PRELIMINARY SITE ASSESSMENT
PARCEL 015, SAMUEL D. TANNER PROPERTY
2006 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
NCDOT PROJECT: U-3456
WBS ELEMENT: 34950.1.1

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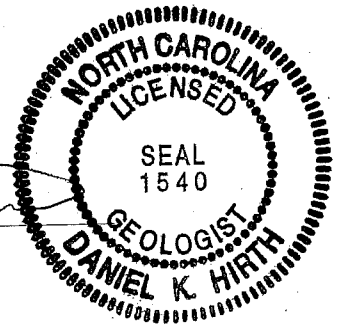

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January 18, 2006

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1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) is widening Fayetteville Road (US-1) in Rockingham, Richmond County, North Carolina. The project will require the NCDOT to acquire additional property for roadway construction. On November 3, 2005, Solutions-IES submitted a proposal to conduct Preliminary Site Assessments (PSAs) for 14 parcels of land that contain or reportedly contained underground storage tanks (USTs) or are areas of concern identified by NCDOT. This report summarizes the results of field and laboratory activities conducted during the PSA of the Samuel D. Tanner property located on the south side of Fayetteville Road and west of Skyline Drive. The location of the parcel is shown on **Figures 1 and 2**. The scope of work executed at the site was performed in accordance with Solutions-IES proposal NC05449P dated November 3, 2005, and a Notice to Proceed issued by the NCDOT Geotechnical Engineering Unit dated November 7, 2005.

2.0 BACKGROUND AND SITE DESCRIPTION

Parcel 015 is an active thrift store that is located on the south side of Fayetteville Road, west of Skyline Drive. The proposed right-of-way will require acquisition of part of the property. The area surrounding the store consists of grass and gravel surfaces. Surface water tends to collect on the southeast side of the parcel, and forms an intermittent stream. Previously, a grocery store and furniture store operated on the site. Fill port and vent pipes are located near the SE side of the building. A monitor well (15-MW) was also noted on the site. This well is likely associated with a UST incident at the Crestview #2 BP (Texaco Sandwich Hut, Incident #3273/FA-34) across Fayetteville Road. The location of monitor well MW-15 is depicted in **Figures 2 and 3**. Photographs of the site are included in **Appendix A**

3.0 FIELD ACTIVITIES

Prior to beginning subsurface sampling, Solutions-IES contacted the North Carolina One Call Center to locate underground utilities at the site. Pyramid Environmental & Engineering, P.C. (Pyramid) was contracted to perform an electromagnetic survey of the subsurface in the proposed right-of-way and easement area. The survey was performed on November 25, 2005. The electromagnetic survey (EM61) identified one UST in the study area. It was located on the north side of the thrift store as depicted in the photo on Figure 8 of the Geophysical Investigation report. Ground penetrating radar (GPR) survey was also performed because suspect anomalies were identified by the electromagnetic survey. The GPR survey suggested the presence of a UST buried approximately 1.4 feet below the surface. The survey also

suggested that the tank is approximately 10 feet long and approximately 3.5 feet wide. Images of the EM61 and GPR findings are included as Figures 6 and 7, and 8, in **Appendix B**: The Geophysical Investigation Report.

After reviewing the geophysical report, Solutions-IES mobilized to the site on December 2, 2005 to collect soil samples from the proposed right-of-way. Nine soil borings were advanced at the site to a depth of 8 ft bgs. Three soil borings were advanced at the site to a depth of 12 feet below ground surface (ft bgs). The borings were spaced approximately 50 feet apart except for borings 15-8 and 15-9. These were located in the vicinity of a possible UST (**Figure 2**). The borings at Parcel 015 were advanced using a Geoprobe®.

A MacroCore® sampler fitted with a single-use, disposable polyvinyl chloride (PVC) liner was used to collect samples at 4-foot intervals. Each soil sample was split into two aliquots. Each aliquot was placed in a separate resealable plastic bag. One bag was placed on ice for possible laboratory analysis, while the other bag was placed at ambient temperature for field screening with a flame ionization detector (FID). Volatile organic compounds (VOCs) were allowed to accumulate in the headspace of the latter bag for approximately twenty minutes. Then, the headspace was scanned with the FID. The FID readings were entered on the boring logs along with the soil description and any indications of petroleum staining or odor (**Appendix C**).

The subsurface soil at the site consisted primarily of sandy clay, clayey fine sand, and fine sand (Unified Soil Classifications CL, SC, and SP). Groundwater was encountered at approximately 8 ft bgs.

There was no indication of VOCs in the headspace of samples scanned with the FID (15-2, 15-3, 15-6, and 15-7). The screening of the remainder of the soil samples indicated the presence of VOCs. The FID readings are summarized on **Table 1**. Because groundwater was encountered at 8 ft bgs, soil samples were collected from borings 15-1, 15-2, 15-3, 15-4, 15-5, 15-8, 15-9, 15-10, and 15-11 at 6 to 8 ft bgs for laboratory analysis. These depths were selected so the samples would be collected above the groundwater table. Boring 15-12 was sampled at 4-6 feet bgs, where elevated FID measurements were recorded. The samples were placed in laboratory-supplied containers and stored on ice pending shipment to Pace Analytical Services, Inc. (Pace) in Huntersville, NC under chain-of-custody control. All soil samples were submitted for analysis of gasoline range organics (GRO) and diesel range organics (DRO) total petroleum hydrocarbons (TPH) by EPA Modified Method 8015 with preparation methods 5030 and 3545, respectively.

Since the water table was encountered, a groundwater sample was collected from monitor well 15-MW. Monitor well 15-MW was measured to be 2-inches in diameter. A peristaltic pump and disposable tubing was used to collect the sample. The samples were placed in laboratory-supplied containers and stored on ice pending shipment to Pace under chain-of-custody control. The samples were submitted for analysis of VOCs using EPA Methods 601 and 602 with IPE, MTBE, EDB and xylenes, EPA Method 625, including the 10 largest tentatively identified compounds (TICs), MADEP VPH and EPH, lead and chromium using Standard Preparation Method 3030C.

On February 8, 2006, we returned to Parcel 015 to conduct a specific capacity test. The nearest well (MW-3) with sufficient well construction information to calculate the hydraulic conductivity using specific capacity information was located on Parcel 017 just north of Fayetteville Road (**Figure 3**). The specific capacity, as described by Wilson et al.(1997), was performed by inserting a ¼-inch polyethylene tube to a known depth beneath the water surface. From the specific capacity, the hydraulic conductivity (K) was estimated to be 0.38 ft/day (**Appendix D**).

4.0 SAMPLING RESULTS

Based on the analytical results (**Appendix D**), total petroleum hydrocarbons (GRO and/or DRO) were detected above the NCDENR Action Level of 10 mg/kg in soil samples collected from borings 15-4, 15-5, 15-8, 15-10, and 15-11. In addition, TPH GRO was detected at concentrations greater than the laboratory method detection limit, but less than the Action Level in soil sample collected from boring 15-1.

The groundwater analytical results indicate that GRO total petroleum hydrocarbons were detected above the method detection limits (MDL), but below the NCDENR action levels in a soil sample collected from boring 15-1. Lead, C5-C8 and C9-C22 aliphatic compounds were detected at concentrations above the MDL, but below the 2L Standards. Two unknown tentatively identified compounds were also found in the ground water sample MW-15.

Soil analytical results are summarized in Table 2 and groundwater analytical results are summarized in Table 3. The laboratory reports for the soil samples are included in **Appendix D**.

5.0 DISCUSSION AND CONCLUSIONS

The geophysical investigation performed at the site identified one anomaly that could be a UST. The GPR survey suggests that the anomaly is buried approximately 1.4 feet below the surface and is approximately 10 feet long and approximately 3.5 feet wide. Field measurements and laboratory analytical data indicated a petroleum impact to soil across the assessment area.

The impacted soils are estimated to be in two locations. The first area (borings 4 and 5) is roughly rectangular in shape and measures 60 feet by 35 feet, or approximately 2,100 square feet. The second area (borings 8 to 11) is also rectangular in shape and measures 85 feet by 25 feet, or approximately 2,125 square feet. Since groundwater is known to have been impacted and is located approximately 8 feet deep, impacted soil is estimated to lie between 4 and 8 ft bgs. Therefore the volume of impacted soil is calculated as 4,225 square feet by 4 feet thick, or 16,900 cubic feet (625 cubic yards). The highest concentration of total petroleum hydrocarbons was detected as GRO from boring 15-10 at 6-8 feet bgs. Boring 15-10 is located NE of the suspected UST. Because the soil sample collected from boring 15-1 contained TPH GRO at concentrations greater than the laboratory method detection limit, but less than the Action Level, soil that may be excavated in vicinity of this boring should be properly transported and disposed of

Based on the laboratory results obtained from the monitor well, the groundwater has been impacted by petroleum hydrocarbons. A water sample from monitor well 15-MW was found to contain C9-C22 aromatic compounds in excess of the 2L Standards. Since only one well is located on the site, groundwater flow direction was not established. There was a historic release of petroleum from UST's located across Fayetteville Road that could be related to the detected compounds. Contingent on the information available from the off-site release, additional assessment would be necessary to characterize the impact to groundwater at the site.

To estimate the volume of water that may need to be removed from an excavations in the Study Area, Solutions-IES discussed the likely depth of excavation work in the vicinity of the drainage system located on Parcel 015 with NCDOT. According to NCDOT, the probable excavation depth in the vicinity of the drainage system is approximately 5 ft bgs. As Solutions-IES measured the depth to water on Parcel 015 to be approximately 8 ft bgs, and according to NCDOT, historical water level measurements in the vicinity of the Study Area range from 6 to 10 feet bgs. Solutions-IES does not anticipate that an excavation trench of 5 ft bgs will require dewatering.

In conclusion, the extent of soil contamination has been identified in two primary areas. However, additional assessment would be necessary to further investigate the vertical and lateral extent of groundwater contamination.

TABLES

TABLE 1
SUMMARY OF FIELD SCREENING RESULTS FOR SOIL
Parcel 015 – Samuel D. Tanner Property
2006 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: December 2, 2005

Sample Depth Below Ground Surface	Soil Borings											
	15-1	15-2	15-3	15-4	15-5	15-6	15-7	15-8	15-9	15-10	15-11	15-12
	FID Reading (ppm)											
0 - 2 feet	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0
2 - 4 feet	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.7
4 - 6 feet	ND	ND	ND	ND	25.2	0.8	ND	ND	0.2	ND	0.2	574.5
6 - 8 feet	44.3	ND	ND	25.9	84	ND	ND	22.7	0.8	290.9	8.0	NS
8 - 10 feet	84.5	NS	ND	11.9	NS	NS	NS	NS	NS	NS	NS	NS
10 - 12 feet	806	NS	NS	198	NS	NS	NS	NS	NS	NS	NS	NS

Notes:
1. FID readings possibly skewed due to proximity of boring to sewer line.
2. FID readings were obtained with a Photovac MicroFID Flame Ionization Detector.
3. Samples denoted by shaded cells were submitted for laboratory analysis.
4. ND - Not detected.
5. NS - Denotes "No sample obtained or no sample screened from indicated depth".

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS
Parcel 015 – Samuel D. Tanner Property
2006 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: December 2, 2005

Sample Information		Total Petroleum Hydrocarbons	
Boring Number	Depth (Feet)	Gasoline Range[1] (mg/kg)	Diesel Range[2] (mg/kg)
15-1	6-8	4.1	<5.6
15-2	6-8	<3.9	<5.6
15-3	6-8	<4.1	<5.8
15-4	6-8	<4.0	13
15-5	6-8	13	22
15-8	6-8	<3.9	45
15-9	6-8	<3.9	<5.7
15-10	6-8	120	200
15-11	6-8	15	34
15-12	4-6	<4.3	<5.8

Notes:
1. Total Petroleum Hydrocarbons (TPH) Method 5030/8015MOD - Gasoline Range Hydrocarbons
2. Total Petroleum Hydrocarbons (TPH) Method 3545/8015MOD - Diesel Range Hydrocarbons
3. Samples denoted by shading exceed the NC DENR Action Level of 10 mg/kg TPH.

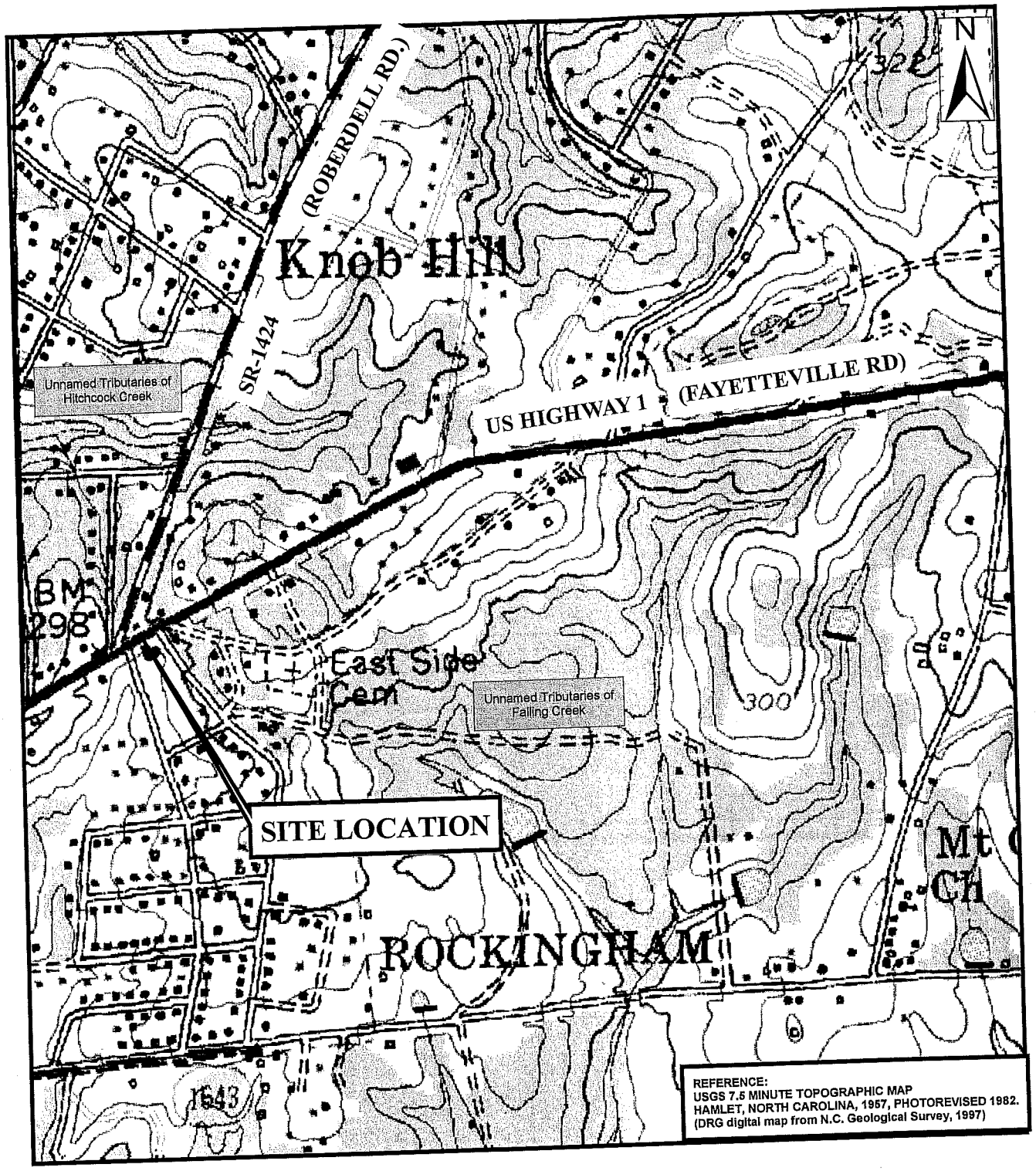
TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
Parcel 015 – Samuel D. Tanner Property
2006 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: December 6, 2005

Water Sample ID	15-MW	2L Standards
Well Location	Parcel 015	
Hydrocarbon Constituent		
EPA Method 601/602 - Volatile Organics (µg/L)		
No Compounds Detected		
EPA Method 625/625SF - Semi-Volatile Organics (µg/L)		
No Compounds Detected		
MADEP VPH and EPH (µg/l)		
C5-C8 Aliphatics	120	420
C9-C12 Aliphatics	380	4,200
C9-C22 Aromatics	260	210
Metals by Trace ICP (EPA Method 6010 / 3010) (mg/L)		
Total Lead	0.0095	0.015
Total Chromium	<0.0020	0.05
Tentatively Identified Compounds (µg/L)		
Unknown	7.50	*
Unknown	5.30	*

Notes:

1. Analytes not shown were not detected above the laboratory method detection limits.
2. Shaded concentrations exceed the 15A NCAC 2L Groundwater Standards.
3. * = standard not established.
4. Tentatively Identified Compounds are estimated concentration levels
5. C9-C22 aromatics represent the combined totals for C9-C10 aromatics (VPH) and C11-C22 aromatics (EPH).

FIGURES



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SITE LOCATION MAP
PARCEL 015 - SAMUEL D. TANNER PROPERTY
2006 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
WBS ELEMENT NO. 34950.1.1(PROJECT: U-3456)

Solutions-IES
Industrial & Environmental Services
1101 Nowell Road, Raleigh, NC 27609
Phone (919) 873-1060, Fax (919) 873-1074

Created by: KBB Checked by: BR File: FIG1.mxd Software: ESRI ArcMap 9.0		Project: 2730.05A2.NCDO Date: 12/15/05	
		FIGURE	1

PROJECT MANAGER SK | CHECKED BY SK | DRAFTER KB/HM | PROJECT NUMBER 2730.05A2.NCDO

DATE 12/15/05

PROJECT

FILE PARCEL 015 FIGURE 2.DGN

STUDY AREA

PROBABLE UST LOCATION

EXISTING MONITORING WELL (15-MW)

US 1 FAYETTEVILLE ROAD

SCALE IN FEET 0 50 100

Solutions-IES
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1101 NOWELL ROAD
RALEIGH, NORTH CAROLINA 27607
TEL.: (919) 873-1060 FAX.: (919) 873-1074

SITE MAP
PARCEL 015 - SAM TANNER PROPERTY
2006 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
WBS ELEMENT NO. 34950.1.1 (NCDOT PROJECT: U-3456)

FIGURE: 2

STUDY AREA

EXISTING MONITORING WELL (MW-3)

EXISTING MONITORING WELL (15-MW)

PROBABLE UST LOCATION

ESTIMATED EXTENT OF SOIL CONTAMINATION

SUMMARY OF SOIL ANALYTICAL RESULTS
Parcel 015 – Samuel D. Tanner Property
2006 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: December 2, 2005

Sample Information		Total Petroleum Hydrocarbons	
Boring Number	Depth (Feet)	Gasoline Range[1] (mg/kg)	Diesel Range[2] (mg/kg)
15-1	6-8	4.1	<5.6
15-2	6-8	<3.9	<5.6
15-3	6-8	<4.1	<5.8
15-4	6-8	<4.0	13
15-5	6-8	13	22
15-8	6-8	<3.9	45
15-9	6-8	<3.9	<5.7
15-10	6-8	120	200
15-11	6-8	15	34
15-12	4-6	<4.3	<5.8

Notes:
1. Total Petroleum Hydrocarbons (TPH) Method 5030/8015MOD - Gasoline Range Hydrocarbons
2. Total Petroleum Hydrocarbons (TPH) Method 3545/8015MOD - Diesel Range Hydrocarbons
3. Samples denoted by shading exceed the NC DENR Action Level of 10 mg/kg TPH

0 50 100
SCALE IN FEET

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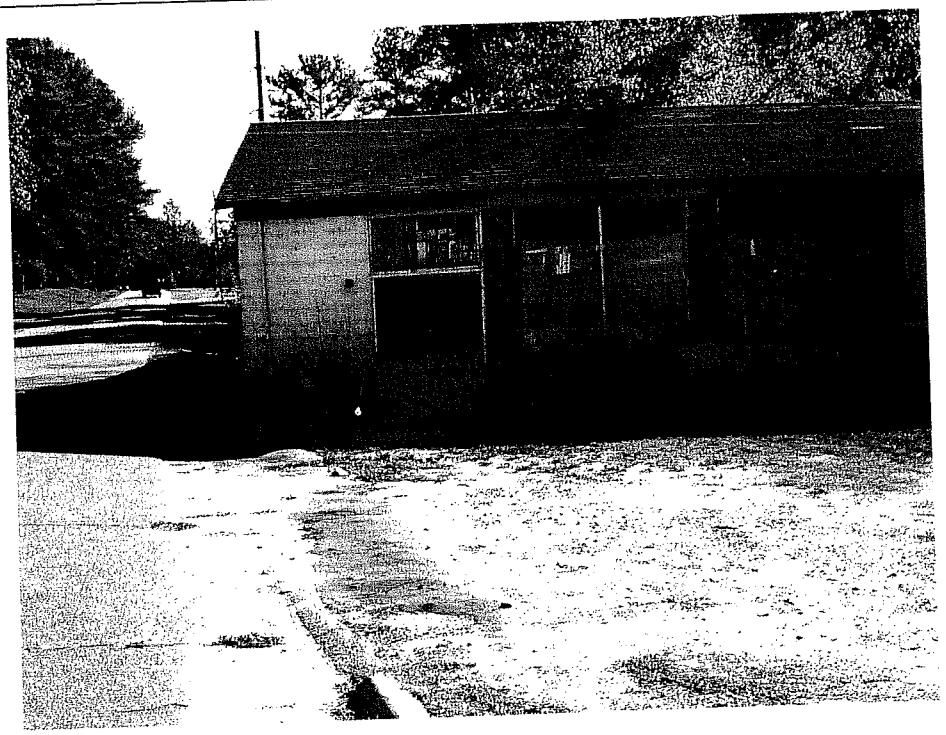
BORING LOCATIONS AND ESTIMATED EXTENT OF SOIL CONTAMINATION
PARCEL 015 - SAM TANNER PROPERTY
2006 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
WBS ELEMENT NO. 34950.1.1 (NCDOT PROJECT: U-3456)

FIGURE: 3

PROJECT NUMBER 2730.05A2.NC00
DRAFTER KB/HM
CHECKED BY SK
PROJECT MANAGER SK
DATE 12/15/05
FILE PARCEL 015 FIGURE 3.DGN

APPENDIX A

PHOTOGRAPHS



Photograph 1 - Looking south down Skyline Drive at Parcel 015. UST location is marked with pink flags.

Photograph 2 - Looking SW at Parcel 015 from across the intersection.

APPENDIX B

GEOPHYSICAL INVESTIGATION

Pyramid Project # 2005292

GEOPHYSICAL INVESTIGATION REPORT

GEOPHYSICAL SURVEYS FOR THE DETECTION OF METALLIC UST'S

Rockingham, US 1 (Fayetteville Road) Sites
Rockingham, North Carolina
State Project Number U-3456

November 30, 2005

Report prepared for: Sheri Knox & Daniel Hirth
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GEOPHYSICAL SURVEYS FOR THE DETECTION OF METALLIC UST'S
Rockingham, US 1 (Fayetteville Road) Sites
State Project Number U-3456

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FIGURES (continued)

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1.0 INTRODUCTION

Pyramid Environmental & Engineering, PC conducted geophysical investigations for Solutions Industrial & Environmental Services, Inc. during the period of November 11-23, 2005, within the proposed Right-of-Way (ROW) areas at 13 sites in Rockingham, North Carolina. The work was done as part of the North Carolina Department of Transportation (NCDOT) road-widening project under State Project number U-3456 and WBS Element 34950.1.1. The sites are located along the north or south sides of US 1 (Fayetteville Road) from 0.25 miles west of SR-1424 (Roberdell Road) to 0.25 miles west of SR 1640 (Wiregrass Road). The geophysical surveys were conducted to determine if unknown metallic underground storage tanks (UST's) were present beneath the proposed ROW area of each site.

Solutions IES representative Mr. Walt Beckwith, PG provided maps during the week of November 1, 2005 that outlined the geophysical survey areas of each site. Solutions IES representatives, Ms. Sheri Knox, PE and Mr. Daniel Hirth, PG provided guidance during the geophysical investigations. Geophysical surveys were conducted at the following 13 sites:

Property Owner	Parcel	Present Use of Property
W. J. Barnhart Property	(Parcel 4)	Used Car Lot & Auto Repair Garage
Julia M. Ratliff Property	(Parcel 7)	Vacant Lot
Samuel D. Tanner Property	(Parcel 15)	Vacant Building & Lot
Harvey E. Melton Property	(Parcel 17)	BP Gas Station
Samuel D. Tanner Property	(Parcel 21)	Strip Mall
W. J. Barnhart Property	(Parcel 41A)	Vacant Building & Lot
Wesly Denham Property	(Parcel 42)	Havoline Carolina Quick Lube
William Ussery Property	(Parcel 57)	Vacant Building & Lot
Walter McCain Property	(Parcel 80)	Vacant Buildings & Lot
Leon Wall Property	(Parcel 99)	Vacant Building & Lot
James Porter Property	(Parcel 117)	Vacant Building & Lot
John Evans Property	(Parcel 126)	Custom Monument Company
Henry Ussery Property	(Parcel 140)	Bo Henry's Pawn Shop

Photos of the above sites are presented in **Figure 1**.

2.0 FIELD METHODOLOGY

Prior to conducting the geophysical investigations, a 10-foot by 10-foot survey grid was established across the proposed ROW areas of the 13 sites using water-based marking paint. These marks were used as X-Y coordinates for location control when collecting the geophysical data and establishing base maps for the geophysical results.

The geophysical investigations consisted of electromagnetic (EM) induction-metal detection surveys and ground penetrating radar (GPR) surveys. The EM surveys were performed using a Geonics EM61-MK1 metal detection instrument. According to the manufacture's specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. The EM61 data were digitally collected at each site along parallel northerly-southerly or easterly-westerly trending survey lines spaced five feet apart. The data were downloaded to a computer and reviewed in the office using the Geonics DAT61W and Surfer for Windows Version 7.0 software programs.

Contour plots of the EM61 bottom coil results and the EM61 differential results for each site are included in this report. The bottom coil results represent the most sensitive component of the EM61 instrument and detect metal objects regardless of size. The bottom coil response can be used to delineate metal conduits or utility lines, small, isolated metal objects, and areas containing insignificant metal debris.

The differential results are obtained from the difference between the top and bottom coils of the EM61 instrument. The differential results focus on the larger metal objects such as drums and UST's and ignore the smaller insignificant metal objects.

GPR surveys were conducted across selected EM61 differential anomalies and steel-reinforced concrete using a GSSI SIR-2000 unit equipped with a 400 MHz antenna. Surveys were also performed across several areas where parked vehicles that obstructed the EM61 survey had since been removed. GPR data were digitally collected in a continuous mode along X and/or Y survey lines, spaced two to five feet apart using a vertical scan of 512 samples, at a rate of 24 scans per second. A 110 MHz high pass filter and an 800 MHz low pass filter were used during data

acquisition with the 400 MHz antenna. GPR data were collected down to a maximum depth of approximately seven feet, based on an estimated two-way travel time of 7 nanoseconds per foot.

The GPR data were downloaded to a field computer and later reviewed in the office using Radprint software. The locations of GPR survey areas or individual GPR survey lines are shown as dashed, purple rectangles or solid purple lines, respectively on the EM61 differential contour plots. Photos of the EM61 and GPR instruments are shown in **Figure 2**. The approximate perimeters of probable or possible UST's , based on the geophysical results, were marked and labeled in the field using orange, water-based marking paint and pin flags when possible. The approximate locations of probable or possible UST's are shown on the EM61 contour plots as magenta-shaded rectangles.

During the weeks of November 14 and November 23, 2005, preliminary contour plots of the EM61 bottom coil and the differential results were emailed to Ms. Knox and Mr. Hirth.

3.0 DISCUSSION OF RESULTS

3.1 Parcel 4 - W. J. Barnhart Property

Parcel 4 is located on the southern side of Fayetteville Road and contains an active used car lot and auto repair garage. The western portion of the ROW area consists of asphalt with a concrete pad and the eastern portion of the ROW area consists of a sandy surface.

The bottom coil results and the differential results are presented in **Figure 3**. The linear anomaly intersecting grid coordinates X=50 Y=26, is probably in response to a buried utility line or conduit. The high amplitude anomaly centered near the former pump island area is probably in response to the steel-reinforced concrete pad. GPR surveys conducted across the steel-reinforced concrete pad did not detect any large metal objects. The geophysical results suggest that the ROW area at Parcel 4 does not contain metallic UST's.

3.2 Parcel 7 - Julia M. Ratliff Property

The Ratliff property is located northwest of the Fayetteville Road and Roberdell Road intersection. The parcel consists of an open, asphalt and grass-covered lot. The EM61 bottom coil results and the differential results are presented in **Figure 4**. The linear bottom coil, EM61 anomalies, such as the ones intersecting grid coordinates X=100 Y=60, X=110 Y=74, and X=130 Y=104, are probably in response to utility lines or conduits. GPR surveys conducted across a portion of the EM anomaly centered near grid coordinates X=65 Y=35, suggest the presence of at least one UST centered near X=71 Y=35, and buried approximately 3.2 feet below surface. Based on the GPR results, the probable UST appears to be approximately 10 feet long and 4 feet wide.

A large water puddle was present across the western portion of the EM anomaly when the GPR surveys were conducted that prevented GPR data to be collected across the entire anomaly. However, based on the location of the probable UST, the size of the EM61 anomaly suggests that a second UST may be centered near grid coordinates X=64 Y=32. Concrete was encountered approximately three inches below surface across this area, which prevented probing with a steel rod to determine whether a second UST exists. A photo showing the approximate location of the probable and possible UST's along with a GPR image obtained along survey line Y=35 are presented in **Figure 5**.

The geophysical results suggest that the remaining portion of the proposed ROW area at Parcel 7 does not contain metallic UST's.

3.3 Parcels 15 & 21 – Samuel D. Tanner Properties

Parcels 15 and 21 are located immediately southwest and southeast, respectively of the Fayetteville Road and Skyline Drive intersection. Parcel 15 consists primarily of grass and gravel surfaces, whereas the front portion of Parcel 21 consists of an asphalt-covered parking area. The EM61 bottom coil results and the differential results are presented in **Figures 6 and 7**, respectively.

GPR surveys across the EM61 anomaly centered near grid coordinates X=188 Y=135, (on Parcel 15) suggest the presence of a UST centered near X=188 Y=137, and buried approximately 1.4 feet below

surface. The surveys also suggest that the probable tank is approximately 10 feet long and 3.5 feet wide.

At Parcel 21, GPR surveys acquired across the EM anomaly centered near grid coordinates X=269 Y=173, suggest the presence of a UST buried approximately 1.7 feet below surface. The UST appears to be approximately 10 feet long and 5 feet wide. Photos showing the approximate locations of the probable UST's at Parcels 15 and 21, along with corresponding GPR images are presented in Figures **8 and 9**, respectively.

3.4 Harvey E. Melton Property (Parcel 17)

The Melton property is an active BP gas station and store located northeast of the Fayetteville Road and Roberdell Road intersection. The pump island area consists of a steel-reinforced concrete surface that overlies the known and active UST's, whereas the parking area adjacent to the store consists of asphalt pavement. A grass yard surrounds the back portion of the site.

The EM61 bottom coil results and the differential results are presented in Figures **10 and 11**, respectively. The linear bottom coil, EM anomalies are probably in response to utility lines or conduits. The majority of non-linear anomalies are probably in response to cultural features such as storm drains, signs, utility-related objects, buildings, metal fence, and steel-reinforced concrete.

GPR surveys were conducted across the concrete pavement and across the area containing the active UST's. The surveys delineated the footprint of the three and possibly four active UST's that are centered near grid coordinates X=54 Y=53, X=50 Y=43, and X=50 Y=34, respectively. The UST centered near grid coordinates X=54 Y=53, appears to be approximately 35 feet long and probably consists of two UST's instead of one. A GPR image obtained across the UST area is presented in **Figure 12** and suggests that the tanks lie approximately 3.5 to 3.9 feet below surface.

GPR data acquired across the EM61 anomaly centered near X=155 Y=144, delineated the footprint of the kerosene tank that is buried approximately 1.7 feet below surface. The kerosene tank appears to be approximately 9 to 10 feet long and 3.5 to 4 feet wide. A photo showing the location of the

tank is presented in Figure 12. The geophysical results suggest that the remainder of the surveyed area at Parcel 17 does not contain UST's.

3.5 W. J. Barnhart Property (Parcel 41A)

Parcel 41A is a former gas station site located on the north side of Fayetteville Road approximately 300 feet west of Lawson Street. The geophysical survey area consists of asphalt and grass-covered surfaces with a concrete pad located around a former pump island. The EM61 bottom coil results and the differential results are presented in **Figure 13**. The linear bottom coil, EM anomalies, such as the ones intersecting grid coordinates X=40 Y=50, X=45 Y=95, and X=70 Y=40, are probably in response to utility lines or conduits.

GPR surveys conducted across a portion of the linear anomaly centered at X=37 Y=22, suggest the probable presence of a wide-diameter (more than 2.5 feet wide) conduit or possibly a UST that is approximately 15 to 17 feet long and buried approximately 4.5 feet below surface. This probable wide-diameter conduit (centered near X=38 Y=25) is located parallel and contingent with the probable utility line identified by the EM61 survey, suggesting that the probable conduit is a utility-related object. However, the footprint of this probable utility-related conduit or possible UST was marked in the field with spray paint and pin flags.

GPR surveys conducted across the concrete pad adjacent to the pump island suggest that the EM61 anomalies recorded in this area are probable in response to steel-reinforcement in the concrete. With the exception of the probable utility-related feature found at X=38 Y=25, the geophysical findings obtained within the survey area at Parcel 41A suggest that the ROW area does not contain metallic UST's.

3.6 Wesly Denham Property (Parcel 42)

The Havoline Carolina Kwik Lube garage operates at Parcel 42, which is located on the south side of Fayetteville Road. Asphalt and grass surfaces cover much of the proposed ROW area with a small concrete pad located in front of the building. The EM61 bottom coil results and the differential

results are presented in **Figure 14**. The linear bottom coil, EM anomalies, such as the ones intersecting grid coordinates X=60 Y=58, and X=80 Y=85, are probably in response to utility lines or conduits. The high amplitude anomaly centered near grid coordinates X=40 Y=40, is in response to a vehicle that could not be moved for the geophysical investigations. The anomalies centered near X=40 Y=12, and X=120 Y=55, are in response to a nearby vehicle and steel-reinforced concrete, respectively.

The geophysical results obtained within the surveyed portion of Parcel 42 suggest that the proposed ROW area does not contain metallic UST's.

3.7 William Ussery Property (Parcel 57)

Parcel 57 is located on the north side of Fayetteville Road approximately 0.2 miles east of Old Aberdeen Road. The EM61 bottom coil results and the differential results are presented in **Figure 15.** A series of small, bottom coil anomalies were recorded along survey line Y=25 from grid coordinate X=5 to X=115, which may be in response to an east-west trending, buried utility line or conduit. Several other bottom coil anomalies were recorded across the survey area that are probably in response to miscellaneous metal debris.

All of the differential anomalies are probably in response to known cultural features or buried debris, suggesting that the proposed ROW area at Parcel 57 does not contain metallic UST's.

3.8 Walter McCain Property (Parcel 80)

Parcel 80 is located immediately northwest of the Fayetteville Road and Philadelphia Road intersection and consists of two vacant buildings surrounded by sandy or grass surfaces. A former pump island pad is located south of the eastern-most building. The EM61 bottom coil results and the differential results are presented in **Figure 16.**

GPR surveys conducted across the EM61 anomalies centered near grid coordinates X=170 Y=35, and X=194 Y=32, suggest the presence of two metallic UST's. The probable UST centered near X=170

Y=35, appears to be approximately 13 feet long, 3.5 feet wide, and buried approximately 1.1 feet below surface. The probable UST centered near grid coordinates X=192 Y=32 appears to be10 feet long, 3.5 feet wide, and buried approximately 1.9 feet below surface. The two probable UST's are separated by the former pump island pad. Photos of the UST locations along with an image of GPR survey line X=167.5 are presented in **Figure 17**.

Based upon the geophysical results, the remaining portion of the proposed ROW area does not appear to contain metallic UST's.

3.9 Leon Wall Property (Parcel 99)

Parcel 99 is located immediately southwest of the Fayetteville Road and Patterson Road intersection and consists mostly of a grass yard surrounding a vacant building. The EM61 bottom coil results and the differential results are presented in **Figure 18** in which a bottom coil, linear anomaly is recorded along survey line Y=230. This linear anomaly is probably in response to a utility line. GPR surveys conducted across the differential EM61 anomaly centered near X=92 Y=165, is probably in response to a water line adjoining the vacant building. GPR surveys were also conducted between the building and the former pump island pad that is centered near coordinates X=84 Y=222. The surveys suggest that the EM anomalies recorded in this portion of the survey area are probably in response to miscellaneous metal debris.

Based upon the geophysical results, the proposed ROW area at Parcel 99 does not appear to contain metallic UST's.

3.10 James Porter Property (Parcel 117)

Parcel 117 is a former gas station site located on the south side of Fayetteville Road approximately 0.25 miles west of Locklear Drive. The site consists primarily of grass and asphalt surfaces with a former pump island pad located in front of the vacant building. The EM61 bottom coil results and the differential results are presented in **Figure 19**. The linear, bottom coil anomaly intersecting grid coordinates X=130 Y=54, is probably in response to a buried utility line or conduit. The linear

anomaly intersecting X=40 Y=74, is probably in response to a metal fence. The remaining EM61 anomalies are probably in response to known cultural features and miscellaneous metal debris.

The geophysical investigation across the survey area of Parcel 117 suggests that the proposed ROW area does not appear to contain metallic UST's.

3.11 John Evans Property (Parcel 126)

The active Custom Monument Company operates on Parcel 126, which is located immediately northeast of the Fayetteville Road and LockLear Drive intersection. The geophysical survey area consists of grass and asphalt surfaces and the EM61 bottom coil results and the differential results are presented in **Figure 20**. All of the EM61 anomalies recorded across the surveyed portion of the site are probably in response to known cultural features, suggesting that the proposed ROW area does not contain metallic UST's.

3.12 Henry Ussery Property (Parcel 140)

Parcel 140 is a former gas station site, which is presently occupied by Bo Henry's Pawn Shop. The property is located immediately southeast of the Fayetteville Road and Port Street intersection. Much of the proposed ROW area consists of sandy or grass-covered surfaces. A concrete pad surrounds the north and west sides of the building. The EM61 bottom coil results and the differential results are presented in **Figure 21**. The linear bottom coil anomaly intersecting grid coordinates X=80 Y=80, is probably in response to a buried utility line.

GPR surveys conducted across the differential anomalies centered near coordinates X=90 Y=60, and X=107 Y=59, suggest the presence of two UST's buried approximately 1.7 feet and 1.8 feet below surface, respectively. Both probable UST's appear to be approximately 10 to 11 feet long and 4 to 4.5 feet wide. Probing with a steel rod across this area suggest the presence of a concrete slab buried approximately 0.3 feet below surface and overlying the UST's. A photo showing the locations of the probable UST along with GPR images are presented in **Figure 22**.

4.0 SUMMARY & CONCLUSIONS

Our evaluation of the EM61 and GPR data collected across the proposed ROW areas at the 13 sites along Fayetteville Road (US 1) in Rockingham, North Carolina provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic UST's within the surveyed portions of the proposed ROW areas of each site.

- GPR surveys were conducted across selected EM61 differential anomalies and across areas containing steel reinforced concrete.

- Linear EM61 anomalies at the 13 sites are probably in response to buried utility lines and/or conduits. The majority of non-linear anomalies are probably in response to known cultural features or miscellaneous metal objects.

- The geophysical results did not detect the presence of unknown metallic UST's within the surveyed portions of the proposed ROW areas at the following sites:

W. J. Barnhart Property	(Parcel 4)
W. J. Barnhart Property	(Parcel 41A)
Wesly Denham Property	(Parcel 42)
William Ussery Property	(Parcel 57)
Leon Wall Property	(Parcel 99)
James Porter Property	(Parcel 117)
John Evans Property	(Parcel 126)

- Julia M. Ratliff Property (Parcel 7): Geophysical results suggest the presence of a UST centered near X=71 Y=35, and buried approximately 3.2 feet below surface. Based on the GPR results, the probable UST appears to be approximately 10 feet long and 4 feet wide. A second UST may be present immediately west of this UST.

- Samuel D. Tanner Property (Parcel 15): Geophysical results suggest the presence of a UST centered near X=188 Y=137, and buried approximately 1.4 feet below surface. GPR surveys suggest that the probable tank is approximately 10 feet long and 3.5 feet wide.

- Harvey E. Melton Property (Parcel 17): Three and probably four active UST's are centered near grid coordinates X=54 Y=53, X=50 Y=43, and X=50 Y=34, respectively. The UST centered near grid coordinates X=54 Y=53, appears to be approximately 35 feet long and probably consists of two UST's instead of one. The known kerosene UST is centered near X=155 Y=144, and is buried approximately 1.7 feet below surface. The kerosene tank appears to be approximately 9 to 10 feet long and 3.5 to 4 feet wide.

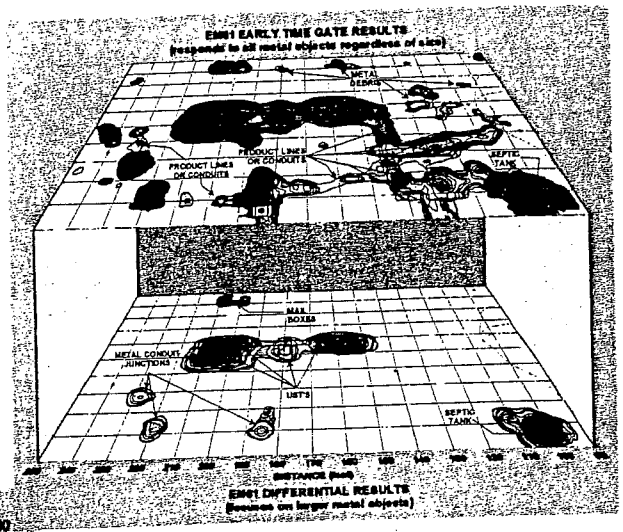
- Samuel D. Tanner Property (Parcel 21): Geophysical results suggest the presence of a UST centered near grid coordinates X=269 Y=173, and buried approximately 1.7 feet below surface. The UST appears to be approximately 10 feet long and 5 feet wide.

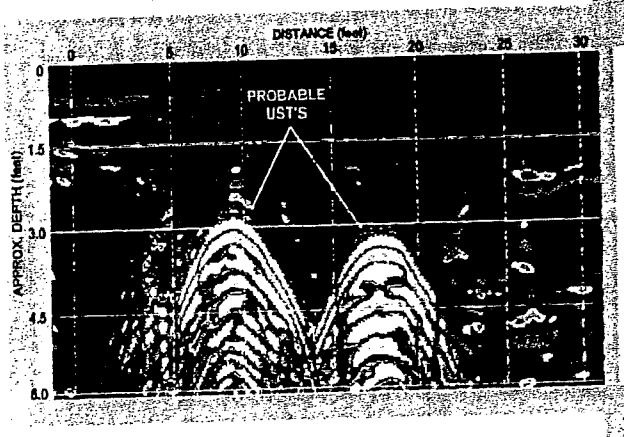
- Walter McCain Property (Parcel 80): Geophysical results suggest the presence of two UST's centered near grid coordinates X=170 Y=35, and X=194 Y=32. The probable UST centered near X=170 Y=35, appears to be approximately 13 feet long, 3.5 feet wide, and buried approximately 1.1 feet below surface. The probable UST centered near grid coordinates X=192 Y=32, appears to be 10 feet long, 3.5 feet wide, and buried approximately 1.9 feet below surface. The two probable UST's are separated by a former pump island pad.

- Henry Ussery Property (Parcel 140): Geophysical results suggest the presence of two UST's centered near coordinates X=90 Y=60, and X=107 Y=59, and buried approximately 1.7 feet and 1.8 feet below surface, respectively. Both probable UST's appear to be approximately 10 to 11 feet long and 4 to 4.5 feet wide.

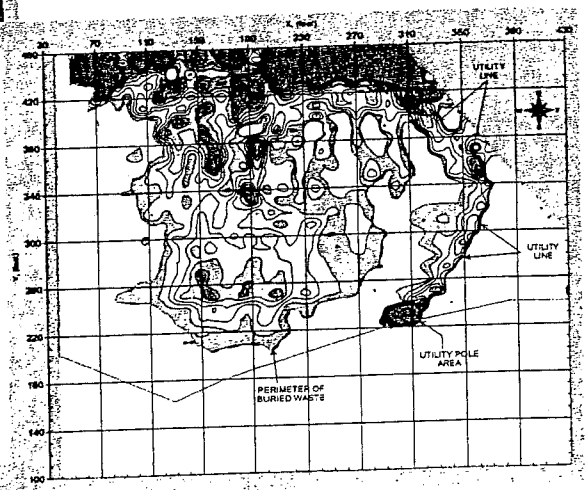
5.0 LIMITATIONS

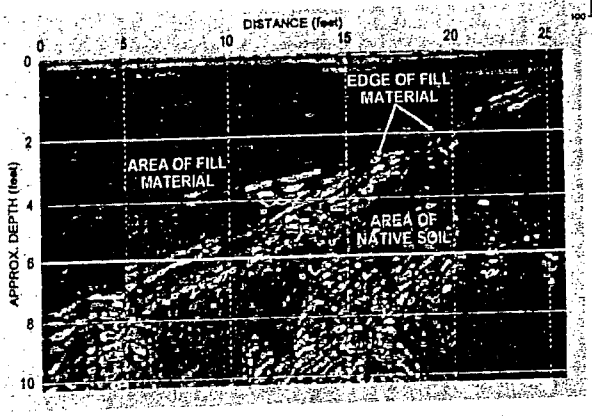
EM61 and GPR surveys have been performed and this report prepared for Solutions Industrial & Environmental Services, Inc. in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project do not conclusively define the locations of all metallic UST's but only suggest where some of the metallic UST's may be present. The EM61 and GPR anomalies, interpreted as possible UST's or tanks, may be attributed to other surface or subsurface conditions or cultural interference.


EM61 EARLY TIME GATE RESULTS
(responds to all metal objects regardless of size)
METAL DEBRIS
PRODUCT LINES OR CONDUITS
SEPTIC TANK
MAN BOXES
METAL CONDUIT JUNCTIONS
UST'S
SEPTIC TANK
EM61 DIFFERENTIAL RESULTS
(focuses on larger metal objects)

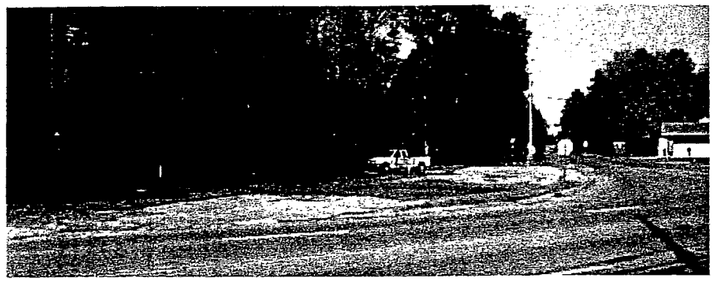

DISTANCE (feet)
0
5
10
15
20
25
30
PROBABLE UST'S
APPROX. DEPTH (feet)
0
1.5
3.0
4.5
6.0

FIGURES


UTILITY LINE
UTILITY LINE
UTILITY POLE AREA
PERIMETER OF BURIED WASTE

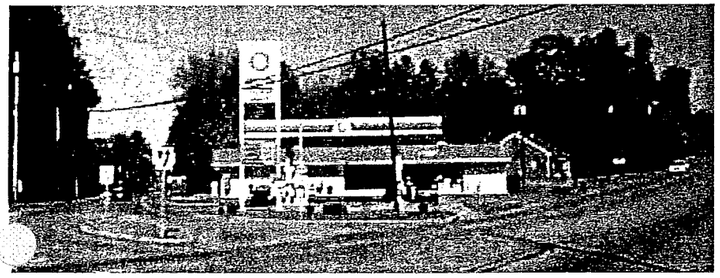

DISTANCE (feet)
0
5
10
15
20
25
EDGE OF FILL MATERIAL
AREA OF FILL MATERIAL
AREA OF NATIVE SOIL
APPROX. DEPTH (feet)
0
2
4
6
8
10

Parcel 4 - W. J. Barnhart Property

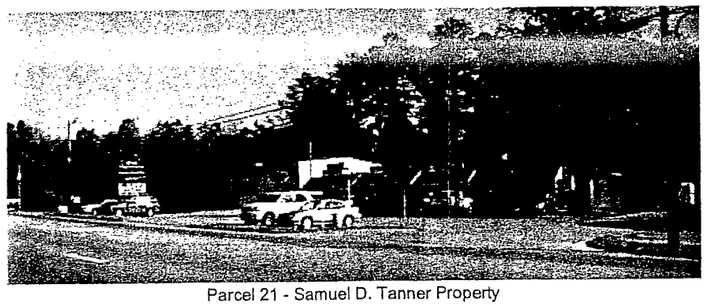


Parcel 7 - Julia M. Ratliff Property

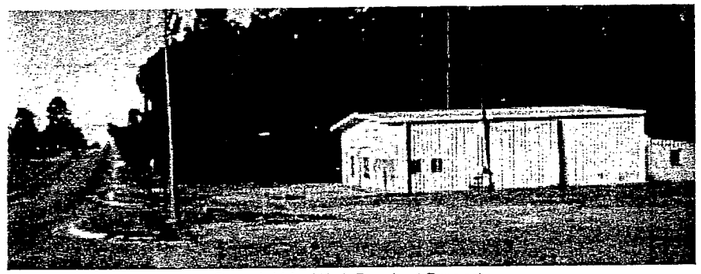
Parcel 15 - Samuel D. Tanner Property



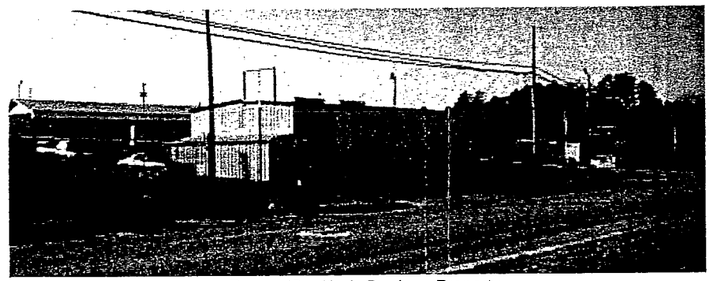
Parcel 17 - Harvey E. Melton Property



Parcel 21 - Samuel D. Tanner Property



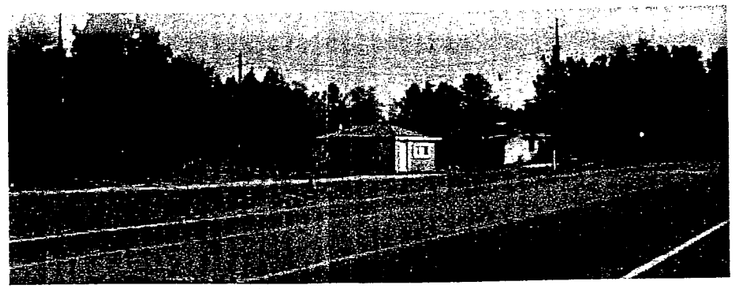
Parcel 41A - W. J. Barnhart Property



Parcel 42 - Wesly Denham Property

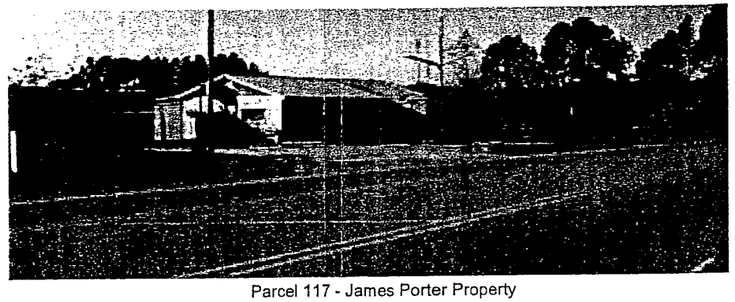
Parcel 57 - William Ussery Property

Parcel 140 - Henry Ussery Property

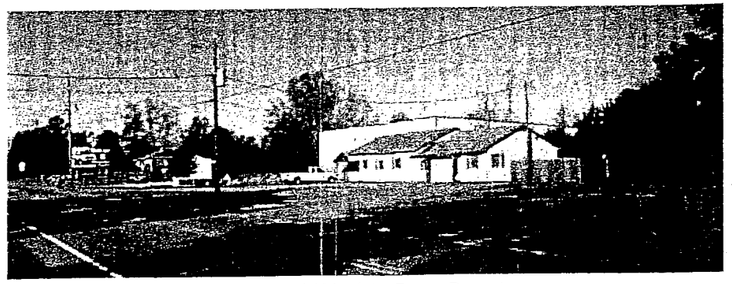


Parcel 80 - Walter McCain Property

Parcel 99 - Leon Wall Property



Parcel 117 - James Porter Property



Parcel 126 - John Evans Property

SITE PHOTOS

FIGURE 1

GRAPHIC SCALE IN METERS

DRAWN	MJD		
CHKD			
DATE	11/28/05	LAY	
DWG			2005-292
JOB NO.			

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

SITE: ROCKINGHAM SITES

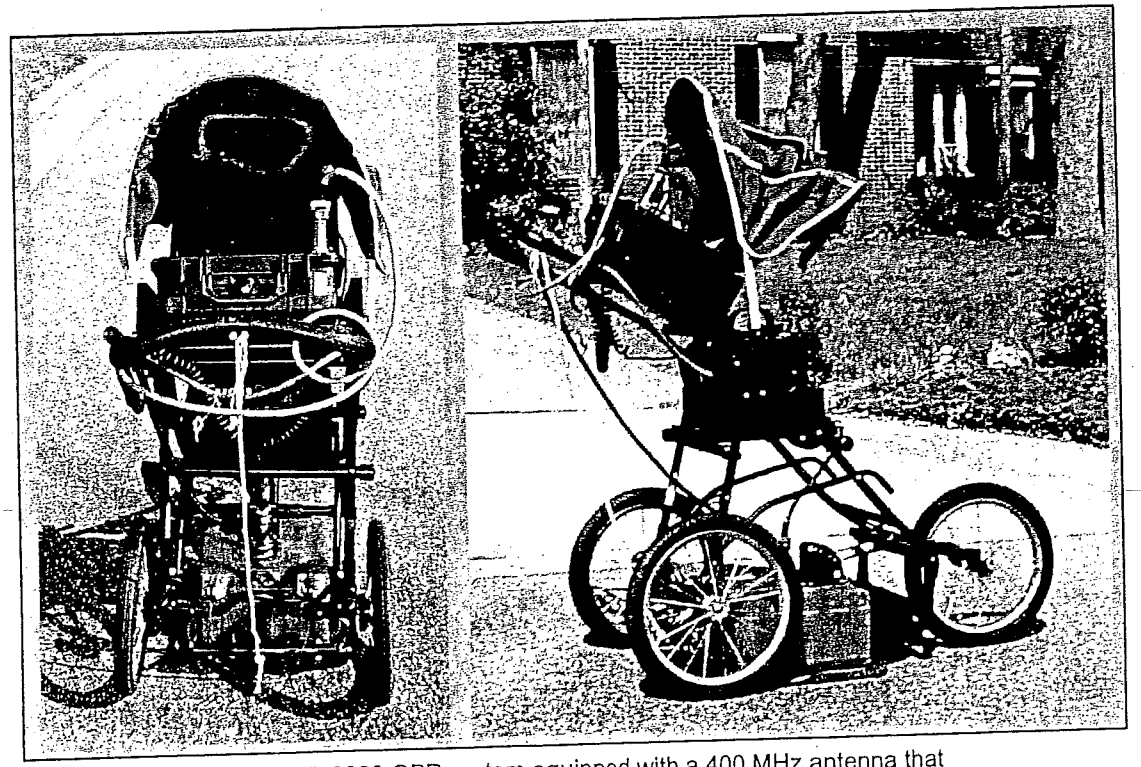
CITY: ROCKINGHAM

STATE: NORTH CAROLINA

TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

The Geonics EM61 metal detector was used to conduct the metal detection surveys at the Rockingham sites in November 2005.



The SIR-2000 GPR system equipped with a 400 MHz antenna that was used at the Rockingham sites in November 2005.

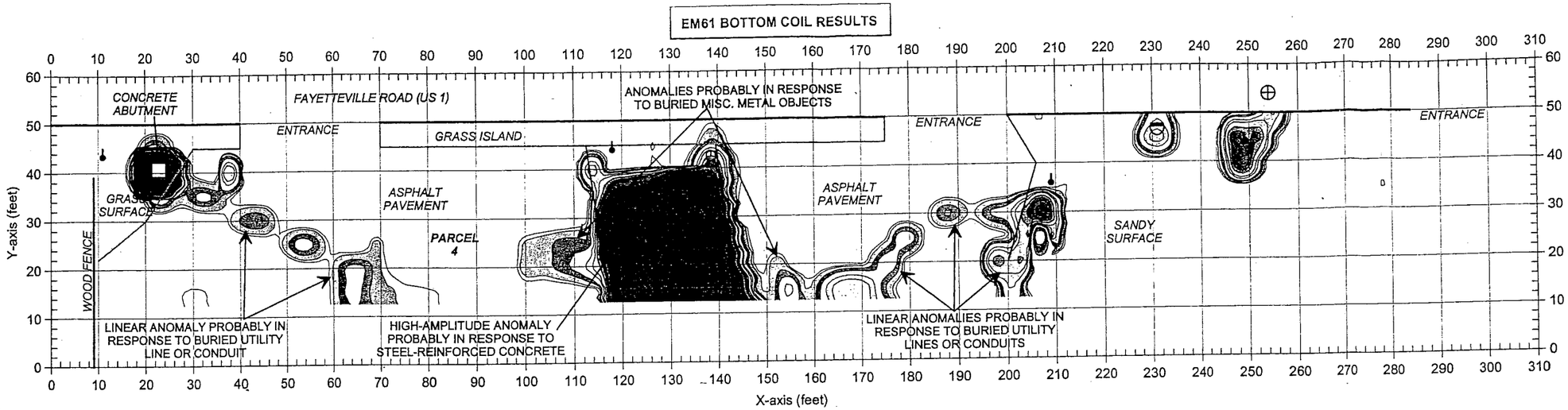
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

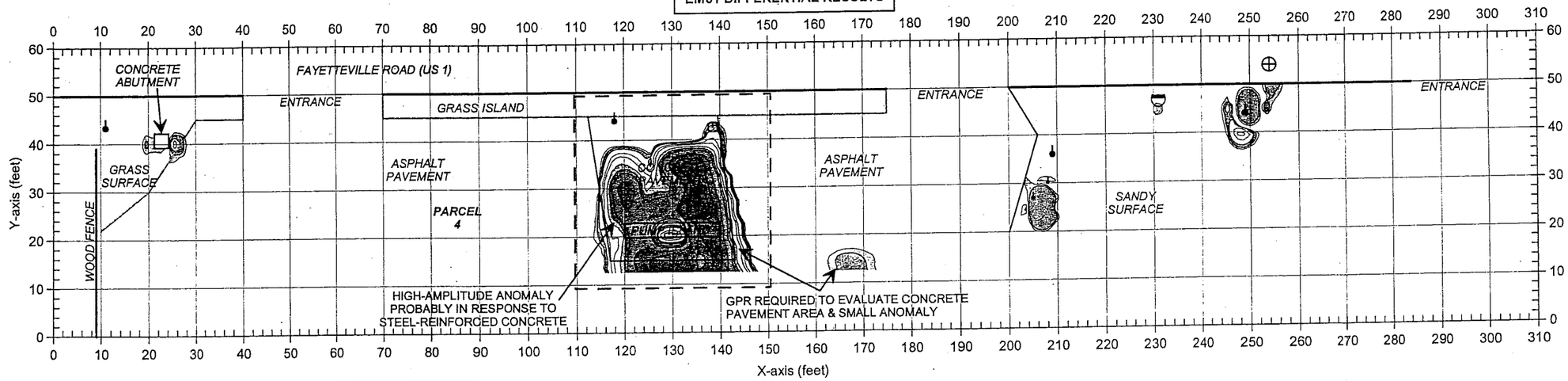
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL		DATE	11/28/05	DRWN
SITE	ROCKINGHAM SITES		LAY		CHKD
CITY	ROCKINGHAM	STATE NORTH CAROLINA	DWG		
TITLE	GEOPHYSICAL RESULTS		JOB #	2005-292	FROM

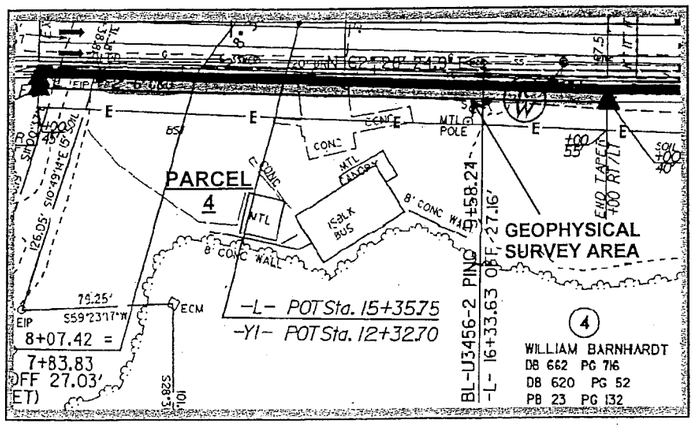
GRAPHIC SCALE IN METERS

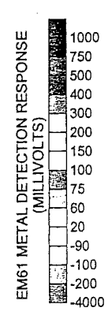
GEOPHYSICAL EQUIPMENT

FIGURE 2









APPROXIMATE NORTH

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- MONITORING WELL
- WATER METER OR VALVE COVER
- GUY WIRE
- UTILITY POLE OR LIGHT POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- MANHOLE COVER
- GPR SURVEY AREA

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

FIGURE 3

EM61
METAL DETECTION
RESULTS

GRAPHIC SCALE IN METERS

DRAWN	MJD
DATE	11/26/05
CHKD	
LAY	
DWG	
FIGURE	
J.NO.	2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

SITE: W. J. BARNHART PROPERTY (PARCEL 4)

CITY: ROCKINGHAM

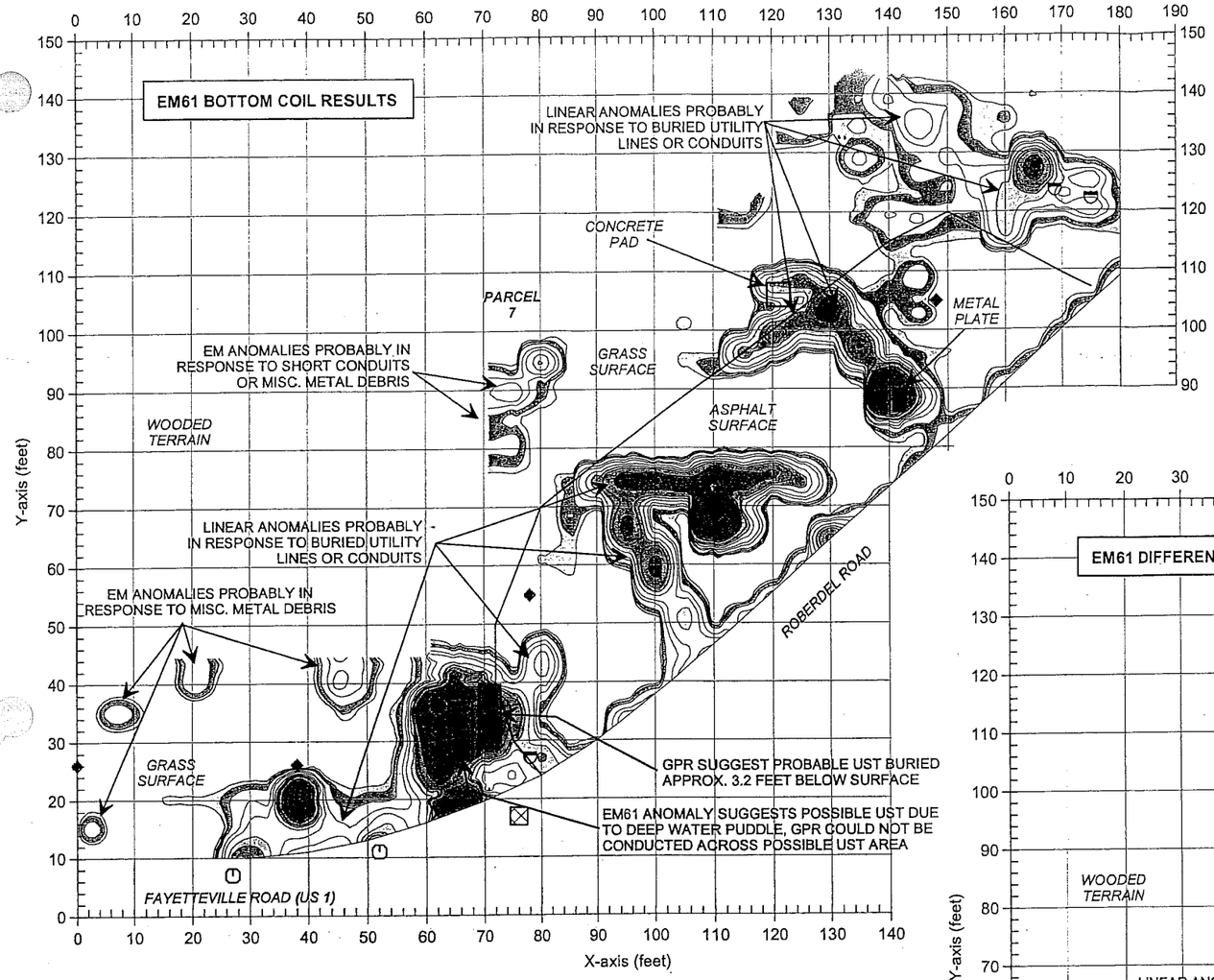
STATE: NORTH CAROLINA

TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 METAL DETECTION RESULTS

FIGURE 4



LEGEND

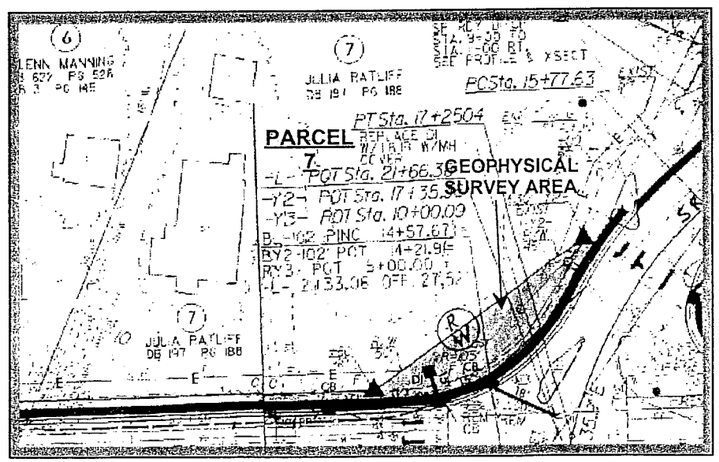
- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH & EAST-WEST TRENDING LINES SPACED 5 FEET APART
- MONITORING WELL
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- MANHOLE COVER
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

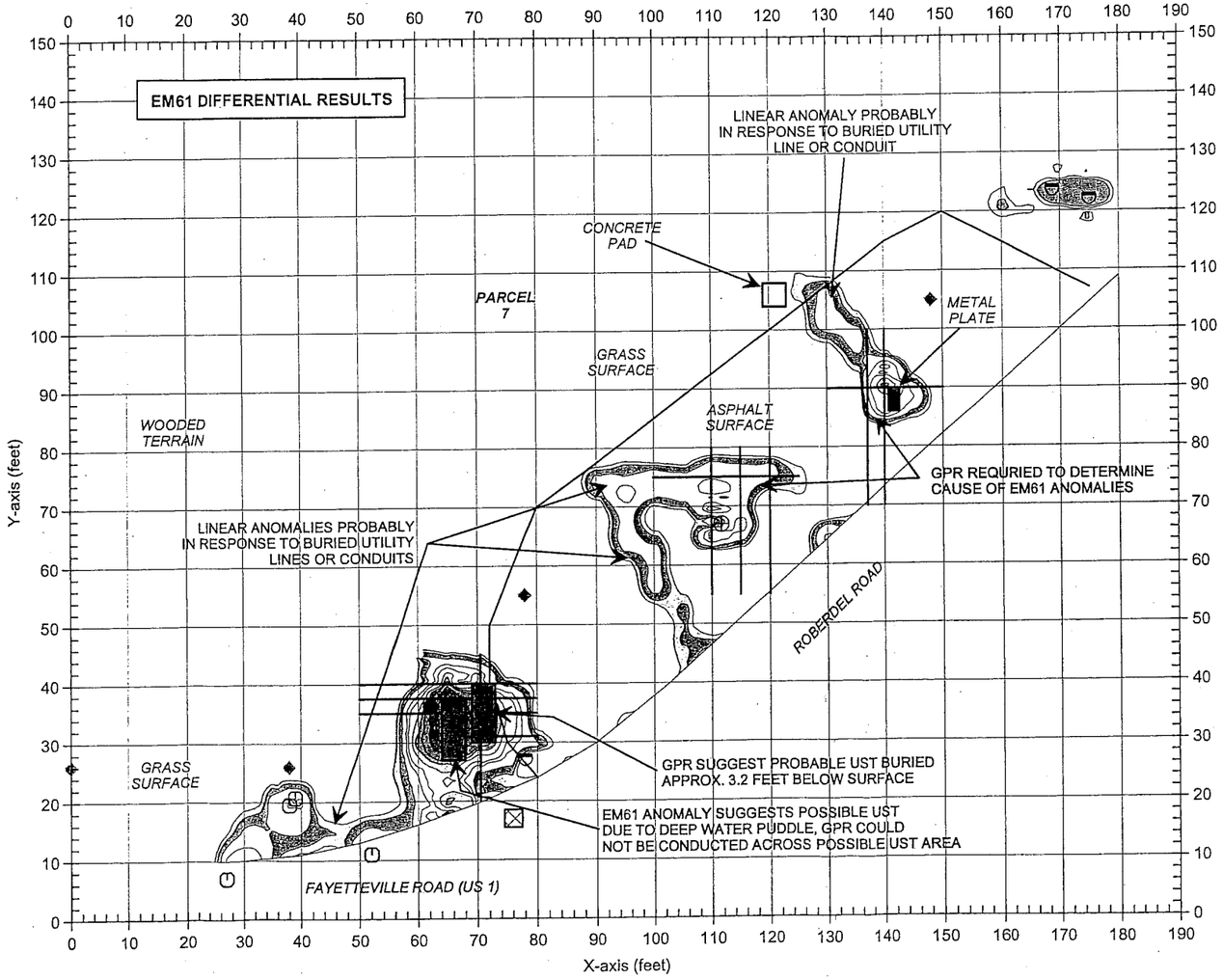
The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -80 -50 -80 -75 -100 -150 -200 -300 -400 -500 -750 -1000



APPROXIMATE NORTH



GRAPHIC SCALE IN METERS

DRWN	MJD	FIGURE	
CHKD			
DATE	11/25/05	J.NO.	2005-292
LAY		DWG	

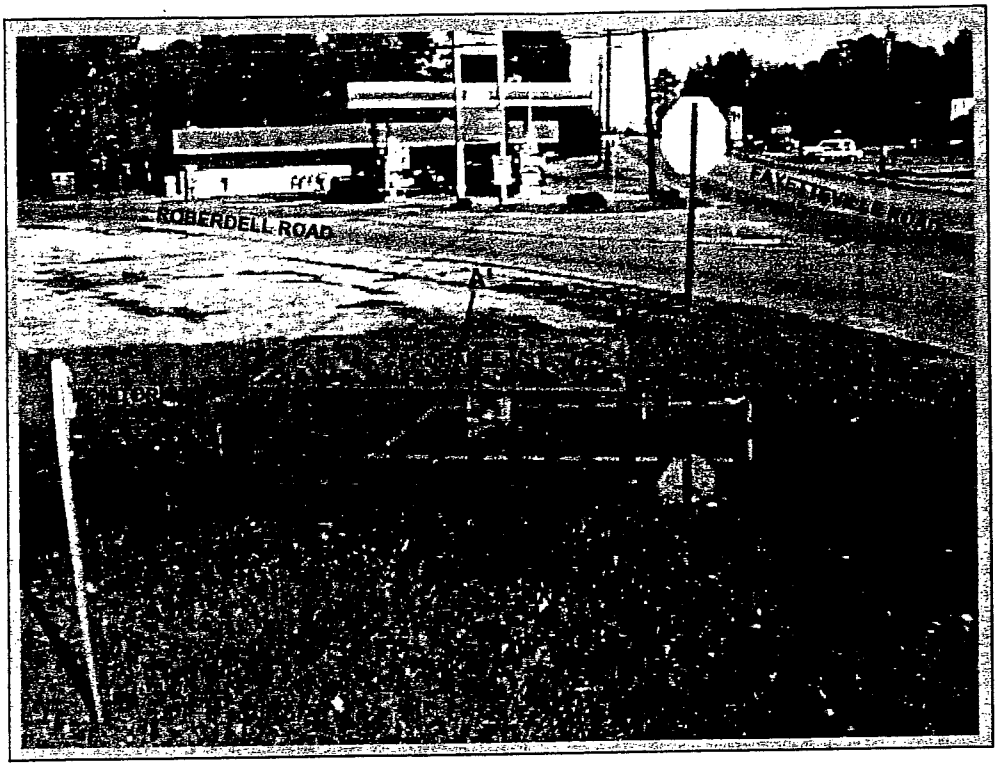
CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

SITE: JULIA M. RATLIFF PROPERTY (PARCEL 7)

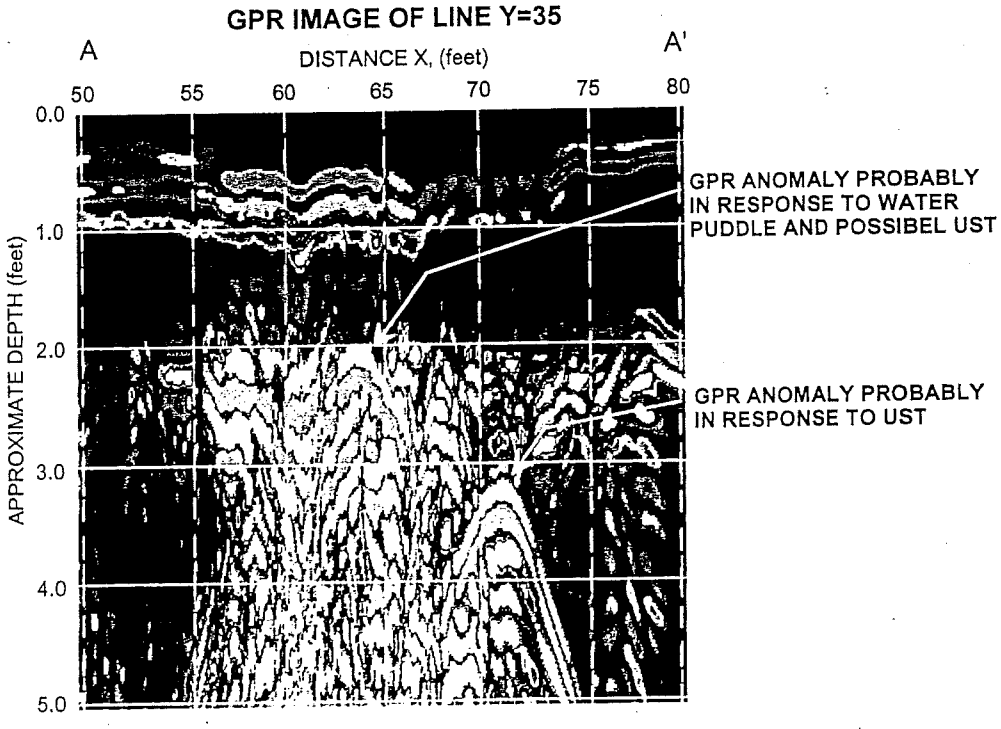
CITY: ROCKINGHAM STATE: NORTH CAROLINA

TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the location of the probable UST and possible UST, as suggested by the geophysical results at Parcel 7.



