

**LIMITED PRELIMINARY SITE ASSESSMENT**

**Parcel 134  
Keith Presnell Property  
East Yancy Automotive  
505 East US Highway 19E  
Burnsville, NC 28714**

State Project No. R-2519A  
WBS Element No. 35609.1.1  
**EI Project No. ENMO060029.00**

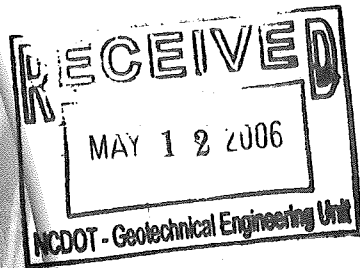
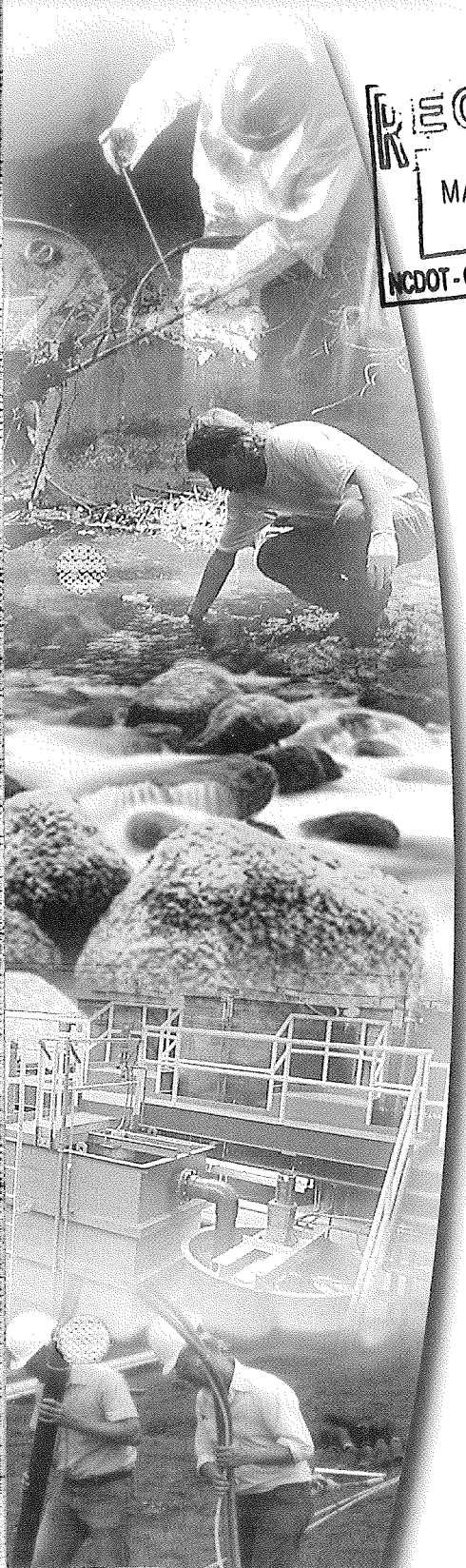
**Prepared For:**

Gregory A. Smith  
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May 2006



**LIMITED PRELIMINARY SITE ASSESSMENT (PSA)**

**Conducted on**


**Parcel 134**  
**Keith Presnell Property**  
**East Yancy Automotive**  
**505 East US Highway 19E**  
**Burnsville, NC 28714**  
**State Project No. R-2519A**  
**WBS Element No. 35609.1.1**  
**EI Project No. ENMO060029.00**

For

Mr. Gregory A. Smith  
State of North Carolina  
Department of Transportation  
Geotechnical Engineering Unit  
GeoEnvironmental Section  
1589 Mail Service Center  
Raleigh, NC 27699-1589

Issue Date: May 12, 2006


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## 1.0 INTRODUCTION

Environmental Investigations, Inc. (EI) conducted a *Limited Preliminary Site Assessment (PSA)* within the existing and/or proposed North Carolina Department of Transportation (NCDOT) *right-of-way (ROW)* adjacent to a parcel (identified by the NCDOT as Parcel 134) located at 505 East US Highway 19E, Burnsville, North Carolina 28714. A one-story brick building containing a automotive service garage, East Yancy Automotive, currently is located on the adjacent parcel. The facility formerly was operated as East Yancy Chevron filling station. The report presented herein documents the findings of the PSA that was conducted within the described ROW. For purposes of this report, the terms subject site and/or site include the existing NCDOT ROW and the proposed ROW, and/or the abutting property/parcel.

### 1.1 Report Organization

Field activities were conducted by Mr. Sterling Turner, an Environmental Scientist with EI, on April 12, 2006. Supplemental field activities were conducted by Mr. Robert Shaut, an Environmental Geologist with EI, on April 20, 2006. The report presented herein summarizes the scope of work conducted, discusses sampling procedures, and presents our findings, conclusions and recommendations. A table entitled "Summary of Soil Analytical Results" is presented in **Table 1**, and a table entitled "Summary of Groundwater Analytical Results", is presented in **Table 2**. A "Site Location Map", a "Site Map" and "Impacted Soils Map" are presented in **Figures 1, 2, and 3**, respectively. A compilation of "Site Photographs" are presented in **Appendix A**, the "Standard Field Operating Procedures (SOP)" are presented in **Appendix B**, "Soil Boring Logs" are included in **Appendix C**, while an "Analytical Laboratory Reports" is presented in **Appendix D**.

### 1.2 Background

Mr. Eugene Tarascio, GeoEnvironmental Project Manager with the NCDOT GeoTechnical Engineering Unit submitted to EI a "*Request for Supplemental Technical and Cost Proposal*" (RFP), dated February 24, 2006. The RFP solicited a technical and cost proposal to perform Limited PSAs on a total of 18 Parcels located within a NCDOT Highway Project, identified as WBS Element #35609.1.1, State Project #R-2519A, located in Burnsville, NC. The RFP outlined site information on each of the 18 parcels, some site photographs and NCDOT Figures (Plan Sheets) were attached to the RFP. Mr. Gregory A. Smith, LG, PE, GeoEnvironmental Supervisor with the NCDOT, GeoTechnical Engineering Unit, GeoEnvironmental Section authorized EI to perform the PSAs, as documented in a "Notice to Proceed" (NTP) dated March 13, 2006.

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WBS Element: 35609.1.1

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Parcel 134 – Keith Presnell  
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Burnsville, NC 28714

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### 1.3 Objectives

The objective of performing the PSA was to determine if a former gasoline station/current automobile service station has impacted the subsurface of the existing and/or proposed ROW. The study (PSA) on the referenced parcel (**Parcel 134 – Keith Presnell Property**) included herein was performed with a reasonable effort to investigate and quantify potentially petroleum-hydrocarbon residual impacted subsurface soils. However, findings documented in the report do not constitute a guarantee that all potential sources of environmental contamination have been assessed and subsequently analyzed.

This report is provided for the sole use of the NCDOT on the project for which it was prepared. All materials and information used for this project were obtained by EI, Inc. Use of this report by any third parties other than the NCDOT will be at such party's sole risk. EI Inc. disclaims liability for any use of or reliance on this report by third parties.

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## 2.0 SCOPE OF WORK & ENVIRONMENTAL SERVICES

### 2.1 Requested Scope of Work

Documented in the RFP, dated February 24, 2006, the NCDOT requested the following scope of work:

- Determine if contaminated soils are present around any underground storage tanks (UST) identified that are within the existing and/or proposed ROW;
- in addition, collect soil samples every 15 meters (~50 feet) to a maximum depth of 2.44 meters (8 feet) along the proposed drainage (if there is no proposed drainage, collect samples at same interval along the edge of existing and/or proposed ROW within the “area of investigation”);
- delineate and estimate the quantity of impacted soils and indicate the approximate area of soil contamination on a site map for each site;
- if groundwater is encountered and the project manager suspects the possibility of groundwater contamination, obtain a sample for analysis by converting one (1) of the borings to a temporary monitoring well;
- for each groundwater sample collected, also obtain a 24-hour groundwater depth;
- if a groundwater sample is collected for proposed drainage, perform aquifer testing to determine the recharge rate and use this to provide an estimated quantity of contaminated water that will have to be disposed of when de-watering occurs to install the proposed drainage;
- prepare a report including field activities, findings, and recommendations for the site and submit in quadruplet to the NCDOT office.

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## 2.2 Scope of Services

To accomplish the scope-of-services, a field reconnaissance was performed to identify general site conditions, and Direct Push Technology (DPT) was utilized to collect soil samples on the subject parcel.

To perform the requested Limited PSA, EI personnel supervised, oversaw and performed site reconnaissance activities and collected appropriate samples to complete the project objectives. To complete the study on the subject parcel, EI performed the following scope of services:

- Limited oversight and supervision of a geophysical survey conducted within the existing and/or proposed ROW.
- Supervision and oversight of the advancement of five (5) soil test borings utilizing DPT methods to a total depth of 2.44 meters (8.0 feet) below the land surface (bls) within the existing and/or the proposed NCDOT right-of-way, in the proposed drainage area location.
- Supervision and oversight of the advancement of six (6) soil test borings utilizing DPT methods to depths ranging from 4.27 meters (14.0 feet) to 4.88 meters (16.0 feet) bls within the existing and/or proposed NCDOT ROW, in the vicinity of current UST systems.
- Collection and submittal of 11 soil samples for laboratory analyses of total petroleum hydrocarbons (TPH) in the gasoline and diesel ranges. Collection and submittal of one (1) soil sample for risk-based laboratory analyses of volatile organic compounds (VOC), semi-volatile organic compounds (SVOC), volatile petroleum hydrocarbons (VPH), and extractable petroleum hydrocarbons (EPH).
- Installation of one (1) temporary monitoring well (piezometer).
- Collection and submittal of one (1) groundwater sample for laboratory analyses of VOCs, SVOCs, VPH, and EPH.
- Photo documentation of pertinent site features.
- Preparation of this *Limited PSA Report*, presenting our findings and conclusions along with our recommendations.



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### 3.0 SITE CHARACTERIZATION

#### 3.1 Site Location

An automotive service station known as East Yancy Automotive currently is located on the north side of US 19E at the intersection with Mill Springs Road Road. The specific address for the property is 505 East US Highway 19E in Burnsville, North Carolina 28714 (**Figure 1**). The site formerly was also utilized as a gasoline filling station. The subject property is currently located immediately adjacent to the NCDOT ROW (**Photograph 1**) as identified in NCDOT's R-2519A Plan Sheet 28. Copies of digital site photographs are presented in **Appendix A**.

#### 3.2 Physical Setting

The subject site parcel contains a one-story brick building containing the office and two garage bays of East Yancy Automotive (**Photograph 2**). A separate one-story building used for office space is located on the northeast portion of the property. The remaining portions of the parcel consist of an out-of-use fuel pump dispenser island with canopy cover, a storage shed, asphalt and concrete access/parking areas, grass and/or shrubbery. See **Figure 2** for pertinent site features.

##### 3.2.1 Number and Capacities of USTs

The subject site formerly maintained four (4) 15,142-liter (4,000-gallon) gasoline USTs. The USTs formerly were located adjacent to the southwest corner of the subject building and west of the former pump island (**Photograph 2**). One 3,785-liter (1,000-gallon) diesel aboveground storage tank (AST) also was formerly located on the subject property. The subject site currently maintains one 1,893-liter (550-gallon) waste oil UST located adjacent to the north side of the subject building.

#### 3.3 Site Topography

Site observations and review of the Burnsville, NC United States Geological Survey (USGS) Topographic Quadrangle Map (July 1, 1984), revealed that the subject site is located at an elevation of approximately 796 meters (2,610 feet) above mean sea level (msl) (**Figure 1**). Topographically, the site slopes moderately the south and southeast. Surface water runoff appears to flow south and southwest.

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### **3.4 Land Use & Surrounding Properties**

The subject property is located inside the city limits of Burnsville, NC. Land use in the immediate vicinity of the site is characterized by residential and commercial properties. The site is bounded on the north by a field used for tree and shrub starts, to the east by a residential property, to the south by US Highway 19E, and to the west by Mill Springs Road.

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## 4.0 SUBSURFACE INVESTIAGTION

### 4.1 Geophysical Survey

Schnabel Engineering South, locally based in Greensboro, North Carolina, was subcontracted to provide geophysical services on the subject site. The purpose of the geophysical survey was to locate potential UST systems within the existing and/or proposed ROW. The contractor conducted an electromagnetic (EM) induction survey utilizing a Geonics EM61-MK2 instrument. "The early time gate results show a number of small, isolated anomalies probably caused by relatively small, insignificant buried metal objects, several linear anomalies apparently caused by buried utilities, culverts and a number of anomalies caused by known site features". Ground penetrating radar (GPR) investigations of selected EM61 anomalies were conducted using a Geophysical Surveys System SIR-2000 system equipped with a 400 MHz antenna. The geophysical contractor surveyed an estimated 1,650 square meters (17,760 square feet) located on the subject site. Based on the Geophysical report, anomalies were identified probably due to insignificant buried metal objects, linear anomalies probably caused by utilities, and several caused by known site features.

### 4.2 Geophysical Survey Results

A detailed report documenting the geophysical survey activities and results of the study is included in **Appendix E**.

### 4.3 Subsurface Soils Investigation

Environmental Probing, based in Clayton, North Carolina, was selected and subcontracted to provide DPT services. On April 12, 2006, EI directed and supervised the advancement of nine (9) soil test borings (GP-1 through GP-9), five (5) (GP-1 through GP-5) of which were situated along the proposed drainage piping (**Photograph 3**) while the remaining four (4) (GP-6 through GP-9) were in the area of investigation in the vicinity of the former UST systems. On April 20, 2006, two supplemental soil test borings (DP-1 and DP-2) were installed in the area of investigation, downgradient of the former UST systems.

In general, the borings were advanced in order to evaluate the absence/presence of potential subsurface soil (vadose zone) impact and/or subsurface groundwater (petroleum smearing) impact associated with potential petroleum releases associated with either former and/or present UST system spills and/or releases into the subsurface. The soil borings were advanced to investigative depths of ranging from 2.44 meters (8.0 feet) to 4.88 meters (16.0 feet) bls.

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#### 4.4 Soil Test Boring Methodology

A complete descriptive explanation of EI's *Standard Field Operating Procedures* that discusses specific sampling methodology is presented in **Appendix B**.

#### 4.5 Soil Sample Collection Procedures

A total of 12 soil samples were collected for laboratory analysis. Soil samples retained for laboratory analysis were shipped to Paradigm Analytical Laboratory for laboratory analytical testing. Dates and times of sample shipment may be referenced in the analytical Chain-of-Custodies (COC) presented in **Appendix D**.

#### 4.6 Backfill Activities

At the completion of the exploratory subsurface advancement activities, the test borings were backfilled to surface grade. A complete descriptive explanation of EI's *Standard Field Operating Procedures* that discusses backfill procedures is presented in **Appendix B**.

#### 4.7 Subsurface Soil Lithology

During boring advancement activities, soil samples were classified in the field by an EI scientist utilizing the Unified Soil Classification System (USCS). Subsurface soils encountered in the area of study were fairly consistent. The on-site geology consists of grass or asphalt pavement with surficial topsoil from the surface to approximately 0.31 meters (1.0 foot) below grade. A layer of soil consisting of tan to orange, slightly indurated, clayey SILT with a large presence of mica was encountered to the maximum investigated depth of approximately 4.88 meters (16.0 feet) bls. Detailed descriptions are presented in Soil Boring Logs presented in **Appendix C**. The boring logs include an interpretation of subsurface conditions based on field samples.

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## 4.8 Groundwater Investigation

### 4.8.1 Temporary Monitoring Well Installation

During the field study (April 12, 2006), soil test boring “GP-9”, located in the grass median approximately 12.0 meters (39.4 feet) south of the former pump island (**Photograph 4**), was converted into a Type I (temporary) 2.54 cm (1.0 inch) diameter groundwater monitoring well (piezometer). The approximate location of the groundwater monitoring well is depicted in **Figure 2**. The well location was selected in the field by the EI field scientist (Sterling Turner) based on the topographic location of the boring and potential impact from the current and/or former UST systems. The well was installed to a depth of 4.57 meters (15.0 feet) bls.

### 4.8.2 Monitoring Well Sampling

On April 13, 2006, EI personnel collected a groundwater sample from the referenced temporary monitoring well (“TMW-1/GP-9”) for purposes of analytical testing. The sample was shipped to Prism Laboratories, Inc. for analytical laboratory testing. Groundwater sampling procedures are discussed in more detail in the *Standard Operating Procedures* presented in **Appendix C**.

The groundwater table was measured in the temporary monitoring well (“GP-3”) on April 14, 2006. Groundwater was measured at approximately 2.52 meters (8.28 feet) below the top of casing (TOC). The TOC was approximately 0.06 meter (0.20 feet) above the ground surface indicating the depth to groundwater is approximately 2.46 meters (8.08 feet) bls.

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## 5.0 LABORATORY TESTING AND RESULTS

### 5.1 Subsurface Soil Analytical Methods

A total of eleven (11) soil samples (“134-1-4”, “134-2-4”, “134-3-4”, “134-4-4”, “134-5-4”, “134-6-3”, “134-7-5”, “134-8-3”, “134-9-6”, “DP-1-5”, and “DP-2-5”) were submitted for TPH analyses by Method 8015B with preparation methods for the analysis of Diesel Range Organics (DRO) by GC-FID and Gasoline Range Organics (GRO) by GC-FID. The GRO method is utilized to extract volatile fuels such as gasoline, while the DRO method is utilized to extract less volatile petroleum products such as diesel fuel, No. 2 fuel oil, kerosene, and varsol. Additionally, soil sample “134-9-3”, collected from boring “GP-9” in the grass median downgradient from the former pump island and a pile of various automotive motor parts, was submitted for risk-based laboratory analyses of VOCs by Method 8260, SVOCs by Method 8270, as well as VPH and EPH by MADEP methodology.

### 5.2 Soil Laboratory Analyses Results

Laboratory analyses of soil sample “134-1-4” collected from boring “GP-1” along the western portion of proposed drainage piping on the subject site revealed a DRO concentration of 11.8 milligrams per kilogram (mg/kg). No other soil samples collected from borings along the proposed drainage piping revealed TPH concentrations at or above the laboratory method detection limits. Laboratory analyses of the soil samples collected from four (4) borings in the vicinity of the former UST systems (“GP-7”, “GP-9”, “DP-1”, and “DP-2”) revealed TPH concentrations ranging from 9.2 mg/kg to 118 mg/kg at depths of 2.44 meters (8.0 feet) to 3.66 meters (12.0 feet). The risk-based analyses of soil sample “134-9-3” revealed a trace concentration of VPH constituents. No other risk-based analytes were detected at or above the laboratory method detection limit. The specific results of the analytical testing of the soil samples are tabulated and presented in **Table 1**. The complete laboratory results and Chain-of-Custody Records are presented in **Appendix D**.

### 5.3 Groundwater Laboratory Analysis

Groundwater sample “167-TMW-1” collected from the referenced temporary well installed in the location of “GP-11” was submitted for VOCs analysis for aromatic and halogenated volatiles by GC/PID-ELCD for EPA Method 6230D + IPE & MTBE, for SVOCs by GC/MS for EPA Method 625 and the top ten (10) peaks identified, as well as for VPH and EPH by MADEP methodology.

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#### 5.4 Groundwater Laboratory Analyses Results

Analysis of the groundwater sample collected from the temporary monitoring well “TMW-1/GP-9” did not show the presence of detectable concentrations (above the method detection limit) of the target analytes. A summary of the analytical results is tabulated in **Table 2**.

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## 6.0 SUMMARY OF FINDINGS

EI has reviewed information gathered during the Limited PSA study including the site reconnaissance activities, review of NCDOT plan sheets, review of the site investigation including soil collection activities, and review of a laboratory analysis report. Compiled below is a summarized list of the significant findings.

- Four (4) gasoline UST systems and one (1) diesel AST system formerly were located at the subject property adjacent to the proposed ROW line. One (1) waste oil UST currently is located on the northern portion of the subject site.
- Groundwater was encountered beneath the site, at a location approximately 12.0 meters (39.4 feet) south of the former pump dispenser island, at a depth of approximately 2.46 meters (8.08 feet) bls.
- Laboratory analyses of soil sample “134-1-4” collected from boring “GP-1” along the western portion of proposed drainage piping on the subject site revealed a DRO concentration of 11.8 milligrams per kilogram (mg/kg). No other soil samples collected from borings along the proposed drainage piping revealed TPH concentrations at or above the laboratory method detection limits.
- Laboratory analyses of the soil samples collected from four (4) borings in the vicinity of the former UST systems (“GP-7”, “GP-9”, “DP-1”, and “DP-2”) revealed TPH concentrations ranging from 9.2 mg/kg to 118 mg/kg at depths of 2.44 meters (8.0 feet) to 3.66 meters (12.0 feet). The NCDENR action limit is 10.0 mg/kg.
- The risk-based analyses of soil sample “134-9-3” collected from boring “GP-9” showed the presence of a trace concentration of VPH constituents. No other risk-based analytes were detected at or above the method detection limit.
- Laboratory analysis of the groundwater sample collected from the temporary monitoring well (“TMW-1/GP-9”) did not show the presence of detectable concentrations of the target analytes.



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## 7.0 CONCLUSIONS AND RECOMMENDATIONS

Based on field and laboratory analytical data, it appears that a moderate release of petroleum from the former and/or current UST systems on the subject site have impacted the downgradient area of investigation within the existing and/or proposed NCDOT ROW. Concentrations of residual-phase petroleum hydrocarbons were identified at depths of approximately 1.22 meters (4.0 feet) to 3.66 meters (12.0 feet) bls, throughout the area of investigation located immediately south of the former UST basin and the associated pump dispenser island.

An isolated area of low level residual-phase petroleum hydrocarbons was identified at one boring location along the proposed drainage piping on the western portion of the subject property. The unpaved area is used for storage of trailers and vehicles in various states of repair. No detectable TPH concentrations were detected in soil samples collected from the additional areas of proposed drainage piping.

No concentrations of dissolved-phase contaminants were identified in a groundwater sample collected from a temporary monitoring well approximately 12.0 meters (39.4 feet) south of the former pump island within the area of investigation.

Based on data collected within the scope of this assessment, a lateral area of approximately 400 square meters (4,000 square feet), located downgradient of the former UST systems within the area of investigation, is estimated to contain petroleum contaminated soils. Based on an estimated average extent of vertical impact between 0.91 meters (3.0 feet) to 3.66 meters (12.0 feet) bls, an estimated **volume of 976 cubic meters (1,277 cubic yards)** of petroleum-impacted soil is present within the proposed ROW. The isolated area of contamination detected along the proposed drainage piping on the western portion of the subject property was not included in the above calculations.

Based on the detection of residual-phase contaminant concentrations above regulatory reportable levels, the property owner should be notified of this finding. Based on the findings of this investigation, EI does not recommend any further assessment at this time.

