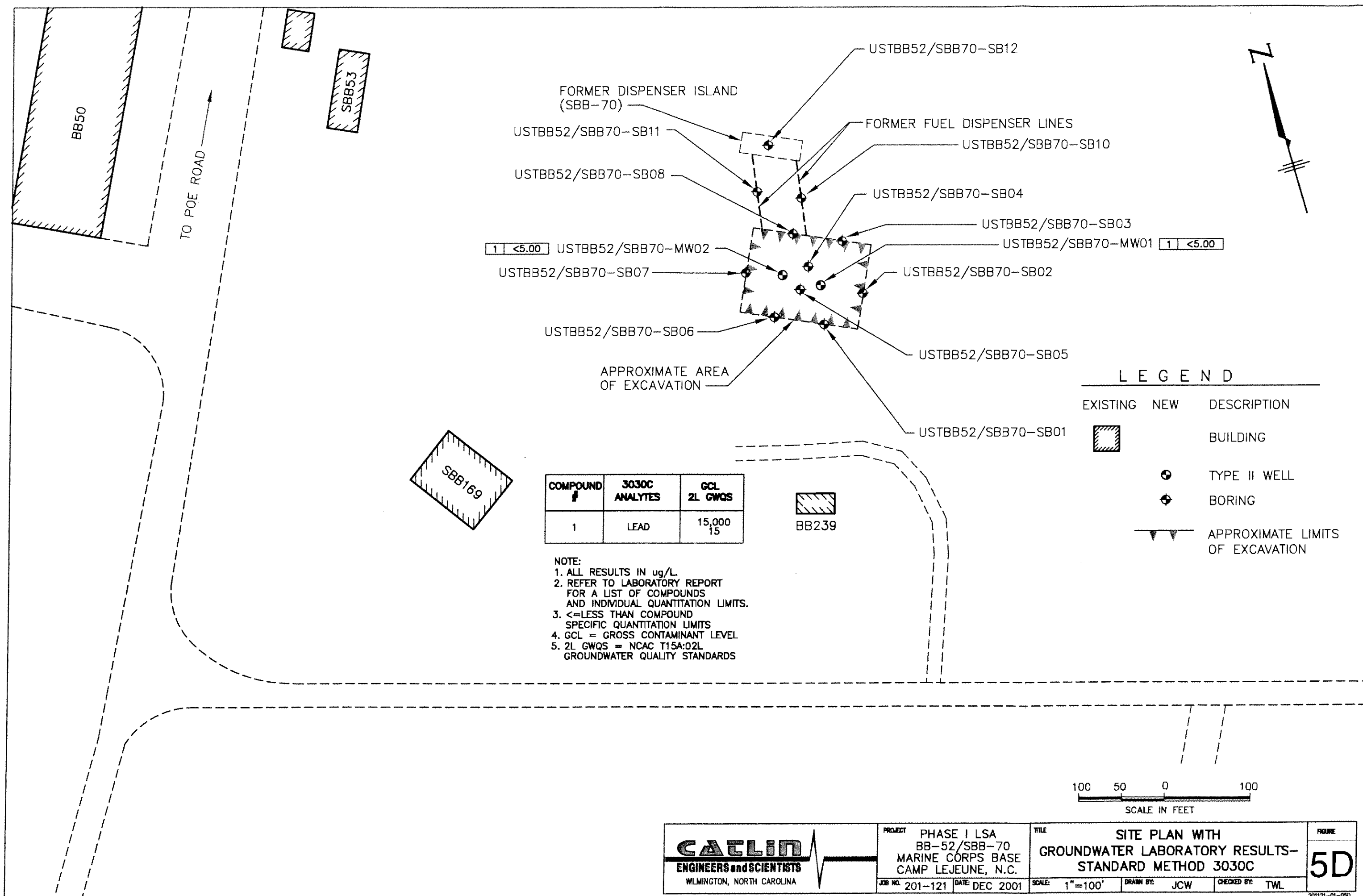












APPENDICES

APPENDIX A

BORING LOGS AND AS-BUILT WELL DETAILS

WELL LOG

CATLIN

ENGINEERS and SCIENTISTS

Wilmington, North Carolina

SHEET 1 OF 1

PROJECT NO.: 201-121 STATE: NC COUNTY: Onslow LOCATION: Camp Lejeune
 PROJECT NAME: BB-52/SBB-70 LOGGED BY: Charles Ray WELL ID: USTBB52
 DRILLER: Bobbie Fowler SBB70-MW01
 NORTHING: EASTING: CREW: Tom Stetler
 SYSTEM: BORING LOCATION: T.O.C. ELEV.:
 DRILL MACHINE: Diedrich D-50 METHOD: HSA 0 HOUR DTW: BORING DEPTH: 18.0
 START DATE: 11/01/01 FINISH DATE: 11/01/01 24 HOUR DTW: 11.0 WELL DEPTH: 18.0

DEPTH	BLOW COUNT				OVA (ppm)	LAB.	U S C S	LOG	DEPTH	SOIL AND ROCK DESCRIPTION	WELL DETAIL
	6in	6in	6in	6in							
									0.0	LAND SURFACE	0.0
4.0	2	5	5	5	7.8	Sampled	SC/ CL		4.0	4.0-5.5- Tan, gray, orange, SILTY, v.f. to f. SAND with clayey layers. Moist No HCO	2" Sch. 40 PVC
6.0									6.0	5.5-6.0- Gray, SILTY v.f. to f. SANDY CLAY. Medium plasticity. No HCO Moist	
9.0	2	12	22	28	600		SP		9.0	9.0-10.0- Orange, well sorted, v.f. to f. SAND. 10.0-11.0- Tan, well sorted, v.f. to f. SAND. Wet Moderate HCO	
11.0									11.0		
14.0	3	3	3	4	1.6		SP		14.0	Orange, well sorted, v.f. to f. SAND. No HCO Sat.	2" Std. 010 Sch. 40 PVC
16.0									16.0		
										Boring Terminated at Depth 18.0 ft	18.0
											18.0

TEST LOG 201-121.GPJ TEST.GDT 12/17/01

Portland Cement

Bentonite Pellets

#2 Medium Sand

WELL LOG

CATLIN

ENGINEERS and SCIENTISTS

Wilmington, North Carolina

SHEET 1 OF 1

PROJECT NO.: 201-121 STATE: NC COUNTY: Onslow LOCATION: Camp Lejeune
 PROJECT NAME: BB-52/SBB-70 LOGGED BY: Charles Ray WELL ID: USTBB52
 DRILLER: Bobbie Fowler SBB70-MW02
 NORTHING: EASTING: CREW: Tom Stetler
 SYSTEM: BORING LOCATION: T.O.C. ELEV.:
 DRILL MACHINE: Diedrich D-50 METHOD: HSA 0 HOUR DTW: BORING DEPTH: 20.0
 START DATE: 11/01/01 FINISH DATE: 11/01/01 24 HOUR DTW: 11.5 WELL DEPTH: 18.0

DEPTH	BLOW COUNT				OVA (ppm)	LAB.	U S C S	L O G	DEPTH	SOIL AND ROCK DESCRIPTION	WELL DETAIL
6in	6in	6in	6in								
									0.0	LAND SURFACE	0.0
4.0	3	8	8	8	1.0	Sampled	SP		4.0	Tan, gray, orange, well sorted, v.f. to f. SAND. No HCO Dry	4.5
6.0									6.0		6.0
9.0	woh	1	1	2	0		CH		9.0	Gray, FAT CLAY No HCO Wet	8.0
11.0									11.0		2" Sct. 0.10 Sct. 40 PVC
14.0	8	13	11	9	0		SP		14.0	Orange, well sorted, fine SAND. No HCO Sat.	18.0
16.0									16.0		18.0
18.0	woh	1	1	1	0.2		SP-SM		18.0	18.0-19.0 SAA 19.0-20.0 Gray, SILTY, v.f. to f. SAND with some clayey characteristics	
20.0									20.0	Boring Terminated at Depth 20.0 ft	

TEST LOG 201-121.GPJ TEST LOG 12/17/01



Portland Cement



Bentonite Pellets



#2 Medium Sand

BORING LOG

CALIN

ENGINEERS and SCIENTISTS

Wilmington, North Carolina

SHEET 1 OF 1

PROJECT NO.: 201-121	STATE: NC	COUNTY: Onslow	LOCATION: Camp Lejeune
PROJECT NAME: BB-52/SBB-70		LOGGED BY: Charles Ray	BORING ID: USTBB52
		DRILLER: Bobbie Fowler	SBB70-SB01
NORTHING:	EASTING:	CREW: Tom Stetler	
SYSTEM:	BORING LOCATION:		LAND ELEV.:
DRILL MACHINE:	METHOD: Hand Auger	0 HOUR DTW:	BORING DEPTH: 6.0
START DATE: 11/01/01	FINISH DATE: 11/01/01	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT				BLOWS PER FOOT					LAB.	U S C S	L O G	DEPTH	SOIL AND ROCK DESCRIPTION
	6in	6in	6in	6in	0	20	40	60	80	100				
0.0													0.0	LAND SURFACE
											SP		0.0	Light tan, well sorted, v.f. to f. SAND. No HCO Moist
1.0											SM		1.0	Gray, tan, SILTY, v.f. to f. SAND with clayey layers. No HCO Moist
2.0											Sampled SC		2.0	Brn/tan, SILTY, v.f. to f. CLAYEY SAND. Slight HCO moist
3.0											SC		3.0	SAA
4.0											SP		4.0	Light gray, well sorted, v.f. to f. SAND. No HCO moist
5.0											SP		5.0	SAA with clayey layers.
6.0													6.0	Boring Terminated at Depth 6.0 ft

BORING LOG

CATLIN

ENGINEERS and SCIENTISTS

Wilmington, North Carolina

SHEET 1 OF 1

PROJECT NO.: 201-121 STATE: NC COUNTY: Onslow LOCATION: Camp Lejeune
 PROJECT NAME: BB-52/SBB-70 LOGGED BY: Charles Ray BORING ID: USTBB52
 DRILLER: Bobbie Fowler SBB70-SB02
 NORTHING: EASTING: CREW: Tom Stetler
 SYSTEM: BORING LOCATION: LAND ELEV.:
 DRILL MACHINE: METHOD: Hand Auger 0 HOUR DTW: BORING DEPTH: 6.0
 START DATE: 11/05/01 FINISH DATE: 11/05/01 24 HOUR DTW: ROCK DEPTH: ---

DEPTH	BLOW COUNT				BLOWS PER FOOT					LAB.	U S C S	L O G	DEPTH	SOIL AND ROCK DESCRIPTION
	6in	6in	6in	6in	0	20	40	60	80	100				
0.0													0.0	LAND SURFACE
													0.0	Brn, SILTY, v.f. to f. SANDY CLAY. No HCO moist low plasticity
1.0													1.0	SAA except tan/orange.
2.0													2.0	Tan/orange, SILTY, v.f to f. CLAYEY SAND. No HCO moist
3.0													3.0	SAA
4.0													4.0	SAA
5.0													5.0	Tan/orange, well sorted, v.f. to f. SAND with trace silt. No HCO Moist
6.0													6.0	Boring Terminated at Depth 6.0 ft

BORING LOG

CATLIN

ENGINEERS and SCIENTISTS

Wilmington, North Carolina

SHEET 1 OF 1

PROJECT NO.: 201-121	STATE: NC	COUNTY: Onslow	LOCATION: Camp Lejeune
PROJECT NAME: BB-52/SBB-70		LOGGED BY: Charles Ray	BORING ID: USTBB52
		DRILLER: Bobbie Fowler	SBB70-SB03
NORTHING:	EASTING:	CREW: Tom Stetler	
SYSTEM:	BORING LOCATION:		LAND ELEV.:
DRILL MACHINE:	METHOD: Hand Auger	0 HOUR DTW:	BORING DEPTH: 6.0
START DATE: 11/01/01	FINISH DATE: 11/01/01	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT				BLOWS PER FOOT					LAB.	U S C S	L O G	DEPTH	SOIL AND ROCK DESCRIPTION
	6in	6in	6in	6in	0	20	40	60	80	100				
													0.0	LAND SURFACE
0.0													0.0	
1.0														
														Tan, well sorted, v.f. SAND. No HCO moist
2.0														
3.0													3.0	
4.0														Tan, SILTY, v.f. to f. CLAYEY SAND. Slight HCO Moist
5.0													5.0	
6.0													6.0	Boring Terminated at Depth 6.0 ft

TEST LOG 201-121.GPJ TEST.GPJ 12/27/01

BORING LOG

CATLIN

ENGINEERS and SCIENTISTS

Wilmington, North Carolina

SHEET 1 OF 1

PROJECT NO.: 201-121 STATE: NC COUNTY: Onslow LOCATION: Camp Lejeune
 PROJECT NAME: BB-52/SBB-70 LOGGED BY: Charles Ray BORING ID: USTBB52
 DRILLER: Bobbie Fowler SBB70-SB04
 NORTHING: EASTING: CREW: Tom Stetler
 SYSTEM: BORING LOCATION: LAND ELEV.:
 DRILL MACHINE: METHOD: Hand Auger 0 HOUR DTW: BORING DEPTH: 6.0
 START DATE: 11/01/01 FINISH DATE: 11/01/01 24 HOUR DTW: ROCK DEPTH: ---

DEPTH	BLOW COUNT				BLOWS PER FOOT						LAB.	USCS	LOG	DEPTH	SOIL AND ROCK DESCRIPTION
	6in	6in	6in	6in	0	20	40	60	80	100					
0.0														0.0	LAND SURFACE
												SP		0.0	Brn/tan, well sorted, v.f. to f. SAND. No HCO moist
1.0														1.0	
												SP			Light tan, well sorted, v.f. to f. SAND. No HCO moist
2.0															
3.0														3.0	
												SM			Tan, SILTY, v.f. to f. SAND with clayey layers. No HCO moist
4.0															
5.0														5.0	
											Sampled	SP			Tan, well sorted, v.f. to f. SAND with trace silt. No HCO moist
6.0														6.0	Boring Terminated at Depth 6.0 ft

TESTLOG 201-121.GPJ TEST.GDT 12/17/01

BORING LOG

CATLIN

ENGINEERS and SCIENTISTS

Wilmington, North Carolina

SHEET 1 OF 1

PROJECT NO.: 201-121 STATE: NC COUNTY: Onslow LOCATION: Camp Lejeune
 PROJECT NAME: BB-52/SBB-70 LOGGED BY: Charles Ray BORING ID: USTBB52
 DRILLER: Bobbie Fowler SBB70-SB05
 NORTHING: EASTING: CREW: Tom Stetler
 SYSTEM: BORING LOCATION: LAND ELEV.:
 DRILL MACHINE: METHOD: Hand Auger 0 HOUR DTW: BORING DEPTH: 6.0
 START DATE: 11/01/01 FINISH DATE: 11/01/01 24 HOUR DTW: ROCK DEPTH: ---

DEPTH	BLOW COUNT				BLOWS PER FOOT					LAB.	U S C S	L O G	DEPTH	SOIL AND ROCK DESCRIPTION
	6in	6in	6in	6in	0	20	40	60	80	100				
0.0													0.0	LAND SURFACE
1.0											SP		1.0	Tan, well sorted. v.f. to f. SAND. NoHCO moist
2.0											SC		2.0	Tan, orange, SILTY, v.f. to f. CLAYEY SAND. No HCO moist
3.0											SM		3.0	TAn, orange, SILTY, v.f.to f. SAND with clayey sand lenses. No HCO moist
4.0													4.0	
5.0											Sampled SC		5.0	Tan, gray, SILTY, v.f. to f. CLAYEY SAND. No HCO moist
6.0													6.0	Boring Terminated at Depth 6.0 ft

TEST LOG 201-121.GPJ TEST LOG 12/1/01

BORING LOG

CATLIN
ENGINEERS and SCIENTISTS
Wilmington, North Carolina

SHEET 1 OF 1

PROJECT NO.: 201-121	STATE: NC	COUNTY: Onslow	LOCATION: Camp Lejeune
PROJECT NAME: BB-52/SBB-70		LOGGED BY: Charles Ray	BORING ID: USTBB52
		DRILLER: Bobbie Fowler	SBB70-SB06
NORTHING:	EASTING:	CREW: Tom Stetler	
SYSTEM:	BORING LOCATION:		LAND ELEV.:
DRILL MACHINE:	METHOD: Hand Auger	0 HOUR DTW:	BORING DEPTH: 6.0
START DATE: 11/01/01	FINISH DATE: 11/01/01	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT				BLOWS PER FOOT					LAB.	USCS	LOG	DEPTH	SOIL AND ROCK DESCRIPTION
	6in	6in	6in	6in	0	20	40	60	80	100				
													0.0	LAND SURFACE
0.0											SP		0.0	Brn, well sorted, v.f. to f. SAND. No HCO moist
1.0													1.0	
2.0											SP			Brn, light tan, well sorted, v.f. to f. SAND. No HCO moist
3.0														
4.0											SP		4.0	
														SAA except tan/orange color
5.0													5.0	
											Sampled	SP		SAA except orange, brown color.
6.0													6.0	Boring Terminated at Depth 6.0 ft

BORING LOG

CATLIN

ENGINEERS and SCIENTISTS

Wilmington, North Carolina

SHEET 1 OF 1

PROJECT NO.: 201-121	STATE: NC	COUNTY: Onslow	LOCATION: Camp Lejeune
PROJECT NAME: BB-52/SBB-70		LOGGED BY: Charles Ray	BORING ID: USTBB52
		DRILLER: Bobbie Fowler	SBB70-SB07
NORTHING:	EASTING:	CREW: Tom Stetler	
SYSTEM:	BORING LOCATION:		LAND ELEV.:
DRILL MACHINE:	METHOD: Hand Auger	0 HOUR DTW:	BORING DEPTH: 6.0
START DATE: 11/01/01	FINISH DATE: 11/01/01	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT				BLOWS PER FOOT					LAB.	U S C S	L O G	DEPTH	SOIL AND ROCK DESCRIPTION
	6in	6in	6in	6in	0	20	40	60	80	100				
0.0													0.0	LAND SURFACE
											SP		0.0	Brown, well sorted, v.f.to f. SAND. No HCO moist
1.0													1.0	
2.0														
3.0											SP			Brown, light tan, well sorted, v.f. to f. SAND. No HCO moist
4.0														
5.0														
											Sampled			
6.0													6.0	Boring Terminated at Depth 6.0 ft

TEST LOG 201-121 GEL TEST GDT 12/17/01

BORING LOG

CALIN

ENGINEERS and SCIENTISTS

Wilmington, North Carolina

SHEET 1 OF 1

PROJECT NO.: 201-121 STATE: NC COUNTY: Onslow LOCATION: Camp Lejeune
 PROJECT NAME: BB-52/SBB-70 LOGGED BY: Charles Ray BORING ID: USTBB52
 DRILLER: Bobbie Fowler SBB70-SB08
 NORTHING: EASTING: CREW: Tom Stetler
 SYSTEM: BORING LOCATION: LAND ELEV.:
 DRILL MACHINE: METHOD: Hand Auger 0 HOUR DTW: BORING DEPTH: 6.0
 START DATE: 11/01/01 FINISH DATE: 11/01/01 24 HOUR DTW: ROCK DEPTH: ---

DEPTH	BLOW COUNT				BLOWS PER FOOT						LAB.	USCS	LOG	DEPTH	SOIL AND ROCK DESCRIPTION
	6in	6in	6in	6in	0	20	40	60	80	100					
0.0														0.0	LAND SURFACE
1.0												SP			Brn, tan, well sorted, v.f. to f. SAND. No HCO moist
2.0												SP			
3.0												SP		3.0	Tan, well sorted, v.f. to f. SAND. No HCO moist
4.0												SC		4.0	
5.0												SC			Tan, SILTY, v.f. to f. CLAYEY SAND. No HCO moist
6.0											Sampled			6.0	Boring Terminated at Depth 6.0 ft

BORING LOG

CATLIN
ENGINEERS and SCIENTISTS
Wilmington, North Carolina

SHEET 1 OF 1

PROJECT NO.: 201-121 STATE: NC COUNTY: Onslow LOCATION: Camp Lejeune
PROJECT NAME: BB-52/SBB-70 LOGGED BY: Charles Ray BORING ID: USTBB52
DRILLER: Bobbie Fowler SBB70-SB10
NORTHING: EASTING: CREW: Tom Stetler
SYSTEM: BORING LOCATION: LAND ELEV.:
DRILL MACHINE: METHOD: Hand Auger 0 HOUR DTW: BORING DEPTH: 6.0
START DATE: 11/05/01 FINISH DATE: 11/05/01 24 HOUR DTW: ROCK DEPTH: ---

DEPTH	BLOW COUNT				BLOWS PER FOOT					LAB.	USCS	LOG	DEPTH	SOIL AND ROCK DESCRIPTION
	6in	6in	6in	6in	0	20	40	60	80	100				
0.0													0.0	LAND SURFACE
1.0											SP		1.0	Tan/brown, well sorted, v.f. to f. SAND. No HCO Dry
2.0											Sampled SM		2.0	Brown, SILTY, v.f. to f. SAND. No HCO moist
3.0											SP		3.0	Light tan, well sorted, v.f. to f. SAND. No HCO moist
4.0											SM		4.0	Tan/gray, SILTY, v.f. to f. SAND. No HCO moist
5.0											SC		5.0	Tan, SILTY, v.f. to f. CLAYEY SAND. No HCO moist.
6.0													6.0	Boring Terminated at Depth 6.0 ft

TESTLOG 201-121.GPJ TEST.GDT 12/17/01

BORING LOG

CATLIN

ENGINEERS and SCIENTISTS

Wilmington, North Carolina

SHEET 1 OF 1

PROJECT NO.: 201-121	STATE: NC	COUNTY: Onslow	LOCATION: Camp Lejeune
PROJECT NAME: BB-52/SBB-70	LOGGED BY: Charles Ray	BORING ID: USTBB52	
	DRILLER: Bobbie Fowler	SBB70-SB11	
NORTHING:	EASTING:	CREW: Tom Stetler	
SYSTEM:	BORING LOCATION:	LAND ELEV.:	
DRILL MACHINE:	METHOD: Hand Auger	0 HOUR DTW:	BORING DEPTH: 6.0
START DATE: 11/05/01	FINISH DATE: 11/05/01	24 HOUR DTW:	ROCK DEPTH: ---

START DATE: 11/05/01														FINISH DATE: 11/05/01													
DEPTH	BLOW COUNT				BLOWS PER FOOT						LAB.	U S C S	L O G	DEPTH	SOIL AND ROCK DESCRIPTION												
	6in	6in	6in	6in	0	20	40	60	80	100																	
														0.0	LAND SURFACE												
0.0												SP		0.0	Brown/tan, well sorted, v.f. to f. SAND. No HCO moist												
1.0												SP		1.0	SAA except Brown and tan.												
2.0												SP		2.0	Light tan, well sorted, v.f. to f. SAND. No HCO moist												
3.0																											
4.0																											
5.0																											
												Sampled															
6.0														6.0	Boring Terminated at Depth 6.0 ft												

ESTLOG_201121.GP4 TEST.GDT 12/17/01

BORING LOG

CATLIN
ENGINEERS and SCIENTISTS
Wilmington, North Carolina

SHEET 1 OF 1

PROJECT NO.: 201-121	STATE: NC	COUNTY: Onslow	LOCATION: Camp Lejeune
PROJECT NAME: BB-52/SBB-70		LOGGED BY: Charles Ray	BORING ID: USTBB52
		DRILLER: Bobbie Fowler	SBB70-SB12
NORTHING:	EASTING:	CREW: Tom Stetler	LAND ELEV.:
SYSTEM:	BORING LOCATION:		
DRILL MACHINE:	METHOD: Hand Auger	0 HOUR DTW:	BORING DEPTH: 6.0
START DATE: 11/05/01	FINISH DATE: 11/05/01	24 HOUR DTW:	ROCK DEPTH: ---

DEPTH	BLOW COUNT				BLOWS PER FOOT					LAB.	U S C S	LOG	DEPTH	SOIL AND ROCK DESCRIPTION
	6in	6in	6in	6in	0	20	40	60	80	100				
													0.0	LAND SURFACE
0.0											SP		0.0	Brown, well sorted, v.f. to f. SAND. No HCO moist
1.0											SP		1.0	light brown, well sorted, v.f. to f. SAND. No HCO moist
2.0											SP		2.0	
3.0											SP		3.0	Light tan, well sorted, v.f. to f. SAND. No HCO moist
4.0											SM		4.0	Tan/orange, light tan, SILTY, v.f. to f. SAND. No HCO moist
5.0											Sampled SC		5.0	Tan/orange, SILTY, v.f. to f. CLAYEY SAND. No HCO moist
6.0													6.0	Boring Terminated at Depth 6.0 ft

TEST LOG 201-121.GPJ TEST.GDT 12/17/01

APPENDIX B

NORTH CAROLINA WELL CONSTRUCTION RECORDS

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section
WELL CONTRACTOR (INDIVIDUAL) NAME (print) Bobbie Fowler CERTIFICATION # 2869
WELL CONTRACTOR COMPANY NAME CATLIN Engineers & Scientists PHONE # (910) 452-5861
STATE WELL CONSTRUCTION PERMIT # 2869 ASSOCIATED WQ PERMIT # (if applicable)
(if applicable)

USTBB52 SBB70-MW01

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____

2. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Camp Lejeune County: Onslow

BB-52/SBB-70

(Road Name and Numbers, Community, Subdivision, Lot No., Zip Code)

3. OWNER: LANTDIV NAVFACENGCOM Commanding General

Address: AC/S EMD/Marine Corps Base/PSC Box 20004
(Street or Route No.)