The GPR image obtained along a portion of survey line Y=35 shows the anomaly that is probably in response to a UST near X=71 and buried approximately 3.2 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL		DATE	11/28/05	DRWN
SITE	JULIA M. RATLIFF PROPERTY (PARCEL 7)		LAY		CHKD
CITY	ROCKINGHAM	STATE NORTH CAROLINA	DWG		
TITLE	GEOPHYSICAL RESULTS		JOB	2005-292	XREF

PHOTO & GPR IMAGE OF UST LOCATION

FIGURE 5

FIGURE 6

EM61 BOTTOM COIL RESULTS

ANOMALY PROBABLY IN RESPONSE TO SEWER LINE

ANOMALY PROBABLY IN RESPONSE TO BUILDING & CONCRETE ENTRANCE

APPROXIMATE LOCATION OF PROBABLE UST BURIED 1.7 FEET BELOW SURFACE

FAYETTEVILLE ROAD (US 1)

LIGHTS

GRASS ISLAND

GRASS ISLAND

LANDSCAPED ISLAND

PLANTER

ANOMALIES PROBABLY IN RESPONSE TO MISC. METAL OBJECTS

GRASS SURFACE

APPROX. LOCATION OF PROBABLE UST BURIED 1.4 FEET BELOW SURFACE

ANOMALIES PROBABLY IN RESPONSE TO MISC. METAL DEBRIS

LINEAR ANOMALIES PROBABLY IN RESPONSE TO UTILITY LINES OR CONDUITS

COLONIAL AVENUE

ANOMALIES PROBABLY IN RESPONSE TO MISC. METAL DEBRIS

GRASS SURFACE

ANOMALY PROBABLY IN RESPONSE TO GAS LINE

ASPHALT PAVEMENT

LANDSCAPED ISLAND

SKYLINE DRIVE

SAMUEL D. TANNER PROPERTY PARCEL 21

WOODED TERRAIN (AREA NOT SURVEYED)

STORE SIGN

LINEAR ANOMALIES PROBABLY IN RESPONSE TO CULVERTS & UTILITY RELATED FEATURES

SAMUEL D. TANNER PROPERTY PARCEL 15

ANOMALY PROBABLY IN RESPONSE TO AIR CONDITION UNIT

GRASS SURFACE

GRASS ISLAND

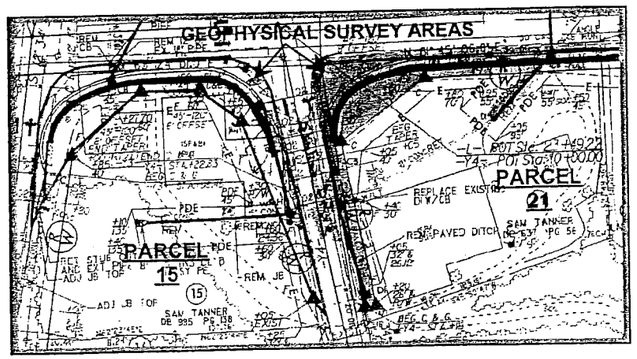
GPR SUGGEST PROBABLE LARGE-DIAMETER CONDUIT BURIED APPROX. 2.5 FEET BELOW SURFACE

APPROXIMATE NORTH

Y-axis (feet)

X-axis (feet)

EM61 BOTTOM COIL RESULTS



EM61 BOTTOM COIL RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-400

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST & NORTH-SOUTH TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CONCRETE R/W MARKER
- GAS METER
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVER
- MANHOLE COVER
- MONITORING WELL
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	SAMUEL D. TANNER PROPERTY (PARCELS 15 & 21)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
DRAWN	MJD
CH'KD	
DATE	11/25/05
LAY	
DWG	
J-NO.	2005-292
FIGURE	

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 DIFFERENTIAL RESULTS

FIGURE 7

ANOMALY PROBABLY IN RESPONSE TO SEWER LINE

ANOMALY PROBABLY IN RESPONSE TO BUILDING & CONCRETE ENTRANCE

FAYETTEVILLE ROAD (US 1)

LIGHTS

GRASS ISLAND

GRASS ISLAND

LANDSCAPED ISLAND

PLANTER

ANOMALIES PROBABLY IN RESPONSE TO MISC. METAL OBJECTS

APPROXIMATE LOCATION OF PROBABLE UST BURIED 1.7 FEET BELOW SURFACE

GRASS SURFACE

APPROXIMATE LOCATION OF PROBABLE UST BURIED 1.4 FEET BELOW SURFACE

COLONIAL AVENUE

GRASS SURFACE

ASPHALT PAVEMENT

ANOMALY PROBABLY IN RESPONSE TO GAS LINE

SKYLINE DRIVE

LANDSCAPED ISLAND

SAMUEL D. TANNER PROPERTY PARCEL 21

WOODED TERRAIN (AREA NOT SURVEYED)

STORE SIGN

ANOMALY PROBABLY IN RESPONSE TO ELECTRICAL BOX

LINEAR ANOMALIES PROBABLY IN RESPONSE TO CULVERTS & UTILITY RELATED FEATURES

GIFT & FLOWER STORE BUILDING

SAMUEL D. TANNER PROPERTY PARCEL 15

ANOMALY PROBABLY IN RESPONSE TO AIR CONDITION UNIT

STORE SIGN

GRASS SURFACE

GRASS ISLAND

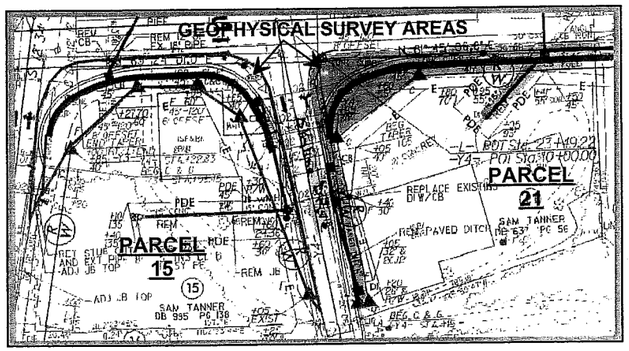
GPR SUGGEST PROBABLE LARGE-DIAMETER CONDUIT BURIED APPROX. 2.5 FEET BELOW SURFACE

EM61 DIFFERENTIAL RESULTS

APPROXIMATE NORTH

Y-axis (feet)

X-axis (feet)



EM61 DIFFERENTIAL RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
50
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST & NORTH-SOUTH TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CONCRETE R/W MARKER
- GAS METER
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVER
- MANHOLE COVER
- MONITORING WELL
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the differential results of the EM61 metal detection survey in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

DRAWN	MJD
CHKD	
DATE	11/25/05
LAY	
DWG	
J.NO.	2005-292
FIGURE	

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

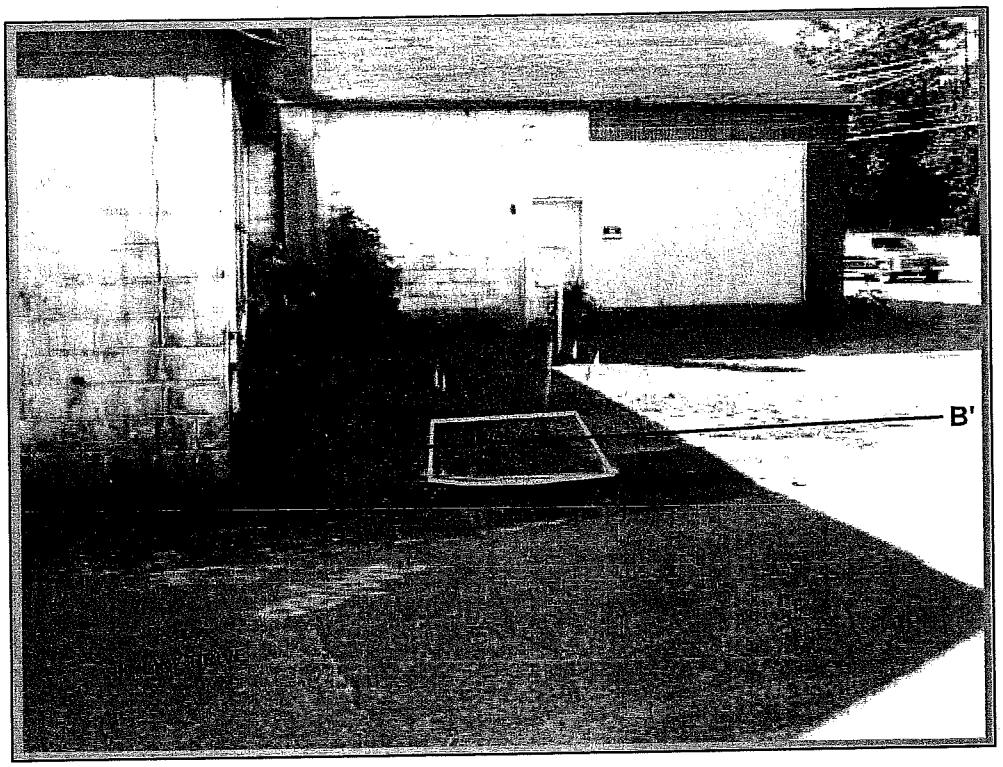
SITE: SAMUEL D. TANNER PROPERTY (PARCELS 15 & 21)

CITY: ROCKINGHAM

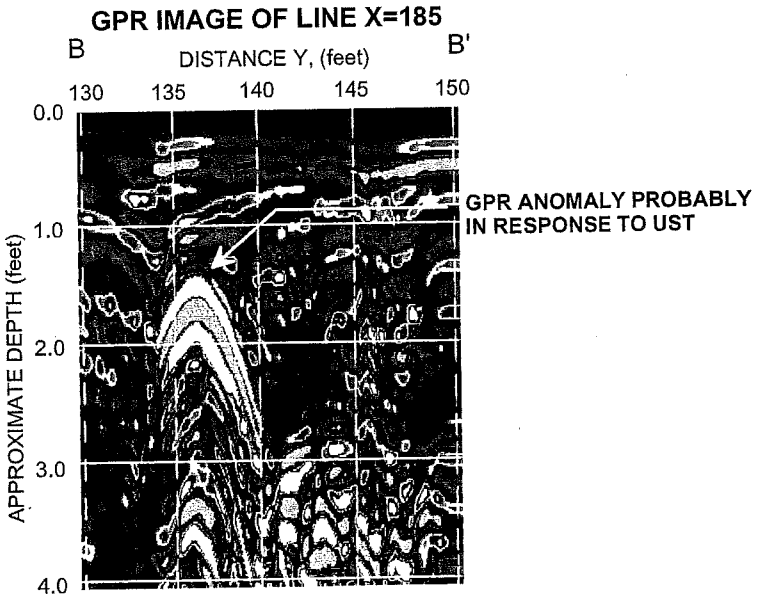
STATE: NORTH CAROLINA

TITLE: EM61 DIFFERENTIAL RESULTS / GEOPHYSICAL RESULTS

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the location of the probable UST,
as suggested by the geophysical results at Parcel 15.



The GPR image obtained along a portion of survey line X=185 shows the anomaly that is probably in response to a UST near Y=137 and buried approximately 1.4 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

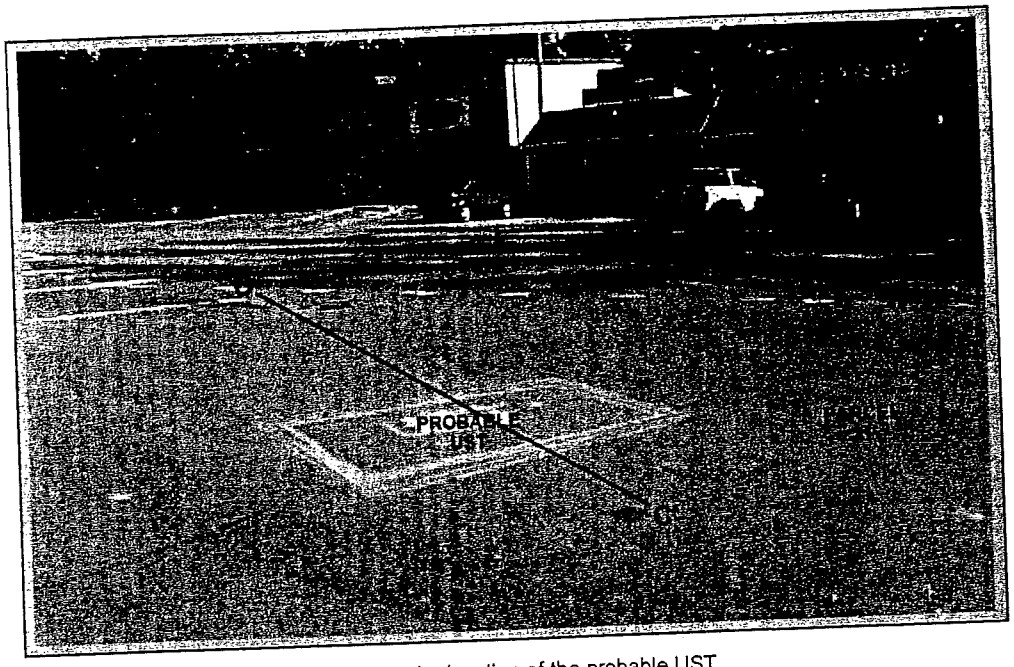
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05	DRWN	
SITE	SAMUEL D. TANNER PROPERTY (PARCEL 15)	LAT		CHKD	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JOB NO.	2005-292	FIGURE	

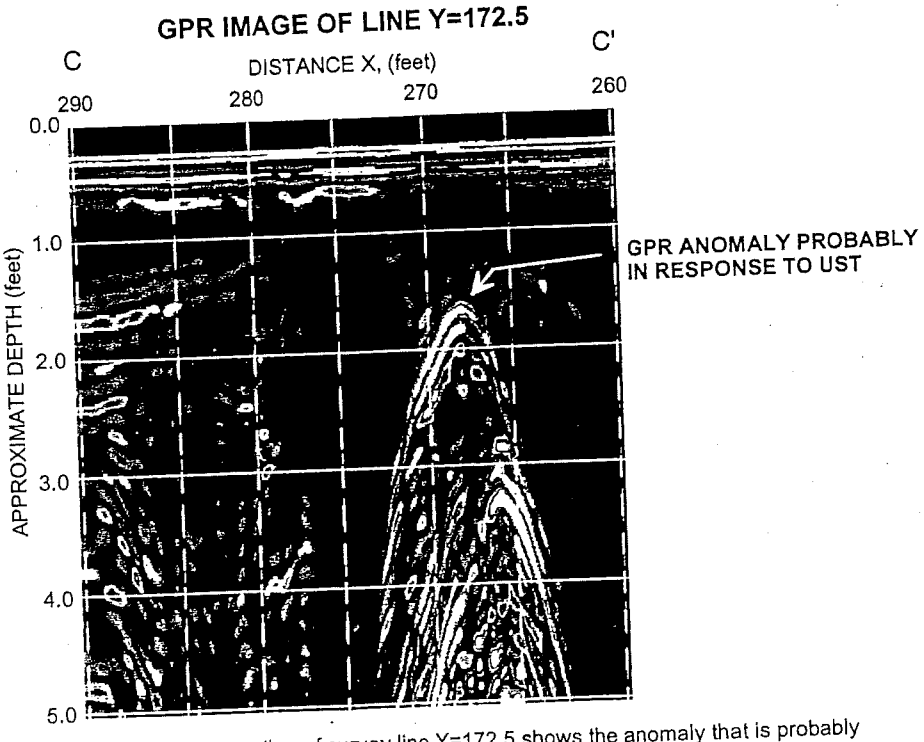
GRAPHIC SCALE IN METERS

PHOTO & GPR IMAGE
OF UST LOCATION

FIGURE 8



The photo shows the location of the probable UST, as suggested by the geophysical results at Parcel 21.



The GPR image obtained along a portion of survey line Y=172.5 shows the anomaly that is probably in response to a UST near X=268 and buried approximately 1.7 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

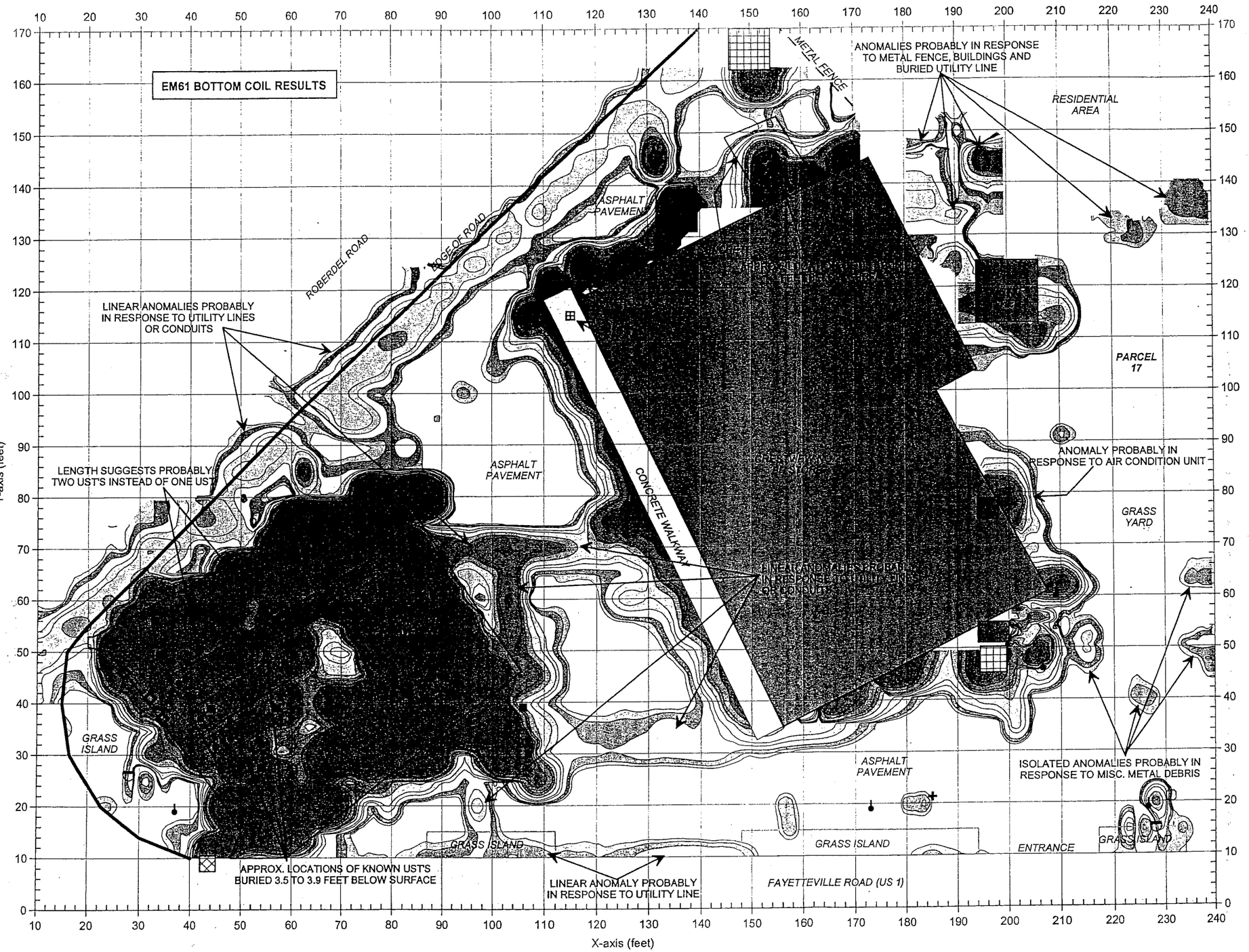
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE 11/28/05	DWN
SITE	SAMUEL D. TANNER PROPERTY (PARCEL 21)	LAY	CHKD
CITY ROCKINGHAM	STATE NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JOB 2005-292	SHEET

GRAPHIC SCALE IN METERS

PHOTO & GPR IMAGE OF UST LOCATION

FIGURE 9

EM61 BOTTOM COIL RESULTS



APPROXIMATE NORTH

EM61 BOTTOM COIL RESPONSE (MILLIVOLTS)
1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- UST COVERS
- WATER METER OR VALVE COVER
- GUY WIRE
- METAL SIGN POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVERS
- GAS METER
- AIR CONDITION UNIT
- DUMPSTER
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

FIGURE 10

EM61
BOTTOM COIL
RESULTS

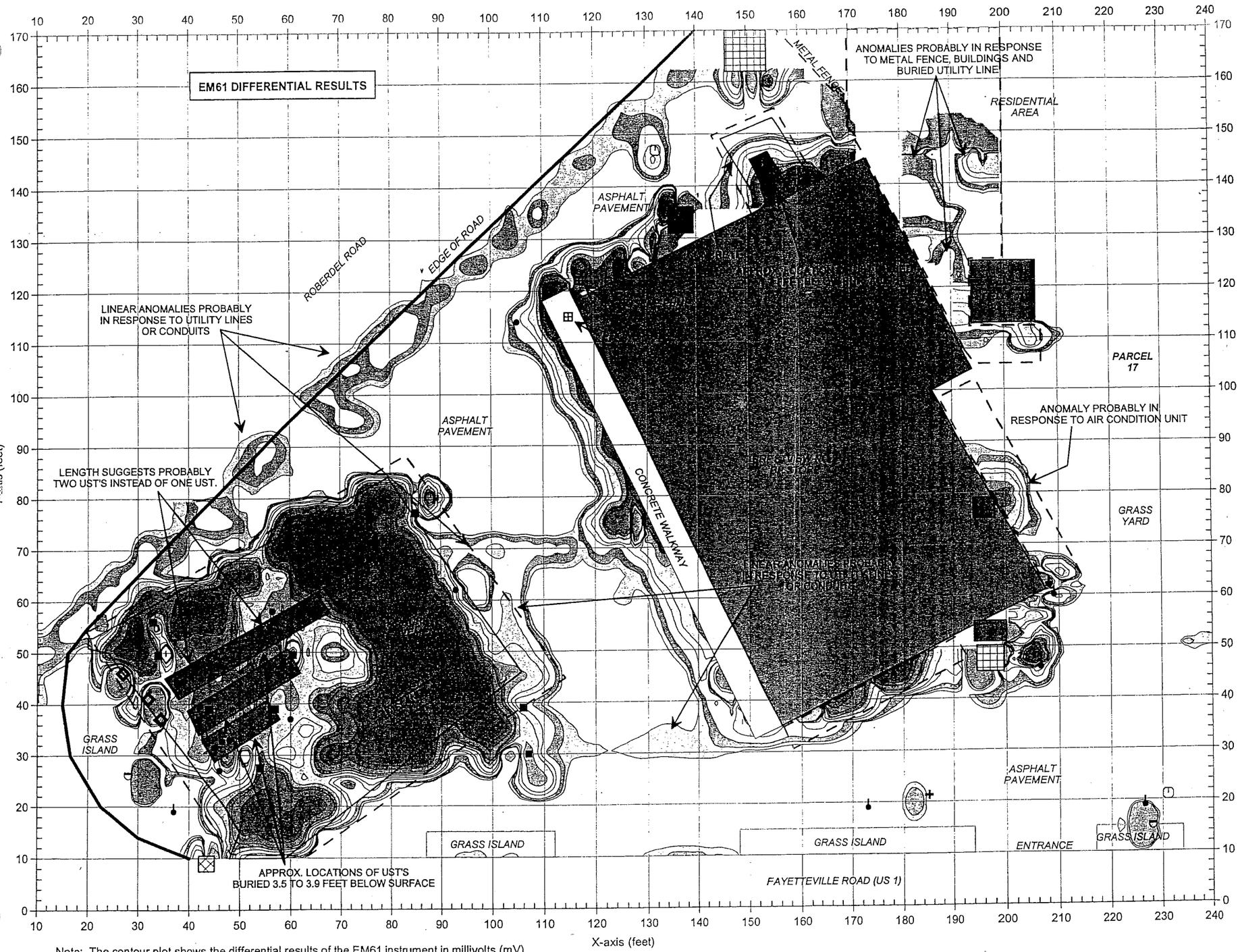
GRAPHIC SCALE IN METERS

DRWN	MJD		
CHKD			FIGURE
DATE	11/25/05		2005-292
LAY		DWG	JOB NO.

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: HARVEY E. MELTON PROPERTY (PARCEL 17)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 DIFFERENTIAL RESULTS



APPROXIMATE NORTH

EM61 DIFFERENTIAL RESPONSE (MILLIVOLTS)
1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- UST COVERS
- WATER METER OR VALVE COVER
- GUY WIRE
- METAL SIGN POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVERS
- GAS METER
- AIR CONDITION UNIT
- DUMPSTER
- GPR SURVEY AREA
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris. The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

FIGURE 11

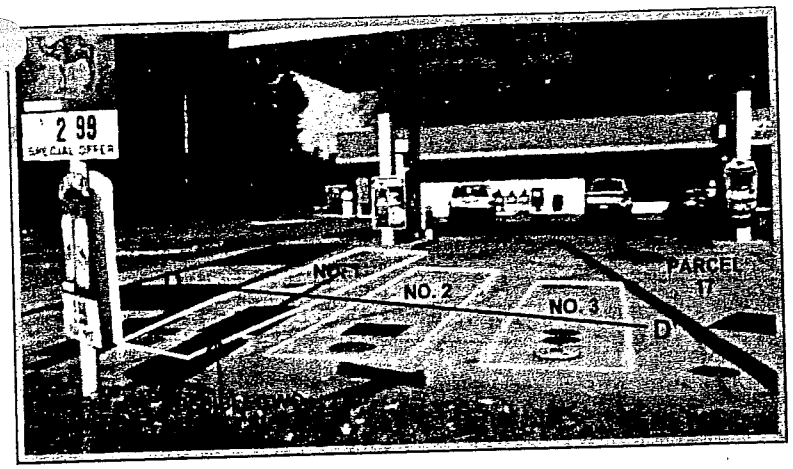
EM61 DIFFERENTIAL RESULTS

DRAWING SCALE IN METERS

DRWN	MJD
CHKD	
DATE	11/25/05
LAY	
DWG	
PROJECT	2005-292
JOB NO.	

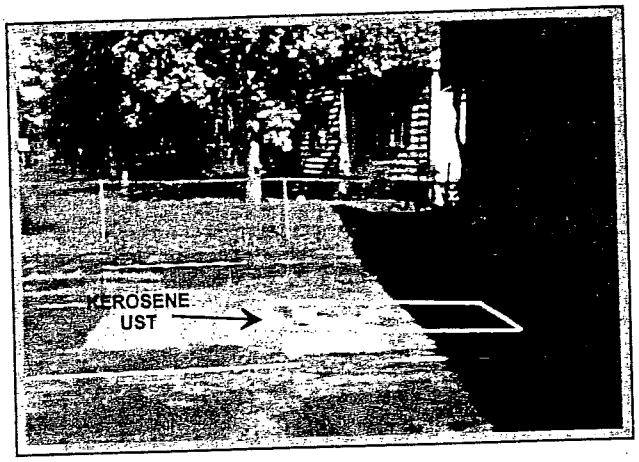
CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: HARVEY E. MELTON PROPERTY (PARCEL 17)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

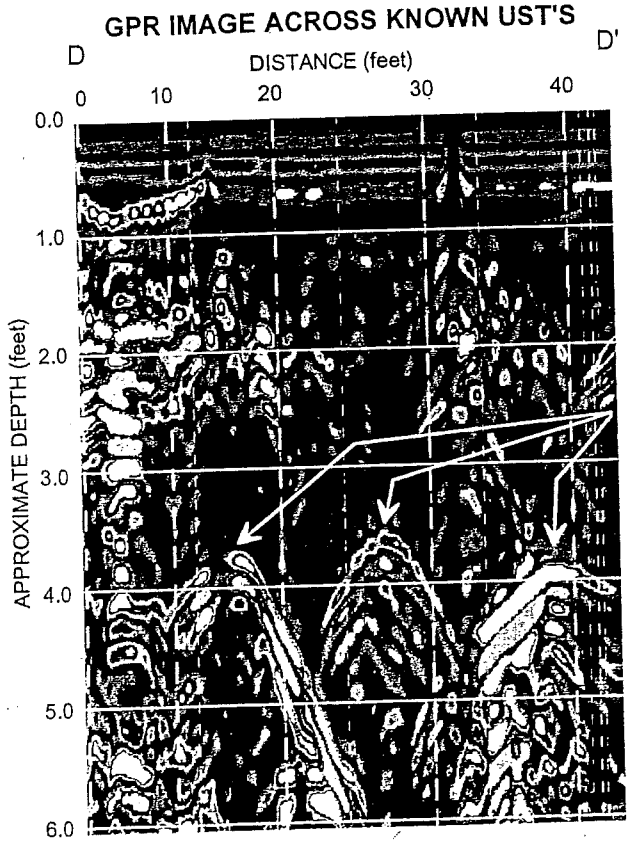
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the approxiamte location of the three or four known and active UST's, as suggested by the geophysical results, at Parcel 17. The UST's appear to be approximately 3.5 to 3.9 feet below surface.

The photo shows the approximate location of the kerosene UST, as suggested by the geophysical results, at Parcel 17. The UST is located along the northwest wall of the store and is buried approximately 2.4 feet below surface.





GPR ANOMALIES PROBABLY IN RESPONSE TO THREE UST'S BURIED 3.5 TO 3.9 FEET BELOW SURFACE

The GPR image is obtained along a traverse line oriented perpendicular to the axis of the UST's. The three GPR anomalies in response to the probable UST's suggest that the UST's are buried approximately 3.5 to 3.9 feet below surface.

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

SUBMIT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE 11/28/05	DRWN
SITE	HARVEY E. MELTON PROPERTY (PARCEL 17)	LAY	CHKD
CITY ROCKINGHAM	STATE NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JOB 2005-292	SCALE

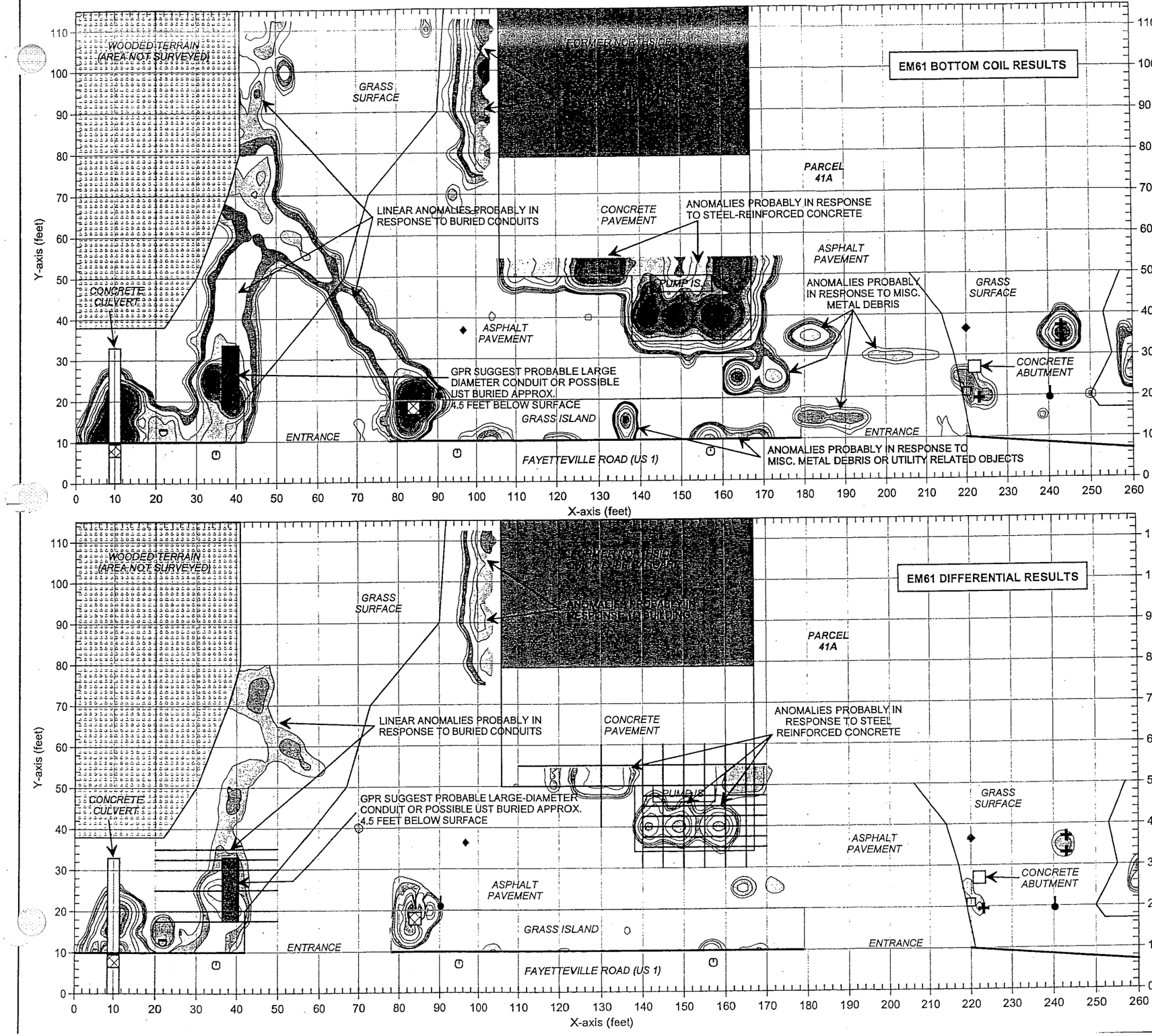
GRAPHIC SCALE IN METERS

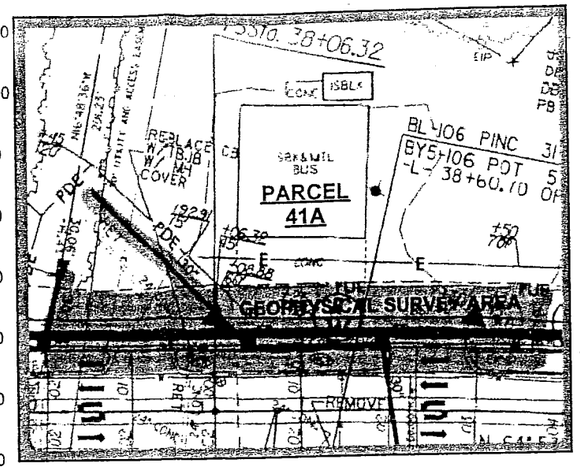
PHOTOS & GPR IMAGE OF UST LOCATIONS

FIGURE 12

EM61 METAL DETECTION RESULTS

FIGURE 13





APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -200 -100 -90 -50 -60 -75 -100 -150 -200 -300 -400 -500 -750 -1000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- MAIL BOX
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE LARGE DIAMETER CONDUIT OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

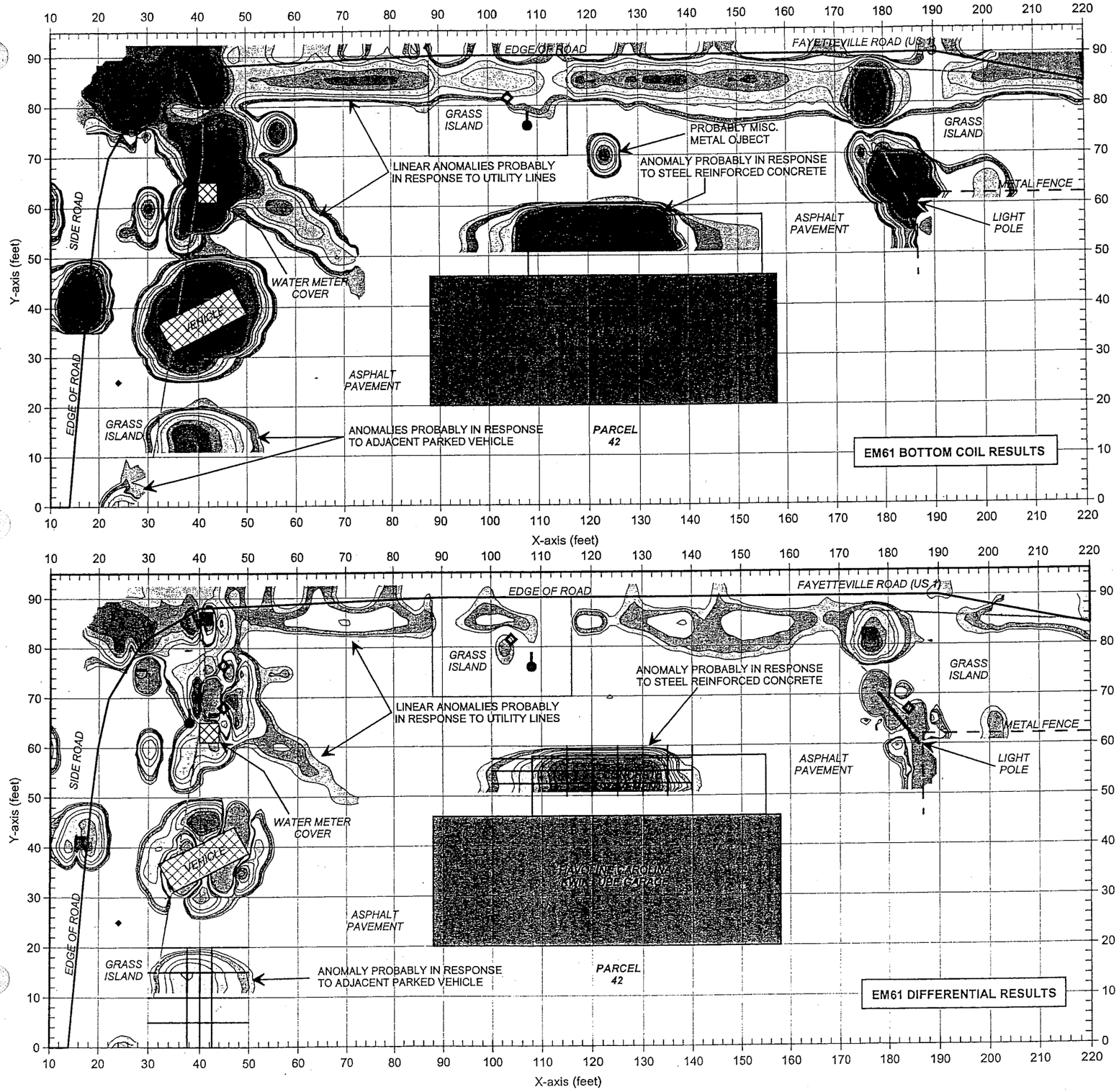
The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

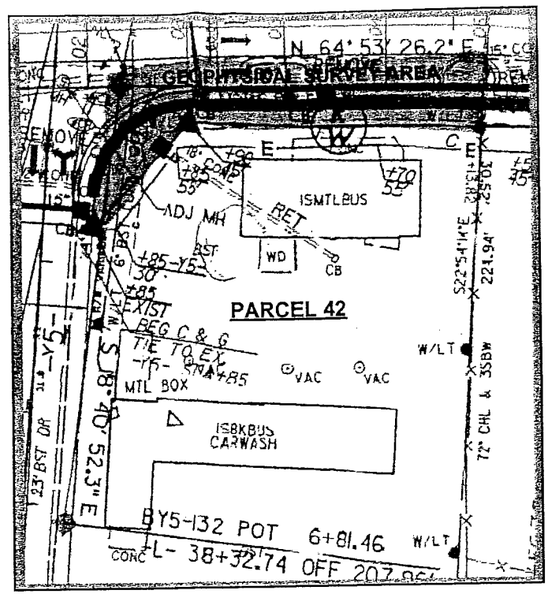
GRAPHIC SCALE IN METERS

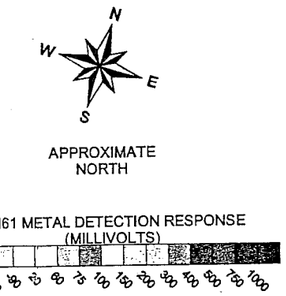
DRAWN	MJD		FIGURE
CHKD			
DATE	11/26/05		JOB NO. 2005-292
LAY			
DWG			

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: W.J. BARNHART PROPERTY (PARCEL 41A)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.







APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -200 -100 -50 -25 0 25 50 75 100 150 200 300 400 500 750 1000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- METAL SIGN POLE
- STORM SEWER GRATE
- GPR SURVEY LINE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 15, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61
METAL DETECTION
RESULTS

FIGURE 14

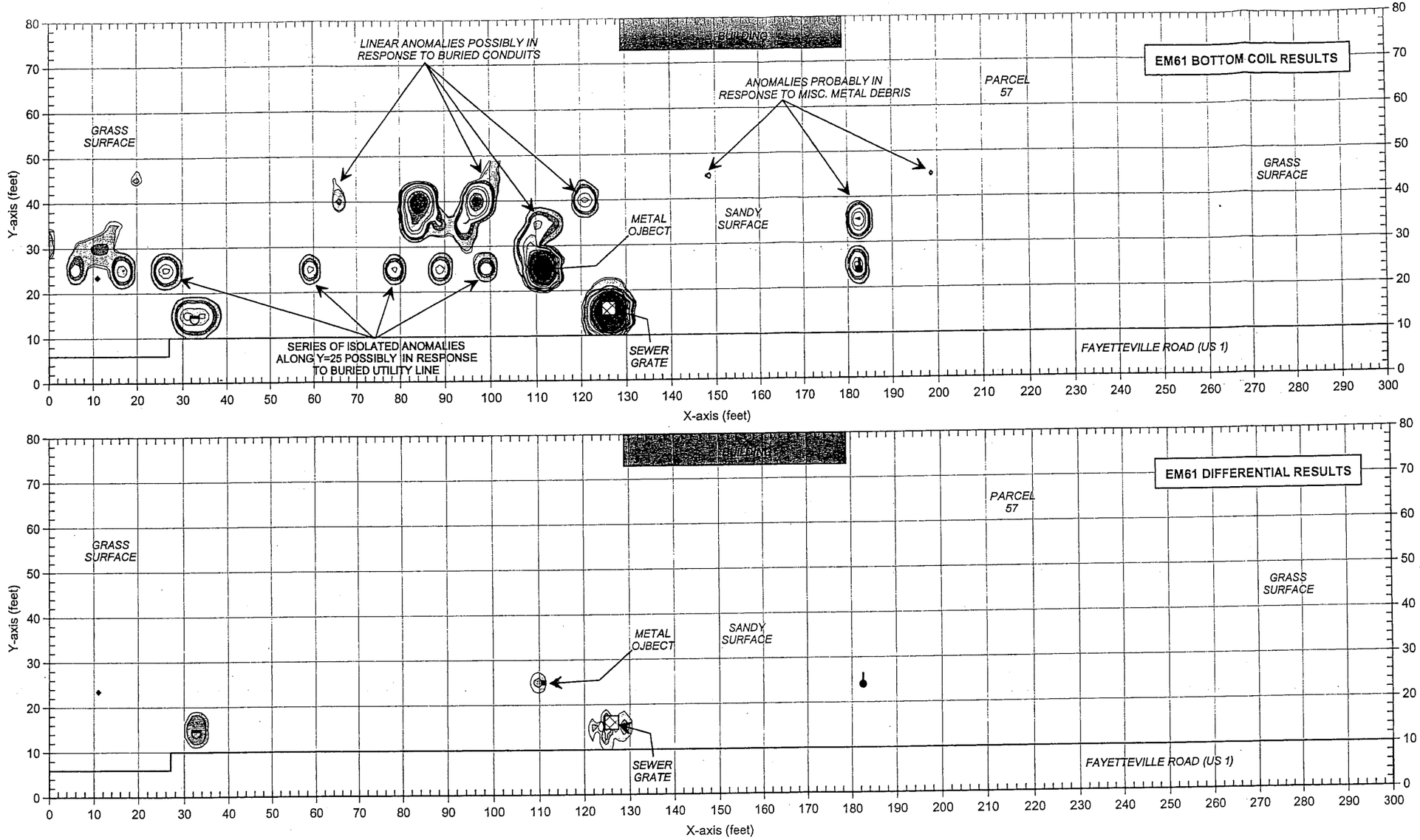
GRAPHIC SCALE IN METERS

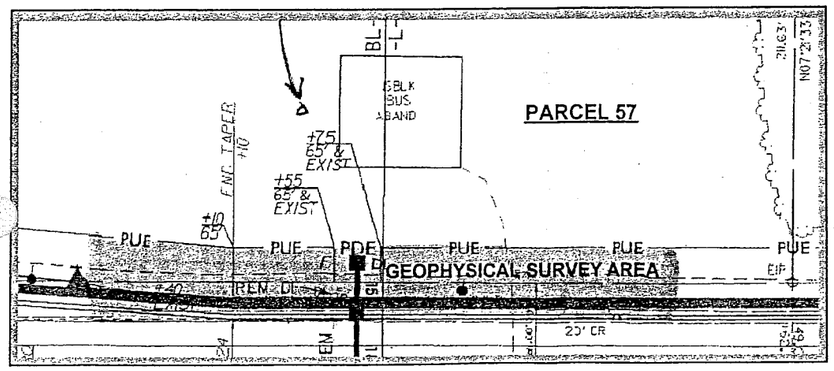
DRAWN	MJD		
CHKD			FIGURE
DATE	11/26/05		2005-292
LAY		DWG	JOB NO.

SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
WESLEY DENHAM PROPERTY (PARCEL 42)
NORTH CAROLINA
ROCKINGHAM
GEOPHYSICAL RESULTS

CLIENT | SITE | CITY | STATE | TITLE

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.





LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -80 -60 -50 -40 -30 -20 -15 -10 -8 -6 -4 -2 0 2 4 6 8 10 15 20 30 40 50 60 80 100 200 4000

N W E S

APPROXIMATE NORTH

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) surveys were not conducted at this site.

EM61 METAL DETECTION RESULTS

FIGURE 15

GRAPHIC SCALE IN METERS

DRWN	CHKD		FIGURE
MJD			
DATE	CAT	DWG	J-NO.
11/18/05			2005-292

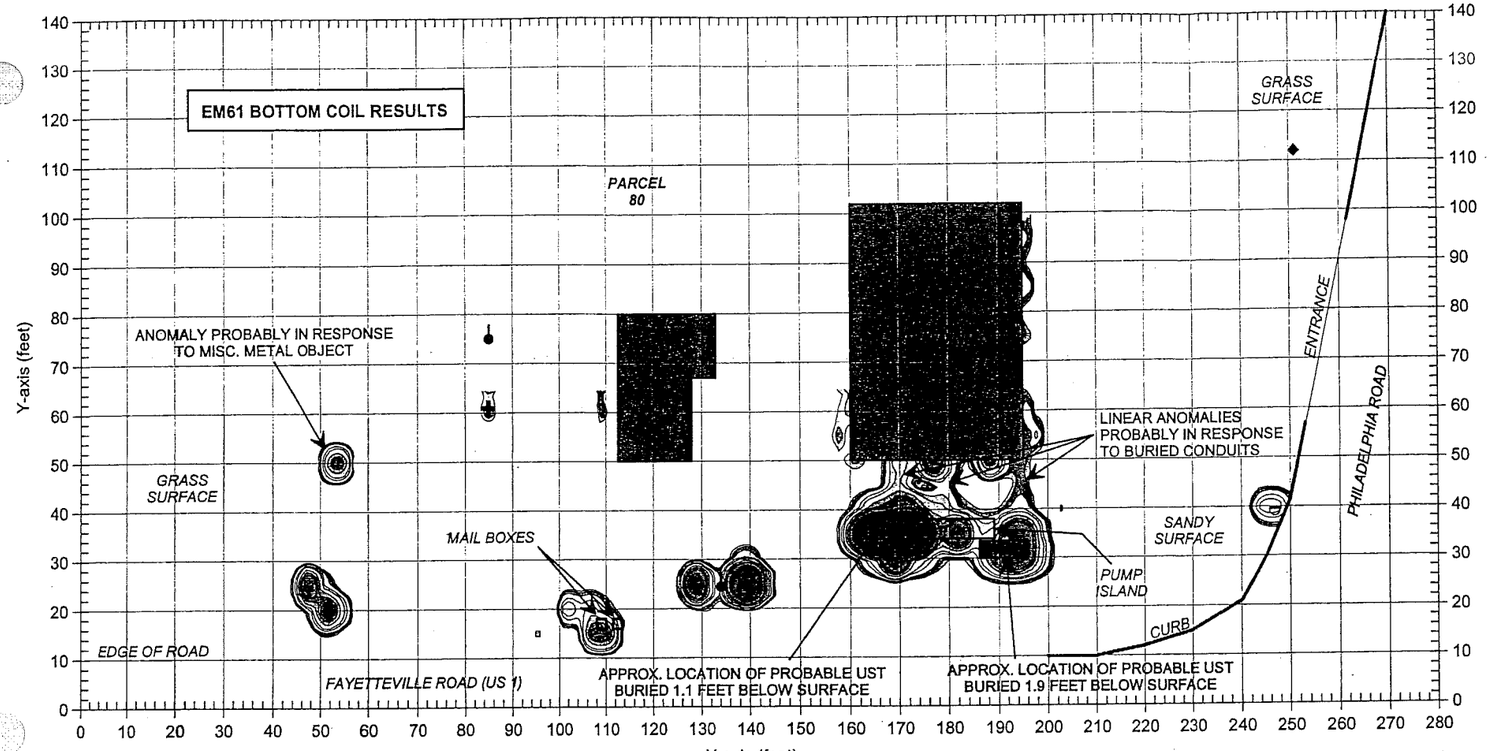
CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: WILLIAM USSERY PROPERTY (PARCEL 57)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

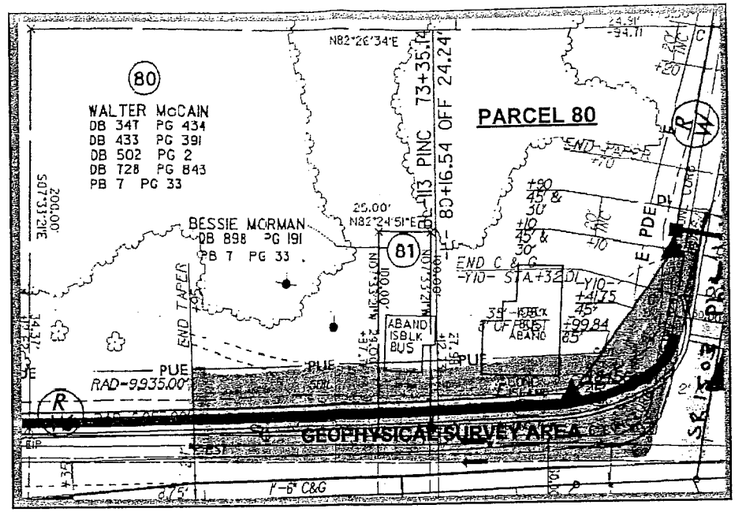
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 METAL DETECTION RESULTS

FIGURE 16

EM61 BOTTOM COIL RESULTS



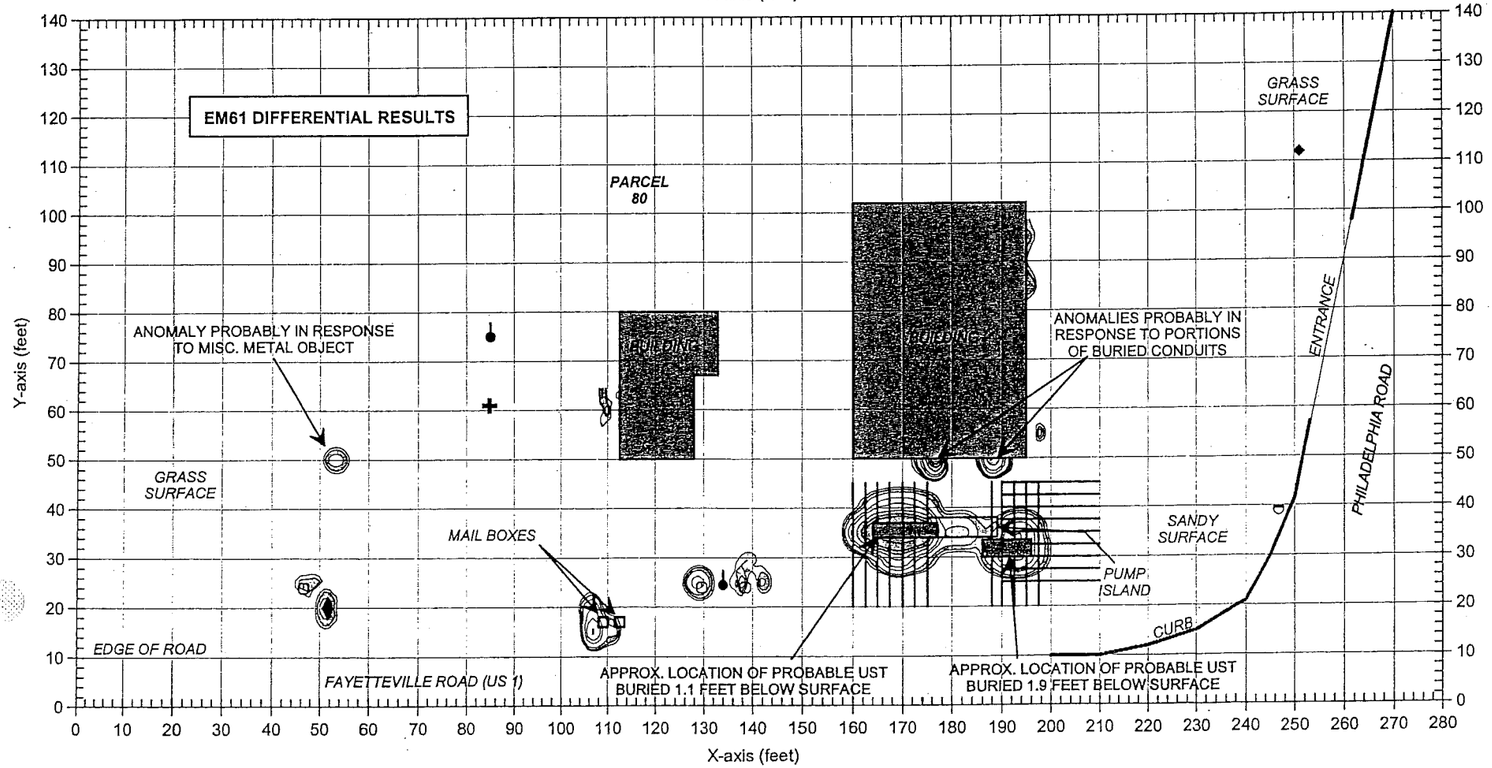


APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -200 -100 -50 -30 -20 -15 -10 10 15 20 30 50 100 200 400 1000

EM61 DIFFERENTIAL RESULTS



LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- FIRE HYDRANT
- TRAFFIC SIGN
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

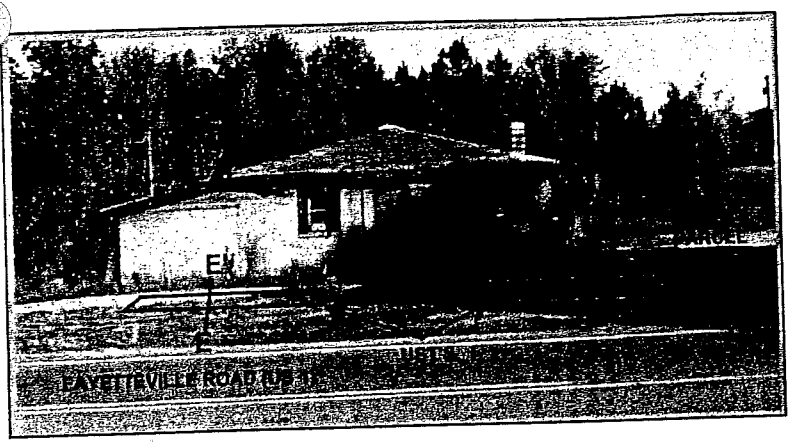
Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

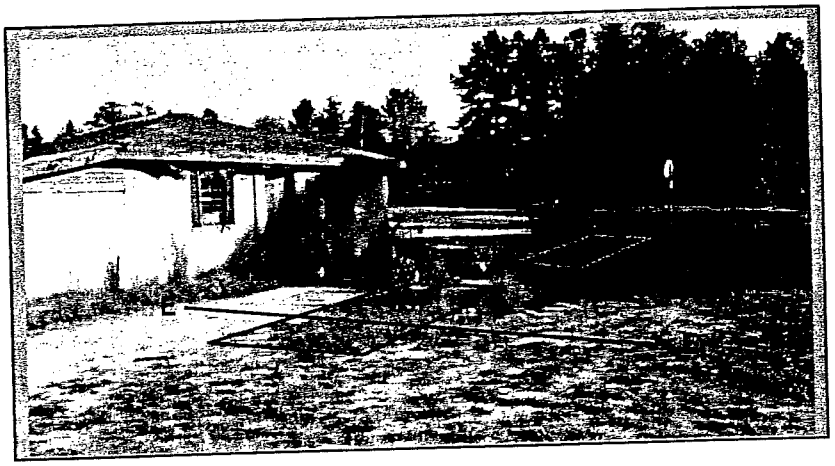
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	WALTER McCAIN PROPERTY (PARCEL 80)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
JOB No.	2005-292
FIGURE	
DWG	
DATE	11/25/05
CH'KD	
DRWN	MJD

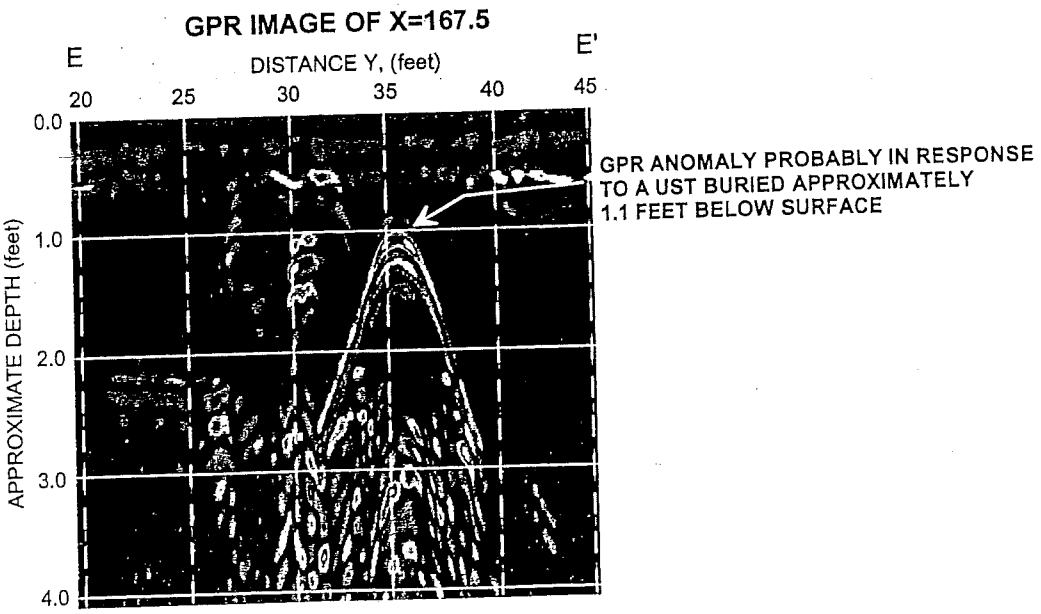
GRAPHIC SCALE IN METERS

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.



The two photos show the approximate locations of the two probable UST's at Parcel 80, as suggested by the geophysical results. The UST's appear to be buried approximately 1 to 2 feet below surface. A former pump island lies between the two probable UST's.



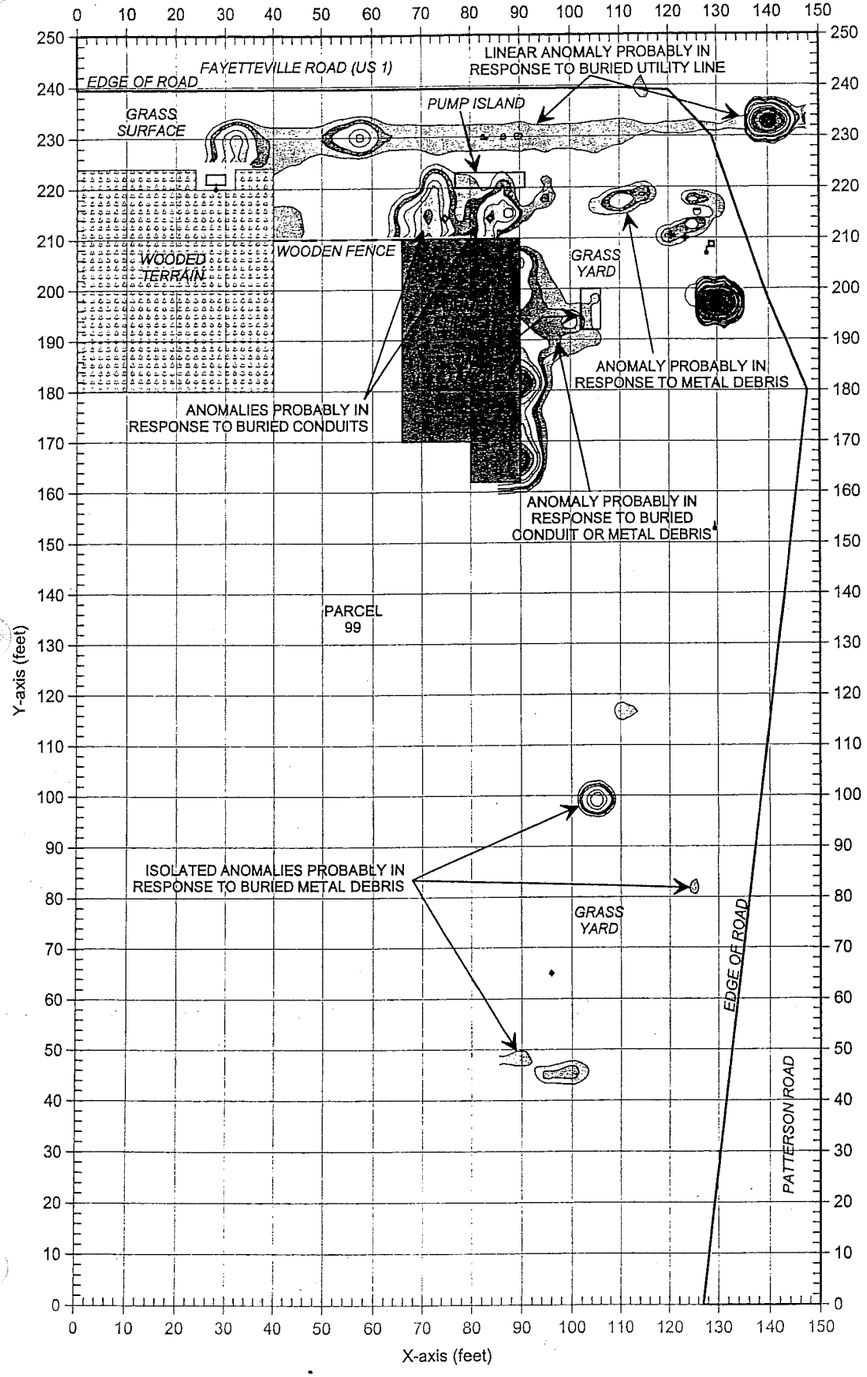


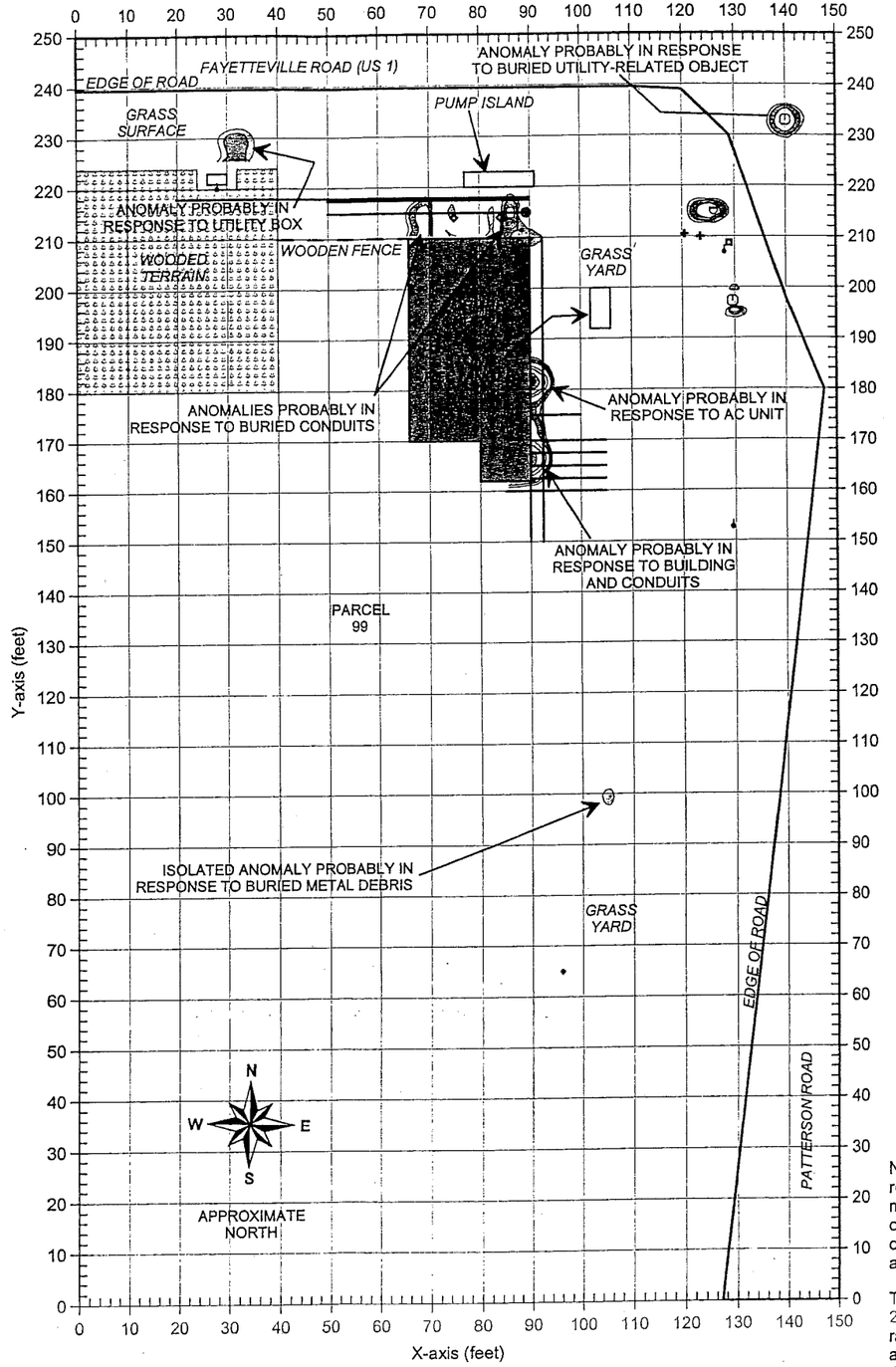
PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

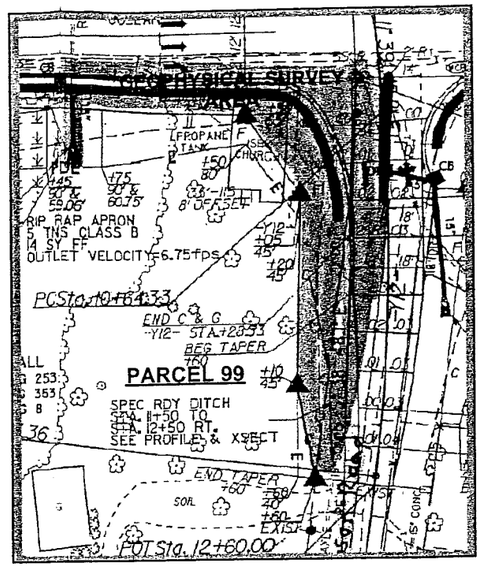
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	WALTER McCAIN PROPERTY (PARCEL 80)		
CITY	ROCKINGHAM	STATE	NORTH CAROLINA
	GEOPHYSICAL RESULTS	NO.	2005-292

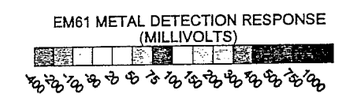
PHOTOS & GPR IMAGE OF UST LOCATIONS

FIGURE 17


EM61 BOTTOM COIL RESULTS


EM61 DIFFERENTIAL RESULTS




EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CANOPY POLE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- GPR SURVEY LINE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

FIGURE 18

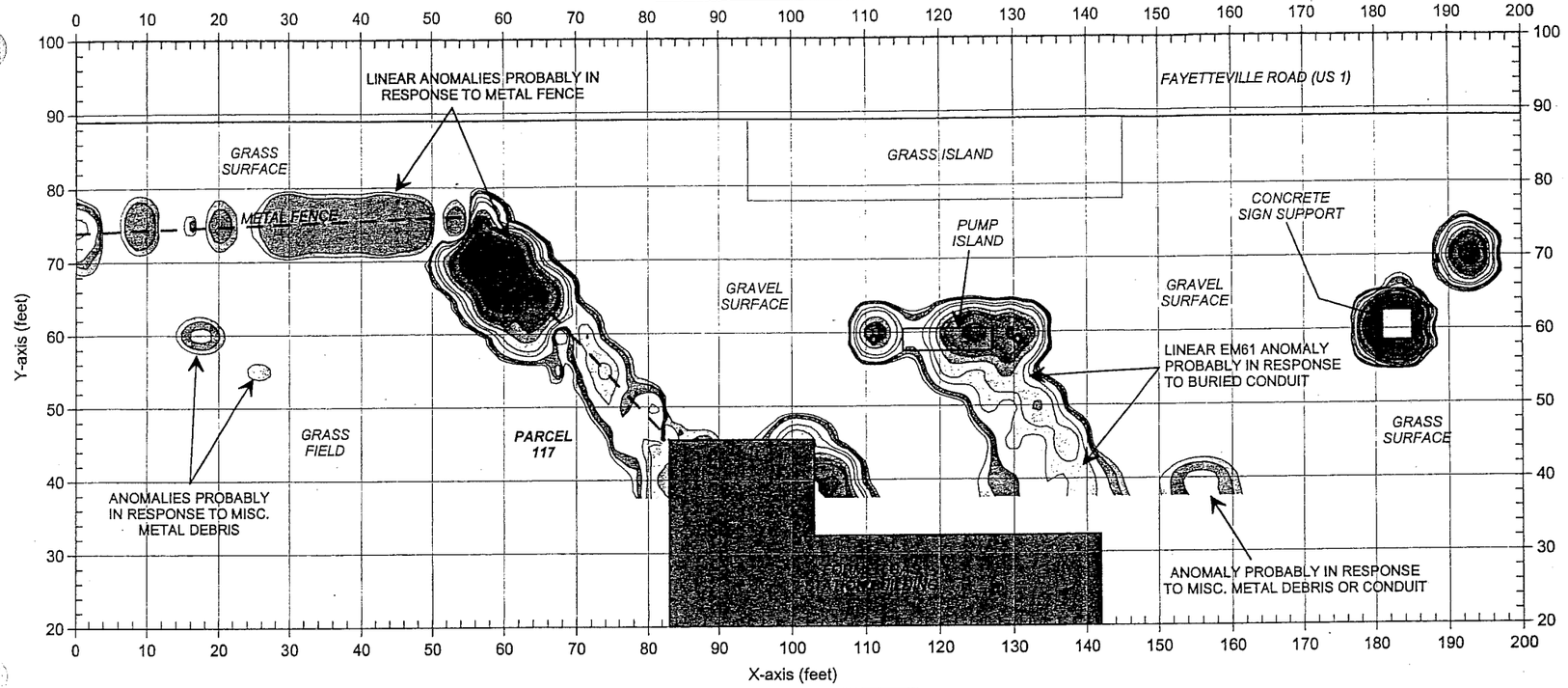
EM61 METAL DETECTION RESULTS

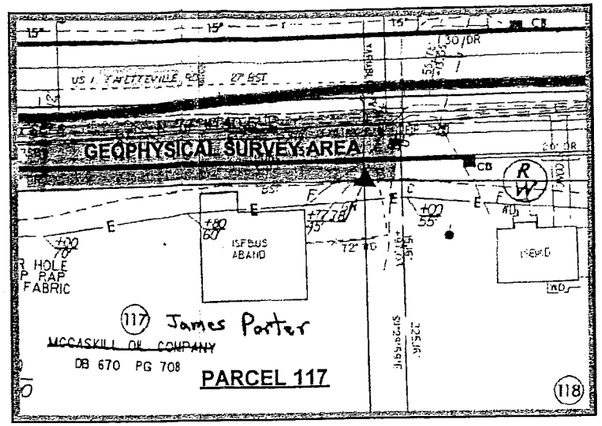
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	LEON WALL PROPERTY (PARCEL 99)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
DATE	11/26/05
DRWN	MJD
CHKD	
DWG	
LAY	
FIGURE	2005-292
JHO.	

GRAPHIC SCALE IN METERS

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

EM61 BOTTOM COIL RESULTS





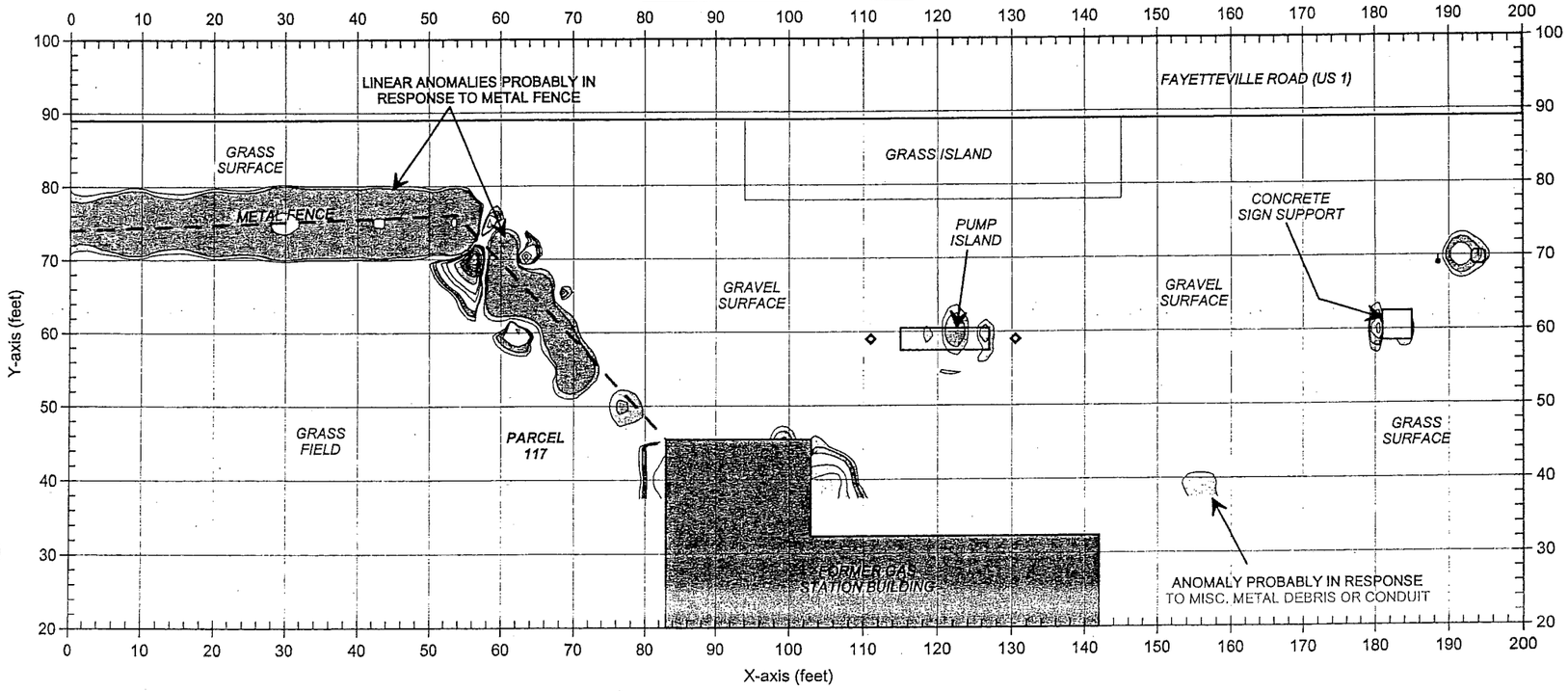
N
W E
S

APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -200 -100 -50 -30 -20 -10 -5 5 10 15 20 30 50 75 100 150 200 300 400 500 750 1000

EM61 DIFFERENTIAL RESULTS



LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- SUPPORT POLE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar surveys were not conducted at this site.