*Note: This report does not constitute a guarantee that all potential sources of environmental contamination have been assessed and subsequently analyzed.*

**TABLES**

**TABLE 1**  
**SUMMARY OF SOIL ANALYTICAL RESULTS**  
 Parcel 134  
 Keith Presnell Property (East Yancy Automotive)  
 505 East US Highway 19E  
 Burrowsville, NC 28714  
 State Project No. R-2519A  
 WBS Element No. 35609.1.1

Sample Identification	Field Screening Results-PID (ppm)										Sample Date				
	134-9-3	134-1-4	134-2-4	134-3-4	134-4-4	134-5-4	134-6-3	134-7-5	134-8-3	134-9-6		DP1-5	DP2-5		
Sample Depth (Meters)	1.22-1.83	1.83-2.44	1.83-2.44	1.83-2.44	1.83-2.44	1.83-2.44	1.22-1.83	2.44-3.05	1.22-1.83	3.06-3.66	2.44-3.05	2.44-3.05			
Sample Depth (Feet)	4-6	6-8	6-8	6-8	6-8	6-8	4-6	8-10	4-6	10-12	8-10	8-10			
Sample Date	4/12/2006										4/20/2006				
Laboratory Analysis	Laboratory Results (mg/kg)														
MADEP VPH	Residential MSCC (mg/kg)	Industrial Commercial MSCC (mg/kg)	Soil-to-GW MSCC (mg/kg)												
	939	24528	72												
C9-C12 Aliphatics	9386	245280	3255												
	469	12264	34												
C9-C10 Aromatics	469	12264	34												
	469	12264	34												
MADEP EPH	Laboratory Results (mg/kg)														
C9-C18 Aliphatics	9386	245280	3255												
	469	12264	34												
C19-C26 Aliphatics	93860	*	Immobilized												
	93860	*	Immobilized												
Volatiles Organic Compounds Method 8260B/6035	Laboratory Results (mg/kg)														
Benzene	22	200	0.0056												
	3200	82000	7												
Toluene	1560	40000	0.24												
	32000	200000	5												
Ethylbenzene	156	4088	0.92												
	156	4088	0.92												
Toluene Xylenes	156	4088	0.92												
	156	4088	0.92												
Methyl Tertiary Ether (MTBE)	NA	NA	NA												
All Remaining Analytes	Laboratory Results (mg/kg)														
Semivolatile Organic Compounds SW846-8270C	Laboratory Results (mg/kg)														
Naphthalene	63	1635	0.56												
	63	1635	0.56												
2-methyl naphthalene	63	1635	3												
	63	1635	3												
Phenanthrene	63	1635	3												
	63	1635	3												
All Remaining Analytes	NA	NA	NA												
	NA	NA	NA												
NGDENR <sup>1</sup> (Volume II) Reportable Concentration (mg/kg)	Laboratory Results (mg/kg)														
10	NA	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	118.0	BQL	63.4	19.6	9.2
	NA	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	BQL	38.70	BQL	15.40	BQL	BQL

**NOTE:**  
 NS = No Standard  
 mg/kg denotes parts per million  
 MSCC = Maximum Soil Contaminant Concentrations  
**Bold & Italic Font** = In Excess of MSCC Cleanup Standards  
<sup>1</sup> NGDENR = North Carolina Department of Environment & Natural Resources

TABLE 2  
**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS**  
Parcel 134 - Keith Presnell Property (East Yancy Automotive)  
505 East US Highway 19E  
Burnsville, NC 28714  
State Project: R-25190A  
WBS Element: 35609.1.1

Sample Identification		134-TMW-1
Groundwater Depth Meters (Feet)		2.46 (8.07)
Sample Date		4/14/2006
<b>Volatiles - GC 6230D</b>		
	2L Groundwater Standards (ug/L)	Laboratory Results (ug/L)
Benzene	1	BQL
sec-Butylbenzene	70	BQL
Diisopropyl ether (DIPE)	NS	BQL
Ethylbenzene	29	BQL
Isopropylbenzene	70	BQL
Methyl-tert butyl ether (MTBE)	200	BQL
Naphthalene	21	BQL
Total Xylenes	530	BQL
Toluene	1,000	BQL
1,2,4-Trimethylbenzene	350	BQL
1,3,5-Trimethylbenzene	350	BQL
MTBE	200	BQL
All remaining analytes	NA	BQL
<b>MADEP WPH</b>		
	2L GW Standards (ug/L)	Laboratory Results (ug/L)
C5-C8 Aliphatics	420	BQL
C9-C12 Aliphatics	4200	BQL
C9-C10 Aliphatics	210	BQL
<b>MADEP EPH</b>		
	2L GW Standards (ug/L)	Laboratory Results (ug/L)
C9-C18 Aliphatics	4200	BQL
C19-C36 Aliphatics	42000	BQL
C11-C22 Aromatics	210	BQL
<b>Semi-volatiles - GCMS/MS 625</b>		
	2L GW Standards (ug/L)	Laboratory Results (ug/L)
Fluorene	280	BQL
Acenaphthene	80	BQL
Acenaphthylene	210	BQL
Bis (2-ethylhexyl) Phthalate	NS	BQL
Di-n-Butylphthalate	700	BQL
Diethylphthalate	5000	BQL
Dimethylphthalate	NS	BQL
Fluoranthene	280	BQL
Fluorene	280	BQL
Naphthalene	21	BQL
Phenanthrene	210	BQL
Pyrene	210	BQL
All remaining analytes	N/A	BQL

**Legend:**  
*Italics/Bold Font* = In Excess of NCAC 2L Class GA Standards  
BQL = Below Quantitation Limit  
NA = Not Applicable  
NS = No Standard

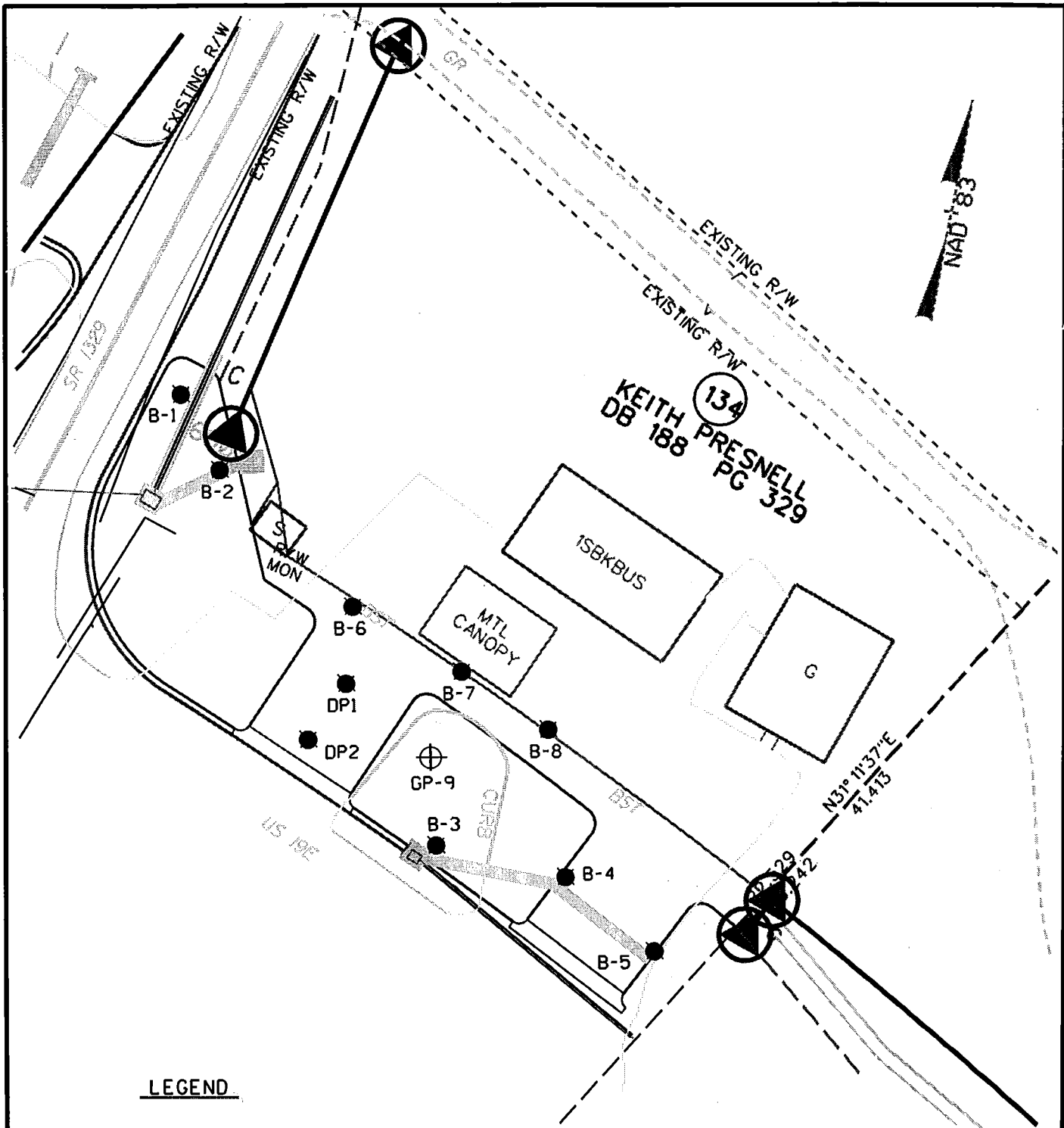
**FIGURES**



3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS 1" = 350 ft Scale: 1:12,800 Detail: 14-0 Datum: WGS84



FIGURE NUMBER:	1	<b>SITE LOCATION MAP</b> Keith Presnell Property 505 East US Highway 19 E Parcel 134 Burnsville, North Carolina	 <b>ENVIRONMENTAL INVESTIGATIONS, INC</b>
QUAD:	Burnsville		
PROJECT NUMBER:	ENMO060029		
SCALE:	As Shown		



**LEGEND**

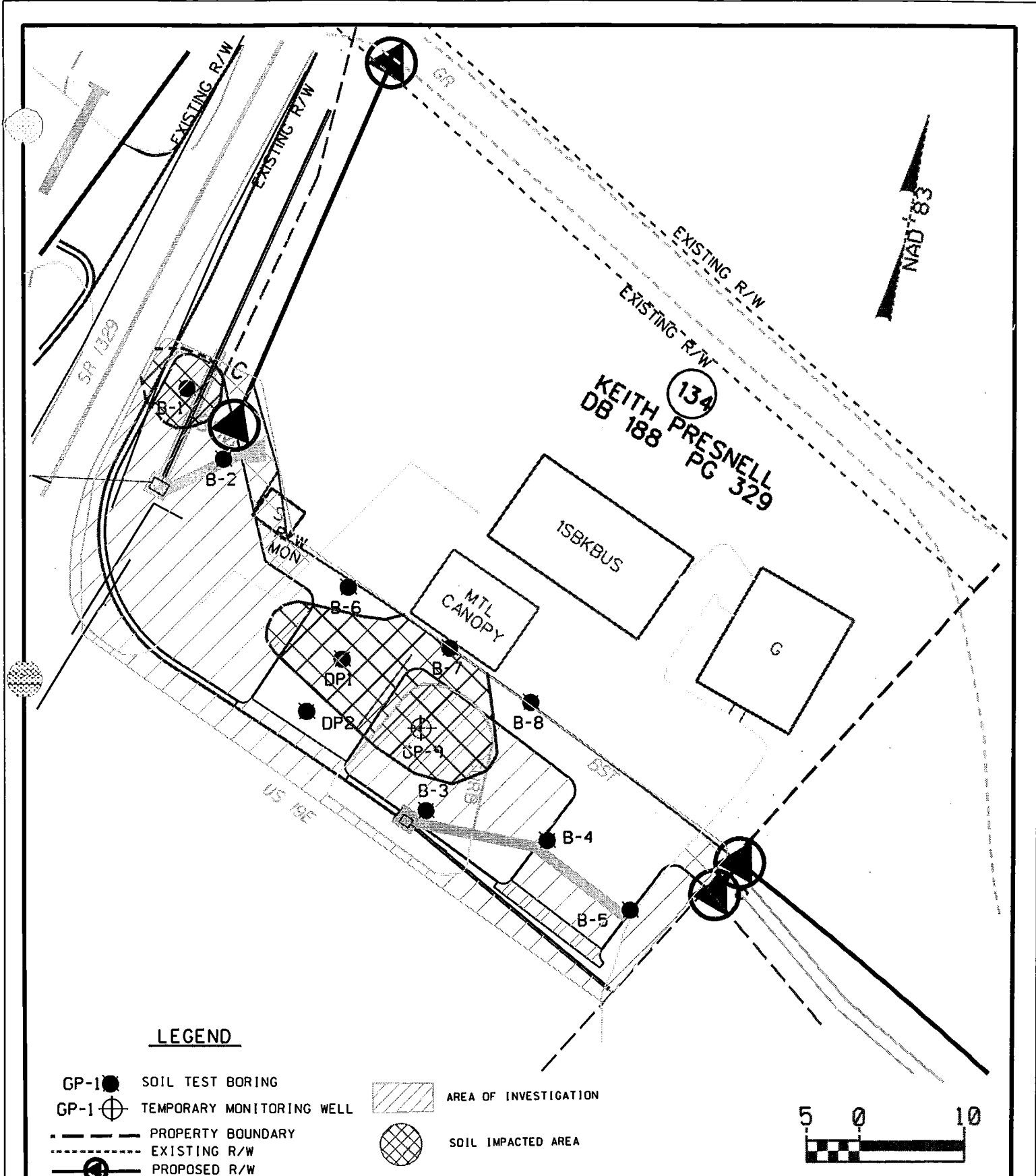
- GP-1 ● SOIL TEST BORING
- GP-1 ⊕ TEMPORARY MONITORING WELL
- PROPERTY BOUNDARY
- - - EXISTING R/W
- PROPOSED R/W



FIGURE:	2
DRAWN BY:	NCDOT/RMS
DATE:	APR 2006
PROJ NO:	ENM0060029.00
SCALE:	1 cm = 5m

**SITE MAP**  
**PARCEL 134**  
 Keith Presnell Property  
 505 US HWY 19E  
 Burnsville, NC 28714  
 WBS Element: 35609.1.1





**LEGEND**

- GP-1 ● SOIL TEST BORING
- GP-1 ⊕ TEMPORARY MONITORING WELL
- PROPERTY BOUNDARY
- - - EXISTING R/W
- PROPOSED R/W
- ▨ AREA OF INVESTIGATION
- ⊗ SOIL IMPACTED AREA

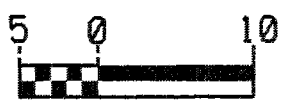
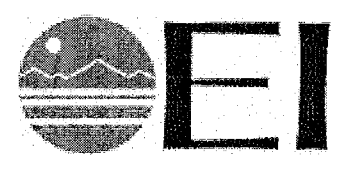


FIGURE:	3
DRAWN BY:	NCDOT/RMS
DATE:	APR 2006
PROJ NO:	ENM0060029.00
SCALE:	1 cm = 5m

**IMPACTED SOILS MAP**  
**PARCEL 134**  
 Keith Presnell Property  
 505 US HWY 19E  
 Burnsville, NC 28714  
 WBS Element: 35609.1.1





**APPENDIX A**  
**SITE PHOTOGRAPHS**



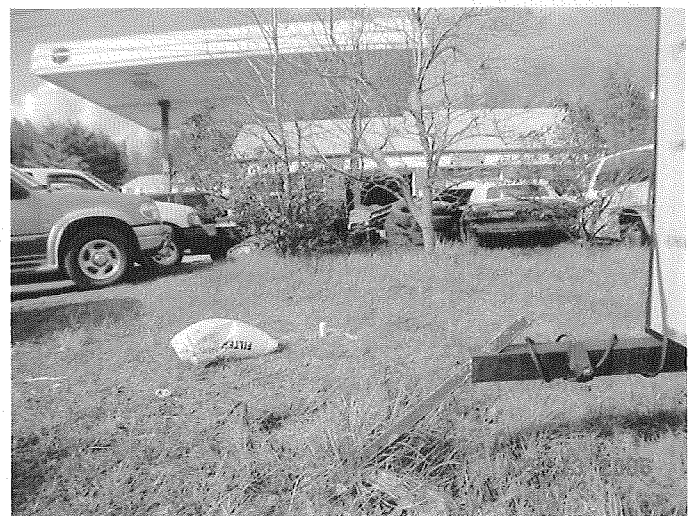
**Photograph 1: View of subject property area of investigation adjacent to Austin Automotive.**



**Photograph 2: View of former pump island fronting site building, beyond which is the location of former USTs.**



**Photograph 3: Area of proposed drainage piping on western portion of subject site.**



**Photograph 4: "GP-9/TWM-1" location is grass median downgradient from former UST systems.**

**APPENDIX B**

**STANDARD OPERATING PROCEDURES**

**STANDARD OPERATING PROCEDURES**  
**Subsurface Assessment Methodology and Sampling Protocol**

**Parcel 134**  
**Keith Presnell Property**  
**East Yancy Automotive**  
**505 East US Highway 19E**  
**Burnsville, NC 28714**

WBS Element # 35609.1.1  
State Project # R-2519A  
**EI Project No. ENMO060029.00**

Prepared For:

Gregory A. Smith  
State of North Carolina  
Department of Transportation  
Geotechnical Unit  
GeoEnvironmental Section  
1589 Mail Service Center  
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Prepared by:

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2101 Gateway Centre Boulevard, Suite 200  
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PH (919) 544-7500 FAX (919) 544-2199

May 2006

## **STANDARD OPERATING PROCEDURES**

### **(Subsurface Assessment Methodology And Sampling Protocol**

#### **INTRODUCTION**

Environmental Investigations, Inc. (EI) has prepared this STANDARD OPERATING PROCEDURES - Subsurface Assessment Methodology and Sampling Protocol Plan (SPP) for a commercial property owned by Keith Presnell located at 505 East US Highway 19E, Burnsville, Yancey County, North Carolina.

The document presented herein describes the methodology and protocol that was utilized during the *Limited Preliminary Site Assessment* conducted at the above referenced project "site".

#### **SAMPLING DESIGN**

Prior to conducting a subsurface assessment, a sampling strategy was developed by EI based on the objectives of the investigation. After designing our soil sampling strategy, the appropriate equipment and techniques were selected to conduct the investigation. Our sampling strategy was based upon the premise of accomplishing the following performance objectives:

- collect soil samples that are representative of conditions as they exist at the study site;
- selecting the appropriate sampling device(s);
- taking measures to avoid introducing contamination as a result of poor sampling and/or poor handling techniques;
- reducing the potential of cross contamination between samples;
- defining sampling site selections and collection procedures for the appropriate individual media;
- defining the quality control assurance procedures;
- analytical requirements and limitations; and
- Data interpretation and assessment.

The sampling plan for this study was developed using the non-probabilistic (directed sampling designs) in nature. The location and frequency was based on this approach, to allow for the flexibility of the field coordinator (Geologist) to determine the number of samples collected for analysis. This approach allowed for the study objectives, properties of the matrix, resource constraints and access to sampling points to be adequately performed. Provision for access, use of sampling equipment, was also pre-determined.

The following section of the SPP discusses the sampling equipment available and collection methods which have been utilized to be technically appropriate.

## **SITE ORIENTATION**

Prior to conducting any soil sampling procedures, the EI Project Geologist/Manager reviewed and presented the Site and Safety Health Plan to all participants involved with the project which was developed based on the EI Safety and Health program. All monitoring, protective equipment (latex gloves, Tyvek® suits, etc.), potential hazards associated with the site and general health and safety standards were discussed.

### **Site Survey**

Prior to conducting specific sampling activities, EI personnel will conduct a limited site survey of the target and surrounding areas. Information discovered during the survey will be utilized to better perform the sampling activities and will provide more insight into establishment of the conclusions of this study. The site survey will consist of the following:

- General site layout (UST system layouts, overhead canopies, dispensers, etc.);
- Site access;
- Soil types and depths;
- Surface water drainage pathways;
- Existing site conditions;
- Visible staining of surface soil;
- Vegetation stress, and
- Possible offsite or non-site related sources.

## **FIELD INVESTIGATIVE PROCEDURES**

### **Sampling Objectives**

The general objective of sampling for this project was to collect a sample representative of subsurface and/or groundwater to reduce the potential bias caused by the sampling equipment used to obtain the sample.

The chosen sample locations were evaluated as discrete samples. A discrete sample is defined as "a discrete aliquot representative of a specific location at a given point in time."

### **Areas of Environmental Concern**

The objectives of choosing the proper sampling methods to collect appropriate samples that are representative of the conditions as they exist at the site were as follows:

- Selecting the appropriate sampling device.
- Taking measures to avoid introducing contamination as a result of poor sampling and/or handling techniques.
- Reducing the potential of cross contamination between samples.

The areas of environmental concern consisted of an existing heating oil UST.

### **SOIL SAMPLING ACTIVITIES**

Manual techniques and equipment, such as hand augers, are usually used for surface or shallow, subsurface soil sampling. Power operated equipment is usually associated with collecting deep samples, but this equipment can also be used for collecting shallow samples when the auger hole begins to collapse, or when the soil is so tight that manual auguring is not practical. Based on the request of the property owner, EI mainly used hand augers and to a lesser extent we utilized Direct Push Technology (DPT). The following section discusses the DPT methods employed during the site study.

#### **Soil Sampling Collection Methods**

Soil samples were collected utilizing Direct Push Technology (DPT) methods.

#### **Direct Push Technology Methodology**

DPT refers to tools and sensors that are inserted into the subsurface without the use of drilling to remove soil and make a path for the tool. To perform the DPT activities, the contractor utilized a GeoProbe® 6600 machine. The GeoProbe® 6600 is a hydraulically-powered probing machine designed, which uses static force and a percussion hammer to advance small diameter sampling tools into the subsurface to collect soil cores, groundwater samples, and or soil gas samples. A GeoProbe relies on a relatively small amount of static (vehicle) weight combined with percussion as the energy for advancement of a tool string.

The advantages of utilizing DPT drilling methods are described as follows:

- avoids the use of drilling fluids and lubricants during drilling;
- the equipment is highly mobile;
- disturbance of geochemical conditions during installation is minimized; and
- The drilling process does not produce drill cuttings.

### **DPT Soil Sample Collection Methods**

Soil samples utilizing DPT methods were collected from the advanced DPT soil borings continuously in 4.0-foot increments using acetate liners contained in a nickel plated macro sampling tubes. Each soil-filled liner was split for field screening and soil sample collection purposes. Soil samples were collected from the liners with disposable vinyl gloves and utilized for soil vapor screening testing and/or laboratory retention. This sampling method allows for continuous soil sampling from the ground surface to the desired depth. Soil samples selected for analyses are referenced in the text section.

### **Soil Sample Collection Protocol**

The following soil sampling collection procedures were utilized during this study:

- Ensured that all equipment, samplers and tools that will come in contact with the sample media was thoroughly decontaminated.
- Informed driller of sample interval (s) for borehole and oversaw the sampling process.
- Prepared and labeled all sample containers. Samples collected for the analytes of volatiles (if applicable) were sampled first.
- Labeled the containers including the location, depth, analyte, date and time of sampling.
- Delegated the driller to prepare the sample liner by cutting the liner in half.
- Placed liners on a clean sheet of plastic.
- Cut the soil core with a clean decontaminated knife to allow of visual soil classification.
- Sniffed the soil core with a PID/FID and recorded instrument readings volatile organics (VOCs) in a logbook (discussed further below).
- Logged the soil core in a logbook, including borehole identification (ID), sample number, date, time and any pertinent data.



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- Logged soil classification including: recording percent recovery, color, description of major constituent, soil texture/structure, grading/sorting/plasticity, relative density or hardness consistency, clay, sand, silt, gravel content, grain size, moisture content, odor, staining and the Unified Soil Classification System (USCS) identifier and symbol;
- Physically collected the selected soil samples and placed these samples into laboratory prepared containers.
- Ensured the soil sample did not contain twigs, stones, and other debris from the soil.
- Packed soil samples for shipment, prepared chain-of-custody records and shipping documentation

### **Soil Vapor Screening**

An important tool in performing this study is performing the soil vapor screening or sniffing activities. Field screening is generally performed for a variety of reasons. The technique conducted during this study was used to screen soil samples for measurable levels of volatile organics. The results obtained from this procedure are not quantitative; however the results from several soil samples are relative and allowed the Field Geologist/Project Manager to select samples that are the most contaminated with the contaminated media. Generally, the presence of little or no organic vapor is possibly indicative of non-contaminated soils. Soil samples collected for purposes of soil headspace screening were tested by the following procedures:

- the field instrument was calibrated, prior to use;
- soil samples were collected directly from the DPT soil liners and placed into sealable plastic bags;
- soil samples within the bags were allowed to equilibrate for approximately five minutes;
- the headspace of each bagged sample was screened with the instrument probe for the presence of volatile organic compound (VOCs) with a Mini-RAE Photo-ionization Detector (PID);
- recording the instrument readings (VOCs) in a field logbook; and
- Verified that the FID/PID was reading background levels prior to exposing the probe into another sample.

### **Collection of Grab Soil Samples**

Soil samples may provide two (2) types of soil contamination representation including grab and composite. Samples may be generally collected in random locations from a grid pattern or selected areas believed to be contaminated as evidenced by field indicators (staining, odors and/or measurable volatile organic readings).

For this study, grab samples selected from areas showing field indicators or confirmation soil samples chosen to confirm the absence of volatile organic readings were chosen. The technical definition for a grab sample is as follows: A grab sample is a discrete aliquot representative of a specific location at a given point in time. The sample is collected at one time and at one particular sampling point and depth. Refer to the text or Chain-of-Custody in this study for soil sample selection, date, time and depths of each sample chosen for laboratory analyses.

### **Sample Handling Procedures**

The sample handling procedures were conducted as follows:

- 1) Disposable surgical latex gloves were used to avoid cross contamination of samples. Gloves were discarded in a designated "waste bag after each sample was collected.
- 2) Each confirmation sample upon collection was immediately stored in a cooler containing ice. During the sample collection process, care was taken to insure the samples were not collected in direct sunlight. In addition, during the collection process, no parts of the body without gloves touched any part of the sample.
- 3) Once placed into the cooler, each sample was protected with bubble wrap® and foam was inserted in the base, sides and top of the cooler.

### **Soil Boring Abandonment Procedures**

Due to the fact that holes in the subsurface may act as a conduit for contamination migration, proper sealing of holes is essential for ensuring that a site assessment does not contribute to the spread of contaminants. The objective of hole-sealing is to prevent preferential migration of contaminants through the bore hole. To seal the boreholes advanced during this study, the contractor utilized a method known as surface pouring. Surface pouring entails sealing the boreholes with dry products (e.g., bentonite granules, chips and/or pellets). Once the DPT drive rods have been withdrawn, dry products are physically poured into the bottom of the

borehole and filled vertically up the column to at least two (2) feet from the base of the borehole. Once the dry products have seated into the borehole, the product is hydrated to expand the clay material. After the hydration process has been performed, the remaining portions of the boreholes are backfilled with the soil cores. Due to the nature of DPT, no soil cuttings were generated during soil boring exploration assessment work.

### **GROUNDWATER INVESTIGATION**

The purpose of a monitoring well is to provide an access point for measuring groundwater levels and to collect groundwater samples representing actual in-situ groundwater conditions at that point of access. For the purpose of this investigation, based on the scope of work, EI chose to install temporary groundwater monitoring wells (Type I).

### **WELL DEVELOPMENT AND GROUNDWATER SAMPLE COLLECTION**

#### **Water Development**

The groundwater monitor well was purged with a Peristaltic™ pump. Well development allows fresh water from the formation to enter the well and the groundwater samples will more accurately represent actual groundwater conditions. The well was purged of approximately three (3) to five (5) well volumes of water or until dry prior to sampling.