Camp Lejeune
City or Town

NC
State

28542-0004
Zip Code

Area code - Phone number

4. DATE DRILLED: 11/01/2001

5. TOTAL DEPTH: 18

6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒

7. STATIC WATER LEVEL Below Top of Casing 11.0 FT.
(Use "+" if Above Top of Casing)

8. TOP OF CASING IS 0 FT. Above Land Surface*

* Top of casing terminated at/or below land surface requires
a variance in accordance with 15A NCAC 2C.0118

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

10. WATER ZONES (depth): Surficial Aquifer

12. DISINFECTION: Type N/A Amount N/A

13. CASING: Depth Diameter Wall Thickness or Weight/Ft. Material
From 0 To 8 ft. 2" in. Sch. 40 PVC
From _____ To _____ ft. _____ in. _____
From _____ To _____ ft. _____ in. _____

14. GROUT: Depth Material Method
From 0 To 4.5 ft. Portland Cement Surface Pour
From 4.5 To 6 ft. Bent. Surface Pour

15. SCREEN: Depth Diameter Slot Size Material
From 8 To 18 ft. 2" in. Slot .010 in. PVC
From _____ To _____ ft. _____ in. _____ in. _____

16. SAND/GRAVEL PACK: Depth Size Material
From 6 To 18 ft. #2 Medium #2 Medium
From _____ To _____ ft. _____ _____

17. REMARKS: _____

Topographic/Land Setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)
Northing/Easting of well location _____

Latitude/longitude source ☐ GPS ☐ Topo. map
(check box)

DEPTH DRILLING LOG
From To Formation Description

4 to 6	- 4.0-5.5- Tan, gray, orange, SILTY, v.f. to f. SAND with clayey layers.
	Moist
	No HCO
	5.5-6.0- Gray, SILTY v.f. to f. SANDY CLAY.
	Medium plasticity.
	No HCO
	Moist
9 to 11	- 9.0-10.0- Orange, well sorted, v.f. to f. SAND.
	10.0-11.0- Tan, well sorted, v.f. to f. SAND.
	Wet
	Moderate HCO
14 to 16	- Orange, well sorted, v.f. to f. SAND.
	No HCO
	Sat.

LOCATION SKETCH

Show direction and distance in miles from at least two State Roads or County Roads. Include road numbers and common road names.

SEE ENCLOSED
REPORT FIGURES

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.

Bobbie Fowler
SIGNATURE OF PERSON CONSTRUCTING THE WELL

12-21-01
DATE

Submit original to Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

Modified from:
GW-1 REV.07/2001

WELL CONSTRUCTION RECORD

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section
WELL CONTRACTOR (INDIVIDUAL) NAME (print) Bobbie Fowler CERTIFICATION # 2869
WELL CONTRACTOR COMPANY NAME CATLIN Engineers & Scientists PHONE # (910) 452-5861
STATE WELL CONSTRUCTION PERMIT # 2869 ASSOCIATED WO PERMIT # (if applicable)
(if applicable)

USTBB52 SBB70-MW02

1. WELL USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
Monitoring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use _____
2. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Camp Lejeune County: Onslow
BB-52/SBB-70
(Road Name and Numbers, Community, Subdivision, Lot No., Zip Code)
Topographic/Land Setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)
Northing/Easting of well location _____
3. OWNER: LANTDIV NAVFACENGCOM Commanding General
Address: AC/S EMD/Marine Corps Base/PSC Box 20004
(Street or Route No.)
Camp Lejeune NC 28542-0004
City or Town State Zip Code
Area code - Phone number _____
4. DATE DRILLED: 11/01/2001
5. TOTAL DEPTH: 18
6. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
7. STATIC WATER LEVEL Below Top of Casing 11.5 FT.
(Use "+" if Above Top of Casing)
8. TOP OF CASING IS 0 FT. Above Land Surface*
* Top of casing terminated at/or below land surface requires a variance in accordance with 15A NCAC 2C.0118
9. YIELD (gpm): N/A METHOD OF TEST N/A
10. WATER ZONES (depth): Surficial Aquifer
12. DISINFECTION: Type N/A Amount N/A
13. CASING: Depth Diameter Wall Thickness or Weight/Ft. Material
From 0 To 8 ft. 2" in. Sch. 40 PVC
From _____ To _____ ft. _____ in. _____
From _____ To _____ ft. _____ in. _____
14. GROUT: Depth Material Method
From 0 To 4.5 ft. Portland Cement Surface Pour
From 4.5 To 6 ft. Bent. Surface Pour
15. SCREEN: Depth Diameter Slot Size Material
From 8 To 18 ft. 2" in. Slot .010 in. PVC
From _____ To _____ ft. _____ in. _____ in.
16. SAND/GRAVEL PACK: Depth Size Material
From 6 To 18 ft. #2 Medium #2 Medium
From _____ To _____ ft. _____
17. REMARKS: _____
- LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads. Include road numbers and common road names.
- SEE ENCLOSED
REPORT FIGURES

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.

Bobbie Fowler
SIGNATURE OF PERSON CONSTRUCTING THE WELL

12-21-01
DATE

Submit original to Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

Modified from:
GW-1 REV.07/2001

APPENDIX C
FIELD MEASUREMENTS

FIELD MEASUREMENTS

WELL I.D.	DATE	TEMPERATURE ° C	DISSOLVED OXYGEN (Mg/L)	pH (Units)	SPECIFIC CONDUCTIVITY
USTBB52/SBB70-MW01	11/1/01	NM	NM	NM	NM
USTBB52/SBB70-MW01	11/1/01	NM	NM	NM	NM

APPENDIX D
STANDARD PROCEDURES

STANDARD METHODS OF INVESTIGATION AND DATA EVALUATION

1.0 DATA COLLECTION

1.1 BACKGROUND DATA

Background data and history information relevant to the site investigation is generated through numerous sources. These sources may include, but are not limited to, the following:

- Conversations with the client and regulatory officials involved with the incident.
- Review of pertinent regulatory correspondence.
- Review of previous and existing reports and other technical data.
- Review of available historical records.

1.2 SURVEYS AND POTENTIAL RECEPTOR DATA

Physical survey and potential receptor data is collected in accordance with the intended level of investigation. In general, the purpose is to collect sufficient information for site assessment and corrective action planning.

Individual receptors are identified and evaluated in the context of their potential for contaminant impact. Potential receptors of contamination can include surface water bodies, ground water supply wells, and subsurface building structures.

1.2.1 Horizontal Survey

Horizontal survey data is generated using either accepted general field surveying techniques, or existing survey maps; or by using a combination of existing data and field generated information. The survey area generally extends to a point at least 50 feet beyond suspected plume boundaries. A receptor scale survey of a larger area surrounding a site will be made if appropriate and necessary.

1.2.2 Vertical Survey

A vertical survey is conducted at the site typically within an accuracy of 0.01 foot. The datum plane is generally assumed unless otherwise noted. Assumed temporary benchmarks (TBM) are selected near ground level. The vertical survey includes such points as top of all well casings, selected ground shots, important utility inverts, utility fluid levels, important surface water levels, and other items determined to be significant.

1.3 DRILLING AND MONITORING WELL/PIEZOMETER INSTALLATION

All necessary permits are applied for and obtained in accordance with federal, state, and local requirements prior to any drilling or well construction activities. Wells are installed under applicable licensing requirements, and are designed and constructed in accordance with accepted standards and practices. Any wells purposely installed at off-site locations are previously permitted through appropriate right-of-entry agreements with all necessary property owners and/or their agents.

1.3.1 Drilling Methods and Subsurface Data Collection

Drilling is accomplished utilizing one or more of the following methods:

Auger Drilling

Auger drilling is the preferred, most often used method of subsurface investigation and is accomplished using a truck or trailer mounted drill rig. Continuous flight auger types used vary upon the site and situation; ranging from the 4-inch solid stem to the 8-inch hollow stem. Auger type is selected based upon appropriateness and/or site-specific requirements.

Hand Augering

Hand augering is utilized when economically and scientifically feasible, or when no other method is suitable. Hand augers typically produce three inch diameter holes and are limited to depths of less than 15 feet.

Other Methods

Other drilling methods, such as mud and air rotary, rock coring, cable tool, and large bucket augering are not widely used except under appropriate conditions.

Regardless of the drilling method used, drill rig(s) and all drilling tools are thoroughly cleaned between boreholes to prevent cross introduction of hydrocarbons. Split spoon samples are collected and field-described at

intervals of five feet, and cuttings are continuously monitored. A geologist or engineer, trained in using visual/manual techniques, is always present during drilling and is responsible for subsurface contaminant and geologic data collection. Soils are classified in accordance with the Unified Soils Classification System (USCS).

1.3.2 Hydropunch Installation

Hydropunch penetrometers (Hydropunches) are used to delineate the spatial extent of dissolved and free phase plumes. The hydropunches are advanced into the water-bearing zone by a trailer-mounted drilling rig. Ground water samples are collected by pulling back on the body of the Hydropunch and allowing the ground water to enter the screened portion of the sample chamber. Samples are retrieved using a decontaminated Teflon bailer.

1.3.3 Well Installation

Wells are typically constructed of threaded PVC casing and screen. No glues or cements are used in joining PVC components. Well diameter, slot sizes, and protective covers vary depending upon site-specific conditions or situation-specific requirements. As-built well construction records are field generated.

1.3.4 Well Development

Wells are developed by overpumping or surging using appropriate pumps, blocks, or bailers. Through development, unwanted fine materials are removed and water generated during development is containerized and properly disposed of.

1.4 HYDROGEOLOGIC DATA COLLECTION

Data used to help characterize hydrogeologic conditions at a site are obtained through various procedures including, but not necessarily limited to, those described below:

1.4.1 Regional Geology

Information pertaining to the regional geologic framework is compiled from existing publications, maps, and scientific papers.

1.4.2 Site Geology

Shallow site geology is generally determined from field descriptions and borehole samples. Interpretations with regard to hydrogeologically important contacts, zones, fractures, faults, cleavage, and facies changes are made when possible.

1.4.3 Ground Water Occurrence and Characteristics

Ground water data is obtained utilizing a number of methods and procedures, not limited to the general list below:

Well Water Levels

After well development, wells are allowed to stabilize for a minimum of 24 hours prior to measuring.

The specific gravity of any accumulated product is determined and used to calculate true hydraulic grade from measured water levels. This information is combined with vertical survey data to determine relative potentiometric surface elevations for all wells.

Aquifer Testing

Various aquifer tests may be used to make determinations of hydraulic conductivity. Slug or pumping tests are often used to characterize hydrogeologic conditions and to develop remedial action alternatives utilizing appropriate pumping technologies.

Other Methods

Other methods may be deemed appropriate for determining various ground water characteristics. These other methods may include nested well configurations and/or clustered piezometer installations; sieve or pipette analysis; fracture trace analysis; computer modeling; geophysical logging; and resistivity surveys.

1.5 HYDROCARBON DATA COLLECTION

1.5.1 Collection Methods

Hydrocarbon data is obtained through various methods including, but not limited to, the following:

Field Analysis

- Direct thickness measurement of phase separated components using tapes and/or probes.
- Manual vapor analysis using Photoionization Detector or HNU meter.
- Detectable odor and visual observation.

Laboratory Analysis

- Laboratory analysis of phase-separated products.
- Laboratory vapor, soil, and ground water analysis using appropriate EPA methods.

1.5.2 Field Sampling

Field sampling procedures are performed in accordance with recommended protocol and accepted industry standards. Generally, sampling procedures are as follows:

Product Samples

Product samples are obtained using clean equipment and containers. Each is shipped to the analytical laboratory in protective containers.

Vapor Samples

PID/FID readings are measured from headspace using containerized samples which have been brought to ambient temperature.

Carbon tubes are utilized in conjunction with a laboratory calibrated vacuum pump to obtain vapor samples. *The carbon tubes are sealed and refrigerated for shipment to the analytical laboratory (*This method is known as the Carbon Adsorption Method).

Soil Samples

Soil samples are immediately packed into clean containers, and refrigerated for shipment to the analytical laboratory.

Ground Water Samples

Ground water samples are collected in accordance with the following procedures:

- Creeks/Lakes/Etc.

Grab samples are obtained.

- Domestic Wells

Wells are pumped for a time sufficient to completely purge the well and any pressure or holding tanks prior to sampling.

- Monitoring Wells

Water level measurements are made and well volumes calculated for each well.

Three well volumes are removed from each well using a thoroughly cleaned Teflon bailer or appropriate purging pump. If it is not possible to remove three volumes, due to very low yields, one volume is removed prior to obtaining a sample.

Samples are collected and containerized in a manner which minimizes agitation and contact with the air.

Sampling records are field prepared.

Samples are labeled and proper chain of custody documents are maintained.

Samples are promptly protectively packed, refrigerated, and shipped to the analytical laboratory for analysis.

2.0 DATA EVALUATION

Data obtained as a result of the site investigation is compiled and evaluated and a report is prepared for distribution to the appropriate agencies, on behalf of the client. The data collected is evaluated both individually and in context with the rest of the data collected. Generally, specific data is evaluated as follows:

- Background data is evaluated in context with the suspected or confirmed problem.
- Survey data is utilized to develop site maps and to evaluate contaminant receptors.
- Well construction records are compiled and presented as part of the Comprehensive Site Assessment. As-built information is used in combination with other data to evaluate subsurface conditions and screen settings as they relate to the investigation.

- Subsurface drilling logs are used to develop geologic cross-sections, fence diagrams, isopachs, structure contours, or other constructions. Regional geologic data are used to obtain an overall framework.
- Hydrogeologic data is used to develop contour maps, flow nets and other constructions. The data is also used to calculate various hydrogeologic parameters which describe aquifer characteristics.
- Hydrocarbon data is utilized to develop various plume geometry and isocon maps.
- All data is compiled and utilized for making specific recommendations with regard to remedial action alternatives.

APPENDIX E

LABORATORY REPORTS
AND
CHAIN-OF-CUSTODY DOCUMENTATION

FILE COPY

PARADIGM ANALYTICAL LABORATORIES, INC.
2627 Northchase Parkway S.E.
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

Mr. Tom Landis
Richard Catlin & Associates
P.O. Box 10279
Wilmington, NC 28404-0279

November 19, 2001

Report Number: G128-830

Client Project ID: BB-52/SB-70

Dear Mr. Landis,

Enclosed are the results of the analytical services performed under the referenced project. 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 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 for assistance. 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.



Laboratory Director
Mark Randall

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB-06
Client Project ID: BB-52/SB-70
Lab Sample ID: 31444
Lab Project ID: G128-830
Matrix: Soil

%Solids: 79.7

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acenaphthene	390	BQL
Acenaphthylene	390	BQL
Anthracene	390	BQL
Benzo[a]anthracene	390	BQL
Benzo[a]pyrene	390	BQL
Benzo[b]fluoranthene	390	BQL
Benzo[g,h,i]perylene	390	BQL
Benzo[k]fluoranthene	390	BQL
Benzoic Acid	770	BQL
Bis(2-chloroethoxy)methane	390	BQL
Bis(2-chloroethyl)ether	390	BQL
Bis(2-chloroisopropyl)ether	390	BQL
Bis(2-ethylhexyl)phthalate	390	BQL
4-bromophenyl phenyl ether	390	BQL
Butylbenzylphthalate	390	BQL
4-Chloroaniline	390	BQL
4-Chloro-3-methylphenol	390	BQL
2-Chloronaphthalene	390	BQL
2-Chlorophenol	390	BQL
4-Chlorophenyl phenyl ether	390	BQL
Chrysene	390	BQL
Di-n-Butylphthalate	390	BQL
Di-n-octylphthalate	390	BQL
Dibenzo[a,h]anthracene	390	BQL
Dibenzofuran	390	BQL
1,2-Dichlorobenzene	390	BQL
1,3-Dichlorobenzene	390	BQL
1,4-Dichlorobenzene	390	BQL
3,3'-Dichlorobenzidine	770	BQL
2,4-Dichlorophenol	390	BQL
Diethylphthalate	390	BQL
2,4-Dimethylphenol	390	BQL
Dimethylphthalate	390	BQL
4,6-Dinitro-2-methylphenol	1900	BQL
2,4-Dinitrophenol	1900	BQL
2,4-Dinitrotoluene	390	BQL
2,6-Dinitrotoluene	390	BQL
Fluoranthene	390	BQL
Fluorene	390	BQL
Hexachlorobenzene	390	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB-06
Client Project ID: BB-52/SB-70
Lab Sample ID: 31444
Lab Project ID: G128-830
Matrix: Soil

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Hexachlorobutadiene	390	BQL
Hexachlorocyclopentadiene	770	BQL
Hexachloroethane	390	BQL
Indeno(1,2,3-c,d)pyrene	390	BQL
Isophorone	390	BQL
2-Methylnaphthalene	390	BQL
2-Methylphenol	390	BQL
3- & 4-Methylphenol	390	BQL
N-Nitrosodi-n-propylamine	390	BQL
N-Nitrosodiphenylamine	390	BQL
Naphthalene	390	BQL
2-Nitroaniline	390	BQL
3-Nitroaniline	390	BQL
4-Nitroaniline	390	BQL
Nitrobenzene	390	BQL
2-Nitrophenol	390	BQL
4-Nitrophenol	1900	BQL
Pentachlorophenol	1900	BQL
Phenanthrene	390	BQL
Phenol	390	BQL
Pyrene	390	BQL
1,2,4-Trichlorobenzene	390	BQL
2,4,5-Trichlorophenol	390	BQL
2,4,6-Trichlorophenol	390	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.7	87
2-Fluorophenol	10	9.1	91
Nitrobenzene-d5	10	8.9	89
Phenol-d6	10	8.1	81
2,4,6-Tribromophenol	10	9.0	90
4-Terphenyl-d14	10	8.8	88

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By:

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB-08
Client Project ID: BB-52/SB-70
Lab Sample ID: 31446
Lab Project ID: G128-830
Matrix: Soil

%Solids: 82.4

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acenaphthene	380	BQL
Acenaphthylene	380	BQL
Anthracene	380	BQL
Benzo[a]anthracene	380	BQL
Benzo[a]pyrene	380	BQL
Benzo[b]fluoranthene	380	BQL
Benzo[g,h,i]perylene	380	BQL
Benzo[k]fluoranthene	380	BQL
Benzoic Acid	760	BQL
Bis(2-chloroethoxy)methane	380	BQL
Bis(2-chloroethyl)ether	380	BQL
Bis(2-chloroisopropyl)ether	380	BQL
Bis(2-ethylhexyl)phthalate	380	BQL
4-bromophenyl phenyl ether	380	BQL
Butylbenzylphthalate	380	BQL
4-Chloroaniline	380	BQL
4-Chloro-3-methylphenol	380	BQL
2-Chloronaphthalene	380	BQL
2-Chlorophenol	380	BQL
4-Chlorophenyl phenyl ether	380	BQL
Chrysene	380	BQL
Di-n-Butylphthalate	380	BQL
Di-n-octylphthalate	380	BQL
Dibenzo[a,h]anthracene	380	BQL
Dibenzofuran	380	BQL
1,2-Dichlorobenzene	380	BQL
1,3-Dichlorobenzene	380	BQL
1,4-Dichlorobenzene	380	BQL
3,3'-Dichlorobenzidine	760	BQL
2,4-Dichlorophenol	380	BQL
Diethylphthalate	380	BQL
2,4-Dimethylphenol	380	BQL
Dimethylphthalate	380	BQL
4,6-Dinitro-2-methylphenol	1900	BQL
2,4-Dinitrophenol	1900	BQL
2,4-Dinitrotoluene	380	BQL
2,6-Dinitrotoluene	380	BQL
Fluoranthene	380	BQL
Fluorene	380	BQL
Hexachlorobenzene	380	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB-08
Client Project ID: BB-52/SB-70
Lab Sample ID: 31446
Lab Project ID: G128-830
Matrix: Soil

%Solids: 82.4

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Hexachlorobutadiene	380	BQL
Hexachlorocyclopentadiene	760	BQL
Hexachloroethane	380	BQL
Indeno(1,2,3-c,d)pyrene	380	BQL
Isophorone	380	BQL
2-Methylnaphthalene	380	BQL
2-Methylphenol	380	BQL
3- & 4-Methylphenol	380	BQL
N-Nitrosodi-n-propylamine	380	BQL
N-Nitrosodiphenylamine	380	BQL
Naphthalene	380	BQL
2-Nitroaniline	380	BQL
3-Nitroaniline	380	BQL
4-Nitroaniline	380	BQL
Nitrobenzene	380	BQL
2-Nitrophenol	380	BQL
4-Nitrophenol	1900	BQL
Pentachlorophenol	1900	BQL
Phenanthrene	380	BQL
Phenol	380	BQL
Pyrene	380	BQL
1,2,4-Trichlorobenzene	380	BQL
2,4,5-Trichlorophenol	380	BQL
2,4,6-Trichlorophenol	380	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.2	92
2-Fluorophenol	10	9.7	97
Nitrobenzene-d5	10	9.8	98
Phenol-d6	10	8.8	88
2,4,6-Tribromophenol	10	9.4	94
4-Terphenyl-d14	10	9.5	95