EM61 METAL DETECTION RESULTS

FIGURE 19

GRAPHIC SCALE IN METERS

DRWN	CHKD	FIGURE
MJD		
DATE	DWG	JOB NO.
11/26/05		2005-292

SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

JAMES PORTER PROPERTY (PARCEL 117)

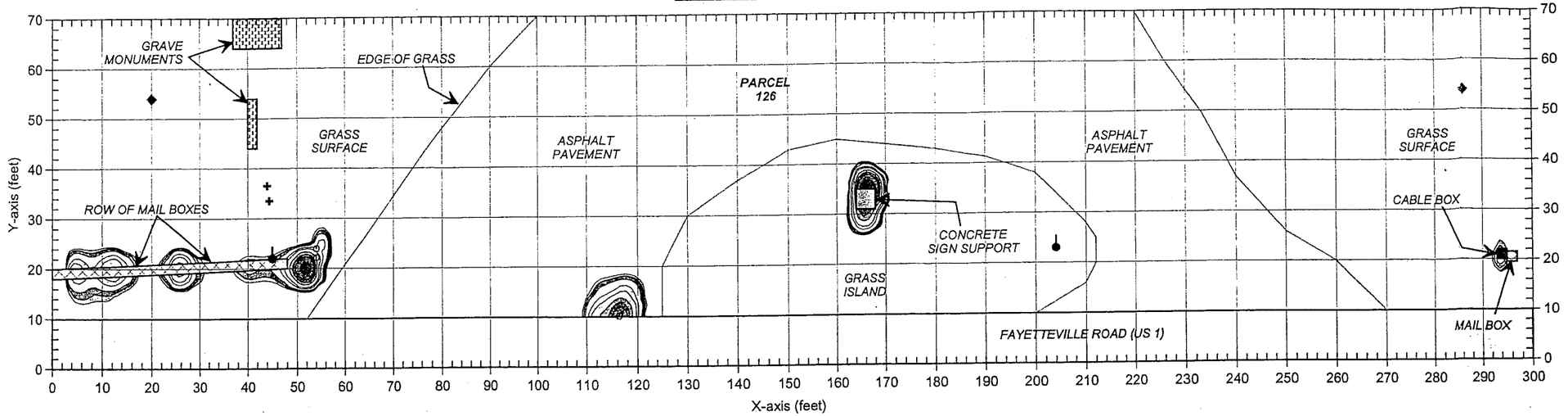
ROCKINGHAM — NORTH CAROLINA

GEOPHYSICAL RESULTS

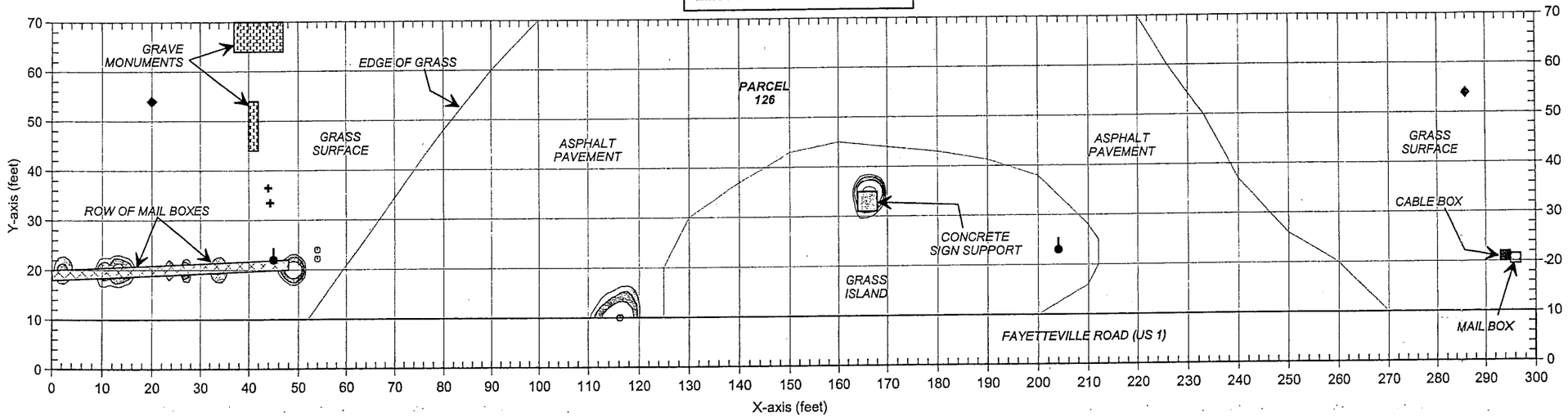
CLIENT | SITE | CITY | STATE | TITLE

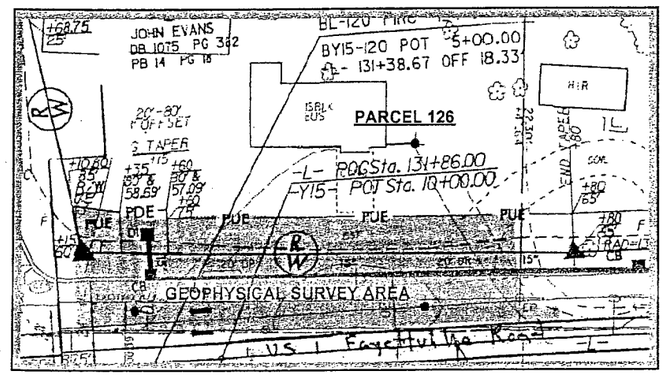
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- RIGHT-OF-WAY MARKER
- UTILITY POLE
- WATER METER OR VALVE COVER
- SIGN POLE
- STORM SEWER GRATE
- TRAFFIC SIGN
- GUY WIRE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data surveys were not conducted at this site

APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)
1000, 750, 500, 400, 300, 200, 150, 100, 75, 60, 20, -90, -100, -200, -400

FIGURE 20

EM61
METAL DETECTION
RESULTS

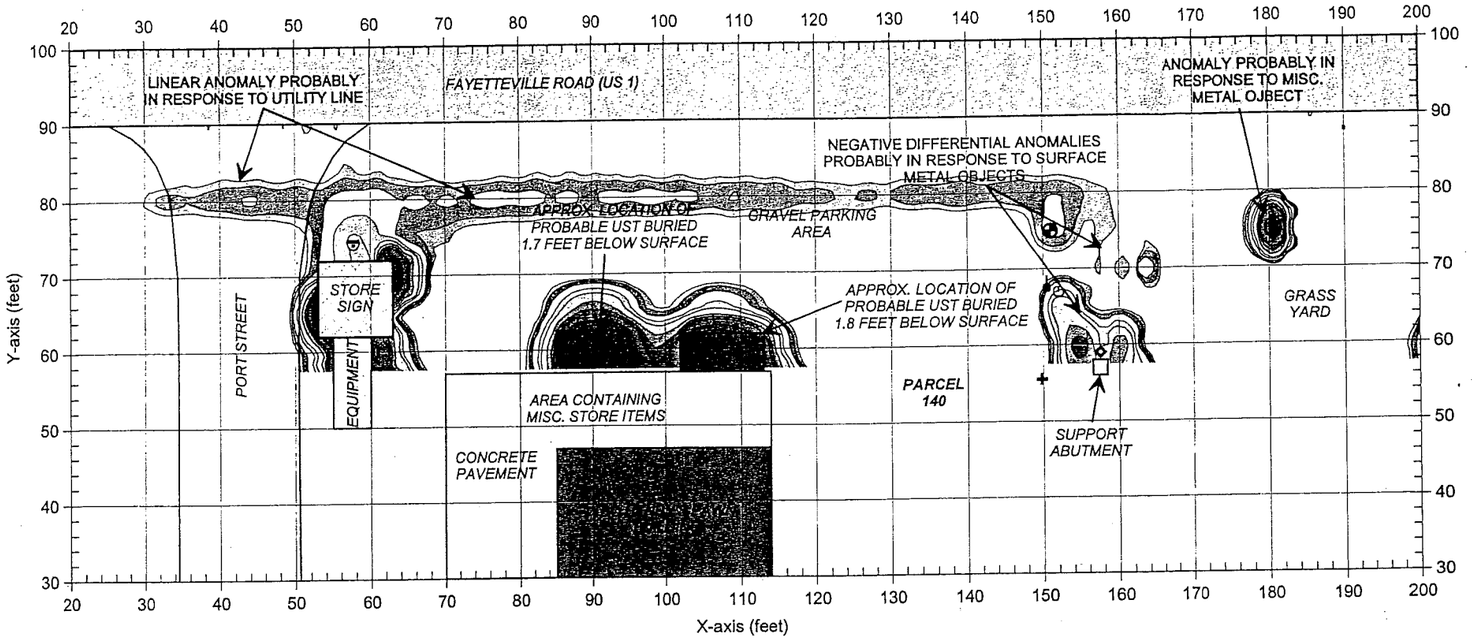
GRAPHIC SCALE IN METERS

DRAWN	CHKD	DWG	FIGURE
MJD			
DATE	LAY	DWG	J.NO.
11/26/05			2005-292

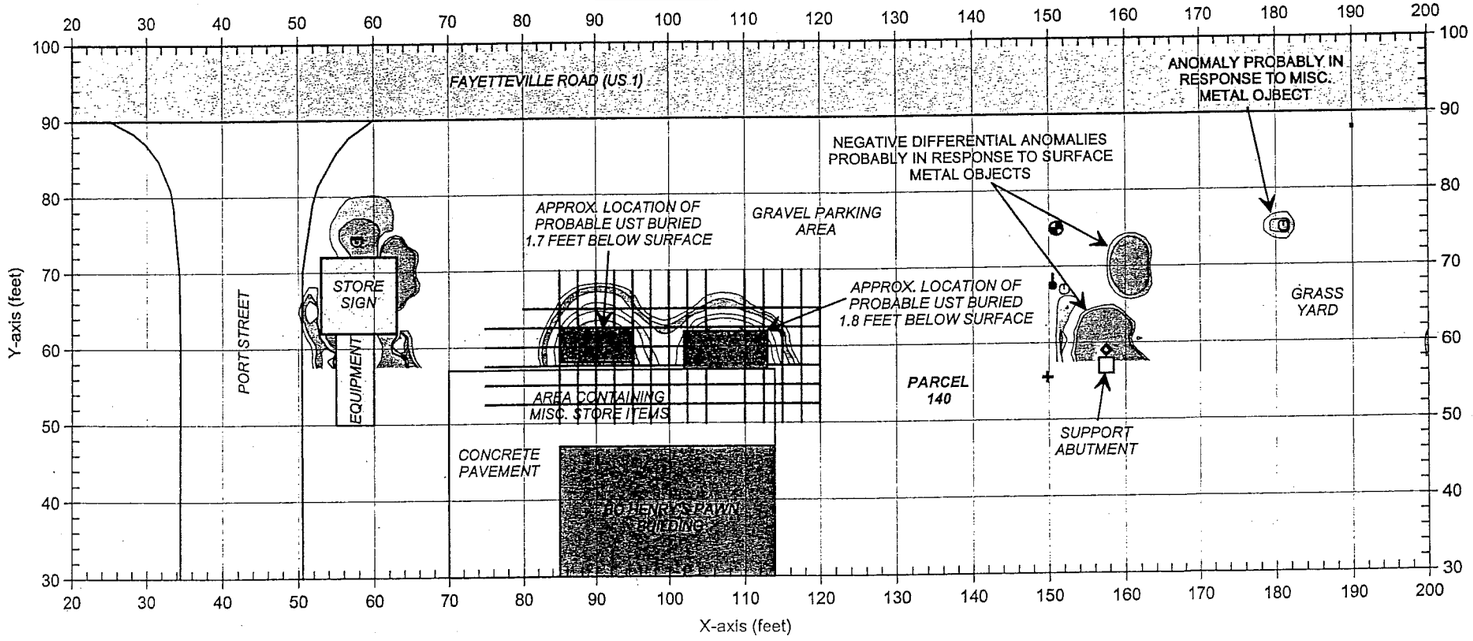
CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: JOHN EVANS PROPERTY (PARCEL 126)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

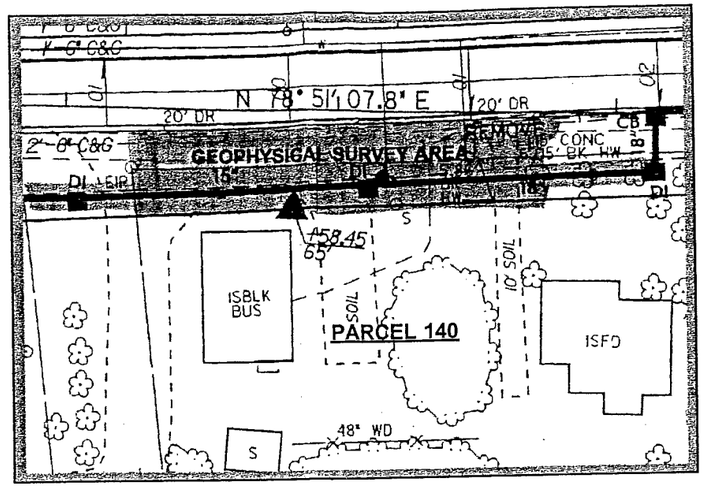
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -50 -20 -10 -5 5 10 20 50 100 200 400 1000

N
W E
S

APPROXIMATE NORTH

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- SIGN POLE
- STORM SEWER GRATE
- TRAFFIC SIGN
- FIBER OPTIC LINE SIGN
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

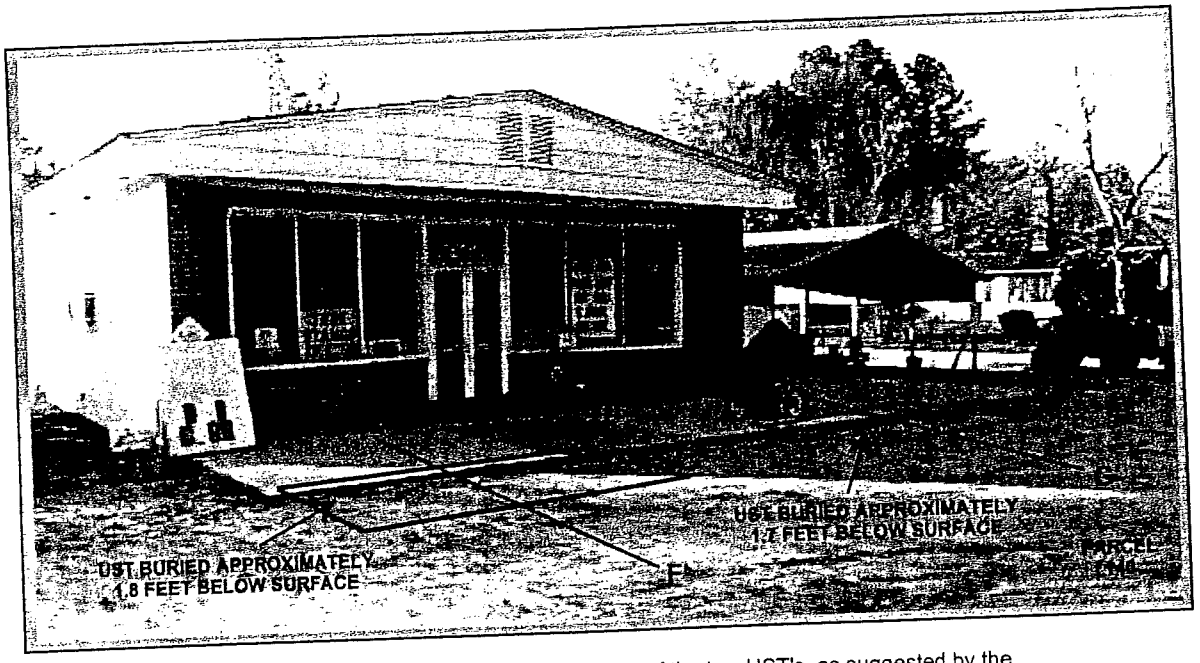
EM61 METAL DETECTION RESULTS

FIGURE 21

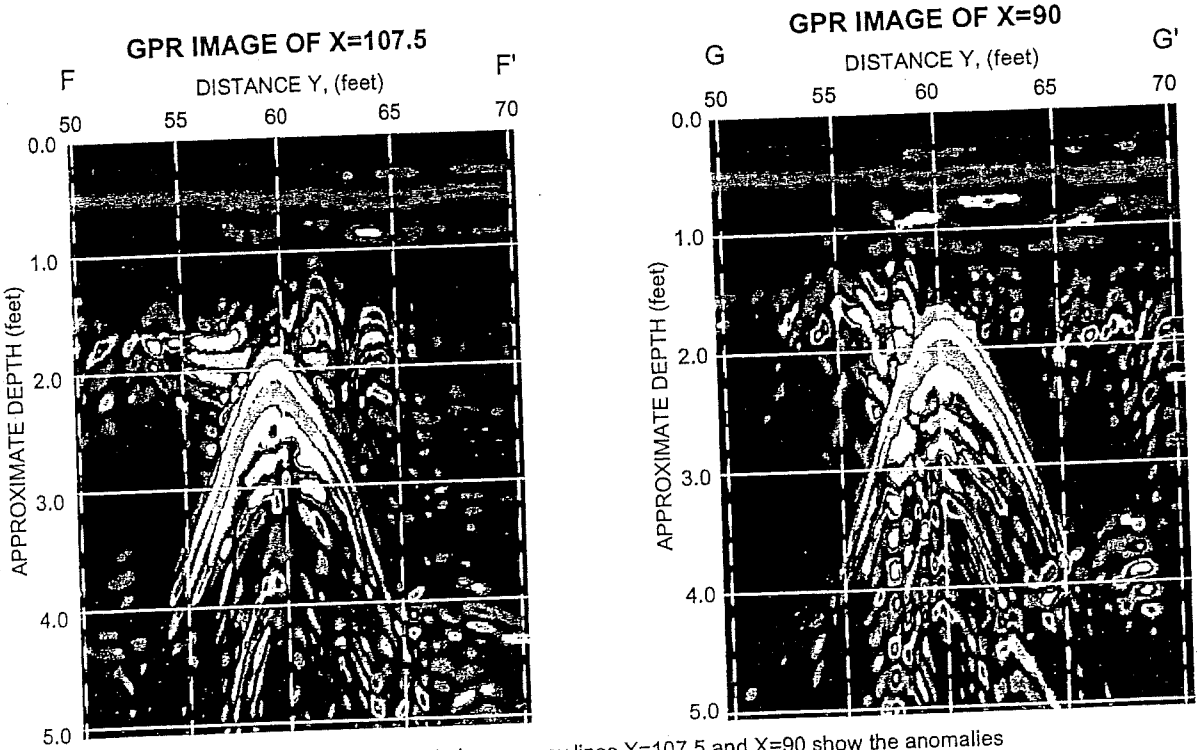
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	HENRY USSERY PROPERTY (PARCEL 140)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
PROJ. NO.	2005-292
DATE	11/25/05
DRWN	MJD
CHKD	
APVD	

GRAPHIC SCALE IN METERS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the approximate locations of the two UST's, as suggested by the geophysical results at Parcel 140. The UST's appear to be approximately 1.8 and 1.7 feet below surface.



The GPR images obtained along survey lines X=107.5 and X=90 show the anomalies that are probably in response to the two UST's buried at Parcel 140. The GPR data suggest the UST's are buried approximately 1.8 feet and 1.7 feet below surface, respectively.

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CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	HENRY USSERY PROPERTY (PARCEL 140)		
CITY	ROCKINGHAM	STATE	NORTH CAROLINA
JOB	GEOPHYSICAL RESULTS	JOB#	2005-292

PHOTO & GPR IMAGES OF UST LOCATIONS

FIGURE 22

APPENDIX C

BORING LOGS

Log of Soil Boring 15-1

Project: Rockingham Sites (Parcel 015) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 15-1

Client: NCDOT

TIP/WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* 8.8' bgs

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* 9.1' bgs

Drilling Method: Direct push *Boring Date:* 12/2/05 *Cave In Depth:* N/A

Sampler Type: Macro Core *Checked By:* DH/SCW *Total Depth of Boring:* 12 feet

Logged By: Dan Hirth

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0–1 / 0	SP	Dry, light brown, fine sand		MC	100	0		
2–3 / 1	SP	Dry, tan, fine sand		MC	100	0		
4 / 1	SC	Dry, tan, clayey fine sand		MC	100	0		
5–6 / 1–2	SC	Dry, gray, clayey fine sand, petroleum odor		MC	100	44		
6–7 / 2	SC	Dry, gray, clayey fine sand, petroleum odor		MC	100	44		
8–9 / 2–3	SC	Dry, gray, clayey fine sand, petroleum odor		MC	100	85		
10–11 / 3	SC	Wet, gray, clayey fine sand, petroleum odor		MC	100	806		
12 / 4		Boring terminated at 12 feet.						
13–15 / 4								

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Solutions-IES
Industrial & Environmental Services

Log of Soil Boring 15-2

Project: Rockingham Sites (Parcel 015) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 15-2

Client: NCDOT

TIP/WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/2/05 *Cave In Depth:* N/A

Sampler Type: Macro Core *Checked By:* JH 1-3-06 *Total Depth of Boring:* 8 feet

Logged By: Dan Hirth

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0–2 / 0–1	SC	Dry, tan, clayey fine sand		MC	100	0		
2–4 / 1–1	SC	Dry, tan, clayey fine sand		MC	100	0		
4–6 / 1–2	SP	Dry, tan, fine sand		MC	100	0		
6–8 / 2–2	SP	Dry, tan, fine sand		MC	100	0		
8 / 2		Boring terminated at 8 feet.						
9–15 / 3–4								

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Raleigh, NC 27607
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Log of Soil Boring 15-3

Project: Rockingham Sites (Parcel 015) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 15-3

Client: NCDOT

TIP/WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/2/05 *Cave In Depth:* N/A

Sampler Type: Macro Core *Checked By:* DH | SWL *Total Depth of Boring:* 12 feet

Logged By: Dan Hirth

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750) / FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0	SP	Dry, light brown, fine sand		MC	100	0		
1	SC	Dry, light brown, clayey fine sand						
2	CL	Dry, orange, fine sandy clay		MC	100	0		
3 / 1								
4	CL	Dry, orange, fine sandy clay		MC	100	0		
6	CL	Dry, orange, fine sandy clay		MC	100	0		
7 / 2								
8	SC	Wet, gray, clayey fine sand		MC	100	0		
9								
10 / 3		No Recovery		MC	0	0		
11								
12		Boring terminated at 12 feet.						
13 / 4								
14								
15								

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Solutions-IES
Industrial & Environmental Services

Log of Soil Boring 15-4

Project: Rockingham Sites (Parcel 015) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 15-4
Client: NCDOT
WBS # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/2/05
Checked By: DH

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A
Total Depth of Boring: 12 feet

SUBSURFACE PROFILE			SAMPLE					
Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen ppm 250 500 750 / FID Field Screen ppm 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0–2		*SP* Dry, tan, fine sand		MC	100	0		
2–4		*SP* Dry, tan, fine sand		MC	100	0		
4–6		*SC* Dry, tan, clayey fine sand		MC	100	0		
6–7.5		*SC* Dry, tan, clayey fine sand		MC	100	26		
7.5–8		*SC* Dry, gray, clayey fine sand						
8–10		*SC* Dry, gray, clayey fine sand, petroleum odor		MC	100	12		
10–12		*SC* Dry, gray, clayey fine sand, petroleum odor		MC	0	198		
12		Boring terminated at 12 feet.						

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Log of Soil Boring 15-5

Project: Rockingham Sites (Parcel 015) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 15-5

Client: NCDOT

TIP/WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/2/05 *Cave In Depth:* N/A

Sampler Type: Macro Core *Checked By:* DH | SLH

Logged By: Dan Hirth *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750	FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface							
0–2 / 0–1	SP	Dry, tan, fine sand		MC	100	0			
2–4 / 1–1	SP	Dry, tan, fine sand		MC	100	0			
4–6 / 1–2	SP	Dry, tan, fine sand		MC	100	25			
6–7 / 2	SC	Dry, tan, clayey fine sand		MC	100	84			
7–8 / 2–3	SP	Wet, tan, fine sand, petroleum odor							
8 / 3		Boring terminated at 8 feet.							

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Log of Soil Boring 15-6

Project: Rockingham Sites (Parcel 015) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 15-6

Client: NCDOT

*BS # 34950.1.1

State Project # U-3456

Drilling Method: Direct push

Sampler Type: Macro Core

Logged By: Dan Hirth

City: Rockingham

County: Richmond

Boring Date: 12/2/05

Checked By: AJ Smith

Initial Water Level: N/A

Stabilized Water Level: N/A

Cave In Depth: N/A

Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750	FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface							
0–2	SP	Dry, tan, fine sand		MC	100	0			
2–4 / 1	SP	Dry, tan, fine sand		MC	100	0			
4–6	SP	Dry, tan, fine sand		MC	100	1			
6–7 / 2	SP	Dry, tan, fine sand		MC	100	0			
7–8	SP	Dry, gray, fine sand							
8		Boring terminated at 8 feet.							
9–15 / 3–4									

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Log of Soil Boring 15-7

Project: Rockingham Sites (Parcel 015) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 15-7

Client: NCDOT

BS # 34950.1.1

State Project # U-3456

Drilling Method: Direct push

Sampler Type: Macro Core

Logged By: Dan Hirth

City: Rockingham

County: Richmond

Boring Date: 12/2/05

Checked By: DH | SLW

Initial Water Level: N/A

Stabilized Water Level: N/A

Cave In Depth: N/A

Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
		Ground Surface						
0		*SP* Dry, tan/orange, fine sand		MC	100	0		
2		*SP* Dry, tan/orange, fine sand		MC	100	0		
4		*SP* Dry, tan, fine sand		MC	100	0		
6		*SP* Dry, tan, fine sand		MC	100	0		
7		*SC* Dry, tan, clayey fine sand						
8		Boring terminated at 8 feet.						

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Log of Soil Boring 15-8

Project: Rockingham Sites (Parcel 015) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 15-8

Client: NCDOT

TIP/WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/2/05 *Cave In Depth:* N/A

Sampler Type: Macro Core *Checked By:* MH | SVL

Logged By: Dan Hirth *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
		SUBSURFACE PROFILE	**SAMPLE**					
0 / 0		Ground Surface						
0–2 / 0–1	SP	*SP* Dry, tan, fine sand		MC	100	0		
2–4 / 1–2	SP	*SP* Dry, tan, fine sand		MC	100	0		
4–6 / 2–3	SC	*SC* Dry, tan, clayey fine sand		MC	100	0		
6–7 / 2–3	SC	*SC* Dry, tan, clayey fine sand		MC	100	23	6–8	
7–8 / 3–4	CL	*CL* Dry, tan, fine sandy clay, petroleum odor						
8 / 4		Boring terminated at 8 feet.						

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Log of Soil Boring 15-9

Project: Rockingham Sites (Parcel 015) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 15-9

Client: NCDOT

TIP # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/2/05 *Cave In Depth:* N/A

Sampler Type: Macro Core *Checked By:* DH / SWL

Logged By: Dan Hirth *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
		SUBSURFACE PROFILE	**SAMPLE**					
0 / 0		Ground Surface						
0–2 / 0–1	SP	Dry, tan/orange, fine sand		MC	100	0		
2–4 / 1–2	SP	Dry, tan and gray, fine sand		MC	100	0		
4–6 / 2	SC	Dry, tan, clayey fine sand		MC	100	0		
6–8 / 2–3	CL	Dry, tan, fine sandy clay, petroleum odor		MC	100	1		
8–15 / 3–4		Boring terminated at 8 feet.						

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Log of Soil Boring 15-10

Project: Rockingham Sites (Parcel 015) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 15-10

Client: NCDOT

BS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/2/05 *Cave In Depth:* N/A

Sampler Type: Macro Core *Checked By:* [illegible] *Total Depth of Boring:* 8 feet

Logged By: Dan Hirth

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm, 250 500 750) / FID Field Screen (ppm, 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Asphalt*						
1	SC	Dry, orange, clayey fine sand		MC	100	0		
2	SC	Dry, orange, clayey fine sand		MC	100	0		
3 / 1	SP	Dry, tan, fine sand						
4	SC	Dry, tan, clayey fine sand		MC	100	0		
6 / 2	SC	Wet, tan, clayey fine sand		MC	100	291		
8		Boring terminated at 8 feet.						
10 / 3								
13 / 4								
15								

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Log of Soil Boring 15-11

Project: Rockingham Sites (Parcel 015) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 15-11

Client: NCDOT

TIP/WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* 9.15' bgs

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/2/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH | JV *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750	FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface							
0		*Asphalt*							
1		*SP* Dry, tan, silty fine sand		MC	100	0			
2		*SP* Dry, tan, silty fine sand		MC	100	0			
3 / 1									
4		*CL* Dry, tan, fine sandy clay		MC	100	0			
6		*CL* Wet, tan, fine sandy clay, petroleum odor		MC	100	8			
7 / 2									
8		Boring terminated at 8 feet.							
9									
10 / 3									
11									
12									
13 / 4									
14									
15									

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Log of Soil Boring 15-12

Project: Rockingham Sites (Parcel 015) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 15-12

Client: NCDOT

TIP/WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/2/05 *Cave In Depth:* N/A

Sampler Type: Macro Core *Checked By:* JH CW *Total Depth of Boring:* 8 feet

Logged By: Dan Hirth

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750	FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface							
0		*Asphalt*							
1	SC	Dry, orange, clayey fine sand		MC	100		1		
2	SP	Dry, tan, fine sand		MC	100		3		
3 / 1									
4	SC	Dry, tan, clayey fine sand		MC	100		575		
6	CL	Dry, tan, fine sandy clay		MC	100		0		
7 / 2									
8		Boring terminated at 8 feet.							
9									
10 / 3									
11									
12									
13 / 4									
14									
15									

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APPENDIX D

SPECIFIC CAPACITY SPREADSHEET

Specific Capacity Test Work Sheet

Project: Parcel 15
Location: Rockingham, NC
Project Number: 2730.05A2.NDOT
Date: February 8, 2006

Personnel: S. Jarvah
B. Rebar

Results:
K= 1.33E-04 cm/sec
or approximately
0.38 feet/day

Well Number: MW-3 Test Zone 2 to 12 ft bgs

Screen Diameter: 2.0 inches Screen Length: 10 feet

Screen Type: Geoprobe SP16 Groundwater Sampler

Stabilized Depth to Water 6.01 feet bgs Time: 12:53

Purge Start _____ Purge Stop _____ Gallons Purged _____

Pump type Peristaltic Pump Capacity 1 L/min

Depth Intake Below Surface 12.00 inches

Start Time: 13:05 End Time: 13:11

Time	Trial #	Volume	Time	Flow Rate
	1	54 ml	60 sec	0.01 gpm
	2	53 ml	60 sec	0.01 gpm
	3	52 ml	60 sec	0.01 gpm
	4	52 ml	60 sec	0.01 gpm
	5	52 ml	60 sec	0.01 gpm
	6	52 ml	60 sec	0.01 gpm

Average Flow Rate

Average Flow Rate 52.5 ml for 60 seconds
Equivalent Average Flow Rate 0.0525 liters per minute
Equivalent Average Flow Rate 0.01 gallons per minute

Confined Aquifer: _____ Unconfined Aquifer: yes

Calculation of Hydraulic Conductivity (K)

For Unconfined Aquifer and 1-inch Well, C=1.153

K=C*Q/^H*Screen Length in feet
Where Q is in gallons per minute and ^H is in inches.
C(1.153)*Q(0.01387054)/^H(12)*Scrn(10) ft

K = 0.00013 cm/sec or approximately 0.378 ft/day

Reference: Wilson, 1997

APPENDIX E

LABORATORY ANALYTICAL REPORTS

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Fax: 828.252.4618

Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

Solid results are reported on a dry weight basis

Lab Sample No: 926413667 Project Sample Number: 92108864-001 Date Collected: 12/02/05 13:00
Client Sample ID: 15-1 (6-8) Matrix: Soil Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	11.0	%		12/07/05 19:41	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	5.6	12/12/05 19:35	KBS	68334-30-5		
n-Pentacosane (S)	104	%		12/12/05 19:35	KBS	629-99-2		
Date Extracted	12/07/05			12/07/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	4.1	mg/kg	3.9	12/12/05 15:38	DHW			
4-Bromofluorobenzene (S)	84	%		12/12/05 15:38	DHW	460-00-4		

Date: 12/19/05

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Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

Lab Sample No: 926413683
Client Sample ID: 15-2 (6-8)

Project Sample Number: 92108864-002
Matrix: Soil

Date Collected: 12/02/05 13:05
Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	10.8	%		12/07/05 19:41	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	5.6	12/12/05 20:10	KBS	68334-30-5		
n-Pentacosane (S)	86	%		12/12/05 20:10	KBS	629-99-2		
Date Extracted	12/07/05			12/07/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	3.9	12/09/05 23:56	DHW			
4-Bromofluorobenzene (S)	99	%		12/09/05 23:56	DHW	460-00-4		

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Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

Lab Sample No: 926413691
Client Sample ID: 15-3 (6-8)

Project Sample Number: 92108864-003
Matrix: Soil

Date Collected: 12/02/05 13:10
Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	14.3	%		12/07/05 19:41	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	5.8	12/12/05 20:45	KBS	68334-30-5		
n-Pentacosane (S)	105	%		12/12/05 20:45	KBS	629-99-2		
Date Extracted	12/07/05			12/07/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	4.1	12/10/05 01:51	DHW			
4-Bromofluorobenzene (S)	90	%		12/10/05 01:51	DHW	460-00-4		

Date: 12/19/05

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Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

Lab Sample No: 926413709
Client Sample ID: 15-4 (6-8)

Project Sample Number: 92108864-004
Matrix: Soil

Date Collected: 12/02/05 13:10
Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	11.5	%		12/07/05 19:41	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	13.	mg/kg	5.7	12/12/05 21:20	KBS	68334-30-5		
n-Pentacosane (S)	125	%		12/12/05 21:20	KBS	629-99-2		
Date Extracted	12/07/05			12/07/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	4.0	12/10/05 02:19	DHW			
4-Bromofluorobenzene (S)	82	%		12/10/05 02:19	DHW	460-00-4		

Date: 12/19/05

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Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

Lab Sample No: 926413717
Client Sample ID: 15-5 (6-8)

Project Sample Number: 92108864-005
Matrix: Soil

Date Collected: 12/02/05 13:15
Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	12.1	%		12/07/05 19:42	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	22.	mg/kg	5.7	12/12/05 21:55	KBS	68334-30-5		
n-Pentacosane (S)	121	%		12/12/05 21:55	KBS	629-99-2		
Date Extracted	12/07/05			12/07/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	13.	mg/kg	4.5	12/10/05 02:48	DHW			
4-Bromofluorobenzene (S)	98	%		12/10/05 02:48	DHW	460-00-4		

Date: 12/19/05

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Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

Lab Sample No: 926413725
Client Sample ID: 15-8 (6-8)

Project Sample Number: 92108864-006
Matrix: Soil

Date Collected: 12/02/05 13:05
Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	12.3	%		12/07/05 19:42	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	45.	mg/kg	5.7	12/13/05 03:46	KBS	68334-30-5		
n-Pentacosane (S)	124	%		12/13/05 03:46	KBS	629-99-2		
Date Extracted	12/08/05			12/08/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	3.9	12/10/05 03:17	DHW			
4-Bromofluorobenzene (S)	90	%		12/10/05 03:17	DHW	460-00-4		

Date: 12/19/05

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Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

Lab Sample No: 926413733
Client Sample ID: 15-9 (6-8)

Project Sample Number: 92108864-007
Matrix: Soil

Date Collected: 12/02/05 13:15
Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	12.5	%		12/07/05 19:42	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	5.7	12/13/05 04:22	KBS	68334-30-5		
n-Pentacosane (S)	102	%		12/13/05 04:22	KBS	629-99-2		
Date Extracted	12/08/05			12/08/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	3.9	12/10/05 03:45	DHW			
4-Bromofluorobenzene (S)	84	%		12/10/05 03:45	DHW	460-00-4		

Date: 12/19/05

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Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

Lab Sample No: 926413741
Client Sample ID: 15-10 (6-8)

Project Sample Number: 92108864-008
Matrix: Soil

Date Collected: 12/02/05 13:20
Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	12.6	%		12/07/05 20:07	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	200	mg/kg	5.7	12/13/05 04:57	KBS	68334-30-5		
n-Pentacosane (S)	105	%		12/13/05 04:57	KBS	629-99-2		
Date Extracted	12/08/05			12/08/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	120	mg/kg	4.0	12/10/05 04:14	DHW			
4-Bromofluorobenzene (S)	487	%		12/10/05 04:14	DHW	460-00-4	1	

Date: 12/19/05

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Charlotte Certification IDs
NC Wastewater 12
NC Drinking Water 37706
SC 99006
FL NELAP E87627

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2225 Riverside Drive
Asheville, NC 28804
Phone: 828.254.7176
Fax: 828.252.4618

Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

Lab Sample No: 926413766
Client Sample ID: 15-11 (6-8)

Project Sample Number: 92108864-009
Matrix: Soil

Date Collected: 12/02/05 13:25
Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	12.3	%		12/07/05 20:07	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	34.	mg/kg	5.7	12/13/05 14:02	KBS	68334-30-5		
n-Pentacosane (S)	111	%		12/13/05 14:02	KBS	629-99-2		
Date Extracted	12/08/05			12/08/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	15.	mg/kg	4.1	12/12/05 16:07	DHW			
4-Bromofluorobenzene (S)	154	%		12/12/05 16:07	DHW	460-00-4	2	

Date: 12/19/05

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Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

Lab Sample No: 926413774
Client Sample ID: 15-12 (4-6)

Project Sample Number: 92108864-010
Matrix: Soil

Date Collected: 12/02/05 13:20
Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	13.9	%		12/07/05 20:07	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	5.8	12/13/05 06:07	KBS	68334-30-5		
n-Pentacosane (S)	88	%		12/13/05 06:07	KBS	629-99-2		
Date Extracted	12/08/05			12/08/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	4.3	12/12/05 16:36	DHW			
4-Bromofluorobenzene (S)	119	%		12/12/05 16:36	DHW	460-00-4		

Date: 12/19/05

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Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

PARAMETER FOOTNOTES

Method 9071B modified to use ASE.

All pH, Free Chlorine, Total Chlorine and Ferrous Iron analyses conducted outside of EPA recommended immediate hold time.

Depending on the moisture content the PRLs can be elevated for all soil samples reported on a dry weight basis.

2-Chloroethyl vinyl ether has been shown to degrade in the presence of acid.

ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
(S)	Surrogate
[1]	The surrogate recovery was outside QC acceptance limits due to matrix interference.
[2]	High surrogate recovery was confirmed as a matrix effect by a second analysis.

Date: 12/19/05

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QUALITY CONTROL DATA

Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

QC Batch: 144509
Analysis Method: EPA 8015
QC Batch Method: EPA 3545
Analysis Description: TPH in Soil by 3545/8015
Associated Lab Samples: 926413667 926413683 926413691 926413709 926413717

METHOD BLANK: 926420845
Associated Lab Samples: 926413667 926413683 926413691 926413709 926413717

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Diesel Fuel	mg/kg	ND	5.0	
n-Pentacosane (S)	%	110		

LABORATORY CONTROL SAMPLE: 926420852

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Diesel Fuel	mg/kg	166.70	155.0	93	
n-Pentacosane (S)				139	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 926420860 926420878

Parameter	Units	926413717 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
Diesel Fuel	mg/kg	22.46	189.70	184.6	178.1	86	82	4	
n-Pentacosane (S)						132	127		

Date: 12/19/05

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QUALITY CONTROL DATA

Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

QC Batch: 144594
Analysis Method: EPA 8015
QC Batch Method: EPA 3545
Analysis Description: TPH in Soil by 3545/8015
Associated Lab Samples: 926413725 926413733 926413741 926413766 926413774

METHOD BLANK: 926424367
Associated Lab Samples: 926413725 926413733 926413741 926413766 926413774

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Diesel Fuel	mg/kg	ND	5.0	
n-Pentacosane (S)	%	106		

LABORATORY CONTROL SAMPLE: 926424375

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Diesel Fuel	mg/kg	166.70	130.8	78	
n-Pentacosane (S)				111	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 926424383 926424391

Parameter	Units	926417015 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
Diesel Fuel	mg/kg	1.143	176.80	156.6	164.9	88	93	5	
n-Pentacosane (S)						123	132		

Date: 12/19/05

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QUALITY CONTROL DATA

Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

QC Batch: 144577
QC Batch Method: EPA 8015
Analysis Method: EPA 8015
Analysis Description: GAS, Soil, North Carolina
Associated Lab Samples: 926413667 926413683 926413691 926413709 926413717 926413725 926413733 926413741 926413766 926413774

METHOD BLANK: 926423732
Associated Lab Samples: 926413667 926413683 926413691 926413709 926413717 926413725 926413733 926413741 926413766 926413774

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Gasoline	mg/kg	ND	5.0	
4-Bromofluorobenzene (S)	%	82		

LABORATORY CONTROL SAMPLE: 926423740

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Gasoline	mg/kg	25.00	26.21	105	
4-Bromofluorobenzene (S)				86	

MATRIX SPIKE: 926430505

Parameter	Units	926413683 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
Gasoline	mg/kg	1.036	20.12	21.88	104	
4-Bromofluorobenzene (S)					86	

SAMPLE DUPLICATE: 926423765

Parameter	Units	926413808 Result	DUP Result	RPD	Footnotes
Gasoline	mg/kg	590.0	600.0	0	
4-Bromofluorobenzene (S)	%	112	105		

Date: 12/19/05

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QUALITY CONTROL DATA

Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

QC Batch: 144510
Analysis Method: % Moisture
QC Batch Method:
Analysis Description: Percent Moisture
Associated Lab Samples: 926413667 926413683 926413691 926413709 926413717 926413725 926413733

SAMPLE DUPLICATE: 926421223

Parameter	Units	926417403 Result	DUP Result	RPD	Footnotes
Percent Moisture	%	9.100	9.100	0	

Date: 12/19/05

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QUALITY CONTROL DATA

Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

QC Batch: 144514
Analysis Method: % Moisture
QC Batch Method:
Analysis Description: Percent Moisture
Associated Lab Samples: 926413741 926413766 926413774

SAMPLE DUPLICATE: 926421256

Parameter	Units	926420498 Result	DUP Result	RPD	Footnotes
Percent Moisture	%	28.20	22.90	21	

Date: 12/19/05

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Lab Project Number: 92108864
Client Project ID: NCDOT 34950.1.1 Parcel 15

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

LCS(D)	Laboratory Control Sample (Duplicate)
MS(D)	Matrix Spike (Duplicate)
DUP	Sample Duplicate
ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
RPD	Relative Percent Difference
(S)	Surrogate

Date: 12/19/05

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

897906

Pace Analytical

Section A
Required Client Information:

Company

Address

Email to:

Phone | Fax

Requested Due Date/TAT:

Section B
Required Project Information:

Report To:

Copy To:

Purchase Order No.:

Project Name:

Project Number:

Section C
Invoice Information:

Attention:

Company Name:

Address:

Pace Quote Reference:

Pace Project Manager:

Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☒ UST ☐ RCRA ☐ Other_____

SITE LOCATION ☐ GA ☐ IL ☐ IN ☐ MI ☐ MN ☒ NC ☐ OH ☐ SC ☐ WI ☐ OTHER _____

Section D
Required Client Information

SAMPLE ID

One Character per box.
(A-Z, 0-9 / -)
Samples IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Filtered (Y/N)	Requested Analysis:	Residual Chlorine (Y/N)	Pace Project Number / Lab I.D
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Additional Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME

SAMPLE CONDITION

Temp °C	Received on Ice Y/N	Custody Sealed Cooler Y/N	Samples Intact Y/N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER:

DATE Signed (MM / DD / YY)

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December 21, 2005

Ms. Sheri Knox
Solutions-IES
1101 Nowell Road
Raleigh, NC 27607

RE: Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

Dear Ms. Knox:

Enclosed are the analytical results for sample(s) received by the laboratory on December 7, 2005. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Inorganic Wet Chemistry and Metals Analyses were performed at our Pace Asheville laboratory and Organic testing was performed at our Pace Charlotte laboratory unless otherwise footnoted.

If you have any questions concerning this report please feel free to contact me.

Sincerely,

Bonnie McKee

Bonnie McKee
Bonnie.McKee@pacelabs.com
Project Manager

Enclosures

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Phone: 828.254.7176
Fax: 828.252.4618

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

Lab Sample No: 926419615
Client Sample ID: 15-MW

Project Sample Number: 92108989-001
Matrix: Water

Date Collected: 12/06/05 15:15
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Metals								
3030C Metals, ICP, Trace	Prep/Method: SM 3030C / EPA 200.7							
Chromium, 3030C	ND	mg/l	0.0020	12/16/05 21:09	ALV	7440-47-3		
Lead, 3030C	0.0095	mg/l	0.0050	12/16/05 21:09	ALV	7439-92-1		
Date Digested	12/08/05 10:30			12/08/05 10:30				
GC/MS Semivolatiles								
Extractables in Water by 625	Prep/Method: EPA 625 SF / EPA 625							
Acenaphthene	ND	ug/l	5.0	12/17/05 19:47	BET	83-32-9		
Acenaphthylene	ND	ug/l	5.0	12/17/05 19:47	BET	208-96-8		
Anthracene	ND	ug/l	5.0	12/17/05 19:47	BET	120-12-7		
Benzidine	ND	ug/l	50.	12/17/05 19:47	BET	92-87-5		
Benzo(k)fluoranthene	ND	ug/l	5.0	12/17/05 19:47	BET	207-08-9		
Benzo(b)fluoranthene	ND	ug/l	5.0	12/17/05 19:47	BET	205-99-2		
Benzo(a)anthracene	ND	ug/l	5.0	12/17/05 19:47	BET	56-55-3		
Benzo(g,h,i)perylene	ND	ug/l	5.0	12/17/05 19:47	BET	191-24-2		
Benzo(a)pyrene	ND	ug/l	5.0	12/17/05 19:47	BET	50-32-8		
4-Bromophenylphenyl ether	ND	ug/l	5.0	12/17/05 19:47	BET	101-55-3		
[illegible]tylbenzylphthalate	ND	ug/l	5.0	12/17/05 19:47	BET	85-68-7		
4-Chloro-3-methylphenol	ND	ug/l	5.0	12/17/05 19:47	BET	59-50-7		
bis(2-Chloroethoxy)methane	ND	ug/l	5.0	12/17/05 19:47	BET	111-91-1		
bis(2-Chloroethyl) ether	ND	ug/l	5.0	12/17/05 19:47	BET	111-44-4		
bis(2-Chloroisopropyl) ether	ND	ug/l	5.0	12/17/05 19:47	BET	39638-32-9		
2-Chloronaphthalene	ND	ug/l	5.0	12/17/05 19:47	BET	91-58-7		
2-Chlorophenol	ND	ug/l	5.0	12/17/05 19:47	BET	95-57-8		
4-Chlorophenylphenyl ether	ND	ug/l	5.0	12/17/05 19:47	BET	7005-72-3		
Chrysene	ND	ug/l	5.0	12/17/05 19:47	BET	218-01-9		
Dibenz(a,h)anthracene	ND	ug/l	5.0	12/17/05 19:47	BET	53-70-3		
1,2-Dichlorobenzene	ND	ug/l	5.0	12/17/05 19:47	BET	95-50-1		
1,3-Dichlorobenzene	ND	ug/l	5.0	12/17/05 19:47	BET	541-73-1		
1,4-Dichlorobenzene	ND	ug/l	5.0	12/17/05 19:47	BET	106-46-7		
3,3'-Dichlorobenzidine	ND	ug/l	10.	12/17/05 19:47	BET	91-94-1		
2,4-Dichlorophenol	ND	ug/l	5.0	12/17/05 19:47	BET	120-83-2		
Diethylphthalate	ND	ug/l	5.0	12/17/05 19:47	BET	84-66-2		
2,4-Dimethylphenol	ND	ug/l	5.0	12/17/05 19:47	BET	105-67-9		
Dimethylphthalate	ND	ug/l	5.0	12/17/05 19:47	BET	131-11-3		
Di-n-butylphthalate	ND	ug/l	5.0	12/17/05 19:47	BET	84-74-2		
4,6-Dinitro-2-methylphenol	ND	ug/l	25.	12/17/05 19:47	BET	534-52-1		
2,4-Dinitrophenol	ND	ug/l	25.	12/17/05 19:47	BET	51-28-5		

Date: 12/21/05

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Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

Lab Sample No: 926419615
Client Sample ID: 15-MW

Project Sample Number: 92108989-001
Matrix: Water

Date Collected: 12/06/05 15:15
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
2,4-Dinitrotoluene	ND	ug/l	5.0	12/17/05 19:47	BET	121-14-2		
2,6-Dinitrotoluene	ND	ug/l	5.0	12/17/05 19:47	BET	606-20-2		
Di-n-octylphthalate	ND	ug/l	5.0	12/17/05 19:47	BET	117-84-0		
bis(2-Ethylhexyl)phthalate	ND	ug/l	5.0	12/17/05 19:47	BET	117-81-7		
Fluoranthene	ND	ug/l	5.0	12/17/05 19:47	BET	206-44-0		
Fluorene	ND	ug/l	5.0	12/17/05 19:47	BET	86-73-7		
Hexachloro-1,3-butadiene	ND	ug/l	5.0	12/17/05 19:47	BET	87-68-3		
Hexachlorobenzene	ND	ug/l	5.0	12/17/05 19:47	BET	118-74-1		
Hexachlorocyclopentadiene	ND	ug/l	10.	12/17/05 19:47	BET	77-47-4		
Hexachloroethane	ND	ug/l	5.0	12/17/05 19:47	BET	67-72-1		
Indeno(1,2,3-cd)pyrene	ND	ug/l	5.0	12/17/05 19:47	BET	193-39-5		
Isophorone	ND	ug/l	5.0	12/17/05 19:47	BET	78-59-1		
Naphthalene	ND	ug/l	5.0	12/17/05 19:47	BET	91-20-3		
Nitrobenzene	ND	ug/l	5.0	12/17/05 19:47	BET	98-95-3		
2-Nitrophenol	ND	ug/l	5.0	12/17/05 19:47	BET	88-75-5		
4-Nitrophenol	ND	ug/l	25.	12/17/05 19:47	BET	100-02-7		
N-Nitrosodimethylamine	ND	ug/l	5.0	12/17/05 19:47	BET	62-75-9		
N-Nitroso-di-n-propylamine	ND	ug/l	5.0	12/17/05 19:47	BET	621-64-7		
-Nitrosodiphenylamine	ND	ug/l	5.0	12/17/05 19:47	BET	86-30-6		
Pentachlorophenol	ND	ug/l	25.	12/17/05 19:47	BET	87-86-5		
Phenanthrene	ND	ug/l	5.0	12/17/05 19:47	BET	85-01-8		
Phenol	ND	ug/l	5.0	12/17/05 19:47	BET	108-95-2		
Pyrene	ND	ug/l	5.0	12/17/05 19:47	BET	129-00-0		
1,2,4-Trichlorobenzene	ND	ug/l	5.0	12/17/05 19:47	BET	120-82-1		
2,4,6-Trichlorophenol	ND	ug/l	5.0	12/17/05 19:47	BET	88-06-2		
Nitrobenzene-d5 (S)	40	%		12/17/05 19:47	BET	4165-60-0		
2-Fluorobiphenyl (S)	50	%		12/17/05 19:47	BET	321-60-8		
Terphenyl-d14 (S)	94	%		12/17/05 19:47	BET	1718-51-0		
Phenol-d5 (S)	20	%		12/17/05 19:47	BET	4165-62-2		
2-Fluorophenol (S)	27	%		12/17/05 19:47	BET	367-12-4		
2,4,6-Tribromophenol (S)	94	%		12/17/05 19:47	BET	118-79-6		
Date Extracted	12/12/05			12/12/05				
GC Semivolatiles								
EPH in Water by Mass. Method	Prep/Method: EPA 3510 / EPH							
Aliphatic (C09-C18)	ND	ug/l	100	12/14/05 04:42	KBS			
Aliphatic (C19-C36)	ND	ug/l	100	12/14/05 04:42	KBS			
Aromatic (C11-22)	ND	ug/l	100	12/14/05 04:42	KBS			
2-Fluorobiphenyl (S)	107	%		12/14/05 04:42	KBS	321-60-8		

Date: 12/21/05

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Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

Lab Sample No: 926419615
Client Sample ID: 15-MW

Project Sample Number: 92108989-001
Matrix: Water

Date Collected: 12/06/05 15:15
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
2-Bromonaphthalene (S)	140	%		12/14/05 04:42	KBS	580-13-2		
Nonatriacontane (S)	67	%		12/14/05 04:42	KBS	7194-86-7		
o-Terphenyl (S)	69	%		12/14/05 04:42	KBS	84-15-1		
Date Extracted	12/08/05			12/08/05				
GC Volatiles								
Halogen. & Aromatic Vol. Orgs.	Method: EPA 601/602							
Benzene	ND	ug/l	1.0	12/20/05 05:24	PPM	71-43-2		
Bromodichloromethane	ND	ug/l	1.0	12/20/05 05:24	PPM	75-27-4		
Bromoform	ND	ug/l	1.0	12/20/05 05:24	PPM	75-25-2		
Bromomethane	ND	ug/l	1.0	12/20/05 05:24	PPM	74-83-9		
Carbon tetrachloride	ND	ug/l	1.0	12/20/05 05:24	PPM	56-23-5		
Chlorobenzene	ND	ug/l	1.0	12/20/05 05:24	PPM	108-90-7		
Chloroethane	ND	ug/l	1.0	12/20/05 05:24	PPM	75-00-3		
Chloroform	ND	ug/l	1.0	12/20/05 05:24	PPM	67-66-3		
Chloromethane	ND	ug/l	2.0	12/20/05 05:24	PPM	74-87-3		
Dibromochloromethane	ND	ug/l	1.0	12/20/05 05:24	PPM	124-48-1		
1,2-Dichlorobenzene	ND	ug/l	1.0	12/20/05 05:24	PPM	95-50-1		
1,3-Dichlorobenzene	ND	ug/l	1.0	12/20/05 05:24	PPM	541-73-1		
1,4-Dichlorobenzene	ND	ug/l	1.0	12/20/05 05:24	PPM	106-46-7		
Dichlorodifluoromethane	ND	ug/l	1.0	12/20/05 05:24	PPM	75-71-8		
1,1-Dichloroethane	ND	ug/l	1.0	12/20/05 05:24	PPM	75-34-3		
1,2-Dichloroethane	ND	ug/l	1.0	12/20/05 05:24	PPM	107-06-2		
1,1-Dichloroethene	ND	ug/l	1.0	12/20/05 05:24	PPM	75-35-4		
trans-1,2-Dichloroethene	ND	ug/l	1.0	12/20/05 05:24	PPM	156-60-5		
1,2-Dichloropropane	ND	ug/l	1.0	12/20/05 05:24	PPM	78-87-5		
cis-1,3-Dichloropropene	ND	ug/l	1.0	12/20/05 05:24	PPM	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/l	1.0	12/20/05 05:24	PPM	10061-02-6		
Diisopropyl ether	ND	ug/l	1.0	12/20/05 05:24	PPM	108-20-3		
Ethylbenzene	ND	ug/l	1.0	12/20/05 05:24	PPM	100-41-4		
Methylene chloride	ND	ug/l	2.0	12/20/05 05:24	PPM	75-09-2		
Methyl-tert-butyl ether	ND	ug/l	1.0	12/20/05 05:24	PPM	1634-04-4		
1,1,2,2-Tetrachloroethane	ND	ug/l	1.0	12/20/05 05:24	PPM	79-34-5		
Tetrachloroethene	ND	ug/l	1.0	12/20/05 05:24	PPM	127-18-4		
Toluene	ND	ug/l	1.0	12/20/05 05:24	PPM	108-88-3		
1,1,1-Trichloroethane	ND	ug/l	1.0	12/20/05 05:24	PPM	71-55-6		
1,1,2-Trichloroethane	ND	ug/l	1.0	12/20/05 05:24	PPM	79-00-5		
Trichloroethene	ND	ug/l	1.0	12/20/05 05:24	PPM	79-01-6		
Trichlorofluoromethane	ND	ug/l	1.0	12/20/05 05:24	PPM	75-69-4		

Date: 12/21/05

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Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

Lab Sample No: 926419615
Client Sample ID: 15-MW

Project Sample Number: 92108989-001
Matrix: Water

Date Collected: 12/06/05 15:15
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Vinyl chloride	ND	ug/l	1.0	12/20/05 05:24	PPM	75-01-4		
Xylene (Total)	ND	ug/l	1.0	12/20/05 05:24	PPM	1330-20-7		
m&p-Xylene	ND	ug/l	2.0	12/20/05 05:24	PPM			
o-Xylene	ND	ug/l	1.0	12/20/05 05:24	PPM	95-47-6		
1-Chloro-3-fluorobenzene (S)	108	%		12/20/05 05:24	PPM	625-98-9		
VPH in Water by Mass. Method	Method: VPH							
Aliphatic (C05-C08)	120	ug/l	100	12/08/05 16:06	DHW			
Aliphatic (C09-C12)	380	ug/l	100	12/08/05 16:06	DHW			
Aromatic (C09-C10)	260	ug/l	100	12/08/05 16:06	DHW			
2,5-Dibromotoluene (FID)(S)	101	%		12/08/05 16:06	DHW			
2,5-Dibromotoluene (PID)(S)	128	%		12/08/05 16:06	DHW			

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Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

PARAMETER FOOTNOTES

Method 9071B modified to use ASE.

All pH, Free Chlorine, Total Chlorine and Ferrous Iron analyses conducted outside of EPA recommended immediate hold time.

Depending on the moisture content the PRLs can be elevated for all soil samples reported on a dry weight basis.

2-Chloroethyl vinyl ether has been shown to degrade in the presence of acid.

ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
(S)	Surrogate

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

QC Batch: 144579
QC Batch Method: EPA 3510
Associated Lab Samples: 926419615

Analysis Method: EPH
Analysis Description: EPH in Water by Mass. Method

METHOD BLANK: 926423856
Associated Lab Samples: 926419615

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Aliphatic (C09-C18)	ug/l	ND	100	
Aliphatic (C19-C36)	ug/l	ND	100	
Aromatic (C11-22)	ug/l	ND	100	
2-Fluorobiphenyl (S)	%	102		
2-Bromonaphthalene (S)	%	133		
Nonatriacontane (S)	%	59		
o-Terphenyl (S)	%	74		

LABORATORY CONTROL SAMPLE & LCSD: 926423864 926423872

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	RPD	Footnotes
Aliphatic (C09-C18)	ug/l	300.00	122.4	121.7	41	41	1	
Aliphatic (C19-C36)	ug/l	400.00	277.2	273.9	69	68	1	
Aromatic (C11-22)	ug/l	850.00	606.5	523.1	71	62	15	
2-Fluorobiphenyl (S)					101	90		
2-Bromonaphthalene (S)					103	89		
Nonatriacontane (S)					58	49		
o-Terphenyl (S)					77	68		

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

QC Batch: 144543
Analysis Method: VPH
QC Batch Method: VPH
Analysis Description: VPH in Water by Mass. Method
Associated Lab Samples: 926419615

METHOD BLANK: 926422445
Associated Lab Samples: 926419615

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Aliphatic (C05-C08)	ug/l	ND	100	
Aliphatic (C09-C12)	ug/l	ND	100	
Aromatic (C09-C10)	ug/l	ND	100	
2,5-Dibromotoluene (FID)(S)	%	108		
2,5-Dibromotoluene (PID)(S)	%	126		

LABORATORY CONTROL SAMPLE & LCSD: 926422452 926422460

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	RPD	Footnotes
Aliphatic (C05-C08)	ug/l	400.00	440.4	425.8	110	106	3	
Aliphatic (C09-C12)	ug/l	100.00	110.5	110.0	110	110	0	
Aromatic (C09-C10)	ug/l	100.00	106.5	106.9	107	107	0	
2,5-Dibromotoluene (FID)(S)					96	100		
2,5-Dibromotoluene (PID)(S)					111	118		

SAMPLE DUPLICATE: 926422478

Parameter	Units	926420647 Result	DUP Result	RPD	Footnotes
Aliphatic (C05-C08)	ug/l	28000	30000	6	
Aliphatic (C09-C12)	ug/l	34000	36000	7	
Aromatic (C09-C10)	ug/l	9400	9500	1	
2,5-Dibromotoluene (FID)(S)	%	90	94		
2,5-Dibromotoluene (PID)(S)	%	117	125		

Date: 12/21/05

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

QC Batch: 145380
QC Batch Method: EPA 601/602
Associated Lab Samples: 926419615

Analysis Method: EPA 601/602
Analysis Description: Halogen. & Aromatic Vol. Orgs.

METHOD BLANK: 926459249
Associated Lab Samples: 926419615

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Benzene	ug/l	ND	1.0	
Bromodichloromethane	ug/l	ND	1.0	
Bromoform	ug/l	ND	1.0	
Bromomethane	ug/l	ND	1.0	
Carbon tetrachloride	ug/l	ND	1.0	
Chlorobenzene	ug/l	ND	1.0	
Chloroethane	ug/l	ND	1.0	
Chloroform	ug/l	ND	1.0	
Chloromethane	ug/l	ND	2.0	
Dibromochloromethane	ug/l	ND	1.0	
1,2-Dichlorobenzene	ug/l	ND	1.0	
1,3-Dichlorobenzene	ug/l	ND	1.0	
1,4-Dichlorobenzene	ug/l	ND	1.0	
Dichlorodifluoromethane	ug/l	ND	1.0	
1,1-Dichloroethane	ug/l	ND	1.0	
1,2-Dichloroethane	ug/l	ND	1.0	
1,1-Dichloroethene	ug/l	ND	1.0	
trans-1,2-Dichloroethene	ug/l	ND	1.0	
1,2-Dichloropropane	ug/l	ND	1.0	
cis-1,3-Dichloropropene	ug/l	ND	1.0	
trans-1,3-Dichloropropene	ug/l	ND	1.0	
Diisopropyl ether	ug/l	ND	1.0	
Ethylbenzene	ug/l	ND	1.0	
Methylene chloride	ug/l	ND	2.0	
Methyl-tert-butyl ether	ug/l	ND	1.0	
1,1,2,2-Tetrachloroethane	ug/l	ND	1.0	
Tetrachloroethene	ug/l	ND	1.0	
Toluene	ug/l	ND	1.0	
1,1,1-Trichloroethane	ug/l	ND	1.0	
1,1,2-Trichloroethane	ug/l	ND	1.0	
Trichloroethene	ug/l	ND	1.0	

Date: 12/21/05

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

METHOD BLANK: 926459249
Associated Lab Samples: 926419615

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Trichlorofluoromethane	ug/l	ND	1.0	
Vinyl chloride	ug/l	ND	1.0	
Xylene (Total)	ug/l	ND	1.0	
m&p-Xylene	ug/l	ND	2.0	
o-Xylene	ug/l	ND	1.0	
1-Chloro-3-fluorobenzene (S)	%	105		

LABORATORY CONTROL SAMPLE: 926459256

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Benzene	ug/l	20.00	20.30	101	
Bromodichloromethane	ug/l	20.00	23.08	115	
Bromoform	ug/l	20.00	22.71	114	
Bromomethane	ug/l	20.00	16.57	83	
Carbon tetrachloride	ug/l	20.00	20.53	103	
Chlorobenzene	ug/l	20.00	23.67	118	
Chloroethane	ug/l	20.00	16.74	84	
Chloroform	ug/l	20.00	16.06	80	
Chloromethane	ug/l	20.00	18.39	92	
Dibromochloromethane	ug/l	20.00	21.23	106	
1,2-Dichlorobenzene	ug/l	20.00	20.09	100	
1,3-Dichlorobenzene	ug/l	20.00	19.68	98	
1,4-Dichlorobenzene	ug/l	20.00	19.24	96	
Dichlorodifluoromethane	ug/l	20.00	18.11	91	
1,1-Dichloroethane	ug/l	20.00	17.00	85	
1,2-Dichloroethane	ug/l	20.00	21.74	109	
1,1-Dichloroethene	ug/l	20.00	20.01	100	
trans-1,2-Dichloroethene	ug/l	20.00	14.39	72	
1,2-Dichloropropane	ug/l	20.00	19.50	98	
cis-1,3-Dichloropropene	ug/l	20.00	20.42	102	
trans-1,3-Dichloropropene	ug/l	20.00	19.72	99	
Diisopropyl ether	ug/l	20.00	19.94	100	
Ethylbenzene	ug/l	20.00	20.83	104	
Methylene chloride	ug/l	20.00	17.86	89	

Date: 12/21/05

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

LABORATORY CONTROL SAMPLE: 926459256

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Methyl-tert-butyl ether	ug/l	20.00	19.94	100	
1,1,2,2-Tetrachloroethane	ug/l	20.00	21.60	108	
Tetrachloroethene	ug/l	20.00	19.88	99	
Toluene	ug/l	20.00	20.11	101	
1,1,1-Trichloroethane	ug/l	20.00	21.02	105	
1,1,2-Trichloroethane	ug/l	20.00	21.33	107	
Trichloroethene	ug/l	20.00	20.58	103	
Trichlorofluoromethane	ug/l	20.00	17.78	89	
Vinyl chloride	ug/l	20.00	21.40	107	
Xylene (Total)	ug/l	60.00	62.86	105	
m&p-Xylene	ug/l	40.00	41.55	104	
o-Xylene	ug/l	20.00	21.31	107	
1-Chloro-3-fluorobenzene (S)				107	

MATRIX SPIKE: 926459280

Parameter	Units	926440389 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
Benzene	ug/l	0	20.00	20.08	100	
Bromodichloromethane	ug/l	0	20.00	22.51	112	
Bromoform	ug/l	0	20.00	20.66	103	
Bromomethane	ug/l	0	20.00	14.06	70	
Carbon tetrachloride	ug/l	0	20.00	20.65	103	
Chlorobenzene	ug/l	0	20.00	19.44	97	
Chloroethane	ug/l	0	20.00	16.65	83	
Chloroform	ug/l	0	20.00	18.50	92	
Chloromethane	ug/l	0	20.00	14.80	74	
Dibromochloromethane	ug/l	0	20.00	18.86	94	
1,2-Dichlorobenzene	ug/l	0	20.00	19.60	98	
1,3-Dichlorobenzene	ug/l	0	20.00	18.65	93	
1,4-Dichlorobenzene	ug/l	0	20.00	19.69	98	
Dichlorodifluoromethane	ug/l	0	20.00	16.79	84	
1,1-Dichloroethane	ug/l	0	20.00	19.53	98	
1,2-Dichloroethane	ug/l	8.590	20.00	28.68	100	
1,1-Dichloroethene	ug/l	0	20.00	28.79	144	
trans-1,2-Dichloroethene	ug/l	0	20.00	17.85	89	

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

MATRIX SPIKE: 926459280

Parameter	Units	926440389 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
1,2-Dichloropropane	ug/l	0	20.00	19.39	97	
cis-1,3-Dichloropropene	ug/l	0	20.00	17.74	89	
trans-1,3-Dichloropropene	ug/l	0	20.00	18.13	91	
Diisopropyl ether	ug/l	0	20.00	22.97	115	
Ethylbenzene	ug/l	0	20.00	21.39	107	
Methylene chloride	ug/l	0	20.00	18.75	94	
Methyl-tert-butyl ether	ug/l	0	20.00	20.28	101	
1,1,2,2-Tetrachloroethane	ug/l	0	20.00	19.29	96	
Tetrachloroethene	ug/l	0	20.00	17.96	90	
Toluene	ug/l	0	20.00	20.20	101	
1,1,1-Trichloroethane	ug/l	0	20.00	21.17	106	
1,1,2-Trichloroethane	ug/l	0	20.00	18.35	92	
Trichloroethene	ug/l	0	20.00	18.87	94	
Trichlorofluoromethane	ug/l	0	20.00	17.90	90	
Vinyl chloride	ug/l	0	20.00	20.81	104	
Xylene (Total)	ug/l	0	60.00	63.11	105	
o-Xylene	ug/l	0	40.00	41.55	104	
m-Xylene	ug/l	0	20.00	21.57	108	
1-Chloro-3-fluorobenzene (S)					101	

SAMPLE DUPLICATE: 926459272

Parameter	Units	926438318 Result	DUP Result	RPD	Footnotes
Benzene	ug/l	ND	ND	NC	
Bromodichloromethane	ug/l	ND	ND	NC	
Bromoform	ug/l	ND	ND	NC	
Bromomethane	ug/l	ND	ND	NC	
Carbon tetrachloride	ug/l	ND	ND	NC	
Chlorobenzene	ug/l	ND	ND	NC	
Chloroethane	ug/l	ND	ND	NC	
Chloroform	ug/l	ND	ND	NC	
Chloromethane	ug/l	ND	ND	NC	
Dibromochloromethane	ug/l	ND	ND	NC	
1,2-Dichlorobenzene	ug/l	ND	ND	NC	
1,3-Dichlorobenzene	ug/l	ND	ND	NC	

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

SAMPLE DUPLICATE: 926459272

Parameter	Units	926438318 Result	DUP Result	RPD	Footnotes
1,4-Dichlorobenzene	ug/l	ND	ND	NC	
Dichlorodifluoromethane	ug/l	ND	ND	NC	
1,1-Dichloroethane	ug/l	ND	ND	NC	
1,2-Dichloroethane	ug/l	ND	ND	NC	
1,1-Dichloroethene	ug/l	ND	ND	NC	
trans-1,2-Dichloroethene	ug/l	ND	ND	NC	
1,2-Dichloropropane	ug/l	ND	ND	NC	
cis-1,3-Dichloropropene	ug/l	ND	ND	NC	
trans-1,3-Dichloropropene	ug/l	ND	ND	NC	
Diisopropyl ether	ug/l	ND	ND	NC	
Ethylbenzene	ug/l	ND	ND	NC	
Methylene chloride	ug/l	ND	ND	NC	
Methyl-tert-butyl ether	ug/l	ND	ND	NC	
1,1,2,2-Tetrachloroethane	ug/l	ND	ND	NC	
Tetrachloroethene	ug/l	ND	ND	NC	
Toluene	ug/l	ND	ND	NC	
1,1,1-Trichloroethane	ug/l	ND	ND	NC	
1,1,2-Trichloroethane	ug/l	ND	ND	NC	
Trichloroethene	ug/l	ND	ND	NC	
Trichlorofluoromethane	ug/l	ND	ND	NC	
Vinyl chloride	ug/l	ND	ND	NC	
Xylene (Total)	ug/l	2.300	2.200	2	
m&p-Xylene	ug/l	2.300	2.200	2	
o-Xylene	ug/l	ND	ND	NC	
1-Chloro-3-fluorobenzene (S)	%	100	105		

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

QC Batch: 143051
QC Batch Method: EPA 625 SF
Associated Lab Samples: 926419615

Analysis Method: EPA 625
Analysis Description: Extractables in Water by 625

METHOD BLANK: 926436411
Associated Lab Samples: 926419615

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Acenaphthene	ug/l	ND	5.0	
Acenaphthylene	ug/l	ND	5.0	
Anthracene	ug/l	ND	5.0	
Benzidine	ug/l	ND	50.	
Benzo(k)fluoranthene	ug/l	ND	5.0	
Benzo(b)fluoranthene	ug/l	ND	5.0	
Benzo(a)anthracene	ug/l	ND	5.0	
Benzo(g,h,i)perylene	ug/l	ND	5.0	
Benzo(a)pyrene	ug/l	ND	5.0	
4-Bromophenylphenyl ether	ug/l	ND	5.0	
ylbenzylphthalate	ug/l	ND	5.0	
-Chloro-3-methylphenol	ug/l	ND	5.0	
bis(2-Chloroethoxy)methane	ug/l	ND	5.0	
bis(2-Chloroethyl) ether	ug/l	ND	5.0	
bis(2-Chloroisopropyl) ether	ug/l	ND	5.0	
2-Chloronaphthalene	ug/l	ND	5.0	
2-Chlorophenol	ug/l	ND	5.0	
4-Chlorophenylphenyl ether	ug/l	ND	5.0	
Chrysene	ug/l	ND	5.0	
Dibenz(a,h)anthracene	ug/l	ND	5.0	
1,2-Dichlorobenzene	ug/l	ND	5.0	
1,3-Dichlorobenzene	ug/l	ND	5.0	
1,4-Dichlorobenzene	ug/l	ND	5.0	
3,3'-Dichlorobenzidine	ug/l	ND	10.	
2,4-Dichlorophenol	ug/l	ND	5.0	
Diethylphthalate	ug/l	ND	5.0	
2,4-Dimethylphenol	ug/l	ND	5.0	
Dimethylphthalate	ug/l	ND	5.0	
Di-n-butylphthalate	ug/l	ND	5.0	
4,6-Dinitro-2-methylphenol	ug/l	ND	25.	
2,4-Dinitrophenol	ug/l	ND	25.	