#### **Groundwater Sampling Procedures**

After well development activities were performed, groundwater samples were collected from the well(s) with the referenced pump. During the collection process, samples were poured directly from the bailer into the laboratory supplied containers which were placed into an ice chest filled with ice. Under no circumstances were any intermediate sample containers used, i.e. jar, beaker, etc., and then transferred to the sample container. In addition, water samples were not field filtered.

Prior to collecting the water sample, the containers were labeled accordingly. This procedure was performed prior to sampling because sample containers have a tendency to "sweat" when filled with groundwater; this makes it difficult to affix a label to the container after sampling.

The sample label also was covered with a clear piece of tape, which was wrapped around the sample container. This procedure prevented the label from detaching from the container during sample storage and shipment.

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Each sample container was labeled indicating the sample location (i.e. GP-1, or MW-1, etc.), date and time of collection, sample location, collector, project site, and analysis identification. Other pertinent information was recorded in the field book.

After the groundwater sample(s) was collected, the containers were immediately placed in a sample cooler containing ice. Upon completion, the samples were transported to Paradigm Analytical Laboratories, located in Wilmington, NC using chain-of-custody documentation.

### **Soil Boring Abandonment Procedures**

Due to the fact that holes in the subsurface may act as a conduit for contamination migration, proper sealing of holes is essential for ensuring that a site assessment does not contribute to the spread of contaminants. The objective of hole-sealing is to prevent preferential migration of contaminants through the bore hole. To seal the boreholes advanced during this study, the contractor utilized a method known as surface pouring. Surface pouring entails sealing the boreholes with dry products (e.g., bentonite granules, chips and/or pellets). Once the DPT drive rods have been withdrawn, dry products are physically poured into the bottom of the borehole and filled vertically up the column to at least two (2) feet from the base of the borehole. Once the dry products have seated into the borehole, the product is hydrated to expand the clay material. After the hydration process has been performed, the remaining portions of the boreholes are backfilled with the soil cores. Due to the nature of DPT, no soil cuttings were generated during soil boring exploration assessment work.

## **LABORATORY ANALYTICAL METHODS**

### **Soil Analytical Methods**

Based upon verbal information provided by NCDOT personnel (Eugene Tarascio), EI selected to analyze the chosen soil samples for total petroleum hydrocarbons (TPH) analyses by Method 8015B with preparation methods for the analysis of Diesel Range Organics (DRO) by GC-FID and Gasoline Range Organics (GRO) by GC-FID. The GRO method is utilized to extract volatile fuels such as gasoline, while the DRO method is utilized to extract less volatile petroleum products such as diesel fuel, fuel oil #2, kerosene, and varsol.

One (1) soil sample from the site was analyzed for volatile organics by SW-846 Method 8260 (5035 Prep), for semi-volatiles (SVOCs) by SW-846 Method 8270, and for aliphatics and aromatics by Massachusetts Department of Environmental Protection's (MADEP) method for volatile petroleum hydrocarbons (VPH) and MADEP's method for extractable

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petroleum hydrocarbons (EPH), respectively.

These laboratory analytical methods were utilized as required in the *Guidelines* in order to compare results to the DWM's maximum soil contaminant concentration (MSCC) cleanup standards. The MSCC concentrations are also published in the *Guidelines*.

### **SAMPLE PACKAGING AND SHIPPING**

This section discusses the sample packaging and shipping protocol that shall be used to transport collected samples to the laboratories for analytical testing. Samples collected, prepared, preserved and stored must then be readied for packaging and shipping. It is important that the presented protocol be followed to ensure that the samples reach their destination in sound condition. In addition, the samples must be under strict COC from the time they are sampled until the analysis is complete.

Samples collected for this project were classified as environmental materials samples and were not considered hazardous. In addition, the samples collected for this study were not classified as "dangerous goods".

Environmental samples collected for this field study were packed prior to shipment using the following procedures:

1. Secure drain plug on cooler with tape.
2. Place cushioned layer on bottom of cooler (vermiculite or "bubble-wrap" plastic).
3. Line cooler with large heavy duty plastic bag.
4. Place all sample containers in large plastic bag within the cooler. Be sure the lids on all bottles are tight (will not leak).
5. Cushion containers to prevent breakage.
6. Put ice that has been "double bagged" in heavy duty polyethylene bags and placed on top of and/or between the samples within the large plastic bag. Fill all remaining space between the containers with cushion materials.
7. Securely fasten the top of the large plastic bag with tape or tie.
8. Place the Chain-of-Custody Record into a plastic bag, and tape the bag to the inner side of the cooler lid.
9. Close the cooler and securely tape (preferably with fiber tape) the top of the cooler shut. Custody seals should be affixed to the top and sides of the cooler within the securing tape so that the cooler cannot be opened without breaking the seal.
10. Shipping containers (ice cooler) must be marked "THIS END UP", and arrow labels which indicate the proper upward position of the container should be affixed to the container. A label containing the name and address of the shipper should be placed on the containers exterior. Labels

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used in the shipment of hazardous materials (e.g., Cargo Only Air Craft, Flammable Solids, etc.) are not permitted to be on the outside of containers used to transport environmental samples.

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**Shipping Note:**

"When samples are to be shipped by common carrier or sent through the United States mail, it must comply with the Department of Transportation Hazardous Materials Regulations (49 CFR 172). The person offering such material for transportation is responsible for ensuring such compliance. For the preservation requirements of 40 CFR, Part 136, Table II, the Office of Hazardous Materials, Materials Transportation Bureau, Department of Transportation has determined that the Hazardous Materials Regulations do not apply to the following materials: Hydrochloric Acid (HCL) in water solutions at concentrations of 0.04% by weight or less (pH about 1.96 or greater); Nitric acid (HN03) in water solutions at concentrations of 0.-15% by weight or less (pH about 1.62 or greater); Sulfuric acid (H2SO4) in water solutions at concentrations of 0.35% by weight or less (pH about 1.15 or greater); and Sodium Hydroxide (Na OH) in water solutions at concentrations of 0.08% by weight or less (pH about 12.30 or less). This footnote is wholly reproduced from 40 CFR 136.3, which is definitive".

**Sample Transportation**

The cooler(s) containing the collected soil samples was shipped overnight via Federal Express, with COC documentation, to SGS Paradigm Laboratories, Inc. in Wilmington, NC. The following protocol was used for sample handling and transportation:

- 1) The lids on all bottles were tightened to reduce the potential for leakage.
- 2) The sample identification label on each individual laboratory container was covered with a clear piece of plastic tape. Each container was then placed within an appropriately sized polyethylene bag and sealed.
- 3) The containers were placed into a bubble-wrap® lined rectangular ice chest (cooler).
- 4) Ice was placed on top and surrounding bubble-wrap® sample containers. Some of the remaining spaces between the containers were filled with bubble-wrap® and/or ice.
- 5) The cooler drain plug was secured with clear tape.
- 6) The COC's was double plastic bagged and was taped to the inner side of the cooler lid.
- 7) The cooler was closed and securely taped.
- 8) A label with adhesive tape containing the name and address of the shipper and the address of the laboratory was placed on top of the cooler.

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### **DECONTAMINATION PROCEDURES**

Decontamination is the process of washing, rinsing and removing contaminants from exposed surfaces of equipment. Decontamination helps prevent the spread of contamination off-site, and avoids cross-contamination to other samples. The decontamination procedures were performed as follows:

- 1) Disposable surgical latex gloves were used in lieu of decontamination procedures to collect soil samples.

The soil samples retained for laboratory analyses were placed in the appropriate clean laboratory prepared containers, labeled and subsequently delivered with chain-of-custody documentation (COC) for analysis. Dates and times of sampling may be referenced on the COC's. Specific laboratory analysis methods are referenced in the text of this Study.

### **QUALITY ASSURANCE PROTOCOL**

#### **Field and Laboratory Control Samples**

The purpose of this section is to describe the standard control sampling program that supported the data quality objectives for this site. These control samples will included field control Quality Assurance (QA) samples used to assess sources of error. To minimize or consider the impact these errors have on the resulting data, a combination of unique field QA/QC protocols and control samples were developed to meet the QA overall objectives.

#### **Field Control Samples**

The elements of the sampling and field QA/QC strategy included the following:

- (1) El developed a well thought out sampling strategy for the site. The plan adequately and sufficiently outlined the different types of environmental media and protocol to sample the media.
- (2) Sampling methodologies to obtain true representative samples.
- (3) Used decontamination procedures in order to reduce cross-contamination potential between sampling points.
- (4) Used the proper sample containers, and preservation requirements.
- (5) Used the proper storage, and shipping of samples protocol.

Techniques to verify the inclusion of the QA/QC program included scheduled field control samples consisting of field blanks (trip and temperature). The field control samples were



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handled similarly as the environmental samples.

### **Quality Control Samples**

A trip and temperature blank were collected during this study.

### **Laboratory QA/QC Procedures**

Laboratory QA/QC procedures are implemented in order to prevent, detects, and corrects potential errors during the analytical process. The reliability and credibility of analytical laboratories are corroborated by the development and performance of their respective QA/QC programs. For this project, the NCDOT contracted laboratory provided and performed their program as they see fit. Standard practices used by the selected laboratory included the following quality control sample information in their generated reports:

- (a) laboratory method blanks;
- (b) temperature blanks.

### **INVESTIGATION DERIVED WASTE MANAGEMENT PROTOCOL**

The investigation derived waste (IDW) generated during the sampling activities were placed on site. These wastes include any derivative investigative soils leftover from the sampling and backfilling protocol, decontamination water (cleaning of field equipment), bailers, bailer haul-line and PPE equipment, if applicable. The management of IDW for this project complies with applicable or relevant and appropriate requirements (ARAs). The site specific ARAs were followed in consensus with the EPA Standard Operating Procedures (SOP) and Quality Assurance Manual, Region 4 and the *Guidelines For Assessment And Corrective Action*, drafted by the North Carolina Underground Storage Tank Section, effective July 1, 2001.

**APPENDIX C**  
**SOIL BORING LOGS**



# E.I.

ENVIRONMENTAL INVESTIGATIONS, INC.

2101 Gateway Centre Boulevard, Suite 200  
Morrisville, North Carolina  
919-544-7500

## SOIL BORING LOG

Boring No. GP-1  
Date Drilled: 04/12/06

Client:	<u>NCDOT</u>	Logged By:	<u>DST</u>
Project Name:	<u>Parcel #134</u>	Drilling Company:	<u>Environmental Probing</u>
Project/Site Location:	<u>505 East US Highway 19E</u>	Drill Device:	<u>Simco</u>
Project Number:	<u>ENMO060029.00</u>	Drill Method:	<u>DPT</u>

Total Boring Depth:	<u>2.44 m</u>	Weather Conditions:	<u>Warm</u>	Surface Elevation:	<u>          </u>
Boring Diameter:	<u>4.0"</u>	Boring Location:	<u>proposed drainage piping</u>		

Depth (Feet)	Depth (meters)	Time	Sample Analyzed	Recovery	Soil Profile	Lithological Description	Sample PID (ppm)
2.00	0.61			80%	(MIL)	Orange to tan to white, slightly indurated clayey SILT	0.0
4.00	1.22						0.0
6.00	1.83			100%			0.0
8.00	2.44	13:30	x				0.0
10.00	3.05					Boring terminated at 2.44m (8.0') bls. x denotes soil sample at 1.83m - 2.44m (6'-8') bls interval collected for laboratory retention.	
12.00	3.66						
14.00	4.27						
16.00	5.88						



# E.I.

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Morrisville, North Carolina  
919-544-7500

## SOIL BORING LOG

Boring No. GP-2  
Date Drilled: 04/12/06

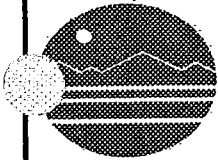
Client: NCDOT  
Project Name: Parcel #134  
Project/Site Location: 505 East US Highway 19E  
Project Number: ENMO060029.00

Logged By: DST  
Drilling Company: Environmental Probing  
Drill Device: Simco  
Drill Method: DPT

Total Boring Depth: 2.44 m  
Boring Diameter: 4.0"

Weather Conditions: Warm Surface Elevation: \_\_\_\_\_  
Boring Location: proposed drainage piping b/w ROW and shed

Depth (Feet)	Depth (meters)	Time	Sample Analyzed	Recovery	Soil Profile	Lithological Description	Sample PID (ppm)
2.00	0.61			100%	(VIL)	Orange to tan to white, slightly indurated clayey SILT	0.0
4.00	1.22			0.0			
6.00	1.83			100%			0.0
8.00	2.44	13:50	x				0.0
10.00	3.05					Boring terminated at 2.44m (8.0') bls. x denotes soil sample at 1.83m - 2.44m (6'-8') bls interval collected for laboratory retention.	
12.00	3.66						
14.00	4.27						
16.00	5.88						



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## SOIL BORING LOG

Boring No. GP-3  
Date Drilled: 04/12/06

Client: NCDOT  
Project Name: Parcel #134  
Project/Site Location: 505 East US Highway 19E  
Project Number: ENMO060029.00

Logged By: DST  
Drilling Company: Environmental Probing  
Drill Device: Simco  
Drill Method: DPT

Total Boring Depth: 2.44 m  
Boring Diameter: 4.0"

Weather Conditions: Warm Surface Elevation: \_\_\_\_\_  
Boring Location: proposed drainage in center grass median

Depth (Feet)	Depth (meters)	Time	Sample Analyzed	Recovery	Soil Profile	Lithological Description	Sample PID (ppm)
2.00	0.61			100%	(ML)	Orange to tan to white, slightly indurated clayey SILT	0.0
4.00	1.22			0.0			
6.00	1.83			100%			0.0
8.00	2.44	14:00	x				0.0
10.00	3.05					Boring terminated at 2.44m (8.0') bls. x denotes soil sample at 1.83m - 2.44m (6'-8') bls interval collected for laboratory retention.	



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## SOIL BORING LOG

Boring No. GP-4  
Date Drilled: 04/12/06

Client:	<u>NCDOT</u>	Logged By:	<u>DST</u>
Project Name:	<u>Parcel #134</u>	Drilling Company:	<u>Environmental Probing</u>
Project/Site Location:	<u>505 East US Highway 19E</u>	Drill Device:	<u>Simco</u>
Project Number:	<u>ENMO060029.00</u>	Drill Method:	<u>DPT</u>

Total Boring Depth: 2.44 m      Weather Conditions: Warm      Surface Elevation: \_\_\_\_\_  
 Boring Diameter: 4.0"      Boring Location: proposed drainage in center of asphalt access

Depth (Feet)	Depth (meters)	Time	Sample Analyzed	Recovery	Soil Profile	Lithological Description	Sample PID (ppm)
						concrete beneath asphalt surface	0.0
2.00	0.61			100%	(YEL)	Orange to tan to white, slightly indurated clayey SILT	0.0
4.00	1.22			0.0			
6.00	1.83			100%			0.0
8.00	2.44	14:15	x				0.0
10.00	3.05					Boring terminated at 2.44m (8.0') bls. x denotes soil sample at 1.83m - 2.44m (6'-8') bls interval collected for laboratory retention.	
12.00	3.66						
14.00	4.27						
16.00	5.88						



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## SOIL BORING LOG

Boring No. GP-5  
Date Drilled: 04/12/06

Client: NCDOT  
Project Name: Parcel #134  
Project/Site Location: 505 East US Highway 19E  
Project Number: ENMO060029.00

Logged By: DST  
Drilling Company: Environmental Probing  
Drill Device: Simco  
Drill Method: DPT

Total Boring Depth: 3.66m  
Boring Diameter: 10.16cm

Weather Conditions: Cool  
Boring Location: Upgradient of trailer

Surface Elevation: \_\_\_\_\_

Depth (Feet)	Depth (meters)	Time	Sample Analyzed	Recovery	Soil Profile	Lithological Description	Sample PID (ppm)
2.00	0.61			100%	(ML)	Orange, to tan/white, slightly indurated SILT (ML)	NA
4.00	1.22						0.4
6.00	1.83	14:30	x	100%			0.0
8.00	2.44						0.0
10.00	3.05					Boring terminated at 2.44m (8.0') bls. x denotes soil sample at 1.22m - 1.83m (4-6') bls interval collected for laboratory retention.	
12.00	3.66						
14.00	4.27						
16.00	4.87						





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## SOIL BORING LOG

Boring No. GP-6  
 Date Drilled: 04/12/06

Client:	<u>NCDOT</u>	Logged By:	<u>DST</u>
Project Name:	<u>Parcel #134</u>	Drilling Company:	<u>Environmental Probing</u>
Project/Site Location:	<u>505 East US Highway 19E</u>	Drill Device:	<u>Simco</u>
Project Number:	<u>ENMO060029.00</u>	Drill Method:	<u>DPT</u>

Total Boring Depth:	<u>5.88m</u>	Weather Conditions:	<u>Warm</u>	Surface Elevation:	<u>          </u>
Boring Diameter:	<u>4.0"</u>	Boring Location:	<u>by former USTs</u>		

Depth (Feet)	Depth (meters)	Time	Sample Analyzed	Recovery	Soil Profile	Lithological Description	Sample PID (ppm)
2.00	0.61			100%	(VIL)	Orange to tan to white, slightly indurated clayey SILT	10.0
4.00	1.22					0.0	
6.00	1.83	15:10	x	100%		105.0	
8.00	2.44					0.0	
10.00	3.05			100%		moist	0.0
12.00	3.66					0.0	
14.00	4.27			100%		wet	0.0
16.00	5.88					0.0	
18.00	5.49					Boring terminated at 5.88m (16.0') bls. x denotes soil sample at 1.22m - 1.83m (4'-6') bls interval collected for laboratory retention.	
20.00	6.1						



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## SOIL BORING LOG

Boring No. GP-7  
Date Drilled: 04/12/06

Client: NCDOT  
Project Name: Parcel #134  
Project/Site Location: 505 East US Highway 19E  
Project Number: ENMO060029.00

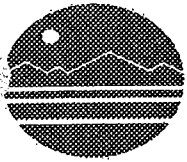
Logged By: DST  
Drilling Company: Environmental Probing  
Drill Device: Simco  
Drill Method: DPT

Total Boring Depth: 5.88m  
Boring Diameter: 4.0"

Weather Conditions: Warm  
Boring Location: by pump island

Surface Elevation: \_\_\_\_\_

Depth (Feet)	Depth (meters)	Time	Sample Analyzed	Recovery	Soil Profile	Lithological Description	Sample PID (ppm)
2.00	0.61			100%	(VBL)	Orange to tan to white, slightly indurated clayey SILT	0.0
4.00	1.22					0.0	
6.00	1.83			100%		45.0	
8.00	2.44					30.0	
10.00	3.05	15:50	x	100%		moist	575.0
12.00	3.66					strong petroleum odor	550.0
14.00	4.27			100%		saturated	30.0
16.00	5.88						0.0
18.00	5.49					Boring terminated at 5.88m (16.0') bls. x denotes soil sample at 2.44m - 3.05m (8'-10') bls interval collected for laboratory retention.	
20.00	6.1						



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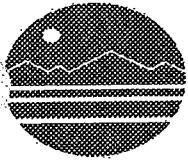
## SOIL BORING LOG

Boring No. GP-8  
Date Drilled: 04/12/06

Client:	<u>NCDOT</u>	Logged By:	<u>DST</u>
Project Name:	<u>Parcel #134</u>	Drilling Company:	<u>Environmental Probing</u>
Project/Site Location:	<u>505 East US Highway 19E</u>	Drill Device:	<u>Simco</u>
Project Number:	<u>ENMO060029.00</u>	Drill Method:	<u>DPT</u>

Total Boring Depth: 3.66m      Weather Conditions: Cool      Surface Elevation: \_\_\_\_\_  
 Boring Diameter: 10.16cm      Boring Location: Upgradient of trailer

Depth (Feet)	Depth (meters)	Time	Sample Analyzed	Recovery	Soil Profile	Lithological Description	Sample PID (ppm)
2.00	0.61			100%	(ML)	Orange, to tan/white, slightly indurated SILT (ML)	NA
4.00	1.22						0.4
		16:50	x				15.0
6.00	1.83			100%			0.0
8.00	2.44						35.0
10.00	3.05			100%			10.0
12.00	3.66						
14.00	4.27			100%			NA
16.00	4.87						
						Boring terminated at 4.87m (16.0') bls. x denotes soil sample at 1.22m - 1.83m (4-6') bls interval collected for laboratory retention.	



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## SOIL BORING LOG

Boring No. GP-9  
Date Drilled: 04/12/06

Client: NCDOT  
Project Name: Parcel #134  
Project/Site Location: 505 East US Highway 19E  
Project Number: ENMO060029.00

Logged By: DST  
Drilling Company: Environmental Probing  
Drill Device: Simco  
Drill Method: DPT

Total Boring Depth: 3.66m  
Boring Diameter: 10.16cm

Weather Conditions: Cool  
Boring Location: Upgradient of trailer

Surface Elevation: \_\_\_\_\_

Depth (Feet)	Depth (meters)	Time	Sample Analyzed	Recovery	Soil Profile	Lithological Description	Sample PID (ppm)
						Orange, to tan/white, slightly indurated SILT (ML)	NA
2.00	0.61			100%			0.4
4.00	1.22	17:29	x				120.0
6.00	1.83			100%			0.0
8.00	2.44				(ML)		35.0
10.00	3.05			100%			10.0
12.00	3.66						
14.00	4.27			100%			NA
16.00	4.87						
						Boring terminated at 4.87m (16.0') bls. x denotes soil sample at 1.22m - 1.83m (4-6') bls interval collected for laboratory retention.	

**APPENDIX D**

**LABORATORY RESULTS**



Mr. Sterling Turner  
Environmental Investigations  
5500-E Cox Rd  
Glen Allen VA 23060

Report Number: G106-596

Client Project: Yancy DOT

Dear Mr. Turner:

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will 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 SGS/Paradigm at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS/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,  
SGS/Paradigm Analytical Laboratories, Inc.