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: tw

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: MW-02
Client Project ID: BB-52/SB-70
Lab Sample ID: 31447
Lab Project ID: G128-830
Matrix: Soil

%Solids: 84.4

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acenaphthene	350	BQL
Acenaphthylene	350	BQL
Anthracene	350	BQL
Benzo[a]anthracene	350	BQL
Benzo[a]pyrene	350	BQL
Benzo[b]fluoranthene	350	BQL
Benzo[g,h,i]perylene	350	BQL
Benzo[k]fluoranthene	350	BQL
Benzoic Acid	690	BQL
Bis(2-chloroethoxy)methane	350	BQL
Bis(2-chloroethyl)ether	350	BQL
Bis(2-chloroisopropyl)ether	350	BQL
Bis(2-ethylhexyl)phthalate	350	BQL
4-bromophenyl phenyl ether	350	BQL
Butylbenzylphthalate	350	BQL
4-Chloroaniline	350	BQL
4-Chloro-3-methylphenol	350	BQL
2-Chloronaphthalene	350	BQL
2-Chlorophenol	350	BQL
4-Chlorophenyl phenyl ether	350	BQL
Chrysene	350	BQL
Di-n-Butylphthalate	350	BQL
Di-n-octylphthalate	350	BQL
Dibenzo[a,h]anthracene	350	BQL
Dibenzofuran	350	BQL
1,2-Dichlorobenzene	350	BQL
1,3-Dichlorobenzene	350	BQL
1,4-Dichlorobenzene	350	BQL
3,3'-Dichlorobenzidine	690	BQL
2,4-Dichlorophenol	350	BQL
Diethylphthalate	350	BQL
2,4-Dimethylphenol	350	BQL
Dimethylphthalate	350	BQL
4,6-Dinitro-2-methylphenol	1700	BQL
2,4-Dinitrophenol	1700	BQL
2,4-Dinitrotoluene	350	BQL
2,6-Dinitrotoluene	350	BQL
Fluoranthene	350	BQL
Fluorene	350	BQL
Hexachlorobenzene	350	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: MW-02
Client Project ID: BB-52/SB-70
Lab Sample ID: 31447
Lab Project ID: G128-830
Matrix: Soil

%Solids: 84.4

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Hexachlorobutadiene	350	BQL
Hexachlorocyclopentadiene	690	BQL
Hexachloroethane	350	BQL
Indeno(1,2,3-c,d)pyrene	350	BQL
Isophorone	350	BQL
2-Methylnaphthalene	350	BQL
2-Methylphenol	350	BQL
3- & 4-Methylphenol	350	BQL
N-Nitrosodi-n-propylamine	350	BQL
N-Nitrosodiphenylamine	350	BQL
Naphthalene	350	BQL
2-Nitroaniline	350	BQL
3-Nitroaniline	350	BQL
4-Nitroaniline	350	BQL
Nitrobenzene	350	BQL
2-Nitrophenol	350	BQL
4-Nitrophenol	1700	BQL
Pentachlorophenol	1700	BQL
Phenanthrene	350	BQL
Phenol	350	BQL
Pyrene	350	BQL
1,2,4-Trichlorobenzene	350	BQL
2,4,5-Trichlorophenol	350	BQL
2,4,6-Trichlorophenol	350	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.3	93
2-Fluorophenol	10	9.6	96
Nitrobenzene-d5	10	9.7	97
Phenol-d6	10	8.7	87
2,4,6-Tribromophenol	10	9.4	94
4-Terphenyl-d14	10	9.8	98

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: mw

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: MW-01
Client Project ID: BB-52/SB-70
Lab Sample ID: 31448
Lab Project ID: G128-830
Matrix: Soil

%Solids: 77.4

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acenaphthene	370	BQL
Acenaphthylene	370	BQL
Anthracene	370	BQL
Benzo[a]anthracene	370	BQL
Benzo[a]pyrene	370	BQL
Benzo[b]fluoranthene	370	BQL
Benzo[g,h,i]perylene	370	BQL
Benzo[k]fluoranthene	370	BQL
Benzoic Acid	750	BQL
Bis(2-chloroethoxy)methane	370	BQL
Bis(2-chloroethyl)ether	370	BQL
Bis(2-chloroisopropyl)ether	370	BQL
Bis(2-ethylhexyl)phthalate	370	BQL
4-bromophenyl phenyl ether	370	BQL
Butylbenzylphthalate	370	BQL
4-Chloroaniline	370	BQL
4-Chloro-3-methylphenol	370	BQL
2-Chloronaphthalene	370	BQL
2-Chlorophenol	370	BQL
4-Chlorophenyl phenyl ether	370	BQL
Chrysene	370	BQL
Di-n-Butylphthalate	370	BQL
Di-n-octylphthalate	370	BQL
Dibenzo[a,h]anthracene	370	BQL
Dibenzofuran	370	BQL
1,2-Dichlorobenzene	370	BQL
1,3-Dichlorobenzene	370	BQL
1,4-Dichlorobenzene	370	BQL
3,3'-Dichlorobenzidine	750	BQL
2,4-Dichlorophenol	370	BQL
Diethylphthalate	370	BQL
2,4-Dimethylphenol	370	BQL
Dimethylphthalate	370	BQL
4,6-Dinitro-2-methylphenol	1900	BQL
2,4-Dinitrophenol	1900	BQL
2,4-Dinitrotoluene	370	BQL
2,6-Dinitrotoluene	370	BQL
Fluoranthene	370	BQL
Fluorene	370	BQL
Hexachlorobenzene	370	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: MW-01
Client Project ID: BB-52/SB-70
Lab Sample ID: 31448
Lab Project ID: G128-830
Matrix: Soil

%Solids: 77.4

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Hexachlorobutadiene	370	BQL
Hexachlorocyclopentadiene	750	BQL
Hexachloroethane	370	BQL
Indeno(1,2,3-c,d)pyrene	370	BQL
Isophorone	370	BQL
2-Methylnaphthalene	370	BQL
2-Methylphenol	370	BQL
3- & 4-Methylphenol	370	BQL
N-Nitrosodi-n-propylamine	370	BQL
N-Nitrosodiphenylamine	370	BQL
Naphthalene	370	BQL
2-Nitroaniline	370	BQL
3-Nitroaniline	370	BQL
4-Nitroaniline	370	BQL
Nitrobenzene	370	BQL
2-Nitrophenol	370	BQL
4-Nitrophenol	1900	BQL
Pentachlorophenol	1900	BQL
Phenanthrene	370	BQL
Phenol	370	BQL
Pyrene	370	BQL
1,2,4-Trichlorobenzene	370	BQL
2,4,5-Trichlorophenol	370	BQL
2,4,6-Trichlorophenol	370	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.1	91
2-Fluorophenol	10	9.9	99
Nitrobenzene-d5	10	9.4	94
Phenol-d6	10	8.7	87
2,4,6-Tribromophenol	10	10.0	100
4-Terphenyl-d14	10	9.6	96

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: MRC

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB-07
Client Project ID: BB-52/SB-70
Lab Sample ID: 31449
Lab Project ID: G128-830
Matrix: Soil

%Solids: 83.5

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acenaphthene	400	BQL
Acenaphthylene	400	BQL
Anthracene	400	BQL
Benzo[a]anthracene	400	BQL
Benzo[a]pyrene	400	BQL
Benzo[b]fluoranthene	400	BQL
Benzo[g,h,i]perylene	400	BQL
Benzo[k]fluoranthene	400	BQL
Benzoic Acid	790	BQL
Bis(2-chloroethoxy)methane	400	BQL
Bis(2-chloroethyl)ether	400	BQL
Bis(2-chloroisopropyl)ether	400	BQL
Bis(2-ethylhexyl)phthalate	400	BQL
4-bromophenyl phenyl ether	400	BQL
Butylbenzylphthalate	400	BQL
4-Chloroaniline	400	BQL
4-Chloro-3-methylphenol	400	BQL
2-Chloronaphthalene	400	BQL
2-Chlorophenol	400	BQL
4-Chlorophenyl phenyl ether	400	BQL
Chrysene	400	BQL
Di-n-Butylphthalate	400	BQL
Di-n-octylphthalate	400	BQL
Dibenzo[a,h]anthracene	400	BQL
Dibenzofuran	400	BQL
1,2-Dichlorobenzene	400	BQL
1,3-Dichlorobenzene	400	BQL
1,4-Dichlorobenzene	400	BQL
3,3'-Dichlorobenzidine	790	BQL
2,4-Dichlorophenol	400	BQL
Diethylphthalate	400	BQL
2,4-Dimethylphenol	400	BQL
Dimethylphthalate	400	BQL
4,6-Dinitro-2-methylphenol	2000	BQL
2,4-Dinitrophenol	2000	BQL
2,4-Dinitrotoluene	400	BQL
2,6-Dinitrotoluene	400	BQL
Fluoranthene	400	BQL
Fluorene	400	BQL
Hexachlorobenzene	400	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB-07
Client Project ID: BB-52/SB-70
Lab Sample ID: 31449
Lab Project ID: G128-830
Matrix: Soil

%Solids: 83.5

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Hexachlorobutadiene	400	BQL
Hexachlorocyclopentadiene	790	BQL
Hexachloroethane	400	BQL
Indeno(1,2,3-c,d)pyrene	400	BQL
Isophorone	400	BQL
2-Methylnaphthalene	400	BQL
2-Methylphenol	400	BQL
3- & 4-Methylphenol	400	BQL
N-Nitrosodi-n-propylamine	400	BQL
N-Nitrosodiphenylamine	400	BQL
Naphthalene	400	BQL
2-Nitroaniline	400	BQL
3-Nitroaniline	400	BQL
4-Nitroaniline	400	BQL
Nitrobenzene	400	BQL
2-Nitrophenol	400	BQL
4-Nitrophenol	2000	BQL
Pentachlorophenol	2000	BQL
Phenanthrene	400	BQL
Phenol	400	BQL
Pyrene	400	BQL
1,2,4-Trichlorobenzene	400	BQL
2,4,5-Trichlorophenol	400	BQL
2,4,6-Trichlorophenol	400	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.6	96
2-Fluorophenol	10	10.0	100
Nitrobenzene-d5	10	9.7	97
Phenol-d6	10	9.0	90
2,4,6-Tribromophenol	10	10.5	105
4-Terphenyl-d14	10	10.7	107

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: MRC

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB-05
Client Project ID: BB-52/SB-70
Lab Sample ID: 31450
Lab Project ID: G128-830
Matrix: Soil

%Solids: 82.9

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acenaphthene	360	BQL
Acenaphthylene	360	BQL
Anthracene	360	BQL
Benzo[a]anthracene	360	BQL
Benzo[a]pyrene	360	BQL
Benzo[b]fluoranthene	360	BQL
Benzo[g,h,i]perylene	360	BQL
Benzo[k]fluoranthene	360	BQL
Benzoic Acid	720	BQL
Bis(2-chloroethoxy)methane	360	BQL
Bis(2-chloroethyl)ether	360	BQL
Bis(2-chloroisopropyl)ether	360	BQL
Bis(2-ethylhexyl)phthalate	360	BQL
4-bromophenyl phenyl ether	360	BQL
Butylbenzylphthalate	360	BQL
4-Chloroaniline	360	BQL
4-Chloro-3-methylphenol	360	BQL
2-Chloronaphthalene	360	BQL
2-Chlorophenol	360	BQL
4-Chlorophenyl phenyl ether	360	BQL
Chrysene	360	BQL
Di-n-Butylphthalate	360	BQL
Di-n-octylphthalate	360	BQL
Dibenzo[a,h]anthracene	360	BQL
Dibenzofuran	360	BQL
1,2-Dichlorobenzene	360	BQL
1,3-Dichlorobenzene	360	BQL
1,4-Dichlorobenzene	360	BQL
3,3'-Dichlorobenzidine	720	BQL
2,4-Dichlorophenol	360	BQL
Diethylphthalate	360	BQL
2,4-Dimethylphenol	360	BQL
Dimethylphthalate	360	BQL
4,6-Dinitro-2-methylphenol	1800	BQL
2,4-Dinitrophenol	1800	BQL
2,4-Dinitrotoluene	360	BQL
2,6-Dinitrotoluene	360	BQL
Fluoranthene	360	BQL
Fluorene	360	BQL
Hexachlorobenzene	360	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB-05
Client Project ID: BB-52/SB-70
Lab Sample ID: 31450
Lab Project ID: G128-830
Matrix: Soil

%Solids: 82.9

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Hexachlorobutadiene	360	BQL
Hexachlorocyclopentadiene	720	BQL
Hexachloroethane	360	BQL
Indeno(1,2,3-c,d)pyrene	360	BQL
Isophorone	360	BQL
2-Methylnaphthalene	360	BQL
2-Methylphenol	360	BQL
3- & 4-Methylphenol	360	BQL
N-Nitrosodi-n-propylamine	360	BQL
N-Nitrosodiphenylamine	360	BQL
Naphthalene	360	BQL
2-Nitroaniline	360	BQL
3-Nitroaniline	360	BQL
4-Nitroaniline	360	BQL
Nitrobenzene	360	BQL
2-Nitrophenol	360	BQL
4-Nitrophenol	1800	BQL
Pentachlorophenol	1800	BQL
Phenanthrene	360	BQL
Phenol	360	BQL
Pyrene	360	BQL
1,2,4-Trichlorobenzene	360	BQL
2,4,5-Trichlorophenol	360	BQL
2,4,6-Trichlorophenol	360	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.6	96
2-Fluorophenol	10	10.1	101
Nitrobenzene-d5	10	10.0	100
Phenol-d6	10	9.0	90
2,4,6-Tribromophenol	10	10.2	102
4-Terphenyl-d14	10	10.6	106

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: hpa

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB-04
Client Project ID: BB-52/SB-70
Lab Sample ID: 31451
Lab Project ID: G128-830
Matrix: Soil

%Solids: 88.0

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acenaphthene	350	BQL
Acenaphthylene	350	BQL
Anthracene	350	BQL
Benzo[a]anthracene	350	BQL
Benzo[a]pyrene	350	BQL
Benzo[b]fluoranthene	350	BQL
Benzo[g,h,i]perylene	350	BQL
Benzo[k]fluoranthene	350	BQL
Benzoic Acid	700	BQL
Bis(2-chloroethoxy)methane	350	BQL
Bis(2-chloroethyl)ether	350	BQL
Bis(2-chloroisopropyl)ether	350	BQL
Bis(2-ethylhexyl)phthalate	350	BQL
4-bromophenyl phenyl ether	350	BQL
Butylbenzylphthalate	350	BQL
4-Chloroaniline	350	BQL
4-Chloro-3-methylphenol	350	BQL
2-Chloronaphthalene	350	BQL
2-Chlorophenol	350	BQL
4-Chlorophenyl phenyl ether	350	BQL
Chrysene	350	BQL
Di-n-Butylphthalate	350	BQL
Di-n-octylphthalate	350	BQL
Dibenzo[a,h]anthracene	350	BQL
Dibenzofuran	350	BQL
1,2-Dichlorobenzene	350	BQL
1,3-Dichlorobenzene	350	BQL
1,4-Dichlorobenzene	350	BQL
3,3'-Dichlorobenzidine	700	BQL
2,4-Dichlorophenol	350	BQL
Diethylphthalate	350	BQL
2,4-Dimethylphenol	350	BQL
Dimethylphthalate	350	BQL
4,6-Dinitro-2-methylphenol	1800	BQL
2,4-Dinitrophenol	1800	BQL
2,4-Dinitrotoluene	350	BQL
2,6-Dinitrotoluene	350	BQL
Fluoranthene	350	BQL
Fluorene	350	BQL
Hexachlorobenzene	350	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB-04
Client Project ID: BB-52/SB-70
Lab Sample ID: 31451
Lab Project ID: G128-830
Matrix: Soil

%Solids: 88.0

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Hexachlorobutadiene	350	BQL
Hexachlorocyclopentadiene	700	BQL
Hexachloroethane	350	BQL
Indeno(1,2,3-c,d)pyrene	350	BQL
Isophorone	350	BQL
2-Methylnaphthalene	350	BQL
2-Methylphenol	350	BQL
3- & 4-Methylphenol	350	BQL
N-Nitrosodi-n-propylamine	350	BQL
N-Nitrosodiphenylamine	350	BQL
Naphthalene	350	BQL
2-Nitroaniline	350	BQL
3-Nitroaniline	350	BQL
4-Nitroaniline	350	BQL
Nitrobenzene	350	BQL
2-Nitrophenol	350	BQL
4-Nitrophenol	1800	BQL
Pentachlorophenol	1800	BQL
Phenanthrene	350	BQL
Phenol	350	BQL
Pyrene	350	BQL
1,2,4-Trichlorobenzene	350	BQL
2,4,5-Trichlorophenol	350	BQL
2,4,6-Trichlorophenol	350	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.6	96
2-Fluorophenol	10	10.4	104
Nitrobenzene-d5	10	10.0	100
Phenol-d6	10	9.2	92
2,4,6-Tribromophenol	10	10.5	105
4-Terphenyl-d14	10	10.8	108

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: MRC

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB-03
Client Project ID: BB-52/SB-70
Lab Sample ID: 31452
Lab Project ID: G128-830
Matrix: Soil

%Solids: 85.7

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acenaphthene	360	BQL
Acenaphthylene	360	BQL
Anthracene	360	BQL
Benzo[a]anthracene	360	BQL
Benzo[a]pyrene	360	BQL
Benzo[b]fluoranthene	360	BQL
Benzo[g,h,i]perylene	360	BQL
Benzo[k]fluoranthene	360	BQL
Benzoic Acid	720	BQL
Bis(2-chloroethoxy)methane	360	BQL
Bis(2-chloroethyl)ether	360	BQL
Bis(2-chloroisopropyl)ether	360	BQL
Bis(2-ethylhexyl)phthalate	360	BQL
4-bromophenyl phenyl ether	360	BQL
Butylbenzylphthalate	360	BQL
4-Chloroaniline	360	BQL
4-Chloro-3-methylphenol	360	BQL
2-Chloronaphthalene	360	BQL
2-Chlorophenol	360	BQL
4-Chlorophenyl phenyl ether	360	BQL
Chrysene	360	BQL
Di-n-Butylphthalate	360	BQL
Di-n-octylphthalate	360	BQL
Dibenzo[a,h]anthracene	360	BQL
Dibenzofuran	360	BQL
1,2-Dichlorobenzene	360	BQL
1,3-Dichlorobenzene	360	BQL
1,4-Dichlorobenzene	360	BQL
3,3'-Dichlorobenzidine	720	BQL
2,4-Dichlorophenol	360	BQL
Diethylphthalate	360	BQL
2,4-Dimethylphenol	360	BQL
Dimethylphthalate	360	BQL
4,6-Dinitro-2-methylphenol	1800	BQL
2,4-Dinitrophenol	1800	BQL
2,4-Dinitrotoluene	360	BQL
2,6-Dinitrotoluene	360	BQL
Fluoranthene	360	BQL
Fluorene	360	BQL
Hexachlorobenzene	360	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB-03
Client Project ID: BB-52/SB-70
Lab Sample ID: 31452
Lab Project ID: G128-830
Matrix: Soil

%Solids: 85.7

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Hexachlorobutadiene	360	BQL
Hexachlorocyclopentadiene	720	BQL
Hexachloroethane	360	BQL
Indeno(1,2,3-c,d)pyrene	360	BQL
Isophorone	360	BQL
2-Methylnaphthalene	360	BQL
2-Methylphenol	360	BQL
3- & 4-Methylphenol	360	BQL
N-Nitrosodi-n-propylamine	360	BQL
N-Nitrosodiphenylamine	360	BQL
Naphthalene	360	BQL
2-Nitroaniline	360	BQL
3-Nitroaniline	360	BQL
4-Nitroaniline	360	BQL
Nitrobenzene	360	BQL
2-Nitrophenol	360	BQL
4-Nitrophenol	1800	BQL
Pentachlorophenol	1800	BQL
Phenanthrene	360	BQL
Phenol	360	BQL
Pyrene	360	BQL
1,2,4-Trichlorobenzene	360	BQL
2,4,5-Trichlorophenol	360	BQL
2,4,6-Trichlorophenol	360	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.7	97
2-Fluorophenol	10	10.1	101
Nitrobenzene-d5	10	10.3	103
Phenol-d6	10	9.2	92
2,4,6-Tribromophenol	10	10.4	104
4-Terphenyl-d14	10	10.0	100

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB-01
Client Project ID: BB-52/SB-70
Lab Sample ID: 31453
Lab Project ID: G128-830
Matrix: Soil

%Solids: 83.1

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Acenaphthene	390	BQL
Acenaphthylene	390	BQL
Anthracene	390	BQL
Benzo[a]anthracene	390	BQL
Benzo[a]pyrene	390	BQL
Benzo[b]fluoranthene	390	BQL
Benzo[g,h,i]perylene	390	BQL
Benzo[k]fluoranthene	390	BQL
Benzoic Acid	770	BQL
Bis(2-chloroethoxy)methane	390	BQL
Bis(2-chloroethyl)ether	390	BQL
Bis(2-chloroisopropyl)ether	390	BQL
Bis(2-ethylhexyl)phthalate	390	BQL
4-bromophenyl phenyl ether	390	BQL
Butylbenzylphthalate	390	BQL
4-Chloroaniline	390	BQL
4-Chloro-3-methylphenol	390	BQL
2-Chloronaphthalene	390	BQL
2-Chlorophenol	390	BQL
4-Chlorophenyl phenyl ether	390	BQL
Chrysene	390	BQL
Di-n-Butylphthalate	390	BQL
Di-n-octylphthalate	390	BQL
Dibenzo[a,h]anthracene	390	BQL
Dibenzofuran	390	BQL
1,2-Dichlorobenzene	390	BQL
1,3-Dichlorobenzene	390	BQL
1,4-Dichlorobenzene	390	BQL
3,3'-Dichlorobenzidine	770	BQL
2,4-Dichlorophenol	390	BQL
Diethylphthalate	390	BQL
2,4-Dimethylphenol	390	BQL
Dimethylphthalate	390	BQL
4,6-Dinitro-2-methylphenol	1900	BQL
2,4-Dinitrophenol	1900	BQL
2,4-Dinitrotoluene	390	BQL
2,6-Dinitrotoluene	390	BQL
Fluoranthene	390	BQL
Fluorene	390	BQL
Hexachlorobenzene	390	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB-01
Client Project ID: BB-52/SB-70
Lab Sample ID: 31453
Lab Project ID: G128-830
Matrix: Soil