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

METHOD BLANK: 926436411
Associated Lab Samples: 926419615

Parameter	Units	Blank Result	Reporting Limit	Footnotes
2,4-Dinitrotoluene	ug/l	ND	5.0	
2,6-Dinitrotoluene	ug/l	ND	5.0	
Di-n-octylphthalate	ug/l	ND	5.0	
bis(2-Ethylhexyl)phthalate	ug/l	ND	5.0	
Fluoranthene	ug/l	ND	5.0	
Fluorene	ug/l	ND	5.0	
Hexachloro-1,3-butadiene	ug/l	ND	5.0	
Hexachlorobenzene	ug/l	ND	5.0	
Hexachlorocyclopentadiene	ug/l	ND	10.	
Hexachloroethane	ug/l	ND	5.0	
Indeno(1,2,3-cd)pyrene	ug/l	ND	5.0	
Isophorone	ug/l	ND	5.0	
Naphthalene	ug/l	ND	5.0	
Nitrobenzene	ug/l	ND	5.0	
2-Nitrophenol	ug/l	ND	5.0	
[illegible]itrophenol	ug/l	ND	25.	
[illegible]-Nitrosodimethylamine	ug/l	ND	5.0	
N-Nitroso-di-n-propylamine	ug/l	ND	5.0	
N-Nitrosodiphenylamine	ug/l	ND	5.0	
Pentachlorophenol	ug/l	ND	25.	
Phenanthrene	ug/l	ND	5.0	
Phenol	ug/l	ND	5.0	
Pyrene	ug/l	ND	5.0	
1,2,4-Trichlorobenzene	ug/l	ND	5.0	
2,4,6-Trichlorophenol	ug/l	ND	5.0	
Nitrobenzene-d5 (S)	%	69		
2-Fluorobiphenyl (S)	%	58		
Terphenyl-d14 (S)	%	90		
Phenol-d5 (S)	%	26		
2-Fluorophenol (S)	%	50		
2,4,6-Tribromophenol (S)	%	97		

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

LABORATORY CONTROL SAMPLE: 926356130

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Acenaphthene	ug/l	50.00	30.64	61	
Acenaphthylene	ug/l	50.00	30.69	61	
Anthracene	ug/l	50.00	35.39	71	
Benzidine	ug/l	100.00	13.51	14	
Benzo(k)fluoranthene	ug/l	50.00	27.26	54	
Benzo(b)fluoranthene	ug/l	50.00	27.04	54	
Benzo(a)anthracene	ug/l	50.00	36.99	74	
Benzo(g,h,i)perylene	ug/l	50.00	54.54	109	
Benzo(a)pyrene	ug/l	50.00	32.93	66	
4-Bromophenylphenyl ether	ug/l	50.00	34.14	68	
Butylbenzylphthalate	ug/l	50.00	31.81	64	
4-Chloro-3-methylphenol	ug/l	50.00	30.89	62	
bis(2-Chloroethoxy)methane	ug/l	50.00	33.66	67	
bis(2-Chloroethyl) ether	ug/l	50.00	31.40	63	
bis(2-Chloroisopropyl) ether	ug/l	50.00	34.47	69	
2-Chloronaphthalene	ug/l	50.00	31.81	64	
hlorophenol	ug/l	50.00	29.42	59	
-Chlorophenylphenyl ether	ug/l	50.00	33.33	67	
Chrysene	ug/l	50.00	35.06	70	
Dibenz(a,h)anthracene	ug/l	50.00	41.72	83	
1,2-Dichlorobenzene	ug/l	50.00	21.26	42	
1,3-Dichlorobenzene	ug/l	50.00	19.41	39	
1,4-Dichlorobenzene	ug/l	50.00	19.59	39	
3,3'-Dichlorobenzidine	ug/l	100.00	35.83	36	
2,4-Dichlorophenol	ug/l	50.00	28.50	57	
Diethylphthalate	ug/l	50.00	37.06	74	
2,4-Dimethylphenol	ug/l	50.00	30.01	60	
Dimethylphthalate	ug/l	50.00	33.35	67	
Di-n-butylphthalate	ug/l	50.00	44.44	89	
4,6-Dinitro-2-methylphenol	ug/l	50.00	34.29	69	
2,4-Dinitrophenol	ug/l	50.00	25.67	51	
2,4-Dinitrotoluene	ug/l	50.00	11.81	24	1
2,6-Dinitrotoluene	ug/l	50.00	35.50	71	
Di-n-octylphthalate	ug/l	50.00	30.61	61	
bis(2-Ethylhexyl)phthalate	ug/l	50.00	32.31	65	
Fluoranthene	ug/l	50.00	42.03	84	
Fluorene	ug/l	50.00	31.21	62	

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

LABORATORY CONTROL SAMPLE: 926356130

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Hexachloro-1,3-butadiene	ug/l	50.00	20.71	41	
Hexachlorobenzene	ug/l	50.00	36.75	74	
Hexachlorocyclopentadiene	ug/l	50.00	23.65	47	
Hexachloroethane	ug/l	50.00	20.10	40	
Indeno(1,2,3-cd)pyrene	ug/l	50.00	41.18	82	
Isophorone	ug/l	50.00	80.95	162	
Naphthalene	ug/l	50.00	24.53	49	
Nitrobenzene	ug/l	50.00	34.27	68	
2-Nitrophenol	ug/l	50.00	27.81	56	
4-Nitrophenol	ug/l	50.00	15.54	31	
N-Nitrosodimethylamine	ug/l	50.00	23.34	47	
N-Nitroso-di-n-propylamine	ug/l	50.00	38.03	76	
N-Nitrosodiphenylamine	ug/l	50.00	31.91	64	
Pentachlorophenol	ug/l	50.00	32.28	65	
Phenanthrene	ug/l	50.00	32.17	64	
Phenol	ug/l	50.00	13.27	26	
ene	ug/l	50.00	27.13	54	
2,4-Trichlorobenzene	ug/l	50.00	22.06	44	
2,4,6-Trichlorophenol	ug/l	50.00	34.37	69	
Nitrobenzene-d5 (S)				75	
2-Fluorobiphenyl (S)				71	
Terphenyl-d14 (S)				71	
Phenol-d5 (S)				26	
2-Fluorophenol (S)				44	
2,4,6-Tribromophenol (S)				91	

LABORATORY CONTROL SAMPLE: 926387374

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Acenaphthene	ug/l	50.00	35.40	71	
Acenaphthylene	ug/l	50.00	35.41	71	
Anthracene	ug/l	50.00	38.02	76	
Benzidine	ug/l	100.00	5.079	5	1
Benzo(k)fluoranthene	ug/l	50.00	37.01	74	
Benzo(b)fluoranthene	ug/l	50.00	32.34	65	

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

LABORATORY CONTROL SAMPLE: 926387374

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Benzo(a)anthracene	ug/l	50.00	34.65	69	
Benzo(g,h,i)perylene	ug/l	50.00	21.29	43	
Benzo(a)pyrene	ug/l	50.00	37.21	74	
4-Bromophenylphenyl ether	ug/l	50.00	36.34	73	
Butylbenzylphthalate	ug/l	50.00	35.01	70	
4-Chloro-3-methylphenol	ug/l	50.00	37.18	74	
bis(2-Chloroethoxy)methane	ug/l	50.00	33.98	68	
bis(2-Chloroethyl) ether	ug/l	50.00	33.90	68	
bis(2-Chloroisopropyl) ether	ug/l	50.00	32.10	64	
2-Chloronaphthalene	ug/l	50.00	32.67	65	
2-Chlorophenol	ug/l	50.00	59.97	120	
4-Chlorophenylphenyl ether	ug/l	50.00	37.61	75	
Chrysene	ug/l	50.00	33.90	68	
Dibenz(a,h)anthracene	ug/l	50.00	24.90	50	
1,2-Dichlorobenzene	ug/l	50.00	20.87	42	
1,3-Dichlorobenzene	ug/l	50.00	20.31	41	
-Dichlorobenzene	ug/l	50.00	21.27	42	
,3'-Dichlorobenzidine	ug/l	100.00	23.19	23	
2,4-Dichlorophenol	ug/l	50.00	33.76	68	
Diethylphthalate	ug/l	50.00	39.20	78	
2,4-Dimethylphenol	ug/l	50.00	36.93	74	
Dimethylphthalate	ug/l	50.00	36.19	72	
Di-n-butylphthalate	ug/l	50.00	46.45	93	
4,6-Dinitro-2-methylphenol	ug/l	50.00	35.12	70	
2,4-Dinitrophenol	ug/l	50.00	27.36	55	
2,4-Dinitrotoluene	ug/l	50.00	36.87	74	
2,6-Dinitrotoluene	ug/l	50.00	37.37	75	
Di-n-octylphthalate	ug/l	50.00	29.90	60	
bis(2-Ethylhexyl)phthalate	ug/l	50.00	35.45	71	
Fluoranthene	ug/l	50.00	42.96	86	
Fluorene	ug/l	50.00	35.90	72	
Hexachloro-1,3-butadiene	ug/l	50.00	22.21	44	
Hexachlorobenzene	ug/l	50.00	37.36	75	
Hexachlorocyclopentadiene	ug/l	50.00	15.22	30	
Hexachloroethane	ug/l	50.00	21.08	42	
Indeno(1,2,3-cd)pyrene	ug/l	50.00	25.60	51	
Isophorone	ug/l	50.00	36.45	73	

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

LABORATORY CONTROL SAMPLE: 926387374

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Naphthalene	ug/l	50.00	29.93	60	
Nitrobenzene	ug/l	50.00	33.29	67	
2-Nitrophenol	ug/l	50.00	30.52	61	
4-Nitrophenol	ug/l	50.00	20.70	41	
N-Nitrosodimethylamine	ug/l	50.00	16.91	34	
N-Nitroso-di-n-propylamine	ug/l	50.00	37.90	76	
N-Nitrosodiphenylamine	ug/l	50.00	42.90	86	
Pentachlorophenol	ug/l	50.00	42.71	85	
Phenanthrene	ug/l	50.00	36.63	73	
Phenol	ug/l	50.00	14.62	29	
Pyrene	ug/l	50.00	35.58	71	
1,2,4-Trichlorobenzene	ug/l	50.00	25.23	50	
2,4,6-Trichlorophenol	ug/l	50.00	38.67	77	
Nitrobenzene-d5 (S)				70	
2-Fluorobiphenyl (S)				73	
Terphenyl-d14 (S)				80	
nol-d5 (S)				31	
Fluorophenol (S)				40	
2,4,6-Tribromophenol (S)				101	

LABORATORY CONTROL SAMPLE: 926397787

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Acenaphthene	ug/l	50.00	36.44	73	
Acenaphthylene	ug/l	50.00	37.01	74	
Anthracene	ug/l	50.00	38.89	78	
Benzidine	ug/l	100.00	4.062	4	1
Benzo(k)fluoranthene	ug/l	50.00	41.05	82	
Benzo(b)fluoranthene	ug/l	50.00	33.61	67	
Benzo(a)anthracene	ug/l	50.00	39.69	79	
Benzo(g,h,i)perylene	ug/l	50.00	35.14	70	
Benzo(a)pyrene	ug/l	50.00	41.15	82	
4-Bromophenylphenyl ether	ug/l	50.00	34.90	70	
Butylbenzylphthalate	ug/l	50.00	39.00	78	
4-Chloro-3-methylphenol	ug/l	50.00	35.47	71	

Date: 12/21/05

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

LABORATORY CONTROL SAMPLE: 926397787

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
bis(2-Chloroethoxy)methane	ug/l	50.00	32.61	65	
bis(2-Chloroethyl) ether	ug/l	50.00	31.31	63	
bis(2-Chloroisopropyl) ether	ug/l	50.00	29.89	60	
2-Chloronaphthalene	ug/l	50.00	35.65	71	
2-Chlorophenol	ug/l	50.00	29.34	59	
4-Chlorophenylphenyl ether	ug/l	50.00	36.83	74	
Chrysene	ug/l	50.00	38.88	78	
Dibenz(a,h)anthracene	ug/l	50.00	38.03	76	
1,2-Dichlorobenzene	ug/l	50.00	25.46	51	
1,3-Dichlorobenzene	ug/l	50.00	24.26	48	
1,4-Dichlorobenzene	ug/l	50.00	24.70	49	
3,3'-Dichlorobenzidine	ug/l	100.00	31.93	32	
2,4-Dichlorophenol	ug/l	50.00	33.78	68	
Diethylphthalate	ug/l	50.00	38.21	76	
-Dimethylphenol	ug/l	50.00	34.55	69	
methylphthalate	ug/l	50.00	35.88	72	
Di-n-butylphthalate	ug/l	50.00	44.67	89	
,6-Dinitro-2-methylphenol	ug/l	50.00	37.53	75	
2,4-Dinitrophenol	ug/l	50.00	35.87	72	
2,4-Dinitrotoluene	ug/l	50.00	37.17	74	
2,6-Dinitrotoluene	ug/l	50.00	36.43	73	
Di-n-octylphthalate	ug/l	50.00	39.30	79	
bis(2-Ethylhexyl)phthalate	ug/l	50.00	41.46	83	
Fluoranthene	ug/l	50.00	38.93	78	
Fluorene	ug/l	50.00	37.21	74	
Hexachloro-1,3-butadiene	ug/l	50.00	23.45	47	
Hexachlorobenzene	ug/l	50.00	34.43	69	
Hexachlorocyclopentadiene	ug/l	50.00	24.55	49	
Hexachloroethane	ug/l	50.00	22.59	45	
Indeno(1,2,3-cd)pyrene	ug/l	50.00	36.90	74	
Isophorone	ug/l	50.00	39.40	79	
Naphthalene	ug/l	50.00	30.51	61	
Nitrobenzene	ug/l	50.00	31.90	64	
2-Nitrophenol	ug/l	50.00	30.99	62	
4-Nitrophenol	ug/l	50.00	12.33	25	
N-Nitrosodimethylamine	ug/l	50.00	19.12	38	
N-Nitroso-di-n-propylamine	ug/l	50.00	34.84	70	

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

LABORATORY CONTROL SAMPLE: 926397787

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
N-Nitrosodiphenylamine	ug/l	50.00	38.38	77	
Pentachlorophenol	ug/l	50.00	39.92	80	
Phenanthrene	ug/l	50.00	37.60	75	
Phenol	ug/l	50.00	12.52	25	
Pyrene	ug/l	50.00	40.82	82	
1,2,4-Trichlorobenzene	ug/l	50.00	27.03	54	
2,4,6-Trichlorophenol	ug/l	50.00	36.35	73	
Nitrobenzene-d5 (S)				70	
2-Fluorobiphenyl (S)				82	
Terphenyl-d14 (S)				86	
Phenol-d5 (S)				27	
2-Fluorophenol (S)				41	
2,4,6-Tribromophenol (S)				76	

LABORATORY CONTROL SAMPLE: 926421066

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Acenaphthene	ug/l	50.00	34.41	69	
Acenaphthylene	ug/l	50.00	35.43	71	
Anthracene	ug/l	50.00	37.43	75	
Benzidine	ug/l	100.00	23.87	24	
Benzo(k)fluoranthene	ug/l	50.00	36.07	72	
Benzo(b)fluoranthene	ug/l	50.00	34.14	68	
Benzo(a)anthracene	ug/l	50.00	37.50	75	
Benzo(g,h,i)perylene	ug/l	50.00	32.82	66	
Benzo(a)pyrene	ug/l	50.00	38.27	76	
4-Bromophenylphenyl ether	ug/l	50.00	32.87	66	
Butylbenzylphthalate	ug/l	50.00	36.53	73	
4-Chloro-3-methylphenol	ug/l	50.00	34.32	69	
bis(2-Chloroethoxy)methane	ug/l	50.00	30.51	61	
bis(2-Chloroethyl) ether	ug/l	50.00	29.50	59	
bis(2-Chloroisopropyl) ether	ug/l	50.00	27.66	55	
2-Chloronaphthalene	ug/l	50.00	32.67	65	
2-Chlorophenol	ug/l	50.00	27.19	54	
4-Chlorophenylphenyl ether	ug/l	50.00	35.47	71	

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

LABORATORY CONTROL SAMPLE: 926421066

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Chrysene	ug/l	50.00	35.82	72	
Dibenz(a,h)anthracene	ug/l	50.00	34.34	69	
1,2-Dichlorobenzene	ug/l	50.00	23.23	46	
1,3-Dichlorobenzene	ug/l	50.00	21.97	44	
1,4-Dichlorobenzene	ug/l	50.00	22.80	46	
3,3'-Dichlorobenzidine	ug/l	100.00	33.76	34	
2,4-Dichlorophenol	ug/l	50.00	31.37	63	
Diethylphthalate	ug/l	50.00	36.76	74	
2,4-Dimethylphenol	ug/l	50.00	31.63	63	
Dimethylphthalate	ug/l	50.00	34.25	68	
Di-n-butylphthalate	ug/l	50.00	39.29	79	
4,6-Dinitro-2-methylphenol	ug/l	50.00	36.51	73	
2,4-Dinitrophenol	ug/l	50.00	34.92	70	
2,4-Dinitrotoluene	ug/l	50.00	36.29	73	
Dinitrotoluene	ug/l	50.00	35.41	71	
Di-n-octylphthalate	ug/l	50.00	37.67	75	
is(2-Ethylhexyl)phthalate	ug/l	50.00	38.09	76	
luoranthene	ug/l	50.00	37.05	74	
Fluorene	ug/l	50.00	35.58	71	
Hexachloro-1,3-butadiene	ug/l	50.00	20.55	41	
Hexachlorobenzene	ug/l	50.00	32.89	66	
Hexachlorocyclopentadiene	ug/l	50.00	21.65	43	
Hexachloroethane	ug/l	50.00	21.17	42	
Indeno(1,2,3-cd)pyrene	ug/l	50.00	33.95	68	
Isophorone	ug/l	50.00	36.72	73	
Naphthalene	ug/l	50.00	27.01	54	
Nitrobenzene	ug/l	50.00	29.26	58	
2-Nitrophenol	ug/l	50.00	28.02	56	
4-Nitrophenol	ug/l	50.00	14.33	29	
N-Nitrosodimethylamine	ug/l	50.00	19.34	39	
N-Nitroso-di-n-propylamine	ug/l	50.00	33.58	67	
N-Nitrosodiphenylamine	ug/l	50.00	38.08	76	
Pentachlorophenol	ug/l	50.00	39.10	78	
Phenanthrene	ug/l	50.00	36.36	73	
Phenol	ug/l	50.00	12.99	26	
Pyrene	ug/l	50.00	37.67	75	
1,2,4-Trichlorobenzene	ug/l	50.00	23.12	46	

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

LABORATORY CONTROL SAMPLE: 926421066

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
2,4,6-Trichlorophenol	ug/l	50.00	35.29	71	
Nitrobenzene-d5 (S)				61	
2-Fluorobiphenyl (S)				73	
Terphenyl-d14 (S)				77	
Phenol-d5 (S)				27	
2-Fluorophenol (S)				43	
2,4,6-Tribromophenol (S)				70	

LABORATORY CONTROL SAMPLE: 926436429

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Acenaphthene	ug/l	50.00	41.32	83	
Acenaphthylene	ug/l	50.00	41.57	83	
Anthracene	ug/l	50.00	45.55	91	
Benzidine	ug/l	100.00	11.85	12	
Benzo(k)fluoranthene	ug/l	50.00	43.19	86	
Benzo(b)fluoranthene	ug/l	50.00	38.05	76	
Benzo(a)anthracene	ug/l	50.00	43.67	87	
Benzo(g,h,i)perylene	ug/l	50.00	45.61	91	
Benzo(a)pyrene	ug/l	50.00	44.17	88	
4-Bromophenylphenyl ether	ug/l	50.00	41.55	83	
Butylbenzylphthalate	ug/l	50.00	41.10	82	
4-Chloro-3-methylphenol	ug/l	50.00	38.88	78	
bis(2-Chloroethoxy)methane	ug/l	50.00	37.96	76	
bis(2-Chloroethyl) ether	ug/l	50.00	37.50	75	
bis(2-Chloroisopropyl) ether	ug/l	50.00	37.99	76	
2-Chloronaphthalene	ug/l	50.00	37.20	74	
2-Chlorophenol	ug/l	50.00	35.08	70	
4-Chlorophenylphenyl ether	ug/l	50.00	41.20	82	
Chrysene	ug/l	50.00	45.36	91	
Dibenz(a,h)anthracene	ug/l	50.00	46.85	94	
1,2-Dichlorobenzene	ug/l	50.00	26.41	53	
1,3-Dichlorobenzene	ug/l	50.00	23.85	48	
1,4-Dichlorobenzene	ug/l	50.00	25.20	50	
3,3'-Dichlorobenzidine	ug/l	100.00	37.90	38	

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

LABORATORY CONTROL SAMPLE: 926436429

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
2,4-Dichlorophenol	ug/l	50.00	37.19	74	
Diethylphthalate	ug/l	50.00	43.15	86	
2,4-Dimethylphenol	ug/l	50.00	38.00	76	
Dimethylphthalate	ug/l	50.00	40.91	82	
Di-n-butylphthalate	ug/l	50.00	43.11	86	
4,6-Dinitro-2-methylphenol	ug/l	50.00	45.15	90	
2,4-Dinitrophenol	ug/l	50.00	36.40	73	
2,4-Dinitrotoluene	ug/l	50.00	44.79	90	
2,6-Dinitrotoluene	ug/l	50.00	42.64	85	
Di-n-octylphthalate	ug/l	50.00	40.45	81	
bis(2-Ethylhexyl)phthalate	ug/l	50.00	46.43	93	
Fluoranthene	ug/l	50.00	41.20	82	
Fluorene	ug/l	50.00	42.43	85	
Hexachloro-1,3-butadiene	ug/l	50.00	25.14	50	
achlorobenzene	ug/l	50.00	40.85	82	
achlorocyclopentadiene	ug/l	50.00	28.27	56	
exachloroethane	ug/l	50.00	23.77	48	
ndeno(1,2,3-cd)pyrene	ug/l	50.00	46.47	93	
Isophorone	ug/l	50.00	39.46	79	
Naphthalene	ug/l	50.00	34.21	68	
Nitrobenzene	ug/l	50.00	37.78	76	
2-Nitrophenol	ug/l	50.00	37.51	75	
4-Nitrophenol	ug/l	50.00	17.52	35	
N-Nitrosodimethylamine	ug/l	50.00	21.57	43	
N-Nitroso-di-n-propylamine	ug/l	50.00	47.05	94	
N-Nitrosodiphenylamine	ug/l	50.00	47.14	94	
Pentachlorophenol	ug/l	50.00	55.65	111	
Phenanthrene	ug/l	50.00	42.39	85	
Phenol	ug/l	50.00	14.94	30	
Pyrene	ug/l	50.00	42.29	85	
1,2,4-Trichlorobenzene	ug/l	50.00	29.55	59	
2,4,6-Trichlorophenol	ug/l	50.00	44.76	90	
Nitrobenzene-d5 (S)				79	
2-Fluorobiphenyl (S)				86	
Terphenyl-d14 (S)				95	
Phenol-d5 (S)				33	
2-Fluorophenol (S)				53	

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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

LABORATORY CONTROL SAMPLE: 926436429

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
2,4,6-Tribromophenol (S)				113	2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 926356148 926356155

Parameter	Units	926345026 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
Acenaphthene	ug/l	0	100.00	63.83	50.38	64	50	24	
Acenaphthylene	ug/l	0	100.00	63.48	53.48	64	54	17	
Anthracene	ug/l	0	100.00	70.68	64.02	71	64	10	
Benzidine	ug/l	0	200.00	25.67	28.57	13	14	11	
Benzo(k)fluoranthene	ug/l	0	100.00	52.35	49.51	52	50	6	
Benzo(b)fluoranthene	ug/l	0	100.00	56.43	48.76	56	49	15	
Benzo(a)anthracene	ug/l	0	100.00	76.11	68.95	76	69	10	
zo(g,h,i)perylene	ug/l	0	100.00	56.57	65.14	57	65	14	
zo(a)pyrene	ug/l	0	100.00	66.95	59.96	67	60	11	
Bromophenylphenyl ether	ug/l	0	100.00	69.97	61.78	70	62	12	
tylbenzylphthalate	ug/l	0	100.00	66.54	63.30	66	63	5	
4-Chloro-3-methylphenol	ug/l	0	100.00	77.40	65.84	77	66	16	
bis(2-Chloroethoxy)methane	ug/l	0	100.00	72.16	57.85	72	58	22	
bis(2-Chloroethyl) ether	ug/l	0	100.00	70.16	46.02	70	46	42	3
bis(2-Chloroisopropyl) ether	ug/l	0	100.00	78.09	52.69	78	53	39	3
2-Chloronaphthalene	ug/l	0	100.00	62.58	45.04	63	45	33	1,4
2-Chlorophenol	ug/l	0	100.00	64.96	46.61	65	47	33	3
4-Chlorophenylphenyl ether	ug/l	0	100.00	70.62	58.50	71	58	19	
Chrysene	ug/l	0	100.00	70.67	65.23	71	65	8	
Dibenz(a,h)anthracene	ug/l	0	100.00	70.91	81.74	71	82	14	
1,2-Dichlorobenzene	ug/l	0	100.00	44.48	20.38	44	20	74	1,4
1,3-Dichlorobenzene	ug/l	0	100.00	41.54	17.85	42	18	80	3
1,4-Dichlorobenzene	ug/l	0	100.00	43.04	18.91	43	19	78	1,4
3,3'-Dichlorobenzidine	ug/l	0	100.00	63.32	63.09	63	63	0	
2,4-Dichlorophenol	ug/l	0	100.00	65.53	51.23	66	51	24	
Diethylphthalate	ug/l	0	100.00	77.35	70.65	77	71	9	
2,4-Dimethylphenol	ug/l	0	100.00	72.86	58.05	73	58	23	
Dimethylphthalate	ug/l	0	100.00	70.40	65.04	70	65	8	
Di-n-butylphthalate	ug/l	6.358	100.00	77.38	79.86	71	74	3	
4,6-Dinitro-2-methylphenol	ug/l	0	100.00	65.09	59.23	65	59	9	

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Pace Analytical Services, Inc.
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Asheville, NC 28804
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QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 926356148 926356155

Parameter	Units	926345026 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
2,4-Dinitrophenol	ug/l	0	100.00	55.38	51.62	55	52	7	
2,4-Dinitrotoluene	ug/l	0	100.00	25.65	23.16	26	23	10	1,1
2,6-Dinitrotoluene	ug/l	0	100.00	74.35	69.20	74	69	7	
Di-n-octylphthalate	ug/l	0	100.00	65.42	61.30	65	61	7	
bis(2-Ethylhexyl)phthalate	ug/l	1.385	100.00	68.58	64.17	67	63	7	
Fluoranthene	ug/l	0	100.00	72.73	66.88	73	67	8	
Fluorene	ug/l	0	100.00	66.89	55.21	67	55	19	
Hexachloro-1,3-butadiene	ug/l	0	100.00	43.04	16.51	43	16	89	1,4
Hexachlorobenzene	ug/l	0	100.00	73.00	63.07	73	63	15	
Hexachlorocyclopentadiene	ug/l	0	100.00	37.96	27.22	38	27	33	3
Hexachloroethane	ug/l	0	100.00	43.60	16.65	44	17	89	1,4
Indeno(1,2,3-cd)pyrene	ug/l	0	100.00	63.58	68.48	64	68	7	
Isophorone	ug/l	0	100.00	178.6	147.1	179	147	19	
Naphthalene	ug/l	0	100.00	51.99	29.93	52	30	54	3
[illegible]trobenzene	ug/l	0	100.00	77.87	56.11	78	56	32	3
[illegible]itrophenol	ug/l	0	100.00	61.60	45.95	62	46	29	
[illegible]-Nitrophenol	ug/l	0	100.00	36.30	33.45	36	34	8	
[illegible]-Nitrosodimethylamine	ug/l	0	100.00	47.34	35.86	47	36	28	
N-Nitroso-di-n-propylamine	ug/l	0	100.00	85.55	66.68	86	67	25	
N-Nitrosodiphenylamine	ug/l	0	100.00	71.92	62.98	72	63	13	
Pentachlorophenol	ug/l	0	100.00	78.27	72.22	78	72	8	
Phenanthrene	ug/l	0	100.00	65.83	58.26	66	58	12	
Phenol	ug/l	0	100.00	31.25	23.67	31	24	28	
Pyrene	ug/l	0	100.00	64.86	59.41	65	59	9	
1,2,4-Trichlorobenzene	ug/l	0	100.00	46.52	21.25	46	21	75	1,4
2,4,6-Trichlorophenol	ug/l	0	100.00	74.65	66.53	75	66	12	
Nitrobenzene-d5 (S)						86	63		
2-Fluorobiphenyl (S)						74	61		
Terphenyl-d14 (S)						82	75		
Phenol-d5 (S)						30	23		
2-Fluorophenol (S)						48	34		
2,4,6-Tribromophenol (S)						102	91		

Date: 12/21/05

Asheville Certification IDs
NC Wastewater 40
NC Drinking Water 37712
SC 99030

REPORT OF LABORATORY ANALYSIS
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Phone: 828.254.7176
Fax: 828.252.4618

QUALITY CONTROL DATA

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

QC Batch: 144527
QC Batch Method: SM 3030C
Analysis Method: EPA 200.7
Analysis Description: 3030C Metals, ICP, Trace
Associated Lab Samples: 926419615

METHOD BLANK: 926421645
Associated Lab Samples: 926419615

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Chromium, 3030C	mg/l	ND	0.0020	
Lead, 3030C	mg/l	ND	0.0050	

LABORATORY CONTROL SAMPLE: 926421652

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
[illegible]omium, 3030C	mg/l	0.5000	0.4480	90	
[illegible]d, 3030C	mg/l	0.5000	0.4340	87	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 926421660 926421678

Parameter	Units	926419615 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
Chromium, 3030C	mg/l	0.00193	0.5000	0.4950	0.4930	99	98	0	
Lead, 3030C	mg/l	0.00947	0.5000	0.4900	0.4890	96	96	0	

Date: 12/21/05

Asheville Certification IDs
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NC Drinking Water 37712
SC 99030

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Fax: 828.252.4618

Lab Project Number: 92108989
Client Project ID: NCDOT 34950.1.1 Parcel 15

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

LCS(D)	Laboratory Control Sample (Duplicate)
MS(D)	Matrix Spike (Duplicate)
DUP	Sample Duplicate
ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
RPD	Relative Percent Difference
(S)	Surrogate
[1]	The surrogate and/or spike recovery was outside acceptance limits.
[2]	Acid surrogate recovery outside of control limits. The data was accepted based on valid recovery of the two remaining acid surrogates.
[3]	RPD value was outside control limits, however both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
[4]	The calculated RPD was outside QC acceptance limits.

Date: 12/21/05

Asheville Certification IDs
NC Wastewater 40
NC Drinking Water 37712
SC 99030

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SC 99006
FL NELAP E87627

Pace Analytical

CHAIN-OF-CUSTODY

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Page: 1 of 1

897903

Section A
Required Client Information:

Company: Solutions - IES
Address: 1101 Nowell Rd
Raleigh, NC 27607
Email To: sknox@solutions-ies.com
Phone: 9198731060 Fax: 9198731074
Requested Due Date/TAT: standard

Section B
Required Project Information:

Report To: Keri Knox
Copy To:
Purchase Order No.: WO3 34950.1.1
Project Name: NCDOT Parcel 15
Project Number: 34950.0010.NCDOT

Section C
Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager: LBM
Pace Profile #: 8469 - 5

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☒ UST ☐ RCRA ☐ Other

SITE LOCATION

☐GA ☐IL ☐IN ☐MI ☐MN ☒NC
☐OH ☐SC ☐WI ☐OTHER

Section D
Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

SAMPLE ID (One Character per box. (A-Z, 0-9 / -) Samples IDs MUST BE UNIQUE)	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis: 8021+602, 625, EDB, VOA, 1,4-D+ECA 3020	Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project Number / Lab I.D
1 15-MW	WT	G	12-6	1515				9	3			6								2469715
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
D. Hardin / Solutions-IES	12/6	1200	[illegible]	12-7-05	1200
	12-7-05	1530	[illegible]	12/7	15:14

SAMPLE CONDITION

Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: S. Parham
SIGNATURE of SAMPLER: [signature]
DATE Signed (MM / DD / YY): 12/7/05

Additional Comments:

SEE REVERSE SIDE FOR INSTRUCTIONS

Data File: \\WT\chem\hpmsd1.i\121705.b\12170513.D
Report Date: 19-Dec-2005 13:39

Pace Analytical Services, Inc.

TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: 92-SOLUTIONS
Lab Smp Id: 926419615
Operator : BET
Sample Location:
Sample Matrix: WATER
Analysis Type: SV
Inj Date: 17-DEC-2005 19:47

Client SDG: 92108989
Client Smp ID: 15-MW
Sample Date: 06-DEC-2005
Sample Point:
Date Received:07-DEC-2005 00:00
Level: LOW

Number TICs found: 2

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	14.649	7.50	J
2.		Unknown	17.975	5.30	J

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Page: 1 of 1

897906

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Section A
Required Client Information:

Company: Solutions-IES
Address: 1101 Nowell Rd
Raleigh NC 27607
Email To: sknox@solutions-ies.com
Phone: (919)873-2410 Fax: 919-873-1074
Requested Due Date/TAT:

Section B
Required Project Information:

Report To: Sheri R. Knox
Copy To:
Purchase Order No.: WBS 34950 1.1
Project Name: NCDOT Parcel
Project Number: 2470 USAC NCDOT

Section C
Invoice Information:

Attention:
Company Name: NCDOT
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☒ UST ☐ RCRA ☐ Other

SITE LOCATION: ☐ GA ☐ IL ☐ IN ☐ MI ☐ MN ☒ NC ☐ OH ☐ SC ☐ WI ☐ OTHER

Section D
Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / -) Samples IDs MUST BE UNIQUE)	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis: 5310 Solid	5310 DRO	3550 Waste	Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project Number / Lab I.D
1	15-1(6-8)	SL	G	12/2	1300				4	2						2		1	1				
2	15-2(6-8)				1305																		
3	15-3(6-8)				1310																		
4	15-4(6-8)				1310																		
5	15-5(6-8)				1315																		
6	15-8(6-8)				1305																		
7	15-9(6-7)				1315																		
8	15-10(6-8)				1300																		
9	15-11(6-8)				1316																		
10	15-12(4-6)				1320																		
11																							
12																							

Additional Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
S. Knox / Solutions-IES	12/6/17	1127	K. Lyon / Pace	12/6/17	1127

SAMPLE CONDITION

Temp	Received on Ice Y/N	Custody Sealed Cooler Y/N	Samples Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: [illegible]
DATE Signed (MM / DD / YY):

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Page: 1 of 1

897903

Section A Required Client Information:

Company	
Address	
Email To:	
Phone	Fax
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	
Copy To:	
Purchase Order No.:	
Project Name:	
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☒ UST ☐ RCRA ☐ Other_____

SITE LOCATION ☐ GA ☐ IL ☐ IN ☐ MI ☐ MN ☒ NC ☐ OH ☐ SC ☐ WI ☐ OTHER _____

Section D Required Client Information

SAMPLE ID

One Character per box. (A-Z, 0-9 / .-) Samples IDs MUST BE UNIQUE

Valid Matrix Codes: MATRIX / CODE; DRINKING WATER / DW; WATER / WT; WASTE WATER / WW; PRODUCT / P; SOIL/SOLID / SL; OIL / OL; WIPE / WP; AIR / AR; OTHER / OT; TISSUE / TS

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Filtered (Y/N)	Requested Analysis:	Residual Chlorine (Y/N)	Pace Project Number / Lab I.D.
1	15-MW	[illegible]	G	1-6	[illegible]				1	2			6								
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Additional Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	[illegible]	[illegible]			

SAMPLE CONDITION

	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
°C		Cooler	

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

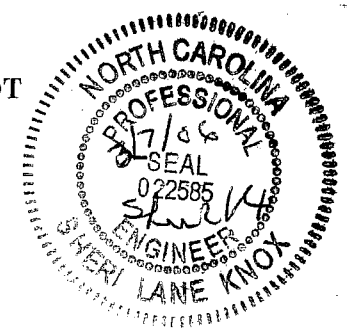
SIGNATURE of SAMPLER: DATE S

PRELIMINARY SITE ASSESSMENT
PARCEL 007, JULIA RATLIFF PROPERTY
1913 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
NCDOT PROJECT: U-3456
WBS ELEMENT: 34950.1.1

Prepared for:
NC Department of Transportation
Geotechnical Engineering Unit
GeoEnvironmental Section
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Prepared by:
Solutions-IES
1101 Nowell Road
Raleigh, North Carolina 27607

Solutions-IES Project No. 2730.05A2.NDOT



Heather Anderson Markell
Environmental Specialist I

Sheri L. Knox, P.E.
Project Manager

January 20, 2006

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3.0 FIELD ACTIVITIES 1

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TABLE 2 – SUMMARY OF SOIL ANALYTICAL RESULTS

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FIGURE 2 – SITE MAP

FIGURE 3 –BORING LOCATIONS WITH ESTIMATED EXTENT OF SOIL CONTAMINATION

APPENDICES

APPENDIX A – PHOTOGRAPHS

APPENDIX B – GEOPHYSICAL INVESTIGATION

APPENDIX C – BORING LOGS

APPENDIX D – LABORATORY ANALYTICAL REPORT

1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) is widening Fayetteville Road (US-1) in Rockingham, Richmond County, North Carolina. The project may require the NCDOT to acquire additional property for roadway construction. On November 3, 2005, Solutions-IES submitted a proposal to conduct Preliminary Site Assessments (PSAs) for 14 parcels of land within the proposed right of way that contain or reportedly contained underground storage tanks (USTs), or are situated within areas of concern identified by NCDOT. This report summarizes the results of field and laboratory activities conducted during the PSA of a portion of the Julia Ratliff property (Study Area) located at 1913 Fayetteville Road (US Highway 1) in Rockingham, Richmond County, North Carolina. The site is identified by the NCDOT as Parcel 007 on the U-3456 roadway plans. The location of Parcel 007 is also identified on Figures 1 and 2. The scope of work executed at the site was performed in general accordance with Solutions-IES proposal NC05449P dated November 3, 2005, and initiated based on a Notice to Proceed issued by the NCDOT Geotechnical Engineering Unit dated November 7, 2005, under contract 7000005553, dated May 9, 2005.

2.0 BACKGROUND AND SITE DESCRIPTION

Parcel 007 is located at the north side of Fayetteville Road, just west of Roberdell Road (SR-1424). Revision of the right of way by the NCDOT may include the acquisition of a portion of Parcel 007 along the southeastern boundary of the property. According to the NCDOT, the property is the former location of a gas station. The original building for the gas station has been demolished and the lot is vacant. Reportedly, the status of the tanks is unknown. There is no physical address or facility ID number for the site. A single monitoring well was identified within the Study Area by NCDOT and Solutions-IES, but it is believed to be associated with the active gas station (Parcel 017) across Roberdell Road. NCDOT could not locate additional information referencing the site at the NCDENR Fayetteville Regional Office. Photographs of the Study Area are presented in Appendix A.

3.0 FIELD ACTIVITIES

Prior to mobilizing to the site to conduct subsurface sampling, Solutions-IES contacted North Carolina One Call to locate underground utilities in the Study Area of the site. Pyramid Environmental & Engineering, P.C. (Pyramid) was contracted to perform an electromagnetic survey of the subsurface in the

proposed right-of-way and easement area. The electromagnetic survey (EM61) was performed on November 12, 2005, using a Geonics EM61 instrument, and the survey identified various magnetic anomalies within the Study Area. A ground penetrating radar (GPR) survey was performed on November 23, 2005 utilizing a Geophysical Survey Systems SIR 2000 instrument. Two anomalies were investigated during the GPR survey, one identified as a probable UST, the other as a possible UST (Appendix B: Section 3.2). The possible UST anomaly could not be surveyed with GPR due to a "deep water puddle" on the surface. Images of these surveys are presented on Figure 4 and Figure 5 in Appendix B.

After reviewing the geophysical report, Solutions-IES mobilized to the site on December 6, 2005 to obtain soil samples from locations within the Study Area. Ms. Ratliff was contacted by phone prior to work at the site. Eight soil borings (borings 7-1 through 7-8) were advanced at the site in the locations depicted on Figure 3. Each of these borings was advanced to total depth of 8 feet below ground surface (ft bgs). Each boring was located within the Study Area established by NCDOT, situated within the existing northwestern right of way of the Fayetteville Road and Roberdell Road intersection (Figure 3). Borings were generally spaced 25-50 ft apart, except where additional borings were advanced delineate the extent of possible contamination. All borings at this site were advanced using a truck-mounted Geoprobe®.

A MacroCore® sampler, fitted with single-use, disposable polyvinyl chloride (PVC) liners, was used to collect soil samples at 4-foot intervals. Each soil sample was split into two aliquots. Each aliquot was placed in a separate resealable plastic bag. One bag was placed on ice for possible laboratory analysis, while the other bag was placed at ambient temperature for field screening with a flame ionization detector (FID). After approximately 20 minutes to allow accumulation of volatile organic compounds (VOCs) in the headspace of the latter bag, it was scanned with the FID. The FID readings were rounded to the nearest whole number and entered on the boring logs along with the soil description and indications of petroleum staining or odor, if present (Appendix C).

All borings at Parcel 007 were advanced from surface grade through approximately 3 inches of asphalt. Soils within borings 7-1, 7-2 and 7-3 consisted of dry, tan fine sand (Unified Soil Classification SP) to depths of 4 ft bgs, underlain to boring termination by dry, tan, clayey fine sand (Unified Soil Classification SC). Soils noted within boring 7-4, 7-6, 7-7, and 7-8 were identified as dry, tan and brown fine sand (SP) from surface grade to 2 ft bgs, underlain to boring termination by dry, tan/tan and gray, clayey fine sand (SC). Soils noted within borings 7-5 were identified as dry, tan, clayey fine sand (SC)

from surface grade to 8 ft bgs. Soils noted in borings 7-3, 7-6 and 7-7 at depths of 6 to 8 ft bgs had a faint petroleum odor. Soils noted within boring 7-8 at depths of 2 to 8 ft bgs had a petroleum odor.

Headspace screening of the soil samples collected from the Study Area ranged from not detected (0) to greater than 4,191 parts per million (ppm). The FID readings are shown on Table 1. The highest FID readings originated from soil samples collected from borings 7-3 (6-8 ft bgs), 7-8 (4-6 and 6-8 ft bgs) at concentrations greater than 4,191 ppm.

Soil samples for laboratory analysis were retained from borings 7-3 (6-8 ft bgs), 7-4 (6-8 ft bgs), 7-6 (6-8 ft bgs), 7-7 (6-8 ft bgs), and 7-8 (6-8 ft bgs). Samples from borings 7-3 and 7-8 were selected for analysis as they presented the highest FID measurements within the specific borings, and were more likely to provide evidence of a release at the site, if present. Samples from borings 7-4, 7-6 and 7-7 were selected for analysis to delineate the extent of possible contamination in the vicinity of borings 7-3 and 7-8. Soil samples selected for analysis were placed in laboratory-supplied containers and stored on ice pending shipment to Pace Analytical Services, Inc. (Pace) in Huntersville, NC under chain-of-custody control. The samples were submitted for analysis of gasoline range organics (GRO) and diesel range organics (DRO) total petroleum hydrocarbons (TPH) by EPA Modified Method 8015 with preparation methods 5030 and 3545, respectively.

Groundwater was not encountered at this site. A single monitoring well was identified at the site, but it is believed to be associated with the active gas station (Parcel 017) across the street. During Solutions-IES' field activities at the site the monitoring well was under water and inaccessible.

4.0 SAMPLING RESULTS

According to the laboratory analytical results, TPH DRO and TPH GRO were detected in two of the five soil samples submitted for chemical analysis at concentrations exceeding the NCDENR UST Section Action Level of 10 mg/kg. These soil samples were collected from borings 7-3 (6 to 8 ft bgs) and 7-8 (6 to 8 ft bgs). TPH DRO and TPH GRO were reported below the laboratory method detection limit in soil samples obtained from borings 7-4, 7-6 and 7-7. The analytical results are summarized in Table 2 and the laboratory reports are included in Appendix D.

5.0 DISCUSSION AND CONCLUSIONS

The electromagnetic survey conducted at Parcel 007 suggested the presence of two possible locations of metallic USTs, situated near the southeastern corner of the parcel. Paint marks at suspected tank locations were not observed by Solutions-IES. In addition, Solutions-IES did not observe evidence of USTs (e.g., fill port, drop tube, vent line) during the field work. Solutions-IES advanced eight soil borings to determine if soil within the Study Area has been impacted by petroleum contamination. Field observations and higher FID readings indicated the presence of elevated VOCs in soil samples collected from borings 7-3 and 7-8. According to the laboratory analytical results, TPH DRO and TPH GRO were detected in soil samples collected from borings 7-3 and 7-8 at concentrations exceeding the NCDENR UST Section Action Level of 10 mg/kg.

Based on assessment data, the lateral extent of petroleum impacted soil is estimated to encompass an area of approximately 35 ft by 50 ft in the vicinity of borings 7-3 and 7-8, at least to a depth of 8 ft bgs. These borings are located in the general vicinity of possible USTs identified by the geophysical survey. Based on this estimate, Solutions-IES calculated that a volume of impacted soil of approximately 14,000 cubic feet (520 cubic yards) has been impacted at concentrations in excess of the Action Level. Removal of the petroleum impacted soil may be necessary when roadway construction begins. At the time of roadway construction, the NCDOT transportation/disposal contactor may use different criteria for estimating the area of impacted soil.

It is possible that soil contamination extends vertically beyond 8 ft bgs to the water table. Since groundwater was not encountered in any of the soil borings, and the existing monitoring well was inaccessible at the time of the PSA, additional assessment would be necessary to further investigate the vertical extent of soil contamination and potential impact to groundwater.

TABLES

TABLE 1
SUMMARY OF FIELD SCREENING RESULTS FOR SOIL
Parcel 007 – Julia Ratliff Property
1913 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: December 6, 2005

Sample Depth Below Ground Surface	Soil Borings							
	7-1	7-2	7-3	7-4	7-5	7-6	7-7	7-8
	FID Reading (ppm)							
0 - 2 feet	0.3	0.3	0.4	2.7	0.3	0.1	ND	ND
2 - 4 feet	0.4	0.2	4.2	1.3	0.4	0.1	ND	3.6
4 - 6 feet	0.1	0.4	108.8	0.7	0.3	ND	ND	>4191
6 - 8 feet	2.1	0.5	>4191	0.8	0.1	ND	2.5	>4191

Notes:

1. FID readings were obtained with a Photovac MicroFID Flame Ionization Detector.
2. Samples denoted by shaded cells were submitted for laboratory analysis.
3. ND - Not detected

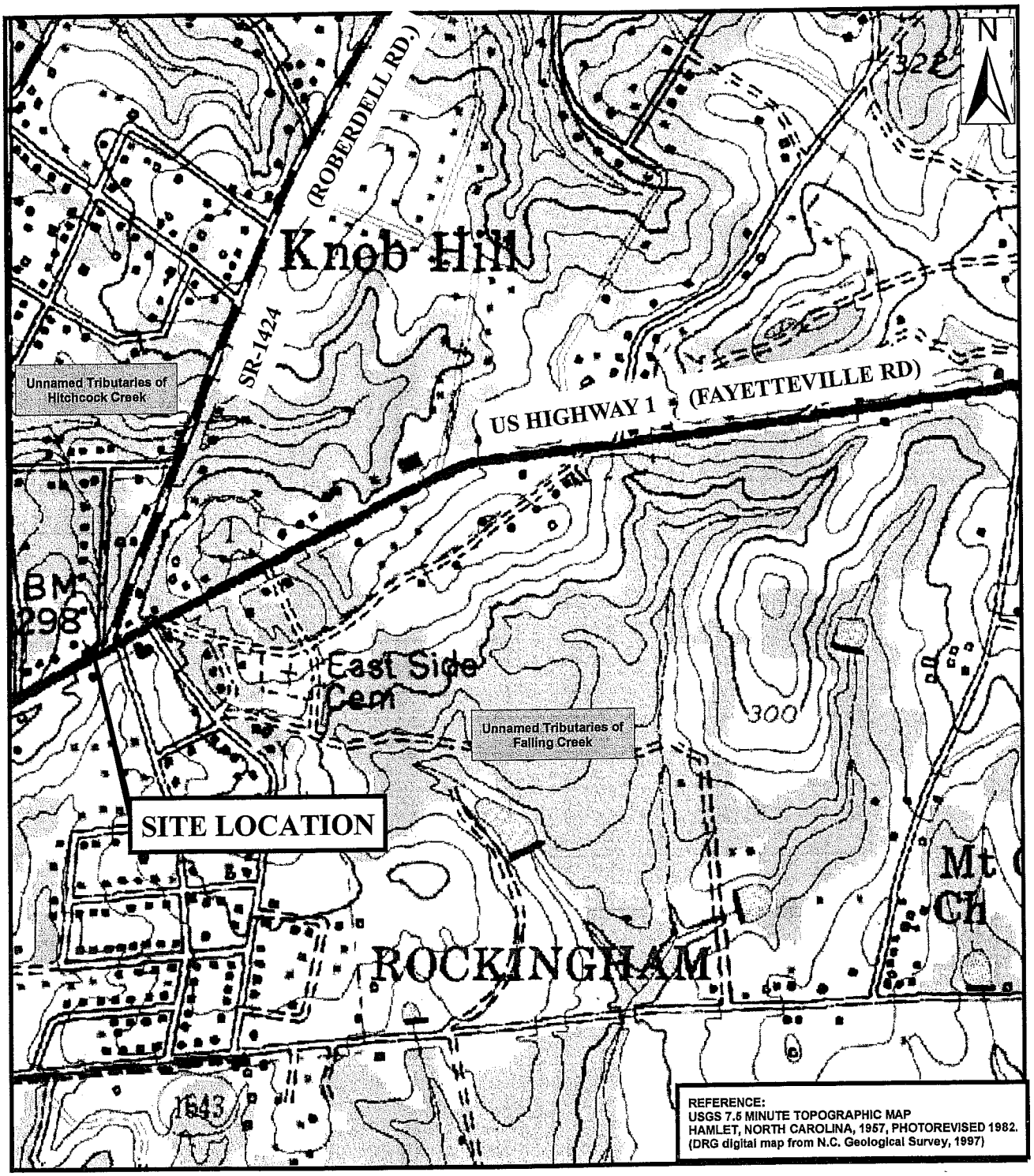
TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS
Parcel 007 – Julia Ratliff Property
1913 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: December 6, 2005

Sample Information		Total Petroleum Hydrocarbons	
Boring Number	Depth (Feet)	Gasoline Range[1] (mg/kg)	Diesel Range[2] (mg/kg)
7-3	6 - 8	1,600	59
7-4	6 - 8	<4.5	<5.6
7-6	6 - 8	<4.3	<5.7
7-7	6 - 8	<4.3	<5.7
7-8	6 - 8	1,500	110

Notes:

1. Total Petroleum Hydrocarbons (TPH) Method 5030/8015MOD - Gasoline Range Hydrocarbons
2. Total Petroleum Hydrocarbons (TPH) Method 3545/8015MOD - Diesel Range Hydrocarbons
3. Shaded concentrations exceed the NCDENR UST Section Action Level of 10 mg/kg.

FIGURES



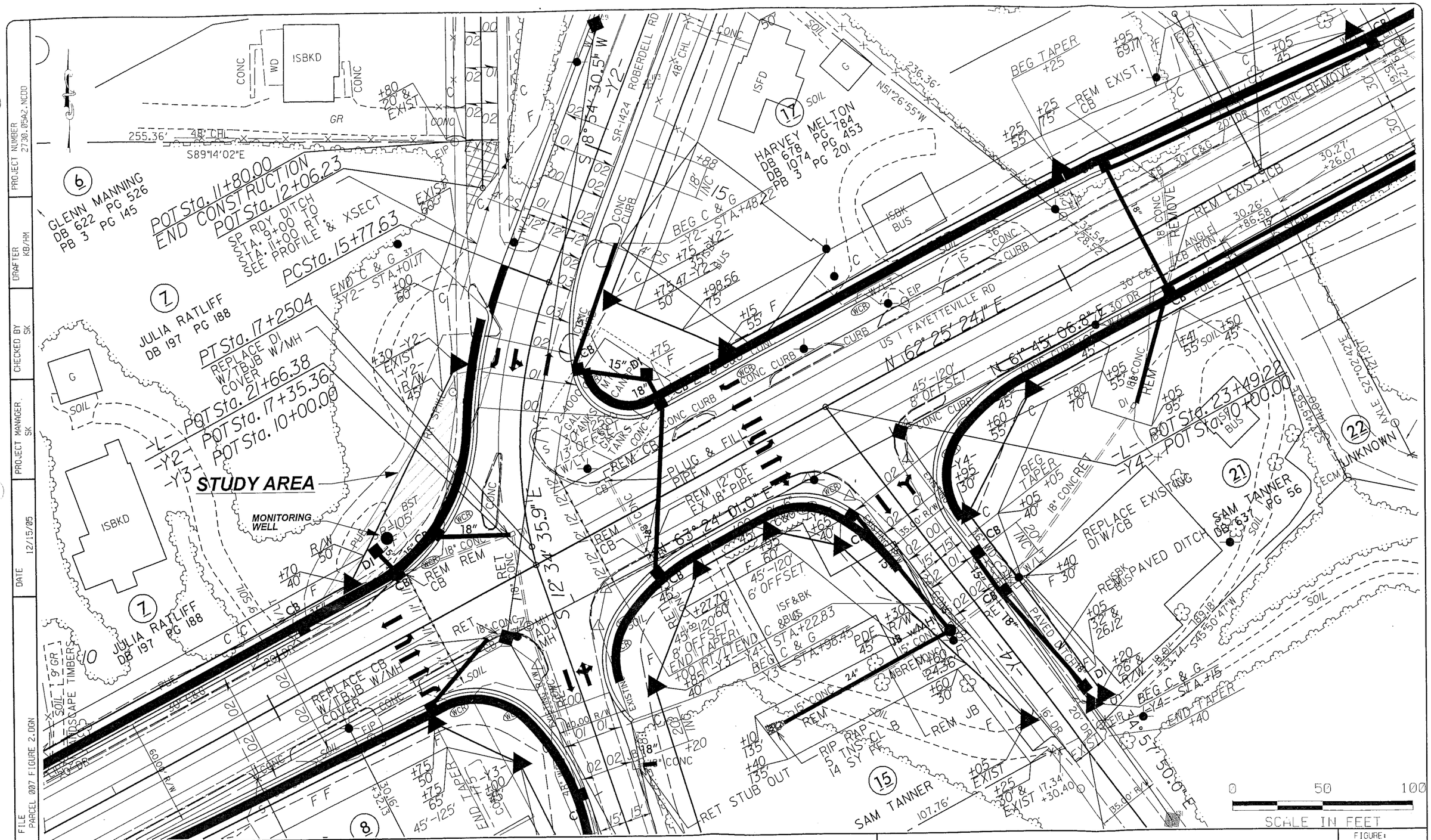
1:10,000

SITE LOCATION MAP
PARCEL # 007 - JULIA RATLIFF PROPERTY
1913 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
WBS ELEMENT NO. 34950.1.1(NCDOT PROJECT: U-3456)

Solutions-IES
Industrial & Environmental Services

1101 Nowell Road, Raleigh, NC 27609
Phone (919) 873-1060, Fax (919) 873-1074

Created by:	KBB	Project: 2730.05A2.NCDO	
Checked by:	BR	Date: 12/15/05	
File:	FIG1.mxd		
Software:	ESRI ArcMap 9.0	FIGURE	1



PROJECT NUMBER 2730.05A2.NCDD

DRAFTER KB/HM

CHECKED BY SK

PROJECT MANAGER SK

DATE 12/15/05

FILE PARCEL 007 FIGURE 2.DGN

Solutions-IES
Industrial & Environmental Services
1101 NOWELL ROAD
RALEIGH, NORTH CAROLINA 27607
TEL.: (919) 873-1060 FAX.: (919) 873-1074

SITE MAP
PARCEL # 007 - JULIA RATLIFF PROPERTY
1913 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
WBS ELEMENT NO. 34950.1.1 (NCDOT PROJECT: U-3456)

FIGURE: 2

PROJECT NUMBER 2730.05A2.NCDO | DRAFTER KB/HM | CHECKED BY SK | PROJECT MANAGER SK | DATE 12/15/05 | FILE PARCEL 007 FIGURE 3.DGN

SUMMARY OF SOIL ANALYTICAL RESULTS

Parcel 007 – Julia Ratliff Property
1913 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: December 6, 2005

Sample Information		Total Petroleum Hydrocarbons	
Boring Number	Depth (Feet)	Gasoline Range[1] (mg/kg)	Diesel Range[2] (mg/kg)
7-3	6 - 8	1,600	59
7-4	6 - 8	<4.5	<5.6
7-6	6 - 8	<4.3	<5.7
7-7	6 - 8	<4.3	<5.7
7-8	6 - 8	1,500	110

Notes:
1. Total Petroleum Hydrocarbons (TPH) Method 5030/8015MOD - Gasoline Range Hydrocarbons
2. Total Petroleum Hydrocarbons (TPH) Method 3545/8015MOD - Diesel Range Hydrocarbons
3. Shaded concentrations exceed the NCDENR UST Section Action Level of 10 mg/kg.

STUDY AREA

ESTIMATED EXTENT OF SOIL CONTAMINATION

SCALE IN FEET: 0 50 100

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LEGEND

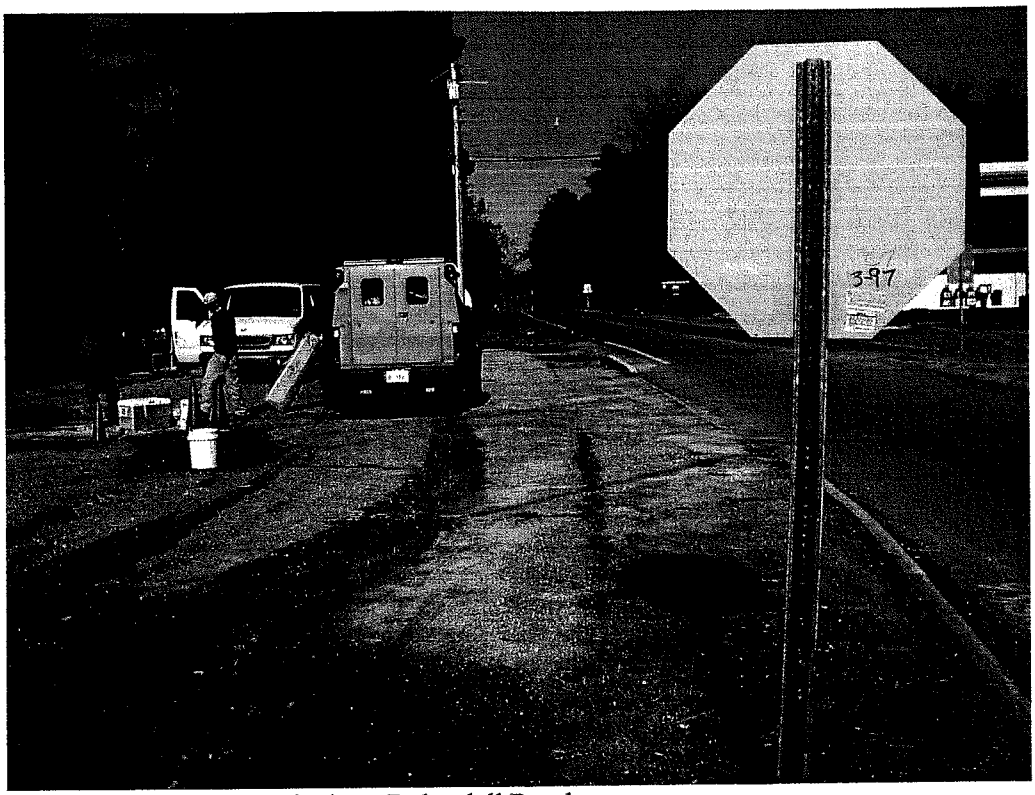
SB-5 BORING LOCATION

BORING LOCATIONS AND ESTIMATED EXTENT OF SOIL CONTAMINATION
PARCEL # 007 - JULIA RATLIFF PROPERTY
1913 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
WBS ELEMENT NO. 34950.1.1 (NCDOT PROJECT: U-3456)

FIGURE: 3

APPENDIX A

PHOTOGRAPHS



Photograph 1 – View facing north along Roberdell Road.

Photograph 2 – View from east to west along Fayetteville Road, the southern boundary of the site and study area. Study Area adjacent to and beneath the deep water puddle was the area investigated by GPR, during the Geophysical Survey.

APPENDIX B

GEOPHYSICAL INVESTIGATION

Pyramid Project # 2005292

GEOPHYSICAL INVESTIGATION REPORT

GEOPHYSICAL SURVEYS FOR THE DETECTION OF METALLIC UST'S

Rockingham, US 1 (Fayetteville Road) Sites
Rockingham, North Carolina
State Project Number U-3456

November 30, 2005

Report prepared for: Sheri Knox & Daniel Hirth
Solutions Industrial & Environmental Services Inc.
1101 Nowell Rd.
Raleigh, NC 27607

Prepared by: _____
Douglas Canavello, PG

Reviewed by: _____
Brett S. Higgins

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Solutions Industrial & Environmental Services Inc.
GEOPHYSICAL SURVEYS FOR THE DETECTION OF METALLIC UST'S
Rockingham, US 1 (Fayetteville Road) Sites
State Project Number U-3456

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1.0 INTRODUCTION

Pyramid Environmental & Engineering, PC conducted geophysical investigations for Solutions Industrial & Environmental Services, Inc. during the period of November 11-23, 2005, within the proposed Right-of-Way (ROW) areas at 13 sites in Rockingham, North Carolina. The work was done as part of the North Carolina Department of Transportation (NCDOT) road-widening project under State Project number U-3456 and WBS Element 34950.1.1. The sites are located along the north or south sides of US 1 (Fayetteville Road) from 0.25 miles west of SR-1424 (Roberdell Road) to 0.25 miles west of SR 1640 (Wiregrass Road). The geophysical surveys were conducted to determine if unknown metallic underground storage tanks (UST's) were present beneath the proposed ROW area of each site.

Solutions IES representative Mr. Walt Beckwith, PG provided maps during the week of November 1, 2005 that outlined the geophysical survey areas of each site. Solutions IES representatives, Ms. Sheri Knox, PE and Mr. Daniel Hirth, PG provided guidance during the geophysical investigations. Geophysical surveys were conducted at the following 13 sites:

Property Owner	Parcel	Present Use of Property
W. J. Barnhart Property	(Parcel 4)	Used Car Lot & Auto Repair Garage
Julia M. Ratliff Property	(Parcel 7)	Vacant Lot
Samuel D. Tanner Property	(Parcel 15)	Vacant Building & Lot
Harvey E. Melton Property	(Parcel 17)	BP Gas Station
Samuel D. Tanner Property	(Parcel 21)	Strip Mall
W. J. Barnhart Property	(Parcel 41A)	Vacant Building & Lot
Wesly Denham Property	(Parcel 42)	Havoline Carolina Quick Lube
William Ussery Property	(Parcel 57)	Vacant Building & Lot
Walter McCain Property	(Parcel 80)	Vacant Buildings & Lot
Leon Wall Property	(Parcel 99)	Vacant Building & Lot
James Porter Property	(Parcel 117)	Vacant Building & Lot
John Evans Property	(Parcel 126)	Custom Monument Company
Henry Ussery Property	(Parcel 140)	Bo Henry's Pawn Shop

Photos of the above sites are presented in **Figure 1**.

2.0 FIELD METHODOLOGY

Prior to conducting the geophysical investigations, a 10-foot by 10-foot survey grid was established across the proposed ROW areas of the 13 sites using water-based marking paint. These marks were used as X-Y coordinates for location control when collecting the geophysical data and establishing base maps for the geophysical results.

The geophysical investigations consisted of electromagnetic (EM) induction-metal detection surveys and ground penetrating radar (GPR) surveys. The EM surveys were performed using a Geonics EM61-MK1 metal detection instrument. According to the manufacture's specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. The EM61 data were digitally collected at each site along parallel northerly-southerly or easterly-westerly trending survey lines spaced five feet apart. The data were downloaded to a computer and reviewed in the office using the Geonics DAT61W and Surfer for Windows Version 7.0 software programs.

Contour plots of the EM61 bottom coil results and the EM61 differential results for each site are included in this report. The bottom coil results represent the most sensitive component of the EM61 instrument and detect metal objects regardless of size. The bottom coil response can be used to delineate metal conduits or utility lines, small, isolated metal objects, and areas containing insignificant metal debris.

The differential results are obtained from the difference between the top and bottom coils of the EM61 instrument. The differential results focus on the larger metal objects such as drums and UST's and ignore the smaller insignificant metal objects.

GPR surveys were conducted across selected EM61 differential anomalies and steel-reinforced concrete using a GSSI SIR-2000 unit equipped with a 400 MHz antenna. Surveys were also performed across several areas where parked vehicles that obstructed the EM61 survey had since been removed. GPR data were digitally collected in a continuous mode along X and/or Y survey lines, spaced two to five feet apart using a vertical scan of 512 samples, at a rate of 24 scans per second. A 110 MHz high pass filter and an 800 MHz low pass filter were used during data

acquisition with the 400 MHz antenna. GPR data were collected down to a maximum depth of approximately seven feet, based on an estimated two-way travel time of 7 nanoseconds per foot.

The GPR data were downloaded to a field computer and later reviewed in the office using Radprint software. The locations of GPR survey areas or individual GPR survey lines are shown as dashed, purple rectangles or solid purple lines, respectively on the EM61 differential contour plots. Photos of the EM61 and GPR instruments are shown in **Figure 2**. The approximate perimeters of probable or possible UST's , based on the geophysical results, were marked and labeled in the field using orange, water-based marking paint and pin flags when possible. The approximate locations of probable or possible UST's are shown on the EM61 contour plots as magenta-shaded rectangles.

During the weeks of November 14 and November 23, 2005, preliminary contour plots of the EM61 bottom coil and the differential results were emailed to Ms. Knox and Mr. Hirth.

3.0 DISCUSSION OF RESULTS

3.1 Parcel 4 - W. J. Barnhart Property

Parcel 4 is located on the southern side of Fayetteville Road and contains an active used car lot and auto repair garage. The western portion of the ROW area consists of asphalt with a concrete pad and the eastern portion of the ROW area consists of a sandy surface.

The bottom coil results and the differential results are presented in **Figure 3**. The linear anomaly intersecting grid coordinates X=50 Y=26, is probably in response to a buried utility line or conduit. The high amplitude anomaly centered near the former pump island area is probably in response to the steel-reinforced concrete pad. GPR surveys conducted across the steel-reinforced concrete pad did not detect any large metal objects. The geophysical results suggest that the ROW area at Parcel 4 does not contain metallic UST's.

3.2 Parcel 7 - Julia M. Ratliff Property

The Ratliff property is located northwest of the Fayetteville Road and Roberdell Road intersection. The parcel consists of an open, asphalt and grass-covered lot. The EM61 bottom coil results and the differential results are presented in **Figure 4**. The linear bottom coil, EM61 anomalies, such as the ones intersecting grid coordinates X=100 Y=60, X=110 Y=74, and X=130 Y=104, are probably in response to utility lines or conduits. GPR surveys conducted across a portion of the EM anomaly centered near grid coordinates X=65 Y=35, suggest the presence of at least one UST centered near X=71 Y=35, and buried approximately 3.2 feet below surface. Based on the GPR results, the probable UST appears to be approximately 10 feet long and 4 feet wide.

A large water puddle was present across the western portion of the EM anomaly when the GPR surveys were conducted that prevented GPR data to be collected across the entire anomaly. However, based on the location of the probable UST, the size of the EM61 anomaly suggests that a second UST may be centered near grid coordinates X=64 Y=32. Concrete was encountered approximately three inches below surface across this area, which prevented probing with a steel rod to determine whether a second UST exists. A photo showing the approximate location of the probable and possible UST's along with a GPR image obtained along survey line Y=35 are presented in **Figure 5**.

The geophysical results suggest that the remaining portion of the proposed ROW area at Parcel 7 does not contain metallic UST's.

3.3 Parcels 15 & 21 – Samuel D. Tanner Properties

Parcels 15 and 21 are located immediately southwest and southeast, respectively of the Fayetteville Road and Skyline Drive intersection. Parcel 15 consists primarily of grass and gravel surfaces, whereas the front portion of Parcel 21 consists of an asphalt-covered parking area. The EM61 bottom coil results and the differential results are presented in **Figures 6 and 7**, respectively.

GPR surveys across the EM61 anomaly centered near grid coordinates X=188 Y=135, (on Parcel 15) suggest the presence of a UST centered near X=188 Y=137, and buried approximately 1.4 feet below

surface. The surveys also suggest that the probable tank is approximately 10 feet long and 3.5 feet wide.

At Parcel 21, GPR surveys acquired across the EM anomaly centered near grid coordinates X=269 Y=173, suggest the presence of a UST buried approximately 1.7 feet below surface. The UST appears to be approximately 10 feet long and 5 feet wide. Photos showing the approximate locations of the probable UST's at Parcels 15 and 21, along with corresponding GPR images are presented in Figures **8 and 9**, respectively.

3.4 Harvey E. Melton Property (Parcel 17)

The Melton property is an active BP gas station and store located northeast of the Fayetteville Road and Roberdell Road intersection. The pump island area consists of a steel-reinforced concrete surface that overlies the known and active UST's, whereas the parking area adjacent to the store consists of asphalt pavement. A grass yard surrounds the back portion of the site.

The EM61 bottom coil results and the differential results are presented in Figures **10 and 11**, respectively. The linear bottom coil, EM anomalies are probably in response to utility lines or conduits. The majority of non-linear anomalies are probably in response to cultural features such as storm drains, signs, utility-related objects, buildings, metal fence, and steel-reinforced concrete.

GPR surveys were conducted across the concrete pavement and across the area containing the active UST's. The surveys delineated the footprint of the three and possibly four active UST's that are centered near grid coordinates X=54 Y=53, X=50 Y=43, and X=50 Y=34, respectively. The UST centered near grid coordinates X=54 Y=53, appears to be approximately 35 feet long and probably consists of two UST's instead of one. A GPR image obtained across the UST area is presented in **Figure 12** and suggests that the tanks lie approximately 3.5 to 3.9 feet below surface.

GPR data acquired across the EM61 anomaly centered near X=155 Y=144, delineated the footprint of the kerosene tank that is buried approximately 1.7 feet below surface. The kerosene tank appears to be approximately 9 to 10 feet long and 3.5 to 4 feet wide. A photo showing the location of the

tank is presented in Figure 12. The geophysical results suggest that the remainder of the surveyed area at Parcel 17 does not contain UST's.

3.5 W. J. Barnhart Property (Parcel 41A)

Parcel 41A is a former gas station site located on the north side of Fayetteville Road approximately 300 feet west of Lawson Street. The geophysical survey area consists of asphalt and grass-covered surfaces with a concrete pad located around a former pump island. The EM61 bottom coil results and the differential results are presented in **Figure 13**. The linear bottom coil, EM anomalies, such as the ones intersecting grid coordinates X=40 Y=50, X=45 Y=95, and X=70 Y=40, are probably in response to utility lines or conduits.

GPR surveys conducted across a portion of the linear anomaly centered at X=37 Y=22, suggest the probable presence of a wide-diameter (more than 2.5 feet wide) conduit or possibly a UST that is approximately 15 to 17 feet long and buried approximately 4.5 feet below surface. This probable wide-diameter conduit (centered near X=38 Y=25) is located parallel and contingent with the probable utility line identified by the EM61 survey, suggesting that the probable conduit is a utility-related object. However, the footprint of this probable utility-related conduit or possible UST was marked in the field with spray paint and pin flags.

GPR surveys conducted across the concrete pad adjacent to the pump island suggest that the EM61 anomalies recorded in this area are probable in response to steel-reinforcement in the concrete. With the exception of the probable utility-related feature found at X=38 Y=25, the geophysical findings obtained within the survey area at Parcel 41A suggest that the ROW area does not contain metallic UST's.

3.6 Wesly Denham Property (Parcel 42)

The Havoline Carolina Kwik Lube garage operates at Parcel 42, which is located on the south side of Fayetteville Road. Asphalt and grass surfaces cover much of the proposed ROW area with a small concrete pad located in front of the building. The EM61 bottom coil results and the differential

results are presented in **Figure 14**. The linear bottom coil, EM anomalies, such as the ones intersecting grid coordinates X=60 Y=58, and X=80 Y=85, are probably in response to utility lines or conduits. The high amplitude anomaly centered near grid coordinates X=40 Y=40, is in response to a vehicle that could not be moved for the geophysical investigations. The anomalies centered near X=40 Y=12, and X=120 Y=55, are in response to a nearby vehicle and steel-reinforced concrete, respectively.

The geophysical results obtained within the surveyed portion of Parcel 42 suggest that the proposed ROW area does not contain metallic UST's.

3.7 William Ussery Property (Parcel 57)

Parcel 57 is located on the north side of Fayetteville Road approximately 0.2 miles east of Old Aberdeen Road. The EM61 bottom coil results and the differential results are presented in **Figure 15**. A series of small, bottom coil anomalies were recorded along survey line Y=25 from grid coordinate X=5 to X=115, which may be in response to an east-west trending, buried utility line or conduit. Several other bottom coil anomalies were recorded across the survey area that are probably in response to miscellaneous metal debris.

All of the differential anomalies are probably in response to known cultural features or buried debris, suggesting that the proposed ROW area at Parcel 57 does not contain metallic UST's.

3.8 Walter McCain Property (Parcel 80)

Parcel 80 is located immediately northwest of the Fayetteville Road and Philadelphia Road intersection and consists of two vacant buildings surrounded by sandy or grass surfaces. A former pump island pad is located south of the eastern-most building. The EM61 bottom coil results and the differential results are presented in **Figure 16**.

GPR surveys conducted across the EM61 anomalies centered near grid coordinates X=170 Y=35, and X=194 Y=32, suggest the presence of two metallic UST's. The probable UST centered near X=170

Y=35, appears to be approximately 13 feet long, 3.5 feet wide, and buried approximately 1.1 feet below surface. The probable UST centered near grid coordinates X=192 Y=32 appears to be10 feet long, 3.5 feet wide, and buried approximately 1.9 feet below surface. The two probable UST's are separated by the former pump island pad. Photos of the UST locations along with an image of GPR survey line X=167.5 are presented in **Figure 17**.

Based upon the geophysical results, the remaining portion of the proposed ROW area does not appear to contain metallic UST's.

3.9 Leon Wall Property (Parcel 99)

Parcel 99 is located immediately southwest of the Fayetteville Road and Patterson Road intersection and consists mostly of a grass yard surrounding a vacant building. The EM61 bottom coil results and the differential results are presented in **Figure 18** in which a bottom coil, linear anomaly is recorded along survey line Y=230. This linear anomaly is probably in response to a utility line. GPR surveys conducted across the differential EM61 anomaly centered near X=92 Y=165, is probably in response to a water line adjoining the vacant building. GPR surveys were also conducted between the building and the former pump island pad that is centered near coordinates X=84 Y=222. The surveys suggest that the EM anomalies recorded in this portion of the survey area are probably in response to miscellaneous metal debris.

Based upon the geophysical results, the proposed ROW area at Parcel 99 does not appear to contain metallic UST's.

3.10 James Porter Property (Parcel 117)

Parcel 117 is a former gas station site located on the south side of Fayetteville Road approximately 0.25 miles west of Locklear Drive. The site consists primarily of grass and asphalt surfaces with a former pump island pad located in front of the vacant building. The EM61 bottom coil results and the differential results are presented in **Figure 19**. The linear, bottom coil anomaly intersecting grid coordinates X=130 Y=54, is probably in response to a buried utility line or conduit. The linear

anomaly intersecting X=40 Y=74, is probably in response to a metal fence. The remaining EM61 anomalies are probably in response to known cultural features and miscellaneous metal debris.

The geophysical investigation across the survey area of Parcel 117 suggests that the proposed ROW area does not appear to contain metallic UST's.

3.11 John Evans Property (Parcel 126)

The active Custom Monument Company operates on Parcel 126, which is located immediately northeast of the Fayetteville Road and LockLear Drive intersection. The geophysical survey area consists of grass and asphalt surfaces and the EM61 bottom coil results and the differential results are presented in **Figure 20**. All of the EM61 anomalies recorded across the surveyed portion of the site are probably in response to known cultural features, suggesting that the proposed ROW area does not contain metallic UST's.

3.12 Henry Ussery Property (Parcel 140)

Parcel 140 is a former gas station site, which is presently occupied by Bo Henry's Pawn Shop. The property is located immediately southeast of the Fayetteville Road and Port Street intersection. Much of the proposed ROW area consists of sandy or grass-covered surfaces. A concrete pad surrounds the north and west sides of the building. The EM61 bottom coil results and the differential results are presented in **Figure 21**. The linear bottom coil anomaly intersecting grid coordinates X=80 Y=80, is probably in response to a buried utility line.

GPR surveys conducted across the differential anomalies centered near coordinates X=90 Y=60, and X=107 Y=59, suggest the presence of two UST's buried approximately 1.7 feet and 1.8 feet below surface, respectively. Both probable UST's appear to be approximately 10 to 11 feet long and 4 to 4.5 feet wide. Probing with a steel rod across this area suggest the presence of a concrete slab buried approximately 0.3 feet below surface and overlying the UST's. A photo showing the locations of the probable UST along with GPR images are presented in **Figure 22**.

4.0 SUMMARY & CONCLUSIONS

Our evaluation of the EM61 and GPR data collected across the proposed ROW areas at the 13 sites along Fayetteville Road (US 1) in Rockingham, North Carolina provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic UST's within the surveyed portions of the proposed ROW areas of each site.

- GPR surveys were conducted across selected EM61 differential anomalies and across areas containing steel reinforced concrete.

- Linear EM61 anomalies at the 13 sites are probably in response to buried utility lines and/or conduits. The majority of non-linear anomalies are probably in response to known cultural features or miscellaneous metal objects.

- The geophysical results did not detect the presence of unknown metallic UST's within the surveyed portions of the proposed ROW areas at the following sites:

W. J. Barnhart Property	(Parcel 4)
W. J. Barnhart Property	(Parcel 41A)
Wesly Denham Property	(Parcel 42)
William Ussery Property	(Parcel 57)
Leon Wall Property	(Parcel 99)
James Porter Property	(Parcel 117)
John Evans Property	(Parcel 126)

- Julia M. Ratliff Property (Parcel 7): Geophysical results suggest the presence of a UST centered near X=71 Y=35, and buried approximately 3.2 feet below surface. Based on the GPR results, the probable UST appears to be approximately 10 feet long and 4 feet wide. A second UST may be present immediately west of this UST.