  
\_\_\_\_\_  
Laboratory Director  
J. Patrick Weaver

5/11/2006  
\_\_\_\_\_  
Date



**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 134-1-4  
 Client Project ID: Yancy DOT  
 Lab Sample ID: G106-596-1  
 Lab Project ID: G106-596  
 Report Basis: Dry Weight

Analyzed By: MJC  
 Date Collected: 4/12/2006 13:30  
 Date Received: 4/19/2006  
 Matrix: Soil  
 Solids 66.09

Analyte	Result MG/KG	RL MG/KG	Prep Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	7.88	5035	1	04/21/06
Diesel Range Organics	11.8	9.20	3541	1	04/26/06

Comments:

Flags:



**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 134-2-4  
 Client Project ID: Yancy DOT  
 Lab Sample ID: G106-596-2  
 Lab Project ID: G106-596  
 Report Basis: Dry Weight

Analyzed By: MJC  
 Date Collected: 4/12/2006 13:50  
 Date Received: 4/19/2006  
 Matrix: Soil  
 Solids 73.22

Analyte	Result MG/KG	RL MG/KG	Prep Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	7.37	5035	1	04/21/06
Diesel Range Organics	BQL	7.84	3541	1	04/26/06

Comments:

Flags:





**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 134-3-4  
 Client Project ID: Yancy DOT  
 Lab Sample ID: G106-596-3  
 Lab Project ID: G106-596  
 Report Basis: Dry Weight

Analyzed By: MJC  
 Date Collected: 4/12/2006 14:00  
 Date Received: 4/19/2006  
 Matrix: Soil  
 Solids 72.66

Analyte	Result MG/KG	RL MG/KG	Prep Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	8.10	5035	1	04/21/06
Diesel Range Organics	BQL	8.54	3541	1	04/26/06

Comments:

Flags:

Reviewed By: *[Signature]*



**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015


Client Sample ID: 134-4-4  
 Client Project ID: Yancy DOT  
 Lab Sample ID: G106-596-4  
 Lab Project ID: G106-596  
 Report Basis: Dry Weight

Analyzed By: MJC  
 Date Collected: 4/12/2006 14:15  
 Date Received: 4/19/2006  
 Matrix: Soil  
 Solids 69.11

Analyte	Result MG/KG	RL MG/KG	Prep Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	9.91	5035	1	04/21/06
Diesel Range Organics	BQL	8.98	3541	1	04/26/06

Comments:

Flags:

Reviewed By: 

TPH\_LIMS\_v1.9



**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 134-5-4  
 Client Project ID: Yancy DOT  
 Lab Sample ID: G106-596-5  
 Lab Project ID: G106-596  
 Report Basis: Dry Weight

Analyzed By: MJC  
 Date Collected: 4/12/2006 14:30  
 Date Received: 4/19/2006  
 Matrix: Soil  
 Solids 64.43

Analyte	Result MG/KG	RL MG/KG	Prep Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	6.84	5035	1	04/21/06
Diesel Range Organics	BQL	9.42	3541	1	04/26/06

Comments:

Flags:

Reviewed By: EW  
 TPH\_LIMS\_v1.9



**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 134-6-3  
 Client Project ID: Yancy DOT  
 Lab Sample ID: G106-596-6  
 Lab Project ID: G106-596  
 Report Basis: Dry Weight

Analyzed By: MJC  
 Date Collected: 4/12/2006 15:10  
 Date Received: 4/19/2006  
 Matrix: Soil  
 Solids 86.50

Analyte	Result MG/KG	RL MG/KG	Prep Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	7.15	5035	1	04/21/06
Diesel Range Organics	BQL	7.01	3541	1	04/26/06

Comments:

Flags:



**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 134-7-5  
 Client Project ID: Yancy DOT  
 Lab Sample ID: G106-596-7  
 Lab Project ID: G106-596  
 Report Basis: Dry Weight

Analyzed By: MJC  
 Date Collected: 4/12/2006 15:50  
 Date Received: 4/19/2006  
 Matrix: Soil  
 Solids 86.51

Analyte	Result MG/KG	RL MG/KG	Prep Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	118	32.1	5035	5	04/22/06
Diesel Range Organics	38.7	6.74	3541	1	04/26/06

Comments:

Flags:



**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 134-8-3  
 Client Project ID: Yancy DOT  
 Lab Sample ID: G106-596-8  
 Lab Project ID: G106-596  
 Report Basis: Dry Weight

Analyzed By: MJC  
 Date Collected: 4/12/2006 16:50  
 Date Received: 4/19/2006  
 Matrix: Soil  
 Solids 68.50

Analyte	Result MG/KG	RL MG/KG	Prep Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	8.28	5035	1	04/22/06
Diesel Range Organics	BQL	9.06	3541	1	04/26/06

Comments:

Flags:



**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: 134-9-6  
 Client Project ID: Yancy DOT  
 Lab Sample ID: G106-596-10  
 Lab Project ID: G106-596  
 Report Basis: Dry Weight

Analyzed By: MJC  
 Date Collected: 4/12/2006 17:25  
 Date Received: 4/19/2006  
 Matrix: Soil  
 Solids 61.06

Analyte	Result MG/KG	RL MG/KG	Prep Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	63.4	8.73	5035	1	04/22/06
Diesel Range Organics	15.4	10.1	3541	1	04/26/06

Comments:

Flags:

Reviewed By:       
 TPH\_LIMS\_v1.8


**Results for Volatiles  
by GCMS 8260-5035**

Client Sample ID: 134-9-3  
 Client Project ID: Yancy DOT  
 Lab Sample ID G106-596-9A  
 Lab Project ID: G106-596  
 Report Basis: Dry Weight

Analyzed By: JTF  
 Date Collected: 04-12-2006 17:20  
 Date Received: 4/19/2006  
 Matrix: Soil  
 %Solids: 77.5

Report Name Compound	Result UG/KG	Quantitation Limit UG/KG	Dilution Factor	Date Analyzed
Acetone	BQL	55.1	1	4/24/2006
Benzene	BQL	5.51	1	4/24/2006
Bromobenzene	BQL	5.51	1	4/24/2006
Bromochloromethane	BQL	5.51	1	4/24/2006
Bromodichloromethane	BQL	5.51	1	4/24/2006
Bromoform	BQL	5.51	1	4/24/2006
Bromomethane	BQL	5.51	1	4/24/2006
2-Butanone	BQL	27.6	1	4/24/2006
n-Butylbenzene	BQL	5.51	1	4/24/2006
sec-Butylbenzene	BQL	5.51	1	4/24/2006
tert-Butylbenzene	BQL	5.51	1	4/24/2006
Carbon disulfide	BQL	5.51	1	4/24/2006
Carbon tetrachloride	BQL	5.51	1	4/24/2006
Chlorobenzene	BQL	5.51	1	4/24/2006
Chloroethane	BQL	5.51	1	4/24/2006
Chloroform	BQL	5.51	1	4/24/2006
Chloromethane	BQL	5.51	1	4/24/2006
2-Chlorotoluene	BQL	5.51	1	4/24/2006
4-Chlorotoluene	BQL	5.51	1	4/24/2006
Dibromochloromethane	BQL	5.51	1	4/24/2006
1,2-Dibromo-3-chloropropane	BQL	5.51	1	4/24/2006
Dibromomethane	BQL	5.51	1	4/24/2006
1,2-Dibromoethane (EDB)	BQL	5.51	1	4/24/2006
1,2-Dichlorobenzene	BQL	5.51	1	4/24/2006
1,3-Dichlorobenzene	BQL	5.51	1	4/24/2006
1,4-Dichlorobenzene	BQL	5.51	1	4/24/2006
trans-1,4-Dichloro-2-butene	BQL	5.51	1	4/24/2006
1,1-Dichloroethane	BQL	5.51	1	4/24/2006
1,1-Dichloroethene	BQL	5.51	1	4/24/2006
1,2-Dichloroethane	BQL	5.51	1	4/24/2006
cis-1,2-Dichloroethene	BQL	5.51	1	4/24/2006
trans-1,2-dichloroethene	BQL	5.51	1	4/24/2006
1,2-Dichloropropane	BQL	5.51	1	4/24/2006
1,3-Dichloropropane	BQL	5.51	1	4/24/2006
2,2-Dichloropropane	BQL	5.51	1	4/24/2006
1,1-Dichloropropene	BQL	5.51	1	4/24/2006
cis-1,3-Dichloropropene	BQL	5.51	1	4/24/2006
trans-1,3-Dichloropropene	BQL	5.51	1	4/24/2006
Dichlorodifluoromethane	BQL	5.51	1	4/24/2006
Diisopropyl ether (DIPE)	BQL	5.51	1	4/24/2006
Ethylbenzene	BQL	5.51	1	4/24/2006
Hexachlorobutadiene	BQL	5.51	1	4/24/2006





**Results for Volatiles  
by GCMS 8260-5035**

Client Sample ID: 134-9-3  
 Client Project ID: Yancy DOT  
 Lab Sample ID G106-596-9A  
 Lab Project ID: G106-596  
 Report Basis: Dry Weight

Analyzed By: JTF  
 Date Collected: 04-12-2006 17:20  
 Date Received: 4/19/2006  
 Matrix: Soil  
 %Solids: 77.5

Report Name Compound	Result UG/KG	Quantitation Limit UG/KG	Dilution Factor	Date Analyzed
2-Hexanone	BQL	5.51	1	4/24/2006
Iodomethane	BQL	5.51	1	4/24/2006
Isopropylbenzene	BQL	5.51	1	4/24/2006
4-Isopropyltoluene	BQL	5.51	1	4/24/2006
Methylene chloride	BQL	22.1	1	4/24/2006
4-Methyl-2-pentanone	BQL	5.51	1	4/24/2006
Methyl-tert-butyl ether (MTBE)	BQL	5.51	1	4/24/2006
Naphthalene	BQL	5.51	1	4/24/2006
n-Propyl benzene	BQL	5.51	1	4/24/2006
Styrene	BQL	5.51	1	4/24/2006
1,1,1,2-Tetrachloroethane	BQL	5.51	1	4/24/2006
1,1,2,2-Tetrachloroethane	BQL	5.51	1	4/24/2006
Tetrachloroethene	BQL	5.51	1	4/24/2006
Toluene	BQL	5.51	1	4/24/2006
1,2,3-Trichlorobenzene	BQL	5.51	1	4/24/2006
1,2,4-Trichlorobenzene	BQL	5.51	1	4/24/2006
Trichloroethene	BQL	5.51	1	4/24/2006
1,1,1-Trichloroethane	BQL	5.51	1	4/24/2006
1,1,2-Trichloroethane	BQL	5.51	1	4/24/2006
Trichlorofluoromethane	BQL	5.51	1	4/24/2006
1,2,3-Trichloropropane	BQL	5.51	1	4/24/2006
1,2,4-Trimethylbenzene	BQL	5.51	1	4/24/2006
1,3,5-Trimethylbenzene	BQL	5.51	1	4/24/2006
Vinyl chloride	BQL	5.51	1	4/24/2006
m-,p-Xylene	BQL	11.0	1	4/24/2006
o-Xylene	BQL	5.51	1	4/24/2006

	Spike Added	Spike Result	Percent Recovered
4-Bromofluorobenzene	50	52.6	105
1,2-Dichloroethane-d4	50	53.8	108
Toluene-d8	50	48.7	97

**Comments:**

**Flags:**

BQL = Below Quantitation Limits.

Reviewed By:



**Results for Semivolatiles  
by GCMS 8270**

Client Sample ID: 134-9-3  
 Client Project ID: Yancy DOT  
 Lab Sample ID: G106-596-9H  
 Lab Project ID: G106-596  
 Report Basis: Dry weight

Analyzed By: MRC  
 Date Collected: 4/12/2006 17:20  
 Date Received: 4/19/2006  
 Date Extracted: 4/24/2006  
 Matrix: Soil  
 % Solids: 77.51

Compound	Result ug/Kg	RL ug/Kg	Dilution Factor	Date Analyzed
Acenaphthene	BQL	399	1	4/25/2006
Acenaphthylene	BQL	399	1	4/25/2006
Anthracene	BQL	399	1	4/25/2006
Benzo[a]anthracene	BQL	399	1	4/25/2006
Benzo[a]pyrene	BQL	399	1	4/25/2006
Benzo[b]fluoranthene	BQL	399	1	4/25/2006
Benzo[g,h,i]perylene	BQL	399	1	4/25/2006
Benzo[k]fluoranthene	BQL	399	1	4/25/2006
Benzoic Acid	BQL	799	1	4/25/2006
Bis(2-chloroethoxy)methane	BQL	399	1	4/25/2006
Bis(2-chloroethyl)ether	BQL	399	1	4/25/2006
Bis(2-chloroisopropyl)ether	BQL	399	1	4/25/2006
Bis(2-ethylhexyl)phthalate	BQL	399	1	4/25/2006
4-bromophenyl phenyl ether	BQL	399	1	4/25/2006
Butylbenzylphthalate	BQL	399	1	4/25/2006
2-Chloronaphthalene	BQL	399	1	4/25/2006
2-Chlorophenol	BQL	399	1	4/25/2006
4-Chloro-3-methylphenol	BQL	399	1	4/25/2006
4-Chloroaniline	BQL	2000	1	4/25/2006
4-Chlorophenyl phenyl ether	BQL	399	1	4/25/2006
Chrysene	BQL	399	1	4/25/2006
Dibenzo[a,h]anthracene	BQL	399	1	4/25/2006
Dibenzofuran	BQL	399	1	4/25/2006
Di-n-Butylphthalate	BQL	399	1	4/25/2006
1,2-Dichlorobenzene	BQL	399	1	4/25/2006
1,3-Dichlorobenzene	BQL	399	1	4/25/2006
1,4-Dichlorobenzene	BQL	399	1	4/25/2006
3,3'-Dichlorobenzidine	BQL	799	1	4/25/2006
2,4-Dichlorophenol	BQL	399	1	4/25/2006
Diethylphthalate	BQL	399	1	4/25/2006
Dimethylphthalate	BQL	399	1	4/25/2006
2,4-Dimethylphenol	BQL	399	1	4/25/2006
Di-n-octylphthalate	BQL	399	1	4/25/2006
4,6-Dinitro-2-methylphenol	BQL	2000	1	4/25/2006
2,4-Dinitrophenol	BQL	2000	1	4/25/2006
2,4-Dinitrotoluene	BQL	399	1	4/25/2006
2,6-Dinitrotoluene	BQL	399	1	4/25/2006
Diphenylamine *	BQL	399	1	4/25/2006
Fluoranthene	BQL	399	1	4/25/2006
Fluorene	BQL	399	1	4/25/2006
Hexachlorobenzene	BQL	399	1	4/25/2006
Hexachlorobutadiene	BQL	399	1	4/25/2006
Hexachlorocyclopentadiene	BQL	799	1	4/25/2006
Hexachloroethane	BQL	399	1	4/25/2006



**Results for Semivolatiles  
by GCMS 8270**

Client Sample ID: 134-9-3  
 Client Project ID: Yancy DOT  
 Lab Sample ID: G106-596-9H  
 Lab Project ID: G106-596  
 Report Basis: Dry weight

Analyzed By: MRC  
 Date Collected: 4/12/2006 17:20  
 Date Received: 4/19/2006  
 Date Extracted: 4/24/2006  
 Matrix: Soil  
 % Solids: 77.51

Compound	Result ug/Kg	RL ug/Kg	Dilution Factor	Date Analyzed
Indeno(1,2,3-c,d)pyrene	BQL	399	1	4/25/2006
Isophorone	BQL	399	1	4/25/2006
2-Methylnaphthalene	BQL	399	1	4/25/2006
2-Methylphenol	BQL	399	1	4/25/2006
3- & 4-Methylphenol	BQL	399	1	4/25/2006
Naphthalene	BQL	399	1	4/25/2006
2-Nitroaniline	BQL	399	1	4/25/2006
3-Nitroaniline	BQL	2000	1	4/25/2006
4-Nitroaniline	BQL	2000	1	4/25/2006
Nitrobenzene	BQL	399	1	4/25/2006
2-Nitrophenol	BQL	399	1	4/25/2006
4-Nitrophenol	BQL	2000	1	4/25/2006
N-Nitrosodi-n-propylamine	BQL	399	1	4/25/2006
Pentachlorophenol	BQL	2000	1	4/25/2006
Phenanthrene	BQL	399	1	4/25/2006
Phenol	BQL	399	1	4/25/2006
Pyrene	BQL	399	1	4/25/2006
1,2,4-Trichlorobenzene	BQL	399	1	4/25/2006
2,4,5-Trichlorophenol	BQL	399	1	4/25/2006
2,4,6-Trichlorophenol	BQL	399	1	4/25/2006

	Spike Added	Spike Result	Percent Recovered
2-Fluorobiphenyl	10	8	80
2-Fluorophenol	10	9	90
Nitrobenzene-d5	10	8.7	87
Phenol-d6	10	9.6	96
2,4,6-Tribromophenol	10	8.5	85
4-Terphenyl-d14	10	7.5	75

**Comments:**

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

**Flags:**

BQL = Below Quantitation Limits.

Reviewed By:



**VPH (Aliphatics/Aromatics) Laboratory Reporting Form**

Client Name: Environmental Investigations

Project Name: Yancy DOT

Sample Information and Analytical Results	
Sample Identification	134-9-3
Sample Matrix	Soil
Collection Option (for Soil)*	2
Date Collected	04/12/06
Date Received	04/19/06
Date Extracted	04/12/06
Date Analyzed	04/22/06
Dry Weight	78
Dilution Factor	1
C <sub>5</sub> -C <sub>8</sub> Aliphatics**	< 10 (mg/Kg)
C <sub>9</sub> -C <sub>12</sub> Aliphatics**	11 (mg/Kg)
C <sub>9</sub> -C <sub>10</sub> Aromatics**	< 10 (mg/Kg)
Surrogate % Recovery - PID	99
Surrogate % Recovery - FID	130

\* = 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: g106-596-9e

Reviewed By: ew



Attachment 2

VPH Laboratory Reporting Form

**Calibration and QA/QC Information**

FID Initial Calibration Date: 02/11/06      PID Initial Calibration Date: 02/11/06

**Calibration Ranges and Limits**

Range	MDL (07/15/2004) (µg/L)	ML (µg/L)	RL	
			(µg/L)	(mg/Kg)
C <sub>5</sub> -C <sub>8</sub> Aliphatics	4.4	14	100	10
C <sub>9</sub> -C <sub>12</sub> Aliphatics	3.4	11	100	10
C <sub>9</sub> -C <sub>10</sub> Aromatics	0.13	0.41	100	10

**Calibration Concentration Levels**

Range	Levels (µg/L)	%RSD or CCC	Method of Quantitation
C <sub>5</sub> -C <sub>8</sub> Aliphatics	40	10.8	Calibration Factor
	1000		
	2000		
	3000		
	4000		
C <sub>9</sub> -C <sub>12</sub> Aliphatics	10	0.99	Linear Regression
	250		
	500		
	750		
	1000		
C <sub>9</sub> -C <sub>10</sub> Aromatics	10	19.30	Calibration Factor
	250		
	500		
	750		
	1000		

Calibration Check Date: 04/22/06

**Calibration Check**

Range	Levels (µg/L)		RPD
	(mg/Kg)		
C <sub>5</sub> -C <sub>8</sub> Aliphatics	2000	200	9.8
C <sub>9</sub> -C <sub>12</sub> Aliphatics	500	50	-16.2
C <sub>9</sub> -C <sub>10</sub> Aromatics	500	50	16.4

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

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



## EPH (Aliphatics/Aromatics) Results

*by MDEP-EPH*

Client Name: Environmental Investigations

Project Name: Yancy DOT

Sample Information and Analytical Results	
Sample Identification	134-9-3
Sample Matrix	Soil
Date Collected	04/12/06
Date Received	04/19/06
Date Extracted	04/20/06
Date Analyzed	04/24/06
Dry Weight	77.5
Dilution Factor	1
C <sub>9</sub> -C <sub>18</sub> Aliphatics*	< 10 (mg/Kg)
C <sub>19</sub> -C <sub>36</sub> Aliphatics*	< 10 (mg/Kg)
C <sub>11</sub> -C <sub>22</sub> Aromatics*	< 10 (mg/Kg)
Aliphatic Surrogate % Recovery	110
Aromatic Surrogate % Recovery	84

### Comments:

\* = Excludes any surrogates or internal standards.

Sample did not require fractionation.

Lab info: G106-596-9G

Reviewed By: EW



Attachment 3

EPH Laboratory Reporting Form

**Calibration and QA/QC Information**

Initial Calibration Date: 04/19/06

**Calibration Ranges and Limits**

Range	MDL (2/2004) (µg/L)	ML (µg/L)	RL (µg/L)	RL (mg/Kg)
C <sub>9</sub> -C <sub>18</sub> Aliphatics	3.84	12.2	100	10
C <sub>19</sub> -C <sub>36</sub> Aliphatics	0.57	1.8	100	10
C <sub>11</sub> -C <sub>22</sub> Aromatics	4.54	14.4	100	10

**Calibration Concentration Levels**

Range	Levels (µg/mL)	%RSD or CCC	Method of Quantitation
C <sub>9</sub> -C <sub>18</sub> Aliphatics	6	13.30	Calibration Factor
	30		
	60		
	120		
	240		
C <sub>19</sub> -C <sub>36</sub> Aliphatics	8	10.1	Calibration Factor
	40		
	80		
	160		
	320		
C <sub>11</sub> -C <sub>22</sub> Aromatics	17	4.5	Calibration Factor
	85		
	170		
	340		
	680		

Calibration Check Date: 04/24/06

**Calibration Check**

Range	Levels (µg/mL)	RPD
C <sub>9</sub> -C <sub>18</sub> Aliphatics	120	4.3
C <sub>19</sub> -C <sub>36</sub> Aliphatics	160	0.7
C <sub>11</sub> -C <sub>22</sub> Aromatics	340	-5.6

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

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



## List of Reporting Abbreviations and Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantitation Limit (RL or MDL)

DF = Dilution Factor

Dup = Duplicate

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

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL = Reporting Limit

RPD = Relative Percent Difference

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

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

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

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

% Rec = Percent Recovery

% solids = Percent Solids

### Special Notes:

- 1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.
- 2) Uncertainty for all reported data is less than or equal to 30 percent.





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  - West Virginia
- www.us.sgs.com

056796

1 CLIENT: **EL JWC.**

CONTACT: **STEELINK TURNER** PHONE NO: (804) 397-1613

PROJECT: **YAWI DOT -** SITE/PWSID#: **RA242-134**

REPORTS TO: **SS00-E Cox Rd Turner/Governments, VA 23060**

**Sturmer @ eit.com** FAX NO: (804) 320-9302

INVOICE TO: **WCDOT** QUOTE # **R-2519A**

P.O. NUMBER **W05 35609.1.1**

SGS Reference: **G106-596**

PAGE **1** OF **1**

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX
	134-1-4	4/12/06	1330	S
	134-2-4		1350	
	134-3-4		1400	
	134-4-4		1415	
	134-5-4		1430	
	134-6-3		1510	
	134-7-5		1550	
	134-8-3		1650	
	134-9-3		1720	
	134-9-6		1725	

No	CONTAINERS	SAMPLE TYPE	Preservatives Used	Analysis Required	REMARKS
3	G	C= COMB G= GRAB	TPH GRO	<input checked="" type="checkbox"/>	8200, 8270, TPH, TPH ONLY FOR
			TPH DRO	<input checked="" type="checkbox"/>	134-9-3 AND
			8260	<input checked="" type="checkbox"/>	8200 DRO ONLY FOR
			8270	<input checked="" type="checkbox"/>	134-9-6 AND 8. TURNER ON 4/19
			VPH	<input checked="" type="checkbox"/>	
			EPT	<input checked="" type="checkbox"/>	

5 Collected/Relinquished By: (1) **[Signature]** Date: **4/19/06** Time: **1600** Received By: **[Signature]**

Relinquished By: (2) **[Signature]** Date: **4/19/06** Time: **0945** Received By: **[Signature]**

Relinquished By: (3) **[Signature]** Date: **4/19/06** Time: **0945** Received By: **[Signature]**

Relinquished By: (4) **[Signature]** Date: **4/19/06** Time: **0945** Received By: **[Signature]**

4 Shipping Carrier: **[Signature]** Samples Received Cold? (Circle) YES  NO

Shipping Ticket No: **[Signature]** Temperature (C): **28°C**

Special Deliverable Requirements: **[Signature]** Chain of Custody Seal: (Circle) INTACT  BROKEN  ABSENT

Requested Turnaround Time and Special Instructions: **5-DAY TAT**



Mr. Bob Shaut  
Environmental Investigations  
2101 Gateway Centre Boulevard  
Suite 200  
Morrisville NC 27560  
Report Number: G106-600  
Client Project: NCDOT-Yancey/R-2519A

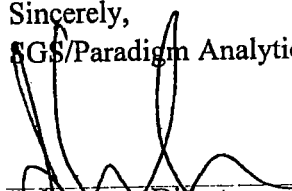
Dear Mr. Shaut:

Enclosed are the results of the analytical services performed under the referenced project. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will 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 SGS/Paradigm at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS/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,  
SGS/Paradigm Analytical Laboratories, Inc.

  
Laboratory Director  
J. Patrick Weaver

  
Date



**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: DP1-5  
 Client Project ID: NCDOT-Yancey/R-2519A  
 Lab Sample ID: G106-600-1  
 Lab Project ID: G106-600  
 Report Basis: Dry Weight

Analyzed By: MJC  
 Date Collected: 4/20/2006 16:30  
 Date Received: 4/25/2006  
 Matrix: Soil  
 Solids 72.89

Analyte	Result MG/KG	RL MG/KG	Prep Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	19.6	7.64	5035	1	05/01/06
Diesel Range Organics	BQL	7.88	3541	1	05/01/06



**Results for Total Petroleum Hydrocarbons**  
by GC/FID 8015

Client Sample ID: DP2-5  
 Client Project ID: NCDOT-Yancey/R-2519A  
 Lab Sample ID: G106-600-2  
 Lab Project ID: G106-600  
 Report Basis: Dry Weight

Analyzed By: MJC  
 Date Collected: 4/20/2006 16:45  
 Date Received: 4/25/2006  
 Matrix: Soil  
 Solids 84.35

Analyte	Result MG/KG	RL MG/KG	Prep Method	Dilution Factor	Date Analyzed
Gasoline Range Organics	9.20	8.09	5035	1	05/02/06
Diesel Range Organics	BQL	7.14	3541	1	05/01/06

Reviewed By:   
 TPH\_LIMS\_v2.0



## List of Reporting Abbreviations and Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantitation Limit (RL or MDL)

DF = Dilution Factor

Dup = Duplicate

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

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL = Reporting Limit

RPD = Relative Percent Difference

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

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

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

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

% Rec = Percent Recovery

% solids = Percent Solids

### Special Notes:

- 1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.
- 2) Uncertainty for all reported data is less than or equal to 30 percent.



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<b>1</b> CLIENT: <u>EEI Inc.</u> CONTACT: <u>BOB SHAOT</u> PHONE NO: <u>919, 657-3500</u> PROJECT: <u>NC DOT YANDEY</u> SITE/PROJECT: <u>P-2519A</u> REPORTS TO: <u>BOB SHAOT - EEI</u> FAX NO: <u>919, 544-2999</u> INVOICE TO: <u>NC DOT</u> QUOTE # WBS: <u>35609.1.1</u> P.O. NUMBER				SGS Reference: <u>PAR 134 G106-600</u> PAGE <u>1</u> OF <u>1</u>			
<b>2</b> LAB NO. SAMPLE IDENTIFICATION DATE TIME MATRIX <u>DP1-5</u> <u>4-20</u> <u>1430</u> <u>SOIL</u> <u>DP2-5</u> <u>4/20/06</u> <u>1645</u> <u>" "</u>				NO CONTAINERS SAMPLE TYPE: <u>G</u> ANALYSIS REQUIRED: <u>3</u> REMARKS: <u>GRO DRO</u>			
<b>3</b> Collected/Requisitioned By: (1) <u>[Signature]</u> Date: <u>4-20-06</u> Time: <u>1030</u> Received By: <u>[Signature]</u> Requisitioned By: (2) <u>[Signature]</u> Date: <u>4/20/06</u> Time: <u>1030</u> Received By: <u>[Signature]</u> Requisitioned By: (3) <u>[Signature]</u> Date: <u>4/20/06</u> Time: <u>1030</u> Received By: <u>[Signature]</u> Requisitioned By: (4) <u>[Signature]</u> Date: <u>4/20/06</u> Time: <u>1030</u> Received By: <u>[Signature]</u>				Shipping Carrier: _____ Samples Received Cold? (Circle) YES NO Shipping Ticket No: _____ Temperature (C): <u>1.9°C</u> Special Deliverable Requirements: _____ Chain of Custody Seal: (Circle) INTACT BROKEN Requested Turnaround Time and Special Instructions: <u>5-DAY</u> _____ ASSENT			



1230 W. Pender Drive Asheville, NC 28818 Tel: (827) 682-2244 Fax: (827) 891-4301  
 1230 Business Drive Wilmington, NC 28408 Tel: (910) 350-1503 Fax: (910) 350-1507

1233 Genshler Street Charleston, WV 25311 Tel: (904) 346-0725 Fax: (904) 346-0761

When Requested By Lab  
 Yellow - Returned with Report  
 Pink - Returned by Customer

RECEIVED MAY 11 REC'D

# Case Narrative



**PRISM**  
LABORATORIES, INC.

Date: 05/04/06

Company: NC Dept. of Transportation  
Contact: c/o EI / Bob Shaut  
Address: Suite 200  
2101 Gateway Centre Blvd.  
Morrisville, NC 27560

Client Project ID: Parcel 134/NCDOT-Burnsville NC  
Client Project Name or No: WBS# 35609.1.1  
Prism COC Group No: G0406515  
Collection Date(s): 04/14/06  
Lab Submittal Date: 04/18/06

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 19 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A Key Reference for the data qualifiers appears at the bottom of this page. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

Please call if you have any questions relating to this analytical report.