%Solids: 83.1

Date Collected: 11/2/2001
Date Received: 11/2/2001
Date Analyzed: 11/15/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/KG)	Result (ug/KG)
Hexachlorobutadiene	390	BQL
Hexachlorocyclopentadiene	770	BQL
Hexachloroethane	390	BQL
Indeno(1,2,3-c,d)pyrene	390	BQL
Isophorone	390	BQL
2-Methylnaphthalene	390	BQL
2-Methylphenol	390	BQL
3- & 4-Methylphenol	390	BQL
N-Nitrosodi-n-propylamine	390	BQL
N-Nitrosodiphenylamine	390	BQL
Naphthalene	390	BQL
2-Nitroaniline	390	BQL
3-Nitroaniline	390	BQL
4-Nitroaniline	390	BQL
Nitrobenzene	390	BQL
2-Nitrophenol	390	BQL
4-Nitrophenol	1900	BQL
Pentachlorophenol	1900	BQL
Phenanthrene	390	BQL
Phenol	390	BQL
Pyrene	390	BQL
1,2,4-Trichlorobenzene	390	BQL
2,4,5-Trichlorophenol	390	BQL
2,4,6-Trichlorophenol	390	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.3	93
2-Fluorophenol	10	10.2	102
Nitrobenzene-d5	10	9.6	96
Phenol-d6	10	9.2	92
2,4,6-Tribromophenol	10	10.3	103
4-Terphenyl-d14	10	10.0	100

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: mm

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-06
Client Project ID: BB-52/SB-70
Lab Sample ID: 31444
Lab Project ID: G128-830
Matrix: Soil

Date Analyzed: 11/8/01
Analyzed By: RNP
Date Collected: 11/2/01
Date Received: 11/2/01
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.063	BQL
Acrolein	0.13	BQL
Acrylonitrile	0.13	BQL
Benzene	0.0063	BQL
Bromobenzene	0.0063	BQL
Bromochloromethane	0.0063	BQL
Bromodichloromethane	0.0063	BQL
Bromoform	0.0063	BQL
Bromomethane	0.0063	BQL
2-Butanone	0.031	BQL
n-Butylbenzene	0.0063	BQL
sec-Butylbenzene	0.0063	BQL
tert-Butylbenzene	0.0063	BQL
Carbon disulfide	0.0063	BQL
Carbon tetrachloride	0.0063	BQL
Chlorobenzene	0.0063	BQL
Chloroethane	0.0063	BQL
Chloroform	0.0063	BQL
Chloromethane	0.0063	BQL
2-Chlorotoluene	0.0063	BQL
4-Chlorotoluene	0.0063	BQL
Dibromochloromethane	0.0063	BQL
1,2-Dibromo-3-chloropropane	0.0063	BQL
Dibromomethane	0.0063	BQL
1,2-Dibromoethane (EDB)	0.0063	BQL
1,2-Dichlorobenzene	0.0063	BQL
1,3-Dichlorobenzene	0.0063	BQL
1,4-Dichlorobenzene	0.0063	BQL
trans-1,4-Dichloro-2-butene	0.0063	BQL
1,1-Dichloroethane	0.0063	BQL
1,1-Dichloroethene	0.0063	BQL
1,2-Dichloroethane	0.0063	BQL
cis-1,2-Dichloroethene	0.0063	BQL
trans-1,2-dichloroethene	0.0063	BQL
1,2-Dichloropropane	0.0063	BQL
1,3-Dichloropropane	0.0063	BQL
2,2-Dichloropropane	0.0063	BQL
1,1-Dichloropropene	0.0063	BQL
cis-1,3-Dichloropropene	0.0063	BQL
trans-1,3-Dichloropropene	0.0063	BQL
Dichlorodifluoromethane	0.0063	BQL
Diisopropyl ether (DIPE)	0.0063	BQL
Ethylbenzene	0.0063	BQL
Hexachlorobutadiene	0.0063	BQL
2-Hexanone	0.0063	BQL

Reviewed by: ma

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-06
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31444
 Lab Project ID: G128-830
 Matrix: Soil

%Solids: 79.7

Date Analyzed: 11/8/01
 Analyzed By: RNP
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Iodomethane	0.0063	BQL
Isopropylbenzene	0.0063	BQL
4-Isopropyltoluene	0.0063	BQL
Methylene chloride	0.025	BQL
4-Methyl-2-pentanone	0.0063	BQL
Methyl-tert-butyl ether (MTBE)	0.0063	BQL
Naphthalene	0.0063	BQL
n-Propyl benzene	0.0063	BQL
Styrene	0.0063	BQL
1,1,1,2-Tetrachloroethane	0.0063	BQL
1,1,2,2-Tetrachloroethane	0.0063	BQL
Tetrachloroethene	0.0063	BQL
Toluene	0.0063	BQL
1,2,3-Trichlorobenzene	0.0063	BQL
1,2,4-Trichlorobenzene	0.0063	BQL
Trichloroethene	0.0063	BQL
1,1,1-Trichloroethane	0.0063	BQL
1,1,2-Trichloroethane	0.0063	BQL
Trichlorofluoromethane	0.0063	BQL
1,2,3-Trichloropropane	0.0063	BQL
1,2,4-Trimethylbenzene	0.0063	BQL
1,3,5-Trimethylbenzene	0.0063	BQL
Vinyl chloride	0.0063	BQL
m,p-Xylene	0.013	BQL
o-Xylene	0.0063	BQL

Surrogate Spike Recoveries	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Compound			
Bromofluorobenzene	50	48.8	98
1,2-Dichloroethane-d4	50	46.4	93
Toluene-d8	50	48.7	97

Comments:

All results are corrected for dilution.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-08 Dup
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31445
 Lab Project ID: G128-830
 Matrix: Soil

%Solids: 80.3

Date Analyzed: 11/9/01
 Analyzed By: RNP
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.062	BQL
Acrolein	0.12	BQL
Acrylonitrile	0.12	BQL
Benzene	0.0062	BQL
Bromobenzene	0.0062	BQL
Bromochloromethane	0.0062	BQL
Bromodichloromethane	0.0062	BQL
Bromoform	0.0062	BQL
Bromomethane	0.0062	BQL
2-Butanone	0.031	BQL
n-Butylbenzene	0.0062	BQL
sec-Butylbenzene	0.0062	BQL
tert-Butylbenzene	0.0062	BQL
Carbon disulfide	0.0062	BQL
Carbon tetrachloride	0.0062	BQL
Chlorobenzene	0.0062	BQL
Chloroethane	0.0062	BQL
Chloroform	0.0062	BQL
Chloromethane	0.0062	BQL
2-Chlorotoluene	0.0062	BQL
4-Chlorotoluene	0.0062	BQL
Dibromochloromethane	0.0062	BQL
1,2-Dibromo-3-chloropropane	0.0062	BQL
Dibromomethane	0.0062	BQL
1,2-Dibromoethane (EDB)	0.0062	BQL
1,2-Dichlorobenzene	0.0062	BQL
1,3-Dichlorobenzene	0.0062	BQL
1,4-Dichlorobenzene	0.0062	BQL
trans-1,4-Dichloro-2-butene	0.0062	BQL
1,1-Dichloroethane	0.0062	BQL
1,1-Dichloroethene	0.0062	BQL
1,2-Dichloroethane	0.0062	BQL
cis-1,2-Dichloroethene	0.0062	BQL
trans-1,2-dichloroethene	0.0062	BQL
1,2-Dichloropropane	0.0062	BQL
1,3-Dichloropropane	0.0062	BQL
2,2-Dichloropropane	0.0062	BQL
1,1-Dichloropropene	0.0062	BQL
cis-1,3-Dichloropropene	0.0062	BQL
trans-1,3-Dichloropropene	0.0062	BQL
Dichlorodifluoromethane	0.0062	BQL
Diisopropyl ether (DIPE)	0.0062	BQL
Ethylbenzene	0.0062	BQL
Hexachlorobutadiene	0.0062	BQL
2-Hexanone	0.0062	BQL

Reviewed by: MA

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-08 Dup
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31445
 Lab Project ID: G128-830

Date Analyzed: 11/9/01
 Analyzed By: RNP
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Matrix: Soil %Solids: 80.3

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Iodomethane	0.0062	BQL
Isopropylbenzene	0.0062	BQL
4-Isopropyltoluene	0.0062	BQL
Methylene chloride	0.025	BQL
4-Methyl-2-pentanone	0.0062	BQL
Methyl-tert-butyl ether (MTBE)	0.0062	BQL
Naphthalene	0.0062	BQL
n-Propyl benzene	0.0062	BQL
Styrene	0.0062	BQL
1,1,1,2-Tetrachloroethane	0.0062	BQL
1,1,2,2-Tetrachloroethane	0.0062	BQL
Tetrachloroethene	0.0062	BQL
Toluene	0.0062	BQL
1,2,3-Trichlorobenzene	0.0062	BQL
1,2,4-Trichlorobenzene	0.0062	BQL
Trichloroethene	0.0062	BQL
1,1,1-Trichloroethane	0.0062	BQL
1,1,2-Trichloroethane	0.0062	BQL
Trichlorofluoromethane	0.0062	BQL
1,2,3-Trichloropropane	0.0062	BQL
1,2,4-Trimethylbenzene	0.0062	BQL
1,3,5-Trimethylbenzene	0.0062	BQL
Vinyl chloride	0.0062	BQL
m,p-Xylene	0.012	BQL
o-Xylene	0.0062	BQL

Surrogate Spike Recoveries	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Compound			
Bromofluorobenzene	50	47.9	96
1,2-Dichloroethane-d4	50	47.6	95
Toluene-d8	50	48.9	98

Comments:

All results are corrected for dilution.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-08
Client Project ID: BB-52/SB-70
Lab Sample ID: 31446
Lab Project ID: G128-830

Date Analyzed: 11/9/01
Analyzed By: RNP
Date Collected: 11/2/01
Date Received: 11/2/01
Dilution: 1

Matrix: Soil %Solids: 82.4

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.061	BQL
Acrolein	0.12	BQL
Acrylonitrile	0.12	BQL
Benzene	0.0061	BQL
Bromobenzene	0.0061	BQL
Bromochloromethane	0.0061	BQL
Bromodichloromethane	0.0061	BQL
Bromoform	0.0061	BQL
Bromomethane	0.0061	BQL
2-Butanone	0.03	BQL
n-Butylbenzene	0.0061	BQL
sec-Butylbenzene	0.0061	BQL
tert-Butylbenzene	0.0061	BQL
Carbon disulfide	0.0061	BQL
Carbon tetrachloride	0.0061	BQL
Chlorobenzene	0.0061	BQL
Chloroethane	0.0061	BQL
Chloroform	0.0061	BQL
Chloromethane	0.0061	BQL
2-Chlorotoluene	0.0061	BQL
4-Chlorotoluene	0.0061	BQL
Dibromochloromethane	0.0061	BQL
1,2-Dibromo-3-chloropropane	0.0061	BQL
Dibromomethane	0.0061	BQL
1,2-Dibromoethane (EDB)	0.0061	BQL
1,2-Dichlorobenzene	0.0061	BQL
1,3-Dichlorobenzene	0.0061	BQL
1,4-Dichlorobenzene	0.0061	BQL
trans-1,4-Dichloro-2-butene	0.0061	BQL
1,1-Dichloroethane	0.0061	BQL
1,1-Dichloroethene	0.0061	BQL
1,2-Dichloroethane	0.0061	BQL
cis-1,2-Dichloroethene	0.0061	BQL
trans-1,2-dichloroethene	0.0061	BQL
1,2-Dichloropropane	0.0061	BQL
1,3-Dichloropropane	0.0061	BQL
2,2-Dichloropropane	0.0061	BQL
1,1-Dichloropropene	0.0061	BQL
cis-1,3-Dichloropropene	0.0061	BQL
trans-1,3-Dichloropropene	0.0061	BQL
Dichlorodifluoromethane	0.0061	BQL
Diisopropyl ether (DIPE)	0.0061	BQL
Ethylbenzene	0.0061	BQL
Hexachlorobutadiene	0.0061	BQL
2-Hexanone	0.0061	BQL

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-08
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31446
 Lab Project ID: G128-830

Date Analyzed: 11/9/01
 Analyzed By: RNP
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Matrix: Soil %Solids: 82.4

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Iodomethane	0.0061	BQL
Isopropylbenzene	0.0061	BQL
4-Isopropyltoluene	0.0061	BQL
Methylene chloride	0.024	BQL
4-Methyl-2-pentanone	0.0061	BQL
Methyl-tert-butyl ether (MTBE)	0.0061	BQL
Naphthalene	0.0061	BQL
n-Propyl benzene	0.0061	BQL
Styrene	0.0061	BQL
1,1,1,2-Tetrachloroethane	0.0061	BQL
1,1,2,2-Tetrachloroethane	0.0061	BQL
Tetrachloroethene	0.0061	BQL
Toluene	0.0061	BQL
1,2,3-Trichlorobenzene	0.0061	BQL
1,2,4-Trichlorobenzene	0.0061	BQL
Trichloroethene	0.0061	BQL
1,1,1-Trichloroethane	0.0061	BQL
1,1,2-Trichloroethane	0.0061	BQL
Trichlorofluoromethane	0.0061	BQL
1,2,3-Trichloropropane	0.0061	BQL
1,2,4-Trimethylbenzene	0.0061	BQL
1,3,5-Trimethylbenzene	0.0061	BQL
Vinyl chloride	0.0061	BQL
m-,p-Xylene	0.012	BQL
o-Xylene	0.0061	BQL

Surrogate Spike Recoveries	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Compound			
Bromofluorobenzene	50	47.2	94
1,2-Dichloroethane-d4	50	49.2	98
Toluene-d8	50	48.6	97

Comments:

All results are corrected for dilution.

Reviewed by: Man

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: MW-02
Client Project ID: BB-52/SB-70
Lab Sample ID: 31447
Lab Project ID: G128-830

Date Analyzed: 11/10/01
Analyzed By: EKR
Date Collected: 11/2/01
Date Received: 11/2/01
Dilution: 1

Matrix: Soil

%Solids: 84.4

Compound	Quantitation	Result
	Limit (mg/KG)	(mg/KG)
Acetone	0.059	BQL
Acrolein	0.12	BQL
Acrylonitrile	0.12	BQL
Benzene	0.0059	BQL
Bromobenzene	0.0059	BQL
Bromochloromethane	0.0059	BQL
Bromodichloromethane	0.0059	BQL
Bromoform	0.0059	BQL
Bromomethane	0.0059	BQL
2-Butanone	0.03	BQL
n-Butylbenzene	0.0059	BQL
sec-Butylbenzene	0.0059	BQL
tert-Butylbenzene	0.0059	BQL
Carbon disulfide	0.0059	BQL
Carbon tetrachloride	0.0059	BQL
Chlorobenzene	0.0059	BQL
Chloroethane	0.0059	BQL
Chloroform	0.0059	BQL
Chloromethane	0.0059	BQL
2-Chlorotoluene	0.0059	BQL
4-Chlorotoluene	0.0059	BQL
Dibromochloromethane	0.0059	BQL
1,2-Dibromo-3-chloropropane	0.0059	BQL
Dibromomethane	0.0059	BQL
1,2-Dibromoethane (EDB)	0.0059	BQL
1,2-Dichlorobenzene	0.0059	BQL
1,3-Dichlorobenzene	0.0059	BQL
1,4-Dichlorobenzene	0.0059	BQL
trans-1,4-Dichloro-2-butene	0.0059	BQL
1,1-Dichloroethane	0.0059	BQL
1,1-Dichloroethene	0.0059	BQL
1,2-Dichloroethane	0.0059	BQL
cis-1,2-Dichloroethene	0.0059	BQL
trans-1,2-dichloroethene	0.0059	BQL
1,2-Dichloropropane	0.0059	BQL
1,3-Dichloropropane	0.0059	BQL
2,2-Dichloropropane	0.0059	BQL
1,1-Dichloropropene	0.0059	BQL
cis-1,3-Dichloropropene	0.0059	BQL
trans-1,3-Dichloropropene	0.0059	BQL
Dichlorodifluoromethane	0.0059	BQL
Diisopropyl ether (DIPE)	0.0059	BQL
Ethylbenzene	0.0059	BQL
Hexachlorobutadiene	0.0059	BQL
2-Hexanone	0.0059	BQL

Reviewed by: ma

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: MW-02
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31447
 Lab Project ID: G128-830

Date Analyzed: 11/10/01
 Analyzed By: EKR
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Matrix: Soil %Solids: 84.4

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Iodomethane	0.0059	BQL
Isopropylbenzene	0.0059	BQL
4-Isopropyltoluene	0.0059	BQL
Methylene chloride	0.024	BQL
4-Methyl-2-pentanone	0.0059	BQL
Methyl-tert-butyl ether (MTBE)	0.0059	BQL
Naphthalene	0.0059	BQL
n-Propyl benzene	0.0059	BQL
Styrene	0.0059	BQL
1,1,1,2-Tetrachloroethane	0.0059	BQL
1,1,2,2-Tetrachloroethane	0.0059	BQL
Tetrachloroethene	0.0059	BQL
Toluene	0.0059	BQL
1,2,3-Trichlorobenzene	0.0059	BQL
1,2,4-Trichlorobenzene	0.0059	BQL
Trichloroethene	0.0059	BQL
1,1,1-Trichloroethane	0.0059	BQL
1,1,2-Trichloroethane	0.0059	BQL
Trichlorofluoromethane	0.0059	BQL
1,2,3-Trichloropropane	0.0059	BQL
1,2,4-Trimethylbenzene	0.0059	BQL
1,3,5-Trimethylbenzene	0.0059	BQL
Vinyl chloride	0.0059	BQL
m-,p-Xylene	0.012	BQL
o-Xylene	0.0059	BQL

Surrogate Spike Recoveries

Compound	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Bromofluorobenzene	50	47.7	95
1,2-Dichloroethane-d4	50	50.9	102
Toluene-d8	50	48.9	98

Comments:

All results are corrected for dilution.

Reviewed by: Ma

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: MW-01
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31448
 Lab Project ID: G128-830

Date Analyzed: 11/11/01
 Analyzed By: RNP
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Matrix: Soil %Solids: 77.4

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.065	BQL
Acrolein	0.13	BQL
Acrylonitrile	0.13	BQL
Benzene	0.0065	BQL
Bromobenzene	0.0065	BQL
Bromochloromethane	0.0065	BQL
Bromodichloromethane	0.0065	BQL
Bromoform	0.0065	BQL
Bromomethane	0.0065	BQL
2-Butanone	0.032	BQL
n-Butylbenzene	0.0065	BQL
sec-Butylbenzene	0.0065	BQL
tert-Butylbenzene	0.0065	BQL
Carbon disulfide	0.0065	BQL
Carbon tetrachloride	0.0065	BQL
Chlorobenzene	0.0065	BQL
Chloroethane	0.0065	BQL
Chloroform	0.0065	BQL
Chloromethane	0.0065	BQL
2-Chlorotoluene	0.0065	BQL
4-Chlorotoluene	0.0065	BQL
Dibromochloromethane	0.0065	BQL
1,2-Dibromo-3-chloropropane	0.0065	BQL
Dibromomethane	0.0065	BQL
1,2-Dibromoethane (EDB)	0.0065	BQL
1,2-Dichlorobenzene	0.0065	BQL
1,3-Dichlorobenzene	0.0065	BQL
1,4-Dichlorobenzene	0.0065	BQL
trans-1,4-Dichloro-2-butene	0.0065	BQL
1,1-Dichloroethane	0.0065	BQL
1,1-Dichloroethene	0.0065	BQL
1,2-Dichloroethane	0.0065	BQL
cis-1,2-Dichloroethene	0.0065	BQL
trans-1,2-dichloroethene	0.0065	BQL
1,2-Dichloropropane	0.0065	BQL
1,3-Dichloropropane	0.0065	BQL
2,2-Dichloropropane	0.0065	BQL
1,1-Dichloropropene	0.0065	BQL
cis-1,3-Dichloropropene	0.0065	BQL
trans-1,3-Dichloropropene	0.0065	BQL
Dichlorodifluoromethane	0.0065	BQL
Diisopropyl ether (DIPE)	0.0065	BQL
Ethylbenzene	0.0065	BQL
Hexachlorobutadiene	0.0065	BQL
2-Hexanone	0.0065	BQL

Reviewed by: mw

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

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PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: MW-01
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31448
 Lab Project ID: G128-830

Date Analyzed: 11/11/01
 Analyzed By: RNP
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Matrix: Soil %Solids: 77.4

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Iodomethane	0.0065	BQL
Isopropylbenzene	0.0065	BQL
4-Isopropyltoluene	0.0065	BQL
Methylene chloride	0.026	BQL
4-Methyl-2-pentanone	0.0065	BQL
Methyl-tert-butyl ether (MTBE)	0.0065	BQL
Naphthalene	0.0065	BQL
n-Propyl benzene	0.0065	BQL
Styrene	0.0065	BQL
1,1,1,2-Tetrachloroethane	0.0065	BQL
1,1,2,2-Tetrachloroethane	0.0065	BQL
Tetrachloroethene	0.0065	BQL
Toluene	0.0065	BQL
1,2,3-Trichlorobenzene	0.0065	BQL
1,2,4-Trichlorobenzene	0.0065	BQL
Trichloroethene	0.0065	BQL
1,1,1-Trichloroethane	0.0065	BQL
1,1,2-Trichloroethane	0.0065	BQL
Trichlorofluoromethane	0.0065	BQL
1,2,3-Trichloropropane	0.0065	BQL
1,2,4-Trimethylbenzene	0.0065	BQL
1,3,5-Trimethylbenzene	0.0065	BQL
Vinyl chloride	0.0065	BQL
m-,p-Xylene	0.013	BQL
o-Xylene	0.0065	BQL

Surrogate Spike Recoveries	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Compound			
Bromofluorobenzene	50	49.6	99
1,2-Dichloroethane-d4	50	47.9	96
Toluene-d8	50	48.9	98

Comments:

All results are corrected for dilution.