- Samuel D. Tanner Property (Parcel 15): Geophysical results suggest the presence of a UST centered near X=188 Y=137, and buried approximately 1.4 feet below surface. GPR surveys suggest that the probable tank is approximately 10 feet long and 3.5 feet wide.

- Harvey E. Melton Property (Parcel 17): Three and probably four active UST's are centered near grid coordinates X=54 Y=53, X=50 Y=43, and X=50 Y=34, respectively. The UST centered near grid coordinates X=54 Y=53, appears to be approximately 35 feet long and probably consists of two UST's instead of one. The known kerosene UST is centered near X=155 Y=144, and is buried approximately 1.7 feet below surface. The kerosene tank appears to be approximately 9 to 10 feet long and 3.5 to 4 feet wide.

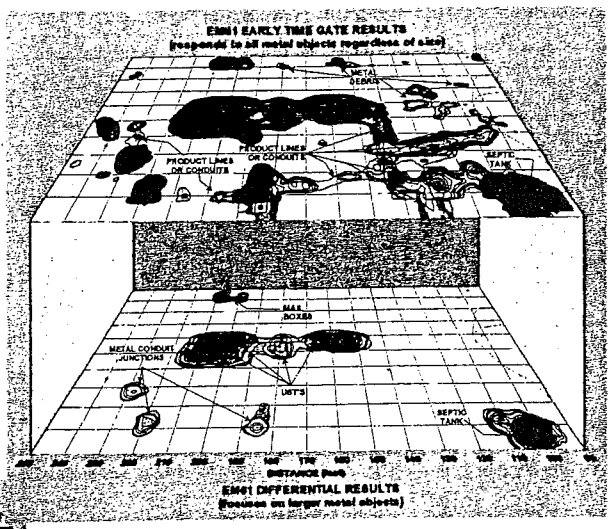
- Samuel D. Tanner Property (Parcel 21): Geophysical results suggest the presence of a UST centered near grid coordinates X=269 Y=173, and buried approximately 1.7 feet below surface. The UST appears to be approximately 10 feet long and 5 feet wide.

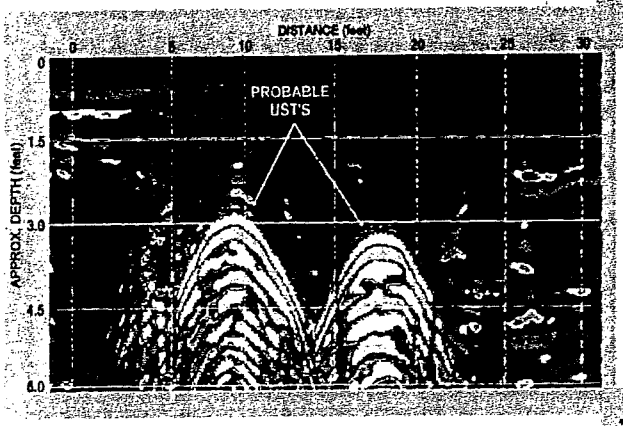
- Walter McCain Property (Parcel 80): Geophysical results suggest the presence of two UST's centered near grid coordinates X=170 Y=35, and X=194 Y=32. The probable UST centered near X=170 Y=35, appears to be approximately 13 feet long, 3.5 feet wide, and buried approximately 1.1 feet below surface. The probable UST centered near grid coordinates X=192 Y=32, appears to be 10 feet long, 3.5 feet wide, and buried approximately 1.9 feet below surface. The two probable UST's are separated by a former pump island pad.

- Henry Ussery Property (Parcel 140): Geophysical results suggest the presence of two UST's centered near coordinates X=90 Y=60, and X=107 Y=59, and buried approximately 1.7 feet and 1.8 feet below surface, respectively. Both probable UST's appear to be approximately 10 to 11 feet long and 4 to 4.5 feet wide.

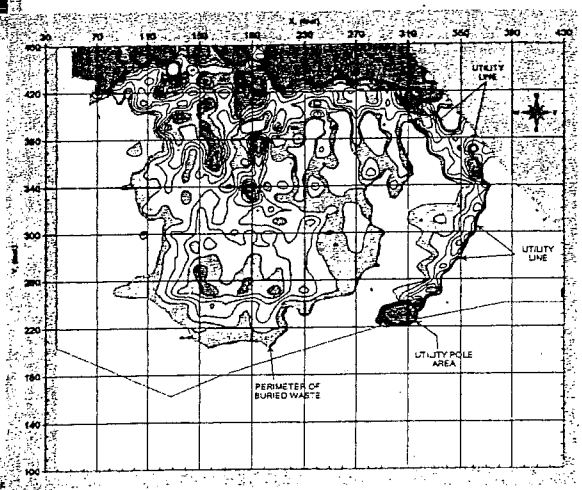
5.0 LIMITATIONS

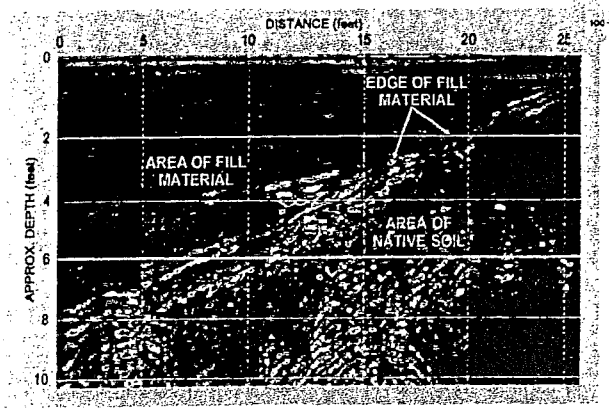
EM61 and GPR surveys have been performed and this report prepared for Solutions Industrial & Environmental Services, Inc. in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project do not conclusively define the locations of all metallic UST's but only suggest where some of the metallic UST's may be present. The EM61 and GPR anomalies, interpreted as possible UST's or tanks, may be attributed to other surface or subsurface conditions or cultural interference.


EM61 EARLY TIME GATE RESULTS
(responds to all metal objects regardless of size)
METAL DEBRIS
PRODUCT LINES OR CONDUITS
SEPTIC TANK
MAG BOXES
METAL CONDUIT JUNCTIONS
UST'S
SEPTIC TANK
DISTANCE (feet)
EM61 DIFFERENTIAL RESULTS
(focuses on larger metal objects)

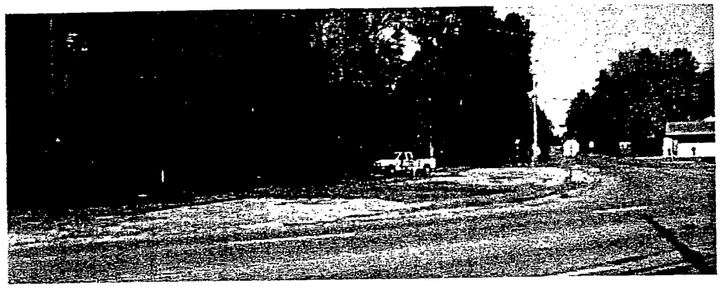

DISTANCE (feet)
0
5
10
15
20
25
30
PROBABLE UST'S
APPROX. DEPTH (feet)
0
1.5
3.0
4.5
6.0

FIGURES

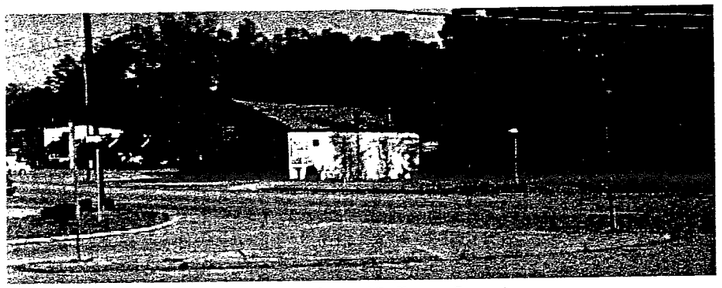

UTILITY LINE
UTILITY LINE
UTILITY POLE AREA
PERIMETER OF BURIED WASTE


DISTANCE (feet)
0
5
10
15
20
EDGE OF FILL MATERIAL
AREA OF FILL MATERIAL
AREA OF NATIVE SOIL
APPROX. DEPTH (feet)
0
2
4
6
8
10

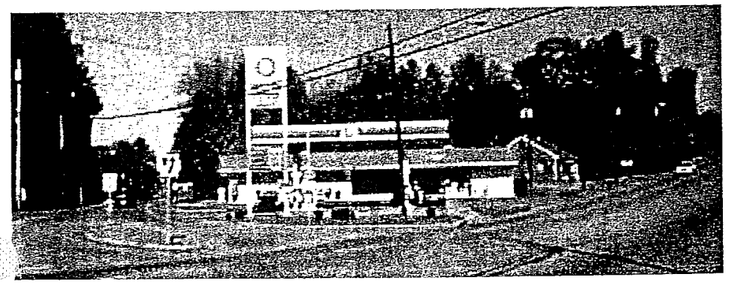
Parcel 4 - W. J. Barnhart Property



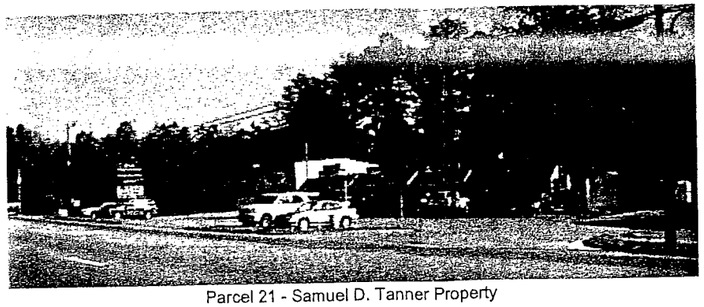
Parcel 7 - Julia M. Ratliff Property



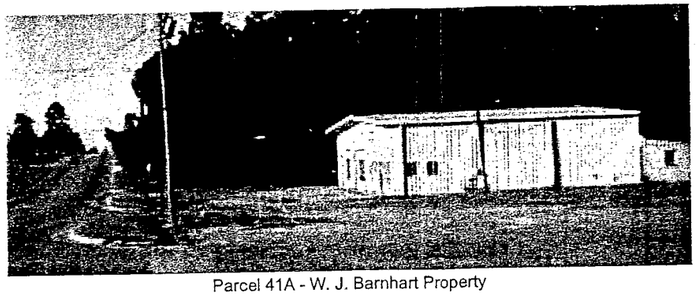
Parcel 15 - Samuel D. Tanner Property



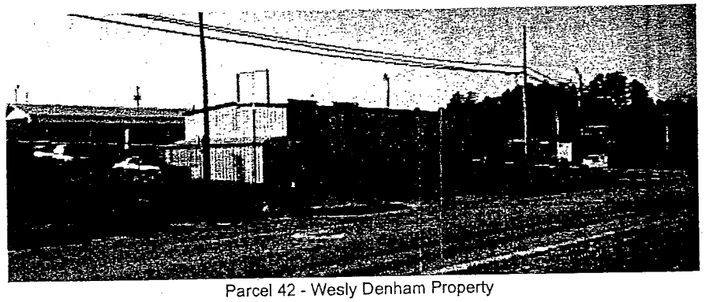
Parcel 17 - Harvey E. Melton Property



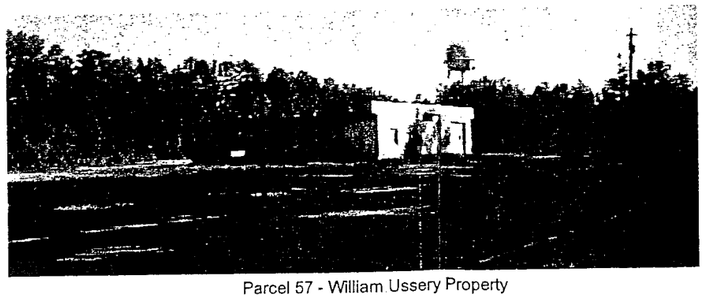
Parcel 21 - Samuel D. Tanner Property



Parcel 41A - W. J. Barnhart Property

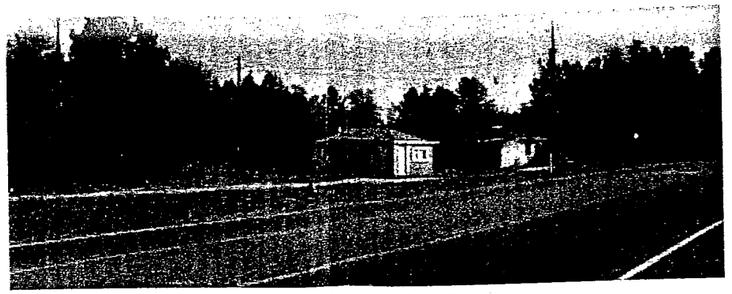


Parcel 42 - Wesly Denham Property



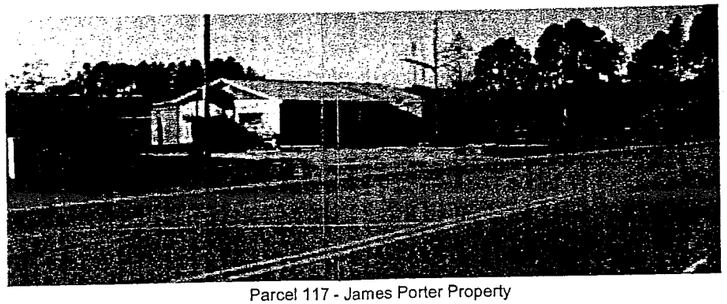
Parcel 57 - William Ussery Property

Parcel 140 - Henry Ussery Property

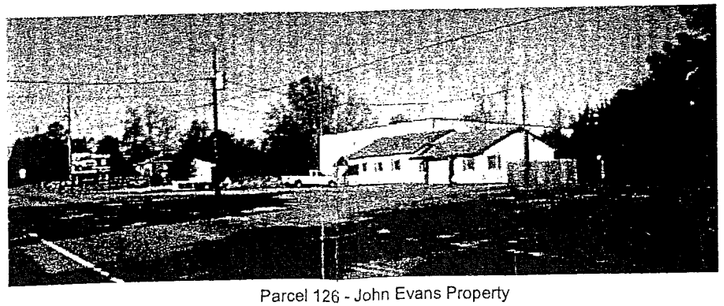


Parcel 80 - Walter McCain Property

Parcel 99 - Leon Wall Property



Parcel 117 - James Porter Property



Parcel 126 - John Evans Property

SITE PHOTOS

FIGURE 1

GRAPHIC SCALE IN METERS

DRWN	CHKD		PROJECT
MJD			
DATE	LAY	DWG	J.NO.
11/28/05			2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

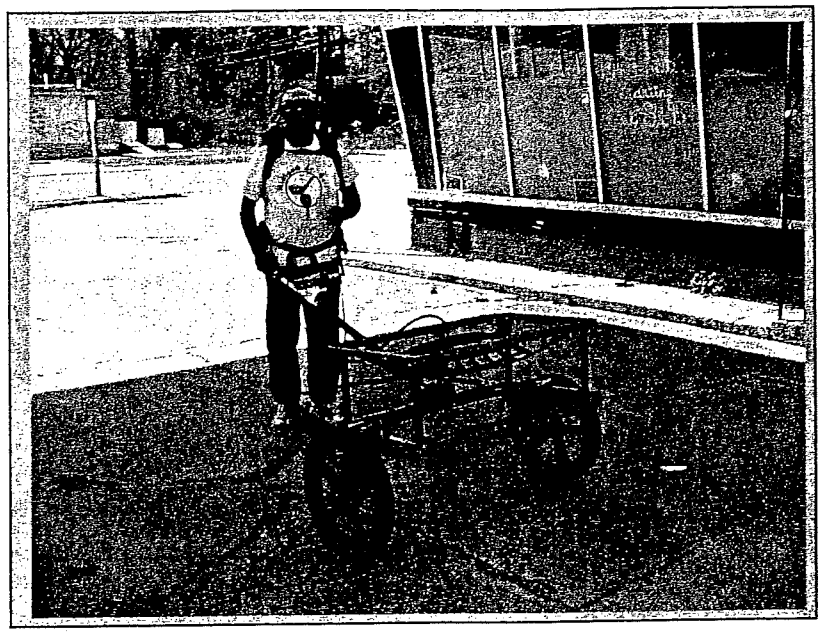
SITE: ROCKINGHAM SITES

CITY: ROCKINGHAM

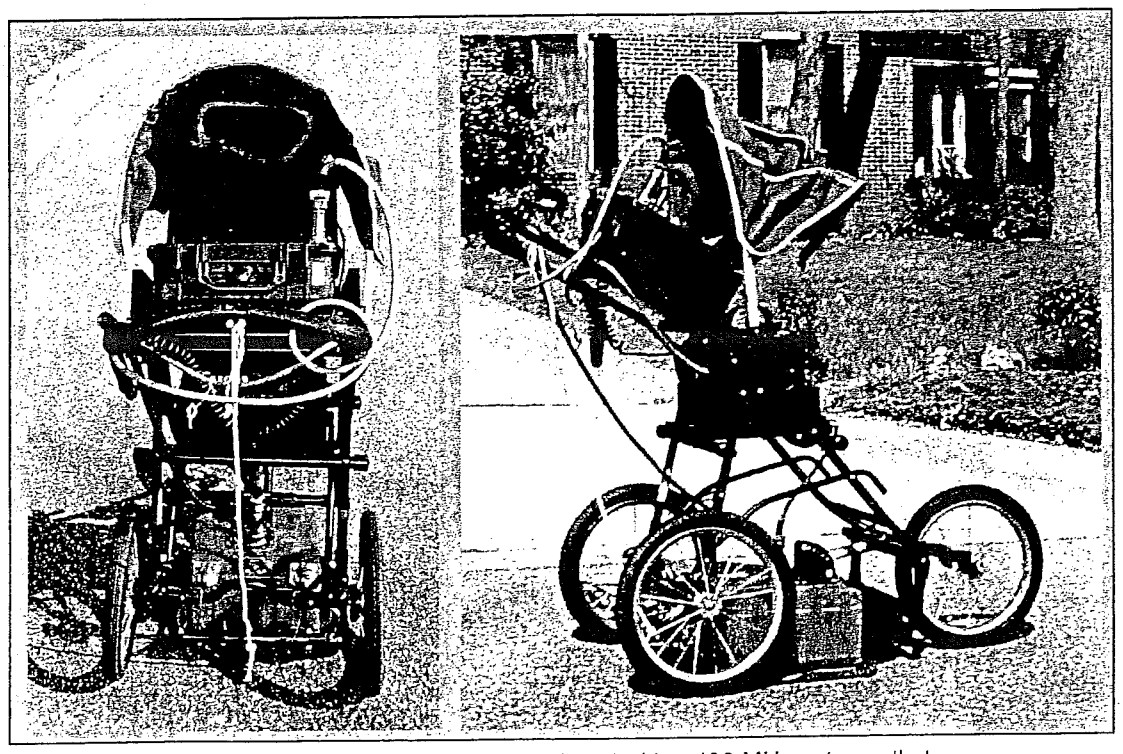
STATE: NORTH CAROLINA

TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The Geonics EM61 metal detector was used to conduct the metal detection surveys at the Rockingham sites in November 2005.



The SIR-2000 GPR system equipped with a 400 MHz antenna that was used at the Rockingham sites in November 2005.

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05	DRWN	
SITE	ROCKINGHAM SITES	LAY		CHKD	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JOB	2005-292	APVD	

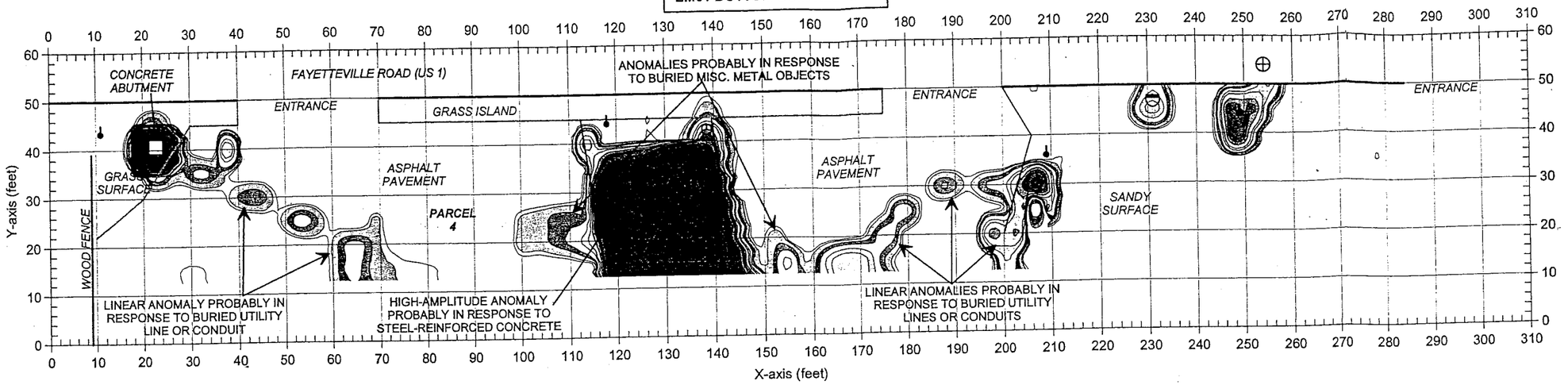
GEOPHYSICAL EQUIPMENT

FIGURE 2

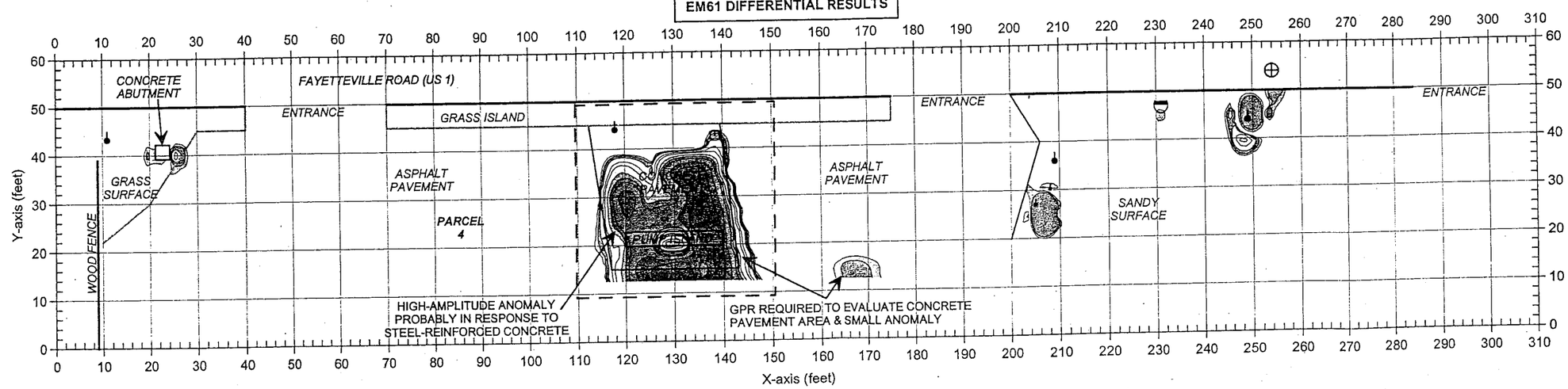
EM61 METAL DETECTION RESULTS

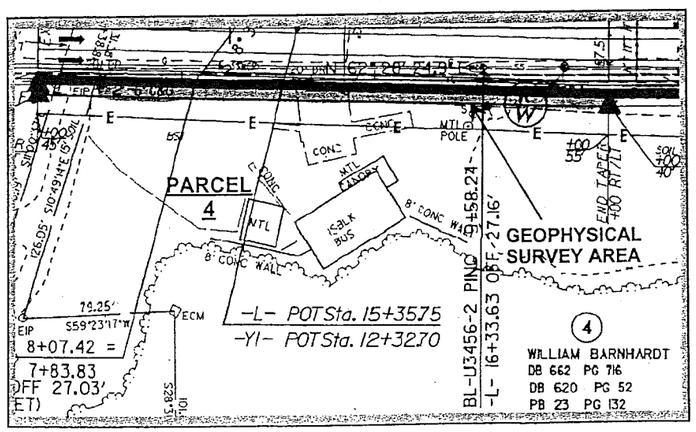
FIGURE 3

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-4000

APPROXIMATE NORTH

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- MONITORING WELL
- WATER METER OR VALVE COVER
- GUY WIRE
- UTILITY POLE OR LIGHT POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- MANHOLE COVER
- GPR SURVEY AREA

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

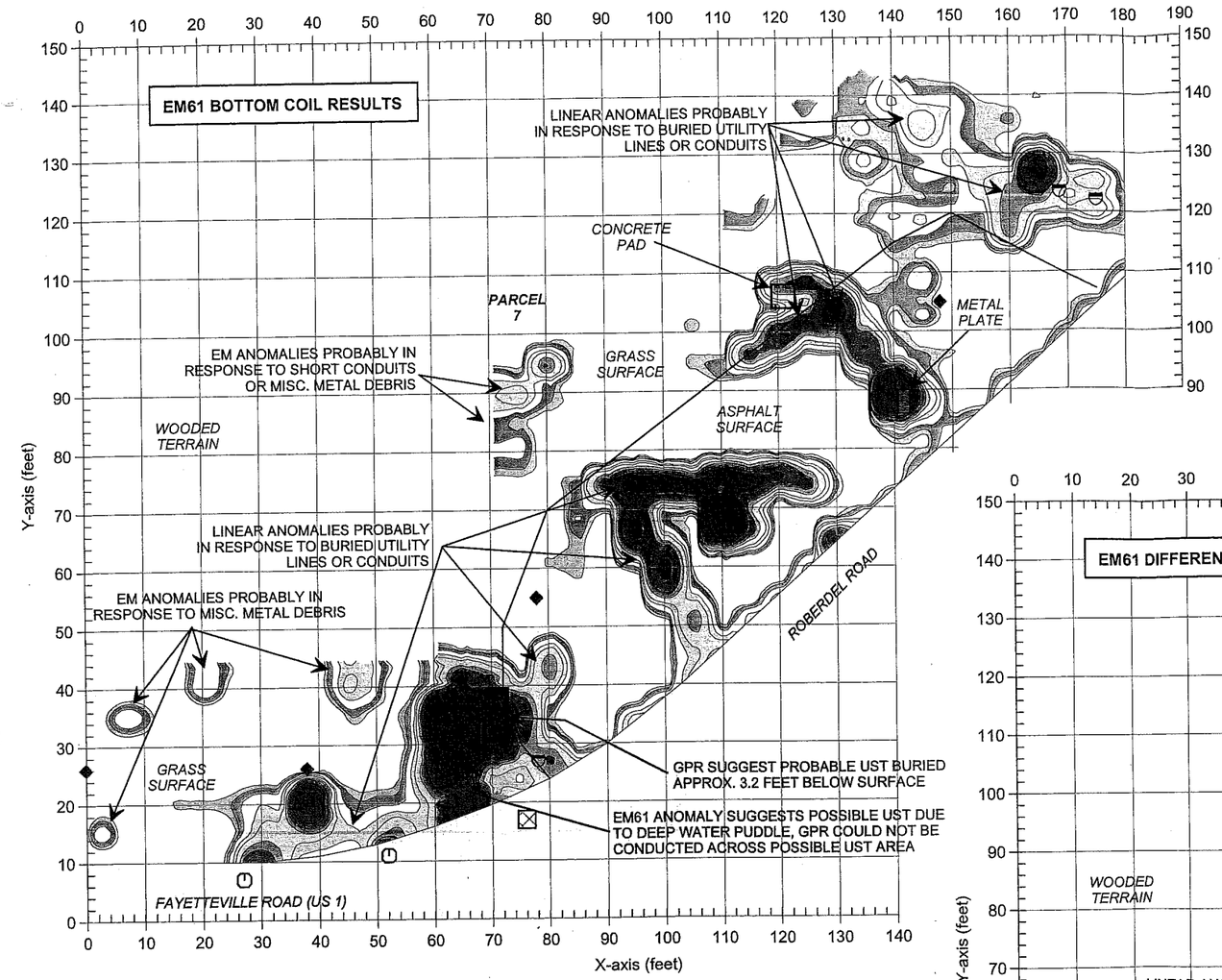
The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

DRAWN	CHKD	FIGURE
MJD		
DATE	LAY	DWG	L-No.
11/26/05			2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: W. J. BARNHART PROPERTY (PARCEL 4)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



LEGEND

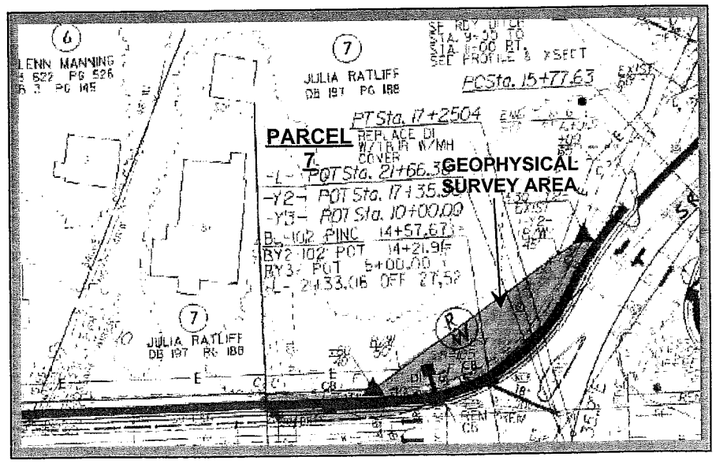
- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH & EAST-WEST TRENDING LINES SPACED 5 FEET APART
- MONITORING WELL
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- MANHOLE COVER
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

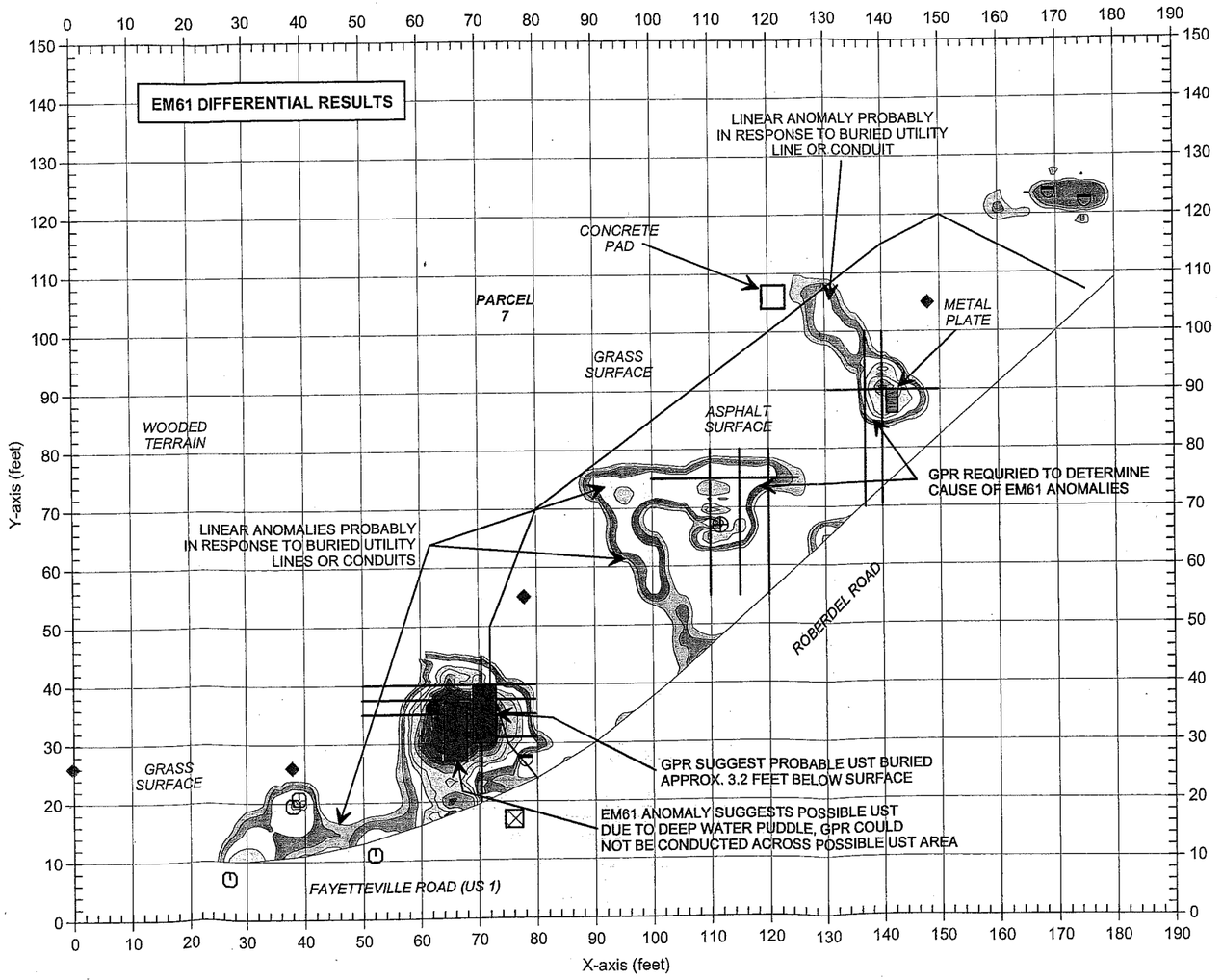
The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -90 -50 -60 -75 -100 -150 -200 -300 -400 -500 -750 -1000



APPROXIMATE NORTH



EM61
METAL DETECTION
RESULTS

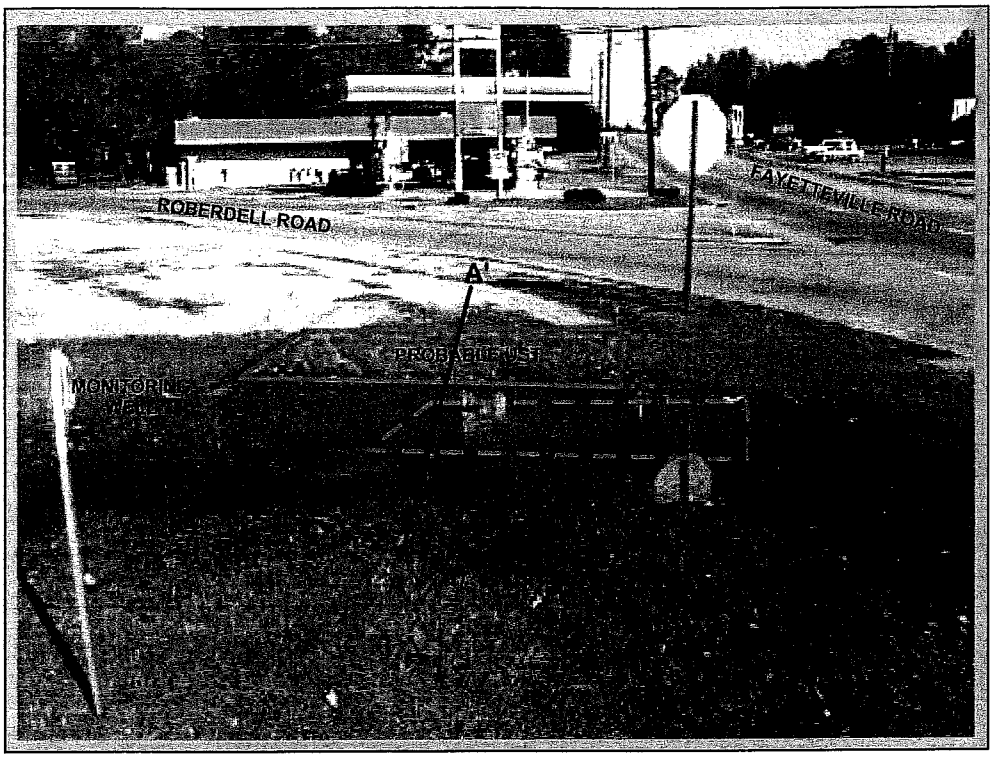
FIGURE 4

GRAPHIC SCALE IN METERS

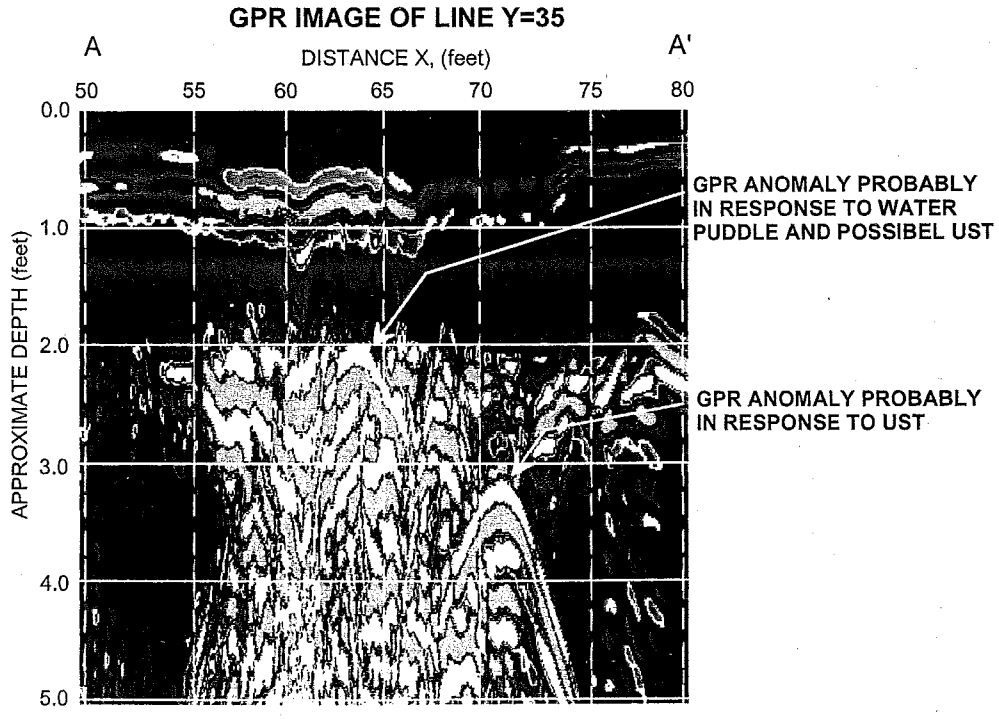
DRWN	MJD		FIGURE
CHKD			
DATE	11/25/05		J-NO. 2005-292
LAY		DWG	

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: JULIA M. RATLIFF PROPERTY (PARCEL 7)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the location of the probable UST and possible UST, as suggested by the geophysical results at Parcel 7.



The GPR image obtained along a portion of survey line Y=35 shows the anomaly that is probably in response to a UST near X=71 and buried approximately 3.2 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL		DATE	11/28/05	DRWN
SITE	JULIA M. RATLIFF PROPERTY (PARCEL 7)		LAY		CHKD
CITY	ROCKINGHAM	STATE NORTH CAROLINA	DWG		
TITLE	GEOPHYSICAL RESULTS		J.NO.	2005-292	FIGURE

GRAPHIC SCALE IN METERS

PHOTO & GPR IMAGE OF UST LOCATION

FIGURE 5

EM61 BOTTOM COIL RESULTS

FIGURE 6

ANOMALY PROBABLY IN RESPONSE TO SEWER LINE

ANOMALY PROBABLY IN RESPONSE TO BUILDING & CONCRETE ENTRANCE

APPROXIMATE LOCATION OF PROBABLE UST BURIED 1.7 FEET BELOW SURFACE

FAYETTEVILLE ROAD (US 1)

LIGHTS

GRASS ISLAND

GRASS ISLAND

LANDSCAPED ISLAND

PLANTER

ANOMALIES PROBABLY IN RESPONSE TO MISC. METAL OBJECTS

COLONIAL AVENUE

GRASS SURFACE

ANOMALIES PROBABLY IN RESPONSE TO MISC. METAL DEBRIS

GRASS SURFACE

APPROX. LOCATION OF PROBABLE UST BURIED 1.4 FEET BELOW SURFACE

ANOMALIES PROBABLY IN RESPONSE TO MISC. METAL DEBRIS

LINEAR ANOMALIES PROBABLY IN RESPONSE TO UTILITY LINES OR CONDUITS

ASPHALT PAVEMENT

LANDSCAPED ISLAND

ANOMALY PROBABLY IN RESPONSE TO GAS LINE

SKYLINE DRIVE

SAMUEL D. TANNER PROPERTY PARCEL 21

WOODED TERRAIN (AREA NOT SURVEYED)

LINEAR ANOMALIES PROBABLY IN RESPONSE TO CULVERTS & UTILITY RELATED FEATURES

SAMUEL D. TANNER PROPERTY PARCEL 15

STORE SIGN

ANOMALY PROBABLY IN RESPONSE TO AIR CONDITION UNIT

GRASS SURFACE

GRASS ISLAND

GPR SUGGEST PROBABLE LARGE-DIAMETER CONDUIT BURIED APPROX. 2.5 FEET BELOW SURFACE

EM61 BOTTOM COIL RESULTS

APPROXIMATE NORTH

Y-axis (feet)

X-axis (feet)

GEOPHYSICAL SURVEY AREAS

PARCEL 15

PARCEL 21

EM61 BOTTOM COIL RESPONSE (MILLIVOLTS)

1000 750 500 400 300 200 150 100 75 60 20 -90 -100 -200 -400

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST & NORTH-SOUTH TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CONCRETE R/W MARKER
- GAS METER
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVER
- MANHOLE COVER
- MONITORING WELL
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

DRWN	MJD
CHKD	
DATE	11/25/05
LAY	
DWG	
FIGURE	
JOB NO.	2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

SITE: SAMUEL D. TANNER PROPERTY (PARCELS 15 & 21)

CITY: ROCKINGHAM

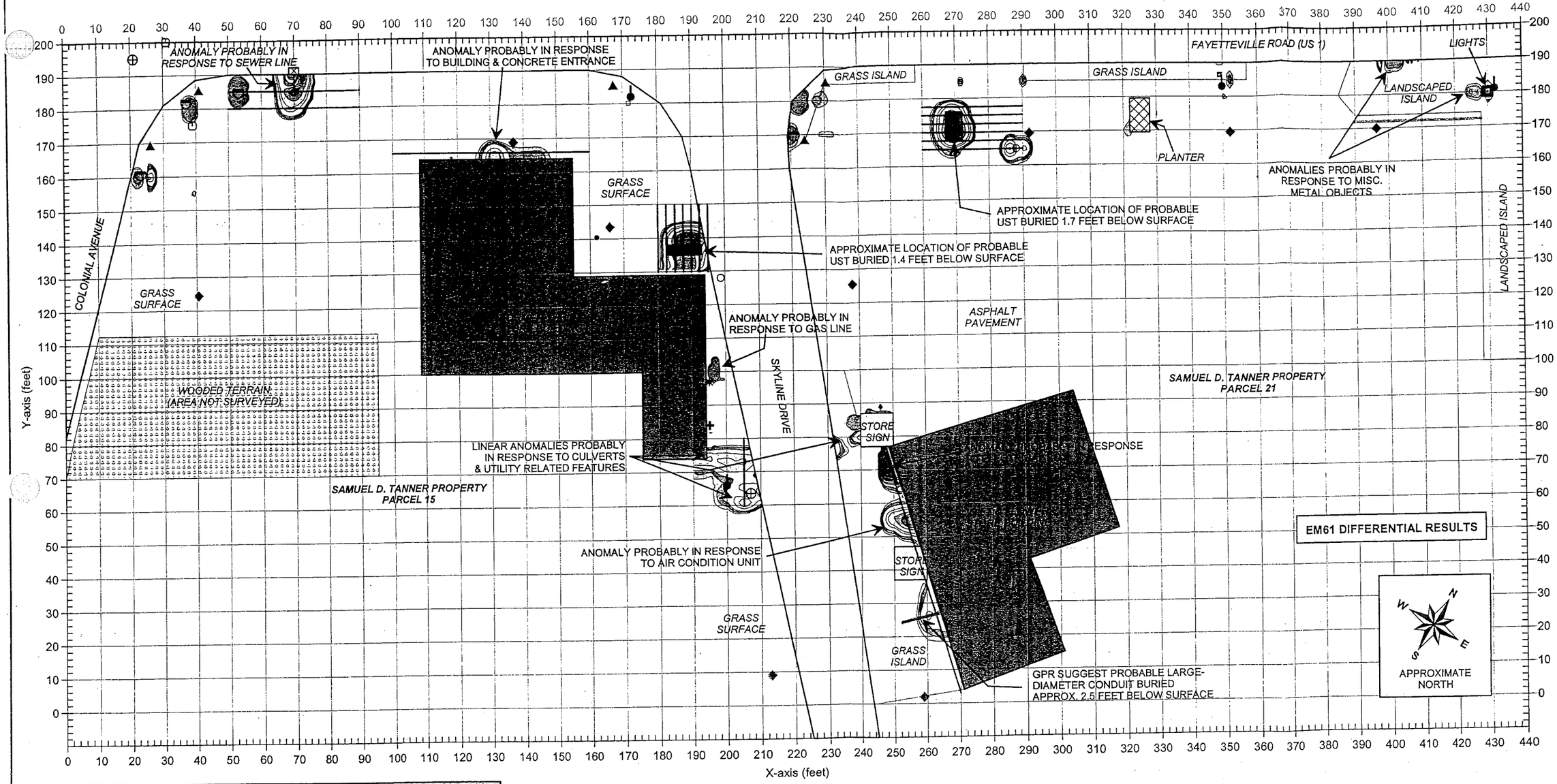
STATE: NORTH CAROLINA

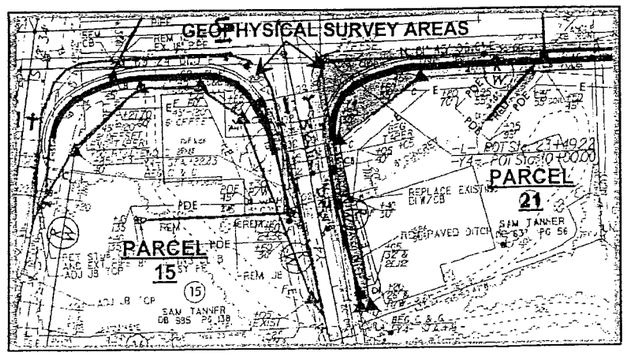
TITLE: GEOPHYSICAL RESULTS

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

EM61 DIFFERENTIAL RESULTS

FIGURE 7





EM61 DIFFERENTIAL RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
50
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST & NORTH-SOUTH TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CONCRETE R/W MARKER
- GAS METER
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVER
- MANHOLE COVER
- MONITORING WELL
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the differential results of the EM61 metal detection survey in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

DRWN	MJD		
CHKD			
DATE	11/25/05		
LAY			
DWG			
JOB NO.	2005-292		

SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

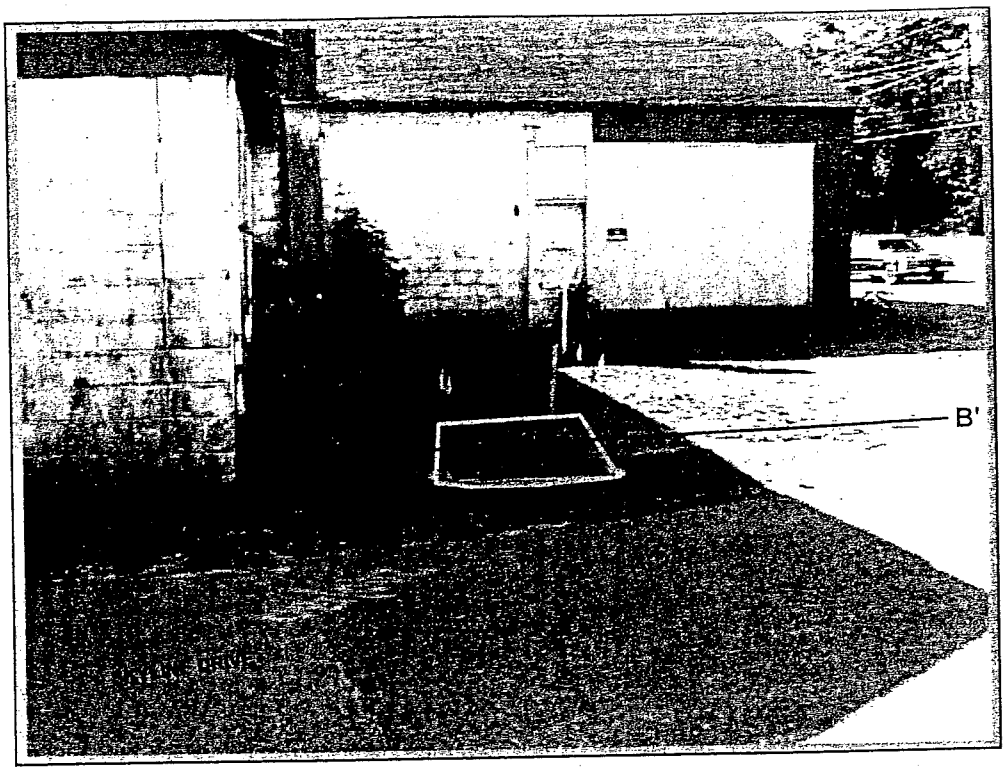
SAMUEL D. TANNER PROPERTY (PARCELS 15 & 21)

ROCKINGHAM — NORTH CAROLINA

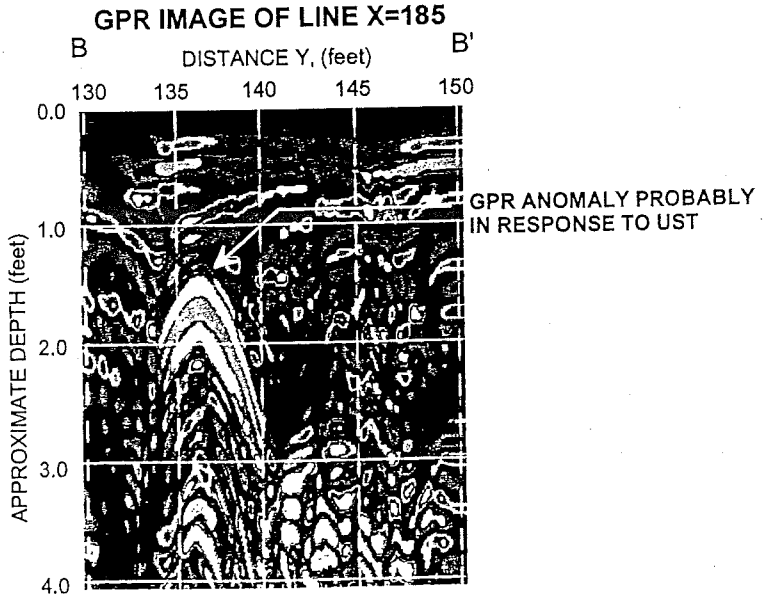
GEOPHYSICAL RESULTS

SUBMT | SITE | CITY | STATE | TITLE

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the location of the probable UST,
as suggested by the geophysical results at Parcel 15.



The GPR image obtained along a portion of survey line X=185 shows the anomaly that is probably in response to a UST near Y=137 and buried approximately 1.4 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

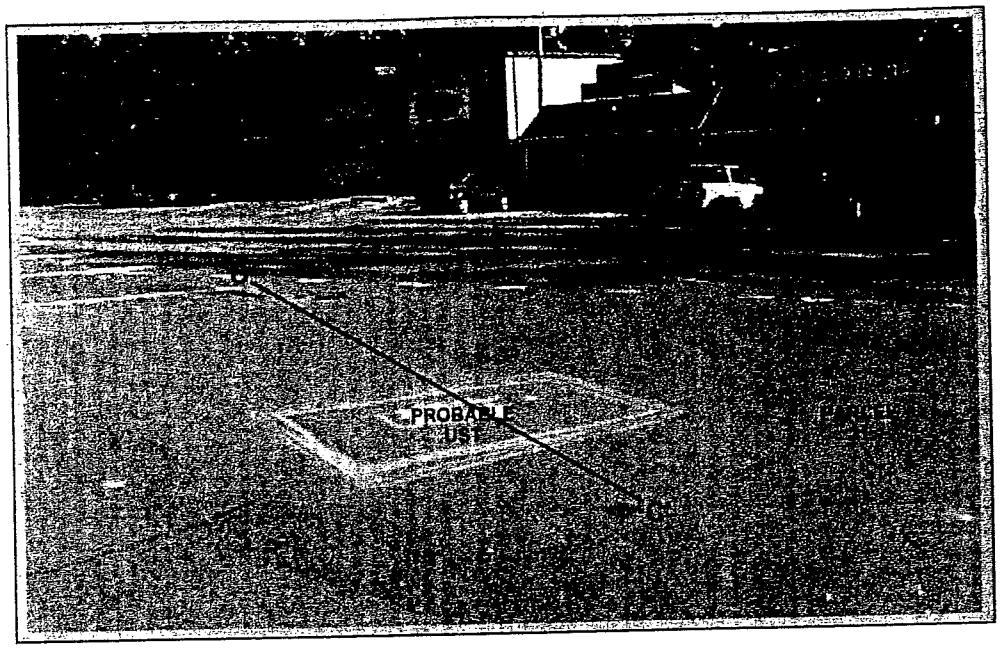
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL		DATE	11/28/05	DWN
SITE	SAMUEL D. TANNER PROPERTY (PARCEL 15)		FILE		CHKD
CITY	ROCKINGHAM	STATE NORTH CAROLINA	SHEET		
TITLE	GEOPHYSICAL RESULTS		JOB	2005-292	FIGURE

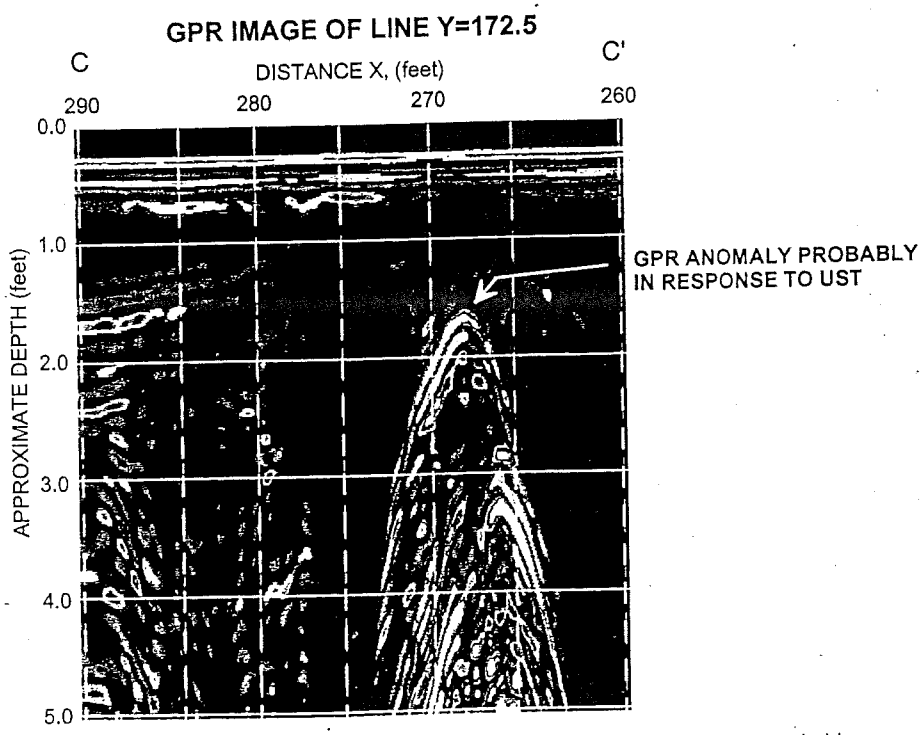
GRAPHIC SCALE IN METERS

PHOTO & GPR IMAGE
OF UST LOCATION

FIGURE 8



The photo shows the location of the probable UST, as suggested by the geophysical results at Parcel 21.



The GPR image obtained along a portion of survey line Y=172.5 shows the anomaly that is probably in response to a UST near X=268 and buried approximately 1.7 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

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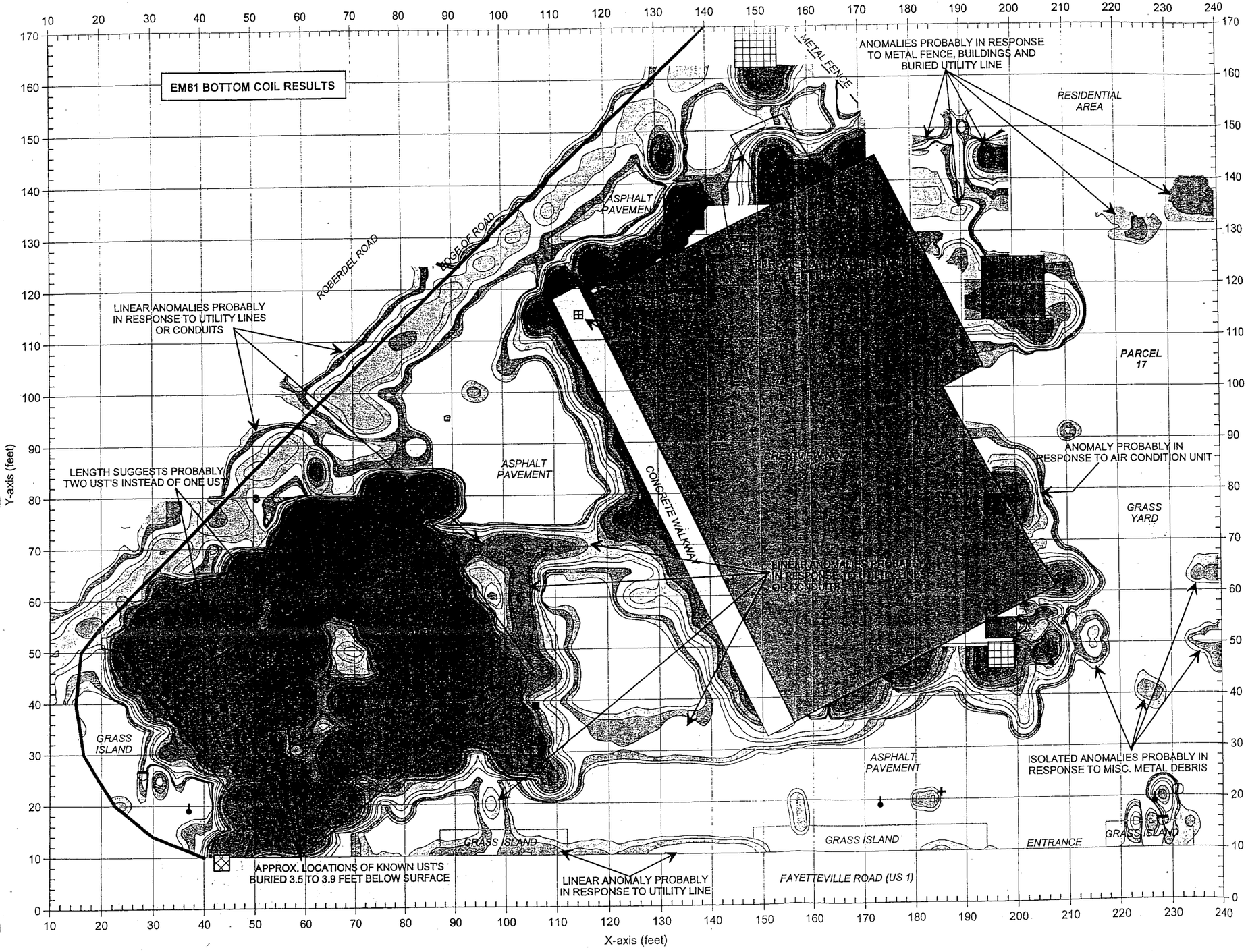
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05	DRWN	
SITE	SAMUEL D. TANNER PROPERTY (PARCEL 21)	LAY		CHKD	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JOB	2005-292	SCALE	

PHOTO & GPR IMAGE OF UST LOCATION

FIGURE 9

EM61 BOTTOM COIL RESULTS



APPROXIMATE NORTH

EM61 BOTTOM COIL RESPONSE (MILLIVOLTS)
1000 750 500 400 300 200 150 100 75 60 20 -90 -100 -200 -4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- UST COVERS
- WATER METER OR VALVE COVER
- GUY WIRE
- METAL SIGN POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVERS
- GAS METER
- AIR CONDITION UNIT
- DUMPSTER
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

FIGURE 10

EM61
BOTTOM COIL
RESULTS

GRAPHIC SCALE IN METERS

DRAWN	CHKD			FIGURE
MJD				2005-292
DATE	LAY	DWG		JOB NO.
11/25/05				

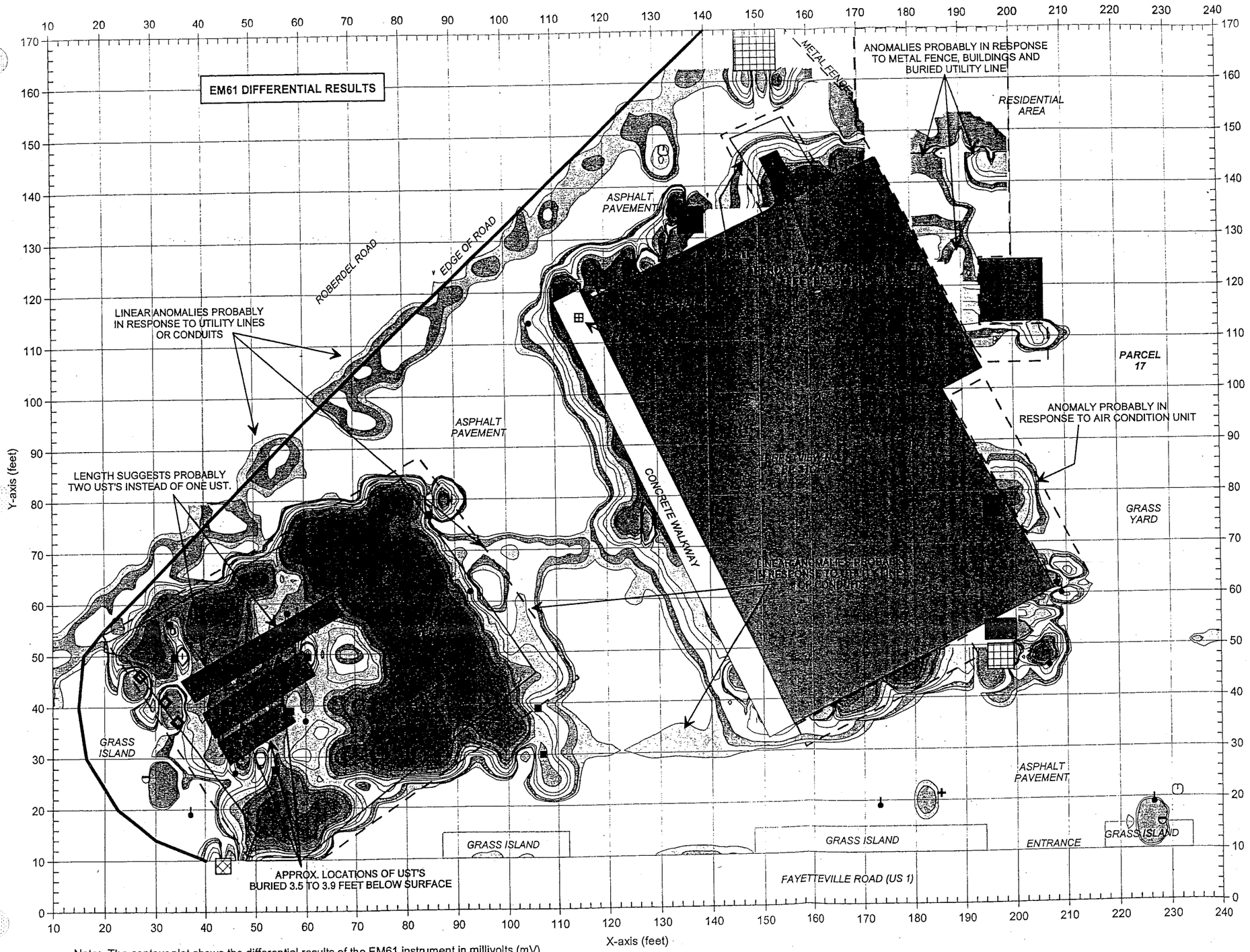
CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: HARVEY E. MELTON PROPERTY (PARCEL 17)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 DIFFERENTIAL RESULTS

FIGURE 11

EM61 DIFFERENTIAL RESULTS



APPROXIMATE NORTH

EM61 DIFFERENTIAL RESPONSE (MILLIVOLTS)

1000 750 500 400 300 200 150 100 75 60 20 -90 -100 -200 -4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- UST COVERS
- WATER METER OR VALVE COVER
- GUY WIRE
- METAL SIGN POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVERS
- GAS METER
- AIR CONDITION UNIT
- DUMPSTER
- GPR SURVEY AREA
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris. The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

DRWN	CHKD	FIGURE
MJD		
DATE	LAY	DWG	JOB NO.
11/25/05			2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

SITE: HARVEY E. MELTON PROPERTY (PARCEL 17)

CITY: ROCKINGHAM

STATE: NORTH CAROLINA

TITLE: GEOPHYSICAL RESULTS

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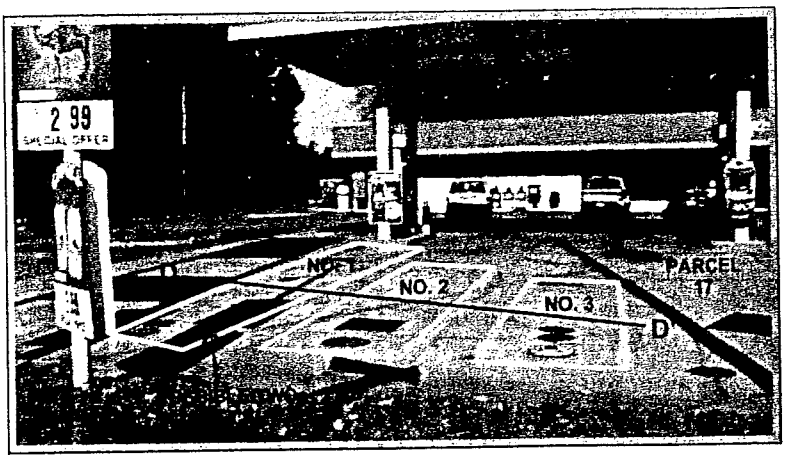
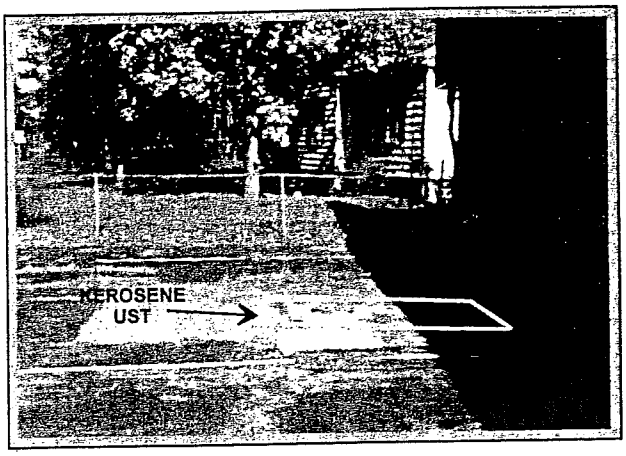
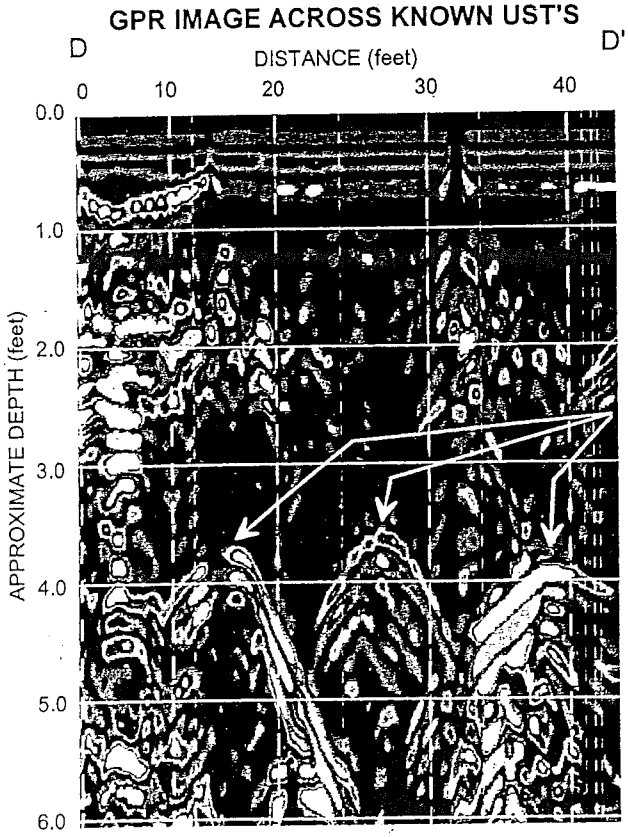


The photo shows the approxiamte location of the three or four known and active UST's, as suggested by the geophysical results, at Parcel 17. The UST's appear to be approximately 3.5 to 3.9 feet below surface.

The photo shows the approximate location of the kerosene UST, as suggested by the geophysical results, at Parcel 17. The UST is located along the northwest wall of the store and is buried approximately 2.4 feet below surface.





GPR ANOMALIES PROBABLY IN RESPONSE TO THREE UST'S BURIED 3.5 TO 3.9 FEET BELOW SURFACE

The GPR image is obtained along a traverse line oriented perpendicular to the axis of the UST's. The three GPR anomalies in response to the probable UST's suggest that the UST's are buried approximately 3.5 to 3.9 feet below surface.

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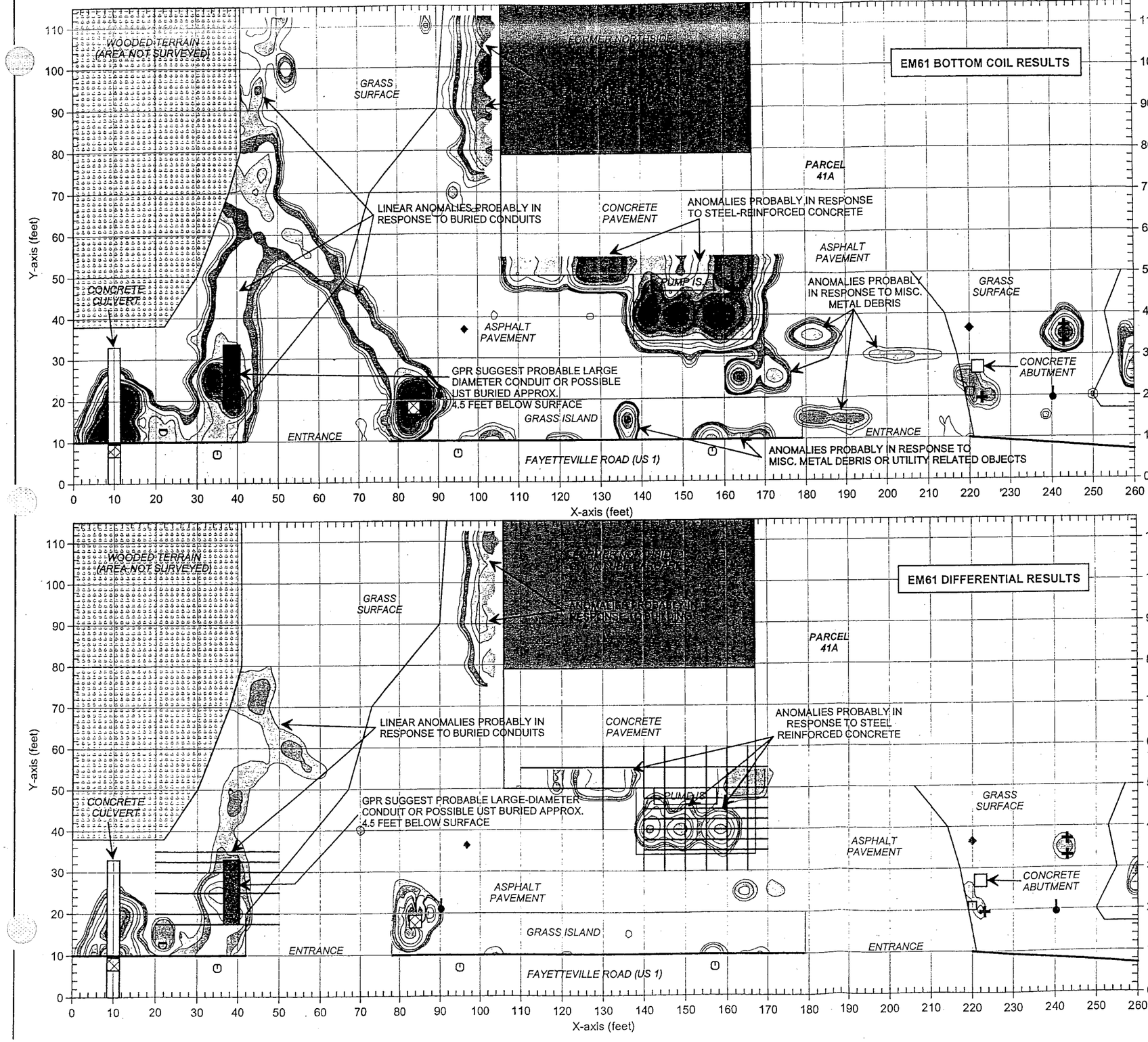
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05	DWN	
SITE	HARVEY E. MELTON PROPERTY (PARCEL 17)	LAY		CHKD	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JOB/PROJ	2005-292	SOURCE	

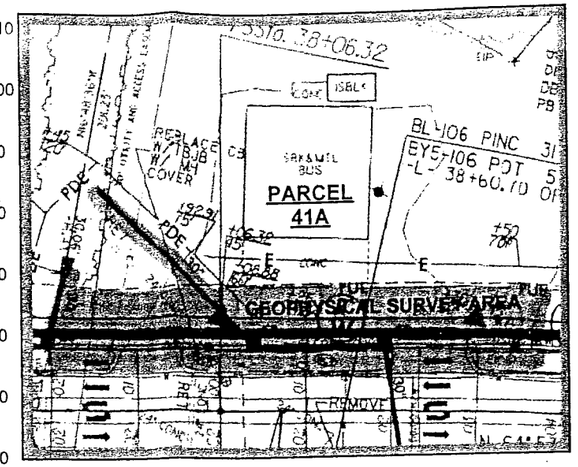
PHOTOS & GPR IMAGE OF UST LOCATIONS

FIGURE 12

EM61 METAL DETECTION RESULTS

FIGURE 13





APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -200 -100 -90 -50 -60 -75 -100 -150 -200 -300 -400 -500 -750 -1000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- MAIL BOX
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE LARGE DIAMETER CONDUIT OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

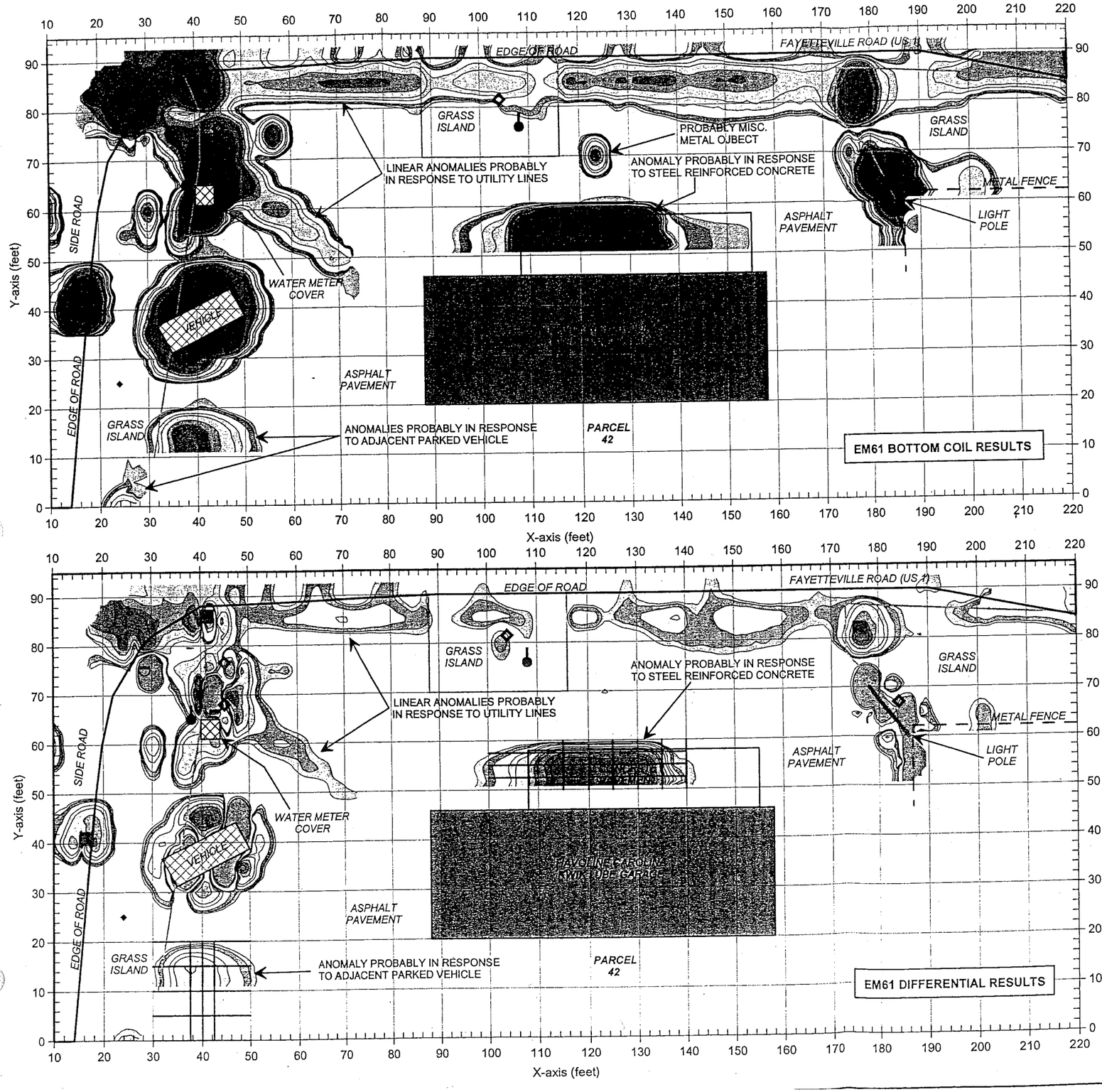
The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

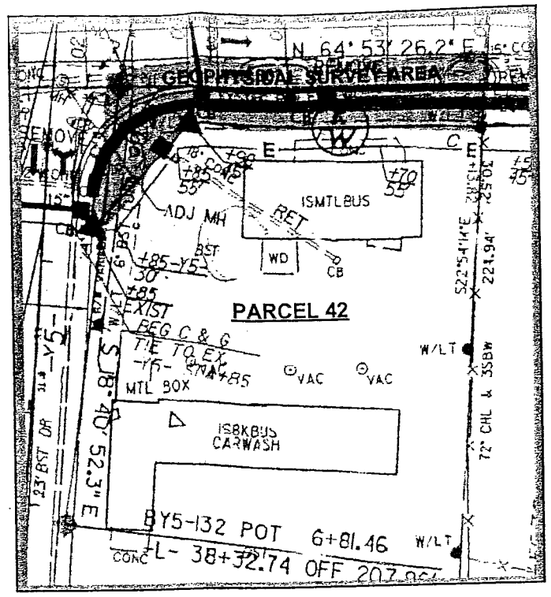
GRAPHIC SCALE IN METERS

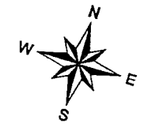
DRWN	CHKD	PROJNO.
MJD		2005-292
DATE	LAY	DWG NO.
11/26/05		

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: W.J. BARNHART PROPERTY (PARCEL 41A)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.







APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-1000 -200 -100 -50 -20 -10 -5 5 10 20 50 100 200 500 1000 2000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- METAL SIGN POLE
- STORM SEWER GRATE
- GPR SURVEY LINE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 15, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

FIGURE 14

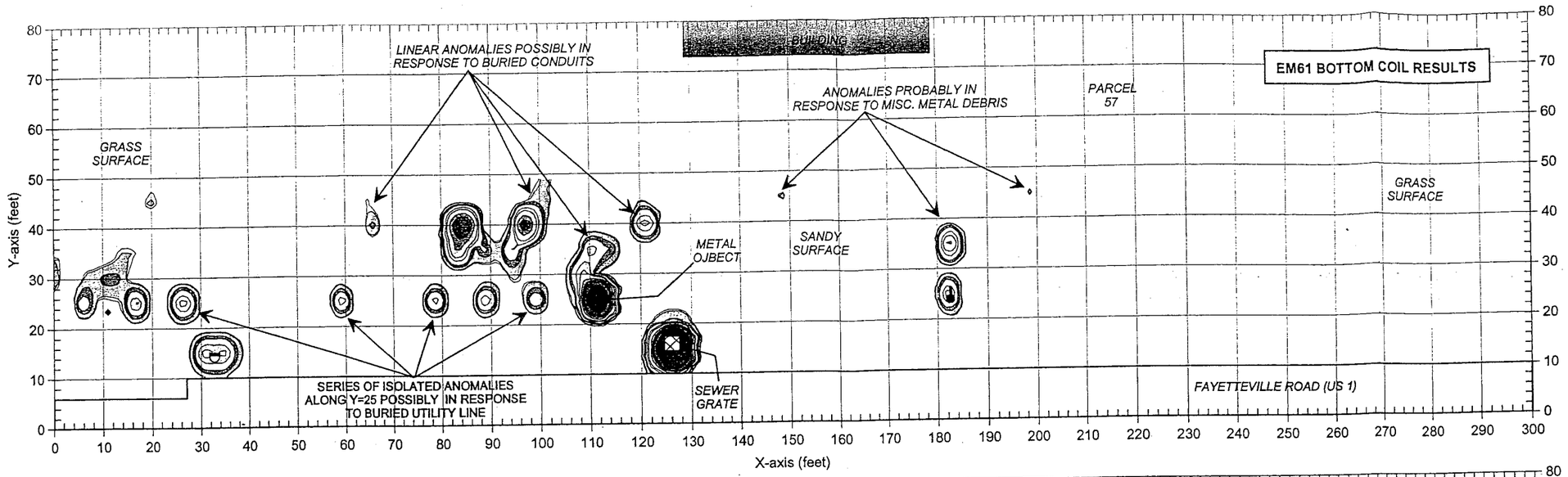
EM61
METAL DETECTION
RESULTS

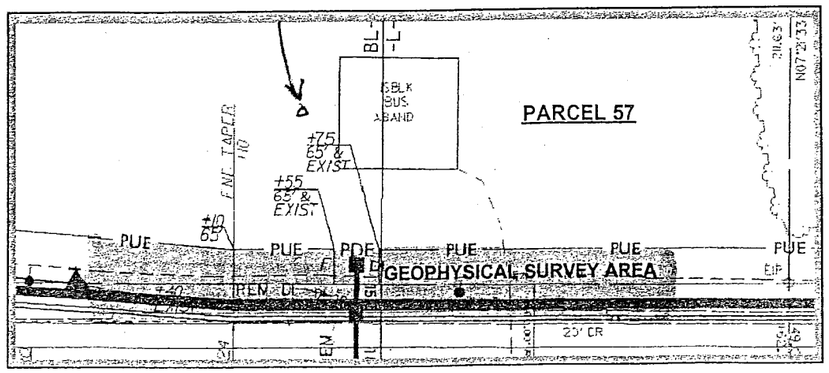
GRAPHIC SCALE IN METERS

DRAWN	MJD		
CHKD			
DATE	11/26/05		
LAY			
DWG			
FIGURE			2005-292
JOB NO.			

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: WESLEY DENHAM PROPERTY (PARCEL 42)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.





LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -50 -25 -10 -5 0 5 10 15 20 25 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300

N W E S

APPROXIMATE NORTH

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) surveys were not conducted at this site.

FIGURE 15

EM61 METAL DETECTION RESULTS

GRAPHIC SCALE IN METERS

DATE	11/18/05
DRWN	MJD
LAY	
CHKD	
DWG	
FIGURE	
J.NO.	2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

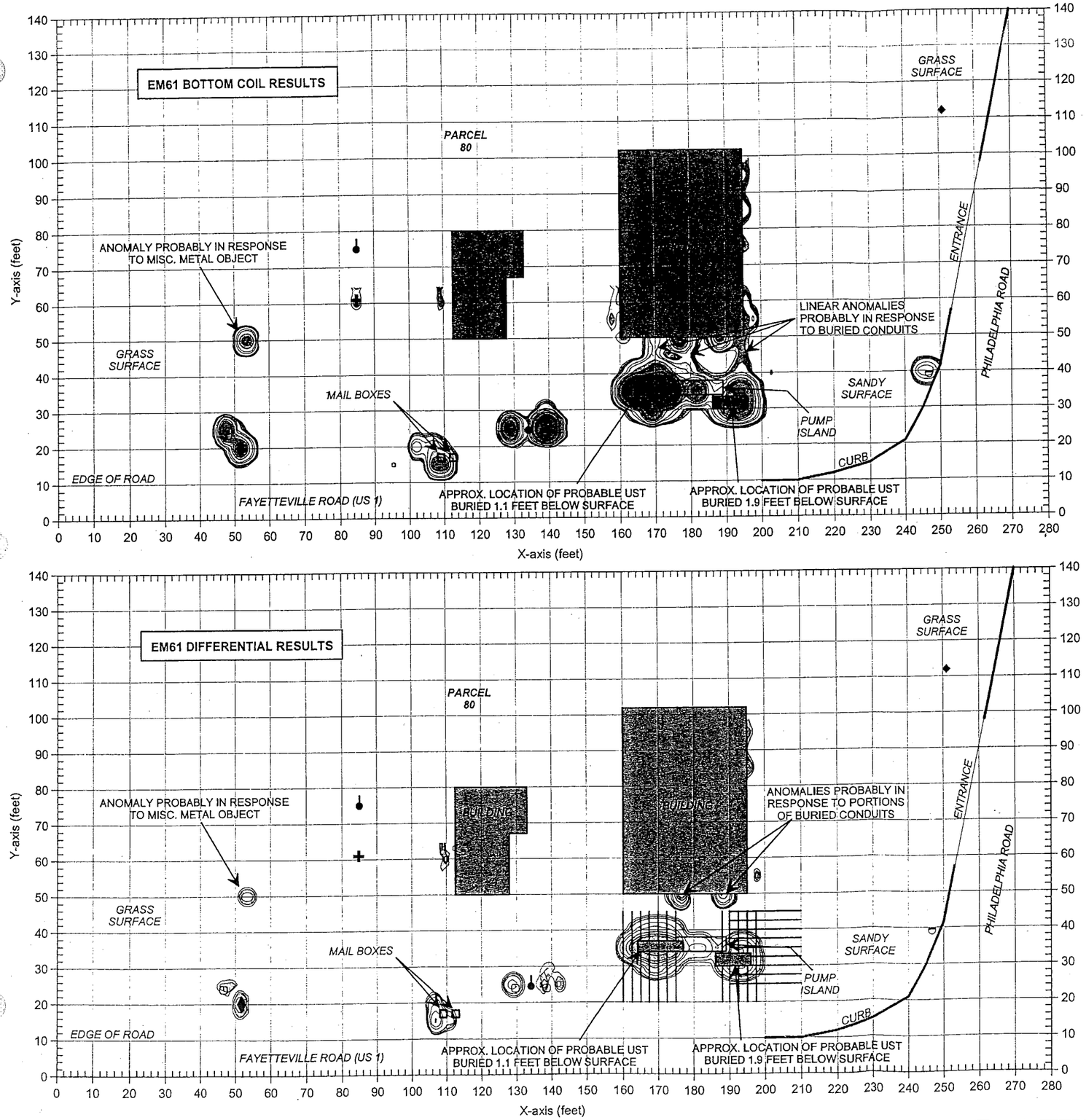
SITE: WILLIAM USSERY PROPERTY (PARCEL 57)

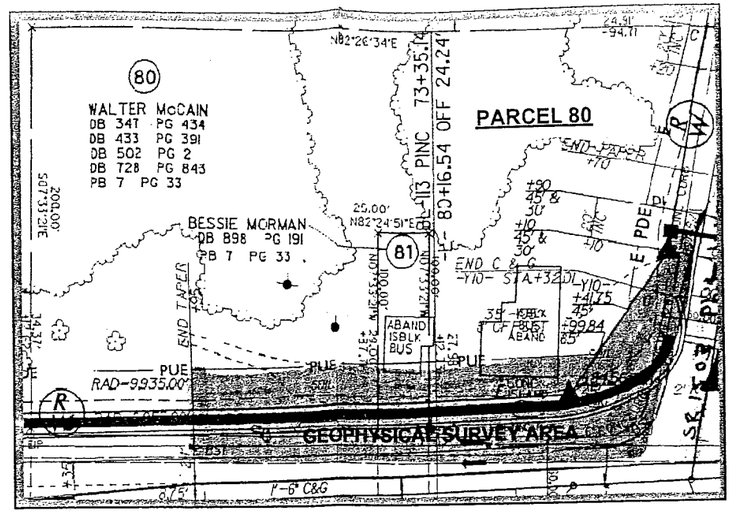
CITY: ROCKINGHAM

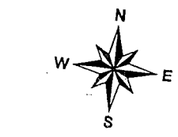
STATE: NORTH CAROLINA

TITLE: GEOPHYSICAL RESULTS

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.







APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -200 -100 -50 -20 -10 -5 0 5 10 20 50 100 200 400 800 1000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- FIRE HYDRANT
- TRAFFIC SIGN
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

FIGURE 16

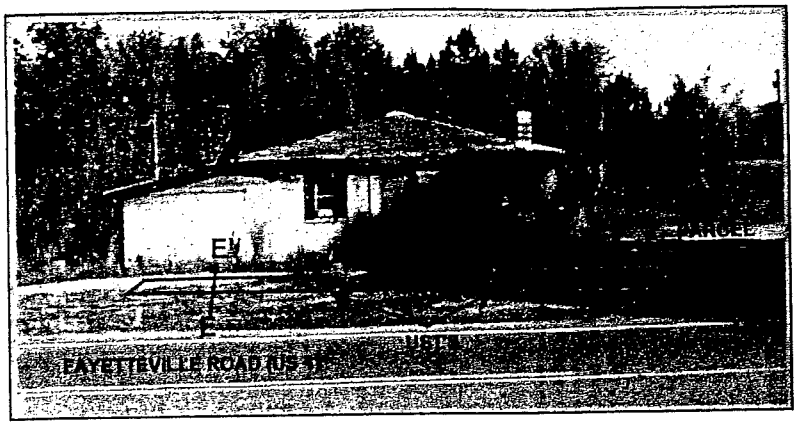
EM61 METAL DETECTION RESULTS

GRAPHIC SCALE IN METERS

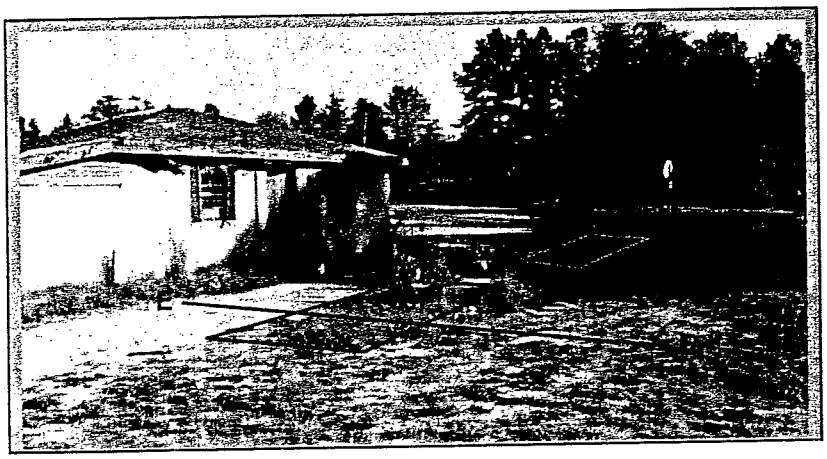
DRAWN	CHKD	DATE	LAY	DWG	FIGURE
MJD		11/25/05			2005-292

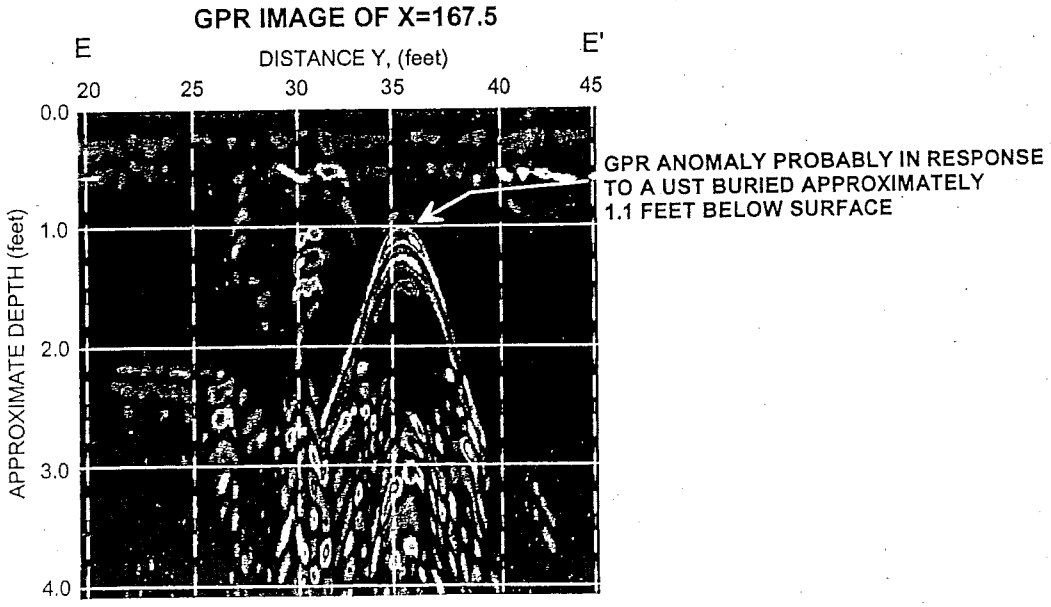
SILENT	SITE	CITY	STATE	TITLE
SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	WALTER McCAIN PROPERTY (PARCEL 80)	ROCKINGHAM	NORTH CAROLINA	GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The two photos show the approximate locations of the two probable UST's at Parcel 80, as suggested by the geophysical results. The UST's appear to be buried approximately 1 to 2 feet below surface. A former pump island lies between the two probable UST's.





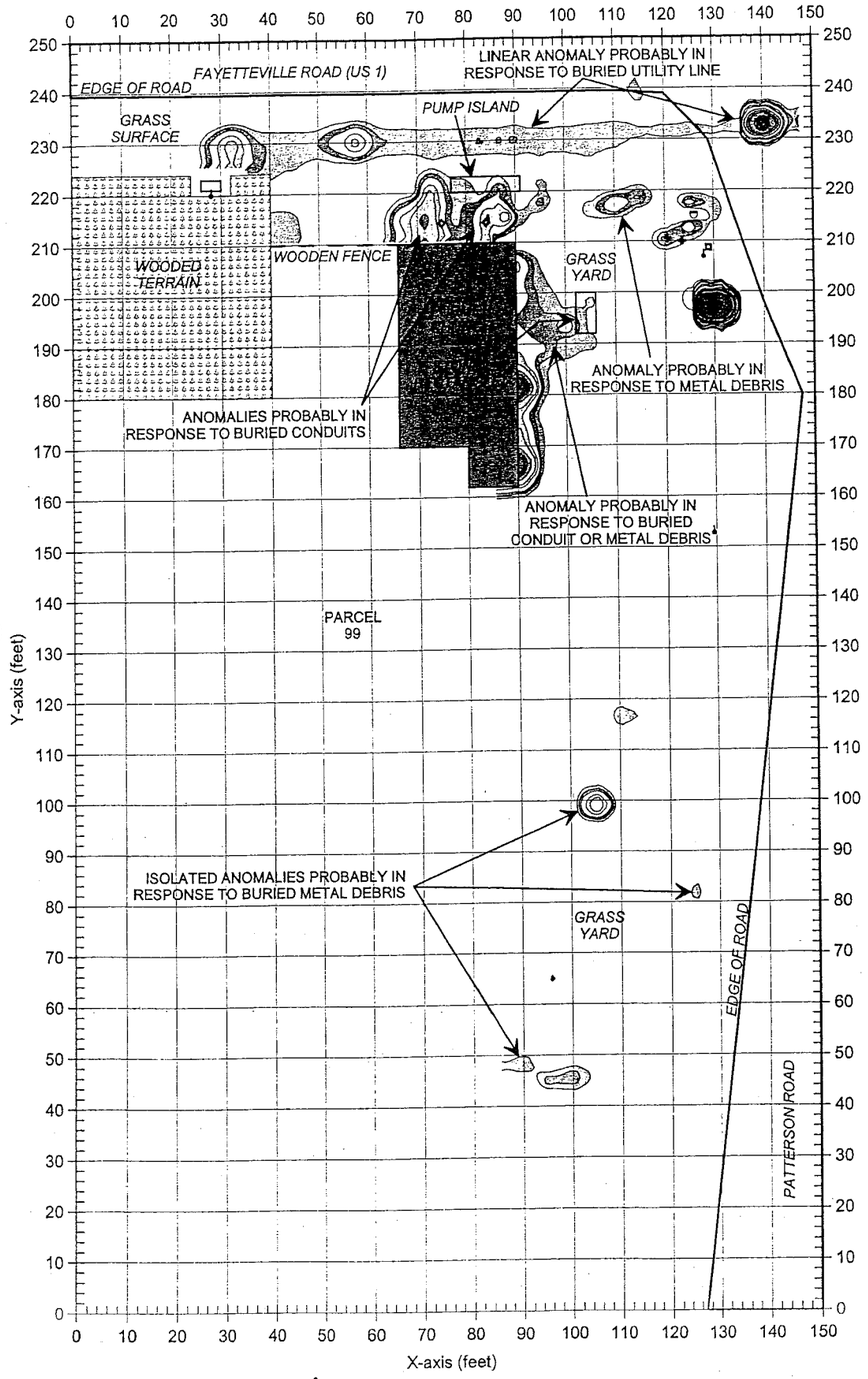
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05	DRWN	
SITE	WALTER McCAIN PROPERTY (PARCEL 80)	LAY		CHKD	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	NO	2005-292	REV	

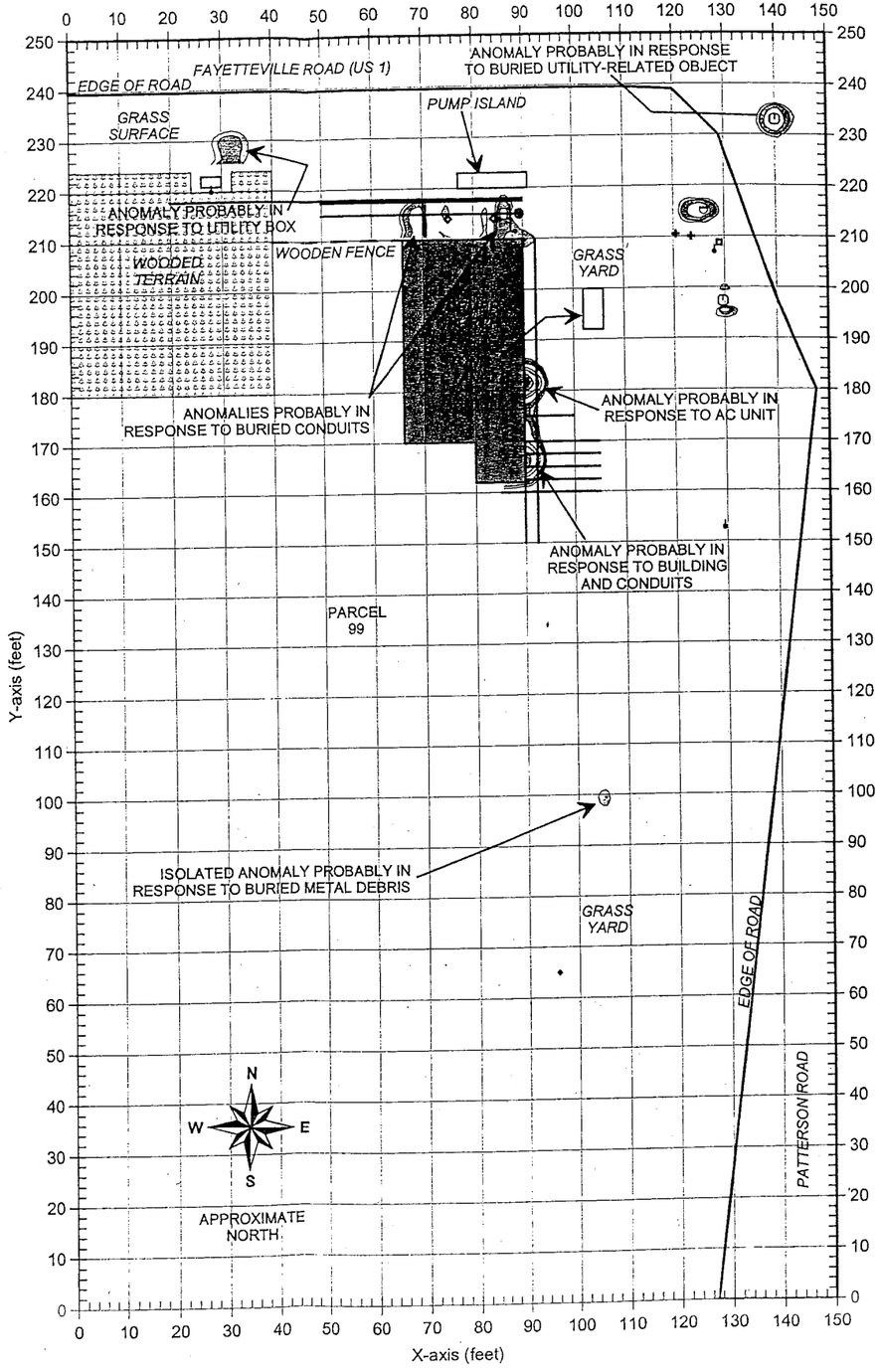
PHOTOS & GPR IMAGE OF UST LOCATIONS

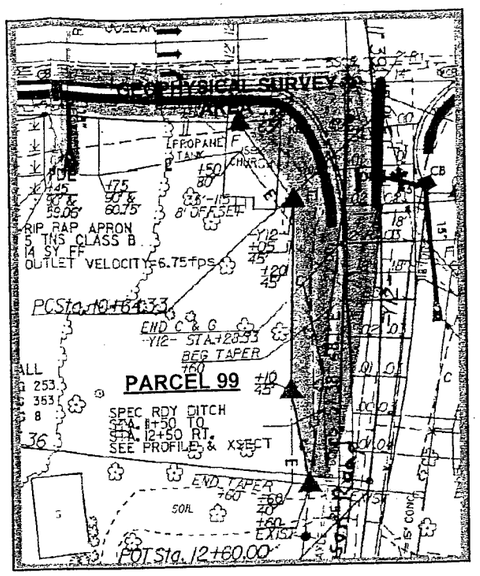
FIGURE 17

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-100 -90 -80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CANOPY POLE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- GPR SURVEY LINE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESULTS

FIGURE 18

GRAPHIC SCALE IN METERS

DRAWN	MJD	DWG	2005-292
DATE	11/26/05	JOB NO.	

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

SITE: LEON WALL PROPERTY (PARCEL 99)

CITY: ROCKINGHAM

STATE: NORTH CAROLINA

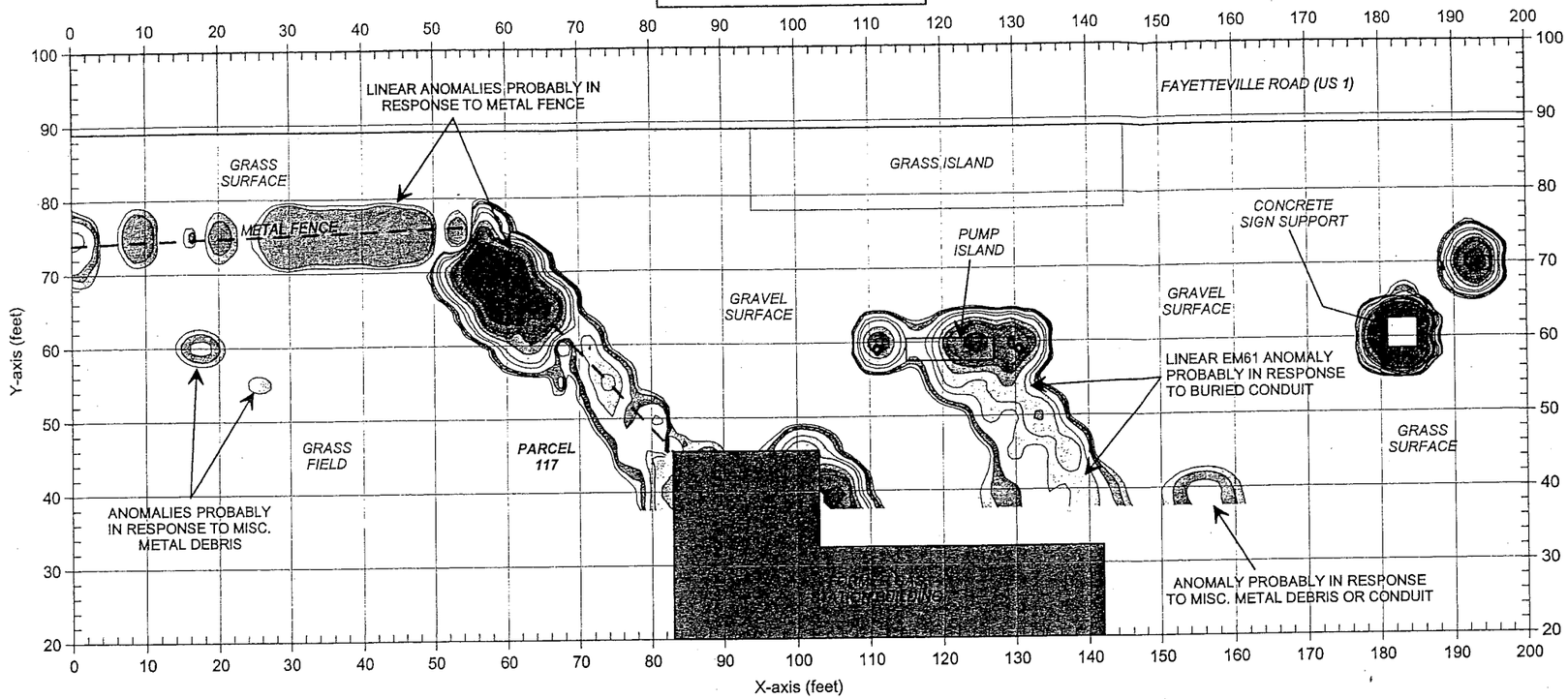
TITLE: GEOPHYSICAL RESULTS

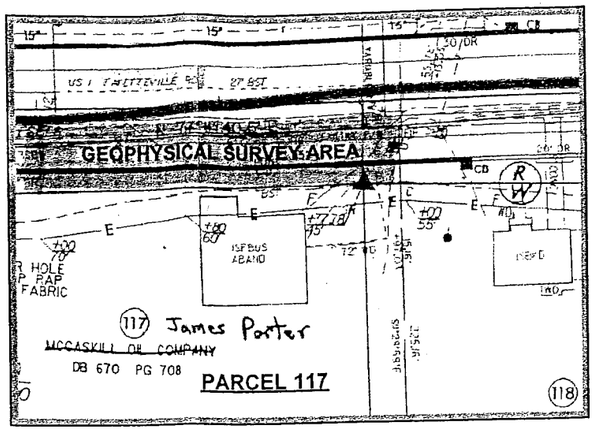
PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

EM61 METAL DETECTION RESULTS

FIGURE 19

EM61 BOTTOM COIL RESULTS





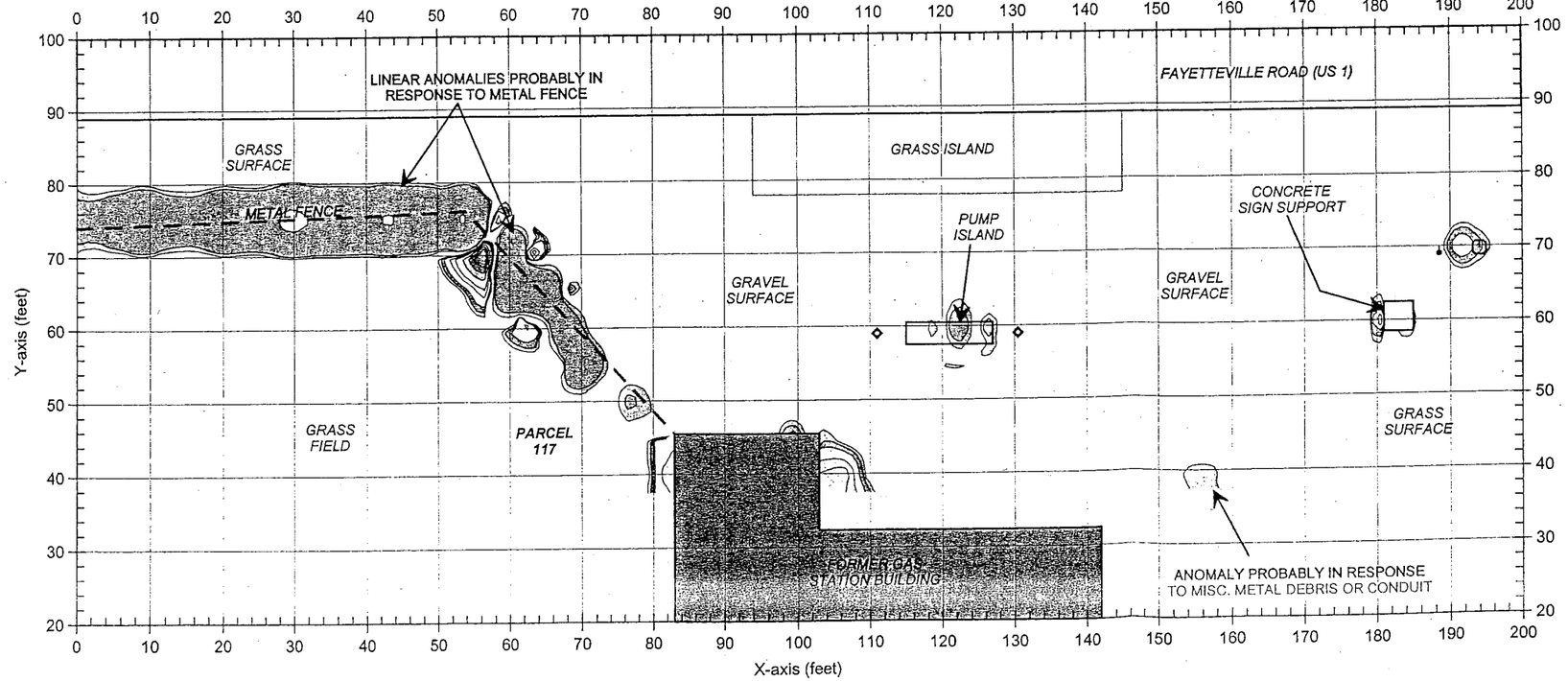
N
W E
S

APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -50 -20 -10 -5 5 10 20 50 100 200 500 1000 4000

EM61 DIFFERENTIAL RESULTS



LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- SUPPORT POLE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar surveys were not conducted at this site.

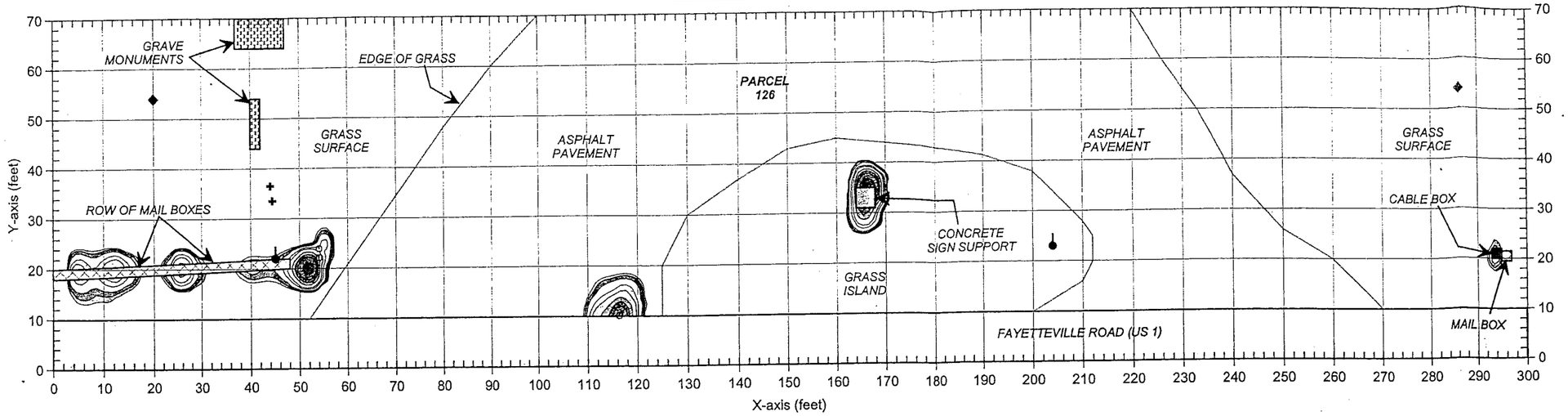
GRAPHIC SCALE IN METERS

DRWN	MJD		
DATE	11/26/05	DWG	2005-292
CHKD			
LAY			

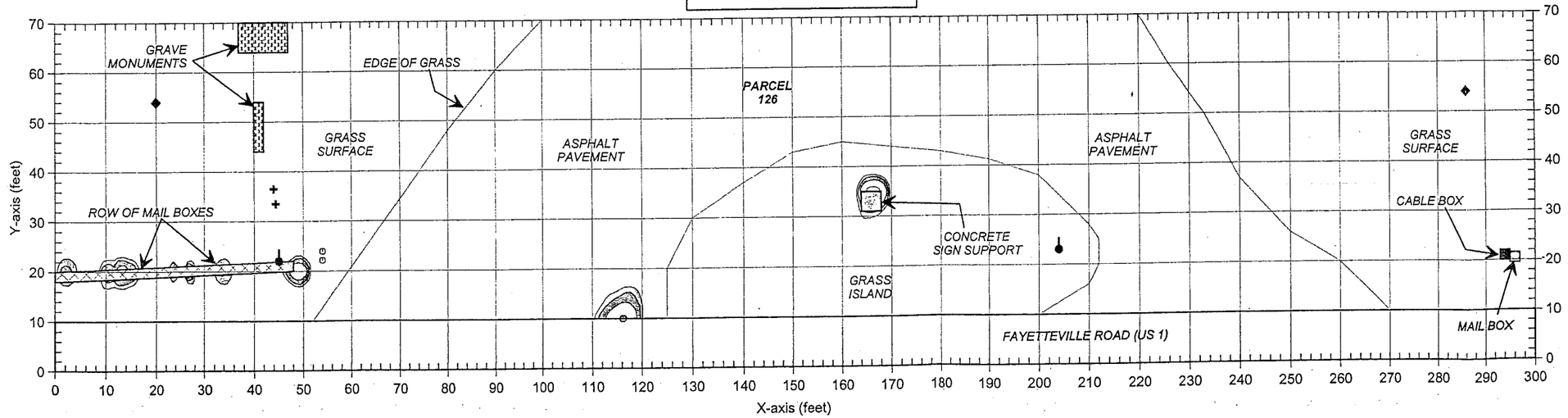
CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: JAMES PORTER PROPERTY (PARCEL 117)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

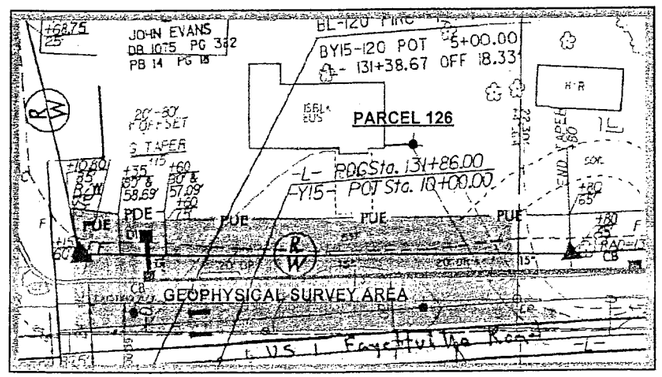
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- RIGHT-OF-WAY MARKER
- UTILITY POLE
- WATER METER OR VALVE COVER
- SIGN POLE
- STORM SEWER GRATE
- TRAFFIC SIGN
- GUY WIRE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data surveys were not conducted at this site

N
W E
S
APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)
1000 750 500 400 300 200 150 100 75 60 20 -90 -100 -200 -400

FIGURE 20

EM61
METAL DETECTION
RESULTS

GRAPHIC SCALE IN METERS

DRWN	CHKD	FIGURE
MJD		
DATE	LAY	DWG	JOB NO.
11/26/05			2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: JOHN EVANS PROPERTY (PARCEL 126)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
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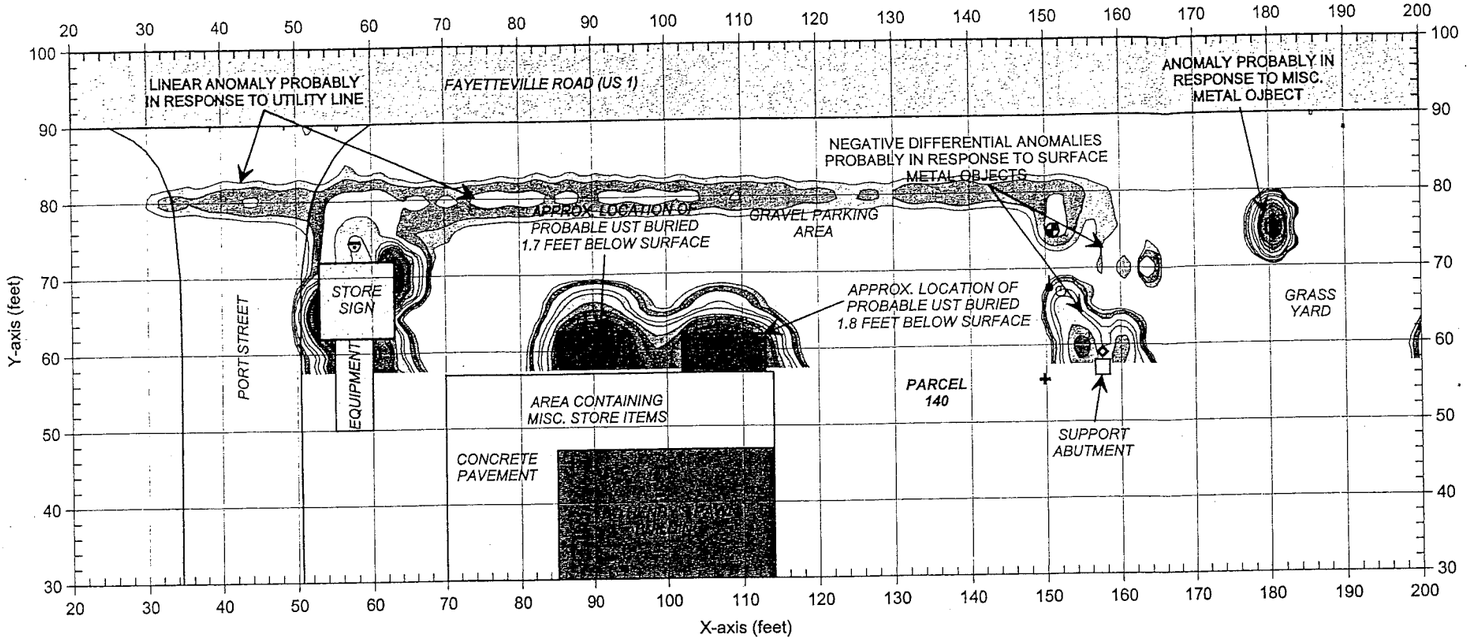
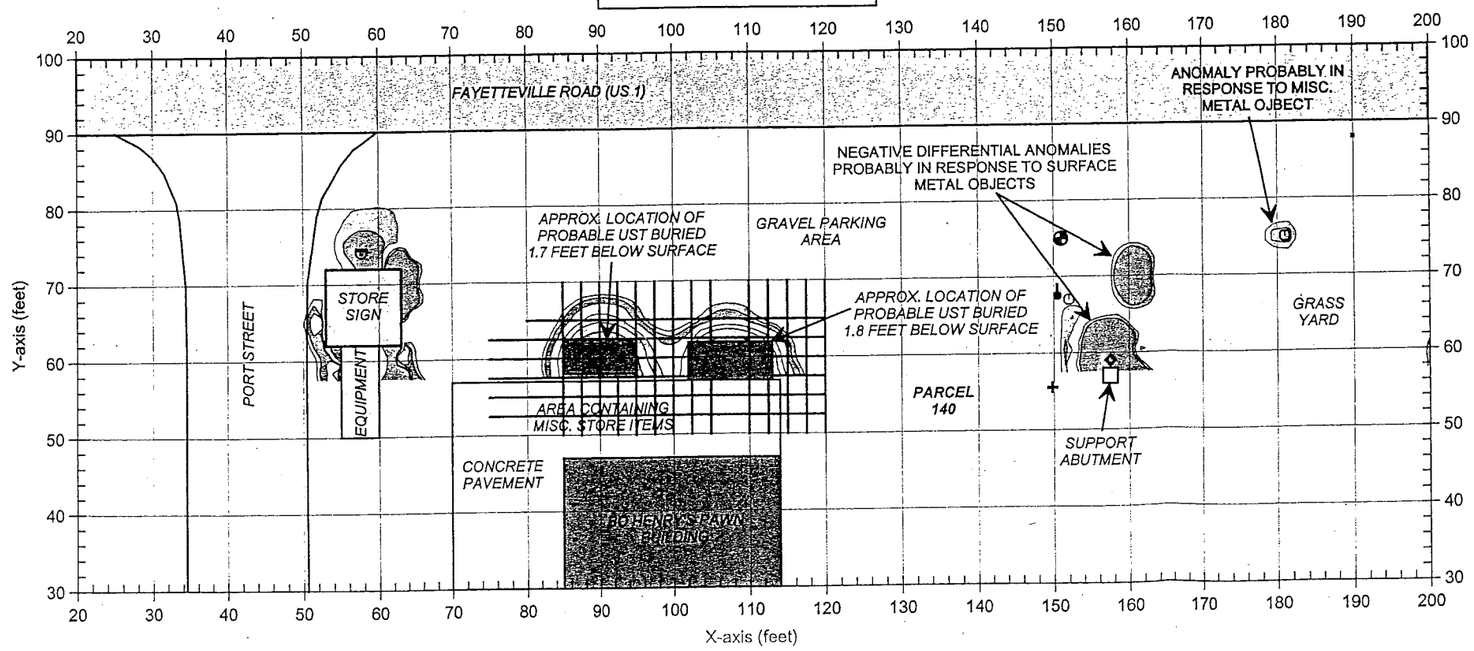
EM61 METAL DETECTION RESULTS

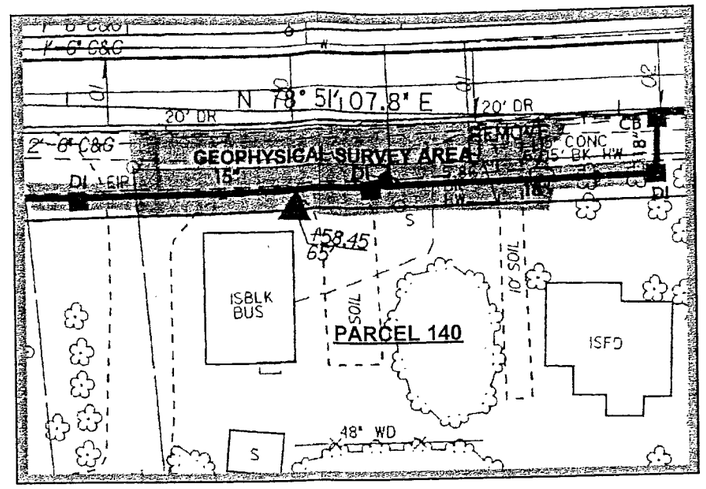
FIGURE 21

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -50 -20 -10 -5 5 10 20 50 100 200 300 400 500 750 1000

APPROXIMATE NORTH

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- SIGN POLE
- STORM SEWER GRATE
- TRAFFIC SIGN
- FIBER OPTIC LINE SIGN
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

DRWN	MJD
CHKD	
DATE	11/25/05
LAY	
DWG	
FIGURE	
JOB NO.	2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

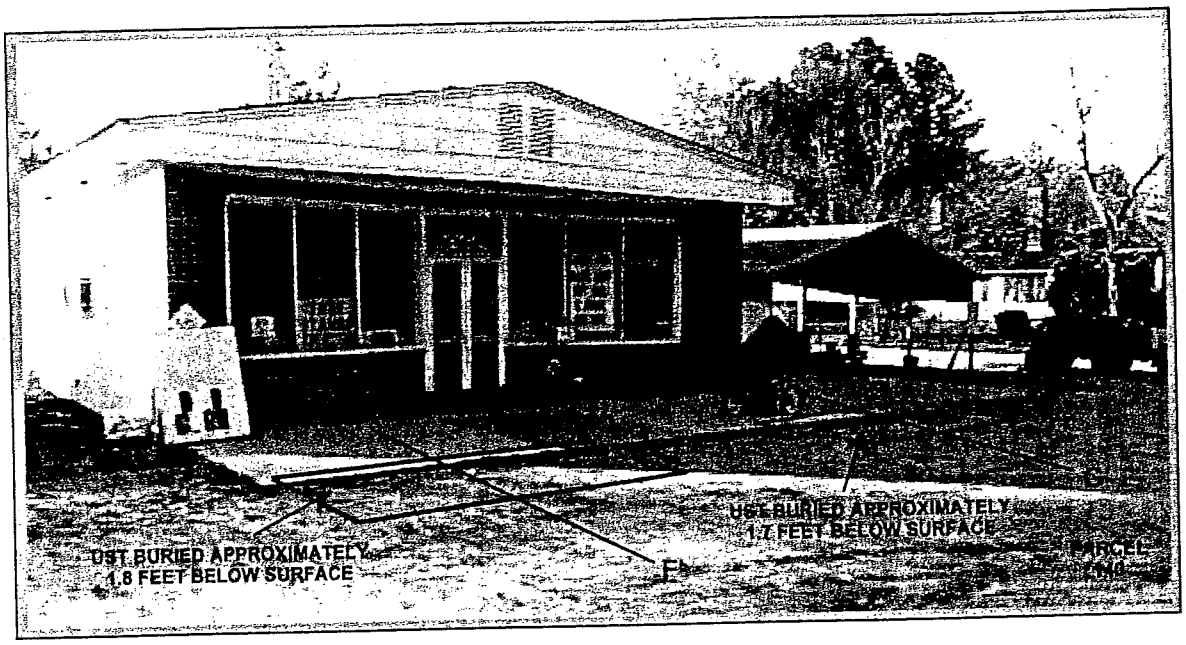
SITE: HENRY USSERY PROPERTY (PARCEL 140)

CITY: ROCKINGHAM

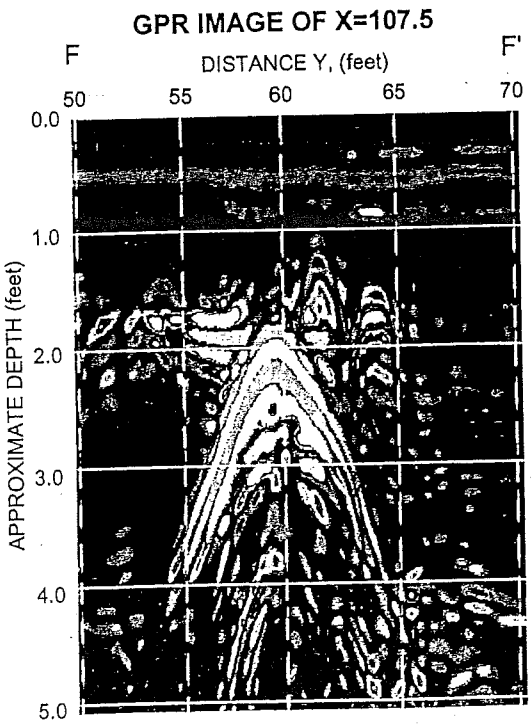
STATE: NORTH CAROLINA

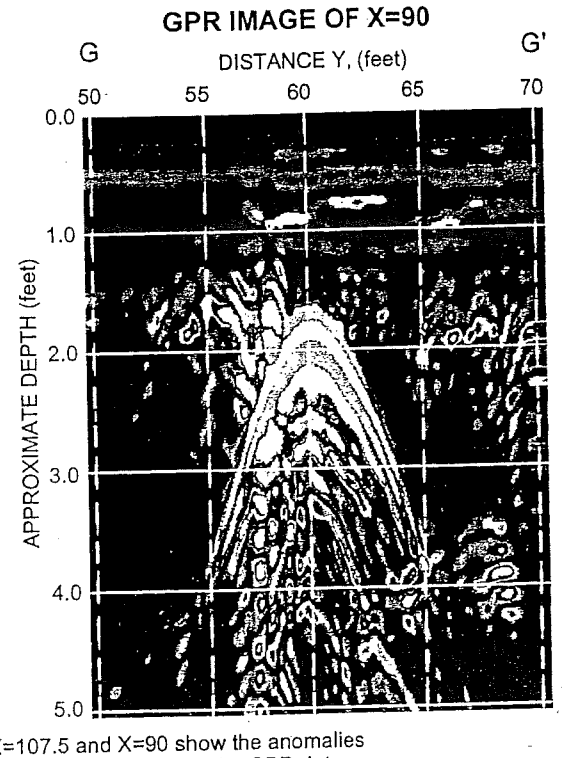
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the approximate locations of the two UST's, as suggested by the geophysical results at Parcel 140. The UST's appear to be approximately 1.8 and 1.7 feet below surface.





The GPR images obtained along survey lines X=107.5 and X=90 show the anomalies that are probably in response to the two UST's buried at Parcel 140. The GPR data suggest the UST's are buried approximately 1.8 feet and 1.7 feet below surface, respectively.

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	HENRY USSERY PROPERTY (PARCEL 140)		
CITY	ROCKINGHAM	STATE	NORTH CAROLINA
	GEOPHYSICAL RESULTS	JOB	2005-292

PHOTO & GPR IMAGES OF UST LOCATIONS

FIGURE 22

APPENDIX C

BORING LOGS

Log of Soil Boring 7-1

Project: Rockingham Sites (Parcel 007) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 7-1

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/06/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH/SJK *Total Depth of Boring:* 8 feet

SUBSURFACE PROFILE			SAMPLE					
Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm: 250 500 750) / FID Field Screen (ppm: 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Asphalt*						
1		*SP* Dry, tan, fine sand		MC	100	0		
2		*SP* Dry, tan, fine sand		MC	100	0		
3 / 1		*SC* Dry, tan, clayey fine sand		MC	100	0		
5		*SC* Dry, tan, clayey fine sand		MC	100	2		
7 / 2		Boring terminated at 8 feet.						
10 / 3								
13 / 4								
15								

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Log of Soil Boring 7-2

Project: Rockingham Sites (Parcel 007) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 7-2

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/06/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH/SWC *Total Depth of Boring:* 8 feet

SUBSURFACE PROFILE			SAMPLE					
Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Asphalt*						
1		*SP* Dry, tan, fine sand		MC	100	0		
2		*SP* Dry, tan, fine sand		MC	100	0		
3 / 1		*SC* Dry, tan, clayey fine sand		MC	100	0		
5		*SC* Dry, tan, clayey fine sand		MC	100	0		
6 / 2		*SC* Dry, tan, clayey fine sand		MC	100	1		
8		Boring terminated at 8 feet.						
10 / 3								
13 / 4								
15								

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Log of Soil Boring 7-3

Project: Rockingham Sites (Parcel 007) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 7-3

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/06/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* PH/SCW *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm, 250 500 750) / FID Field Screen (ppm, 250 500 750)	Lab Sample Depth	Well Data
		SUBSURFACE PROFILE	**SAMPLE**					
0 / 0		Ground Surface						
0		*Asphalt*						
1	SP	*SP* Dry, tan, fine sand		MC	100	0		
2	SP	*SP* Dry, tan, fine sand		MC	100	4		
3 / 1	SC	*SC* Dry, tan, clayey fine sand		MC	100	109		
4	SC	*SC* Dry, tan, clayey fine sand, petroleum odor		MC	100	>1000		
5								
6								
7 / 2								
8		Boring terminated at 8 feet.						
9								
10 / 3								
11								
12								
13 / 4								
14								
15								

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Log of Soil Boring 7-4

Project: Rockingham Sites (Parcel 007) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 7-4
Client: NCDOT
WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A
State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A
Drilling Method: Direct push *Boring Date:* 12/06/05 *Cave In Depth:* N/A
Sampler Type: Macro Core
Logged By: Dan Hirth *Checked By:* DH/SW *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) / FID Field Screen (ppm)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Asphalt*						
1	SP	Dry, tan, fine sand		MC	100	3		
2	SC	Dry, tan/orange, clayey fine sand		MC	100	1		
3 / 1	SC	Dry, tan/orange, clayey fine sand		MC	100	1		
5	SC	Dry, tan, clayey fine sand		MC	100	1		
6 / 2		Boring terminated at 8 feet.						
8								
9 / 3								
10								
11								
12								
13 / 4								
14								
15								

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Log of Soil Boring 7-5

Project: Rockingham Sites (Parcel 007) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 7-5

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/06/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH/SV *Total Depth of Boring:* 8 feet

SUBSURFACE PROFILE			SAMPLE					
Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Asphalt*						
1	*SC*	Dry, tan, clayey fine sand		MC	100	0		
2	*SC*	Dry, tan, clayey fine sand		MC	100	0		
3 / 1	*SC*	Dry, tan, clayey fine sand		MC	100	0		
5	*SC*	Dry, tan, clayey fine sand		MC	100	0		
6 / 2	*SC*	Dry, tan, clayey fine sand		MC	100	0		
8		Boring terminated at 8 feet.						
10 / 3								
13 / 4								
15								

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Log of Soil Boring 7-6

Project: Rockingham Sites (Parcel 007) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 7-6

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/06/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH | SWL *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
		SUBSURFACE PROFILE	**SAMPLE**					
0 / 0		Ground Surface						
0		*Asphalt*						
1	SP	*SP* Dry, tan, fine sand		MC	100	0		
2	SC	*SC* Dry, tan, clayey fine sand		MC	100	0		
3 / 1	SC	*SC* Dry, tan, clayey fine sand		MC	100	0		
4	SC	*SC* Dry, tan, clayey fine sand, faint petroleum odor		MC	100	0		
5								
6								
7 / 2								
8		Boring terminated at 8 feet.						
9								
10 / 3								
11								
12								
13 / 4								
14								
15								

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Log of Soil Boring 7-7

Project: Rockingham Sites (Parcel 007) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 7-7

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/06/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH | SW *Total Depth of Boring:* 8 feet

SUBSURFACE PROFILE			SAMPLE					
Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Asphalt*						
1		*SP* Dry, tan, fine sand		MC	100	0		
2		*SC* Dry, tan, clayey fine sand		MC	100	0		
3 / 1								
4		*SC* Dry, tan, clayey fine sand		MC	100	0		
6 / 2		*SC* Dry, tan, clayey fine sand, faint petroleum odor		MC	100	3		
8		Boring terminated at 8 feet.						
10 / 3								
13 / 4								
15								

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Log of Soil Boring 7-8

Project: Rockingham Sites (Parcel 007) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 7-8

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/06/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH | SW *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm, 250 / 500 / 750) / FID Field Screen (ppm, 250 / 500 / 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Asphalt*						
1	*SP*	Dry, tan and brown, fine sand		MC	100	0		
2	*SC*	Dry, tan, clayey fine sand, petroleum odor		MC	100	4		
3 / 1								
4	*SC*	Dry, tan and gray, clayey fine sand, petroleum odor		MC	100	>1000		
5								
6	*SC*	Dry, tan and gray, clayey fine sand, petroleum odor		MC	100	>1000		
7 / 2								
8		Boring terminated at 8 feet.						
9								
10 / 3								
11								
12								
13 / 4								
14								
15								

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APPENDIX D

LABORATORY ANALYTICAL REPORT

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

Pace Analytical Services, Inc.
2225 Riverside Drive
Asheville, NC 28804
Phone: 828.254.7176
Fax: 828.252.4618

December 20, 2005

Ms. Sheri Knox
Solutions-IES
1101 Nowell Road
Raleigh, NC 27607

RE: Lab Project Number: 92109000
Client Project ID: NCDOT 34950.1.1 Parcel 7

Dear Ms. Knox:

Enclosed are the analytical results for sample(s) received by the laboratory on December 7, 2005. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Inorganic Wet Chemistry and Metals Analyses were performed at our Pace Asheville laboratory and Organic testing was performed at our Pace Charlotte laboratory unless otherwise footnoted.

If you have any questions concerning this report please feel free to contact me.

Sincerely,

Bonnie McKee

Bonnie McKee
Bonnie.McKee@pacelabs.com
Project Manager

Enclosures

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2225 Riverside Drive
Asheville, NC 28804
Phone: 828.254.7176
Fax: 828.252.4618

Lab Project Number: 92109000
Client Project ID: NCDOT 34950.1.1 Parcel 7

Solid results are reported on a dry weight basis

Lab Sample No: 926419987 Project Sample Number: 92109000-001 Date Collected: 12/06/05 13:30
Client Sample ID: 7-3(6-8) Matrix: Soil Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	10.8	%		12/07/05 20:35	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	59.	mg/kg	5.6	12/16/05 20:15	KBS	68334-30-5		
n-Pentacosane (S)	50	%		12/16/05 20:15	KBS	629-99-2		
Date Extracted	12/14/05			12/14/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	1600	mg/kg	96.	12/12/05 21:25	DHW			
4-Bromofluorobenzene (S)	165	%		12/12/05 21:25	DHW	460-00-4	1	

Asheville Certification IDs
NC Wastewater 40
NC Drinking Water 37712
SC 99030
FL NELAP E87648

REPORT OF LABORATORY ANALYSIS
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Charlotte Certification IDs
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NC Drinking Water 37706
SC 99006
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Asheville, NC 28804
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Fax: 828.252.4618

Lab Project Number: 92109000
Client Project ID: NCDOT 34950.1.1 Parcel 7

Lab Sample No: 926419995 Project Sample Number: 92109000-002 Date Collected: 12/06/05 13:30
Client Sample ID: 7-4(6-8) Matrix: Soil Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	11.0	%		12/07/05 20:35	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	5.6	12/19/05 12:15	KBS	68334-30-5		
n-Pentacosane (S)	61	%		12/19/05 12:15	KBS	629-99-2		
Date Extracted	12/14/05			12/14/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	4.5	12/12/05 18:02	DHW			
4-Bromofluorobenzene (S)	120	%		12/12/05 18:02	DHW	460-00-4		

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Lab Project Number: 92109000
Client Project ID: NCDOT 34950.1.1 Parcel 7

Lab Sample No: 926420001 Project Sample Number: 92109000-003 Date Collected: 12/06/05 13:35
Client Sample ID: 7-6(6-8) Matrix: Soil Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	12.3	%		12/07/05 20:35	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	5.7	12/16/05 21:25	KBS	68334-30-5		
n-Pentacosane (S)	64	%		12/16/05 21:25	KBS	629-99-2		
Date Extracted	12/14/05			12/14/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	4.3	12/10/05 16:15	DHW			
4-Bromofluorobenzene (S)	90	%		12/10/05 16:15	DHW	460-00-4		

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Phone: 704.875.9092
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Pace Analytical Services, Inc.
2225 Riverside Drive
Asheville, NC 28804
Phone: 828.254.7176
Fax: 828.252.4618

Lab Project Number: 92109000
Client Project ID: NCDOT 34950.1.1 Parcel 7

Lab Sample No: 926420019 Project Sample Number: 92109000-004 Date Collected: 12/06/05 13:35
Client Sample ID: 7-7(6-8) Matrix: Soil Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	12.5	%		12/07/05 20:35	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	5.7	12/16/05 21:59	KBS	68334-30-5		
n-Pentacosane (S)	66	%		12/16/05 21:59	KBS	629-99-2		
Date Extracted	12/14/05			12/14/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	4.3	12/10/05 17:51	DHW			
4-Bromofluorobenzene (S)	86	%		12/10/05 17:51	DHW	460-00-4		

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Lab Project Number: 92109000
Client Project ID: NCDOT 34950.1.1 Parcel 7

Lab Sample No: 926420027 Project Sample Number: 92109000-005 Date Collected: 12/06/05 13:40
Client Sample ID: 7-8(4-6) Matrix: Soil Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	9.5	%		12/07/05 20:36	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	110	mg/kg	5.5	12/16/05 22:34	KBS	68334-30-5		
n-Pentacosane (S)	63	%		12/16/05 22:34	KBS	629-99-2		
Date Extracted	12/14/05			12/14/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	1500	mg/kg	82.	12/12/05 21:54	DHW			
4-Bromofluorobenzene (S)	208	%		12/12/05 21:54	DHW	460-00-4	1	

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Lab Project Number: 92109000
Client Project ID: NCDOT 34950.1.1 Parcel 7

PARAMETER FOOTNOTES

Method 9071B modified to use ASE.

All pH, Free Chlorine, Total Chlorine and Ferrous Iron analyses conducted outside of EPA recommended immediate hold time.

Depending on the moisture content the PRLs can be elevated for all soil samples reported on a dry weight basis.

2-Chloroethyl vinyl ether has been shown to degrade in the presence of acid.

ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
(S)	Surrogate
[1]	High surrogate recovery was confirmed as a matrix effect by a second analysis.

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QUALITY CONTROL DATA

Lab Project Number: 92109000
Client Project ID: NCDOT 34950.1.1 Parcel 7

QC Batch: 145042 Analysis Method: EPA 8015
QC Batch Method: EPA 3545 Analysis Description: TPH in Soil by 3545/8015
Associated Lab Samples: 926419987 926419995 926420001 926420019 926420027

METHOD BLANK: 926446337
Associated Lab Samples: 926419987 926419995 926420001 926420019 926420027

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Diesel Fuel	mg/kg	ND	5.0	
n-Pentacosane (S)	%	62		

LABORATORY CONTROL SAMPLE: 926446345

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Diesel Fuel	mg/kg	166.70	97.66	59	
n-Pentacosane (S)				91	

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QUALITY CONTROL DATA

Lab Project Number: 92109000
Client Project ID: NCDOT 34950.1.1 Parcel 7

QC Batch: 144711 Analysis Method: EPA 8015
QC Batch Method: EPA 8015 Analysis Description: GAS, Soil, North Carolina
Associated Lab Samples: 926419987 926419995 926420001 926420019 926420027

METHOD BLANK: 926431222
Associated Lab Samples: 926419987 926419995 926420001 926420019 926420027

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Gasoline	mg/kg	ND	5.0	
4-Bromofluorobenzene (S)	%	70		

LABORATORY CONTROL SAMPLE: 926431230

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Gasoline	mg/kg	25.00	27.78	111	
4-Bromofluorobenzene (S)				75	

MATRIX SPIKE: 926431248

Parameter	Units	926419839 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
Gasoline	mg/kg	0.03725	20.55	24.16	117	
4-Bromofluorobenzene (S)					76	

SAMPLE DUPLICATE: 926431255

Parameter	Units	926419854 Result	DUP Result	RPD	Footnotes
Gasoline	mg/kg	5.000	5.300	6	
4-Bromofluorobenzene (S)	%	96	88		

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QUALITY CONTROL DATA

Lab Project Number: 92109000
Client Project ID: NCDOT 34950.1.1 Parcel 7

QC Batch: 144515 Analysis Method: % Moisture
QC Batch Method: Analysis Description: Percent Moisture
Associated Lab Samples: 926419987 926419995 926420001 926420019 926420027

SAMPLE DUPLICATE: 926421264

Parameter	Units	926417098 Result	DUP Result	RPD	Footnotes
Percent Moisture	%	13.80	14.00	2	

Date: 12/20/05

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Phone: 828.254.7176
Fax: 828.252.4618

Lab Project Number: 92109000
Client Project ID: NCDOT 34950.1.1 Parcel 7

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

LCS(D)	Laboratory Control Sample (Duplicate)
MS(D)	Matrix Spike (Duplicate)
DUP	Sample Duplicate
ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
RPD	Relative Percent Difference
(S)	Surrogate

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The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Page: 1 of 1

897901

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company:	Report To: Steve Kroc	Attention:
Address: Hwy Wood Rd Bolton NC 28607	Copy To:	Company Name:
		Address:
Email To: steve.kroc@latimerassoc.com	Purchase Order No.: WO 99460.1.1	Pace Quote Reference:
Phone: 919 873 0060 Fax: 919 873 0074	Project Name: Wood Road 7	Pace Project Manager: BKM
Requested Due Date/TAT: 5 to 10 wks	Project Number: 2330 Grant Street	Pace Profile #: 3869-6

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☒ UST ☐ RCRA ☐ Other

SITE LOCATION

☐ GA ☐ IL ☐ IN ☐ MI ☐ MN ☒ NC
☐ OH ☐ SC ☐ WI ☐ OTHER

Section D Required Client Information

SAMPLE ID

One Character per box.
(A-Z, 0-9 / .-)
Samples IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Filtered (Y/N)	Requested Analysis:	Residual Chlorine (Y/N)	Pace Project Number / Lab I.D
1	7-5(6-12)	SL	G	12/6	1350				1	2						2		N		N	
2	7-4(6-12)				1330																
3	7-6(6-12)				1335																
4	7-7(6-12)				1335																
5	7-8(9-6)				1340																
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Additional Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Daniel K. Hunter	12-7-05	1200		12-7-05	1200
	12-7-05	1530			

SAMPLE CONDITION

Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Daniel K. Hunter

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM / DD / YY): 12/06/05

SEE REVERSE SIDE FOR INSTRUCTIONS

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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897901

Section A
Required Client Information:

Company	
Address	
Email To:	
Phone	Fax
Requested Due Date/TAT:	

Section B
Required Project Information:

Report To:	
Copy To:	
Purchase Order No.:	
Project Name:	
Project Number:	

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

[ ] NPDES [ ] GROUND WATER [ ] DRINKING WATER
[x] UST [ ] RCRA [ ] Other_____

SITE LOCATION [ ]GA [ ]IL [ ]IN [ ]MI [ ]MN [ ]NC [ ]OH [ ]SC [ ]WI [ ]OTHER _____

Section D
Required Client Information

SAMPLE ID

One Character per box.
(A-Z, 0-9 / -)
Samples IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Filtered (Y/N)	Requested Analysis:	Residual Chlorine (Y/N)	Pace Project Number / Lab I.D
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

Additional Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITION

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM / DD / YY)

Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

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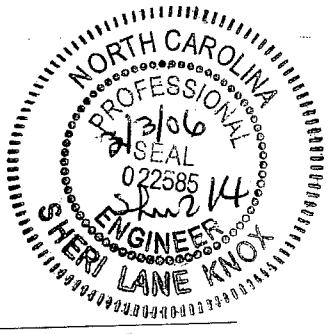
PRELIMINARY SITE ASSESSMENT
PARCEL 021, SAMUEL D. TANNER PROPERTY
2008 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
NCDOT PROJECT: U-3456
WBS ELEMENT: 34950.1.1

Prepared for:
NC Department of Transportation
Geotechnical Engineering Unit
GeoEnvironmental Section
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Prepared by:
Solutions-IES
1101 Nowell Road
Raleigh, North Carolina 27607

Solutions-IES Project No. 2730.05A2.NDOT



Daniel K. Hirth
Hydrogeologist

Sheri L. Knox, P.E.
Project Manager

January 20, 2006

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2.0 BACKGROUND AND SITE DESCRIPTION 1

3.0 FIELD ACTIVITIES 2

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APPENDIX B – GEOPHYSICAL INVESTIGATION

APPENDIX C – BORING LOGS

APPENDIX D – LABORATORY ANALYTICAL REPORTS

1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) plans to realign US Route 1 - Fayetteville Road (Fayetteville Road) in Rockingham, Richmond County, North Carolina. The project may require the NCDOT to acquire additional property for roadway construction. On November 3, 2005, Solutions-IES submitted a proposal to conduct Preliminary Site Assessments (PSAs) for 14 parcels of land that contain or reportedly contained underground storage tanks (USTs) or are areas of interest identified by NCDOT. This report summarizes the results of field and laboratory activities conducted on December 5 and December 6, 2005 during the PSA of a portion of the Samuel D. Tanner Property (Study Area) located at the southeast quadrant of the intersection of Fayetteville Road and Skyline Drive. The location of Parcel 021 is shown on Figures 1 and 2. The scope of work executed at the site was performed in general accordance with Solutions-IES proposal NC05449P dated November 3, 2005, and initiated based on a Notice to Proceed issued by the NCDOT Geotechnical Engineering Unit dated November 7, 2005, under contract 7000005553, dated May 9, 2005.

2.0 BACKGROUND AND SITE DESCRIPTION

The Samuel D. Tanner Property (2008 Fayetteville Road) is developed with a former gas station (Facility ID # 0-018729) located on the south side of Fayetteville Road and adjacent to the eastern side of Skyline Drive. According to NCDOT, the building is still in place, and is currently a 'Gift and Flower' Store. Three other small businesses also share the parcel in adjoining buildings. The portion of Parcel 021 fronting Fayetteville Road consists of an asphalt-covered parking lot with grassy areas. Evidence of monitoring wells was not observed during the field work performed by Solutions-IES.

Reportedly, the NCDENR UST registry indicates four tanks were removed from Parcel 021 in 1993. The main tank bed area and pump island were in front of the building, about 32 feet from the centerline of Fayetteville Road. Contaminated soil was removed, but elevated contaminant concentrations remained in final excavation confirmation samples (Incident # 10490). Further assessment work was conducted, but the Assessment Report could not be located in the Fayetteville Regional Office by NCDOT.

3.0 FIELD ACTIVITIES

Prior to beginning subsurface sampling, Solutions-IES contacted the North Carolina One Call Center to locate underground utilities at the site. Solutions-IES contracted Pyramid Environmental & Engineering, P.C. (Pyramid) to conduct geophysical investigations1 in the proposed right-of-way and easement areas. The geophysical investigations consisted of electromagnetic (EM) induction-metal detection surveys and ground penetrating radar (GPR) surveys. The EM surveys were conducted using a Geonics EM61-MK1 (EM61) metal detection instrument.

The geophysical surveys were performed on November 12 and 22, 2005. The EM61 surveys suggested the presence of several anomalies. The GPR survey suggested the presence of one UST buried approximately 1.7 feet below surface approximately 25 feet from the centerline of Fayetteville Road and approximately 70 feet from the centerline of Skyline Drive. Images from the EM61 and GPR surveys are shown in Appendix B as Figures 6 and 7 (excerpted from the Pyramid Report), respectively. The probable UST location was marked and labeled using orange, water-based marking paint (Appendix B - Figure 9 excerpted from the Pyramid Report).

After reviewing the geophysical report, Solutions-IES mobilized to the site on December 5, 2005 to collect soil samples near the probable UST identified during the geophysical investigation, and the proposed right-of-way. Fourteen soil borings were advanced a depth of 8 feet below ground surface (ft bgs) using a Geoprobe®. Four borings (21-4, 21-5, 21-6, and 21-7) were located in close proximity to the probable UST, and three borings (21-11, 21-12, and 21-13) were located to help define the extent of possible soil contamination. The remaining borings were located in the proposed right-of-way (21-8, 21-9, and 21-10) or along a paved ditch (21-1, 21-2, 21-3, 21-14, and 21-15). One additional boring (Boring Number 21-12) was advanced to a depth of 12 ft bgs to install a temporary well. Boring locations with associated boring numbers are illustrated in Figure 3.