Data Reviewed by: Robbi A. Jones

Signature: Robbi A. Jones

Review Date: 05/04/06

Project Manager: Angela D. Overcash

Signature: Robbi A. Jones for Angela Overcash

Approval Date: 05/04/06

## Data Qualifier Key Reference:

- #: Result outside of QC Limits
- B: Compound also detected in the method blank
- DO: Compound diluted out.
- E: Estimated concentration, calibration range exceeded
- J: The analyte was positively identified but the value is estimated below the reporting limit
- JH: Estimated concentration with a high bias
- JL: Estimated concentration with a low bias
- M: A matrix effect is present
- T: Tentatively identified compound. The concentration is estimated.

Notes: This report should not be reproduced, except in its entirety, without the written consent of Prism Laboratories, Inc. The results in this report relate only to the samples submitted for analysis.

449 Springbrook Road, P. O. Box 240543, Charlotte, NC 28224-0403  
Phone: 704/529-6364 Toll Free: 800/529-6364 Fax: 704/525-0409

F:\common\casenarrative Revised 8/25/05



NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Laboratory Report

05/04/06

N. C. Department of Transportation  
 Attn: Bob Shaut/EI  
 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1  
 Sample Matrix: Water

Client Sample ID: 134-TMW-1  
 Prism Sample ID: 148235  
 COC Group: G0406515  
 Time Collected: 04/14/06 10:00  
 Time Submitted: 04/18/06 14:45

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
<b><u>Aromatic and Halogenated Volatiles by GC/PID-ELCD</u></b>									
1,1,1,2-Tetrachloroethane	BRL	µg/L	0.50	0.17	1	6230D	04/25/06 23:45	erussell	Q14297
1,1,1-Trichloroethane	BRL	µg/L	0.50	0.080	1	6230D	04/25/06 23:45	erussell	Q14297
1,1,1,2,2-Tetrachloroethane	BRL	µg/L	0.50	0.11	1	6230D	04/25/06 23:45	erussell	Q14297
1,1,2-Trichloroethane	BRL	µg/L	0.50	0.080	1	6230D	04/25/06 23:45	erussell	Q14297
1,1-Dichloroethane	BRL	µg/L	0.50	0.11	1	6230D	04/25/06 23:45	erussell	Q14297
1,1-Dichloroethene	BRL	µg/L	0.50	0.13	1	6230D	04/25/06 23:45	erussell	Q14297
1,1-Dichloropropene	BRL	µg/L	0.50	0.090	1	6230D	04/25/06 23:45	erussell	Q14297
1,2,3-Trichlorobenzene	BRL	µg/L	0.50	0.12	1	6230D	04/25/06 23:45	erussell	Q14297
1,2,3-Trichloropropane	BRL	µg/L	0.50	0.11	1	6230D	04/25/06 23:45	erussell	Q14297
1,2,4-Trichlorobenzene	BRL	µg/L	0.50	0.040	1	6230D	04/25/06 23:45	erussell	Q14297
1,2,4-Trimethylbenzene	BRL	µg/L	0.50	0.10	1	6230D	04/25/06 23:45	erussell	Q14297
1,2-Dibromo-3-chloropropane	BRL	µg/L	0.50	0.14	1	6230D	04/25/06 23:45	erussell	Q14297
1,2-Dibromoethane (EDB)	BRL	µg/L	0.50	0.12	1	6230D	04/25/06 23:45	erussell	Q14297
1,2-Dichlorobenzene	BRL	µg/L	0.50	0.12	1	6230D	04/25/06 23:45	erussell	Q14297
1,2-Dichloroethane	BRL	µg/L	0.50	0.070	1	6230D	04/25/06 23:45	erussell	Q14297
1,2-Dichloropropane	BRL	µg/L	0.50	0.12	1	6230D	04/25/06 23:45	erussell	Q14297
1,3,5-Trimethylbenzene	BRL	µg/L	0.50	0.10	1	6230D	04/25/06 23:45	erussell	Q14297
1,3-Dichlorobenzene	BRL	µg/L	0.50	0.050	1	6230D	04/25/06 23:45	erussell	Q14297
1,3-Dichloropropane	BRL	µg/L	0.50	0.070	1	6230D	04/25/06 23:45	erussell	Q14297
1,4-Dichlorobenzene	BRL	µg/L	0.50	0.060	1	6230D	04/25/06 23:45	erussell	Q14297
2,2-Dichloropropane	BRL	µg/L	0.50	0.13	1	6230D	04/25/06 23:45	erussell	Q14297
2-Chlorotoluene	BRL	µg/L	0.50	0.21	1	6230D	04/25/06 23:45	erussell	Q14297
4-Chlorotoluene	BRL	µg/L	0.50	0.090	1	6230D	04/25/06 23:45	erussell	Q14297
Benzene	BRL	µg/L	0.50	0.060	1	6230D	04/25/06 23:45	erussell	Q14297
Bromobenzene	BRL	µg/L	0.50	0.13	1	6230D	04/25/06 23:45	erussell	Q14297
Chloromethane	BRL	µg/L	0.50	0.090	1	6230D	04/25/06 23:45	erussell	Q14297
Dibromodichloromethane	BRL	µg/L	0.50	0.090	1	6230D	04/25/06 23:45	erussell	Q14297

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NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Laboratory Report

05/04/06

N. C. Department of Transportation  
 Attn: Bob Shaut/EI  
 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1  
 Sample Matrix: Water

Client Sample ID: 134-TMW-1  
 Prism Sample ID: 148235  
 COC Group: G0406515  
 Time Collected: 04/14/06 10:00  
 Time Submitted: 04/18/06 14:45

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Bromoform	BRL	µg/L	0.50	0.050	1	6230D	04/25/06 23:45	erussell	Q14297
Bromomethane	BRL	µg/L	0.50	0.27	1	6230D	04/25/06 23:45	erussell	Q14297
Carbon Tetrachloride	BRL	µg/L	0.50	0.060	1	6230D	04/25/06 23:45	erussell	Q14297
Chlorobenzene	BRL	µg/L	0.50	0.17	1	6230D	04/25/06 23:45	erussell	Q14297
Chloroethane	BRL	µg/L	0.50	0.41	1	6230D	04/25/06 23:45	erussell	Q14297
Chloroform	BRL	µg/L	0.50	0.060	1	6230D	04/25/06 23:45	erussell	Q14297
Chloromethane	BRL	µg/L	0.50	0.14	1	6230D	04/25/06 23:45	erussell	Q14297
cis-1,2-Dichloroethene	BRL	µg/L	0.50	0.13	1	6230D	04/25/06 23:45	erussell	Q14297
cis-1,3-Dichloropropene	BRL	µg/L	0.50	0.14	1	6230D	04/25/06 23:45	erussell	Q14297
Monochloromethane	BRL	µg/L	0.50	0.080	1	6230D	04/25/06 23:45	erussell	Q14297
Dibromomethane	BRL	µg/L	0.50	0.13	1	6230D	04/25/06 23:45	erussell	Q14297
Dichlorodifluoromethane	BRL	µg/L	0.50	0.14	1	6230D	04/25/06 23:45	erussell	Q14297
Ethylbenzene	BRL	µg/L	0.50	0.16	1	6230D	04/25/06 23:45	erussell	Q14297
Hexachlorobutadiene	BRL	µg/L	0.50	0.17	1	6230D	04/25/06 23:45	erussell	Q14297
Isopropyl ether (IPE)	BRL	µg/L	0.50	0.24	1	6230D	04/25/06 23:45	erussell	Q14297
Isopropylbenzene	BRL	µg/L	0.50	0.10	1	6230D	04/25/06 23:45	erussell	Q14297
m,p-Xylenes	BRL	µg/L	1.0	0.43	1	6230D	04/25/06 23:45	erussell	Q14297
Methyl t-butyl ether (MTBE)	BRL	µg/L	0.50	0.14	1	6230D	04/25/06 23:45	erussell	Q14297
Methylene chloride	BRL	µg/L	2.0	0.75	1	6230D	04/25/06 23:45	erussell	Q14297
n-Butylbenzene	BRL	µg/L	0.50	0.19	1	6230D	04/25/06 23:45	erussell	Q14297
n-Propylbenzene	BRL	µg/L	0.50	0.10	1	6230D	04/25/06 23:45	erussell	Q14297
Naphthalene	BRL	µg/L	0.50	0.10	1	6230D	04/25/06 23:45	erussell	Q14297
o-Xylene	BRL	µg/L	0.50	0.16	1	6230D	04/25/06 23:45	erussell	Q14297
p-Isopropyltoluene	BRL	µg/L	0.50	0.17	1	6230D	04/25/06 23:45	erussell	Q14297
sec-Butylbenzene	BRL	µg/L	0.50	0.12	1	6230D	04/25/06 23:45	erussell	Q14297
Styrene	BRL	µg/L	0.50	0.050	1	6230D	04/25/06 23:45	erussell	Q14297
Butylbenzene	BRL	µg/L	0.50	0.13	1	6230D	04/25/06 23:45	erussell	Q14297
Tetrachloroethene	BRL	µg/L	0.50	0.11	1	6230D	04/25/06 23:45	erussell	Q14297

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NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Laboratory Report

05/04/06

N. C. Department of Transportation  
 Attn: Bob Shaut/EI  
 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1  
 Sample Matrix: Water

Client Sample ID: 134-TMW-1  
 Prism Sample ID: 148235  
 COC Group: G0406515  
 Time Collected: 04/14/06 10:00  
 Time Submitted: 04/18/06 14:45

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Toluene	BRL	µg/L	0.50	0.11	1	6230D	04/25/06 23:45	erussell	Q14297
trans-1,2-Dichloroethene	BRL	µg/L	0.50	0.27	1	6230D	04/25/06 23:45	erussell	Q14297
trans-1,3-Dichloropropene	BRL	µg/L	0.50	0.070	1	6230D	04/25/06 23:45	erussell	Q14297
Trichloroethene	BRL	µg/L	0.50	0.10	1	6230D	04/25/06 23:45	erussell	Q14297
Trichlorofluoromethane	BRL	µg/L	0.50	0.19	1	6230D	04/25/06 23:45	erussell	Q14297
Vinyl chloride	BRL	µg/L	0.50	0.24	1	6230D	04/25/06 23:45	erussell	Q14297

Surrogate	% Recovery	Control Limits
Bromochlorobenzene-ELCD	115	60 - 144
1,4-Difluorobenzene-PID	89	50 - 141

### Semivolatile Organic Compounds by GC/MS

1,2,4-Trichlorobenzene	BRL	µg/L	9.7	2.4	1	625	04/22/06 0:22	kelliot	Q14195
1,2-Dichlorobenzene	BRL	µg/L	9.7	2.6	1	625	04/22/06 0:22	kelliot	Q14195
1,3-Dichlorobenzene	BRL	µg/L	9.7	1.8	1	625	04/22/06 0:22	kelliot	Q14195
1,4-Dichlorobenzene	BRL	µg/L	9.7	2.3	1	625	04/22/06 0:22	kelliot	Q14195
2,4-Dinitrotoluene	BRL	µg/L	9.7	0.82	1	625	04/22/06 0:22	kelliot	Q14195
2,6-Dinitrotoluene	BRL	µg/L	9.7	1.6	1	625	04/22/06 0:22	kelliot	Q14195
2-Chloronaphthalene	BRL	µg/L	9.7	2.1	1	625	04/22/06 0:22	kelliot	Q14195
3,3'-Dichlorobenzidine	BRL	µg/L	49	9.1	1	625	04/22/06 0:22	kelliot	Q14195
4-Bromophenylphenylether	BRL	µg/L	9.7	1.9	1	625	04/22/06 0:22	kelliot	Q14195
4-Chlorophenylphenylether	BRL	µg/L	9.7	1.6	1	625	04/22/06 0:22	kelliot	Q14195
Acenaphthene	BRL	µg/L	9.7	1.8	1	625	04/22/06 0:22	kelliot	Q14195
Acenaphthylene	BRL	µg/L	9.7	2.0	1	625	04/22/06 0:22	kelliot	Q14195
Anthracene	BRL	µg/L	9.7	0.95	1	625	04/22/06 0:22	kelliot	Q14195
Benzo(a)anthracene	BRL	µg/L	9.7	0.91	1	625	04/22/06 0:22	kelliot	Q14195
Benzo(a)pyrene	BRL	µg/L	9.7	0.97	1	625	04/22/06 0:22	kelliot	Q14195
Benzo(b)fluoranthene	BRL	µg/L	9.7	1.7	1	625	04/22/06 0:22	kelliot	Q14195

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NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Laboratory Report

05/04/06

N. C. Department of Transportation  
 Attn: Bob Shaut/EI  
 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1  
 Sample Matrix: Water

Client Sample ID: 134-TMW-1  
 Prism Sample ID: 148235  
 COC Group: G0406515  
 Time Collected: 04/14/06 10:00  
 Time Submitted: 04/18/06 14:45

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Benzo(g,h,i)perylene	BRL	µg/L	9.7	2.0	1	625	04/22/06 0:22	kelliot	Q14195
Benzo(k)fluoranthene	BRL	µg/L	9.7	1.8	1	625	04/22/06 0:22	kelliot	Q14195
Bis(2-chloroethoxy)methane	BRL	µg/L	9.7	2.1	1	625	04/22/06 0:22	kelliot	Q14195
Bis(2-chloroethyl)ether	BRL	µg/L	9.7	2.0	1	625	04/22/06 0:22	kelliot	Q14195
Bis(2-chloroisopropyl)ether	BRL	µg/L	9.7	2.3	1	625	04/22/06 0:22	kelliot	Q14195
Bis(2-ethylhexyl)phthalate	BRL	µg/L	9.7	0.69	1	625	04/22/06 0:22	kelliot	Q14195
Butylbenzylphthalate	BRL	µg/L	9.7	0.68	1	625	04/22/06 0:22	kelliot	Q14195
Chrysene	BRL	µg/L	9.7	0.55	1	625	04/22/06 0:22	kelliot	Q14195
Di-n-butylphthalate	BRL	µg/L	9.7	1.4	1	625	04/22/06 0:22	kelliot	Q14195
Di-n-octylphthalate	BRL	µg/L	9.7	2.1	1	625	04/22/06 0:22	kelliot	Q14195
Dibenzo(a,h)anthracene	BRL	µg/L	9.7	1.1	1	625	04/22/06 0:22	kelliot	Q14195
Dibenzofuran	BRL	µg/L	9.7	2.1	1	625	04/22/06 0:22	kelliot	Q14195
Diethylphthalate	BRL	µg/L	9.7	1.1	1	625	04/22/06 0:22	kelliot	Q14195
Dimethylphthalate	BRL	µg/L	9.7	1.4	1	625	04/22/06 0:22	kelliot	Q14195
Fluoranthene	BRL	µg/L	9.7	0.91	1	625	04/22/06 0:22	kelliot	Q14195
Fluorene	BRL	µg/L	9.7	1.4	1	625	04/22/06 0:22	kelliot	Q14195
Hexachlorobenzene	BRL	µg/L	9.7	1.3	1	625	04/22/06 0:22	kelliot	Q14195
Hexachlorobutadiene	BRL	µg/L	9.7	2.1	1	625	04/22/06 0:22	kelliot	Q14195
Hexachlorocyclopentadiene	BRL	µg/L	9.7	2.3	1	625	04/22/06 0:22	kelliot	Q14195
Hexachloroethane	BRL	µg/L	9.7	1.7	1	625	04/22/06 0:22	kelliot	Q14195
Indeno(1,2,3-cd)pyrene	BRL	µg/L	9.7	1.7	1	625	04/22/06 0:22	kelliot	Q14195
Isophorone	BRL	µg/L	9.7	1.6	1	625	04/22/06 0:22	kelliot	Q14195
N-Nitrosodi-n-propylamine	BRL	µg/L	9.7	2.1	1	625	04/22/06 0:22	kelliot	Q14195
Naphthalene	BRL	µg/L	9.7	2.1	1	625	04/22/06 0:22	kelliot	Q14195
Nitrobenzene	BRL	µg/L	9.7	1.8	1	625	04/22/06 0:22	kelliot	Q14195
Phenanthrene	BRL	µg/L	9.7	0.87	1	625	04/22/06 0:22	kelliot	Q14195
Phenanthrene	BRL	µg/L	9.7	0.88	1	625	04/22/06 0:22	kelliot	Q14195

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NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Laboratory Report

05/04/06

N. C. Department of Transportation  
 Attn: Bob Shaut/EI  
 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1  
 Sample Matrix: Water

Client Sample ID: 134-TMW-1  
 Prism Sample ID: 148235  
 COC Group: G0406515  
 Time Collected: 04/14/06 10:00  
 Time Submitted: 04/18/06 14:45

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
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Sample Preparation: 1030 mL / 1 mL 625BN 04/20/06 8:00 smanivanh P15189

Surrogate	% Recovery	Control Limits
Terphenyl-d14	136	10 - 154
Phenol-d5	10	10 - 48
Nitrobenzene-d5	50	22 - 103
2-Fluorophenol	16	10 - 59
2-Fluorobiphenyl	51	29 - 112
2,4,6-Tribromophenol	53	27 - 125

### Table Petroleum Hydrocarbons by GC-FID

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
C11-C22 Aromatics	BRL	µg/L	100	71	1	MADEP EPH	05/02/06 17:27	grappaccioli	Q14542
C19-C36 Aliphatics	BRL	µg/L	100	31	1	MADEP EPH	05/02/06 17:27	grappaccioli	Q14542
C9-C18 Aliphatics	BRL	µg/L	100	75	1	MADEP EPH	05/02/06 17:27	grappaccioli	Q14542

\* Analysis Note for C11-C22 Aromatics: Adjusted value.

Sample Preparation: 1000 mL / 2 mL EPH 04/27/06 12:00 smanivanh P15260

Surrogate	% Recovery	Control Limits
o-Terphenyl	92	40 - 140
2-Fluorobiphenyl	101	40 - 140
2-Bromonaphthalene	57	40 - 140
1-Chloro-octadecane	102	40 - 140

### Volatile Petroleum Hydrocarbons by GC-PID/FID

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
C5-C8 Aliphatics	BRL	µg/L	100	50	1	MADEP VPH	04/26/06 14:06	jvogel	Q14411
C9-C10 Aromatics	BRL	µg/L	100	35	1	MADEP VPH	04/26/06 14:06	jvogel	Q14411
C9-C12 Aliphatics	BRL	µg/L	100	50	1	MADEP VPH	04/26/06 14:06	jvogel	Q14411

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NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Laboratory Report

05/04/06

N.C. Department of Transportation  
 Attn: Bob Shau/EI  
 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1  
 Sample Matrix: Water

Client Sample ID: 134-TMW-1  
 Prism Sample ID: 148235  
 COC Group: G0406515  
 Time Collected: 04/14/06 10:00  
 Time Submitted: 04/18/06 14:45

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
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- \* Analysis Note for C5-C8 Aliphatics: Adjusted value.
- \* Analysis Note for C9-C12 Aliphatics: Adjusted value.

Surrogate	% Recovery	Control Limits
2,5-Dibromotoluene-PID	113	70 - 130
2,5-Dibromotoluene-FID	105	70 - 130

Sample Comment(s):

*BRL = Below Reporting Limit*

*Estimated value between the Reporting Limit and the MDL*

*results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.*

Angela D. Overcash, V.P. Laboratory Services



NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Level II QC Report

5/5/2006

N. C. Department of Transportation  
 Attn: Bob Shaut/EI  
 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1

COC Group Number: G0406515  
 Date/Time Submitted: 4/18/2006 14:45

## Semivolatile Organic Compounds by GC/MS, method 625

### Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
1,2,4-Trichlorobenzene	ND	10	<5	µg/L	Q14195
1,2-Dichlorobenzene	ND	10	<5	µg/L	Q14195
1,3-Dichlorobenzene	ND	10	<5	µg/L	Q14195
1,4-Dichlorobenzene	ND	10	<5	µg/L	Q14195
2,4-Dinitrotoluene	ND	10	<5	µg/L	Q14195
2,6-Dinitrotoluene	ND	10	<5	µg/L	Q14195
2-Chloronaphthalene	ND	10	<5	µg/L	Q14195
3,3'-Dichlorobenzidine	ND	50	<25	µg/L	Q14195
4-Bromophenylphenylether	ND	10	<5	µg/L	Q14195
4-Chlorophenylphenylether	ND	10	<5	µg/L	Q14195
Acenaphthene	ND	10	<5	µg/L	Q14195
Acenaphthylene	ND	10	<5	µg/L	Q14195
Anthracene	ND	10	<5	µg/L	Q14195
Benzo(a)anthracene	ND	10	<5	µg/L	Q14195
Benzo(a)pyrene	ND	10	<5	µg/L	Q14195
Benzo(b)fluoranthene	ND	10	<5	µg/L	Q14195
Benzo(g,h,i)perylene	ND	10	<5	µg/L	Q14195
Benzo(k)fluoranthene	ND	10	<5	µg/L	Q14195
Bis(2-chloroethoxy)methane	ND	10	<5	µg/L	Q14195
Bis(2-chloroethyl)ether	ND	10	<5	µg/L	Q14195
Bis(2-chloroisopropyl)ether	ND	10	<5	µg/L	Q14195
Bis(2-ethylhexyl)phthalate	ND	10	<5	µg/L	Q14195
Butylbenzylphthalate	ND	10	<5	µg/L	Q14195
Chrysene	ND	10	<5	µg/L	Q14195
Di-n-butylphthalate	ND	10	<5	µg/L	Q14195
Di-n-octylphthalate	ND	10	<5	µg/L	Q14195
Dibenzo(a,h)anthracene	ND	10	<5	µg/L	Q14195
Diethylphthalate	ND	10	<5	µg/L	Q14195
Dimethylphthalate	ND	10	<5	µg/L	Q14195
Fluoranthene	ND	10	<5	µg/L	Q14195
Fluorene	ND	10	<5	µg/L	Q14195
Hexachlorobenzene	ND	10	<5	µg/L	Q14195
Hexachlorobutadiene	ND	10	<5	µg/L	Q14195
Hexachlorocyclopentadiene	ND	10	<5	µg/L	Q14195
Hexachloroethane	ND	10	<5	µg/L	Q14195
Indeno(1,2,3-cd)pyrene	ND	10	<5	µg/L	Q14195
Isophorone	ND	10	<5	µg/L	Q14195
N-Nitrosodi-n-propylamine	ND	10	<5	µg/L	Q14195
Naphthalene	ND	10	<5	µg/L	Q14195
Nitrobenzene	ND	10	<5	µg/L	Q14195
Phenanthrene	ND	10	<5	µg/L	Q14195
Pyrene	ND	10	<5	µg/L	Q14195

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NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Level II QC Report

5/5/2006

N. C. Department of Transportation  
 Attn: Bob Shaut/EI  
 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1

COC Group Number: G0406515  
 Date/Time Submitted: 4/18/2006 14:45

## Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Range %	QC Batch ID
1,2,4-Trichlorobenzene	74.13	100	µg/L	74	44 - 142	Q14195
1,2-Dichlorobenzene	75.67	100	µg/L	76	32 - 129	Q14195
1,3-Dichlorobenzene	75.43	100	µg/L	75	20 - 124	Q14195
1,4-Dichlorobenzene	76.15	100	µg/L	76	20 - 124	Q14195
2,4-Dinitrotoluene	132.12	100	µg/L	132	39 - 139	Q14195
2,6-Dinitrotoluene	107.71	100	µg/L	108	50 - 158	Q14195
2-Chloronaphthalene	86.2	100	µg/L	86	60 - 118	Q14195
3,3'-Dichlorobenzidine	214.97	100	µg/L	215	10 - 262	Q14195
4-Bromophenylphenylether	96.63	100	µg/L	97	53 - 127	Q14195
4-Chlorophenylphenylether	101.75	100	µg/L	102	25 - 158	Q14195
Acenaphthene	80.56	100	µg/L	81	47 - 145	Q14195
Acenaphthylene	94.51	100	µg/L	95	33 - 145	Q14195
Anthracene	80.67	100	µg/L	81	27 - 133	Q14195
Benzo(a)anthracene	72.33	100	µg/L	72	33 - 143	Q14195
Benzo(a)pyrene	111.11	100	µg/L	111	17 - 163	Q14195
Benzo(b)fluoranthene	116.31	100	µg/L	116	24 - 159	Q14195
Benzo(g,h,i)perylene	114.22	100	µg/L	114	10 - 219	Q14195
Benzo(k)fluoranthene	114.21	100	µg/L	114	11 - 162	Q14195
Bis(2-chloroethoxy)methane	76	100	µg/L	76	33 - 184	Q14195
Bis(2-chloroethyl)ether	70.5	100	µg/L	71	12 - 158	Q14195
Bis(2-chloroisopropyl)ether	79.62	100	µg/L	80	36 - 166	Q14195
Bis(2-ethylhexyl)phthalate	110.72	100	µg/L	111	10 - 158	Q14195
Butylbenzylphthalate	114.79	100	µg/L	115	10 - 152	Q14195
Chrysene	67.69	100	µg/L	68	17 - 168	Q14195
Di-n-butylphthalate	100.07	100	µg/L	100	10 - 118	Q14195
Di-n-octylphthalate	103.54	100	µg/L	104	10 - 146	Q14195
Dibenzo(a,h)anthracene	114.29	100	µg/L	114	10 - 227	Q14195
Diethylphthalate	95.31	100	µg/L	95	10 - 114	Q14195
Dimethylphthalate	80.67	100	µg/L	81	10 - 112	Q14195
Fluoranthene	91.38	100	µg/L	91	26 - 137	Q14195
Fluorene	108.68	100	µg/L	109	59 - 121	Q14195
Hexachlorobenzene	90.26	100	µg/L	90	10 - 152	Q14195
Hexachlorobutadiene	74.48	100	µg/L	74	24 - 116	Q14195
Hexachlorocyclopentadiene	79.69	100	µg/L	80	32 - 103	Q14195
Hexachloroethane	73.22	100	µg/L	73	40 - 113	Q14195
Indeno(1,2,3-cd)pyrene	118.99	100	µg/L	119	10 - 171	Q14195
Isophorone	80.67	100	µg/L	81	21 - 196	Q14195
N-Nitrosodi-n-propylamine	81.6	100	µg/L	82	10 - 230	Q14195
Naphthalene	80.84	100	µg/L	81	21 - 133	Q14195
Nitrobenzene	76.31	100	µg/L	76	35 - 180	Q14195
Phenanthrene	85.84	100	µg/L	86	54 - 120	Q14195
Pyrene	117.14	100	µg/L	117 #	52 - 115	Q14195

\* Analysis Note for Pyrene: LCS recovery above the control limits. This compound was not detected in samples associated with this batch. No further action was taken.