Reviewed by: mw

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-07
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31449
 Lab Project ID: G128-830
 Matrix: Soil

Date Analyzed: 11/11/01
 Analyzed By: RNP
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.06	BQL
Acrolein	0.12	BQL
Acrylonitrile	0.12	BQL
Benzene	0.006	BQL
Bromobenzene	0.006	BQL
Bromochloromethane	0.006	BQL
Bromodichloromethane	0.006	BQL
Bromoform	0.006	BQL
Bromomethane	0.006	BQL
2-Butanone	0.03	BQL
n-Butylbenzene	0.006	BQL
sec-Butylbenzene	0.006	BQL
tert-Butylbenzene	0.006	BQL
Carbon disulfide	0.006	BQL
Carbon tetrachloride	0.006	BQL
Chlorobenzene	0.006	BQL
Chloroethane	0.006	BQL
Chloroform	0.006	BQL
Chloromethane	0.006	BQL
2-Chlorotoluene	0.006	BQL
4-Chlorotoluene	0.006	BQL
Dibromochloromethane	0.006	BQL
1,2-Dibromo-3-chloropropane	0.006	BQL
Dibromomethane	0.006	BQL
1,2-Dibromoethane (EDB)	0.006	BQL
1,2-Dichlorobenzene	0.006	BQL
1,3-Dichlorobenzene	0.006	BQL
1,4-Dichlorobenzene	0.006	BQL
trans-1,4-Dichloro-2-butene	0.006	BQL
1,1-Dichloroethane	0.006	BQL
1,1-Dichloroethene	0.006	BQL
1,2-Dichloroethane	0.006	BQL
cis-1,2-Dichloroethene	0.006	BQL
trans-1,2-dichloroethene	0.006	BQL
1,2-Dichloropropane	0.006	BQL
1,3-Dichloropropane	0.006	BQL
2,2-Dichloropropane	0.006	BQL
1,1-Dichloropropene	0.006	BQL
cis-1,3-Dichloropropene	0.006	BQL
trans-1,3-Dichloropropene	0.006	BQL
Dichlorodifluoromethane	0.006	BQL
Diisopropyl ether (DIPE)	0.006	BQL
Ethylbenzene	0.006	BQL
Hexachlorobutadiene	0.006	BQL
2-Hexanone	0.006	BQL

Reviewed by: MA

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-07
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31449
 Lab Project ID: G128-830
 Matrix: Soil

%Solids: 83.5

Date Analyzed: 11/11/01
 Analyzed By: RNP
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Iodomethane	0.006	BQL
Isopropylbenzene	0.006	BQL
4-Isopropyltoluene	0.006	BQL
Methylene chloride	0.024	BQL
4-Methyl-2-pentanone	0.006	BQL
Methyl-tert-butyl ether (MTBE)	0.006	BQL
Naphthalene	0.006	BQL
n-Propyl benzene	0.006	BQL
Styrene	0.006	BQL
1,1,1,2-Tetrachloroethane	0.006	BQL
1,1,2,2-Tetrachloroethane	0.006	BQL
Tetrachloroethene	0.006	BQL
Toluene	0.006	BQL
1,2,3-Trichlorobenzene	0.006	BQL
1,2,4-Trichlorobenzene	0.006	BQL
Trichloroethene	0.006	BQL
1,1,1-Trichloroethane	0.006	BQL
1,1,2-Trichloroethane	0.006	BQL
Trichlorofluoromethane	0.006	BQL
1,2,3-Trichloropropane	0.006	BQL
1,2,4-Trimethylbenzene	0.006	BQL
1,3,5-Trimethylbenzene	0.006	BQL
Vinyl chloride	0.006	BQL
m-,p-Xylene	0.012	BQL
o-Xylene	0.006	BQL

Surrogate Spike Recoveries	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Compound			
Bromofluorobenzene	50	48.8	98
1,2-Dichloroethane-d4	50	48.7	97
Toluene-d8	50	48.9	98

Comments:

All results are corrected for dilution.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-05
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31450
 Lab Project ID: G128-830

Date Analyzed: 11/11/01
 Analyzed By: RNP
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Matrix: Soil %Solids: 82.9

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.06	BQL
Acrolein	0.12	BQL
Acrylonitrile	0.12	BQL
Benzene	0.006	BQL
Bromobenzene	0.006	BQL
Bromochloromethane	0.006	BQL
Bromodichloromethane	0.006	BQL
Bromoform	0.006	BQL
Bromomethane	0.006	BQL
2-Butanone	0.03	BQL
n-Butylbenzene	0.006	BQL
sec-Butylbenzene	0.006	BQL
tert-Butylbenzene	0.006	BQL
Carbon disulfide	0.006	BQL
Carbon tetrachloride	0.006	BQL
Chlorobenzene	0.006	BQL
Chloroethane	0.006	BQL
Chloroform	0.006	BQL
Chloromethane	0.006	BQL
2-Chlorotoluene	0.006	BQL
4-Chlorotoluene	0.006	BQL
Dibromochloromethane	0.006	BQL
1,2-Dibromo-3-chloropropane	0.006	BQL
Dibromomethane	0.006	BQL
1,2-Dibromoethane (EDB)	0.006	BQL
1,2-Dichlorobenzene	0.006	BQL
1,3-Dichlorobenzene	0.006	BQL
1,4-Dichlorobenzene	0.006	BQL
trans-1,4-Dichloro-2-butene	0.006	BQL
1,1-Dichloroethane	0.006	BQL
1,1-Dichloroethene	0.006	BQL
1,2-Dichloroethane	0.006	BQL
cis-1,2-Dichloroethene	0.006	BQL
trans-1,2-dichloroethene	0.006	BQL
1,2-Dichloropropane	0.006	BQL
1,3-Dichloropropane	0.006	BQL
2,2-Dichloropropane	0.006	BQL
1,1-Dichloropropene	0.006	BQL
cis-1,3-Dichloropropene	0.006	BQL
trans-1,3-Dichloropropene	0.006	BQL
Dichlorodifluoromethane	0.006	BQL
Diisopropyl ether (DIPE)	0.006	BQL
Ethylbenzene	0.006	BQL
Hexachlorobutadiene	0.006	BQL
2-Hexanone	0.006	BQL

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-05
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31450
 Lab Project ID: G128-830
 Matrix: Soil

%Solids: 82.9

Date Analyzed: 11/11/01
 Analyzed By: RNP
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Iodomethane	0.006	BQL
Isopropylbenzene	0.006	BQL
4-Isopropyltoluene	0.006	BQL
Methylene chloride	0.024	BQL
4-Methyl-2-pentanone	0.006	BQL
Methyl-tert-butyl ether (MTBE)	0.006	BQL
Naphthalene	0.006	BQL
n-Propyl benzene	0.006	BQL
Styrene	0.006	BQL
1,1,1,2-Tetrachloroethane	0.006	BQL
1,1,2,2-Tetrachloroethane	0.006	BQL
Tetrachloroethene	0.006	BQL
Toluene	0.006	BQL
1,2,3-Trichlorobenzene	0.006	BQL
1,2,4-Trichlorobenzene	0.006	BQL
Trichloroethene	0.006	BQL
1,1,1-Trichloroethane	0.006	BQL
1,1,2-Trichloroethane	0.006	BQL
Trichlorofluoromethane	0.006	BQL
1,2,3-Trichloropropane	0.006	BQL
1,2,4-Trimethylbenzene	0.006	BQL
1,3,5-Trimethylbenzene	0.006	BQL
Vinyl chloride	0.006	BQL
m-,p-Xylene	0.012	BQL
o-Xylene	0.006	BQL

Surrogate Spike Recoveries

Compound	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Bromofluorobenzene	50	48.3	97
1,2-Dichloroethane-d4	50	50.4	101
Toluene-d8	50	49.0	98

Comments:

All results are corrected for dilution.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-04
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31451
 Lab Project ID: G128-830
 Matrix: Soil

%Solids: 88.0

Date Analyzed: 11/11/01
 Analyzed By: RNP
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.057	BQL
Acrolein	0.11	BQL
Acrylonitrile	0.11	BQL
Benzene	0.0057	BQL
Bromobenzene	0.0057	BQL
Bromochloromethane	0.0057	BQL
Bromodichloromethane	0.0057	BQL
Bromoform	0.0057	BQL
Bromomethane	0.0057	BQL
2-Butanone	0.028	BQL
n-Butylbenzene	0.0057	BQL
sec-Butylbenzene	0.0057	BQL
tert-Butylbenzene	0.0057	BQL
Carbon disulfide	0.0057	BQL
Carbon tetrachloride	0.0057	BQL
Chlorobenzene	0.0057	BQL
Chloroethane	0.0057	BQL
Chloroform	0.0057	BQL
Chloromethane	0.0057	BQL
2-Chlorotoluene	0.0057	BQL
4-Chlorotoluene	0.0057	BQL
Dibromochloromethane	0.0057	BQL
1,2-Dibromo-3-chloropropane	0.0057	BQL
Dibromomethane	0.0057	BQL
1,2-Dibromoethane (EDB)	0.0057	BQL
1,2-Dichlorobenzene	0.0057	BQL
1,3-Dichlorobenzene	0.0057	BQL
1,4-Dichlorobenzene	0.0057	BQL
trans-1,4-Dichloro-2-butene	0.0057	BQL
1,1-Dichloroethane	0.0057	BQL
1,1-Dichloroethene	0.0057	BQL
1,2-Dichloroethane	0.0057	BQL
cis-1,2-Dichloroethene	0.0057	BQL
trans-1,2-dichloroethene	0.0057	BQL
1,2-Dichloropropane	0.0057	BQL
1,3-Dichloropropane	0.0057	BQL
2,2-Dichloropropane	0.0057	BQL
1,1-Dichloropropene	0.0057	BQL
cis-1,3-Dichloropropene	0.0057	BQL
trans-1,3-Dichloropropene	0.0057	BQL
Dichlorodifluoromethane	0.0057	BQL
Diisopropyl ether (DIPE)	0.0057	BQL
Ethylbenzene	0.0057	BQL
Hexachlorobutadiene	0.0057	BQL
2-Hexanone	0.0057	BQL

Reviewed by: mm

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-04
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31451
 Lab Project ID: G128-830
 Matrix: Soil

%Solids: 88.0

Date Analyzed: 11/11/01
 Analyzed By: RNP
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Iodomethane	0.0057	BQL
Isopropylbenzene	0.0057	BQL
4-Isopropyltoluene	0.0057	BQL
Methylene chloride	0.023	BQL
4-Methyl-2-pentanone	0.0057	BQL
Methyl-tert-butyl ether (MTBE)	0.0057	BQL
Naphthalene	0.0057	BQL
n-Propyl benzene	0.0057	BQL
Styrene	0.0057	BQL
1,1,1,2-Tetrachloroethane	0.0057	BQL
1,1,2,2-Tetrachloroethane	0.0057	BQL
Tetrachloroethene	0.0057	BQL
Toluene	0.0057	BQL
1,2,3-Trichlorobenzene	0.0057	BQL
1,2,4-Trichlorobenzene	0.0057	BQL
Trichloroethene	0.0057	BQL
1,1,1-Trichloroethane	0.0057	BQL
1,1,2-Trichloroethane	0.0057	BQL
Trichlorofluoromethane	0.0057	BQL
1,2,3-Trichloropropane	0.0057	BQL
1,2,4-Trimethylbenzene	0.0057	BQL
1,3,5-Trimethylbenzene	0.0057	BQL
Vinyl chloride	0.0057	BQL
m-,p-Xylene	0.011	BQL
o-Xylene	0.0057	BQL

Surrogate Spike Recoveries	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Compound			
Bromofluorobenzene	50	47.5	95
1,2-Dichloroethane-d4	50	46.7	93
Toluene-d8	50	48.9	98

Comments:

All results are corrected for dilution.

Reviewed by: mw

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-03
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31452
 Lab Project ID: G128-830
 Matrix: Soil

%Solids: 85.7

Date Analyzed: 11/11/01
 Analyzed By: RNP
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.058	BQL
Acrolein	0.12	BQL
Acrylonitrile	0.12	BQL
Benzene	0.0058	BQL
Bromobenzene	0.0058	BQL
Bromochloromethane	0.0058	BQL
Bromodichloromethane	0.0058	BQL
Bromoform	0.0058	BQL
Bromomethane	0.0058	BQL
2-Butanone	0.029	BQL
n-Butylbenzene	0.0058	BQL
sec-Butylbenzene	0.0058	BQL
tert-Butylbenzene	0.0058	BQL
Carbon disulfide	0.0058	BQL
Carbon tetrachloride	0.0058	BQL
Chlorobenzene	0.0058	BQL
Chloroethane	0.0058	BQL
Chloroform	0.0058	BQL
Chloromethane	0.0058	BQL
2-Chlorotoluene	0.0058	BQL
4-Chlorotoluene	0.0058	BQL
Dibromochloromethane	0.0058	BQL
1,2-Dibromo-3-chloropropane	0.0058	BQL
Dibromomethane	0.0058	BQL
1,2-Dibromoethane (EDB)	0.0058	BQL
1,2-Dichlorobenzene	0.0058	BQL
1,3-Dichlorobenzene	0.0058	BQL
1,4-Dichlorobenzene	0.0058	BQL
trans-1,4-Dichloro-2-butene	0.0058	BQL
1,1-Dichloroethane	0.0058	BQL
1,1-Dichloroethene	0.0058	BQL
1,2-Dichloroethane	0.0058	BQL
cis-1,2-Dichloroethene	0.0058	BQL
trans-1,2-dichloroethene	0.0058	BQL
1,2-Dichloropropane	0.0058	BQL
1,3-Dichloropropane	0.0058	BQL
2,2-Dichloropropane	0.0058	BQL
1,1-Dichloropropene	0.0058	BQL
cis-1,3-Dichloropropene	0.0058	BQL
trans-1,3-Dichloropropene	0.0058	BQL
Dichlorodifluoromethane	0.0058	BQL
Diisopropyl ether (DIPE)	0.0058	BQL
Ethylbenzene	0.0058	BQL
Hexachlorobutadiene	0.0058	BQL
2-Hexanone	0.0058	BQL

Reviewed by: Mn

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-03
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31452
 Lab Project ID: G128-830
 Matrix: Soil

%Solids: 85.7

Date Analyzed: 11/11/01
 Analyzed By: RNP
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Iodomethane	0.0058	BQL
Isopropylbenzene	0.0058	BQL
4-Isopropyltoluene	0.0058	BQL
Methylene chloride	0.023	BQL
4-Methyl-2-pentanone	0.0058	BQL
Methyl-tert-butyl ether (MTBE)	0.0058	BQL
Naphthalene	0.0058	BQL
n-Propyl benzene	0.0058	BQL
Styrene	0.0058	BQL
1,1,1,2-Tetrachloroethane	0.0058	BQL
1,1,2,2-Tetrachloroethane	0.0058	BQL
Tetrachloroethene	0.0058	BQL
Toluene	0.0058	BQL
1,2,3-Trichlorobenzene	0.0058	BQL
1,2,4-Trichlorobenzene	0.0058	BQL
Trichloroethene	0.0058	BQL
1,1,1-Trichloroethane	0.0058	BQL
1,1,2-Trichloroethane	0.0058	BQL
Trichlorofluoromethane	0.0058	BQL
1,2,3-Trichloropropane	0.0058	BQL
1,2,4-Trimethylbenzene	0.0058	BQL
1,3,5-Trimethylbenzene	0.0058	BQL
Vinyl chloride	0.0058	BQL
m,p-Xylene	0.012	BQL
o-Xylene	0.0058	BQL

Surrogate Spike Recoveries	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Compound			
Bromofluorobenzene	50	48.8	98
1,2-Dichloroethane-d4	50	47.1	94
Toluene-d8	50	49.1	98

Comments:

All results are corrected for dilution.

Reviewed by: ma

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-01
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31453
 Lab Project ID: G128-830
 Matrix: Soil

%Solids: 83.1

Date Analyzed: 11/10/01
 Analyzed By: EKR
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.06	0.063
Acrolein	0.12	BQL
Acrylonitrile	0.12	BQL
Benzene	0.006	BQL
Bromobenzene	0.006	BQL
Bromochloromethane	0.006	BQL
Bromodichloromethane	0.006	BQL
Bromoform	0.006	BQL
Bromomethane	0.006	BQL
2-Butanone	0.03	BQL
n-Butylbenzene	0.006	BQL
sec-Butylbenzene	0.006	BQL
tert-Butylbenzene	0.006	BQL
Carbon disulfide	0.006	BQL
Carbon tetrachloride	0.006	BQL
Chlorobenzene	0.006	BQL
Chloroethane	0.006	BQL
Chloroform	0.006	BQL
Chloromethane	0.006	BQL
2-Chlorotoluene	0.006	BQL
4-Chlorotoluene	0.006	BQL
Dibromochloromethane	0.006	BQL
1,2-Dibromo-3-chloropropane	0.006	BQL
Dibromomethane	0.006	BQL
1,2-Dibromoethane (EDB)	0.006	BQL
1,2-Dichlorobenzene	0.006	BQL
1,3-Dichlorobenzene	0.006	BQL
1,4-Dichlorobenzene	0.006	BQL
trans-1,4-Dichloro-2-butene	0.006	BQL
1,1-Dichloroethane	0.006	BQL
1,1-Dichloroethene	0.006	BQL
1,2-Dichloroethane	0.006	BQL
cis-1,2-Dichloroethene	0.006	BQL
trans-1,2-dichloroethene	0.006	BQL
1,2-Dichloropropane	0.006	BQL
1,3-Dichloropropane	0.006	BQL
2,2-Dichloropropane	0.006	BQL
1,1-Dichloropropene	0.006	BQL
cis-1,3-Dichloropropene	0.006	BQL
trans-1,3-Dichloropropene	0.006	BQL
Dichlorodifluoromethane	0.006	BQL
Diisopropyl ether (DIPE)	0.006	BQL
Ethylbenzene	0.006	BQL
Hexachlorobutadiene	0.006	BQL
2-Hexanone	0.006	BQL

Reviewed by: hmo

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB-01
 Client Project ID: BB-52/SB-70
 Lab Sample ID: 31453
 Lab Project ID: G128-830
 Matrix: Soil

%Solids: 83.1

Date Analyzed: 11/10/01
 Analyzed By: EKR
 Date Collected: 11/2/01
 Date Received: 11/2/01
 Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Iodomethane	0.006	BQL
Isopropylbenzene	0.006	BQL
4-Isopropyltoluene	0.006	BQL
Methylene chloride	0.024	BQL
4-Methyl-2-pentanone	0.006	BQL
Methyl-tert-butyl ether (MTBE)	0.006	BQL
Naphthalene	0.006	BQL
n-Propyl benzene	0.006	BQL
Styrene	0.006	BQL
1,1,1,2-Tetrachloroethane	0.006	BQL
1,1,2,2-Tetrachloroethane	0.006	BQL
Tetrachloroethene	0.006	BQL
Toluene	0.006	BQL
1,2,3-Trichlorobenzene	0.006	BQL
1,2,4-Trichlorobenzene	0.006	BQL
Trichloroethene	0.006	BQL
1,1,1-Trichloroethane	0.006	BQL
1,1,2-Trichloroethane	0.006	BQL
Trichlorofluoromethane	0.006	BQL
1,2,3-Trichloropropane	0.006	BQL
1,2,4-Trimethylbenzene	0.006	BQL
1,3,5-Trimethylbenzene	0.006	BQL
Vinyl chloride	0.006	BQL
m-,p-Xylene	0.012	BQL
o-Xylene	0.006	BQL

Surrogate Spike Recoveries	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Compound			
Bromofluorobenzene	50	47.8	96
1,2-Dichloroethane-d4	50	48.1	96
Toluene-d8	50	48.8	98

Comments:

All results are corrected for dilution.

Reviewed by: mm

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	SB-06
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/02/01
Date Analyzed	11/09/01
Dry Weight	80
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	95
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: G128-830-31444

Reviewed By: ma

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	SB-08
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/02/01
Date Analyzed	11/09/01
Dry Weight	82
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	96
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: G128-830-31446

Reviewed By: hmn

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	MW-02
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/02/01
Date Analyzed	11/09/01
Dry Weight	84
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₈ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	96
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: G128-830-31447

Reviewed By: mw

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	MW-01
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/02/01
Date Analyzed	11/09/01
Dry Weight	77
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
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: G128-830-31448

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	SB-07
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/02/01
Date Analyzed	11/09/01
Dry Weight	83
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	96
Surrogate % Recovery - FID	99

* = 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: G128-830-31449

Reviewed By: Ma

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	SB-05
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/02/01
Date Analyzed	11/09/01
Dry Weight	83
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	94
Surrogate % Recovery - FID	97

* = 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: G128-830-31450

Reviewed By: lm

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	SB-04
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/02/01
Date Analyzed	11/09/01
Dry Weight	88
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
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: G128-830-31451

Reviewed By: mn

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	SB-03
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/02/01
Date Analyzed	11/09/01
Dry Weight	86
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
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: G128-830-31452

Reviewed By: mw

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	SB-01
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/02/01
Date Analyzed	11/09/01
Dry Weight	83
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	98
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: G128-830-31453

Reviewed By: jm

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 11/08/01

PID Initial Calibration Date: 11/08/01

Calibration Ranges and Limits

Range	MDL		ML		RL	
	(µg/L)	(mg/Kg)	(µg/L)	(mg/Kg)	(µg/L)	(mg/Kg)
C ₅ -C ₈ Aliphatics	2.4	0.12	7.5	0.38	100	10
C ₉ -C ₁₂ Aliphatics	1.3	0.065	4.0	0.21	100	10
C ₉ -C ₁₀ Aromatics	0.5	0.025	1.6	0.08	100	10

Calibration Concentration Levels

Range	Levels		%RSD or CCC	Method of Quantitation
	(µg/L)	(mg/Kg)		
C ₅ -C ₈ Aliphatics	20	2	3.9	Calibration Factor
	80	8		
	200	20		
	800	80		
	2000	200		
C ₉ -C ₁₂ Aliphatics	15	1.5	8.8	Calibration Factor
	60	6		
	150	15		
	600	60		
	1500	150		
C ₉ -C ₁₀ Aromatics	32.5	3.25	17.4	Calibration Factor
	130	13		
	325	32.5		
	1300	130		
	3250	325		

Calibration Check Date: 11/08/01

Calibration Check

Range	Levels		RPD
	(µg/L)	(mg/Kg)	
C ₅ -C ₈ Aliphatics	200	20	5.8
C ₉ -C ₁₂ Aliphatics	150	15	13.8
C ₉ -C ₁₀ Aromatics	325	32.5	-12.6

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

Reviewed By: mm

N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	SB-06
Sample Matrix	Soil
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/08/01
Date Analyzed	11/09/01
Dry Weight	79.7
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	110
Aromatic Surrogate % Recovery	110

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-830-31444

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	SB-08
Sample Matrix	Soil
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/08/01
Date Analyzed	11/09/01
Dry Weight	82.4
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	130
Aromatic Surrogate % Recovery	130

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-830-31446

Reviewed By: mm

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	MW-02
Sample Matrix	Soil
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/08/01
Date Analyzed	11/09/01
Dry Weight	84.4
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	110
Aromatic Surrogate % Recovery	110

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-830-31447

Reviewed By: MM

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	MW-01
Sample Matrix	Soil
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/08/01
Date Analyzed	11/09/01
Dry Weight	77.4
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₅ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	130
Aromatic Surrogate % Recovery	120

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-830-31448

Reviewed By:

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	SB-07
Sample Matrix	Soil
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/08/01
Date Analyzed	11/09/01
Dry Weight	83.5
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	110
Aromatic Surrogate % Recovery	120

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-830-31449

Reviewed By: mm

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	SB-05
Sample Matrix	Soil
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/08/01
Date Analyzed	11/09/01
Dry Weight	82.9
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	110
Aromatic Surrogate % Recovery	110

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-830-31450

Reviewed By: mm

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	SB-04
Sample Matrix	Soil
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/08/01
Date Analyzed	11/09/01
Dry Weight	88
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	110
Aromatic Surrogate % Recovery	110

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-830-31451

Reviewed By: MM

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	SB-03
Sample Matrix	Soil
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/08/01
Date Analyzed	11/12/01
Dry Weight	85.7
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	120
Aromatic Surrogate % Recovery	120

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-830-31452

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: BB-52/SB-70

Sample Information and Analytical Results	
Sample Identification	SB-01
Sample Matrix	Soil
Date Collected	11/02/01
Date Received	11/02/01
Date Extracted	11/08/01
Date Analyzed	11/12/01
Dry Weight	83.1
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	130
Aromatic Surrogate % Recovery	120

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-830-31453

Reviewed By: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 04/05/01

Calibration Ranges and Limits

Range	MDL (mg/Kg)	(µg/L)	ML (mg/Kg)	(µg/L)	RL (mg/Kg)	(µg/L)
C ₉ -C ₁₈ Aliphatics	0.1	2	0.3	6.5	100	10
C ₁₉ -C ₃₆ Aliphatics	0.1	1	0.3	3.1	100	10
C ₁₁ -C ₂₂ Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (µg/L) (mg/Kg)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	0.06 1	5.70	Calibration Factor
	0.15 2.5		
	0.3 5		
	0.6 10		
	1.2 20		
C ₁₉ -C ₃₆ Aliphatics	0.08 1.33	7.0	Calibration Factor
	0.2 3.33		
	0.4 6.67		
	0.8 13.3		
	1.6 26.7		
C ₁₁ -C ₂₂ Aromatics	0.12 2	3.2	Calibration Factor
	0.3 5		
	0.6 10		
	1.2 20		
	2.4 40		

Calibration Check Date: 11/09/01

Calibration Check

Range	Levels (µg/mL) (mg/Kg)	RPD
C ₉ -C ₁₈ Aliphatics	0.6 10	-0.1
C ₁₉ -C ₃₆ Aliphatics	0.8 13.3	-5.2
C ₁₁ -C ₂₂ Aromatics	1.2 20	0.9

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 04/05/01

Calibration Ranges and Limits

Range	MDL (mg/Kg)	(µg/L)	ML (mg/Kg)	(µg/L)	RL (mg/Kg)	(µg/L)
C ₉ -C ₁₈ Aliphatics	0.1	2	0.3	6.5	100	10
C ₁₉ -C ₃₆ Aliphatics	0.1	1	0.3	3.1	100	10
C ₁₁ -C ₂₂ Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (µg/L) (mg/Kg)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	0.06 1	5.70	Calibration Factor
	0.15 2.5		
	0.3 5		
	0.6 10		
	1.2 20		
C ₁₉ -C ₃₆ Aliphatics	0.08 1.33	7.0	Calibration Factor
	0.2 3.33		
	0.4 6.67		
	0.8 13.3		
	1.6 26.7		
C ₁₁ -C ₂₂ Aromatics	0.12 2	3.2	Calibration Factor
	0.3 5		
	0.6 10		
	1.2 20		
	2.4 40		

Calibration Check Date: 11/12/01

Calibration Check

Range	Levels (µg/mL) (mg/Kg)	RPD
C ₉ -C ₁₈ Aliphatics	0.6 10	-2.0
C ₁₉ -C ₃₆ Aliphatics	0.8 13.3	-10.1
C ₁₁ -C ₂₂ Aromatics	1.2 20	1.2

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

ARADIGM ANALYTICAL LABORATORIES, INC.