A MacroCore® sampler fitted with a single-use, polyvinyl chloride (PVC) liner was used to collect samples at 4-foot intervals. Each soil sample was split into two aliquots. Each aliquot was placed in a separate resealable plastic bag. One bag was placed on ice for possible laboratory analysis, while the other bag was placed at ambient temperature for field screening of volatile organic compounds (VOCs)

[1] Pyramid Environmental & Engineering, P.C. work results were incorporated into the report "*Geophysical Investigation Report – Geophysical Surveys for the Detection of Metallic UST's. Rockingham, US1 (Fayetteville Road) Sites*" dated November 30, 2005 ("Pyramid Report").

using a flame ionization detector (FID). After approximately 20 minutes, allowing accumulation of VOCs in the headspace of the latter bag, it was scanned with the FID. The FID readings were entered on the boring logs along with a description of the soil and indication of staining or odor. Boring logs are included in Appendix C and summarized in Table 1.

In general, the subsurface in the area of the former pump island and probable UST (Borings 21-3 through 21-7) consisted of approximately 3-inches of asphalt underlain by fine-grained sand (Unified Soil Classification SP) and fine-grained sandy clay (Unified Soil Classification CL). However, soil from borings 21-11, 21-12, and 21-13, also located in close proximity to the probable UST (Figure 3), consisted of fine-grained sand (Unified Soil Classification SP) underlain by clayey sand (Unified Soil Classification SC). Soil from the remaining borings located along the southeast side of Fayetteville Road (21-8, 21-9, and 21-10), and those located on the northeast side of Skyline Drive along a paved ditch (21-1, 21-2, 21-14, and 21-15), consisted of fine-grained sand (Unified Soil Classification SP) underlain by sandy clay (Unified Soil Classification CL) or clayey sand (Unified Soil Classification SC). While advancing borings 21-8 and 21-10, asphalt paving was encountered. Boring logs are included in Appendix C.

Headspace screening of the soil gas from borings 21-1, 21-4, 21-5, 21-6, 21-7, 21-11, 21-12, 21-14, and 21-15 indicated the presence of elevated VOCs. The FID readings are summarized in Table 1. Samples from selected borings were placed in laboratory-supplied containers and stored on ice pending shipment to Pace Analytical Services, Inc. (Pace) in Huntersville, NC under chain-of-custody control. The samples were analyzed for total petroleum hydrocarbons (TPH) using EPA Modified Method 8015 for gasoline-range organics (GRO) and EPA Method 3545/8015 for diesel-range organics (DRO). The laboratory results are included in Table 2.

Because groundwater was encountered in boring 21-12, boring 21-12 was advanced to a depth of 12 ft bgs to facilitate the installation and sampling of a temporary groundwater monitoring well. Upon completion of the boring, a 10-foot section of 1-inch diameter PVC slotted well screen, joined with an approximate 2-foot section of 1-inch diameter PVC riser, was introduced into the boring. Washed #2 well sand was introduced into the annulus of the boring, forming a sand pack around the screen from the base of the temporary well to within 1.5-foot of surface grade. The remainder of the annulus, from 1.5 ft bgs to surface grade, was filled with bentonite clay pellets, which were hydrated to ensure a firm seal at the surface. Appendix C contains boring log 21-12 and temporary well construction information. The initial water level within the temporary well was measured at 8.92 ft bgs. The stabilized water level was

measured at 7.29 ft bgs. The well was then sampled with a peristaltic pump, utilizing 3/8-inch diameter disposable polyethylene tubing. Groundwater samples obtained from the well were submitted for analysis of volatile organic compounds (VOCs) by EPA Methods 601 and 602, aliphatic and aromatic volatile petroleum hydrocarbons (VPH) by the Massachusetts Department of Environmental Protection (MADEP) method, semivolatile organic compounds (SVOCs) by EPA Method 625 (including the ten largest tentatively identified compounds or TICs), aliphatic and aromatic extractable petroleum hydrocarbons (EPH) by the MADEP method, and chromium (Cr) and lead (Pb) by EPA Method 200.7 (Standard Preparation Method 3030C). Results of the groundwater analysis are shown in Table 3.

Specific capacity testing was not performed due to insufficient groundwater recovery after the sampling activities were completed.

4.0 LABORATORY RESULTS

According to analytical results (Appendix D), concentrations of TPH (GRO and DRO) were detected in excess of the NCDENR UST Section Action Level of 10 milligrams per kilogram (mg/kg) in the soil samples collected from borings 21-5 (820 and 69 mg/kg), 21–6 (660 and 62 mg/kg), 21–7 (440 and 60 mg/kg), and 21–11 (150 and 80 mg/kg) (Table 2).

TPH GRO also was detected in soil sample 21-4 at a concentration of 5 mg/kg; this concentration does not exceed the Action Level. TPH DRO from the same soil sample was non-detect. TPH (GRO and DRO) were not detected in soil samples collected from Borings 021-1, 021-3, 021-12, 021-14, and 021-15.

The analytical results for temporary well 21-12, indicated that the groundwater sample contained naphthalene, benzene, total xylenes, C05-C08 aliphatics, and C09-C22 aromatics (Table 3) in excess of the 15A NCAC 2L .0202 Groundwater Standards (2L Standards). Total lead and total chromium concentrations also exceeded their respective 2L Standard.

The laboratory report in Appendix D includes a list of 25 tentatively identified compounds (TICS) detected in the groundwater sample collected from the temporary monitoring well installed in boring 21-12. Some of the TICS may be transformation and degradation products from petroleum hydrocarbons. and others are of unknown origin.

5.0 DISCUSSION AND CONCLUSIONS

The geophysical investigation performed at the site suggests the presence of a UST buried approximately 1.7 ft bgs. Field measurement screening of soil gas from selected borings indicated elevated VOC concentrations. Soil samples from these borings were sent to Pace for TPH GRO and TPH DRO analysis. According to analytical results, concentrations of TPH (GRO and DRO) were detected in excess of the NCDENR Action Level of 10 mg/kg in soil samples collected from borings 21-5, 21–6, 21–7, and 21–11.

Impacted soils are believed to be located in the vicinity of the probable tank and west of the probable tank. The area surrounding the probable tank (illustrated by borings 021-5, 021-6, 021-7 and 021-4) is elliptical in shape and measures approximated 20 feet by 50 feet, or approximately 780 square feet. The maximum depth of soil contamination is the depth to groundwater at approximately 7 ft bgs. Solutions-IES calculates that the volume of soil impacted at concentrations greater than the Action Level is approximately 5,500 cubic feet (200 cubic yards). Although the soil sample collected from boring 021-4 contained TPH GRO at a concentration greater than the laboratory method detection limit, but less than the Action Level, soil that is excavated in vicinity of boring 021-4 should be properly transported and disposed of. At the time of roadway construction, the NCDOT transportation/disposal contactor may use different criteria for estimating the area of impacted soil. Solutions-IES recommends the confirmation of the probable UST and its removal along with the soil located in the vicinity of the UST.

Based on the analytical results obtained from the temporary well, groundwater likely has been impacted by petroleum hydrocarbons. A water sample from a temporary well installed in boring 21-12 indicated that the groundwater sample contained various petroleum constituents in excess of the 2L Standards. Total lead and total chromium concentrations also exceeded the 2L Standard. Additional assessment would be necessary to determine the vertical and lateral extent of groundwater contamination.

TABLES

TABLE 1
SUMMARY OF FIELD SCREENING RESULTS FOR SOIL
Parcel 021, Samuel D. Tanner Property
2008 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: December 6, 2005

Sample Depth Below Ground Surface Unless Otherwise Noted	Soil Borings														
	21-1	21-2	21-3	21-4	21-5	21-6	21-7	21-8	21-9	21-10	21-11	21-12[2]	21-13	21-14	21-15
	FID Reading (ppm)														
0 - 2 feet	81.9	ND	ND	ND	ND	ND	ND	0.4	0.2	0.2	0.2	ND	2.9	24.1	28.3
2 - 4 feet	182.9	ND	ND	ND	ND	ND	ND	0.4	0.2	0.2	0.1	ND	2.8	197.2	139.7
4 - 6 feet	230.4	ND	ND	ND	32.8	ND	ND	0.4	0.3	0.3	0.5	0.1	4.8	107.8	10.9
6 - 8 feet	13.2[1]	1.7	0.0	390.9[1]	81.5[1]	508.3[1]	503.8[1]	0.5	0.2	1.1	596.8	2.0[1]	100.5	9.6	11.6

Notes:
1. Petroleum odor noted from marked sample interval.
2. FID readings were not recording for boring 21-12 at 8-12 ft bgs.
3. ppm = parts per million
4. Shaded cells denote samples submitted for laboratory analysis.

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS
Parcel 021, Samuel D. Tanner Property
2008 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: December 6, 2005

Sample Information		Total Petroleum Hydrocarbons	
Boring Number	Depth (Feet)	Gasoline Range[1] (mg/kg)	Diesel Range[2] (mg/kg)
021-1	4-6	ND	ND
021-3	6-8	ND	ND
021-4	6-8	5	ND
021-5	6-8	820	69
021-6	6-8	660	62
021-7	6-8	440	60
021-11	6-8	150	80
021-12	6-8	ND	ND
021-14	4-6	ND	ND
021-15	4-6	ND	ND

Notes:

1. Total Petroleum Hydrocarbons (TPH) EPA Method 8015 - Gasoline in Soil Hydrocarbons
2. Total Petroleum Hydrocarbons (TPH) EPA Method 3545/8015 - Diesel Fuel in Soil Hydrocarbons
3. ND denotes TPH Not Detected at or above laboratory method detection limits.
4. Shaded cells denote samples that exceed the NC DENR Action Level of 10 mg/kg TPH.

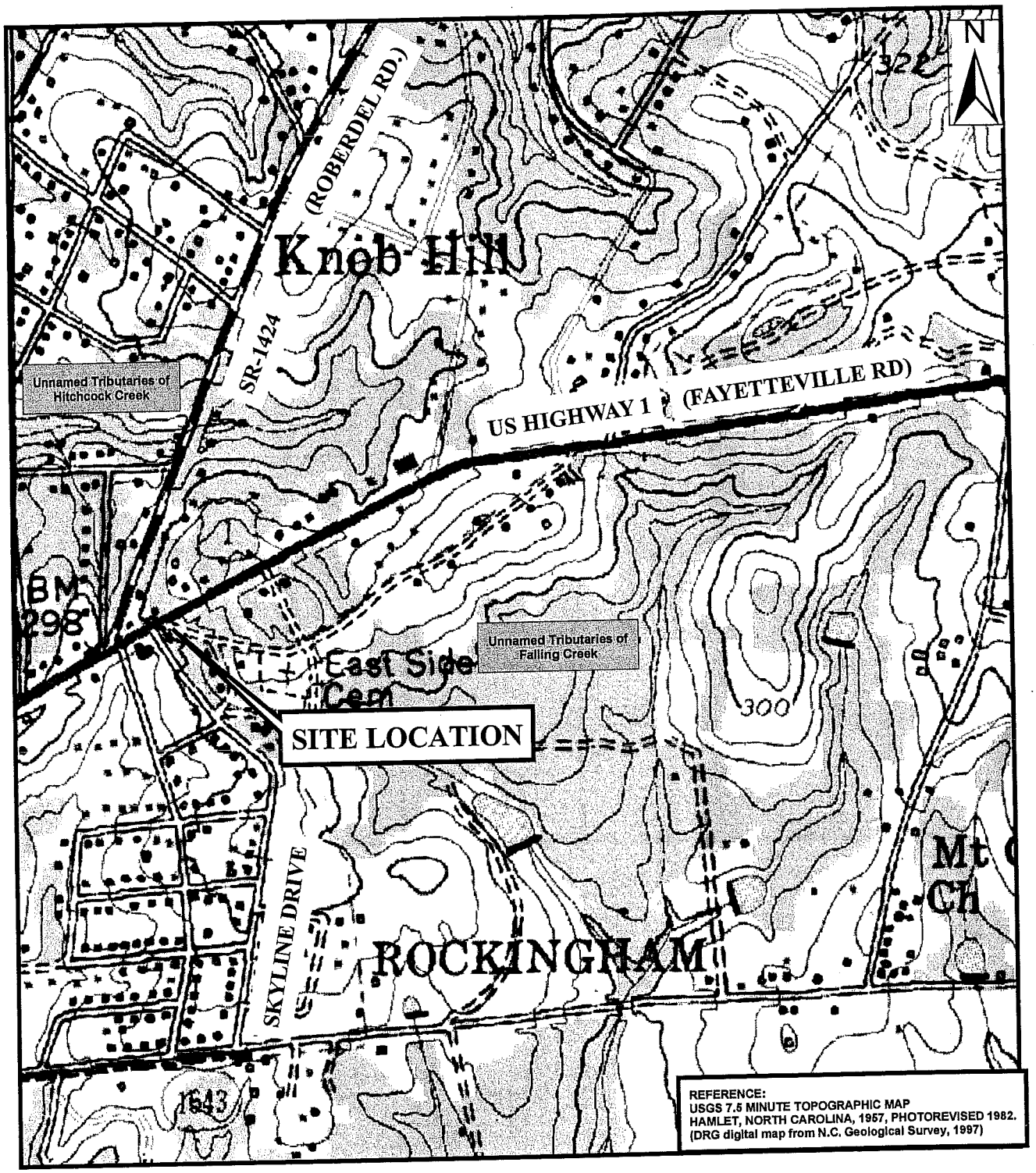
TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
Parcel 021, Samuel D. Tanner Property
2008 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: December 6, 2005

Water Sample ID	21-12-MW	15A NCAC 02L .0202 Groundwater Quality Standards
Hydrocarbon Constituent[1]		
EPA Method 625/625SF - Semivolatile Organics (µg/l)		
Naphthalene	59	21
Di-n-butylphthalate ("DBP")	6.5 J[2]	700
Diethylphthalate	11	5000
EPA Method 601/602Volatile Organics (µg/l)		
Benzene	310	1
Ethylenebenzene	220	550
Methyl-tert-butyl ether ("MTBE")	37 J[2]	200
Xylene (Total)	91,000	530
MADEP - VPH AND EPH (µg/L)		
C05 - C08 Aliphatics	1,400	420
C09 - C18 Aliphatics	3,505	4200
C09 - C22 Aromatics	973	210
Metals by Trace ICP (EPA Method 200.7/3030C) (mg/L)		
Total Lead	0.86	0.015
Total Chromium	2.6	0.05

Notes:

1. Constituents not shown were not detected above laboratory method detection limits.
2. Estimated concentration above laboratory method detection limit and below adjusted reporting limit.
3. Shaded cells denote constituents and concentrations that exceed the 15A NCAC 2L Groundwater Standards.
4. 25 TICs (Semi-volatile organics) were also detected in the groundwater sample collected from the Study Area. The TICs are listed in Appendix D.
5. C9-C18 Aliphatics represent the combined totals of C9-C12 Aliphatics and C9-C18 Aliphatics (EPH).
6. C9-C22 Aromatics represent the combined totals for C9-C10 Aromatics (VPH) and C11-C22 Aromatics (EPH).

FIGURES



1:10,000

SITE LOCATION MAP
PARCEL 021 - SAM TANNER PROPERTY
2008 FAYETTEVILLE ROAD (US HIGHWAY 1)
WBS ELEMENT NO. 34950.1.1(NCDOT PROJECT: U-3456)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA

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1101 Nowell Road, Raleigh, NC 27609
Phone (919) 873-1060, Fax (919) 873-1074

Created by:	KBB	Project:	2730.05A2.NCDO
Checked by:	BR	Date:	12/15/05
File:	FIG1.mxd		
Software:	ESRI ArcMap 9.0	FIGURE	1

PROJECT NUMBER	2730.M0A.NCDOT
DRAWN BY	KB/JM
CHECKED BY	SK
PROJECT MANAGER	SK
DATE	12/15/05
FILE	PARCEL 021 FIGURE 2.DGN

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SITE MAP
PARCEL 021 - SAM TANNER PROPERTY
2008 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
WBS ELEMENT NO. 34950.1.1 (NCDOT PROJECT: U-3456)

FIGURE
2

PROJECT NUMBER	2730.05A2.NCDO
DRAFTER	KB/HM
CHECKED BY	SK
PROJECT MANAGER	SK
DATE	12/15/05
FILE	PARCEL 021 FIGURE 3.DGN

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BORING LOCATIONS
PARCEL 021 - SAM TANNER PROPERTY
2008 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
WBS ELEMENT NO. 34950.1.1 (NCDOT PROJECT: U-3456)

FIGURE: 3

APPENDIX A

PHOTOGRAPHS

Photograph 1 – Parcel 021 facing south along Skyline Drive.

Photograph 2 – Parcel 021 facing east along Fayetteville Road

APPENDIX B

GEOPHYSICAL DATA

Pyramid Project # 2005292

GEOPHYSICAL INVESTIGATION REPORT

GEOPHYSICAL SURVEYS FOR THE DETECTION OF METALLIC UST'S

Rockingham, US 1 (Fayetteville Road) Sites
Rockingham, North Carolina
State Project Number U-3456

November 30, 2005

Report prepared for: Sheri Knox & Daniel Hirth
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GEOPHYSICAL SURVEYS FOR THE DETECTION OF METALLIC UST'S
Rockingham, US 1 (Fayetteville Road) Sites
State Project Number U-3456

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1.0 INTRODUCTION

Pyramid Environmental & Engineering, PC conducted geophysical investigations for Solutions Industrial & Environmental Services, Inc. during the period of November 11-23, 2005, within the proposed Right-of-Way (ROW) areas at 13 sites in Rockingham, North Carolina. The work was done as part of the North Carolina Department of Transportation (NCDOT) road-widening project under State Project number U-3456 and WBS Element 34950.1.1. The sites are located along the north or south sides of US 1 (Fayetteville Road) from 0.25 miles west of SR-1424 (Roberdell Road) to 0.25 miles west of SR 1640 (Wiregrass Road). The geophysical surveys were conducted to determine if unknown metallic underground storage tanks (UST's) were present beneath the proposed ROW area of each site.

Solutions IES representative Mr. Walt Beckwith, PG provided maps during the week of November 1, 2005 that outlined the geophysical survey areas of each site. Solutions IES representatives, Ms. Sheri Knox, PE and Mr. Daniel Hirth, PG provided guidance during the geophysical investigations. Geophysical surveys were conducted at the following 13 sites:

Property Owner	Parcel	Present Use of Property
W. J. Barnhart Property	(Parcel 4)	Used Car Lot & Auto Repair Garage
Julia M. Ratliff Property	(Parcel 7)	Vacant Lot
Samuel D. Tanner Property	(Parcel 15)	Vacant Building & Lot
Harvey E. Melton Property	(Parcel 17)	BP Gas Station
Samuel D. Tanner Property	(Parcel 21)	Strip Mall
W. J. Barnhart Property	(Parcel 41A)	Vacant Building & Lot
Wesly Denham Property	(Parcel 42)	Havoline Carolina Quick Lube
William Ussery Property	(Parcel 57)	Vacant Building & Lot
Walter McCain Property	(Parcel 80)	Vacant Buildings & Lot
Leon Wall Property	(Parcel 99)	Vacant Building & Lot
James Porter Property	(Parcel 117)	Vacant Building & Lot
John Evans Property	(Parcel 126)	Custom Monument Company
Henry Ussery Property	(Parcel 140)	Bo Henry's Pawn Shop

Photos of the above sites are presented in **Figure 1.**

2.0 FIELD METHODOLOGY

Prior to conducting the geophysical investigations, a 10-foot by 10-foot survey grid was established across the proposed ROW areas of the 13 sites using water-based marking paint. These marks were used as X-Y coordinates for location control when collecting the geophysical data and establishing base maps for the geophysical results.

The geophysical investigations consisted of electromagnetic (EM) induction-metal detection surveys and ground penetrating radar (GPR) surveys. The EM surveys were performed using a Geonics EM61-MK1 metal detection instrument. According to the manufacture's specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. The EM61 data were digitally collected at each site along parallel northerly-southerly or easterly-westerly trending survey lines spaced five feet apart. The data were downloaded to a computer and reviewed in the office using the Geonics DAT61W and Surfer for Windows Version 7.0 software programs.

Contour plots of the EM61 bottom coil results and the EM61 differential results for each site are included in this report. The bottom coil results represent the most sensitive component of the EM61 instrument and detect metal objects regardless of size. The bottom coil response can be used to delineate metal conduits or utility lines, small, isolated metal objects, and areas containing insignificant metal debris.

The differential results are obtained from the difference between the top and bottom coils of the EM61 instrument. The differential results focus on the larger metal objects such as drums and UST's and ignore the smaller insignificant metal objects.

GPR surveys were conducted across selected EM61 differential anomalies and steel-reinforced concrete using a GSSI SIR-2000 unit equipped with a 400 MHz antenna. Surveys were also performed across several areas where parked vehicles that obstructed the EM61 survey had since been removed. GPR data were digitally collected in a continuous mode along X and/or Y survey lines, spaced two to five feet apart using a vertical scan of 512 samples, at a rate of 24 scans per second. A 110 MHz high pass filter and an 800 MHz low pass filter were used during data

acquisition with the 400 MHz antenna. GPR data were collected down to a maximum depth of approximately seven feet, based on an estimated two-way travel time of 7 nanoseconds per foot.

The GPR data were downloaded to a field computer and later reviewed in the office using Radprint software. The locations of GPR survey areas or individual GPR survey lines are shown as dashed, purple rectangles or solid purple lines, respectively on the EM61 differential contour plots. Photos of the EM61 and GPR instruments are shown in **Figure 2**. The approximate perimeters of probable or possible UST's , based on the geophysical results, were marked and labeled in the field using orange, water-based marking paint and pin flags when possible. The approximate locations of probable or possible UST's are shown on the EM61 contour plots as magenta-shaded rectangles.

During the weeks of November 14 and November 23, 2005, preliminary contour plots of the EM61 bottom coil and the differential results were emailed to Ms. Knox and Mr. Hirth.

3.0 DISCUSSION OF RESULTS

3.1 Parcel 4 - W. J. Barnhart Property

Parcel 4 is located on the southern side of Fayetteville Road and contains an active used car lot and auto repair garage. The western portion of the ROW area consists of asphalt with a concrete pad and the eastern portion of the ROW area consists of a sandy surface.

The bottom coil results and the differential results are presented in **Figure 3**. The linear anomaly intersecting grid coordinates X=50 Y=26, is probably in response to a buried utility line or conduit. The high amplitude anomaly centered near the former pump island area is probably in response to the steel-reinforced concrete pad. GPR surveys conducted across the steel-reinforced concrete pad did not detect any large metal objects. The geophysical results suggest that the ROW area at Parcel 4 does not contain metallic UST's.

3.2 Parcel 7 - Julia M. Ratliff Property

The Ratliff property is located northwest of the Fayetteville Road and Roberdell Road intersection. The parcel consists of an open, asphalt and grass-covered lot. The EM61 bottom coil results and the differential results are presented in **Figure 4**. The linear bottom coil, EM61 anomalies, such as the ones intersecting grid coordinates X=100 Y=60, X=110 Y=74, and X=130 Y=104, are probably in response to utility lines or conduits. GPR surveys conducted across a portion of the EM anomaly centered near grid coordinates X=65 Y=35, suggest the presence of at least one UST centered near X=71 Y=35, and buried approximately 3.2 feet below surface. Based on the GPR results, the probable UST appears to be approximately 10 feet long and 4 feet wide.

A large water puddle was present across the western portion of the EM anomaly when the GPR surveys were conducted that prevented GPR data to be collected across the entire anomaly. However, based on the location of the probable UST, the size of the EM61 anomaly suggests that a second UST may be centered near grid coordinates X=64 Y=32. Concrete was encountered approximately three inches below surface across this area, which prevented probing with a steel rod to determine whether a second UST exists. A photo showing the approximate location of the probable and possible UST's along with a GPR image obtained along survey line Y=35 are presented in **Figure 5**.

The geophysical results suggest that the remaining portion of the proposed ROW area at Parcel 7 does not contain metallic UST's.

3.3 Parcels 15 & 21 – Samuel D. Tanner Properties

Parcels 15 and 21 are located immediately southwest and southeast, respectively of the Fayetteville Road and Skyline Drive intersection. Parcel 15 consists primarily of grass and gravel surfaces, whereas the front portion of Parcel 21 consists of an asphalt-covered parking area. The EM61 bottom coil results and the differential results are presented in **Figures 6 and 7**, respectively.

GPR surveys across the EM61 anomaly centered near grid coordinates X=188 Y=135, (on Parcel 15) suggest the presence of a UST centered near X=188 Y=137, and buried approximately 1.4 feet below

surface. The surveys also suggest that the probable tank is approximately 10 feet long and 3.5 feet wide.

At Parcel 21, GPR surveys acquired across the EM anomaly centered near grid coordinates X=269 Y=173, suggest the presence of a UST buried approximately 1.7 feet below surface. The UST appears to be approximately 10 feet long and 5 feet wide. Photos showing the approximate locations of the probable UST's at Parcels 15 and 21, along with corresponding GPR images are presented in Figures **8 and 9**, respectively.

3.4 Harvey E. Melton Property (Parcel 17)

The Melton property is an active BP gas station and store located northeast of the Fayetteville Road and Roberdell Road intersection. The pump island area consists of a steel-reinforced concrete surface that overlies the known and active UST's, whereas the parking area adjacent to the store consists of asphalt pavement. A grass yard surrounds the back portion of the site.

The EM61 bottom coil results and the differential results are presented in Figures **10 and 11**, respectively. The linear bottom coil, EM anomalies are probably in response to utility lines or conduits. The majority of non-linear anomalies are probably in response to cultural features such as storm drains, signs, utility-related objects, buildings, metal fence, and steel-reinforced concrete.

GPR surveys were conducted across the concrete pavement and across the area containing the active UST's. The surveys delineated the footprint of the three and possibly four active UST's that are centered near grid coordinates X=54 Y=53, X=50 Y=43, and X=50 Y=34, respectively. The UST centered near grid coordinates X=54 Y=53, appears to be approximately 35 feet long and probably consists of two UST's instead of one. A GPR image obtained across the UST area is presented in **Figure 12** and suggests that the tanks lie approximately 3.5 to 3.9 feet below surface.

GPR data acquired across the EM61 anomaly centered near X=155 Y=144, delineated the footprint of the kerosene tank that is buried approximately 1.7 feet below surface. The kerosene tank appears to be approximately 9 to 10 feet long and 3.5 to 4 feet wide. A photo showing the location of the

tank is presented in Figure 12. The geophysical results suggest that the remainder of the surveyed area at Parcel 17 does not contain UST's.

3.5 W. J. Barnhart Property (Parcel 41A)

Parcel 41A is a former gas station site located on the north side of Fayetteville Road approximately 300 feet west of Lawson Street. The geophysical survey area consists of asphalt and grass-covered surfaces with a concrete pad located around a former pump island. The EM61 bottom coil results and the differential results are presented in **Figure 13**. The linear bottom coil, EM anomalies, such as the ones intersecting grid coordinates X=40 Y=50, X=45 Y=95, and X=70 Y=40, are probably in response to utility lines or conduits.

GPR surveys conducted across a portion of the linear anomaly centered at X=37 Y=22, suggest the probable presence of a wide-diameter (more than 2.5 feet wide) conduit or possibly a UST that is approximately 15 to 17 feet long and buried approximately 4.5 feet below surface. This probable wide-diameter conduit (centered near X=38 Y=25) is located parallel and contingent with the probable utility line identified by the EM61 survey, suggesting that the probable conduit is a utility-related object. However, the footprint of this probable utility-related conduit or possible UST was marked in the field with spray paint and pin flags.

GPR surveys conducted across the concrete pad adjacent to the pump island suggest that the EM61 anomalies recorded in this area are probable in response to steel-reinforcement in the concrete. With the exception of the probable utility-related feature found at X=38 Y=25, the geophysical findings obtained within the survey area at Parcel 41A suggest that the ROW area does not contain metallic UST's.

3.6 Wesly Denham Property (Parcel 42)

The Havoline Carolina Kwik Lube garage operates at Parcel 42, which is located on the south side of Fayetteville Road. Asphalt and grass surfaces cover much of the proposed ROW area with a small concrete pad located in front of the building. The EM61 bottom coil results and the differential

results are presented in **Figure 14**. The linear bottom coil, EM anomalies, such as the ones intersecting grid coordinates X=60 Y=58, and X=80 Y=85, are probably in response to utility lines or conduits. The high amplitude anomaly centered near grid coordinates X=40 Y=40, is in response to a vehicle that could not be moved for the geophysical investigations. The anomalies centered near X=40 Y=12, and X=120 Y=55, are in response to a nearby vehicle and steel-reinforced concrete, respectively.

The geophysical results obtained within the surveyed portion of Parcel 42 suggest that the proposed ROW area does not contain metallic UST's.

3.7 William Ussery Property (Parcel 57)

Parcel 57 is located on the north side of Fayetteville Road approximately 0.2 miles east of Old Aberdeen Road. The EM61 bottom coil results and the differential results are presented in **Figure 15**. A series of small, bottom coil anomalies were recorded along survey line Y=25 from grid coordinate X=5 to X=115, which may be in response to an east-west trending, buried utility line or conduit. Several other bottom coil anomalies were recorded across the survey area that are probably in response to miscellaneous metal debris.

All of the differential anomalies are probably in response to known cultural features or buried debris, suggesting that the proposed ROW area at Parcel 57 does not contain metallic UST's.

3.8 Walter McCain Property (Parcel 80)

Parcel 80 is located immediately northwest of the Fayetteville Road and Philadelphia Road intersection and consists of two vacant buildings surrounded by sandy or grass surfaces. A former pump island pad is located south of the eastern-most building. The EM61 bottom coil results and the differential results are presented in **Figure 16**.

GPR surveys conducted across the EM61 anomalies centered near grid coordinates X=170 Y=35, and X=194 Y=32, suggest the presence of two metallic UST's. The probable UST centered near X=170

Y=35, appears to be approximately 13 feet long, 3.5 feet wide, and buried approximately 1.1 feet below surface. The probable UST centered near grid coordinates X=192 Y=32 appears to be10 feet long, 3.5 feet wide, and buried approximately 1.9 feet below surface. The two probable UST's are separated by the former pump island pad. Photos of the UST locations along with an image of GPR survey line X=167.5 are presented in **Figure 17.**

Based upon the geophysical results, the remaining portion of the proposed ROW area does not appear to contain metallic UST's.

3.9 Leon Wall Property (Parcel 99)

Parcel 99 is located immediately southwest of the Fayetteville Road and Patterson Road intersection and consists mostly of a grass yard surrounding a vacant building. The EM61 bottom coil results and the differential results are presented in **Figure 18** in which a bottom coil, linear anomaly is recorded along survey line Y=230. This linear anomaly is probably in response to a utility line. GPR surveys conducted across the differential EM61 anomaly centered near X=92 Y=165, is probably in response to a water line adjoining the vacant building. GPR surveys were also conducted between the building and the former pump island pad that is centered near coordinates X=84 Y=222. The surveys suggest that the EM anomalies recorded in this portion of the survey area are probably in response to miscellaneous metal debris.

Based upon the geophysical results, the proposed ROW area at Parcel 99 does not appear to contain metallic UST's.

3.10 James Porter Property (Parcel 117)

Parcel 117 is a former gas station site located on the south side of Fayetteville Road approximately 0.25 miles west of Locklear Drive. The site consists primarily of grass and asphalt surfaces with a former pump island pad located in front of the vacant building. The EM61 bottom coil results and the differential results are presented in **Figure 19**. The linear, bottom coil anomaly intersecting grid coordinates X=130 Y=54, is probably in response to a buried utility line or conduit. The linear

anomaly intersecting X=40 Y=74, is probably in response to a metal fence. The remaining EM61 anomalies are probably in response to known cultural features and miscellaneous metal debris.

The geophysical investigation across the survey area of Parcel 117 suggests that the proposed ROW area does not appear to contain metallic UST's.

3.11 John Evans Property (Parcel 126)

The active Custom Monument Company operates on Parcel 126, which is located immediately northeast of the Fayetteville Road and LockLear Drive intersection. The geophysical survey area consists of grass and asphalt surfaces and the EM61 bottom coil results and the differential results are presented in **Figure 20**. All of the EM61 anomalies recorded across the surveyed portion of the site are probably in response to known cultural features, suggesting that the proposed ROW area does not contain metallic UST's.

3.12 Henry Ussery Property (Parcel 140)

Parcel 140 is a former gas station site, which is presently occupied by Bo Henry's Pawn Shop. The property is located immediately southeast of the Fayetteville Road and Port Street intersection. Much of the proposed ROW area consists of sandy or grass-covered surfaces. A concrete pad surrounds the north and west sides of the building. The EM61 bottom coil results and the differential results are presented in **Figure 21**. The linear bottom coil anomaly intersecting grid coordinates X=80 Y=80, is probably in response to a buried utility line.

GPR surveys conducted across the differential anomalies centered near coordinates X=90 Y=60, and X=107 Y=59, suggest the presence of two UST's buried approximately 1.7 feet and 1.8 feet below surface, respectively. Both probable UST's appear to be approximately 10 to 11 feet long and 4 to 4.5 feet wide. Probing with a steel rod across this area suggest the presence of a concrete slab buried approximately 0.3 feet below surface and overlying the UST's. A photo showing the locations of the probable UST along with GPR images are presented in **Figure 22**.

4.0 SUMMARY & CONCLUSIONS

Our evaluation of the EM61 and GPR data collected across the proposed ROW areas at the 13 sites along Fayetteville Road (US 1) in Rockingham, North Carolina provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic UST's within the surveyed portions of the proposed ROW areas of each site.

- GPR surveys were conducted across selected EM61 differential anomalies and across areas containing steel reinforced concrete.

- Linear EM61 anomalies at the 13 sites are probably in response to buried utility lines and/or conduits. The majority of non-linear anomalies are probably in response to known cultural features or miscellaneous metal objects.

- The geophysical results did not detect the presence of unknown metallic UST's within the surveyed portions of the proposed ROW areas at the following sites:

W. J. Barnhart Property	(Parcel 4)
W. J. Barnhart Property	(Parcel 41A)
Wesly Denham Property	(Parcel 42)
William Ussery Property	(Parcel 57)
Leon Wall Property	(Parcel 99)
James Porter Property	(Parcel 117)
John Evans Property	(Parcel 126)

- Julia M. Ratliff Property (Parcel 7): Geophysical results suggest the presence of a UST centered near X=71 Y=35, and buried approximately 3.2 feet below surface. Based on the GPR results, the probable UST appears to be approximately 10 feet long and 4 feet wide. A second UST may be present immediately west of this UST.

- Samuel D. Tanner Property (Parcel 15): Geophysical results suggest the presence of a UST centered near X=188 Y=137, and buried approximately 1.4 feet below surface. GPR surveys suggest that the probable tank is approximately 10 feet long and 3.5 feet wide.

- Harvey E. Melton Property (Parcel 17): Three and probably four active UST's are centered near grid coordinates X=54 Y=53, X=50 Y=43, and X=50 Y=34, respectively. The UST centered near grid coordinates X=54 Y=53, appears to be approximately 35 feet long and probably consists of two UST's instead of one. The known kerosene UST is centered near X=155 Y=144, and is buried approximately 1.7 feet below surface. The kerosene tank appears to be approximately 9 to 10 feet long and 3.5 to 4 feet wide.

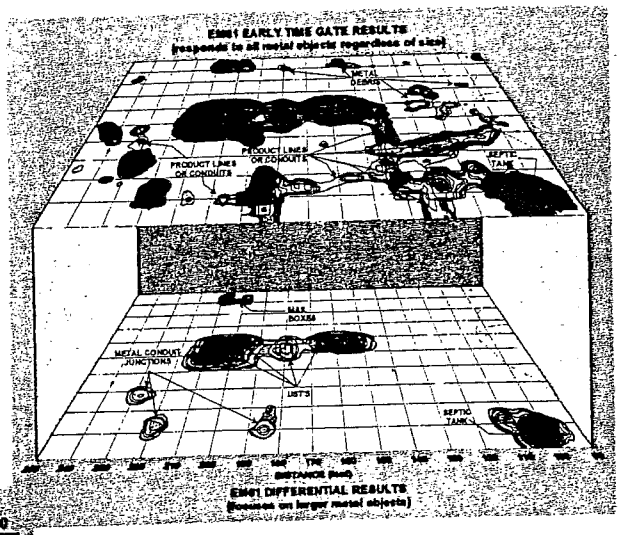
- Samuel D. Tanner Property (Parcel 21): Geophysical results suggest the presence of a UST centered near grid coordinates X=269 Y=173, and buried approximately 1.7 feet below surface. The UST appears to be approximately 10 feet long and 5 feet wide.

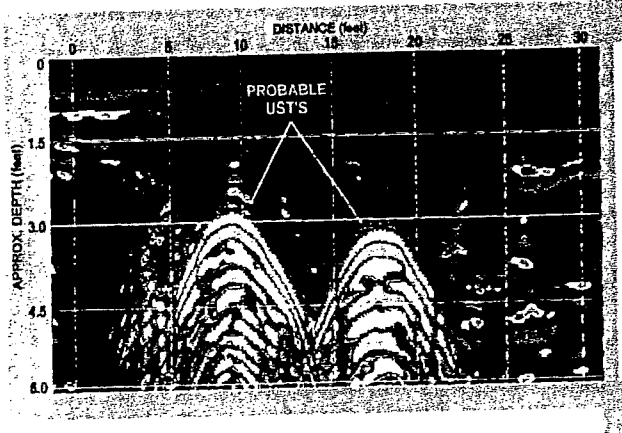
- Walter McCain Property (Parcel 80): Geophysical results suggest the presence of two UST's centered near grid coordinates X=170 Y=35, and X=194 Y=32. The probable UST centered near X=170 Y=35, appears to be approximately 13 feet long, 3.5 feet wide, and buried approximately 1.1 feet below surface. The probable UST centered near grid coordinates X=192 Y=32, appears to be 10 feet long, 3.5 feet wide, and buried approximately 1.9 feet below surface. The two probable UST's are separated by a former pump island pad.

- Henry Ussery Property (Parcel 140): Geophysical results suggest the presence of two UST's centered near coordinates X=90 Y=60, and X=107 Y=59, and buried approximately 1.7 feet and 1.8 feet below surface, respectively. Both probable UST's appear to be approximately 10 to 11 feet long and 4 to 4.5 feet wide.

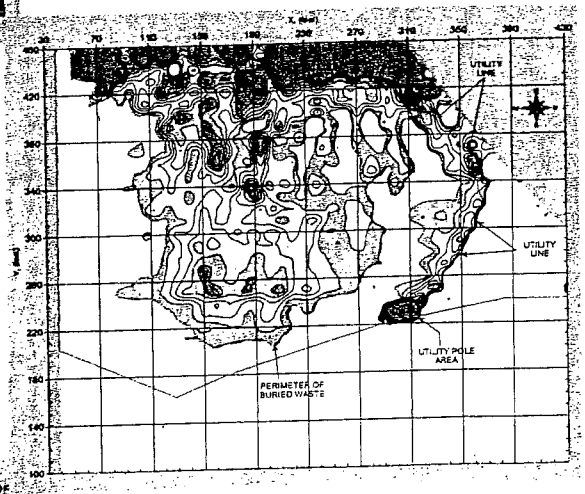
5.0 LIMITATIONS

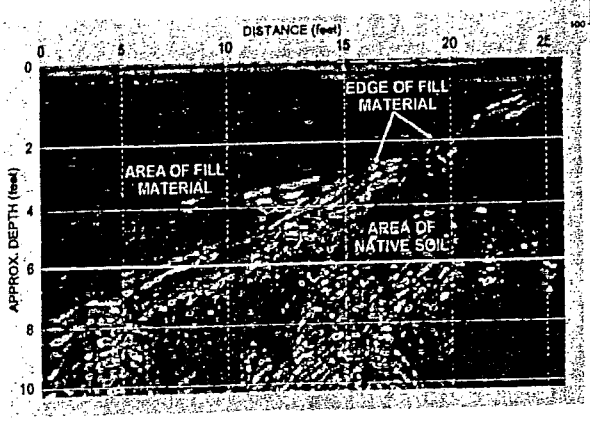
EM61 and GPR surveys have been performed and this report prepared for Solutions Industrial & Environmental Services, Inc. in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project do not conclusively define the locations of all metallic UST's but only suggest where some of the metallic UST's may be present. The EM61 and GPR anomalies, interpreted as possible UST's or tanks, may be attributed to other surface or subsurface conditions or cultural interference.


EM61 EARLY TIME GATE RESULTS
(responds to all metal objects regardless of size)
METAL DEBRIS
PRODUCT LINES OR CONDUITS
PRODUCT LINES OR CONDUITS
SEPTIC TANK
MAN BOXES
METAL CONDUIT JUNCTIONS
UST'S
SEPTIC TANK
DISTANCE (feet)
EM61 DIFFERENTIAL RESULTS
(focuses on larger metal objects)

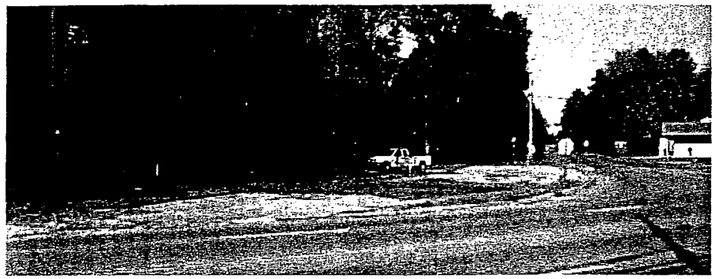

DISTANCE (feet)
0
5
10
15
20
25
30
PROBABLE UST'S
APPROX. DEPTH (feet)
0
1.5
3.0
4.5
6.0

FIGURES


UTILITY LINE
UTILITY LINE
UTILITY POLE AREA
PERIMETER OF BURIED WASTE

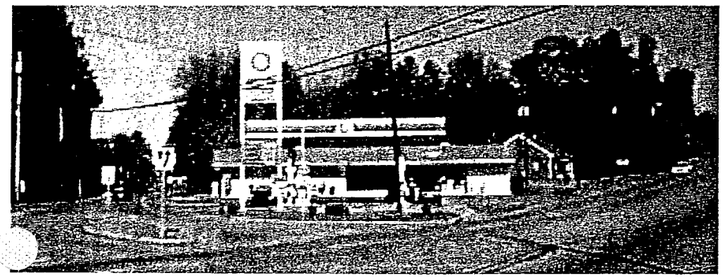

DISTANCE (feet)
0
5
10
15
20
25
EDGE OF FILL MATERIAL
AREA OF FILL MATERIAL
AREA OF NATIVE SOIL
APPROX. DEPTH (feet)
0
2
4
6
8
10

Parcel 4 - W. J. Barnhart Property

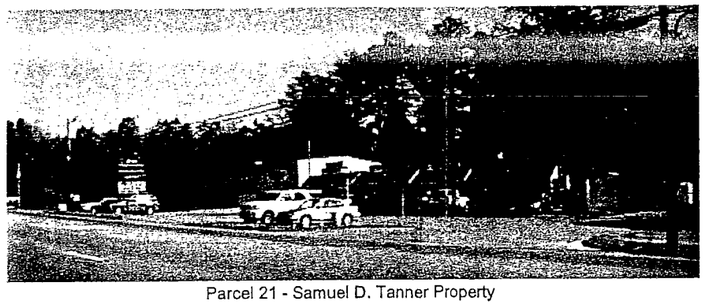


Parcel 7 - Julia M. Ratliff Property

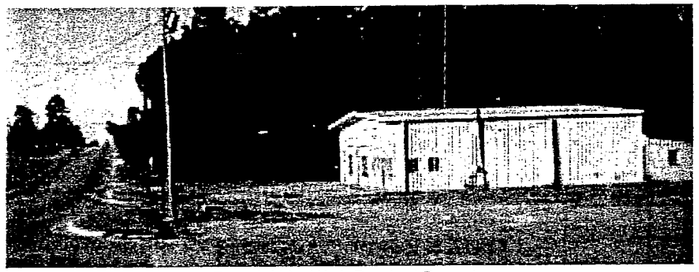
Parcel 15 - Samuel D. Tanner Property



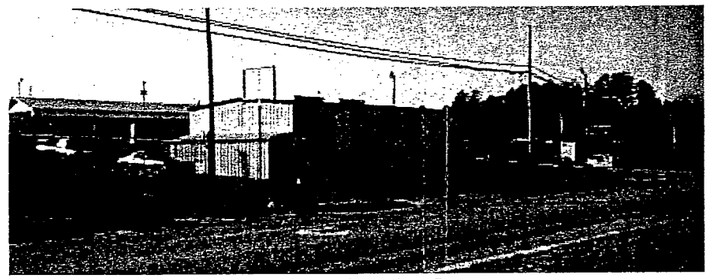
Parcel 17 - Harvey E. Melton Property



Parcel 21 - Samuel D. Tanner Property



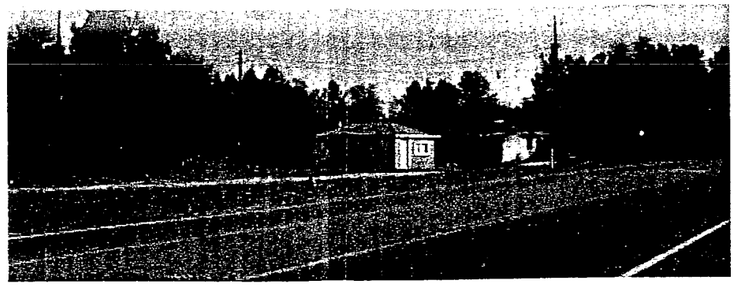
Parcel 41A - W. J. Barnhart Property



Parcel 42 - Wesly Denham Property

Parcel 57 - William Ussery Property

Parcel 140 - Henry Ussery Property



Parcel 80 - Walter McCain Property

Parcel 99 - Leon Wall Property

Parcel 117 - James Porter Property

Parcel 126 - John Evans Property

SITE PHOTOS

FIGURE 1

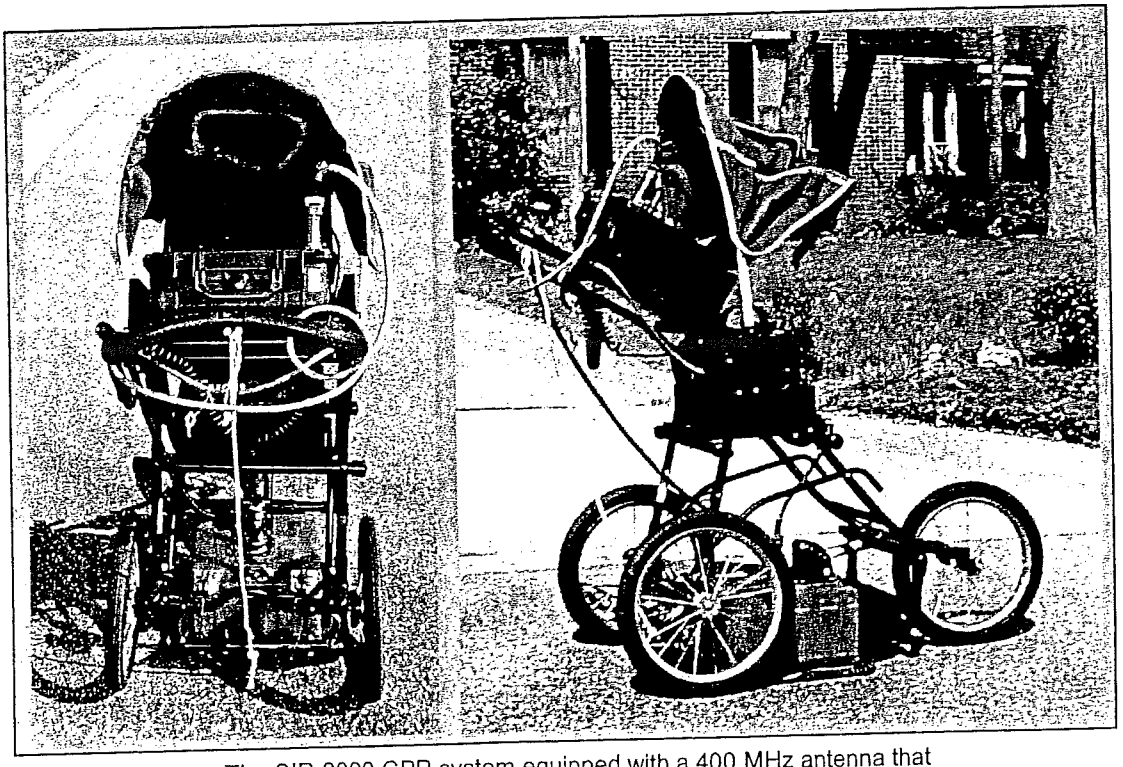
GRAPHIC SCALE IN METERS

DRWN	CHKD		FIGURE
MJD			
DATE	LAY	DWG	JNO.
11/28/05			2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: ROCKINGHAM SITES
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

The Geonics EM61 metal detector was used to conduct the metal detection surveys at the Rockingham sites in November 2005.



The SIR-2000 GPR system equipped with a 400 MHz antenna that was used at the Rockingham sites in November 2005.

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

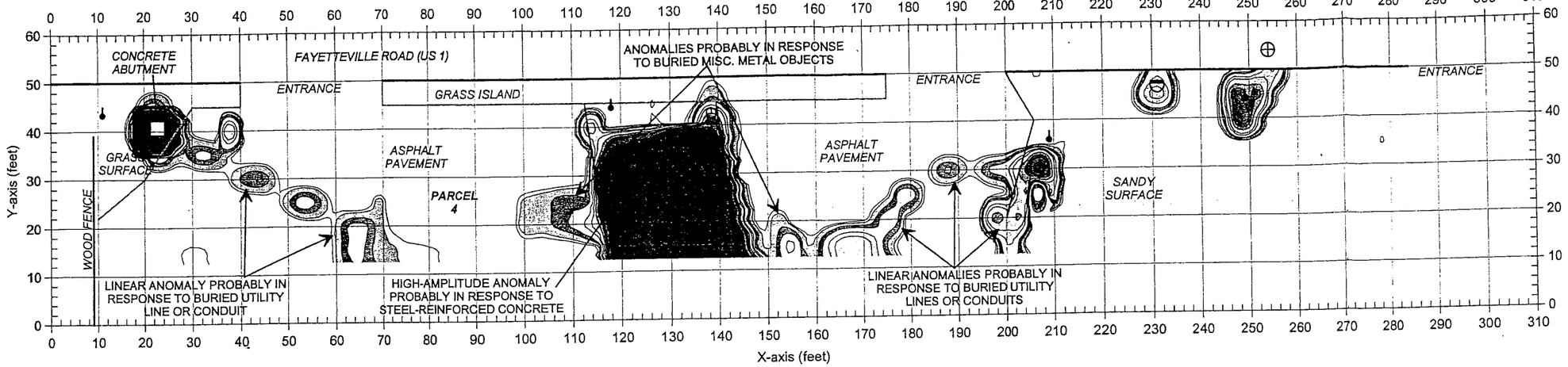
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05	DRWN	
SITE	ROCKINGHAM SITES	LAY		CHKD	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JNO	2005-292	REVN	

GRAPHIC SCALE IN METERS

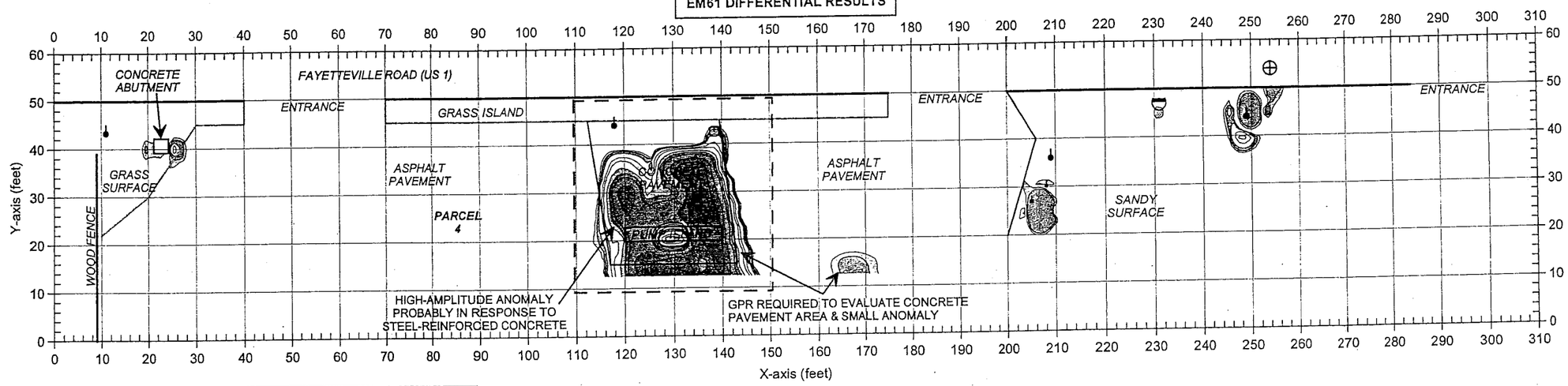
GEOPHYSICAL EQUIPMENT

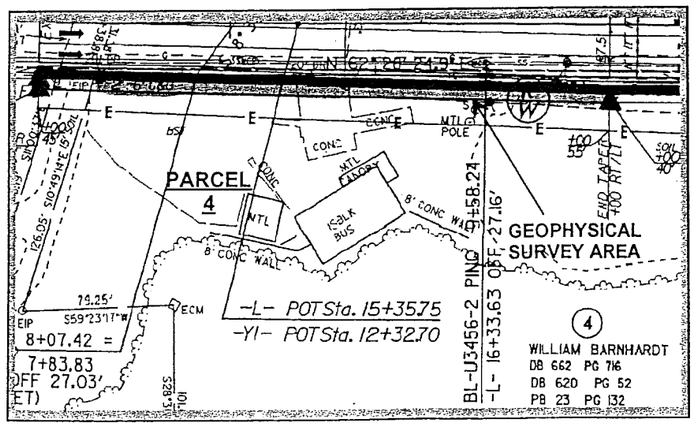
FIGURE 2

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-4000

APPROXIMATE NORTH

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- MONITORING WELL
- WATER METER OR VALVE COVER
- GUY WIRE
- UTILITY POLE OR LIGHT POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- MANHOLE COVER
- GPR SURVEY AREA

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESULTS

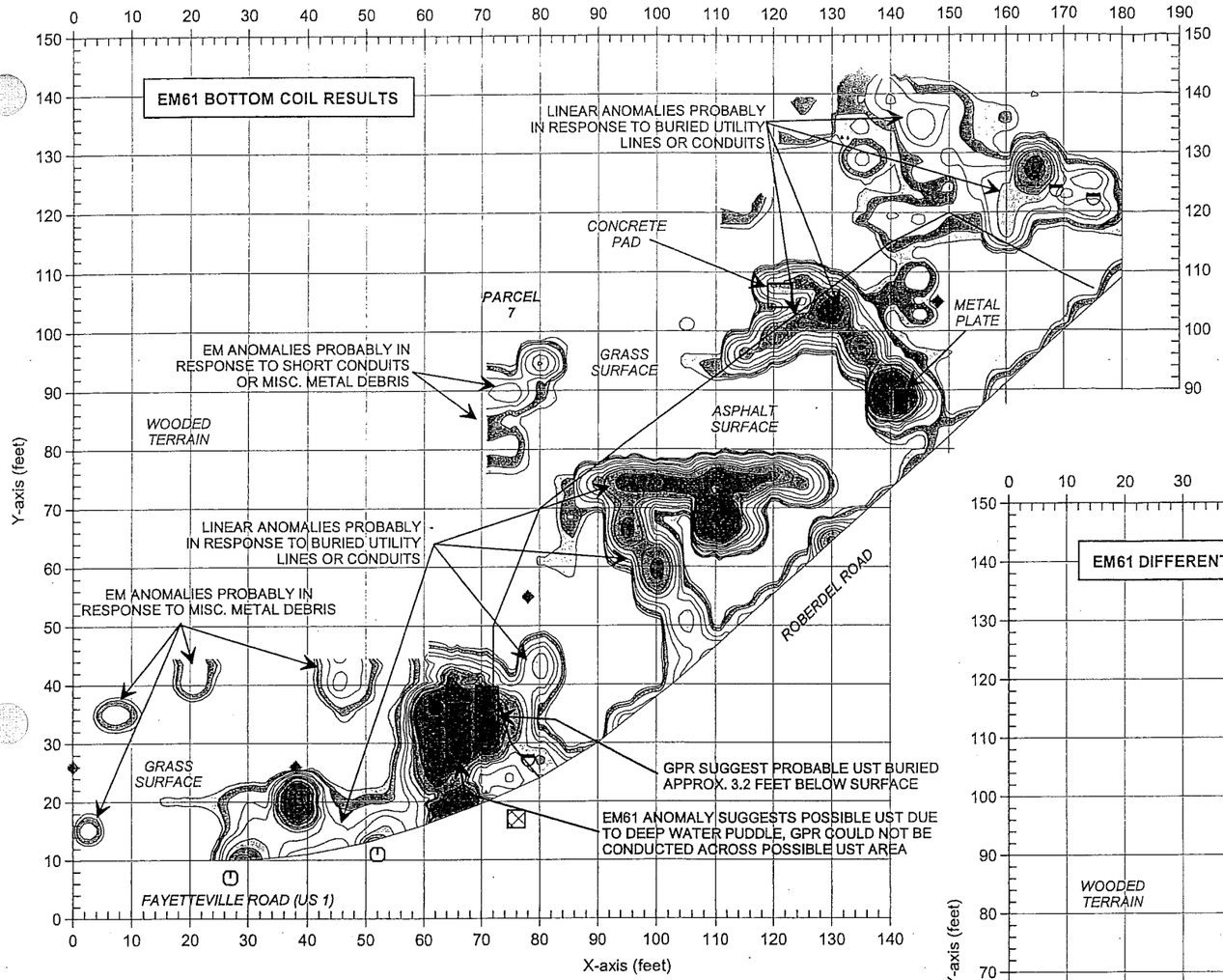
FIGURE 3

GRAPHIC SCALE IN METERS

DRAWN	MJD
DATE	11/26/05
LAY	
DWG	
PROJ NO.	2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: W. J. BARNHART PROPERTY (PARCEL 4)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



LEGEND

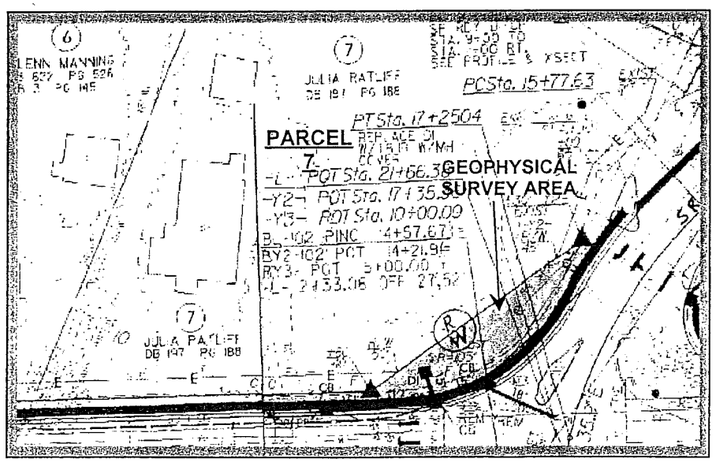
- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH & EAST-WEST TRENDING LINES SPACED 5 FEET APART
- MONITORING WELL
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- MANHOLE COVER
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -50 -25 -10 -5 5 10 25 50 100 200 400 1000



APPROXIMATE NORTH

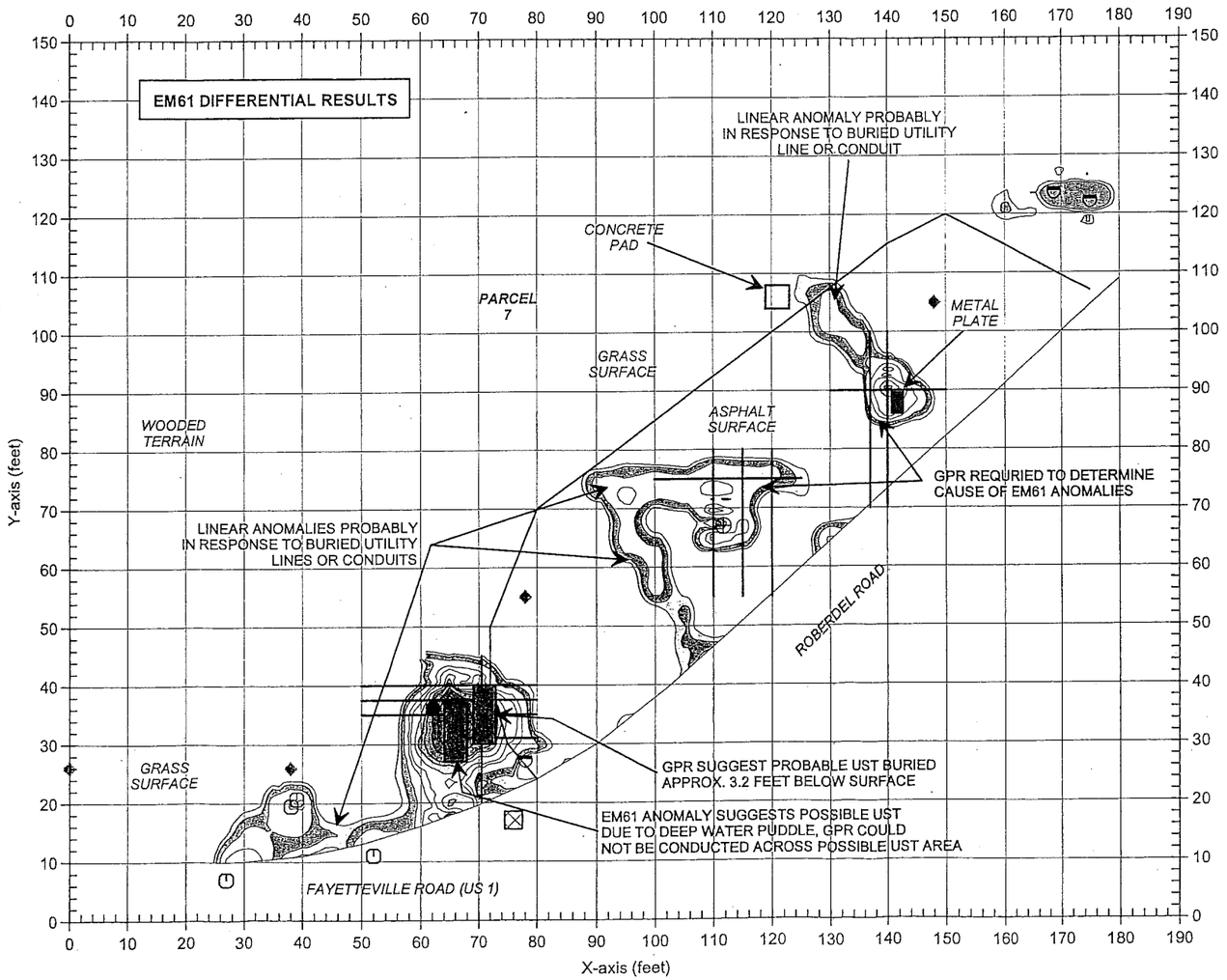


FIGURE 4

EM61
METAL DETECTION
RESULTS

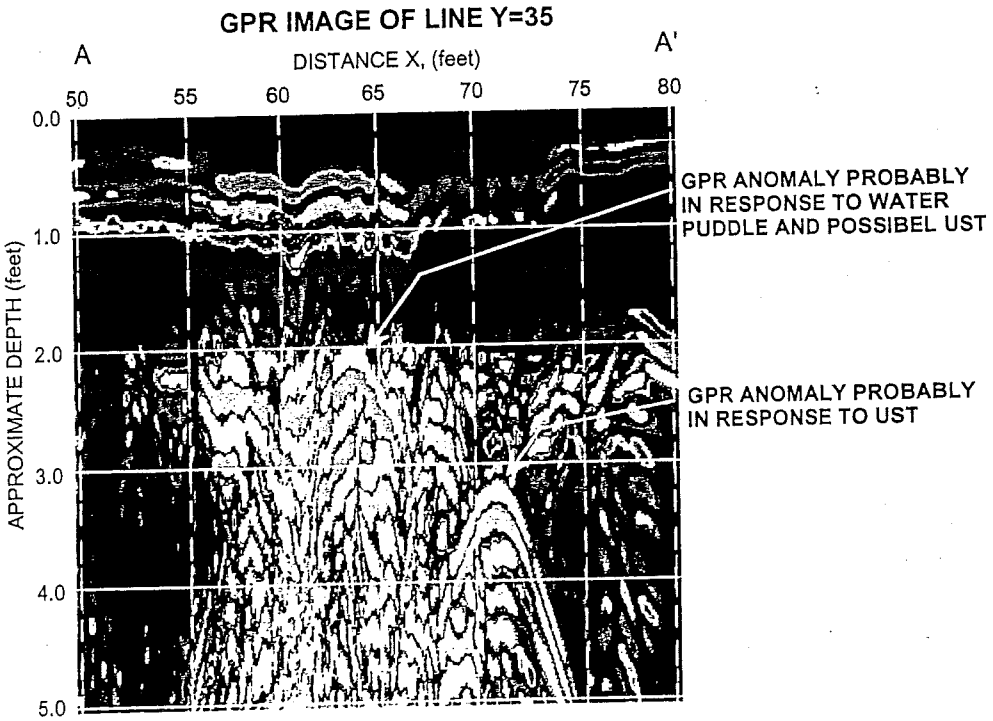
GRAPHIC SCALE IN METERS

DRAWN	MJD
CHKD	
DATE	11/25/05
DWG	2005-292
LAY	
JNO	

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: JULIA M. RATLIFF PROPERTY (PARCEL 7)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

The photo shows the location of the probable UST and possible UST, as suggested by the geophysical results at Parcel 7.



The GPR image obtained along a portion of survey line Y=35 shows the anomaly that is probably in response to a UST near X=71 and buried approximately 3.2 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

PYRAMID
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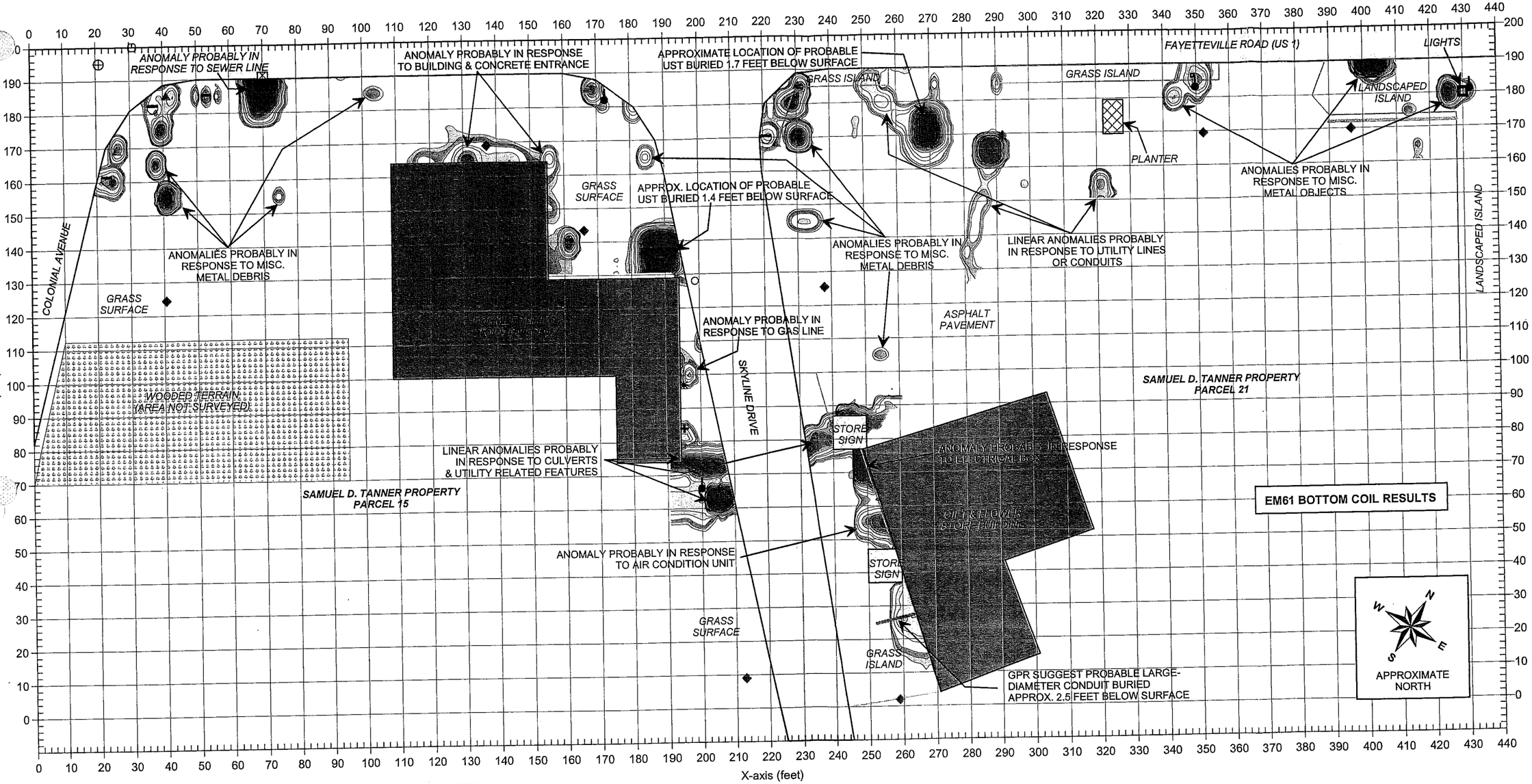
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	JULIA M. RATLIFF PROPERTY (PARCEL 7)		
CITY	ROCKINGHAM	STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS	JOB	2005-292

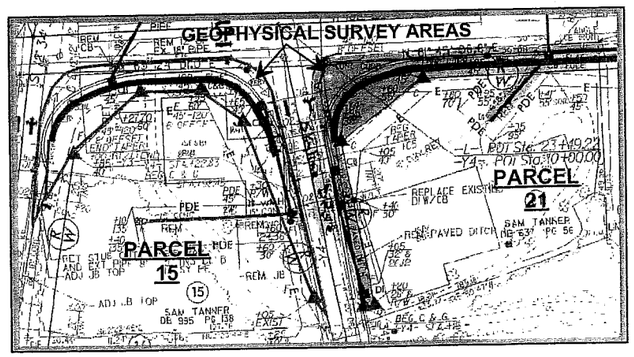
PHOTO & GPR IMAGE OF UST LOCATION

FIGURE 5

EM61 BOTTOM COIL RESULTS

FIGURE 6





EM61 BOTTOM COIL RESPONSE (MILLIVOLTS)

1000 750 500 400 300 200 150 100 75 60 20 -90 -100 -200 -400

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST & NORTH-SOUTH TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CONCRETE R/W MARKER
- GAS METER
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVER
- MANHOLE COVER
- MONITORING WELL
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

DRWN	CHKD	FIGURE
MJD		
DATE	LAY	DWG
11/25/05		2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: SAMUEL D. TANNER PROPERTY (PARCELS 15 & 21)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 DIFFERENTIAL RESULTS

FIGURE 7

ANOMALY PROBABLY IN RESPONSE TO SEWER LINE

ANOMALY PROBABLY IN RESPONSE TO BUILDING & CONCRETE ENTRANCE

FAYETTEVILLE ROAD (US 1)

LIGHTS

GRASS ISLAND

GRASS ISLAND

LANDSCAPED ISLAND

PLANTER

ANOMALIES PROBABLY IN RESPONSE TO MISC. METAL OBJECTS

APPROXIMATE LOCATION OF PROBABLE UST BURIED 1.7 FEET BELOW SURFACE

APPROXIMATE LOCATION OF PROBABLE UST BURIED 1.4 FEET BELOW SURFACE

GRASS SURFACE

COLONIAL AVENUE

GRASS SURFACE

ASPHALT PAVEMENT

LANDSCAPED ISLAND

ANOMALY PROBABLY IN RESPONSE TO GAS LINE

SKYLINE DRIVE

SAMUEL D. TANNER PROPERTY PARCEL 21

WOODED TERRAIN (AREA NOT SURVEYED)

STORE SIGN

LINEAR ANOMALIES PROBABLY IN RESPONSE TO CULVERTS & UTILITY RELATED FEATURES

SAMUEL D. TANNER PROPERTY PARCEL 15

ANOMALY PROBABLY IN RESPONSE TO AIR CONDITION UNIT

STORE SIGN

GRASS SURFACE

GRASS ISLAND

GPR SUGGEST PROBABLE LARGE-DIAMETER CONDUIT BURIED APPROX. 2.5 FEET BELOW SURFACE

EM61 DIFFERENTIAL RESULTS

N

W

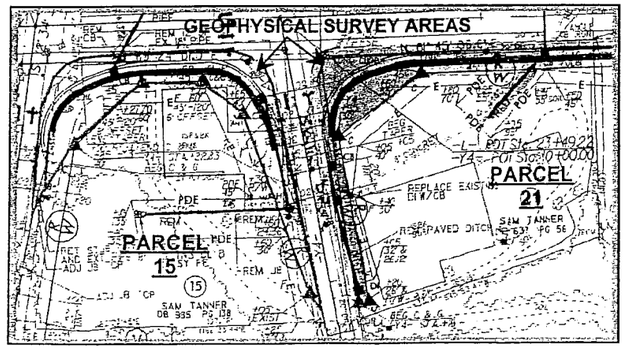
E

S

APPROXIMATE NORTH

Y-axis (feet)

X-axis (feet)



EM61 DIFFERENTIAL RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
50
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST & NORTH-SOUTH TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CONCRETE R/W MARKER
- GAS METER
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVER
- MANHOLE COVER
- MONITORING WELL
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the differential results of the EM61 metal detection survey in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

DRWN	MJD
DATE	11/25/05
FIGURE	2005-292

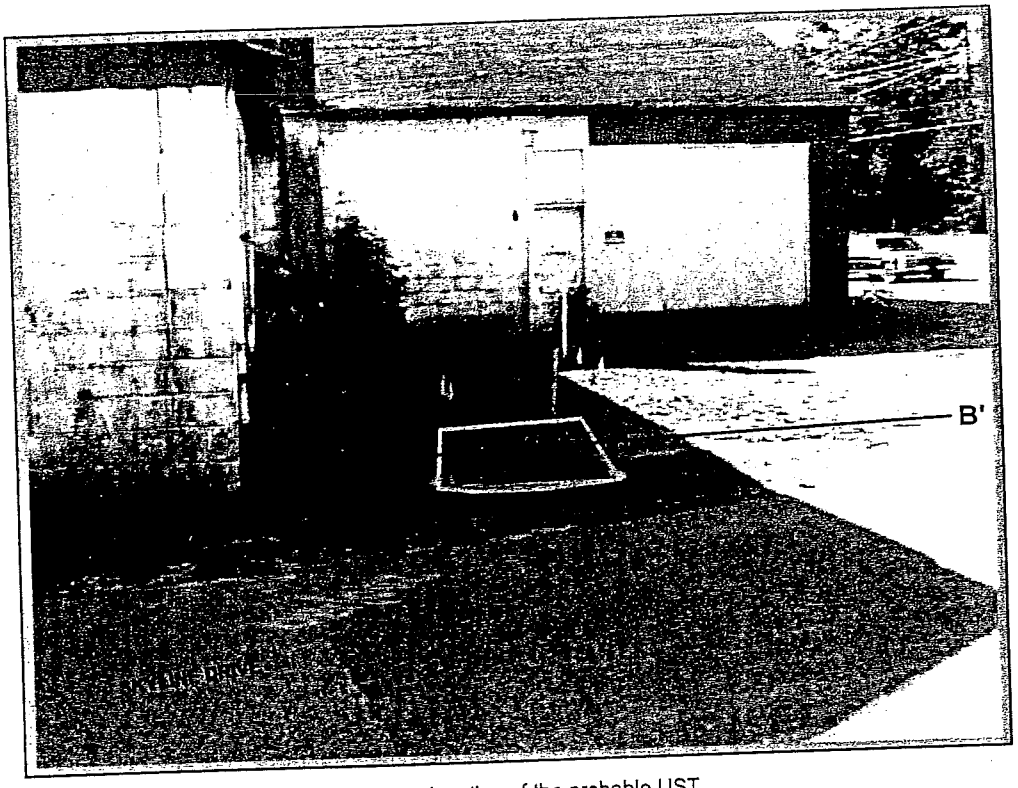
SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

SAMUEL D. TANNER PROPERTY (PARCELS 15 & 21)

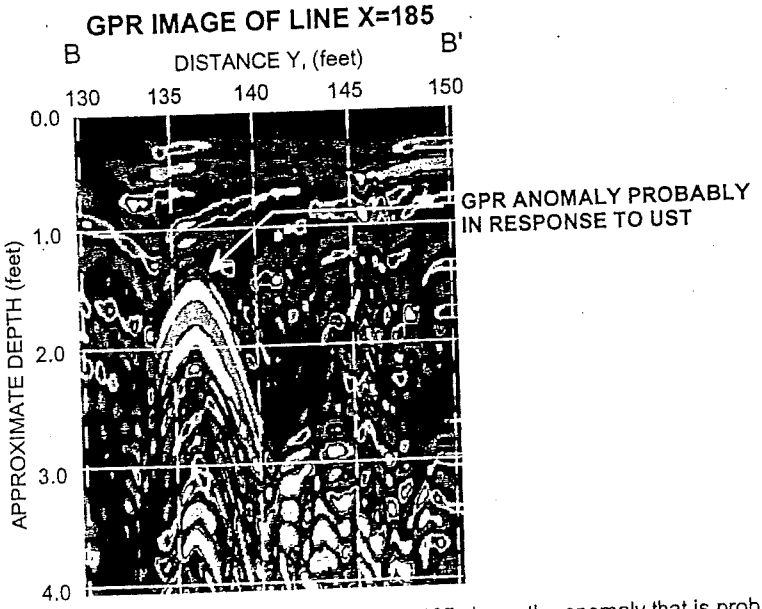
ROCKINGHAM — NORTH CAROLINA

GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the location of the probable UST,
as suggested by the geophysical results at Parcel 15.