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NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Level II QC Report

5/5/2006

N. C. Department of Transportation  
 Attn: Bob Shaut/EI  
 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1

COC Group Number: G0406515  
 Date/Time Submitted: 4/18/2006 14:45

## Matrix Spike

Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Range %	QC Batch ID	
147985	1,2,4-Trichlorobenzene	143.8431	196.08	µg/L	73	44 - 142	Q14195
	1,2-Dichlorobenzene	137.3137	196.08	µg/L	70	32 - 129	Q14195
	1,3-Dichlorobenzene	138.1960	196.08	µg/L	70	20 - 124	Q14195
	1,4-Dichlorobenzene	140.8627	196.08	µg/L	72	20 - 124	Q14195
	2,4-Dinitrotoluene	257.8431	196.08	µg/L	132	39 - 139	Q14195
	2,6-Dinitrotoluene	200.3529	196.08	µg/L	102	50 - 158	Q14195
	2-Chloronaphthalene	156.3725	196.08	µg/L	80	60 - 118	Q14195
	3,3'-Dichlorobenzidine	302.3333	196.08	µg/L	154	10 - 262	Q14195
	4-Bromophenylphenylether	191.7647	196.08	µg/L	98	53 - 127	Q14195
	4-Chlorophenylphenylether	201.4901	196.08	µg/L	103	25 - 158	Q14195
	Acenaphthene	157.1960	196.08	µg/L	80	47 - 145	Q14195
	Acenaphthylene	180.2549	196.08	µg/L	92	33 - 145	Q14195
	Anthracene	168.6078	196.08	µg/L	86	27 - 133	Q14195
	Benzo(a)anthracene	148.0784	196.08	µg/L	76	33 - 143	Q14195
	Benzo(a)pyrene	200.7058	196.08	µg/L	102	17 - 163	Q14195
	Benzo(b)fluoranthene	219.5686	196.08	µg/L	112	24 - 159	Q14195
	Benzo(g,h,i)perylene	227.2549	196.08	µg/L	116	10 - 219	Q14195
	Benzo(k)fluoranthene	206.5294	196.08	µg/L	105	11 - 162	Q14195
	Bis(2-chloroethoxy)methane	135.4509	196.08	µg/L	69	33 - 184	Q14195
	Bis(2-chloroethyl)ether	129.0588	196.08	µg/L	66	12 - 158	Q14195
	Bis(2-chloroisopropyl)ether	139.1764	196.08	µg/L	71	36 - 166	Q14195
	Bis(2-ethylhexyl)phthalate	201.8235	196.08	µg/L	103	10 - 158	Q14195
	Butylbenzylphthalate	211.3725	196.08	µg/L	108	10 - 152	Q14195
	Chrysene	140.0980	196.08	µg/L	71	17 - 168	Q14195
	Di-n-butylphthalate	196.8823	196.08	µg/L	100	10 - 118	Q14195
	Di-n-octylphthalate	189.5882	196.08	µg/L	97	10 - 146	Q14195
	Dibenzo(a,h)anthracene	208.6666	196.08	µg/L	106	10 - 227	Q14195
	Diethylphthalate	191.1568	196.08	µg/L	97	10 - 114	Q14195
	Dimethylphthalate	155.1960	196.08	µg/L	79	10 - 112	Q14195
	Fluoranthene	188.1372	196.08	µg/L	96	26 - 137	Q14195
	Fluorene	209.8039	196.08	µg/L	107	59 - 121	Q14195
	Hexachlorobenzene	179.8039	196.08	µg/L	92	10 - 152	Q14195
	Hexachlorobutadiene	140.0784	196.08	µg/L	71	24 - 116	Q14195
	Hexachlorocyclopentadiene	141.9607	196.08	µg/L	72	48 - 94	Q14195
	Hexachloroethane	134.3725	196.08	µg/L	69	40 - 113	Q14195
	Indeno(1,2,3-cd)pyrene	231.1372	196.08	µg/L	118	10 - 171	Q14195
	Isophorone	145.0392	196.08	µg/L	74	21 - 196	Q14195
	N-Nitrosodi-n-propylamine	144.4117	196.08	µg/L	74	10 - 230	Q14195
	Naphthalene	148.9411	196.08	µg/L	76	21 - 133	Q14195
	Nitrobenzene	141.4313	196.08	µg/L	72	35 - 180	Q14195
	Phenanthrene	165.6666	196.08	µg/L	84	54 - 120	Q14195
	Pyrene	214.4313	196.08	µg/L	109	52 - 115	Q14195

## Matrix Spike Duplicate

Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Range %	RPD %	RPD Range %	QC Batch ID
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NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Level II QC Report

5/5/2006

N. C. Department of Transportation  
 Attn: Bob Shaut/EI  
 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1

COC Group Number: G0406515  
 Date/Time Submitted: 4/18/2006 14:45

## Matrix Spike Duplicate

Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Range %	RPD %	RPD Range %	QC Batch ID	
147985	1,2,4-Trichlorobenzene	131.90	196.08	µg/L	67	44 - 142	9	0 - 36	Q14195
	1,2-Dichlorobenzene	129.29	196.08	µg/L	66	32 - 129	6	0 - 38	Q14195
	1,3-Dichlorobenzene	130.21	196.08	µg/L	66	20 - 124	6	0 - 41	Q14195
	1,4-Dichlorobenzene	132.19	196.08	µg/L	67	20 - 124	6	0 - 36	Q14195
	2,4-Dinitrotoluene	256	196.08	µg/L	131	39 - 139	1	0 - 29	Q14195
	2,6-Dinitrotoluene	224.70	196.08	µg/L	115	50 - 158	11	0 - 15	Q14195
	2-Chloronaphthalene	167.13	196.08	µg/L	85	60 - 118	7	0 - 21	Q14195
	3,3'-Dichlorobenzidine	313.58	196.08	µg/L	160	10 - 262	4	0 - 50	Q14195
	4-Bromophenylphenylether	188.03	196.08	µg/L	96	53 - 127	2	0 - 18	Q14195
	4-Chlorophenylphenylether	207.80	196.08	µg/L	106	25 - 158	3	0 - 19	Q14195
	Acenaphthene	165.31	196.08	µg/L	84	47 - 145	5	0 - 20	Q14195
	Acenaphthylene	182.33	196.08	µg/L	93	33 - 145	1	0 - 24	Q14195
	Anthracene	167.90	196.08	µg/L	86	27 - 133	0	0 - 30	Q14195
	Benzo(a)anthracene	142.82	196.08	µg/L	73	33 - 143	4	0 - 26	Q14195
	Benzo(a)pyrene	212.70	196.08	µg/L	108	17 - 163	6	0 - 25	Q14195
	Benzo(b)fluoranthene	239.74	196.08	µg/L	122	24 - 159	9	0 - 29	Q14195
	Benzo(g,h,i)perylene	227.90	196.08	µg/L	116	10 - 219	0	0 - 27	Q14195
	Benzo(k)fluoranthene	217.33	196.08	µg/L	111	11 - 162	5	0 - 11	Q14195
	Bis(2-chloroethoxy)methane	131	196.08	µg/L	67	33 - 184	3	0 - 31	Q14195
	Bis(2-chloroethyl)ether	122.54	196.08	µg/L	63	12 - 158	5	0 - 36	Q14195
	Bis(2-chloroisopropyl)ether	130.88	196.08	µg/L	67	36 - 166	6	0 - 40	Q14195
	Bis(2-ethylhexyl)phthalate	200.96	196.08	µg/L	102	10 - 158	0	0 - 17	Q14195
	Butylbenzylphthalate	210.41	196.08	µg/L	107	10 - 152	0	0 - 15	Q14195
	Chrysene	140.52	196.08	µg/L	72	17 - 168	0	0 - 25	Q14195
	Di-n-butylphthalate	200.47	196.08	µg/L	102	10 - 118	2	0 - 27	Q14195
	Di-n-octylphthalate	193.29	196.08	µg/L	99	10 - 146	2	0 - 17	Q14195
	Dibenzo(a,h)anthracene	214.74	196.08	µg/L	110	10 - 227	3	0 - 28	Q14195
	Diethylphthalate	205.47	196.08	µg/L	105	10 - 114	7	0 - 16	Q14195
	Dimethylphthalate	155.05	196.08	µg/L	79	10 - 112	0	0 - 15	Q14195
	Fluoranthene	181.98	196.08	µg/L	93	26 - 137	3	0 - 24	Q14195
	Fluorene	212.92	196.08	µg/L	109	59 - 121	1	0 - 15	Q14195
	Hexachlorobenzene	185.54	196.08	µg/L	95	10 - 152	3	0 - 18	Q14195
	Hexachlorobutadiene	137.31	196.08	µg/L	70	24 - 116	2	0 - 34	Q14195
	Hexachlorocyclopentadiene	143	196.08	µg/L	73	48 - 94	1	0 - 30	Q14195
	Hexachloroethane	124.98	196.08	µg/L	64	40 - 113	7	0 - 38	Q14195
	Indeno(1,2,3-cd)pyrene	221.19	196.08	µg/L	113	10 - 171	4	0 - 29	Q14195
	Isophorone	136.33	196.08	µg/L	70	21 - 196	6	0 - 32	Q14195
	N-Nitrosodi-n-propylamine	145.62	196.08	µg/L	74	10 - 230	1	0 - 36	Q14195
	Naphthalene	140.49	196.08	µg/L	72	21 - 133	6	0 - 42	Q14195
	Nitrobenzene	124.90	196.08	µg/L	64	35 - 180	12	0 - 25	Q14195
	Phenanthrene	165.43	196.08	µg/L	84	54 - 120	0	0 - 29	Q14195
	Pyrene	217.31	196.08	µg/L	111	52 - 115	1	0 - 15	Q14195

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 NC Drinking Water Cert. No. 37735

# Level II QC Report

5/5/2006

N. C. Department of Transportation  
 Attn: Bob Shaut/EI  
 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1

COC Group Number: G0406515  
 Date/Time Submitted: 4/18/2006 14:45

## Aromatic and Halogenated Volatiles by GC/PID-ELCD, method 6230D

### Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
1,1,1,2-Tetrachloroethane	ND	0.5	<0.25	µg/L	Q14297
1,1,1-Trichloroethane	ND	0.5	<0.25	µg/L	Q14297
1,1,2,2-Tetrachloroethane	ND	0.5	<0.25	µg/L	Q14297
1,1,2-Trichloroethane	ND	0.5	<0.25	µg/L	Q14297
1,1-Dichloroethane	ND	0.5	<0.25	µg/L	Q14297
1,1-Dichloroethene	ND	0.5	<0.25	µg/L	Q14297
1,1-Dichloropropene	ND	0.5	<0.25	µg/L	Q14297
1,2,3-Trichlorobenzene	ND	0.5	<0.25	µg/L	Q14297
1,2,3-Trichloropropane	ND	0.5	<0.25	µg/L	Q14297
1,2,4-Trichlorobenzene	ND	0.5	<0.25	µg/L	Q14297
1,2,4-Trimethylbenzene	ND	0.5	<0.25	µg/L	Q14297
1,2-Dibromo-3-chloropropane	ND	0.5	<0.25	µg/L	Q14297
1,2-Dibromoethane (EDB)	ND	0.5	<0.25	µg/L	Q14297
1,2-Dichloroethane	ND	0.5	<0.25	µg/L	Q14297
1,2-Dichloroethene	ND	0.5	<0.25	µg/L	Q14297
1,2-Dichloropropane	ND	0.5	<0.25	µg/L	Q14297
1,3,5-Trimethylbenzene	ND	0.5	<0.25	µg/L	Q14297
1,3-Dichlorobenzene	ND	0.5	<0.25	µg/L	Q14297
1,3-Dichloropropane	ND	0.5	<0.25	µg/L	Q14297
1,4-Dichlorobenzene	ND	0.5	<0.25	µg/L	Q14297
2,2-Dichloropropane	ND	0.5	<0.25	µg/L	Q14297
2-Chlorotoluene	ND	0.5	<0.25	µg/L	Q14297
4-Chlorotoluene	ND	0.5	<0.25	µg/L	Q14297
Benzene	ND	0.5	<0.25	µg/L	Q14297
Bromobenzene	ND	0.5	<0.25	µg/L	Q14297
Bromochloromethane	ND	0.5	<0.25	µg/L	Q14297
Bromodichloromethane	ND	0.5	<0.25	µg/L	Q14297
Bromoform	ND	0.5	<0.25	µg/L	Q14297
Bromomethane	ND	0.5	<0.25	µg/L	Q14297
Carbon Tetrachloride	ND	0.5	<0.25	µg/L	Q14297
Chlorobenzene	ND	0.5	<0.25	µg/L	Q14297
Chloroethane	ND	0.5	<0.25	µg/L	Q14297
Chloroform	ND	0.5	<0.25	µg/L	Q14297
Chloromethane	ND	0.5	<0.25	µg/L	Q14297
cis-1,2-Dichloroethene	ND	0.5	<0.25	µg/L	Q14297
cis-1,3-Dichloropropene	ND	0.5	<0.25	µg/L	Q14297
Dibromochloromethane	ND	0.5	<0.25	µg/L	Q14297
Dibromomethane	ND	0.5	<0.25	µg/L	Q14297
Dichlorodifluoromethane	ND	0.5	<0.25	µg/L	Q14297
Ethylbenzene	ND	0.5	<0.25	µg/L	Q14297
Hexachlorobutadiene	ND	0.5	<0.25	µg/L	Q14297
Isopropyl ether (IPE)	ND	0.5	<0.25	µg/L	Q14297

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 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1

COC Group Number: G0406515  
 Date/Time Submitted: 4/18/2006 14:45

**Method Blank**

	Result	RL	Control Limit	Units	QC Batch ID
Isopropylbenzene	ND	0.5	<0.25	µg/L	Q14297
m,p-Xylenes	ND	1	<0.5	µg/L	Q14297
Methyl t-butyl ether (MTBE)	ND	0.5	<0.25	µg/L	Q14297
Methylene chloride	ND	2	<1	µg/L	Q14297
n-Butylbenzene	ND	0.5	<0.25	µg/L	Q14297
n-Propylbenzene	ND	0.5	<0.25	µg/L	Q14297
Naphthalene	ND	0.5	<0.25	µg/L	Q14297
o-Xylene	ND	0.5	<0.25	µg/L	Q14297
p-Isopropyltoluene	ND	0.5	<0.25	µg/L	Q14297
sec-Butylbenzene	ND	0.5	<0.25	µg/L	Q14297
Styrene	ND	0.5	<0.25	µg/L	Q14297
tert-Butylbenzene	ND	0.5	<0.25	µg/L	Q14297
Tetrachloroethene	ND	0.5	<0.25	µg/L	Q14297
Toluene	ND	0.5	<0.25	µg/L	Q14297
trans-1,2-Dichloroethene	ND	0.5	<0.25	µg/L	Q14297
trans-1,3-Dichloropropene	ND	0.5	<0.25	µg/L	Q14297
Trichloroethene	ND	0.5	<0.25	µg/L	Q14297
Trichlorofluoromethane	ND	0.5	<0.25	µg/L	Q14297
Vinyl chloride	ND	0.5	<0.25	µg/L	Q14297

**Laboratory Control Sample**

	Result	Spike Amount	Units	Recovery %	Recovery Range %	QC Batch ID
1,1,1,2-Tetrachloroethane	46.32	40	µg/L	116	70 - 139	Q14297
1,1,1-Trichloroethane	24.919	20	µg/L	125	60 - 140	Q14297
1,1,2,2-Tetrachloroethane	22.947	20	µg/L	115	60 - 140	Q14297
1,1,2-Trichloroethane	23.581	20	µg/L	118	60 - 140	Q14297
1,1-Dichloroethane	24.567	20	µg/L	123	60 - 140	Q14297
1,1-Dichloroethene	19.511	20	µg/L	98	60 - 140	Q14297
1,1-Dichloropropene	25.314	20	µg/L	127	62 - 140	Q14297
1,2,3-Trichlorobenzene	19.261	20	µg/L	96	72 - 119	Q14297
1,2,3-Trichloropropane	23.038	20	µg/L	115	68 - 131	Q14297
1,2,4-Trichlorobenzene	19.267	20	µg/L	96	58 - 133	Q14297
1,2,4-Trimethylbenzene	19.055	20	µg/L	95	72 - 125	Q14297
1,2-Dibromo-3-chloropropane	18.484	20	µg/L	92	50 - 135	Q14297
1,2-Dibromoethane (EDB)	21.875	20	µg/L	109	66 - 130	Q14297
1,2-Dichlorobenzene	18.598	20	µg/L	93	64 - 137	Q14297
1,2-Dichloroethane	25.566	20	µg/L	128	72 - 137	Q14297
1,2-Dichloropropane	24.028	20	µg/L	120	70 - 139	Q14297
1,3,5-Trimethylbenzene	19.343	20	µg/L	97	73 - 124	Q14297
1,3-Dichlorobenzene	17.603	20	µg/L	88	60 - 137	Q14297
1,3-Dichloropropane	22.677	20	µg/L	113	67 - 131	Q14297
1,4-Dichlorobenzene	18.311	20	µg/L	92	64 - 139	Q14297
2,2-Dichloropropane	51.74	40	µg/L	129	62 - 138	Q14297
2-Chlorotoluene	24.837	20	µg/L	124	59 - 140	Q14297

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NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Level II QC Report

5/5/2006

N. C. Department of Transportation  
 Attn: Bob Shaut/EI  
 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1

COC Group Number: G0406515  
 Date/Time Submitted: 4/18/2006 14:45

## Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Range %	QC Batch ID
4-Chlorotoluene	25.413	20	µg/L	127	67 - 140	Q14297
Benzene	20.07	20	µg/L	100	68 - 130	Q14297
Bromobenzene	22.261	20	µg/L	111	62 - 133	Q14297
Bromochloromethane	25.073	20	µg/L	125	69 - 131	Q14297
Bromodichloromethane	24.838	20	µg/L	124	72 - 130	Q14297
Bromoform	21.421	20	µg/L	107	59 - 126	Q14297
Bromomethane	17.63	20	µg/L	88	55 - 138	Q14297
Carbon Tetrachloride	25.774	20	µg/L	129	70 - 144	Q14297
Chlorobenzene	18.166	20	µg/L	91	75 - 122	Q14297
Chloroethane	25.583	20	µg/L	128	63 - 145	Q14297
Chloroform	24.347	20	µg/L	122	71 - 137	Q14297
Chloromethane	22.717	20	µg/L	114	50 - 144	Q14297
cis-1,2-Dichloroethene	20.517	20	µg/L	103	62 - 138	Q14297
cis-1,3-Dichloropropene	24.372	20	µg/L	122	67 - 133	Q14297
Dibromochloromethane	24.76	20	µg/L	124	65 - 133	Q14297
Dibromomethane	25.407	20	µg/L	127	71 - 133	Q14297
Dichlorodifluoromethane	20.929	20	µg/L	105	52 - 152	Q14297
Ethylbenzene	19.011	20	µg/L	95	74 - 130	Q14297
Hexachlorobutadiene	28.215	20	µg/L	141	52 - 149	Q14297
Isopropyl ether (IPE)	20.123	20	µg/L	101	70 - 121	Q14297
Isopropylbenzene	19.6	20	µg/L	98	71 - 130	Q14297
m,p-Xylenes	38.042	40	µg/L	95	74 - 128	Q14297
Methyl t-butyl ether (MTBE)	19.886	20	µg/L	99	75 - 119	Q14297
Methylene chloride	24.657	20	µg/L	123	68 - 133	Q14297
n-Butylbenzene	19.976	20	µg/L	100	70 - 135	Q14297
n-Propylbenzene	19.392	20	µg/L	97	75 - 128	Q14297
Naphthalene	19.182	20	µg/L	96	71 - 114	Q14297
o-Xylene	17.826	20	µg/L	89	65 - 130	Q14297
p-Isopropyltoluene	19.83	20	µg/L	99	59 - 138	Q14297
sec-Butylbenzene	18.475	20	µg/L	92	66 - 136	Q14297
Styrene	18.436	20	µg/L	92	78 - 122	Q14297
tert-Butylbenzene	19.23	20	µg/L	96	65 - 133	Q14297
Tetrachloroethene	18.242	20	µg/L	91	66 - 145	Q14297
Toluene	18.598	20	µg/L	93	69 - 129	Q14297
trans-1,2-Dichloroethene	20.338	20	µg/L	102	59 - 144	Q14297
trans-1,3-Dichloropropene	22.701	20	µg/L	114	67 - 130	Q14297
Trichloroethene	17.853	20	µg/L	89	52 - 152	Q14297
Trichlorofluoromethane	24.864	20	µg/L	124	52 - 153	Q14297
Vinyl chloride	20.666	20	µg/L	103	48 - 144	Q14297

## Matrix Spike

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Range %	QC Batch ID
148622	1,1,1,2-Tetrachloroethane	186.36	160	µg/L	116	60 - 134	Q14297
	1,1,1-Trichloroethane	97.04	80	µg/L	121	60 - 133	Q14297

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NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Level II QC Report

5/5/2006

N. C. Department of Transportation  
 Attn: Bob Shaut/EI  
 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1

COC Group Number: G0406515  
 Date/Time Submitted: 4/18/2006 14:45

## Matrix Spike

Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Range %	QC Batch ID
1,1,2,2-Tetrachloroethane	99.236	80	µg/L	124	58 - 143	Q14297
1,1,2-Trichloroethane	86.152	80	µg/L	108	58 - 138	Q14297
1,1-Dichloroethane	104.592	80	µg/L	131	57 - 131	Q14297
1,1-Dichloroethene	75.236	80	µg/L	94	53 - 141	Q14297
1,1-Dichloropropene	97.284	80	µg/L	122	53 - 135	Q14297
1,2,3-Trichlorobenzene	82.36	80	µg/L	103	53 - 129	Q14297
1,2,3-Trichloropropane	97.248	80	µg/L	122	63 - 135	Q14297
1,2,4-Trichlorobenzene	79.816	80	µg/L	100	51 - 129	Q14297
1,2,4-Trimethylbenzene	76.324	80	µg/L	95	70 - 121	Q14297
1,2-Dibromo-3-chloropropane	77.008	80	µg/L	96	46 - 137	Q14297
1,2-Dibromoethane (EDB)	88.076	80	µg/L	110	60 - 133	Q14297
1,2-Dichlorobenzene	76.82	80	µg/L	96	64 - 130	Q14297
1,2-Dichloroethane	102.364	80	µg/L	128	66 - 136	Q14297
1,2-Dichloropropane	96.696	80	µg/L	121	64 - 133	Q14297
1,3,5-Trimethylbenzene	75.96	80	µg/L	95	66 - 121	Q14297
1,3-Dichlorobenzene	70.512	80	µg/L	88	58 - 130	Q14297
1,3-Dichloropropane	89.468	80	µg/L	112	62 - 130	Q14297
1,4-Dichlorobenzene	74.464	80	µg/L	93	59 - 136	Q14297
2,2-Dichloropropane	195.4	160	µg/L	122	58 - 127	Q14297
2-Chlorotoluene	100.572	80	µg/L	126	56 - 134	Q14297
4-Chlorotoluene	104.648	80	µg/L	131	56 - 141	Q14297
Benzene	79.444	80	µg/L	99	69 - 122	Q14297
Bromobenzene	92.892	80	µg/L	116	61 - 128	Q14297
Bromochloromethane	92.892	80	µg/L	116	62 - 128	Q14297
Bromodichloromethane	97.824	80	µg/L	122	63 - 127	Q14297
Bromoform	90.22	80	µg/L	113	56 - 127	Q14297
Bromomethane	77.708	80	µg/L	97	57 - 134	Q14297
Carbon Tetrachloride	99.068	80	µg/L	124	64 - 133	Q14297
Chlorobenzene	72.94	80	µg/L	91	72 - 117	Q14297
Chloroethane	106.052	80	µg/L	133	57 - 143	Q14297
Chloroform	99.604	80	µg/L	125	65 - 133	Q14297
Chloromethane	99.484	80	µg/L	124	45 - 142	Q14297
cis-1,2-Dichloroethene	80.64	80	µg/L	101	58 - 127	Q14297
cis-1,3-Dichloropropene	99.556	80	µg/L	124	62 - 129	Q14297
Dibromochloromethane	96.696	80	µg/L	121	59 - 132	Q14297
Dibromomethane	104.176	80	µg/L	130	64 - 134	Q14297
Dichlorodifluoromethane	80.948	80	µg/L	101	52 - 138	Q14297
Ethylbenzene	74.012	80	µg/L	93	71 - 122	Q14297
Hexachlorobutadiene	95.976	80	µg/L	120	54 - 134	Q14297
Isopropyl ether (IPE)	78.916	80	µg/L	99	73 - 115	Q14297
Isopropylbenzene	78.9	80	µg/L	99	69 - 121	Q14297
m,p-Xylenes	151.724	160	µg/L	95	69 - 122	Q14297
Methyl t-butyl ether (MTBE)	79.372	80	µg/L	99	75 - 116	Q14297
Methylene chloride	108.596	80	µg/L	136	58 - 137	Q14297