627 Northchase - Arkway SE, Wilmington, NC 28405

Phone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

COC#

Page 1 of 1

Client: Catlin Project ID: BB52/SB-70 Date: 11/2/01 Report To: T. Landris

Address: 220 Old Dairy Rd Contact: Tom Landris Turnaround: _____

Address: _____ Phone: 4525861 Job Number: 201-121

note #: 1489 Fax: _____ P.O. Number: 211102-5 Invoice To: Shelia Catlin

Sample ID	Date	Time	Matrix	Preservatives		Analyses				Comments: Please specify any special reporting requirements
				Met	Si	8260	8260	8260	8260	
SB-06	11/2/01	1215	soil	✓	✓	✓	✓	✓	✓	G128-830
SB-06 ⁵⁰⁰⁸		1215		✓	✓	✓	✓	✓	✓	EDD Format
SB-08		1100		✓	✓	✓	✓	✓	✓	
NW-02		1120		✓	✓	✓	✓	✓	✓	
NW-01		1200		✓	✓	✓	✓	✓	✓	
SB-07		1115		✓	✓	✓	✓	✓	✓	
SB-05		1235		✓	✓	✓	✓	✓	✓	
SB-04		1245		✓	✓	✓	✓	✓	✓	
SB-03		1135		✓	✓	✓	✓	✓	✓	
SB-01		1245		✓	✓	✓	✓	✓	✓	
Relinquished By	Date	Time	Received By	Date	Time	Temperature	State Certification Requested	NC	SC	Other
Chris Jolly	11/2	530	Paul J. Spivey	11/2/01	12:30	ICE				

SEE REVERSE FOR
TERMS AND CONDITIONS

FILE COPY

PARADIGM ANALYTICAL LABORATORIES, INC.
2627 Northchase Parkway S.E.
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

Mr. Tom Landis
Richard Catlin & Associates
P.O. Box 10279
Wilmington, NC 28404-0279

November 27, 2001

Report Number: G128-837

Client Project ID: BB-52

Dear Mr. Landis,

Enclosed are the results of the analytical services performed under the referenced project. 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 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 for assistance. 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.



Laboratory Director
Mark Randall

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: BB-52

Sample Information and Analytical Results	
Sample Identification	SB02
Sample Matrix	Soil
Date Collected	11/06/01
Date Received	11/07/01
Date Extracted	11/13/01
Date Analyzed	11/14/01
Dry Weight	87.3
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	100
Aromatic Surrogate % Recovery	99

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-837-31676

Reviewed By: WZ

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: BB-52

Sample Information and Analytical Results	
Sample Identification	SB10
Sample Matrix	Soil
Date Collected	11/06/01
Date Received	11/07/01
Date Extracted	11/13/01
Date Analyzed	11/26/01
Dry Weight	89.2
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	15 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	11 (mg/Kg)
Aliphatic Surrogate % Recovery	88
Aromatic Surrogate % Recovery	79
Fractionation Surrogate 1 % Recovery	100

Comments:

* = Excludes any surrogates or internal standards.

Lab info: G128-837-31678

Reviewed By: WV

N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: BB-52

Sample Information and Analytical Results	
Sample Identification	SB11
Sample Matrix	Soil
Date Collected	11/06/01
Date Received	11/07/01
Date Extracted	11/13/01
Date Analyzed	11/15/01
Dry Weight	94.5
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	90
Aromatic Surrogate % Recovery	85

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-837-31679

Reviewed By: M2

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: BB-52

Sample Information and Analytical Results	
Sample Identification	SB12
Sample Matrix	Soil
Date Collected	11/06/01
Date Received	11/07/01
Date Extracted	11/13/01
Date Analyzed	11/15/01
Dry Weight	86.1
Dilution Factor	1
C ₉ -C ₁₈ Aliphatics*	< 10 (mg/Kg)
C ₁₉ -C ₃₆ Aliphatics*	< 10 (mg/Kg)
C ₁₁ -C ₂₂ Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	96
Aromatic Surrogate % Recovery	92

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-837-31680

Reviewed By: WZ

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 04/05/01

Calibration Ranges and Limits

Range	MDL (mg/Kg)	(µg/L)	ML (mg/Kg)	(µg/L)	RL (mg/Kg)	(µg/L)
C ₉ -C ₁₈ Aliphatics	0.1	2	0.3	6.5	100	10
C ₁₉ -C ₃₆ Aliphatics	0.1	1	0.3	3.1	100	10
C ₁₁ -C ₂₂ Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (µg/L) (mg/Kg)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	0.06 1	5.70	Calibration Factor
	0.15 2.5		
	0.3 5		
	0.6 10		
	1.2 20		
C ₁₉ -C ₃₆ Aliphatics	0.08 1.33	7.0	Calibration Factor
	0.2 3.33		
	0.4 6.67		
	0.8 13.3		
	1.6 26.7		
C ₁₁ -C ₂₂ Aromatics	0.12 2	3.2	Calibration Factor
	0.3 5		
	0.6 10		
	1.2 20		
	2.4 40		

Calibration Check Date: 11/14/01

Calibration Check

Range	Levels (µg/mL) (mg/Kg)	RPD
C ₉ -C ₁₈ Aliphatics	0.6 10	-1.2
C ₁₉ -C ₃₆ Aliphatics	0.8 13.3	-5.3
C ₁₁ -C ₂₂ Aromatics	1.2 20	2.7

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 04/05/01

Calibration Ranges and Limits

Range	MDL (mg/Kg)	(µg/L)	ML (mg/Kg)	(µg/L)	RL (mg/Kg)	(µg/L)
C ₉ -C ₁₈ Aliphatics	0.1	2	0.3	6.5	100	10
C ₁₉ -C ₃₆ Aliphatics	0.1	1	0.3	3.1	100	10
C ₁₁ -C ₂₂ Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (µg/L) (mg/Kg)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	0.06 1	5.70	Calibration Factor
	0.15 2.5		
	0.3 5		
	0.6 10		
	1.2 20		
C ₁₉ -C ₃₆ Aliphatics	0.08 1.33	7.0	Calibration Factor
	0.2 3.33		
	0.4 6.67		
	0.8 13.3		
	1.6 26.7		
C ₁₁ -C ₂₂ Aromatics	0.12 2	3.2	Calibration Factor
	0.3 5		
	0.6 10		
	1.2 20		
	2.4 40		

Calibration Check Date: 11/26/01

Calibration Check

Range	Levels (µg/mL) (mg/Kg)	RPD
C ₉ -C ₁₈ Aliphatics	0.6 10	-0.6
C ₁₉ -C ₃₆ Aliphatics	0.8 13.3	-4.9
C ₁₁ -C ₂₂ Aromatics	1.2 20	-0.2

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: BB-52

Sample Information and Analytical Results	
Sample Identification	SB02
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/06/01
Date Received	11/07/01
Date Extracted	11/06/01
Date Analyzed	11/14/01
Dry Weight	87
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	99
Surrogate % Recovery - FID	110

* = 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: G128-837-31676

Reviewed By: Mo

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: BB-52

Sample Information and Analytical Results	
Sample Identification	SB10
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/06/01
Date Received	11/07/01
Date Extracted	11/06/01
Date Analyzed	11/16/01
Dry Weight	89
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	100
Surrogate % Recovery - FID	110

* = 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: G128-837-31678

Reviewed By: Mr

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: BB-52

Sample Information and Analytical Results	
Sample Identification	SB11
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/06/01
Date Received	11/07/01
Date Extracted	11/06/01
Date Analyzed	11/16/01
Dry Weight	94
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	98
Surrogate % Recovery - FID	110

* = 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: G128-837-31679

Reviewed By: mm

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: BB-52

Sample Information and Analytical Results	
Sample Identification	SB12
Sample Matrix	Soil
Collection Option (for Soil)*	3
Date Collected	11/06/01
Date Received	11/07/01
Date Extracted	11/06/01
Date Analyzed	11/17/01
Dry Weight	86
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₂ Aliphatics**	< 10 (mg/Kg)
C ₉ -C ₁₀ Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	99
Surrogate % Recovery - FID	110

* = 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: G128-837-31680

Reviewed By: MB

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 11/08/01

PID Initial Calibration Date: 11/08/01

Calibration Ranges and Limits

Range	MDL		ML		RL	
	($\mu\text{g/L}$)	(mg/Kg)	($\mu\text{g/L}$)	(mg/Kg)	($\mu\text{g/L}$)	(mg/Kg)
C ₅ -C ₈ Aliphatics	2.4	0.12	7.5	0.38	100	10
C ₉ -C ₁₂ Aliphatics	1.3	0.065	4.0	0.21	100	10
C ₉ -C ₁₀ Aromatics	0.5	0.025	1.6	0.08	100	10

Calibration Concentration Levels

Range	Levels		%RSD or CCC	Method of Quantitation
	($\mu\text{g/L}$)	(mg/Kg)		
C ₅ -C ₈ Aliphatics	20	2	3.9	Calibration Factor
	80	8		
	200	20		
	800	80		
	2000	200		
C ₉ -C ₁₂ Aliphatics	15	1.5	8.8	Calibration Factor
	60	6		
	150	15		
	600	60		
	1500	150		
C ₉ -C ₁₀ Aromatics	32.5	3.25	17.4	Calibration Factor
	130	13		
	325	32.5		
	1300	130		
	3250	325		

Calibration Check Date: 11/16/01

Calibration Check

Range	Levels		RPD
	($\mu\text{g/L}$)	(mg/Kg)	
C ₅ -C ₈ Aliphatics	200	20	-9.8
C ₉ -C ₁₂ Aliphatics	150	15	7.1
C ₉ -C ₁₀ Aromatics	325	32.5	-13.2

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

Reviewed By: ma

N.C. Certification #481 S.C. Certification #99029

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 11/08/01 PID Initial Calibration Date: 11/08/01

Calibration Ranges and Limits

Range	MDL		ML		RL	
	(µg/L)	(mg/Kg)	(µg/L)	(mg/Kg)	(µg/L)	(mg/Kg)
C ₅ -C ₈ Aliphatics	2.4	0.12	7.5	0.38	100	10
C ₉ -C ₁₂ Aliphatics	1.3	0.065	4.0	0.21	100	10
C ₉ -C ₁₀ Aromatics	0.5	0.025	1.6	0.08	100	10

Calibration Concentration Levels

Range	Levels		%RSD or CCC	Method of Quantitation
	(µg/L)	(mg/Kg)		
C ₅ -C ₈ Aliphatics	20	2	3.9	Calibration Factor
	80	8		
	200	20		
	800	80		
	2000	200		
C ₉ -C ₁₂ Aliphatics	15	1.5	8.8	Calibration Factor
	60	6		
	150	15		
	600	60		
	1500	150		
C ₉ -C ₁₀ Aromatics	32.5	3.25	17.4	Calibration Factor
	130	13		
	325	32.5		
	1300	130		
	3250	325		

Calibration Check Date: 11/13/01

Calibration Check

Range	Levels		RPD
	(µg/L)	(mg/Kg)	
C ₅ -C ₈ Aliphatics	200	20	-1.3
C ₉ -C ₁₂ Aliphatics	150	15	9.7
C ₉ -C ₁₀ Aromatics	325	32.5	-15.7

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

N.C. Certification #481 S.C. Certification #99029

Reviewed By: Wm

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB02
Client Project ID: BB-52
Lab Sample ID: 31676
Lab Project ID: G128-837

Matrix: Soil

%Solids: 87.3

Date Collected: 11/6/2001
Date Received: 11/7/2001
Date Analyzed: 11/20/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acenaphthene	0.36	BQL
Acenaphthylene	0.36	BQL
Anthracene	0.36	BQL
Benzo[a]anthracene	0.36	BQL
Benzo[a]pyrene	0.36	BQL
Benzo[b]fluoranthene	0.36	BQL
Benzo[g,h,i]perylene	0.36	BQL
Benzo[k]fluoranthene	0.36	BQL
Benzoic Acid	0.72	BQL
Bis(2-chloroethoxy)methane	0.36	BQL
Bis(2-chloroethyl)ether	0.36	BQL
Bis(2-chloroisopropyl)ether	0.36	BQL
Bis(2-ethylhexyl)phthalate	0.36	BQL
4-bromophenyl phenyl ether	0.36	BQL
Butylbenzylphthalate	0.36	BQL
4-Chloroaniline	0.36	BQL
4-Chloro-3-methylphenol	0.36	BQL
2-Chloronaphthalene	0.36	BQL
2-Chlorophenol	0.36	BQL
4-Chlorophenyl phenyl ether	0.36	BQL
Chrysene	0.36	BQL
Di-n-Butylphthalate	0.36	BQL
Di-n-octylphthalate	0.36	BQL
Dibenzo[a,h]anthracene	0.36	BQL
Dibenzofuran	0.36	BQL
1,2-Dichlorobenzene	0.36	BQL
1,3-Dichlorobenzene	0.36	BQL
1,4-Dichlorobenzene	0.36	BQL
3,3'-Dichlorobenzidine	0.72	BQL
2,4-Dichlorophenol	0.36	BQL
Diethylphthalate	0.36	BQL
2,4-Dimethylphenol	0.36	BQL
Dimethylphthalate	0.36	BQL
4,6-Dinitro-2-methylphenol	1.8	BQL
2,4-Dinitrophenol	1.8	BQL
2,4-Dinitrotoluene	0.36	BQL
2,6-Dinitrotoluene	0.36	BQL
Fluoranthene	0.36	BQL
Fluorene	0.36	BQL
Hexachlorobenzene	0.36	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB02
Client Project ID: BB-52
Lab Sample ID: 31676
Lab Project ID: G128-837
Matrix: Soil

%Solids: 87.3

Date Collected: 11/6/2001
Date Received: 11/7/2001
Date Analyzed: 11/20/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Hexachlorobutadiene	0.36	BQL
Hexachlorocyclopentadiene	0.72	BQL
Hexachloroethane	0.36	BQL
Indeno(1,2,3-c,d)pyrene	0.36	BQL
Isophorone	0.36	BQL
2-Methylnaphthalene	0.36	BQL
2-Methylphenol	0.36	BQL
3- & 4-Methylphenol	0.36	BQL
N-Nitrosodi-n-propylamine	0.36	BQL
N-Nitrosodiphenylamine	0.36	BQL
Naphthalene	0.36	BQL
2-Nitroaniline	0.36	BQL
3-Nitroaniline	0.36	BQL
4-Nitroaniline	0.36	BQL
Nitrobenzene	0.36	BQL
2-Nitrophenol	0.36	BQL
4-Nitrophenol	1.8	BQL
Pentachlorophenol	1.8	BQL
Phenanthrene	0.36	BQL
Phenol	0.36	BQL
Pyrene	0.36	BQL
1,2,4-Trichlorobenzene	0.36	BQL
2,4,5-Trichlorophenol	0.36	BQL
2,4,6-Trichlorophenol	0.36	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8.9	89
2-Fluorophenol	10	10.2	102
Nitrobenzene-d5	10	9.3	93
Phenol-d6	10	9.1	91
2,4,6-Tribromophenol	10	8.5	85
4-Terphenyl-d14	10	11.4	114

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: WV

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB10
Client Project ID: BB-52
Lab Sample ID: 31678
Lab Project ID: G128-837
Matrix: Soil

%Solids: 89.2

Date Collected: 11/6/2001
Date Received: 11/7/2001
Date Analyzed: 11/20/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acenaphthene	0.35	BQL
Acenaphthylene	0.35	BQL
Anthracene	0.35	BQL
Benzo[a]anthracene	0.35	BQL
Benzo[a]pyrene	0.35	BQL
Benzo[b]fluoranthene	0.35	BQL
Benzo[g,h,i]perylene	0.35	BQL
Benzo[k]fluoranthene	0.35	BQL
Benzoic Acid	0.69	BQL
Bis(2-chloroethoxy)methane	0.35	BQL
Bis(2-chloroethyl)ether	0.35	BQL
Bis(2-chloroisopropyl)ether	0.35	BQL
Bis(2-ethylhexyl)phthalate	0.35	BQL
4-bromophenyl phenyl ether	0.35	BQL
Butylbenzylphthalate	0.35	BQL
4-Chloroaniline	0.35	BQL
4-Chloro-3-methylphenol	0.35	BQL
2-Chloronaphthalene	0.35	BQL
2-Chlorophenol	0.35	BQL
4-Chlorophenyl phenyl ether	0.35	BQL
Chrysene	0.35	BQL
Di-n-Butylphthalate	0.35	BQL
Di-n-octylphthalate	0.35	BQL
Dibenzo[a,h]anthracene	0.35	BQL
Dibenzofuran	0.35	BQL
1,2-Dichlorobenzene	0.35	BQL
1,3-Dichlorobenzene	0.35	BQL
1,4-Dichlorobenzene	0.35	BQL
3,3'-Dichlorobenzidine	0.69	BQL
2,4-Dichlorophenol	0.35	BQL
Diethylphthalate	0.35	BQL
2,4-Dimethylphenol	0.35	BQL
Dimethylphthalate	0.35	BQL
4,6-Dinitro-2-methylphenol	1.7	BQL
2,4-Dinitrophenol	1.7	BQL
2,4-Dinitrotoluene	0.35	BQL
2,6-Dinitrotoluene	0.35	BQL
Fluoranthene	0.35	BQL
Fluorene	0.35	BQL
Hexachlorobenzene	0.35	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB10
Client Project ID: BB-52
Lab Sample ID: 31678
Lab Project ID: G128-837
Matrix: Soil

%Solids: 89.2

Date Collected: 11/6/2001
Date Received: 11/7/2001
Date Analyzed: 11/20/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Hexachlorobutadiene	0.35	BQL
Hexachlorocyclopentadiene	0.69	BQL
Hexachloroethane	0.35	BQL
Indeno(1,2,3-c,d)pyrene	0.35	BQL
Isophorone	0.35	BQL
2-Methylnaphthalene	0.35	BQL
2-Methylphenol	0.35	BQL
3- & 4-Methylphenol	0.35	BQL
N-Nitrosodi-n-propylamine	0.35	BQL
N-Nitrosodiphenylamine	0.35	BQL
Naphthalene	0.35	0.48
2-Nitroaniline	0.35	BQL
3-Nitroaniline	0.35	BQL
4-Nitroaniline	0.35	BQL
Nitrobenzene	0.35	BQL
2-Nitrophenol	0.35	BQL
4-Nitrophenol	1.7	BQL
Pentachlorophenol	1.7	BQL
Phenanthrene	0.35	BQL
Phenol	0.35	BQL
Pyrene	0.35	BQL
1,2,4-Trichlorobenzene	0.35	BQL
2,4,5-Trichlorophenol	0.35	BQL
2,4,6-Trichlorophenol	0.35	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.3	93
2-Fluorophenol	10	10.3	103
Nitrobenzene-d5	10	9.6	96
Phenol-d6	10	9.3	93
2,4,6-Tribromophenol	10	9.0	90
4-Terphenyl-d14	10	10.3	103

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: Wm

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB11
Client Project ID: BB-52
Lab Sample ID: 31679
Lab Project ID: G128-837
Matrix: Soil

%Solids: 94.5

Date Collected: 11/6/2001
Date Received: 11/7/2001
Date Analyzed: 11/20/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acenaphthene	0.32	BQL
Acenaphthylene	0.32	BQL
Anthracene	0.32	BQL
Benzo[a]anthracene	0.32	BQL
Benzo[a]pyrene	0.32	BQL
Benzo[b]fluoranthene	0.32	BQL
Benzo[g,h,i]perylene	0.32	BQL
Benzo[k]fluoranthene	0.32	BQL
Benzoic Acid	0.65	BQL
Bis(2-chloroethoxy)methane	0.32	BQL
Bis(2-chloroethyl)ether	0.32	BQL
Bis(2-chloroisopropyl)ether	0.32	BQL
Bis(2-ethylhexyl)phthalate	0.32	BQL
4-bromophenyl phenyl ether	0.32	BQL
Butylbenzylphthalate	0.32	BQL
4-Chloroaniline	0.32	BQL
4-Chloro-3-methylphenol	0.32	BQL
2-Chloronaphthalene	0.32	BQL
2-Chlorophenol	0.32	BQL
4-Chlorophenyl phenyl ether	0.32	BQL
Chrysene	0.32	BQL
Di-n-Butylphthalate	0.32	BQL
Di-n-octylphthalate	0.32	BQL
Dibenzo[a,h]anthracene	0.32	BQL
Dibenzofuran	0.32	BQL
1,2-Dichlorobenzene	0.32	BQL
1,3-Dichlorobenzene	0.32	BQL
1,4-Dichlorobenzene	0.32	BQL
3,3'-Dichlorobenzidine	0.65	BQL
2,4-Dichlorophenol	0.32	BQL
Diethylphthalate	0.32	BQL
2,4-Dimethylphenol	0.32	BQL
Dimethylphthalate	0.32	BQL
4,6-Dinitro-2-methylphenol	1.6	BQL
2,4-Dinitrophenol	1.6	BQL
2,4-Dinitrotoluene	0.32	BQL
2,6-Dinitrotoluene	0.32	BQL
Fluoranthene	0.32	BQL
Fluorene	0.32	BQL
Hexachlorobenzene	0.32	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB11
Client Project ID: BB-52
Lab Sample ID: 31679
Lab Project ID: G128-837
Matrix: Soil