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NC Certification No. 402  
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 NC Drinking Water Cert. No. 37735

# Level II QC Report

5/5/2006

N. C. Department of Transportation  
 Attn: Bob Shaut/EI  
 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1

COC Group Number: G0406515  
 Date/Time Submitted: 4/18/2006 14:45

## Matrix Spike

Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Range %	QC Batch ID
n-Butylbenzene	81.404	80	µg/L	102	71 - 121	Q14297
n-Propylbenzene	77.512	80	µg/L	97	73 - 119	Q14297
Naphthalene	81.388	80	µg/L	102	64 - 118	Q14297
o-Xylene	70.736	80	µg/L	88	66 - 124	Q14297
p-Isopropyltoluene	79.236	80	µg/L	99	61 - 127	Q14297
sec-Butylbenzene	73.7	80	µg/L	92	65 - 126	Q14297
Styrene	73.968	80	µg/L	92	64 - 124	Q14297
tert-Butylbenzene	76.616	80	µg/L	96	63 - 123	Q14297
Tetrachloroethene	71.448	80	µg/L	89	62 - 135	Q14297
Toluene	73.792	80	µg/L	92	71 - 120	Q14297
trans-1,2-Dichloroethene	79.764	80	µg/L	100	62 - 133	Q14297
trans-1,3-Dichloropropene	78.936	80	µg/L	99	58 - 129	Q14297
Trichloroethene	95.772	80	µg/L	77	56 - 128	Q14297
Trichlorofluoromethane	101.876	80	µg/L	127	49 - 147	Q14297
Vinyl chloride	74.852	80	µg/L	94	53 - 135	Q14297

## Matrix Spike Duplicate

Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Range %	RPD %	RPD Range %	QC Batch ID
148622 1,1,1,2-Tetrachloroethane	191.52	160	µg/L	120	60 - 134	3	0 - 20	Q14297
1,1,1-Trichloroethane	98.396	80	µg/L	123	60 - 133	1	0 - 20	Q14297
1,1,2,2-Tetrachloroethane	99.196	80	µg/L	124	58 - 143	0	0 - 20	Q14297
1,1,2-Trichloroethane	95.764	80	µg/L	120	58 - 138	11	0 - 20	Q14297
1,1-Dichloroethane	99.884	80	µg/L	125	57 - 131	5	0 - 20	Q14297
1,1-Dichloroethene	73.248	80	µg/L	92	53 - 141	3	0 - 20	Q14297
1,1-Dichloropropene	98.94	80	µg/L	124	53 - 135	2	0 - 20	Q14297
1,2,3-Trichlorobenzene	83.688	80	µg/L	105	53 - 129	2	0 - 20	Q14297
1,2,3-Trichloropropane	98.544	80	µg/L	123	63 - 135	1	0 - 20	Q14297
1,2,4-Trichlorobenzene	79.072	80	µg/L	99	51 - 129	1	0 - 20	Q14297
1,2,4-Trimethylbenzene	74.044	80	µg/L	93	70 - 121	3	0 - 20	Q14297
1,2-Dibromo-3-chloropropane	80.232	80	µg/L	100	46 - 137	4	0 - 20	Q14297
1,2-Dibromoethane (EDB)	96.94	80	µg/L	121	60 - 133	10	0 - 20	Q14297
1,2-Dichlorobenzene	74.984	80	µg/L	94	64 - 130	2	0 - 20	Q14297
1,2-Dichloroethane	102.92	80	µg/L	129	66 - 136	1	0 - 20	Q14297
1,2-Dichloropropane	100.1	80	µg/L	125	64 - 133	3	0 - 20	Q14297
1,3,5-Trimethylbenzene	73.72	80	µg/L	92	66 - 121	3	0 - 20	Q14297
1,3-Dichlorobenzene	68.44	80	µg/L	86	58 - 130	3	0 - 20	Q14297
1,3-Dichloropropane	100.95	80	µg/L	126	62 - 130	12	0 - 20	Q14297
1,4-Dichlorobenzene	72.444	80	µg/L	91	59 - 136	3	0 - 20	Q14297
2,2-Dichloropropane	184.28	160	µg/L	115	58 - 127	6	0 - 20	Q14297
2-Chlorotoluene	98.104	80	µg/L	123	56 - 134	2	0 - 20	Q14297
4-Chlorotoluene	102.48	80	µg/L	128	56 - 141	2	0 - 20	Q14297
Benzene	76.496	80	µg/L	96	69 - 122	4	0 - 20	Q14297
Bromobenzene	91.848	80	µg/L	115	61 - 128	1	0 - 20	Q14297
Bromochloromethane	96.164	80	µg/L	120	62 - 128	3	0 - 20	Q14297

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NC Certification No. 402  
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# Level II QC Report

5/5/2006

N. C. Department of Transportation  
 Attn: Bob Shaut/EI  
 c/o Environmental Investigations, Inc  
 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1

COC Group Number: G0406515  
 Date/Time Submitted: 4/18/2006 14:45

## Matrix Spike Duplicate

Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Range %	RPD %	RPD Range %	QC Batch ID
Bromodichloromethane	99.916	80	µg/L	125	63 - 127	2	0 - 20	Q14297
Bromoform	91.932	80	µg/L	115	56 - 127	2	0 - 20	Q14297
Bromomethane	78.56	80	µg/L	98	57 - 134	1	0 - 20	Q14297
Carbon Tetrachloride	98.94	80	µg/L	124	64 - 133	0	0 - 20	Q14297
Chlorobenzene	70.748	80	µg/L	88	72 - 117	3	0 - 20	Q14297
Chloroethane	109.78	80	µg/L	137	57 - 143	3	0 - 20	Q14297
Chloroform	99.312	80	µg/L	124	65 - 133	0	0 - 20	Q14297
Chloromethane	98.74	80	µg/L	123	45 - 142	1	0 - 20	Q14297
cis-1,2-Dichloroethene	78.72	80	µg/L	98	58 - 127	2	0 - 20	Q14297
cis-1,3-Dichloropropene	97.348	80	µg/L	122	62 - 129	2	0 - 20	Q14297
Dibromochloromethane	101.38	80	µg/L	127	59 - 132	5	0 - 20	Q14297
Dibromomethane	105.61	80	µg/L	132	64 - 134	1	0 - 20	Q14297
Dichlorodifluoromethane	77.584	80	µg/L	97	52 - 138	4	0 - 20	Q14297
Ethylbenzene	72.24	80	µg/L	90	71 - 122	2	0 - 20	Q14297
Hexachlorobutadiene	105.12	80	µg/L	131	54 - 134	9	0 - 20	Q14297
Isopropyl ether (IPE)	78.732	80	µg/L	98	73 - 115	0	0 - 20	Q14297
Isopropylbenzene	75.264	80	µg/L	94	69 - 121	5	0 - 20	Q14297
m,p-Xylenes	145.65	160	µg/L	91	69 - 122	4	0 - 20	Q14297
Methyl t-butyl ether (MTBE)	80.516	80	µg/L	101	75 - 116	1	0 - 20	Q14297
Methylene chloride	103.31	80	µg/L	129	58 - 137	5	0 - 20	Q14297
n-Butylbenzene	77.38	80	µg/L	97	71 - 121	5	0 - 20	Q14297
n-Propylbenzene	74.456	80	µg/L	93	73 - 119	4	0 - 20	Q14297
Naphthalene	84.072	80	µg/L	105	64 - 118	3	0 - 20	Q14297
o-Xylene	67.596	80	µg/L	84	66 - 124	5	0 - 20	Q14297
p-Isopropyltoluene	75.836	80	µg/L	95	61 - 127	4	0 - 20	Q14297
sec-Butylbenzene	70.52	80	µg/L	88	65 - 126	4	0 - 20	Q14297
Styrene	72.008	80	µg/L	90	64 - 124	3	0 - 20	Q14297
tert-Butylbenzene	73.296	80	µg/L	92	63 - 123	4	0 - 20	Q14297
Tetrachloroethene	68.876	80	µg/L	86	62 - 135	4	0 - 20	Q14297
Toluene	71.408	80	µg/L	89	71 - 120	3	0 - 20	Q14297
trans-1,2-Dichloroethene	77.76	80	µg/L	97	62 - 133	3	0 - 20	Q14297
trans-1,3-Dichloropropene	91.036	80	µg/L	114	58 - 129	14	0 - 20	Q14297
Trichloroethene	92.7	80	µg/L	73	56 - 128	3	0 - 20	Q14297
Trichlorofluoromethane	98.816	80	µg/L	124	49 - 147	3	0 - 20	Q14297
Vinyl chloride	71.64	80	µg/L	90	53 - 135	4	0 - 20	Q14297

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5/5/2006

N. C. Department of Transportation  
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 2101 Gateway Centre Blvd. Ste 200  
 Morrisville, NC 27560

Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1

COC Group Number: G0406515  
 Date/Time Submitted: 4/18/2006 14:45

## Volatile Petroleum Hydrocarbons by GC-PID/FID, method MADEP VPH

### Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
C5-C8 Aliphatics	ND	100	<50	µg/L	Q14411
C9-C10 Aromatics	ND	100	<50	µg/L	Q14411
C9-C12 Aliphatics	ND	100	<50	µg/L	Q14411

### Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Range %	QC Batch ID
C5-C8 Aliphatics	150.5	150	µg/L	100	70 - 130	Q14411
C9-C10 Aromatics	41.76	50	µg/L	84	70 - 130	Q14411
C9-C12 Aliphatics	80.54	100	µg/L	81	70 - 130	Q14411

### Matrix Spike

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Range %	QC Batch ID
148235	C5-C8 Aliphatics	158.43	150	µg/L	106	70 - 130	Q14411
	C9-C10 Aromatics	43.53	50	µg/L	87	70 - 130	Q14411
	C9-C12 Aliphatics	78.74	100	µg/L	79	70 - 130	Q14411

### Matrix Spike Duplicate

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Range %	RPD %	RPD Range %	QC Batch ID
148235	C5-C8 Aliphatics	157.72	150	µg/L	105	70 - 130	0	0 - 25	Q14411
	C9-C10 Aromatics	42.25	50	µg/L	85	70 - 130	3	0 - 25	Q14411
	C9-C12 Aliphatics	77.45	100	µg/L	77	70 - 130	2	0 - 25	Q14411

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Project Name: Burnsville, NC  
 Project ID: NCDOT Parcel 134  
 Project No.: WBS #356091.1

COC Group Number: G0406515  
 Date/Time Submitted: 4/18/2006 14:45

## Extractable Petroleum Hydrocarbons by GC-FID, method MADEP EPH

### Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
C11-C22 Aromatics	ND	100	<50	µg/L	Q14542
C19-C36 Aliphatics	ND	100	<50	µg/L	Q14542
C9-C18 Aliphatics	ND	100	<50	µg/L	Q14542

### Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Range %	QC Batch ID
C11-C22 Aromatics	1398.2	1700	µg/L	82	40 - 140	Q14542
C19-C36 Aliphatics	619.4	800	µg/L	77	40 - 140	Q14542
C9-C18 Aliphatics	364.8	600	µg/L	61	40 - 140	Q14542

### Matrix Spike

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Range %	QC Batch ID
148235	C11-C22 Aromatics	1502.4	1700	µg/L	88	40 - 140	Q14542
	C19-C36 Aliphatics	691.6	800	µg/L	86	40 - 140	Q14542
	C9-C18 Aliphatics	469.8	600	µg/L	78	40 - 140	Q14542

### Matrix Spike Duplicate

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Range %	RPD %	RPD Range %	QC Batch ID
148235	C11-C22 Aromatics	1665.2	1700	µg/L	98	40 - 140	10	0 - 50	Q14542
	C19-C36 Aliphatics	692.8	800	µg/L	87	40 - 140	0	0 - 50	Q14542
	C9-C18 Aliphatics	486.8	600	µg/L	81	40 - 140	4	0 - 50	Q14542

**VPH (Aliphatics/Aromatics) Laboratory Reporting Form**

Client Name: Environmental Investigations, Inc. Laboratory Name: Prism Laboratories, Inc.  
 Project Name: NCDOT Parcel 134 NC Certification # (Lab): 402  
 Site Location: Burnsville, NC Sample Matrix: Water

Sample Information and Analytical Results						
Method for Ranges: MADEP VPH						
VPH Surrogate Standards: Aliphatic - 2,5-Dibromotoluene / Aromatic - 2,5-Dibromotoluene						
Sample Identification:		148235	NA	NA	NA	NA
Collection Option (for soil*):		NA				
Date Collected:		4/14/06				
Date Received:		4/18/06				
Date Extracted:		NA				
Date Analyzed:		4/26/06				
% Dry Solids:		NA				
Dilution Factor:		1				
Hydrocarbon Ranges in ug/L:		Sample Results	Sample Results	Sample Results	Sample Results	Sample Results
C5-C8 Aliphatics ***		<100				
C9-C12 Aliphatics ***		<100				
C9-C10 Aromatics **		<100				
Blank:	C5-C8 Aliphatics	<100	<100	<100	<100	<100
	C9-C12 Aliphatics	<100	<100	<100	<100	<100
	C9-C10 Aromatics	<100	<100	<100	<100	<100
RL:	C5-C8 Aliphatics	100				
	C9-C12 Aliphatics	100				
	C9-C10 Aromatics	100				
MDL:	C5-C8 Aliphatics	50				
	C9-C12 Aliphatics	50				
	C9-C10 Aromatics	35				
Surrogate Acceptance Range:	Blank	70-130 %	70-130 %	70-130 %	70-130 %	70-130 %
Aliphatic Surrogate % Rec. - FID:	110	105				
Aromatic Surrogate % Rec. - PID:	106	113				

- \* Option 1 = Established fill line on vial
- \* Option 2 = Sampling device (indicate brand, e.g., EnCore TM)
- \* Option 3 = Field weight of soil

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

\*\*\* Adjusted value

MDL = Method Detection Limit      RL = Reporting Limit      Blank = Laboratory Method Blank or Trip Blank  
 (whichever is higher - indicate type)

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

<b>YES</b>	No - Details Attached
<b>NO</b>	Yes - Details Attached

Were any significant modifications to the VPH method made?

Comments:

**EPH (Aliphatics/Aromatics) Laboratory Reporting Form**

Client Name: Environmental Investigations, Inc. Laboratory Name: Prism Laboratories, Inc.  
 Project Name: NCDOT Parcel 134 NC Certification # (Lab): 402  
 Site Location: Burnsville, NC Sample Matrix: Water

Sample Information and Analytical Results						
Method for Ranges: MADEP EPH						
EPH Surrogate Standards: Aliphatic - 1-Chloro-octadecane / Aromatic - o-Terphenyl						
EPH Fractionation Surrogates: #1 - 2-Bromonaphthalene / #2 - Fluorobiphenyl						
Sample Identification:		148235	NA	NA	NA	NA
Date Collected:		4/14/06				
Date Received:		4/18/06				
Date Extracted:		4/27/06				
Date Analyzed:		5/2/06				
% Dry Solids:		NA				
Dilution Factor:		1				
Hydrocarbon Ranges in ug/L:		Sample Results	Sample Results	Sample Results	Sample Results	Sample Results
C9-C18 Aliphatics *		<100				
C19-C36 Aliphatics *		<100				
C11-C22 Aromatics **		<100				
Blank:	C9-C18 Aliphatics	<100	<100	<100	<100	<100
	C19-C36 Aliphatics	<100	<100	<100	<100	<100
	C11-C22 Aromatics	<100	<100	<100	<100	<100
RL:	C9-C18 Aliphatics	100				
	C19-C36 Aliphatics	100				
	C11-C22 Aromatics	100				
MDL:	C9-C18 Aliphatics	75				
	C19-C36 Aliphatics	31				
	C11-C22 Aromatics	71				
Surrogate Acceptance Range:	Blank	40-140 %	40-140 %	40-140 %	40-140 %	40-140 %
Aliphatic Surrogate % Rec.:	42	102				
Aromatic Surrogate % Rec.:	109	92				
Fractionation Surrogate Accep. Range:	Blank	40-140 %	40-140 %	40-140 %	40-140 %	40-140 %
Frac. Surrogate #1 % Rec.:	114	57				
Frac. Surrogate #2 % Rec.:	112	101				

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

\*\* Adjusted value

MDL = Method Detection Limit      RL = Reporting Limit      Blank = Laboratory Method Blank

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

**YES**      No - Details Attached

Was blank correction applied as a significant modification of the method?

Yes      **NO**

Were any significant modifications to the EPH method made?

**NO**      Yes - Details Attached

Comments:



Full Service Analytical & Environmental Solutions

449 Springbrook Road • P.O. Box 240543 • Charlotte, NC 28224-0543  
Phone: 704/529-6364 • Fax: 704/525-0409

Client Company Name: ELI INC.

Report To/Contact Name: STERLING TWEWER

Reporting Address: 5500 E GAY RD.

GLENN AVENUE, VA 23060

Phone: 804-347-9413 Fax (Yes) (NO)

Email (Yes) (No) Email Address: STERLING@ELI.COM

EDD Type:  PDF  Excel  Other

Site Location Name: YANCY DOT

Site Location Physical Address: RAVENHILL, NC

# CHAIN OF CUSTODY RECORD

LAB USE ONLY

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING: \_\_\_\_\_  
Project Name: YANCY DOT  
Short Hold Analysis: (Yes)  (No)   
\*Please ATTACH any project specific reporting (QC LEVEL I III III IV) provisions and/or QC Requirements  
Invoice To: NE DOT  
Address: \_\_\_\_\_

Purchase Order No./Billing Reference: E-2519A, 1A03 35609.11  
Requested Due Date:  1 Day  2 Days  3 Days  4 Days  5 Days  
"Working Days"  6-9 Days  Standard 10 days  
Samples received after 15:00 will be processed next business day.  
Turnaround time is based on business days, excluding weekends and holidays.  
(SEE REVERSE FOR TERMS & CONDITIONS REGARDING SERVICES  
RENDERED BY PRISM LABORATORIES, INC. TO CLIENT)

BE FILLED IN BY CLIENT/SAMPLING PERSONNEL  
Certification: NELAC  USACE  FL  NC   
Water Chlorinated: YES  NO  N/A \_\_\_\_\_  
Sample Iced Upon Collection: YES  NO

CLIENT SAMPLE DESCRIPTION Parcel #	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER			PRESERVATIVES	ANALYSES REQUESTED	REMARKS	PRISM LAB ID NO.
				TYPE SEE BELOW	NO.	SIZE				
134-Tmw-1	4/14/06	1000	W	(C) NOA (4)	AL	AS PROVIDED	X	X	X	14B235
214-Tmw-1	4/13/06	1500	W				X	X	X	14B236

Sampler's Signature: [Signature] Sampled By (Print Name): STERLING TWEWER Affiliation: \_\_\_\_\_  
Upon relinquishing this Chain of Custody is your authorization for Prism to proceed with the analyses as requested above. Any changes must be submitted in writing to the Prism Project Manager. There will be charges for any changes after analyses have been initialized.

Relinquished By (Signature): [Signature] Received By (Signature): [Signature] Date: 4/18/06 Military/Hours: 14:15

Relinquished By (Signature): \_\_\_\_\_ Received By (Signature): \_\_\_\_\_ Date: \_\_\_\_\_ Military/Hours: \_\_\_\_\_

Relinquished By (Signature): \_\_\_\_\_ Received By (Signature): \_\_\_\_\_ Date: \_\_\_\_\_ Military/Hours: \_\_\_\_\_

Method of Shipment:  Fed Ex  UPS  Hand-delivered  Prism Field Service  Other \_\_\_\_\_

NPDES:  NC  SC  US  SC  NC  SC  SC

GROUNDWATER:  NC  SC

DRINKING WATER:  NC  SC

SOLID WASTE:  NC  SC

RCRA:  NC  SC

CERCLA:  NC  SC

LANDFILL:  NC  SC

OTHER:  NC  SC

LogIn Group No: G0406515

Additional Comments: Send Orig. to Bob Shauff  
EMail Bob  
Stewart + Tiner

SEE REVERSE FOR TERMS & CONDITIONS ORIGINAL

**APPENDIX E**  
**GEOPHYSICAL REPORT**

May 8, 2006

Mr. Robert M. Shaut  
EI, Inc.  
2101 Gateway Centre Boulevard, Suite 200  
Morrisville, NC 27560

Via email (pdf)

RE: State Project: R-2519A, WBS Element 35609.1.1, Yancey County  
US 19E from east of SR 1336 (Jacks Creek Road) to SR 1186 (Old US 19)

SUBJECT: Report on Geophysical Surveys for Locating Possible UST's on 14 Parcels  
Schnabel Engineering Project No. 05211014.01-07

Dear Mr. Shaut:

This letter contains our report on the geophysical surveys we conducted on the subject properties. This letter report includes one 8.5x11 color figure and thirty-two 11x17 color figures.

## **1.0 INTRODUCTION**

The work described in this report was conducted by Schnabel Engineering under our contract with the NCDOT. The work was conducted at the locations indicated by EI to support their environmental assessment of the subject parcels. The purpose of the geophysical surveys was to locate possible metal underground storage tanks (UST's) and associated metal product lines in the accessible areas of the sites.

Schnabel Engineering conducted geophysical surveys on March 13 through 17, 2006, in the accessible areas of the proposed right-of-way (ROW) sections of the parcels: 040, 042, 088, 099, 114, 115, 117, 134, 144, 167, 177, 194, 196 and 214. Photographs of these properties are included on Figures 1 through 4. Photographs of UST locations as marked in the field are included on Figure

5.

The geophysical investigation consisted of electromagnetic (EM) induction surveys using a Geonics EM61-MK2 instrument. The EM61 metal detector is used to locate metal objects buried up to about eight feet below ground surface. Ground-penetrating radar (GPR) investigations of selected EM61 anomalies were conducted using a Geophysical Survey Systems SIR-2000 system equipped with a 400 MHz antenna. A Fisher Gemini-3 was used in the conduction mode to trace exposed vent pipes and product lines. Photographs of these instruments are shown in Figure 6.

## **2.0 FIELD METHODOLOGY**

### **2.1 Location Control**

Locations of geophysical data points and site features were obtained using a sub-meter Trimble Pro-XRS DGPS system on Parcels 40, 42, 88, 99, 114, 115, 117, 134, 144, 167, 177, 194, and 214. An X-Y survey grid was set up on Parcel 196. References to direction and location in this report for Parcel 196 are based on this local site grid. References to direction and location in this report for Parcels 40, 42, 88, 99, 114, 115, 117, 134, 144, 167, 177, 194, and 214 are based on the US State Plane 1983 System, North Carolina 3200 Zone, using the NAD 83 datum, with units in meters. The locations of existing site features (building, curbs, signs, etc.) were recorded for later correlation with the geophysical data and for location references to the NCDOT drawings.

### **2.2 Data Collection**

The EM61 data were collected in the accessible portions of the parcels along parallel survey lines spaced approximately one meter apart. The EM61 and DGPS data were recorded digitally using a field computer and later transferred to a desktop computer for data processing. The GPR data were collected along survey lines spaced one-half to one meter apart in orthogonal directions over areas of reinforced concrete and over anomalous EM readings not attributed to cultural features. The GPR

data were reviewed in the field to evaluate the possible presence of USTs. The GPR data also were recorded digitally and later transferred to a desktop computer for further review.

Preliminary results were sent to Bob Shaut of EI on March 20, 2006.