%Solids: 94.5

Date Collected: 11/6/2001
Date Received: 11/7/2001
Date Analyzed: 11/20/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Hexachlorobutadiene	0.32	BQL
Hexachlorocyclopentadiene	0.65	BQL
Hexachloroethane	0.32	BQL
Indeno(1,2,3-c,d)pyrene	0.32	BQL
Isophorone	0.32	BQL
2-Methylnaphthalene	0.32	BQL
2-Methylphenol	0.32	BQL
3- & 4-Methylphenol	0.32	BQL
N-Nitrosodi-n-propylamine	0.32	BQL
N-Nitrosodiphenylamine	0.32	BQL
Naphthalene	0.32	BQL
2-Nitroaniline	0.32	BQL
3-Nitroaniline	0.32	BQL
4-Nitroaniline	0.32	BQL
Nitrobenzene	0.32	BQL
2-Nitrophenol	0.32	BQL
4-Nitrophenol	1.6	BQL
Pentachlorophenol	1.6	BQL
Phenanthrene	0.32	BQL
Phenol	0.32	BQL
Pyrene	0.32	BQL
1,2,4-Trichlorobenzene	0.32	BQL
2,4,5-Trichlorophenol	0.32	BQL
2,4,6-Trichlorophenol	0.32	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.8	98
2-Fluorophenol	10	10.7	107
Nitrobenzene-d5	10	10.2	102
Phenol-d6	10	9.7	97
2,4,6-Tribromophenol	10	9.5	95
4-Terphenyl-d14	10	12.5	125

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: MRC

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB12
Client Project ID: BB-52
Lab Sample ID: 31680
Lab Project ID: G128-837
Matrix: Soil

%Solids: 86.1

Date Collected: 11/6/2001
Date Received: 11/7/2001
Date Analyzed: 11/20/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acenaphthene	0.35	BQL
Acenaphthylene	0.35	BQL
Anthracene	0.35	BQL
Benzo[a]anthracene	0.35	BQL
Benzo[a]pyrene	0.35	BQL
Benzo[b]fluoranthene	0.35	BQL
Benzo[g,h,i]perylene	0.35	BQL
Benzo[k]fluoranthene	0.35	BQL
Benzoic Acid	0.71	BQL
Bis(2-chloroethoxy)methane	0.35	BQL
Bis(2-chloroethyl)ether	0.35	BQL
Bis(2-chloroisopropyl)ether	0.35	BQL
Bis(2-ethylhexyl)phthalate	0.35	BQL
4-bromophenyl phenyl ether	0.35	BQL
Butylbenzylphthalate	0.35	BQL
4-Chloroaniline	0.35	BQL
4-Chloro-3-methylphenol	0.35	BQL
2-Chloronaphthalene	0.35	BQL
2-Chlorophenol	0.35	BQL
4-Chlorophenyl phenyl ether	0.35	BQL
Chrysene	0.35	BQL
Di-n-Butylphthalate	0.35	BQL
Di-n-octylphthalate	0.35	BQL
Dibenzo[a,h]anthracene	0.35	BQL
Dibenzofuran	0.35	BQL
1,2-Dichlorobenzene	0.35	BQL
1,3-Dichlorobenzene	0.35	BQL
1,4-Dichlorobenzene	0.35	BQL
3,3'-Dichlorobenzidine	0.71	BQL
2,4-Dichlorophenol	0.35	BQL
Diethylphthalate	0.35	BQL
2,4-Dimethylphenol	0.35	BQL
Dimethylphthalate	0.35	BQL
4,6-Dinitro-2-methylphenol	1.8	BQL
2,4-Dinitrophenol	1.8	BQL
2,4-Dinitrotoluene	0.35	BQL
2,6-Dinitrotoluene	0.35	BQL
Fluoranthene	0.35	BQL
Fluorene	0.35	BQL
Hexachlorobenzene	0.35	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 8270

Client Sample ID: SB12
Client Project ID: BB-52
Lab Sample ID: 31680
Lab Project ID: G128-837
Matrix: Soil

%Solids: 86.1

Date Collected: 11/6/2001
Date Received: 11/7/2001
Date Analyzed: 11/20/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Hexachlorobutadiene	0.35	BQL
Hexachlorocyclopentadiene	0.71	BQL
Hexachloroethane	0.35	BQL
Indeno(1,2,3-c,d)pyrene	0.35	BQL
Isophorone	0.35	BQL
2-Methylnaphthalene	0.35	BQL
2-Methylphenol	0.35	BQL
3- & 4-Methylphenol	0.35	BQL
N-Nitrosodi-n-propylamine	0.35	BQL
N-Nitrosodiphenylamine	0.35	BQL
Naphthalene	0.35	BQL
2-Nitroaniline	0.35	BQL
3-Nitroaniline	0.35	BQL
4-Nitroaniline	0.35	BQL
Nitrobenzene	0.35	BQL
2-Nitrophenol	0.35	BQL
4-Nitrophenol	1.8	BQL
Pentachlorophenol	1.8	BQL
Phenanthrene	0.35	BQL
Phenol	0.35	BQL
Pyrene	0.35	BQL
1,2,4-Trichlorobenzene	0.35	BQL
2,4,5-Trichlorophenol	0.35	BQL
2,4,6-Trichlorophenol	0.35	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.6	96
2-Fluorophenol	10	10.5	105
Nitrobenzene-d5	10	9.8	98
Phenol-d6	10	9.5	95
2,4,6-Tribromophenol	10	9.6	96
4-Terphenyl-d14	10	11.9	119

Comments:

Results are corrected for %solids and dilution where applicable.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: MRC

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB02
 Client Project ID: BB-52
 Lab Sample ID: 31676
 Lab Project ID: G128-837

Date Analyzed: 11/9/01
 Analyzed By: EKR
 Date Collected: 11/6/01
 Date Received: 11/7/01
 Dilution: 1

Matrix: Soil %Solids: 87.3

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.057	BQL
Acrolein	0.11	BQL
Acrylonitrile	0.11	BQL
Benzene	0.0057	BQL
Bromobenzene	0.0057	BQL
Bromochloromethane	0.0057	BQL
Bromodichloromethane	0.0057	BQL
Bromoform	0.0057	BQL
Bromomethane	0.0057	BQL
2-Butanone	0.029	BQL
n-Butylbenzene	0.0057	BQL
sec-Butylbenzene	0.0057	BQL
tert-Butylbenzene	0.0057	BQL
Carbon disulfide	0.0057	BQL
Carbon tetrachloride	0.0057	BQL
Chlorobenzene	0.0057	BQL
Chloroethane	0.0057	BQL
Chloroform	0.0057	BQL
Chloromethane	0.0057	BQL
2-Chlorotoluene	0.0057	BQL
4-Chlorotoluene	0.0057	BQL
Dibromochloromethane	0.0057	BQL
1,2-Dibromo-3-chloropropane	0.0057	BQL
Dibromomethane	0.0057	BQL
1,2-Dibromoethane (EDB)	0.0057	BQL
1,2-Dichlorobenzene	0.0057	BQL
1,3-Dichlorobenzene	0.0057	BQL
1,4-Dichlorobenzene	0.0057	BQL
trans-1,4-Dichloro-2-butene	0.0057	BQL
1,1-Dichloroethane	0.0057	BQL
1,1-Dichloroethene	0.0057	BQL
1,2-Dichloroethane	0.0057	BQL
cis-1,2-Dichloroethene	0.0057	BQL
trans-1,2-dichloroethene	0.0057	BQL
1,2-Dichloropropane	0.0057	BQL
1,3-Dichloropropane	0.0057	BQL
2,2-Dichloropropane	0.0057	BQL
1,1-Dichloropropene	0.0057	BQL
cis-1,3-Dichloropropene	0.0057	BQL
trans-1,3-Dichloropropene	0.0057	BQL
Dichlorodifluoromethane	0.0057	BQL
Diisopropyl ether (DIPE)	0.0057	BQL
Ethylbenzene	0.0057	BQL
Hexachlorobutadiene	0.0057	BQL
2-Hexanone	0.0057	BQL

Reviewed by: Wan

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB02
Client Project ID: BB-52
Lab Sample ID: 31676
Lab Project ID: G128-837
Matrix: Soil

%Solids: 87.3

Date Analyzed: 11/9/01
Analyzed By: EKR
Date Collected: 11/6/01
Date Received: 11/7/01
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Iodomethane	0.0057	BQL
Isopropylbenzene	0.0057	BQL
4-Isopropyltoluene	0.0057	BQL
Methylene chloride	0.023	0.031
4-Methyl-2-pentanone	0.0057	BQL
Methyl-tert-butyl ether (MTBE)	0.0057	BQL
Naphthalene	0.0057	BQL
n-Propyl benzene	0.0057	BQL
Styrene	0.0057	BQL
1,1,1,2-Tetrachloroethane	0.0057	BQL
1,1,2,2-Tetrachloroethane	0.0057	BQL
Tetrachloroethene	0.0057	BQL
Toluene	0.0057	0.012
1,2,3-Trichlorobenzene	0.0057	BQL
1,2,4-Trichlorobenzene	0.0057	BQL
Trichloroethene	0.0057	BQL
1,1,1-Trichloroethane	0.0057	BQL
1,1,2-Trichloroethane	0.0057	BQL
Trichlorofluoromethane	0.0057	BQL
1,2,3-Trichloropropane	0.0057	BQL
1,2,4-Trimethylbenzene	0.0057	BQL
1,3,5-Trimethylbenzene	0.0057	BQL
Vinyl chloride	0.0057	BQL
m-,p-Xylene	0.011	BQL
o-Xylene	0.0057	BQL

Surrogate Spike Recoveries	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Compound			
Bromofluorobenzene	50	48.6	97
1,2-Dichloroethane-d4	50	47.3	95
Toluene-d8	50	48.7	97

Comments:

All results are corrected for dilution.
Presence of targets confirmed by duplicate analysis.

Reviewed by: W

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB02D
 Client Project ID: BB-52
 Lab Sample ID: 31677
 Lab Project ID: G128-837
 Matrix: Soil

%Solids: 87.4

Date Analyzed: 11/10/01
 Analyzed By: EKR
 Date Collected: 11/6/01
 Date Received: 11/7/01
 Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.057	BQL
Acrolein	0.11	BQL
Acrylonitrile	0.11	BQL
Benzene	0.0057	BQL
Bromobenzene	0.0057	BQL
Bromochloromethane	0.0057	BQL
Bromodichloromethane	0.0057	BQL
Bromoform	0.0057	BQL
Bromomethane	0.0057	BQL
2-Butanone	0.029	BQL
n-Butylbenzene	0.0057	BQL
sec-Butylbenzene	0.0057	BQL
tert-Butylbenzene	0.0057	BQL
Carbon disulfide	0.0057	BQL
Carbon tetrachloride	0.0057	BQL
Chlorobenzene	0.0057	BQL
Chloroethane	0.0057	BQL
Chloroform	0.0057	BQL
Chloromethane	0.0057	BQL
2-Chlorotoluene	0.0057	BQL
4-Chlorotoluene	0.0057	BQL
Dibromochloromethane	0.0057	BQL
1,2-Dibromo-3-chloropropane	0.0057	BQL
Dibromomethane	0.0057	BQL
1,2-Dibromoethane (EDB)	0.0057	BQL
1,2-Dichlorobenzene	0.0057	BQL
1,3-Dichlorobenzene	0.0057	BQL
1,4-Dichlorobenzene	0.0057	BQL
trans-1,4-Dichloro-2-butene	0.0057	BQL
1,1-Dichloroethane	0.0057	BQL
1,1-Dichloroethene	0.0057	BQL
1,2-Dichloroethane	0.0057	BQL
cis-1,2-Dichloroethene	0.0057	BQL
trans-1,2-dichloroethene	0.0057	BQL
1,2-Dichloropropane	0.0057	BQL
1,3-Dichloropropane	0.0057	BQL
2,2-Dichloropropane	0.0057	BQL
1,1-Dichloropropene	0.0057	BQL
cis-1,3-Dichloropropene	0.0057	BQL
trans-1,3-Dichloropropene	0.0057	BQL
Dichlorodifluoromethane	0.0057	BQL
Diisopropyl ether (DIPE)	0.0057	BQL
Ethylbenzene	0.0057	BQL
Hexachlorobutadiene	0.0057	BQL
2-Hexanone	0.0057	BQL

Reviewed by: Wm

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB02D

Client Project ID: BB-52

Lab Sample ID: 31677

Lab Project ID: G128-837

Matrix: Soil

%Solids: 87.4

Date Analyzed: 11/10/01

Analyzed By: EKR

Date Collected: 11/6/01

Date Received: 11/7/01

Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Iodomethane	0.0057	BQL
Isopropylbenzene	0.0057	BQL
4-Isopropyltoluene	0.0057	BQL
Methylene chloride	0.023	BQL
4-Methyl-2-pentanone	0.0057	BQL
Methyl-tert-butyl ether (MTBE)	0.0057	BQL
Naphthalene	0.0057	BQL
n-Propyl benzene	0.0057	BQL
Styrene	0.0057	BQL
1,1,1,2-Tetrachloroethane	0.0057	BQL
1,1,2,2-Tetrachloroethane	0.0057	BQL
Tetrachloroethene	0.0057	BQL
Toluene	0.0057	0.0087
1,2,3-Trichlorobenzene	0.0057	BQL
1,2,4-Trichlorobenzene	0.0057	BQL
Trichloroethene	0.0057	BQL
1,1,1-Trichloroethane	0.0057	BQL
1,1,2-Trichloroethane	0.0057	BQL
Trichlorofluoromethane	0.0057	BQL
1,2,3-Trichloropropane	0.0057	BQL
1,2,4-Trimethylbenzene	0.0057	BQL
1,3,5-Trimethylbenzene	0.0057	BQL
Vinyl chloride	0.0057	BQL
m,p-Xylene	0.011	BQL
o-Xylene	0.0057	BQL

Surrogate Spike Recoveries	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Compound			
Bromofluorobenzene	50	47.9	96
1,2-Dichloroethane-d4	50	45.8	92
Toluene-d8	50	48.8	98

Comments:

All results are corrected for dilution.

Presence of targets confirmed by duplicate analysis.

Reviewed by: W2

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB10
 Client Project ID: BB-52
 Lab Sample ID: 31678
 Lab Project ID: G128-837

Date Analyzed: 11/8/01
 Analyzed By: RNP
 Date Collected: 11/6/01
 Date Received: 11/7/01
 Dilution: 1

Matrix: Soil %Solids: 89.2

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.056	BQL
Acrolein	0.11	BQL
Acrylonitrile	0.11	BQL
Benzene	0.0056	BQL
Bromobenzene	0.0056	BQL
Bromochloromethane	0.0056	BQL
Bromodichloromethane	0.0056	BQL
Bromoform	0.0056	BQL
Bromomethane	0.0056	BQL
2-Butanone	0.028	BQL
n-Butylbenzene	0.0056	BQL
sec-Butylbenzene	0.0056	BQL
tert-Butylbenzene	0.0056	BQL
Carbon disulfide	0.0056	BQL
Carbon tetrachloride	0.0056	BQL
Chlorobenzene	0.0056	BQL
Chloroethane	0.0056	BQL
Chloroform	0.0056	BQL
Chloromethane	0.0056	BQL
2-Chlorotoluene	0.0056	BQL
4-Chlorotoluene	0.0056	BQL
Dibromochloromethane	0.0056	BQL
1,2-Dibromo-3-chloropropane	0.0056	BQL
Dibromomethane	0.0056	BQL
1,2-Dibromoethane (EDB)	0.0056	BQL
1,2-Dichlorobenzene	0.0056	BQL
1,3-Dichlorobenzene	0.0056	BQL
1,4-Dichlorobenzene	0.0056	BQL
trans-1,4-Dichloro-2-butene	0.0056	BQL
1,1-Dichloroethane	0.0056	BQL
1,1-Dichloroethene	0.0056	BQL
1,2-Dichloroethane	0.0056	BQL
cis-1,2-Dichloroethene	0.0056	BQL
trans-1,2-dichloroethene	0.0056	BQL
1,2-Dichloropropane	0.0056	BQL
1,3-Dichloropropane	0.0056	BQL
2,2-Dichloropropane	0.0056	BQL
1,1-Dichloropropene	0.0056	BQL
cis-1,3-Dichloropropene	0.0056	BQL
trans-1,3-Dichloropropene	0.0056	BQL
Dichlorodifluoromethane	0.0056	BQL
Diisopropyl ether (DIPE)	0.0056	BQL
Ethylbenzene	0.0056	BQL
Hexachlorobutadiene	0.0056	BQL
2-Hexanone	0.0056	BQL

Reviewed by: MA

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB10
 Client Project ID: BB-52
 Lab Sample ID: 31678
 Lab Project ID: G128-837

Date Analyzed: 11/8/01
 Analyzed By: RNP
 Date Collected: 11/6/01
 Date Received: 11/7/01
 Dilution: 1

Matrix: Soil %Solids: 89.2

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Iodomethane	0.0056	BQL
Isopropylbenzene	0.0056	BQL
4-Isopropyltoluene	0.0056	BQL
Methylene chloride	0.022	BQL
4-Methyl-2-pentanone	0.0056	BQL
Methyl-tert-butyl ether (MTBE)	0.0056	BQL
Naphthalene	0.0056	BQL
n-Propyl benzene	0.0056	BQL
Styrene	0.0056	BQL
1,1,1,2-Tetrachloroethane	0.0056	BQL
1,1,2,2-Tetrachloroethane	0.0056	BQL
Tetrachloroethene	0.0056	BQL
Toluene	0.0056	BQL
1,2,3-Trichlorobenzene	0.0056	BQL
1,2,4-Trichlorobenzene	0.0056	BQL
Trichloroethene	0.0056	BQL
1,1,1-Trichloroethane	0.0056	BQL
1,1,2-Trichloroethane	0.0056	BQL
Trichlorofluoromethane	0.0056	BQL
1,2,3-Trichloropropane	0.0056	BQL
1,2,4-Trimethylbenzene	0.0056	BQL
1,3,5-Trimethylbenzene	0.0056	BQL
Vinyl chloride	0.0056	BQL
m-,p-Xylene	0.011	BQL
o-Xylene	0.0056	BQL

Surrogate Spike Recoveries	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Compound			
Bromofluorobenzene	50	49.4	99
1,2-Dichloroethane-d4	50	48.6	97
Toluene-d8	50	49.7	99

Comments:

All results are corrected for dilution.

Reviewed by: Mor

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB11
 Client Project ID: BB-52
 Lab Sample ID: 31679
 Lab Project ID: G128-837
 Matrix: Soil

%Solids: 94.5

Date Analyzed: 11/10/01
 Analyzed By: EKR
 Date Collected: 11/6/01
 Date Received: 11/7/01
 Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.053	BQL
Acrolein	0.11	BQL
Acrylonitrile	0.11	BQL
Benzene	0.0053	BQL
Bromobenzene	0.0053	BQL
Bromochloromethane	0.0053	BQL
Bromodichloromethane	0.0053	BQL
Bromoform	0.0053	BQL
Bromomethane	0.0053	BQL
2-Butanone	0.026	BQL
n-Butylbenzene	0.0053	BQL
sec-Butylbenzene	0.0053	BQL
tert-Butylbenzene	0.0053	BQL
Carbon disulfide	0.0053	BQL
Carbon tetrachloride	0.0053	BQL
Chlorobenzene	0.0053	BQL
Chloroethane	0.0053	BQL
Chloroform	0.0053	BQL
Chloromethane	0.0053	BQL
2-Chlorotoluene	0.0053	BQL
4-Chlorotoluene	0.0053	BQL
Dibromochloromethane	0.0053	BQL
1,2-Dibromo-3-chloropropane	0.0053	BQL
Dibromomethane	0.0053	BQL
1,2-Dibromoethane (EDB)	0.0053	BQL
1,2-Dichlorobenzene	0.0053	BQL
1,3-Dichlorobenzene	0.0053	BQL
1,4-Dichlorobenzene	0.0053	BQL
trans-1,4-Dichloro-2-butene	0.0053	BQL
1,1-Dichloroethane	0.0053	BQL
1,1-Dichloroethene	0.0053	BQL
1,2-Dichloroethane	0.0053	BQL
cis-1,2-Dichloroethene	0.0053	BQL
trans-1,2-dichloroethene	0.0053	BQL
1,2-Dichloropropane	0.0053	BQL
1,3-Dichloropropane	0.0053	BQL
2,2-Dichloropropane	0.0053	BQL
1,1-Dichloropropene	0.0053	BQL
cis-1,3-Dichloropropene	0.0053	BQL
trans-1,3-Dichloropropene	0.0053	BQL
Dichlorodifluoromethane	0.0053	BQL
Diisopropyl ether (DIPE)	0.0053	BQL
Ethylbenzene	0.0053	BQL
Hexachlorobutadiene	0.0053	BQL
2-Hexanone	0.0053	BQL

Reviewed by: W

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 82608/5035

Client Sample ID: SB11
Client Project ID: BB-52
Lab Sample ID: 31679
Lab Project ID: G128-837
Matrix: Soil

%Solids: 94.5

Date Analyzed: 11/10/01
Analyzed By: EKR
Date Collected: 11/6/01
Date Received: 11/7/01
Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Iodomethane	0.0053	BQL
Isopropylbenzene	0.0053	BQL
4-Isopropyltoluene	0.0053	BQL
Methylene chloride	0.021	BQL
4-Methyl-2-pentanone	0.0053	BQL
Methyl-tert-butyl ether (MTBE)	0.0053	BQL
Naphthalene	0.0053	BQL
n-Propyl benzene	0.0053	BQL
Styrene	0.0053	BQL
1,1,1,2-Tetrachloroethane	0.0053	BQL
1,1,2,2-Tetrachloroethane	0.0053	BQL
Tetrachloroethene	0.0053	BQL
Toluene	0.0053	0.0064
1,2,3-Trichlorobenzene	0.0053	BQL
1,2,4-Trichlorobenzene	0.0053	BQL
Trichloroethene	0.0053	BQL
1,1,1-Trichloroethane	0.0053	BQL
1,1,2-Trichloroethane	0.0053	BQL
Trichlorofluoromethane	0.0053	BQL
1,2,3-Trichloropropane	0.0053	BQL
1,2,4-Trimethylbenzene	0.0053	BQL
1,3,5-Trimethylbenzene	0.0053	BQL
Vinyl chloride	0.0053	BQL
m,p-Xylene	0.011	BQL
o-Xylene	0.0053	BQL

Surrogate Spike Recoveries	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Compound			
Bromofluorobenzene	50	48.8	98
1,2-Dichloroethane-d4	50	48.1	96
Toluene-d8	50	49.3	99

Comments:

All results are corrected for dilution.
Presence of targets confirmed by duplicate analysis.