### **3.0 DISCUSSION OF RESULTS**

The contoured EM61 data are shown on Figures 7 through 34. The EM61 early time gate results are plotted on Figures 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, and 33. The early time gate data provide the most sensitive detection of metal object targets, regardless of size. Figures 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, and 32 show the difference between the response of the top and bottom coils of the EM61 instrument (differential response). The difference is taken to remove the effect of surface and very shallowly buried metallic objects. Typically, the differential response emphasizes anomalies from deeper and larger objects such as USTs.

#### **3.1 Parcel 040 - Andrew E. Brown Property (Andy's, Inc.)**

The parcel owned by Andrew E. Brown is located approximately 61 meters east of NCSR 1375 on the north side of US Highway 19E. The EM61 results are shown on Figure 7 (early time gate) and Figure 8 (differential). Two vehicles could not be moved at the time of our surveys. The early time gate results show anomalies probably due to reinforced concrete, several small anomalies probably caused by insignificant buried metal objects, several anomalies caused by known site features, and a large linear anomaly probably caused by a buried utility. The observed anomalies not attributed to known site features are removed in the differential data set. GPR surveys were conducted over three areas of reinforced concrete. The GPR data did not indicate the presence of USTs in the areas surveyed.

#### **3.2 Parcel 042 - Danny Hensley Property (Burnsville Independent)**

The parcel owned by Danny Hensley is located approximately 244 meters to the east of NCSR 1196



on the south side of US Highway 19E. The EM61 results are shown on Figure 9 (early time gate) and Figure 10 (differential). Several vehicles and trailers could not be moved at the time of our surveys. The early time gate results show several small anomalies probably caused by insignificant buried metal objects, and several anomalies caused by known site features. The observed anomalies not attributed to known site features are removed in the differential data set. GPR surveys were not conducted on the site.

### **3.3 Parcel 088 - Bill Riddle Property (Riddle Fuel Oil Company)**

The parcel owned by Bill Riddle is located approximately 488 meters to the west of NC Highway 197 on the north side of US Highway 19E. The EM61 results are shown on Figure 11 (early time gate) and Figure 12 (differential). The early time gate results show several small anomalies probably caused by insignificant buried metal objects, linear anomalies probably caused by buried utilities, two linear anomalies probably caused by buried metal culverts, and several anomalies caused by known site features. The observed anomalies not attributed to known site features are removed in the differential data set. GPR surveys were not conducted on the site.

### **3.4 Parcel 099 - Charles Dellinger Property (Texaco)**

The parcel owned by Charles Dellinger is located at the southwestern quadrant of the intersection of US Highway 19E and NC 197. The EM61 results are shown on Figure 13 (early time gate) and Figure 14 (differential). The early time gate results show several small anomalies probably caused by insignificant buried metal objects, linear anomalies probably caused by buried utilities, and several anomalies caused by known site features. The observed anomalies not attributed to known site features are removed in the differential data set. GPR surveys were not conducted on the site.

### **3.5 Parcel 114 - Arlene Ray, Inc. Property (Burnsville Gas, Inc.)**

The parcel owned by Arlene Ray, Inc. is located at the southwest quadrant of US Highway 19E and NCSR 1140. The EM61 results are shown on Figure 15 (early time gate) and Figure 16

(differential). The early time gate results show several small anomalies probably caused by insignificant buried metal objects, three linear anomalies probably caused by buried metal culverts, an anomaly probably caused by reinforced concrete, and several anomalies caused by known site features. The observed anomalies not attributed to known site features are removed in the differential data set. GPR surveys were conducted to investigate the reinforced concrete. The GPR data did not indicate the presence of USTs in the areas surveyed.

### **3.6 Parcel 115 - Tom Morgan Property (Convenience King 22)**

The parcel owned by Tom Morgan is located at the intersection of Main Street and US Highway 19E. The EM61 results are shown on Figure 17 (early time gate) and Figure 18 (differential). The early time gate results show several small anomalies probably caused by insignificant buried metal objects, several anomalies probably caused by buried metal culverts, and several anomalies caused by known site features. Some of the observed anomalies not attributed to known site features are removed in the differential data set. GPR surveys were conducted to investigate several EM61 differential anomalies on the site. The GPR data did not indicate the presence of USTs in the areas surveyed.

### **3.7 Parcel 117 - Samuel S. Styles Property (Former Sam's Oil Company)**

The parcel owned by Samuel S. Styles is located on the north side of US 19 East Business (East Main Street) just west of SR 1436. The EM61 results are shown on Figure 19 (early time gate) and Figure 20 (differential). The early time gate results show several small anomalies probably caused by insignificant buried metal objects, an anomaly probably caused by a buried metal culvert, and several anomalies caused by known site features. The observed anomalies not attributed to known site features are removed in the differential data set. GPR surveys were conducted to investigate several EM61 differential anomalies on the site. GPR surveys were not conducted behind the building in the area of the observed fill port because of the presence of large metallic obstructions and debris, and because this area was not within the intended survey area indicated by EI. The GPR data did not indicate the presence of USTs in the areas surveyed. The Gemini-3 was used in the

conduction mode in an attempt to trace out the extent of the vent pipe on the east side of the building. A signal was not detected, which suggests the vent pipe either does not extend very far under the surface beyond the exposed section, or the vent pipe extends beneath the building. A signal would have been detected if the vent pipe connected directly to a UST next to the building.

### **3.8 Parcel 134 - Keith Presnell Property (Austin Automotive)**

The parcel owned by Keith Presnell is located at the northeast quadrant of the intersection of US Highway 19E and NCSR 1329. The EM61 results are shown on Figure 21 (early time gate) and Figure 22 (differential). Several vehicles and trailers could not be moved at the time of our surveys. The early time gate results show several small anomalies probably caused by insignificant buried metal objects, linear anomalies probably caused by utilities, and several anomalies caused by known site features. The observed anomalies not attributed to known site features are removed in the differential data set. GPR surveys were not conducted on the site.

### **3.9 Parcel 144 - Peggy Jones Property (Prives & Perches)**

The parcel owned by Peggy Jones is located approximately 305 meters west of NCSR 1141 on the south side of US Highway 19E. The EM61 results are shown on Figure 23 (early time gate) and Figure 25 (differential). The early time gate results show several small anomalies probably caused by insignificant buried metal objects, two linear anomalies probably caused by buried metal culverts, an anomaly probably caused by a partially buried metal conduit pipe, and several anomalies caused by known site features. The observed anomalies not attributed to known site features are removed in the differential data set. GPR surveys were not conducted on the site. The Gemini-3 was used in the conduction mode to trace out the extent of the metal conduit pipe that was visible in the area of the former pump island, which was then marked out on the ground surface. The conduit pipe was traced to the front of the building, and the owner of the property informed our representative that on the wall inside the building a switch existed that was used to turn the pump off and on. The owner also informed our representative that the USTs and product lines were removed at the same time as the pump island, but the conduit pipe for the electrical was left in place.

### **3.10 Parcel 167 - Edd Cassida Property (Edd's Independent Station)**

The parcel owned by Edd Cassida is located at the southwest quadrant of the intersection of US Highway 19E and NCSR 1142. The EM61 results are shown on Figure 25 (early time gate) and Figure 26 (differential). The early time gate results show several small anomalies probably caused by insignificant buried metal objects, two linear anomalies probably caused by buried metal culverts, and several anomalies caused by known site features. The observed anomalies not attributed to known site features are removed in the differential data set. GPR surveys were not conducted on the site.

### **3.11 Parcel 177 - Johnnie Bennett Property (Former BP Gas Station)**

The parcel owned by Johnnie Bennett is located at the southwest quadrant of the intersection of US Highway 19E and NCSR 1143. The EM61 results are shown on Figure 27 (early time gate) and Figure 28 (differential). The early time gate results show several small anomalies probably caused by insignificant buried metal objects, an anomaly probably caused by reinforced concrete, and several anomalies caused by known site features. The observed anomalies not attributed to known cultural features are removed in the differential data set. GPR surveys were conducted to investigate the reinforced concrete. The GPR data did not indicate the presence of USTs in the areas surveyed.

### **3.12 Parcel 194 - William Ira Young Property (Former Gas Station)**

The parcel owned by William Ira Young is located at the northwest quadrant of the intersection of SR 1323 and US Highway 19E. The EM61 results are shown on Figure 29 (early time gate) and Figure 30 (differential). Three site visits were required in order to survey the areas of concern because the site owner could only move obstructing trailers around at specific times. The early time gate results show several small anomalies probably caused by insignificant buried metal objects, an anomaly probably caused by a buried metal culvert, a linear anomaly probably caused by a buried utility, vent pipe line, or product line, and several anomalies caused by known site features. Some of

the observed anomalies not attributed to known site features are removed in the differential data set. Information provided by EI indicated a vent pipe at the southwest corner of the building, and three fill ports located southwest of the building. These features could not be located at the time of our surveys. GPR surveys were conducted to investigate the linear anomaly extending from the southwest corner of the building, as well as the areas occupied by trailers to the southwest of the building. The GPR data indicated the presence of one probable UST as shown on Figures 29 and 30, which was marked out on the ground surface as shown on Figure 5. The GPR data indicate that the UST is approximately 1.0 meter in diameter and about 1.5 meters in length, with an approximate capacity of 1100-1200 liters. It appears to be buried 1.0 to 1.5 meters below the ground surface.

### **3.13 Parcel 196 - Ed Gouge Property (Heritage Tire)**

The parcel owned by Ed Gouge is located on the south side of US Highway 19E approximately 60 meters east of SR 1144. A local X-Y site grid was laid out for positioning of the geophysical surveys at this parcel because the steep valley walls at this location did not allow enough satellite visuals to provide a reliable GPS signal to be used for positioning. The EM61 results are shown on Figure 31 (early time gate) and Figure 32 (differential). The early time gate results show several small anomalies probably caused by insignificant buried metal objects, an anomaly probably caused by a buried metal culvert, and several anomalies caused by known site features. Some of the observed anomalies not attributed to known cultural features are removed in the differential data set. GPR surveys were conducted to investigate three EM61 differential anomalies on the site. The GPR data did not indicate the presence of USTs in the areas surveyed.

### **3.14 Parcel 214 - Charles R. Dellinger**

The parcel owned by Charles Dellinger is located at the southwest corner of the intersection of US Highway 19E and SR 1146 (Cane Bridge Road). The EM61 results are shown on Figure 33 (early time gate). A malfunction with the top coil of the EM61 caused it to record random erroneous data, which influenced the differential data set. The differential data set was not used and has not been included in this report. The early time gate results show several small anomalies probably caused by

insignificant buried metal objects, an anomaly probably caused by a reinforced concrete bridge, and several anomalies caused by known site features. GPR surveys were conducted to investigate two EM61 early time gate anomalies on the site. The GPR data did not indicate the presence of USTs in the areas surveyed.

#### **4.0 CONCLUSIONS**

Our evaluation of the geophysical data collected on 14 Parcels on State Project R-2519A in Yancey County, NC indicate the following:

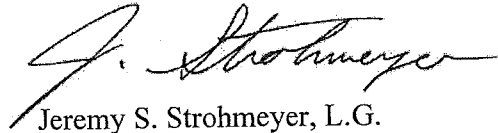
- The geophysical data indicate the presence of one possible UST on parcel 194. The possible UST is about 1.0 meter in diameter and about 1.5 meters in length, with an approximate capacity of 1100 to 1200 liters.
- The geophysical data do not indicate the presence USTs in the areas surveyed on parcels 040, 042, 088, 099, 114, 115, 117, 134, 144, 167, 177, 196, and 214.

#### **5.0 LIMITATIONS**

These services have been performed and this report prepared for the North Carolina Department of Transportation in accordance with generally accepted guidelines for conducting geophysical surveys. It is generally recognized that the results of geophysical surveys are non-unique and may not represent actual subsurface conditions.

Thank you for the opportunity to serve you on this project. Please call if you need additional information or have any questions.

Sincerely,

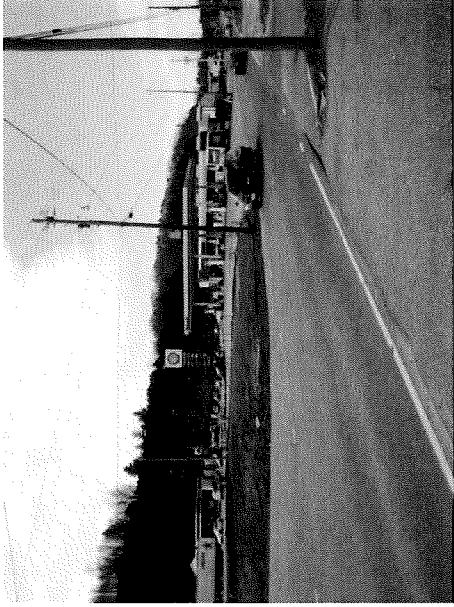


Jeremy S. Strohmeyer, L.G.  
Project Manager

JS/RC  
Attachment: Figures (1-33)



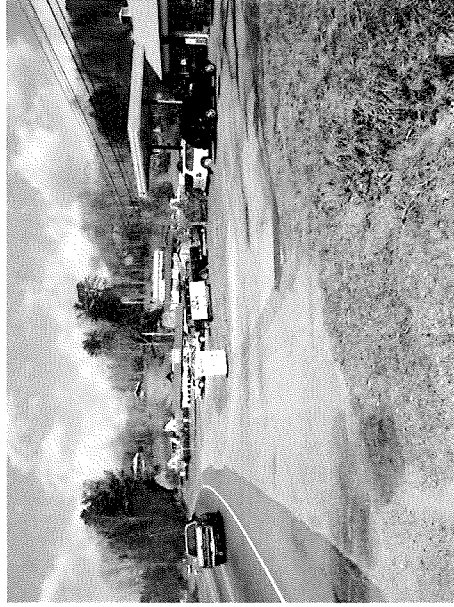
Parcel 114 - Arlene Ray Property, looking southwest



Parcel 115 - Tom Morgan Property, looking southwest



Parcel 117 - Samuel S. Styles Property, looking north



Parcel 134 - Keith Presnell Property, looking northwest



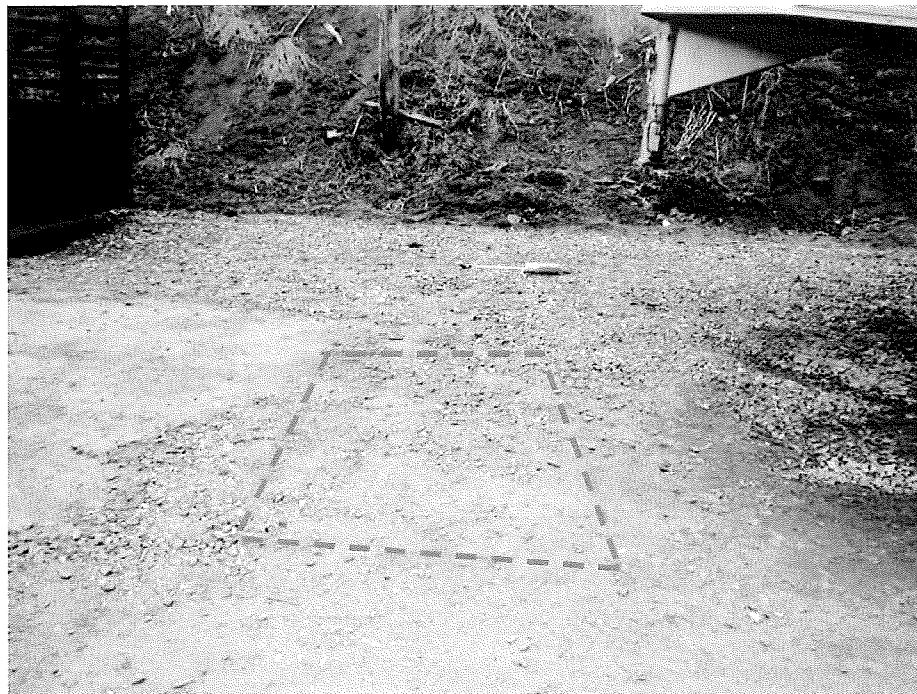
NC Department of Transportation  
 Geotechnical Engineering Unit  
 State Project No. R-2519A  
 Yancey County, North Carolina

**SITE PHOTOS**





Location of possible UST as marked on site, looking northeast



Location of possible UST as marked on site, looking west



NC Department of Transportation  
Geotechnical Engineering Unit

State Project No. R-2519A  
Yancey County, North Carolina

PHOTOS OF  
POSSIBLE UST  
LOCATION

FIGURE 5



Geonics EM61-MK2



Geophysical Survey Systems SIR-2000 with 400 MHz antenna



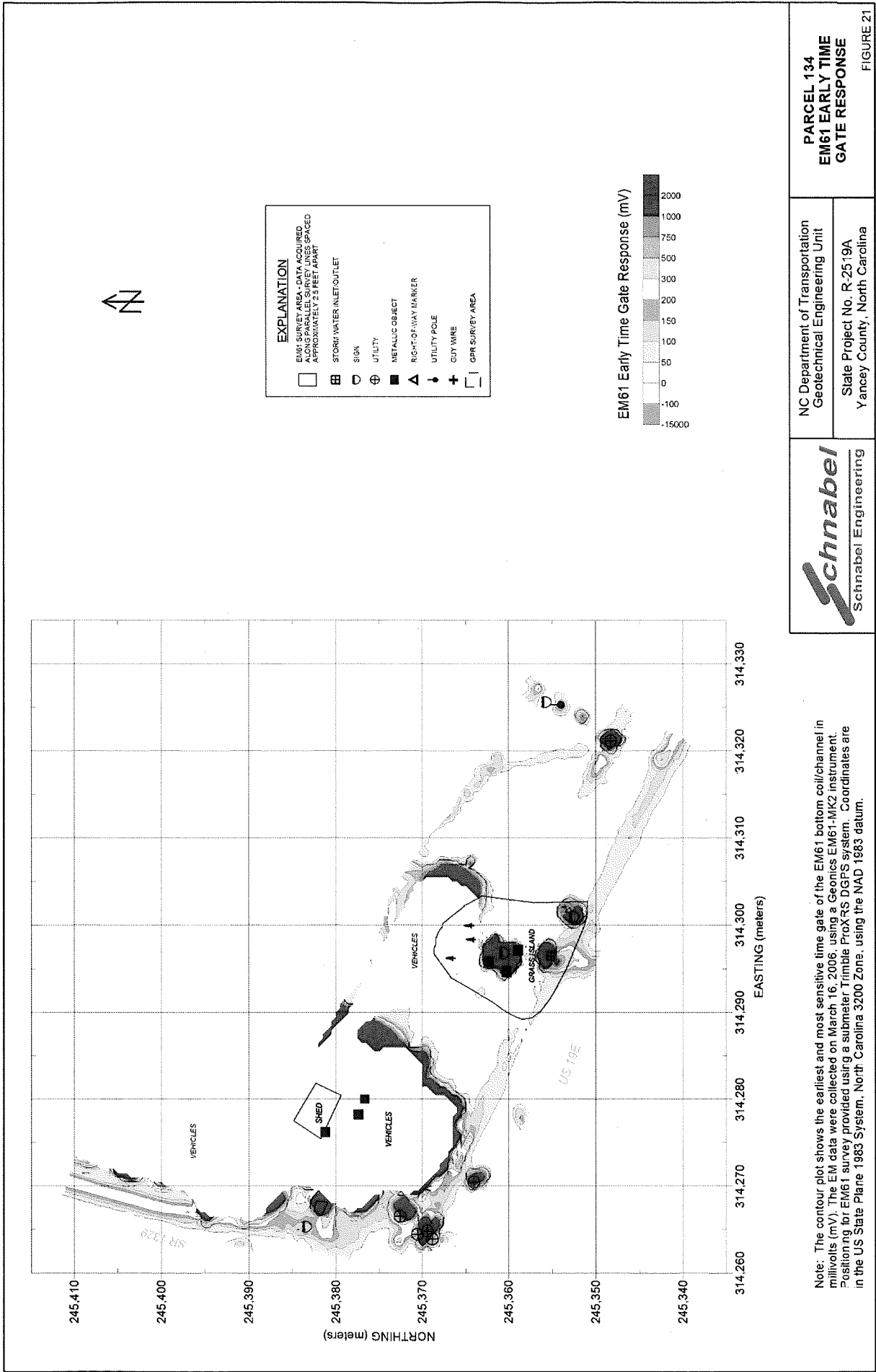
Fisher Gemini-3 used in conduction mode



NC Department of Transportation  
 Geotechnical Engineering Unit  
 State Project No. R-2519A  
 Yancey County, North Carolina

PHOTOS OF  
 GEOPHYSICAL  
 EQUIPMENT

FIGURE 6

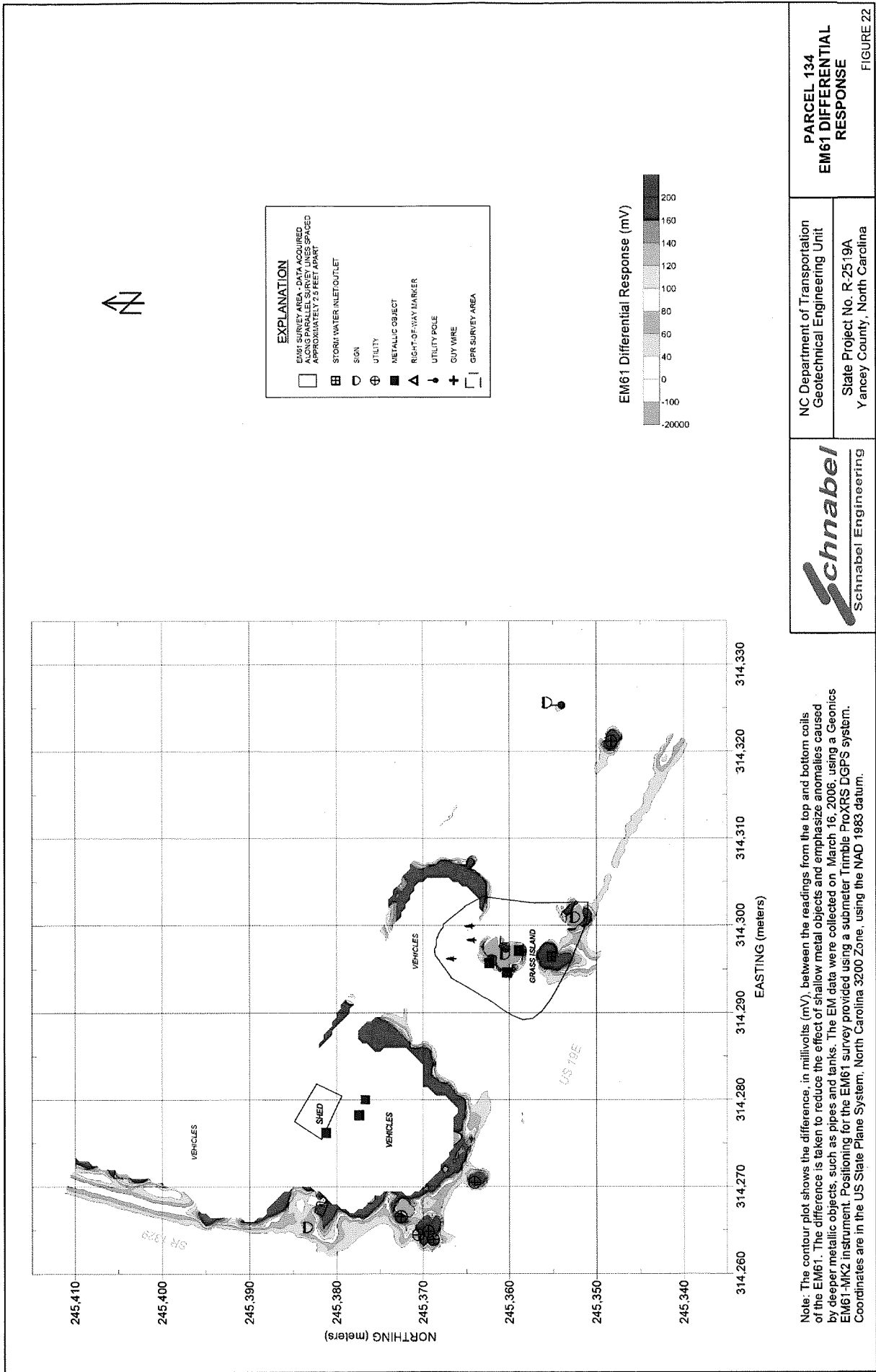


Note: The contour plot shows the earliest and most sensitive time gate of the EM61 bottom coil/channel in millivolts (mV). The EM data were collected on March 16, 2006, using a Geonics EM61-MK2 instrument. Positioning for EM61 survey provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina 3200 Zone, using the NAD 1983 datum.



NC Department of Transportation  
 Geotechnical Engineering Unit  
 State Project No. R-2519A  
 Yancey County, North Carolina

PARCEL 134  
 EM61 EARLY TIME  
 GATE RESPONSE  
 FIGURE 21



Note: The contour plot shows the difference, in millivolts (mV), between the readings from the top and bottom coils of the EM61. The difference is taken to reduce the effect of shallow metal objects and emphasize anomalies caused by deeper metallic objects, such as pipes and tanks. The EM data were collected on March 16, 2006, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey provided using a submeter Trimble ProXR5 DGPS system. Coordinates are in the US State Plane System, North Carolina 3200 Zone, using the NAD 1983 datum.

NC Department of Transportation  
 Geotechnical Engineering Unit  
 State Project No. R-2519A  
 Yancey County, North Carolina



**PARCEL 134  
 EM61 DIFFERENTIAL  
 RESPONSE**  
 FIGURE 22