Reviewed by: Ma

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB12
 Client Project ID: BB-52
 Lab Sample ID: 31680
 Lab Project ID: G128-837

Date Analyzed: 11/10/01
 Analyzed By: EKR
 Date Collected: 11/6/01
 Date Received: 11/7/01

Matrix: Soil %Solids: 86.1

Dilution: 1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Acetone	0.058	BQL
Acrolein	0.12	BQL
Acrylonitrile	0.12	BQL
Benzene	0.0058	BQL
Bromobenzene	0.0058	BQL
Bromochloromethane	0.0058	BQL
Bromodichloromethane	0.0058	BQL
Bromoform	0.0058	BQL
Bromomethane	0.0058	BQL
2-Butanone	0.029	BQL
n-Butylbenzene	0.0058	BQL
sec-Butylbenzene	0.0058	BQL
tert-Butylbenzene	0.0058	BQL
Carbon disulfide	0.0058	BQL
Carbon tetrachloride	0.0058	BQL
Chlorobenzene	0.0058	BQL
Chloroethane	0.0058	BQL
Chloroform	0.0058	BQL
Chloromethane	0.0058	BQL
2-Chlorotoluene	0.0058	BQL
4-Chlorotoluene	0.0058	BQL
Dibromochloromethane	0.0058	BQL
1,2-Dibromo-3-chloropropane	0.0058	BQL
Dibromomethane	0.0058	BQL
1,2-Dibromoethane (EDB)	0.0058	BQL
1,2-Dichlorobenzene	0.0058	BQL
1,3-Dichlorobenzene	0.0058	BQL
1,4-Dichlorobenzene	0.0058	BQL
trans-1,4-Dichloro-2-butene	0.0058	BQL
1,1-Dichloroethane	0.0058	BQL
1,1-Dichloroethene	0.0058	BQL
1,2-Dichloroethane	0.0058	BQL
cis-1,2-Dichloroethene	0.0058	BQL
trans-1,2-dichloroethene	0.0058	BQL
1,2-Dichloropropane	0.0058	BQL
1,3-Dichloropropane	0.0058	BQL
2,2-Dichloropropane	0.0058	BQL
1,1-Dichloropropene	0.0058	BQL
cis-1,3-Dichloropropene	0.0058	BQL
trans-1,3-Dichloropropene	0.0058	BQL
Dichlorodifluoromethane	0.0058	BQL
Diisopropyl ether (DIPE)	0.0058	BQL
Ethylbenzene	0.0058	BQL
Hexachlorobutadiene	0.0058	BQL
2-Hexanone	0.0058	BQL

Reviewed by: Man

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 8260B/5035

Client Sample ID: SB12
 Client Project ID: BB-52
 Lab Sample ID: 31680
 Lab Project ID: G128-837

Date Analyzed: 11/10/01
 Analyzed By: EKR
 Date Collected: 11/6/01
 Date Received: 11/7/01
 Dilution: 1

Matrix: Soil %Solids: 86.1

Compound	Quantitation Limit (mg/KG)	Result (mg/KG)
Iodomethane	0.0058	BQL
Isopropylbenzene	0.0058	BQL
4-Isopropyltoluene	0.0058	BQL
Methylene chloride	0.023	BQL
4-Methyl-2-pentanone	0.0058	BQL
Methyl-tert-butyl ether (MTBE)	0.0058	BQL
Naphthalene	0.0058	BQL
n-Propyl benzene	0.0058	BQL
Styrene	0.0058	BQL
1,1,1,2-Tetrachloroethane	0.0058	BQL
1,1,2,2-Tetrachloroethane	0.0058	BQL
Tetrachloroethene	0.0058	BQL
Toluene	0.0058	0.0064
1,2,3-Trichlorobenzene	0.0058	BQL
1,2,4-Trichlorobenzene	0.0058	BQL
Trichloroethene	0.0058	BQL
1,1,1-Trichloroethane	0.0058	BQL
1,1,2-Trichloroethane	0.0058	BQL
Trichlorofluoromethane	0.0058	BQL
1,2,3-Trichloropropane	0.0058	BQL
1,2,4-Trimethylbenzene	0.0058	BQL
1,3,5-Trimethylbenzene	0.0058	BQL
Vinyl chloride	0.0058	BQL
m,p-Xylene	0.012	BQL
o-Xylene	0.0058	BQL

Surrogate Spike Recoveries	Spike Added (mg/KG)	Surrogate Result (mg/KG)	%Rec
Compound			
Bromofluorobenzene	50	46.5	93
1,2-Dichloroethane-d4	50	48.6	97
Toluene-d8	50	48.5	97

Comments:

All results are corrected for dilution.
 Presence of targets confirmed by duplicate analysis.

Reviewed by: 

one: (910)-350-1903 FAX: (910)-350-1557

Chain-of-Custody Record & Analytical Request

#000

Page _____ of _____

ent: Cathin Engineers & Scientist Project ID: PB-52
 dress: 220 Old Dairy Rd. Contact: Don Landis
 dress: Washington DC 28407 Phone: 452-5861
 ote #: 1489 Fax: _____

Date: 11/7/01
Turnaround: Standard
Job Number: 201-121
P.O. Number: 111107-7

Date: 11/2/01

Turnaround: Storland

Job Number: 201-121

P.O. Number: 211107-7

Fax:

[illegible]

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PARADIGM ANALYTICAL LABORATORIES, INC.
2627 Northchase Parkway S.E.
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

Mr. Tom Landis
Richard Catlin & Associates
P.O. Box 10279
Wilmington, NC 28404-0279

November 30, 2001

Report Number: G128-836

Client Project ID: BB-52

Dear Mr. Landis,

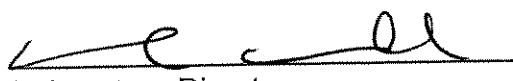
Enclosed are the results of the analytical services performed under the referenced project. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained 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 for assistance. 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.


Laboratory Director
Mark Randall

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: MW-2
Client Project ID: BB-52
Lab Sample ID: 31596
Lab Project ID: G128-836
Matrix: Water

Date Collected: 11/5/2001
Date Received: 11/7/2001
Date Analyzed: 11/29/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Acenaphthene	10	BQL
Acenaphthylene	10	BQL
Anthracene	10	BQL
Benzo[a]anthracene	10	BQL
Benzo[a]pyrene	10	BQL
Benzo[b]fluoranthene	10	BQL
Benzo[g,h,i]perylene	10	BQL
Benzo[k]fluoranthene	10	BQL
Bis(2-chloroethoxy)methane	10	BQL
Bis(2-chloroethyl)ether	10	BQL
Bis(2-chloroisopropyl)ether	10	BQL
Bis(2-ethylhexyl)phthalate	10	BQL
4-bromophenyl phenyl ether	10	BQL
Butylbenzylphthalate	10	BQL
4-Chloro-3-methylphenol	10	BQL
2-Chloronaphthalene	10	BQL
2-Chlorophenol	10	BQL
4-Chlorophenyl phenyl ether	10	BQL
Chrysene	10	BQL
Di-n-Butylphthalate	10	BQL
Di-n-octylphthalate	10	BQL
Dibenzo[a,h]anthracene	10	BQL
1,2-Dichlorobenzene	10	BQL
1,3-Dichlorobenzene	10	BQL
1,4-Dichlorobenzene	10	BQL
3,3'-Dichlorobenzidine	20	BQL
2,4-Dichlorophenol	10	BQL
Diethylphthalate	10	BQL
2,4-Dimethylphenol	10	BQL
Dimethylphthalate	10	BQL
4,6-Dinitro-2-methylphenol	50	BQL
2,4-Dinitrophenol	50	BQL
2,4-Dinitrotoluene	10	BQL
2,6-Dinitrotoluene	10	BQL
Fluoranthene	10	BQL
Fluorene	10	BQL
Hexachlorobenzene	10	BQL
Hexachlorobutadiene	10	BQL
Hexachlorocyclopentadiene	20	BQL
Hexachloroethane	10	BQL

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Semivolatiles by GCMS 625

Client Sample ID: MW-2
Client Project ID: BB-52
Lab Sample ID: 31596
Lab Project ID: G128-836
Matrix: Water

Date Collected: 11/5/2001
Date Received: 11/7/2001
Date Analyzed: 11/29/2001
Analyzed By: MRC
Dilution: 1

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Indeno(1,2,3-c,d)pyrene	10	BQL
Isophorone	10	BQL
N-Nitrosodi-n-propylamine	10	BQL
N-Nitrosodiphenylamine	10	BQL
Naphthalene	10	BQL
Nitrobenzene	10	BQL
2-Nitrophenol	10	BQL
4-Nitrophenol	50	BQL
Pentachlorophenol	50	BQL
Phenanthrene	10	BQL
Phenol	10	BQL
Pyrene	10	BQL
1,2,4-Trichlorobenzene	10	BQL
2,4,6-Trichlorophenol	10	BQL

Surrogate Spike Recoveries	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	9.3	93
2-Fluorophenol	10	9.1	91
Nitrobenzene-d5	10	9.1	91
Phenol-d6	10	8.8	88
2,4,6-Tribromophenol	10	7.1	71
4-Terphenyl-d14	10	12.1	121

Comments:

Results are corrected for %solids and dilution where applicable.
Sample was extracted outside the method recommended holding time limits.

Flags:

BQL = Below Quantitation Limit.

Reviewed By: MRC

PARADIGM ANALYTICAL LABORATORIES, INC.

Results of Library Search for Semivolatile Compounds
by GCMS

Client Sample ID: MW-2

Client Project ID: BB-52

Lab Sample ID: 31596

Lab Project ID: G128-836

Matrix: Water

Date Collected: 11/5/2001

Date Received: 11/7/2001

Date Analyzed: 11/29/2001

Analyzed By: MRC

Dilution: 1

Num.	Compound	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 height 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 height is equal to or greater than 10% of that of the nearest internal standard. Quantitation provided is an estimate.

Sample was extracted outside the method recommended holding time limits.

Reviewed by: WZ

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: MW-2
 Client Project ID: BB-52
 Lab Sample ID: 31596
 Lab Project ID: G128-836
 Matrix: Water

Date Analyzed: 11/10/01
 Analyzed By: EKR
 Date Collected: 11/5/01
 Date Received: 11/7/01
 Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: MW

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: MW-2
Client Project ID: BB-52
Lab Sample ID: 31596
Lab Project ID: G128-836
Matrix: Water

Date Analyzed: 11/10/01
Analyzed By: EKR
Date Collected: 11/5/01
Date Received: 11/7/01
Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Compound			
Bromofluorobenzene	10.0	9.7	97
1,2-Dichloroethane-d4	10.0	9.5	95
Toluene-d8	10.0	10.3	103

Comments:

All results are corrected for dilution.

Reviewed by: MW

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: MW-2D
 Client Project ID: BB-52
 Lab Sample ID: 31598
 Lab Project ID: G128-836
 Matrix: Water

Date Analyzed: 11/10/01
 Analyzed By: EKR
 Date Collected: 11/5/01
 Date Received: 11/7/01
 Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	BQL
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	BQL
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: Mm

Flags: BQL = Below Quantitation Limit

N.C. Certification #481 S.C. Certification #99029

Page 1

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: MW-2D
 Client Project ID: BB-52
 Lab Sample ID: 31598
 Lab Project ID: G128-836
 Matrix: Water

Date Analyzed: 11/10/01
 Analyzed By: EKR
 Date Collected: 11/5/01
 Date Received: 11/7/01
 Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	BQL
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m-,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Compound			
Bromofluorobenzene	10.0	9.9	99
1,2-Dichloroethane-d4	10.0	9.4	94
Toluene-d8	10.0	10.2	102

Comments:

All results are corrected for dilution.

Reviewed by: WZ

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & AssociatesProject Name: BB-52

Sample Information and Analytical Results	
Sample Identification	MW-2
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	11/05/01
Date Received	11/07/01
Date Extracted	11/08/01
Date Analyzed	11/08/01
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	96
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: G128-836-31596

Reviewed By: W2

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & AssociatesProject Name: BB-52

Sample Information and Analytical Results	
Sample Identification	MW-1
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	11/05/01
Date Received	11/07/01
Date Extracted	11/08/01
Date Analyzed	11/08/01
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	110 (µg/L)
C ₉ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	86
Surrogate % Recovery - FID	110

* = 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: G128-836-31597

Reviewed By: Mn

PARADIGM ANALYTICAL LABORATORIES, INC.

VPH (Aliphatics/Aromatics) Laboratory Reporting Form

Client Name: Richard Catlin & Associates

Project Name: BB-52

Sample Information and Analytical Results	
Sample Identification	Trip Blank
Sample Matrix	Water
Collection Option (for Soil)*	
Date Collected	11/05/01
Date Received	11/07/01
Date Extracted	11/08/01
Date Analyzed	11/08/01
Dry Weight	
Dilution Factor	1
C ₅ -C ₈ Aliphatics**	< 100 (µg/L)
C ₉ -C ₁₂ Aliphatics**	< 100 (µg/L)
C ₈ -C ₁₀ Aromatics**	< 100 (µg/L)
Surrogate % Recovery - PID	83
Surrogate % Recovery - FID	93

* = 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: G128-836-31599

Reviewed By: Ma

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 2

VPH Laboratory Reporting Form

Calibration and QA/QC Information

FID Initial Calibration Date: 11/08/01

PID Initial Calibration Date: 11/08/01

Calibration Ranges and Limits

Range	MDL		ML		RL	
	(µg/L)	(mg/Kg)	(µg/L)	(mg/Kg)	(µg/L)	(mg/Kg)
C ₅ -C ₈ Aliphatics	2.4	0.12	7.5	0.38	100	10
C ₉ -C ₁₂ Aliphatics	1.3	0.065	4.0	0.21	100	10
C ₉ -C ₁₀ Aromatics	0.5	0.025	1.6	0.08	100	10

Calibration Concentration Levels

Range	Levels		%RSD or CCC	Method of Quantitation
	(µg/L)	(mg/Kg)		
C ₅ -C ₈ Aliphatics	20	2	3.9	Calibration Factor
	80	8		
	200	20		
	800	80		
	2000	200		
C ₉ -C ₁₂ Aliphatics	15	1.5	8.8	Calibration Factor
	60	6		
	150	15		
	600	60		
	1500	150		
C ₉ -C ₁₀ Aromatics	32.5	3.25	17.4	Calibration Factor
	130	13		
	325	32.5		
	1300	130		
	3250	325		

Calibration Check Date: 11/08/01

Calibration Check

Range	Levels		RPD
	(µg/L)	(mg/Kg)	
C ₅ -C ₈ Aliphatics	200	20	-1.5
C ₉ -C ₁₂ Aliphatics	150	15	5.1
C ₉ -C ₁₀ Aromatics	325	32.5	-14.0

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

Reviewed By: MA

PARADIGM ANALYTICAL LABORATORIES, INC.

EPH (Aliphatics/Aromatics) Results

by MDEP-EPH

Client Name: Richard Catlin & Associates

Project Name: BB-52

Sample Information and Analytical Results	
Sample Identification	MW-2
Sample Matrix	Water
Date Collected	11/05/01
Date Received	11/07/01
Date Extracted	11/12/01
Date Analyzed	11/14/01
Dry Weight	
Dilution Factor	1
C ₉ -C ₁₆ Aliphatics*	< 100 (µg/L)
C ₁₉ -C ₃₆ Aliphatics*	< 100 (µg/L)
C ₁₁ -C ₂₂ Aromatics*	< 100 (µg/L)
Aliphatic Surrogate % Recovery	94
Aromatic Surrogate % Recovery	90

Comments:

* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G128-836-31596

Reviewed By: WJ

PARADIGM ANALYTICAL LABORATORIES, INC.

Attachment 3

EPH Laboratory Reporting Form

Calibration and QA/QC Information

Initial Calibration Date: 04/05/01

Calibration Ranges and Limits

Range	MDL (mg/Kg)	(µg/L)	ML (mg/Kg)	(µg/L)	RL (mg/Kg)	(µg/L)
C ₉ -C ₁₈ Aliphatics	0.1	2	0.3	6.5	100	10
C ₁₉ -C ₃₆ Aliphatics	0.1	1	0.3	3.1	100	10
C ₁₁ -C ₂₂ Aromatics	0.2	2.5	0.6	8	100	10

Calibration Concentration Levels

Range	Levels (µg/L) (mg/Kg)	%RSD or CCC	Method of Quantitation
C ₉ -C ₁₈ Aliphatics	0.06 1	5.70	Calibration Factor
	0.15 2.5		
	0.3 5		
	0.6 10		
	1.2 20		
C ₁₉ -C ₃₆ Aliphatics	0.08 1.33	7.0	Calibration Factor
	0.2 3.33		
	0.4 6.67		
	0.8 13.3		
	1.6 26.7		
C ₁₁ -C ₂₂ Aromatics	0.12 2	3.2	Calibration Factor
	0.3 5		
	0.6 10		
	1.2 20		
	2.4 40		

Calibration Check Date: 11/13/01

Calibration Check

Range	Levels (µg/mL) (mg/Kg)	RPD
C ₉ -C ₁₈ Aliphatics	0.6 10	-1.9
C ₁₉ -C ₃₆ Aliphatics	0.8 13.3	-6.9
C ₁₁ -C ₂₂ Aromatics	1.2 20	3.3

MDL = Method Detection Limit

ML = Minimum Limit

RL = Reportable Limit

RPD = Relative Percent Difference

%RSD = Percent Relative Standard Deviation

CCC = Correlation Coefficient of Curve

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID: MW-2
Client Project ID: BB-52
Lab Sample ID: 31596
Lab Project ID: G128-836
Batch ID:

Analyzed By: RML
Date Collected: 11/5/01
Date Received: 11/7/01
Matrix: Water

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Lead,Extractable	BQL	5.00	1	UG/L	239.2	11/15/01

Comments

BQL = Below Quantitation Limits

DF = Dilution Factor

J = Between MDL and RL

nt: Catlin Engineers & Scientists Project ID: BD-52

Address: 270 Old Dairy Rd Contact: Tom Landis

Address: Wilmington NC 28403 Phone: 452-5881

ote #: 1889 Fax: _____

Date: 11-6-01

Turnaround: Standard

Job Number: 201-129

P.O. Number: 211107-1

Report To: Tom Landis

Invoice To: Stik

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3 COPY

PARADIGM ANALYTICAL LABORATORIES, INC.

2627 Northchase Parkway S.E.
Wilmington, North Carolina 28405
(910) 350-1903
Fax (910) 350-1557

Mr. Tom Landis
Richard Catlin & Associates
P.O. Box 10279
Wilmington, NC 28404-0279

December 17, 2001

Report Number: G128-851

Client Project ID: BB52/SBB70

Dear Mr. Landis,

Enclosed are the results of the analytical services performed under the referenced project. 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 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 for assistance. 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.



Laboratory Director
Mark Randall

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: MW-01
 Client Project ID: BB52/SBB70
 Lab Sample ID: 33711
 Lab Project ID: G128-851
 Matrix: Water

Date Analyzed: 12/12/01
 Analyzed By: EKR
 Date Collected: 12/7/01
 Date Received: 12/7/01
 Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Benzene	0.5	BQL
Bromobenzene	0.5	BQL
Bromochloromethane	0.5	BQL
Bromodichloromethane	0.5	BQL
Bromoform	0.5	BQL
Bromomethane	0.5	BQL
n-Butylbenzene	0.5	BQL
sec-Butylbenzene	0.5	1
tert-Butylbenzene	0.5	BQL
Carbon tetrachloride	0.5	BQL
Chlorobenzene	0.5	BQL
Chloroethane	0.5	BQL
Chloroform	0.5	BQL
Chloromethane	0.5	BQL
2-Chlorotoluene	0.5	BQL
4-Chlorotoluene	0.5	BQL
Dibromochloromethane	0.5	BQL
1,2-Dibromo-3-chloropropane	5	BQL
Dibromomethane	0.5	BQL
1,2-Dibromoethane (EDB)	0.5	BQL
1,2-Dichlorobenzene	0.5	BQL
1,3-Dichlorobenzene	0.5	BQL
1,4-Dichlorobenzene	0.5	BQL
1,1-Dichloroethane	0.5	BQL
1,1-Dichloroethene	0.5	BQL
1,2-Dichloroethane	0.5	BQL
cis-1,2-Dichloroethene	0.5	BQL
trans-1,2-dichloroethene	0.5	BQL
1,2-Dichloropropane	0.5	BQL
1,3-Dichloropropane	0.5	BQL
2,2-Dichloropropane	0.5	BQL
1,1-Dichloropropene	0.5	BQL
Dichlorodifluoromethane	5	BQL
Diisopropyl ether (DIPE)	0.5	BQL
Ethylbenzene	0.5	BQL
Hexachlorobutadiene	0.5	BQL
Isopropylbenzene	0.5	BQL
4-Isopropyltoluene	0.5	0.7
Methylene chloride	5	BQL
Methyl-tert-butyl ether (MTBE)	0.5	BQL

Reviewed by: EW

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Volatiles

by GCMS 6210D

Client Sample ID: MW-01
 Client Project ID: BB52/SBB70
 Lab Sample ID: 33711
 Lab Project ID: G128-851
 Matrix: Water

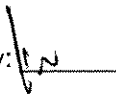
Date Analyzed: 12/12/01
 Analyzed By: EKR
 Date Collected: 12/7/01
 Date Received: 12/7/01
 Dilution: 1.0

Compound	Quantitation Limit (ug/L)	Result (ug/L)
Naphthalene	0.5	0.6
n-Propyl benzene	0.5	BQL
Styrene	0.5	BQL
1,1,1,2-Tetrachloroethane	0.5	BQL
1,1,2,2-Tetrachloroethane	0.5	BQL
Tetrachloroethene	0.5	BQL
Toluene	0.5	BQL
1,2,3-Trichlorobenzene	0.5	BQL
1,2,4-Trichlorobenzene	0.5	BQL
Trichloroethene	0.5	BQL
1,1,1-Trichloroethane	0.5	BQL
1,1,2-Trichloroethane	0.5	BQL
Trichlorofluoromethane	0.5	BQL
1,2,3-Trichloropropane	0.5	BQL
1,2,4-Trimethylbenzene	0.5	BQL
1,3,5-Trimethylbenzene	0.5	BQL
Vinyl chloride	0.5	BQL
m,p-Xylene	1	BQL
o-Xylene	0.5	BQL

Surrogate Spike Recoveries	Spike Added (ug/L)	Surrogate Result (ug/L)	%Rec
Compound			
Bromofluorobenzene	10.0	10.2	102
1,2-Dichloroethane-d4	10.0	9.5	95
Toluene-d8	10.0	10.2	102

Comments:

All results are corrected for dilution.

Reviewed by: 

PARADIGM ANALYTICAL LABORATORIES, INC.

Results for Metals

Client Sample ID: MW-01
Client Project ID: BB52/SBB70
Lab Sample ID: 33711
Lab Project ID: G128-851

Analyzed By: RML
Date Collected: 12/7/01
Date Received: 12/7/01
Matrix: Water

Metals	Result	Quantitation Limit	DF	Units	Method	Date Analyzed
Lead,Extractable	BQL	5.00	1	UG/L	239.2	12/7/01

Comments

BQL = Below Quantitation Limits

DF = Dilution Factor

J = Between MDL and RL

nt: *Catlin Engineers & Scientist* Project ID: *BUS2/SPH70*

Date: 12-7-01

Report To: Tom Landis

Phone: 770 Old Dairy Rd
Contact: For Land's

Turnaround: 5 day

Phone: 452-5861
Address: Wilmington, NC 28403

Job Number: 201-121

le # 1489 Fax: _____

P.O. Number: 211207-2

Invoice To: *Shick & Catlin*

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