The GPR image obtained along a portion of survey line X=185 shows the anomaly that is probably in response to a UST near Y=137 and buried approximately 1.4 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

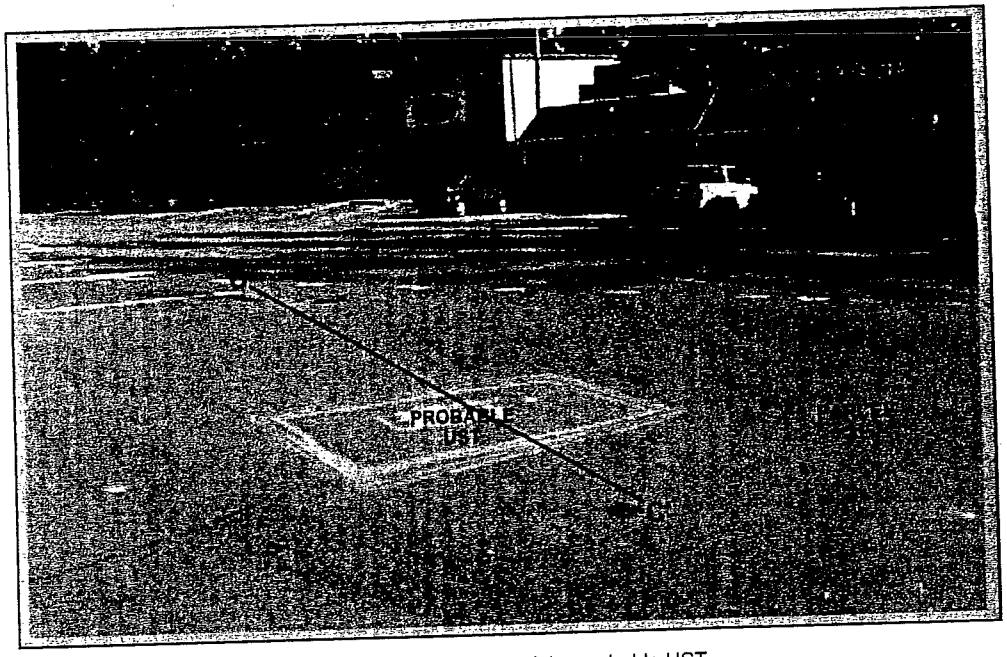
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL		DATE	11/28/05	DRAWN
SITE	SAMUEL D. TANNER PROPERTY (PARCEL 15)		LAY		CHKD
CITY	ROCKINGHAM	STATE NORTH CAROLINA	DWG		
TITLE	GEOPHYSICAL RESULTS		JNO	2005-292	SCALE

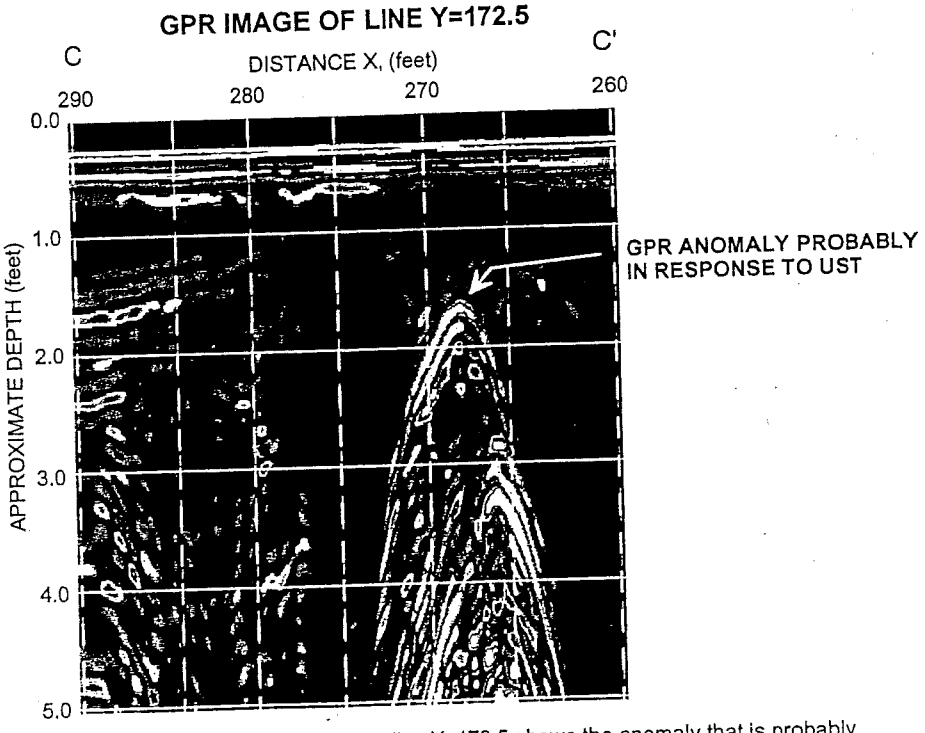
GRAPHIC SCALE IN METERS

PHOTO & GPR IMAGE
OF UST LOCATION

FIGURE 8



The photo shows the location of the probable UST, as suggested by the geophysical results at Parcel 21.



The GPR image obtained along a portion of survey line Y=172.5 shows the anomaly that is probably in response to a UST near X=268 and buried approximately 1.7 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

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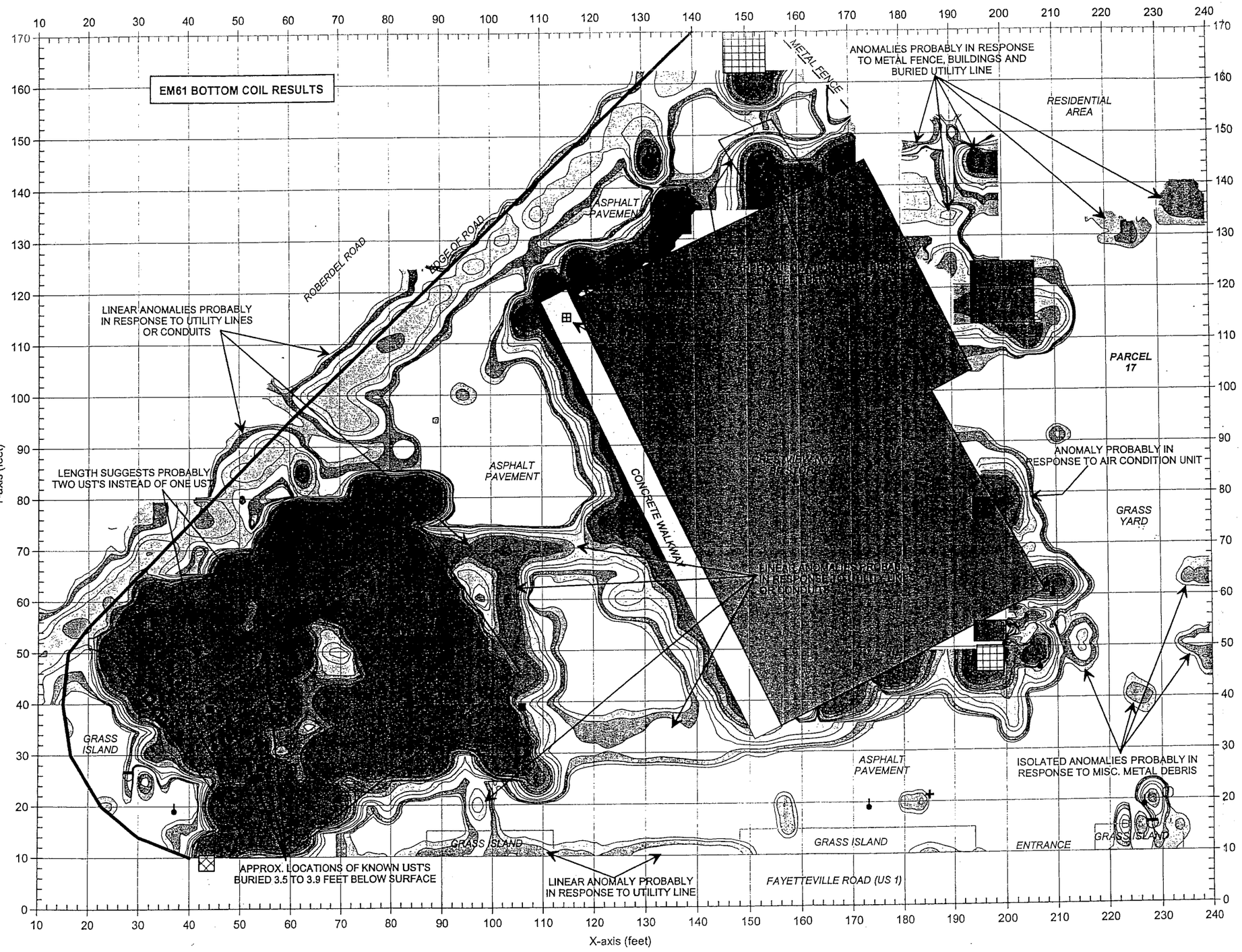
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	SAMUEL D. TANNER PROPERTY (PARCEL 21)		
CITY	ROCKINGHAM	STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS	JOB NO.	2005-292

PHOTO & GPR IMAGE OF UST LOCATION

FIGURE 9

EM61 BOTTOM COIL RESULTS



APPROXIMATE NORTH

EM61 BOTTOM COIL RESPONSE (MILLIVOLTS)
1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- UST COVERS
- WATER METER OR VALVE COVER
- GUY WIRE
- METAL SIGN POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVERS
- GAS METER
- AIR CONDITION UNIT
- DUMPSTER
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

FIGURE 10

EM61
BOTTOM COIL
RESULTS

GRAPHIC SCALE IN METERS

DRWN	DATE	LAY	DWG	JOB
MJD	11/25/05	CHKD		2005-292

FIGURE

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: HARVEY E. MELTON PROPERTY (PARCEL 17)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
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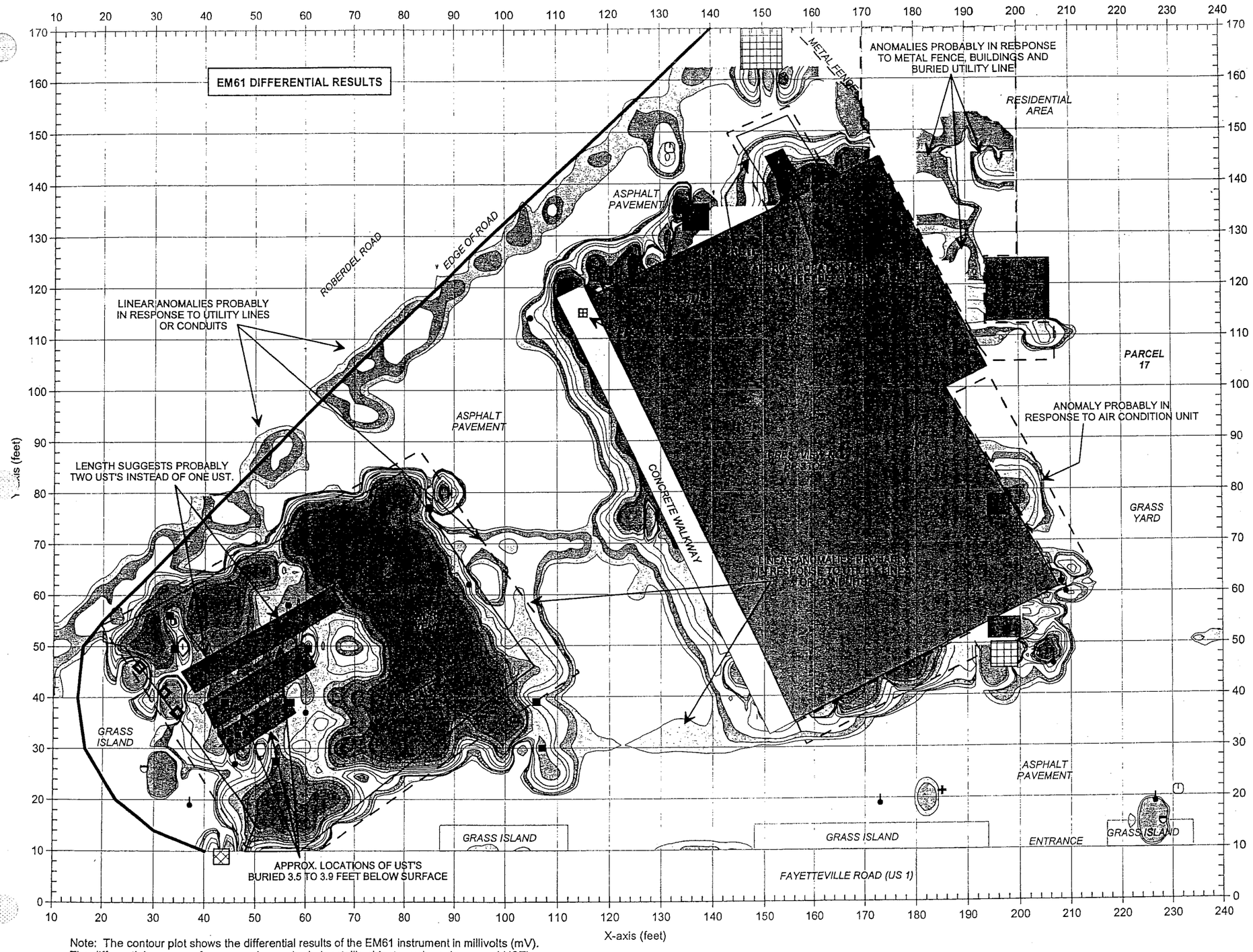
EM61 DIFFERENTIAL RESULTS



APPROXIMATE NORTH

EM61 DIFFERENTIAL RESPONSE (MILLIVOLTS)
1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- UST COVERS
- WATER METER OR VALVE COVER
- GUY WIRE
- METAL SIGN POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVERS
- GAS METER
- AIR CONDITION UNIT
- DUMPSTER
- GPR SURVEY AREA
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris. The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

FIGURE 11

EM61 DIFFERENTIAL RESULTS

GRAPHIC SCALE IN METERS

DRAWN	MJD
CHKD	
DATE	11/25/05
LAY	
DWG	
FIGURE	
JOB NO.	2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: HARVEY E. MELTON PROPERTY (PARCEL 17)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

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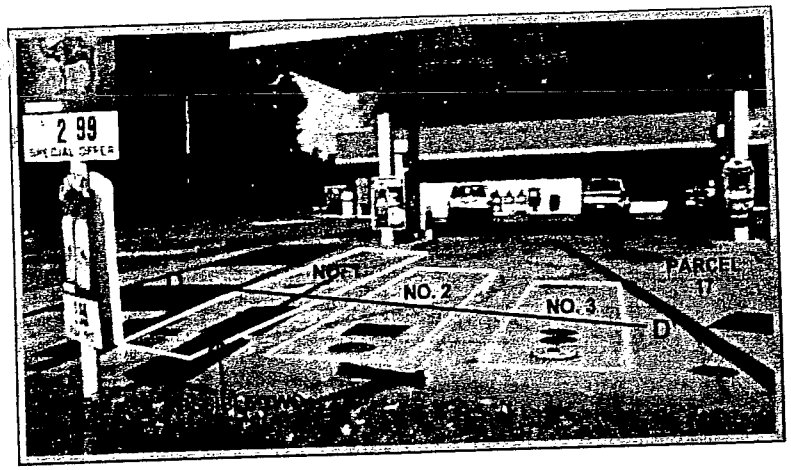
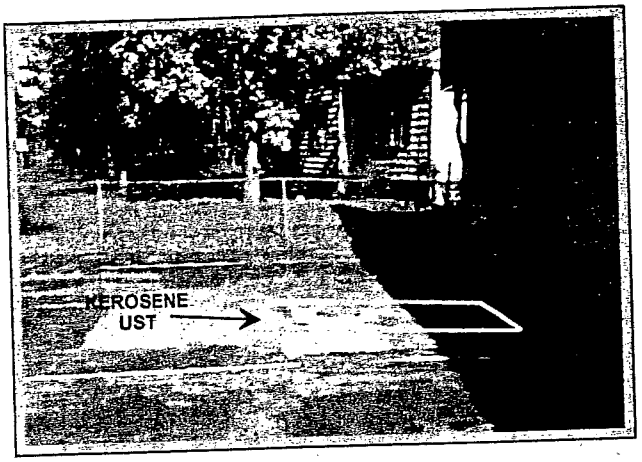
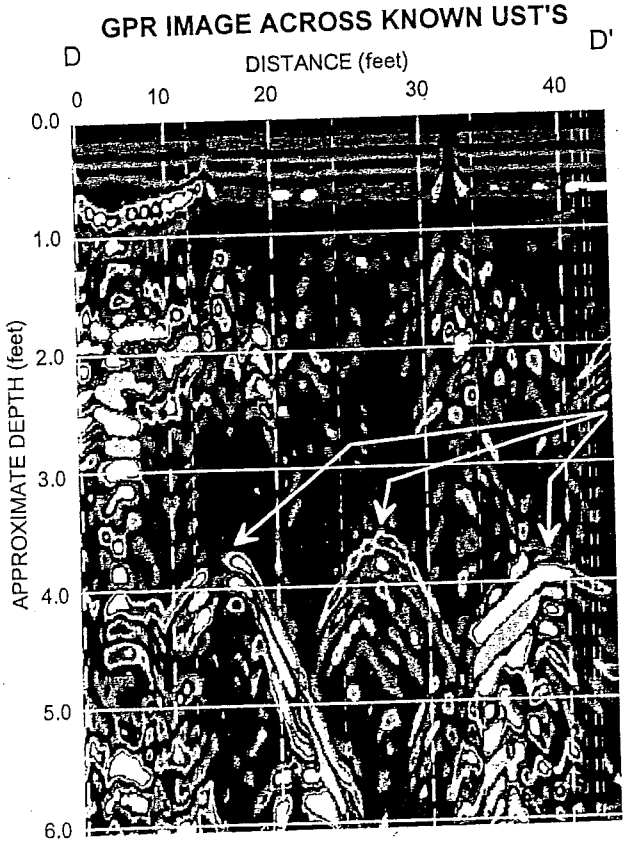


The photo shows the approxiamte location of the three or four known and active UST's, as suggested by the geophysical results, at Parcel 17. The UST's appear to be approximately 3.5 to 3.9 feet below surface.

The photo shows the approximate location of the kerosene UST, as suggested by the geophysical results, at Parcel 17. The UST is located along the northwest wall of the store and is buried approximately 2.4 feet below surface.





GPR ANOMALIES PROBABLY IN RESPONSE TO THREE UST'S BURIED 3.5 TO 3.9 FEET BELOW SURFACE

The GPR image is obtained along a traverse line oriented perpendicular to the axis of the UST's. The three GPR anomalies in response to the probable UST's suggest that the UST's are buried approximately 3.5 to 3.9 feet below surface.

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CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	HARVEY E. MELTON PROPERTY (PARCEL 17)		
CITY	ROCKINGHAM	STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS	JOB	2005-292

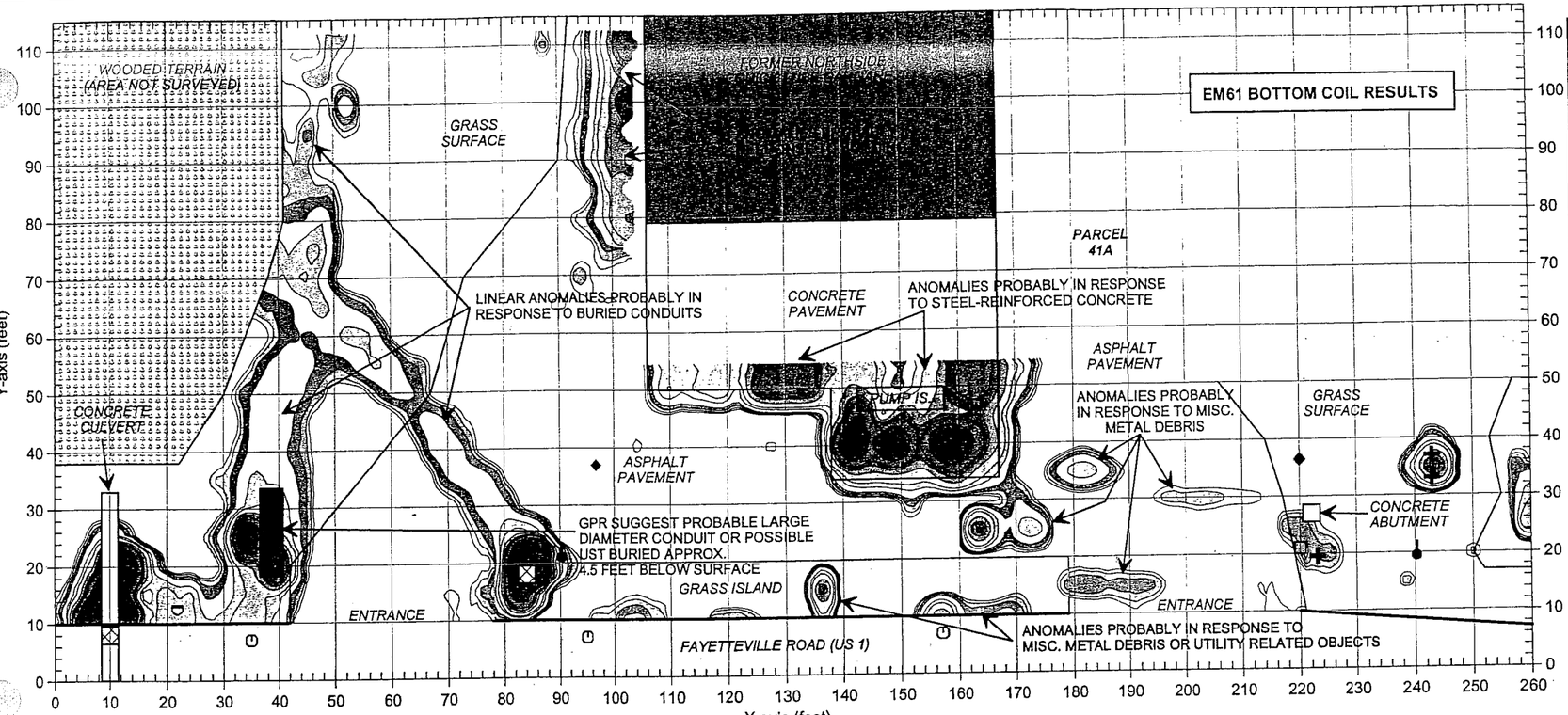
PHOTOS & GPR IMAGE OF UST LOCATIONS

FIGURE 12

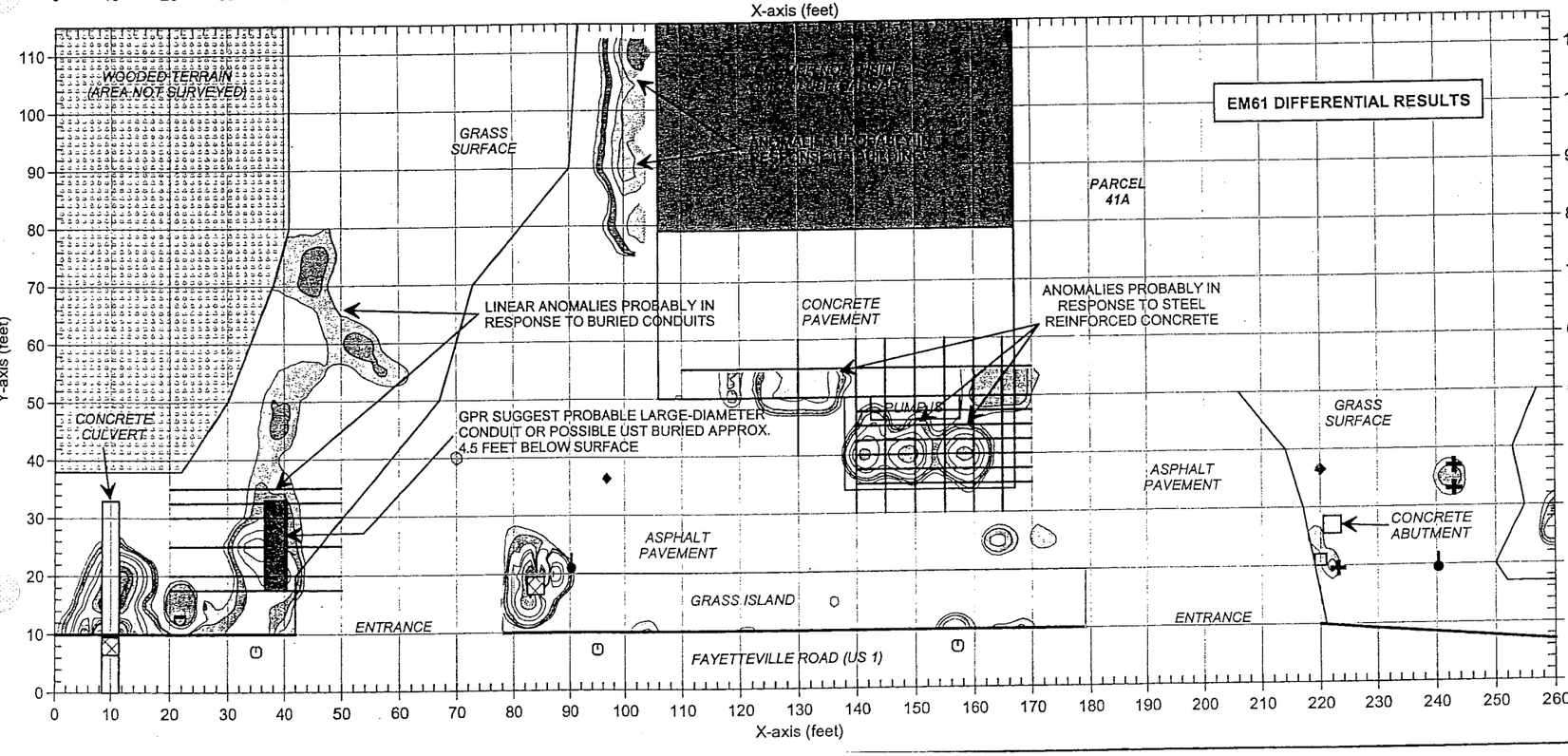
EM61 METAL DETECTION RESULTS

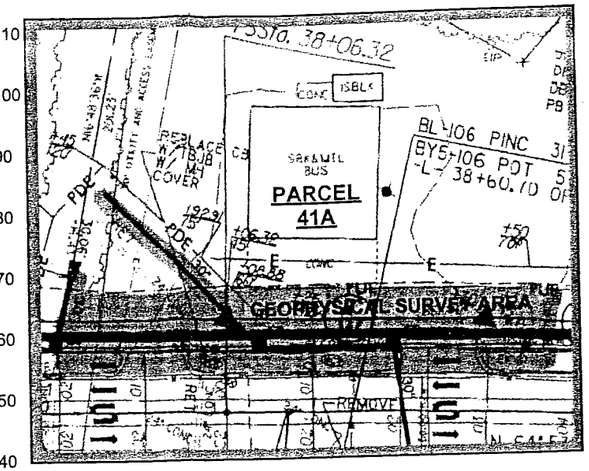
FIGURE 13

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -200 -100 -90 -50 -60 -75 -100 -150 -200 -300 -400 -500 -750 -1000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- MAIL BOX
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE LARGE DIAMETER CONDUIT OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	W.J. BARNHART PROPERTY (PARCEL 41A)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
JOB NO.	2005-292
SCALE	GRAPHIC SCALE IN METERS
DWG	
DATE	11/26/05
DRAWN	MJD
CHKD	
APVD	

PYRAMID
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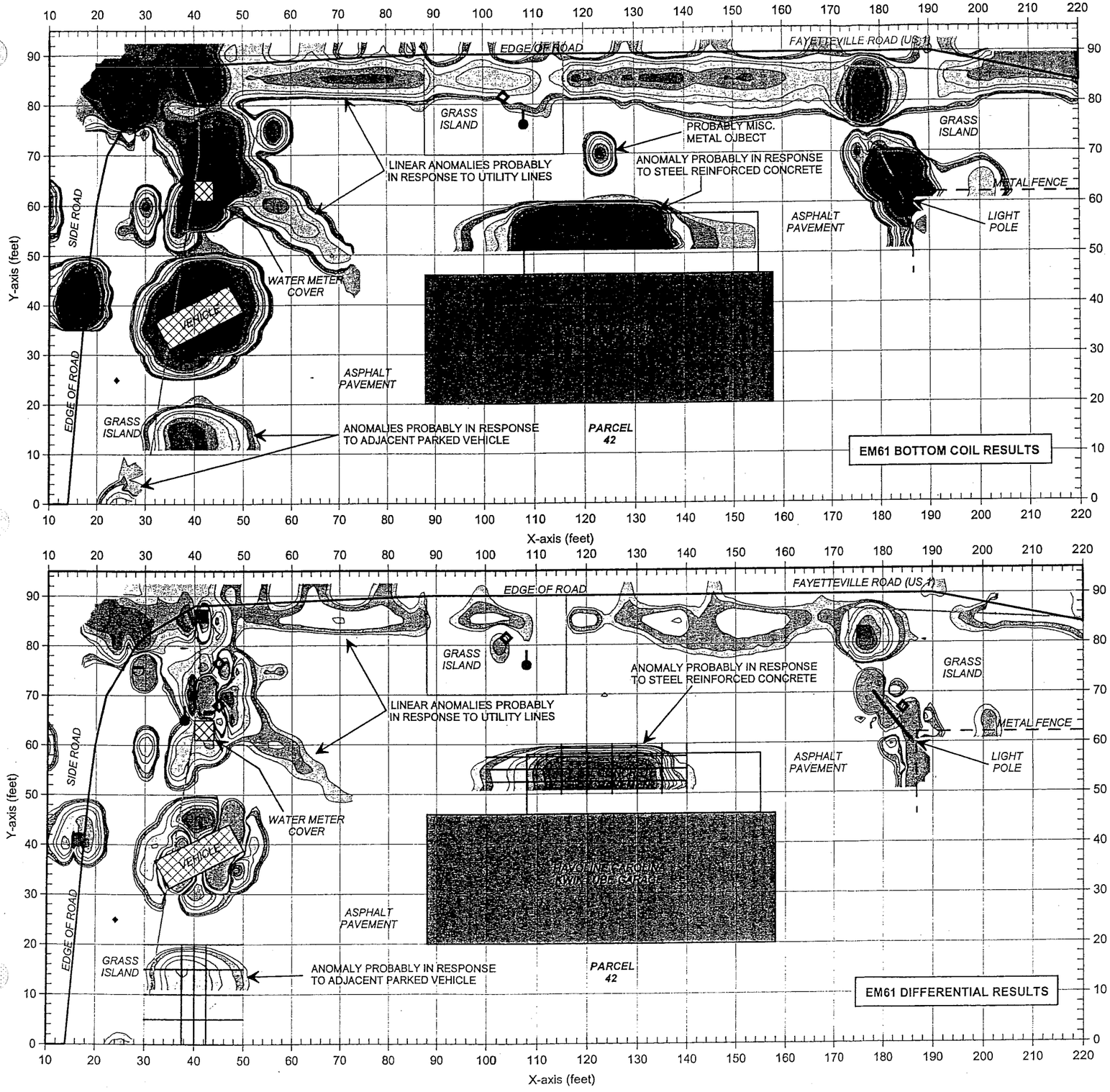
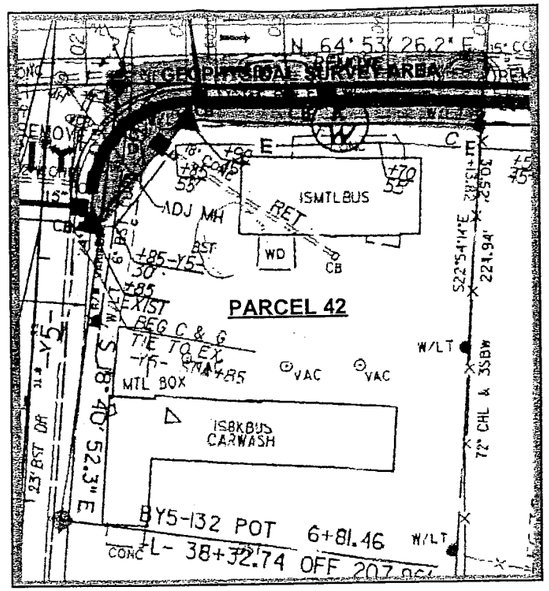




N
W
E
S

APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -300 -200 -100 -50 -25 -10 10 25 50 100 200 300 400 500 750 1000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- METAL SIGN POLE
- STORM SEWER GRATE
- GPR SURVEY LINE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 15, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

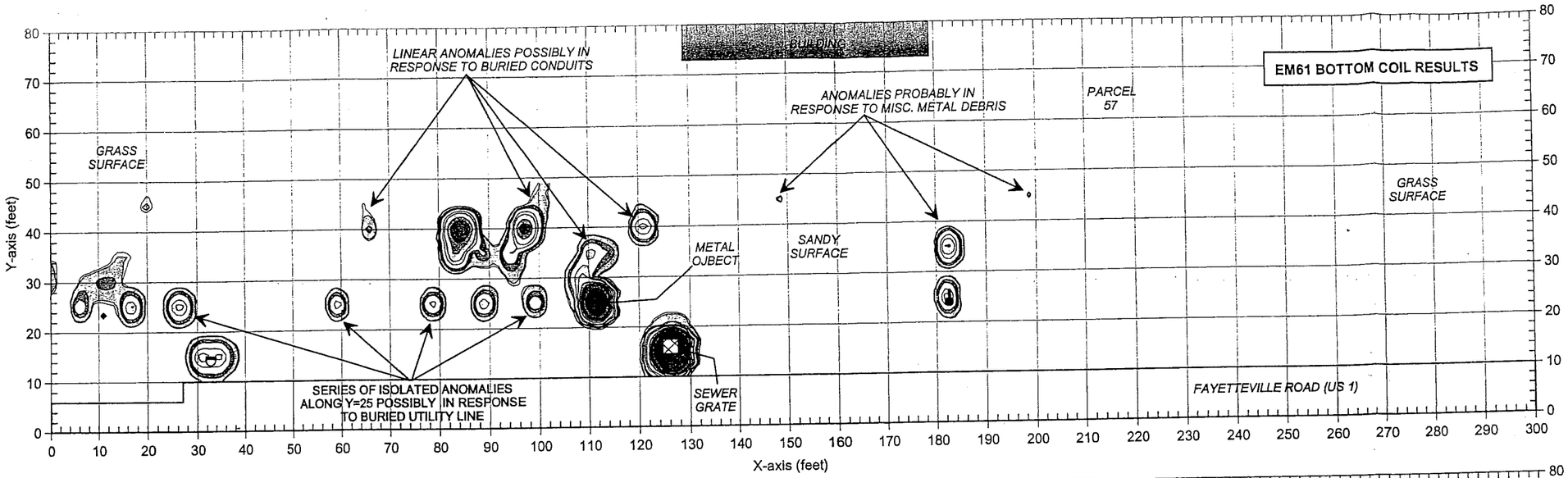
EM61 METAL DETECTION RESULTS

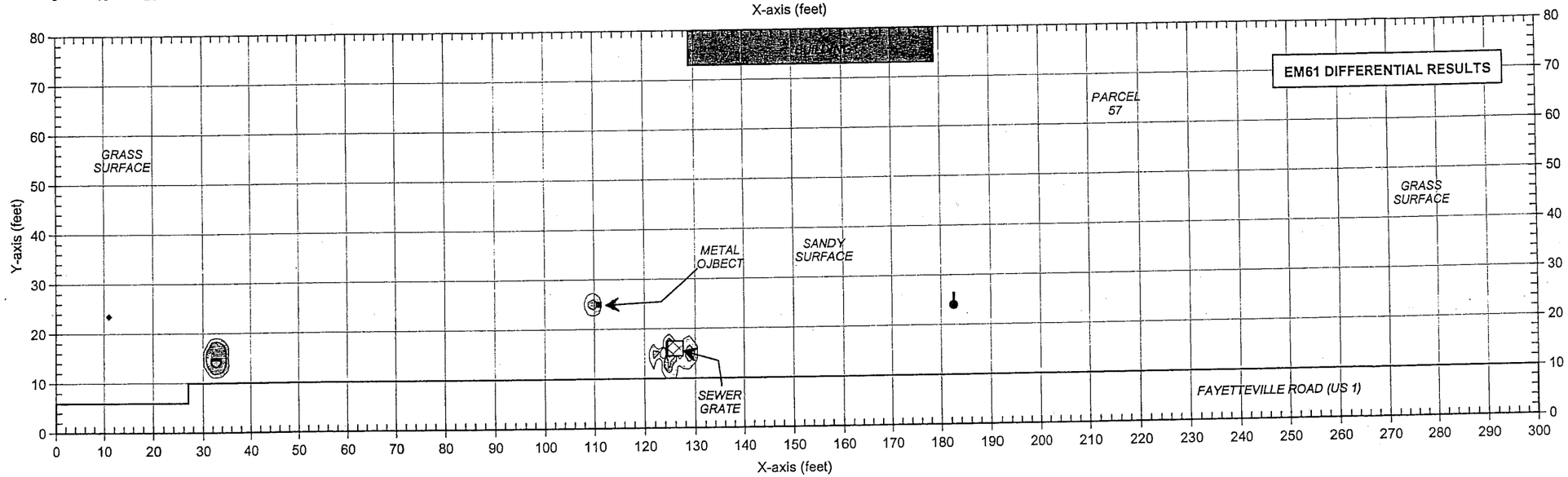
FIGURE 14

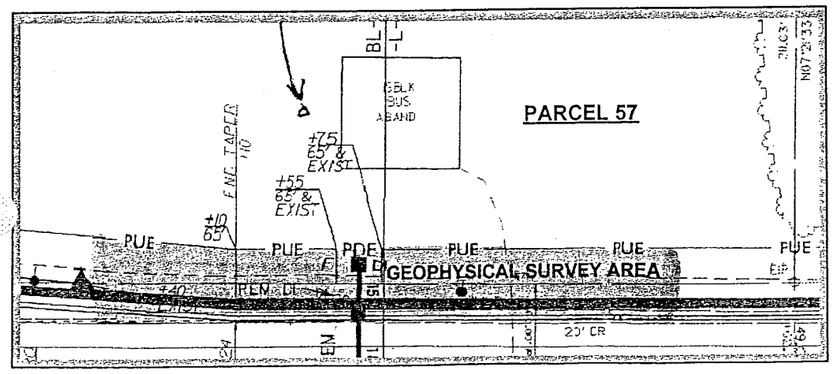
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	WESLEY DENHAM PROPERTY (PARCEL 42)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
JOB NO.	2005-292
FIGURE	
DRWG	
DWG	
DATE	11/26/05
CHKD	
DRWN	MJD

GRAPHIC SCALE IN METERS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.







LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-100 -20 -10 -5 -2.5 -1 1 2.5 5 10 20 50 100 200

N W E S

APPROXIMATE NORTH

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) surveys were not conducted at this site.

FIGURE 15

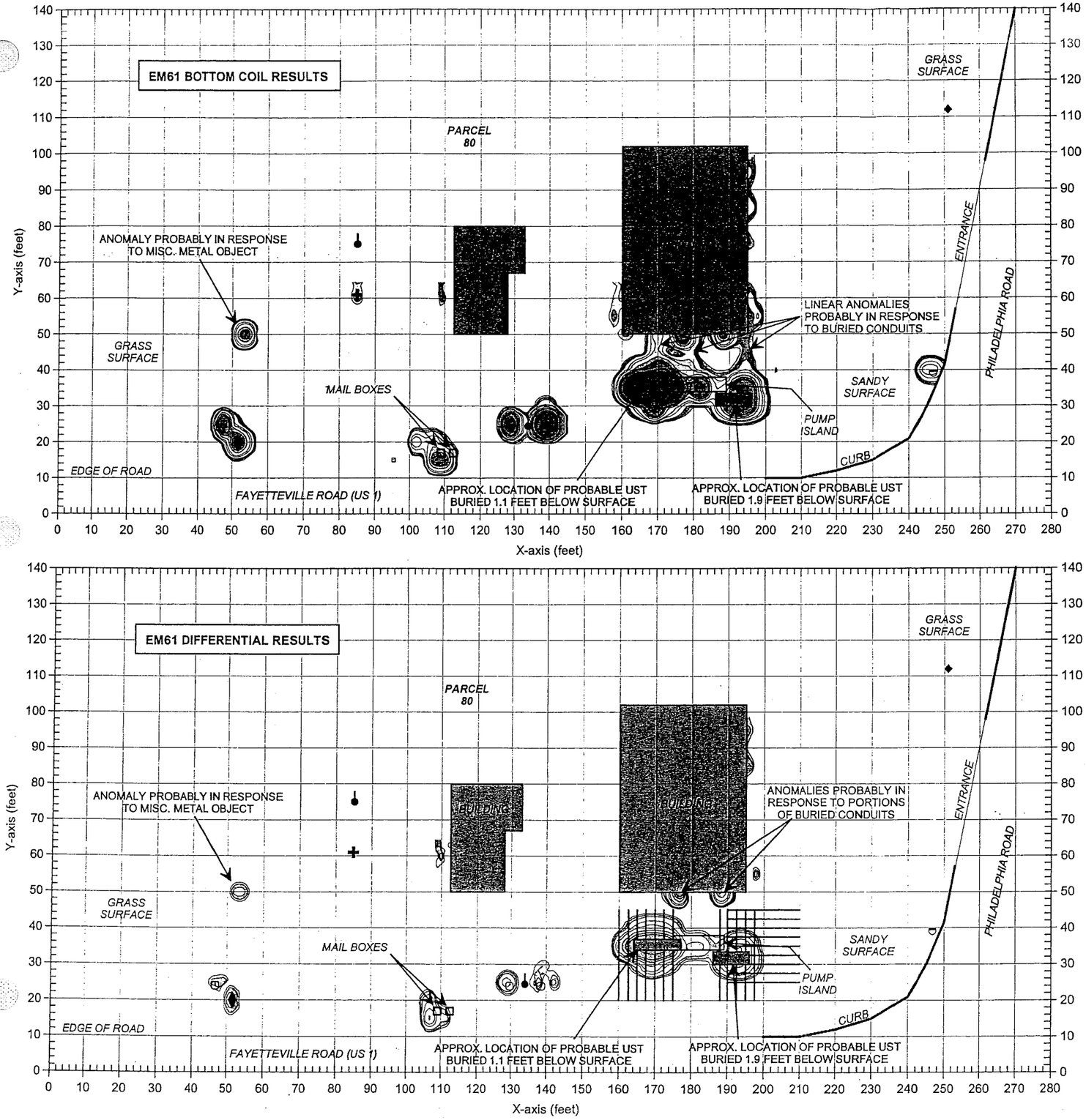
EM61
METAL DETECTION
RESULTS

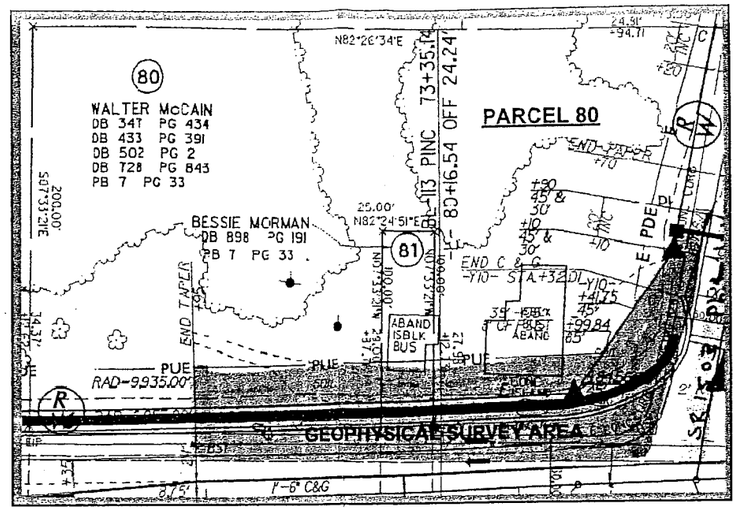
GRAPHIC SCALE IN METERS

DRWN	CHKD	FIGURE
MJD		
DATE	LAY	DWG	JOB NO.
11/18/05			2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: WILLIAM USSERY PROPERTY (PARCEL 57)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

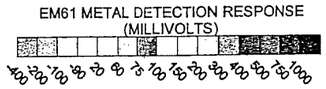
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.





APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)



LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- FIRE HYDRANT
- TRAFFIC SIGN
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESULTS

FIGURE 16

DRAWN	MJD
DATE	11/25/05
DWG.	2005-292

SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

WALTER McCAIN PROPERTY (PARCEL 80)

ROCKINGHAM, NORTH CAROLINA

GEOPHYSICAL RESULTS

PYRAMID
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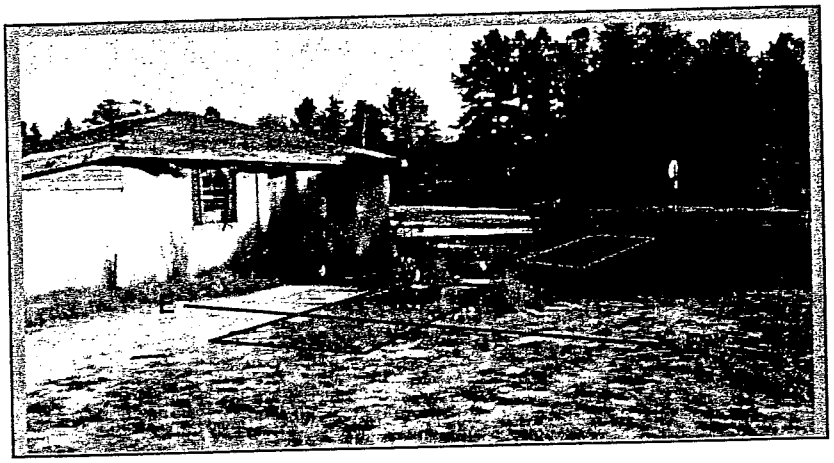
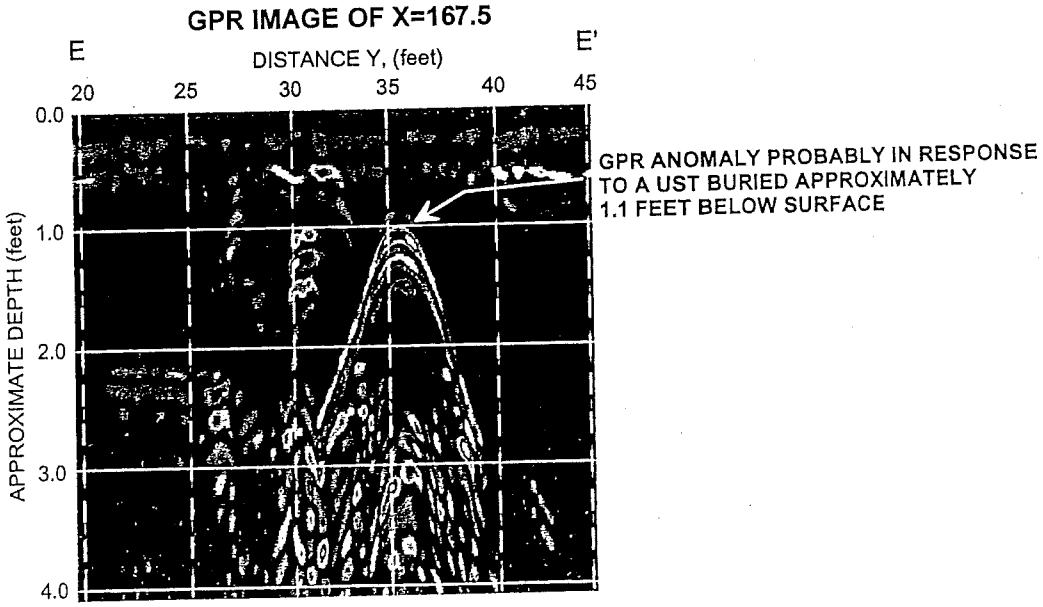
The two photos show the approximate locations of the two probable UST's at Parcel 80, as suggested by the geophysical results. The UST's appear to be buried approximately 1 to 2 feet below surface. A former pump island lies between the two probable UST's.



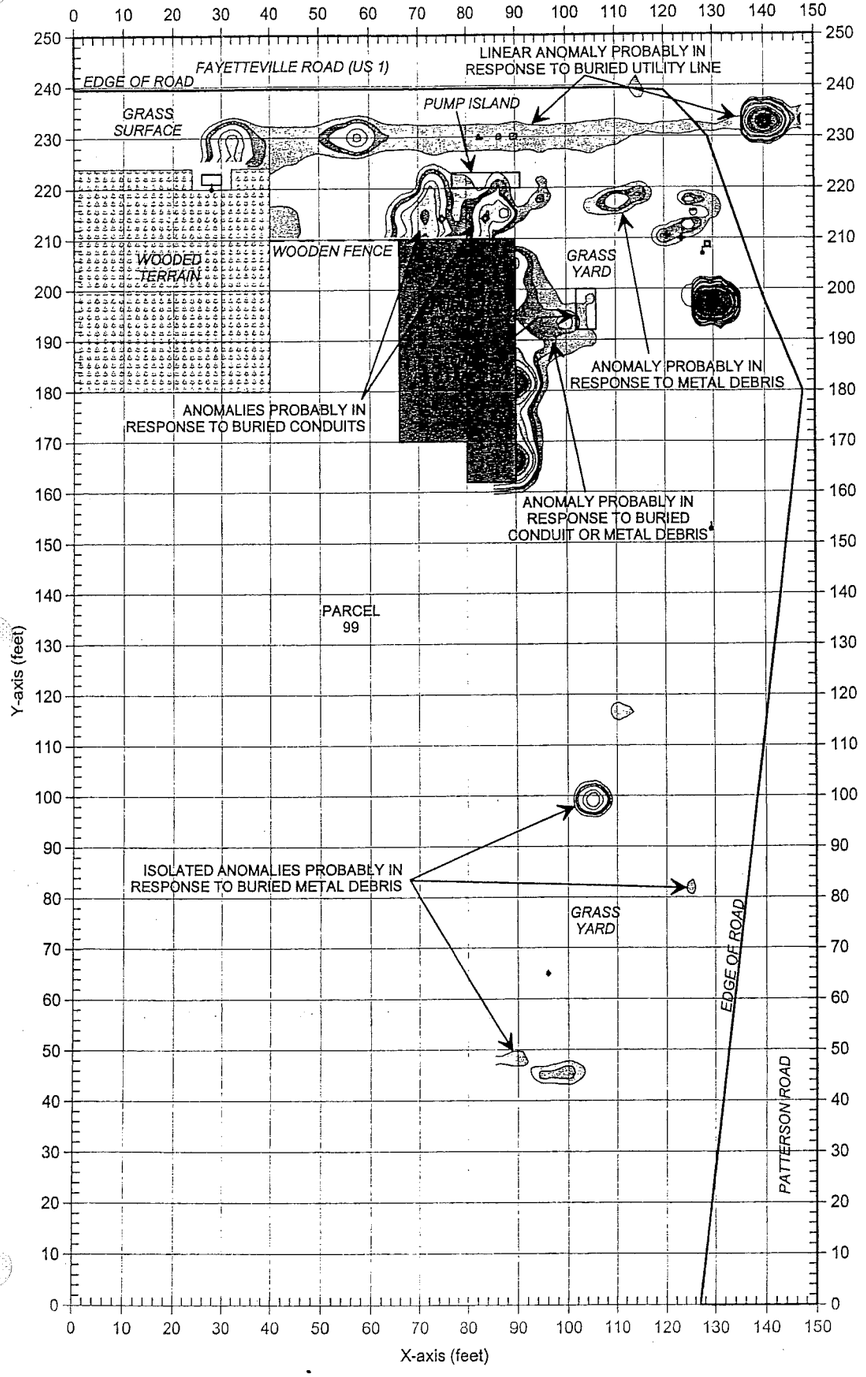


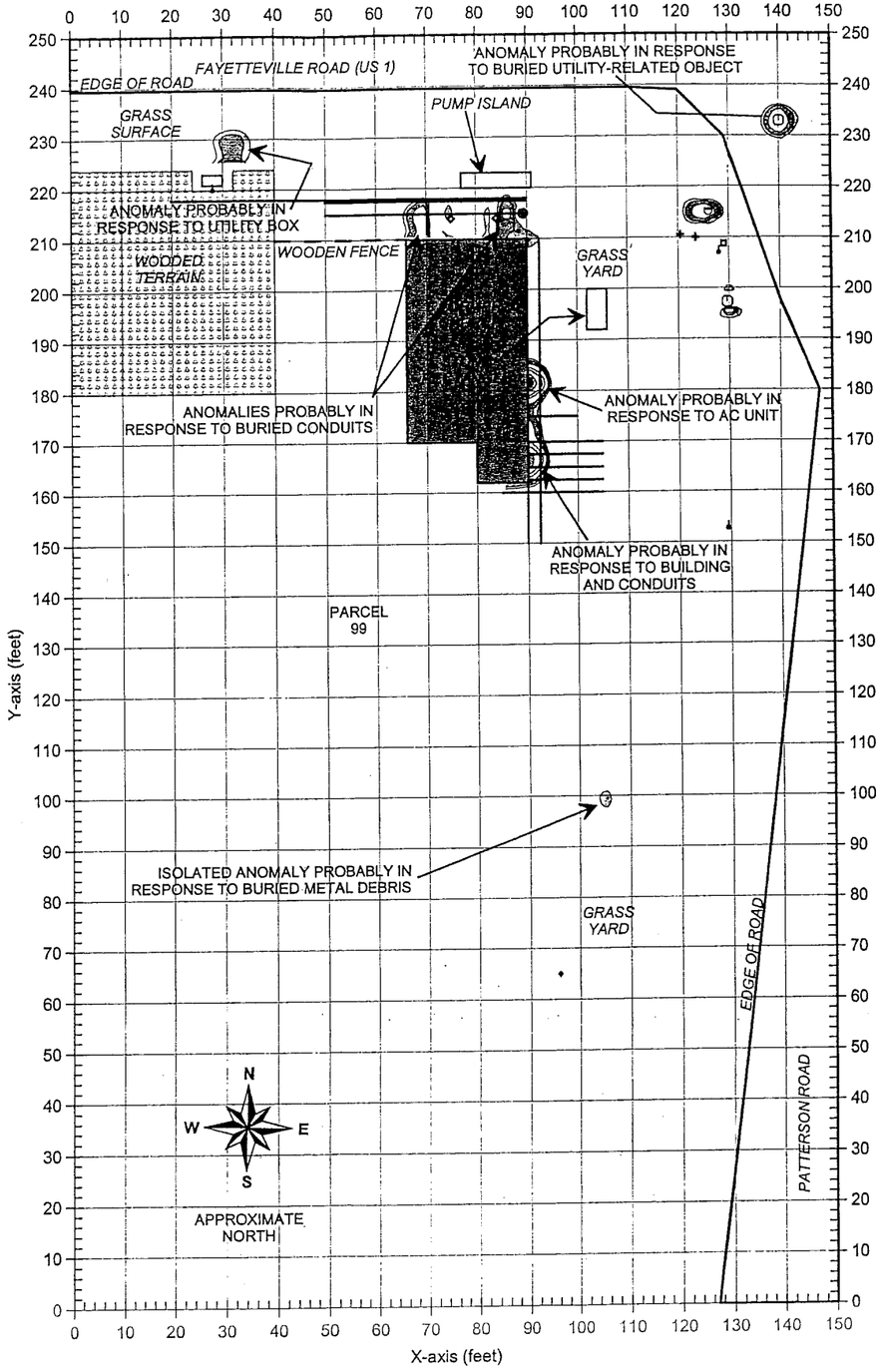
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

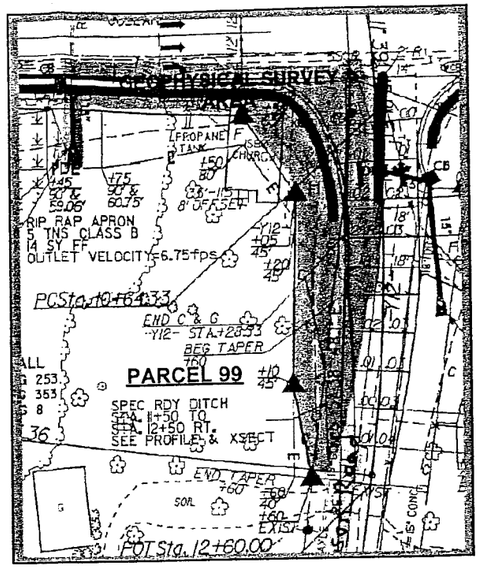
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	WALTER McCAIN PROPERTY (PARCEL 80)		
CITY	ROCKINGHAM	STATE	NORTH CAROLINA
	GEOPHYSICAL RESULTS	JOB	2005-292

PHOTOS & GPR IMAGE OF UST LOCATIONS

FIGURE 17







LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CANOPY POLE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- GPR SURVEY LINE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61
METAL DETECTION
RESULTS

FIGURE 18

GRAPHIC SCALE IN METERS

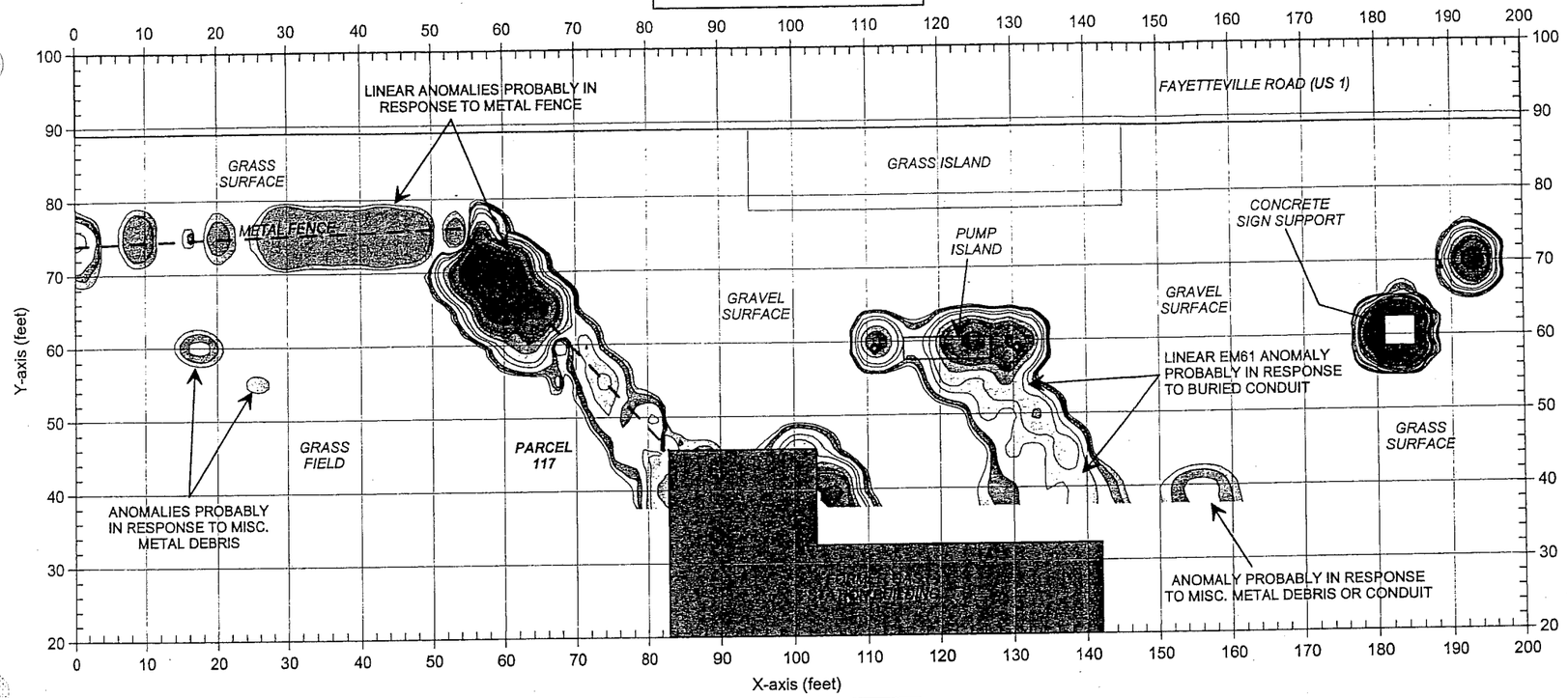
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	LEON WALL PROPERTY (PARCEL 99)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
DATE	11/26/05
DRWN	MJD
LAY	
CHKD	
DWG	
FIGURE	
J.NO.	2005-292

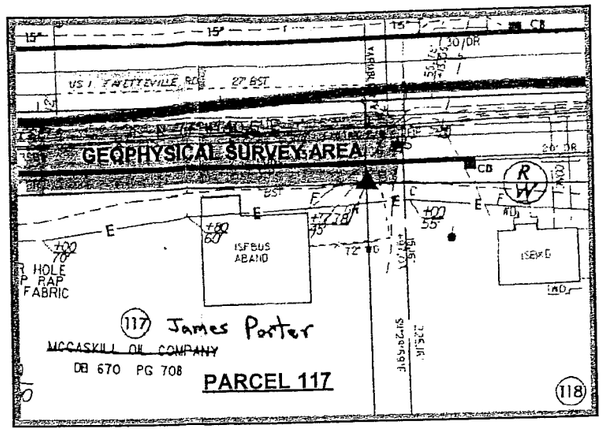
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 METAL DETECTION RESULTS

FIGURE 19

EM61 BOTTOM COIL RESULTS





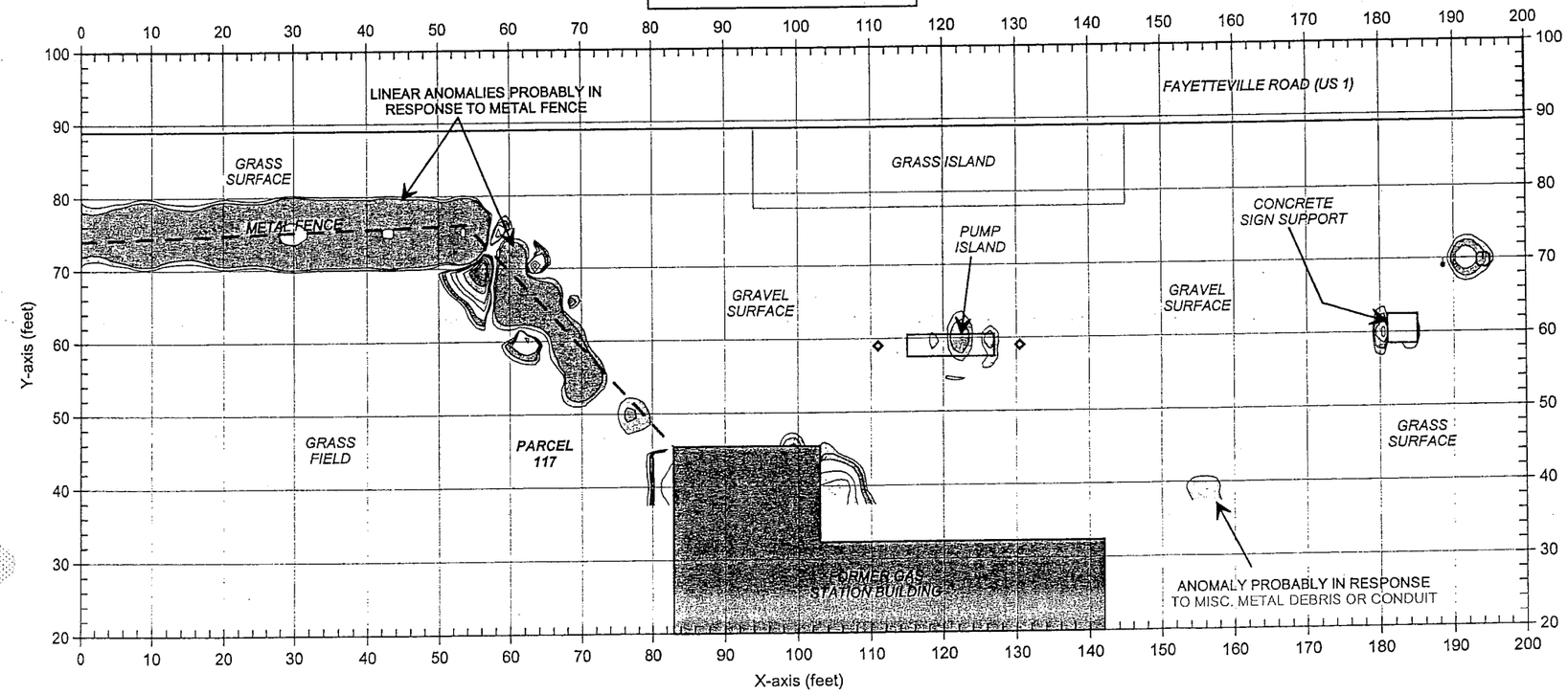
N
W E
S

APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -50 -30 -20 -10 -5 5 10 20 30 50 75 100 150 200 300 400 500 750 1000

EM61 DIFFERENTIAL RESULTS



LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- SUPPORT POLE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar surveys were not conducted at this site.

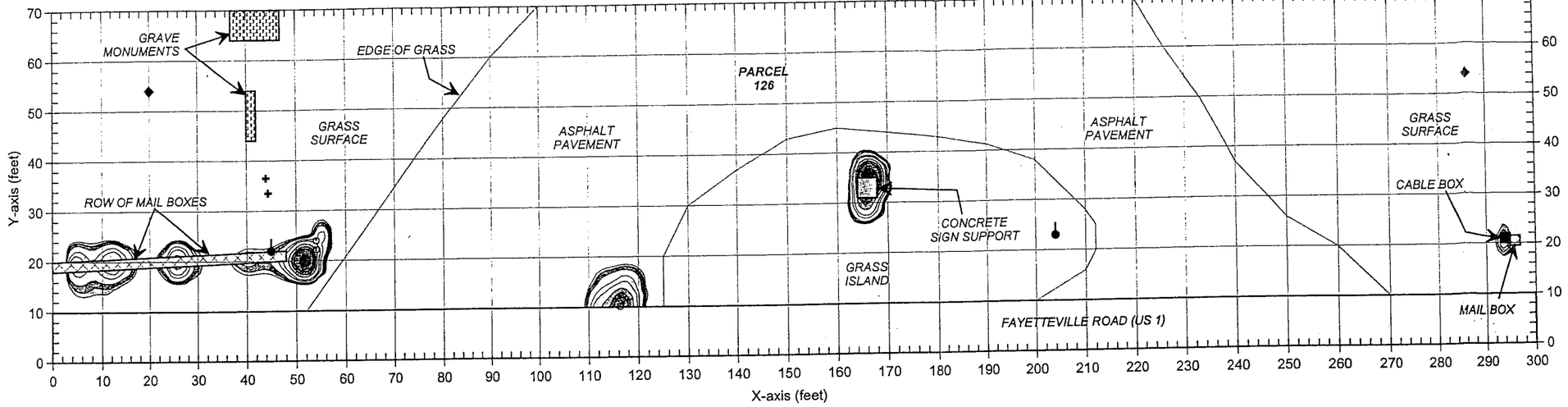
DRAWING SCALE IN METERS

DRWN	MJD
CHKD	
DATE	11/26/05
LAY	
DWG	
FIGURE	
J-NO.	2005-292

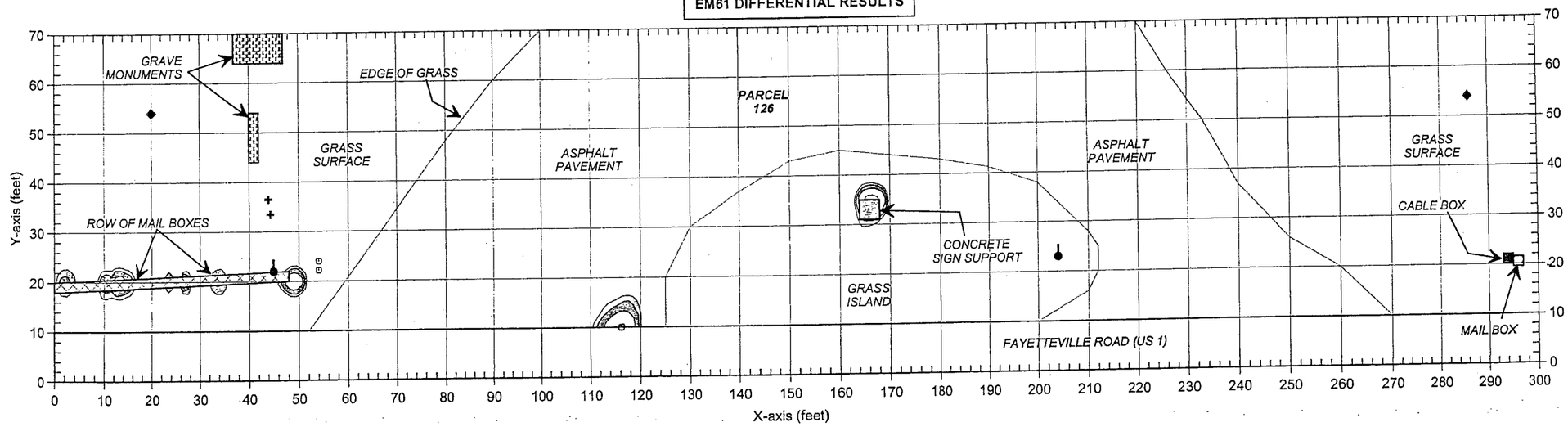
CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: JAMES PORTER PROPERTY (PARCEL 117)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

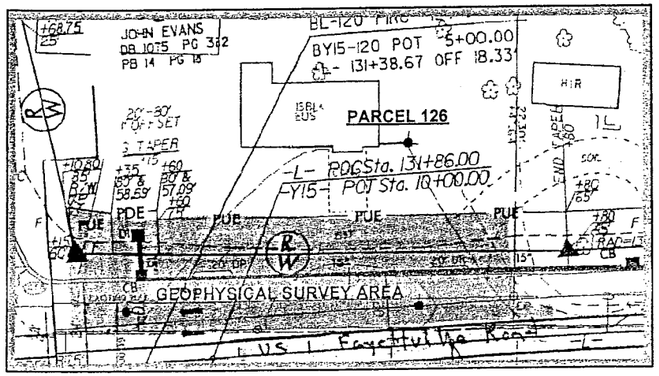
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- RIGHT-OF-WAY MARKER
- UTILITY POLE
- WATER METER OR VALVE COVER
- SIGN POLE
- STORM SEWER GRATE
- TRAFFIC SIGN
- GUY WIRE

N
W E
S

APPROXIMATE NORTH

EM61 METAL DETECTION (MILLIVOLTS)
1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-400

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data surveys were not conducted at this site

FIGURE 20

EM61
METAL DETECTION
RESULTS

GRAPHIC SCALE IN METERS

DRWN	MJD
CHKD	
DATE	11/26/05
LAY	
DWG	
PROJ#	2005-292

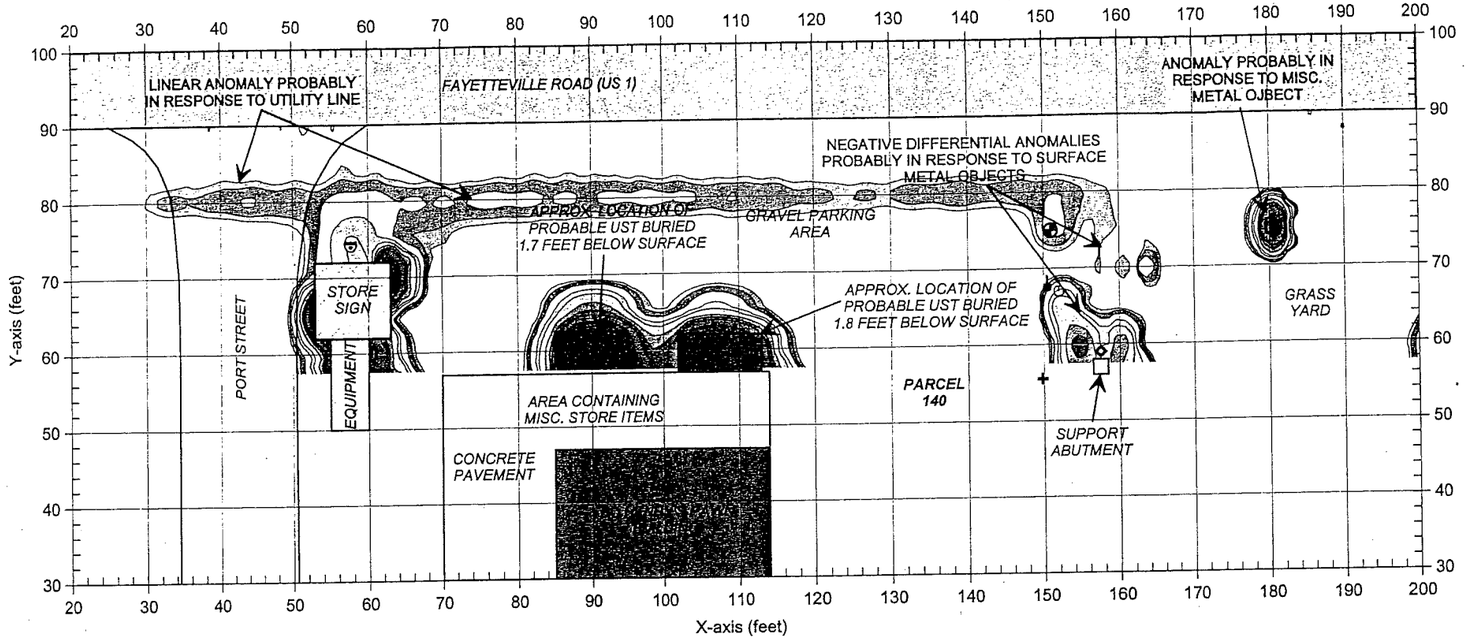
CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: JOHN EVANS PROPERTY (PARCEL 126)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

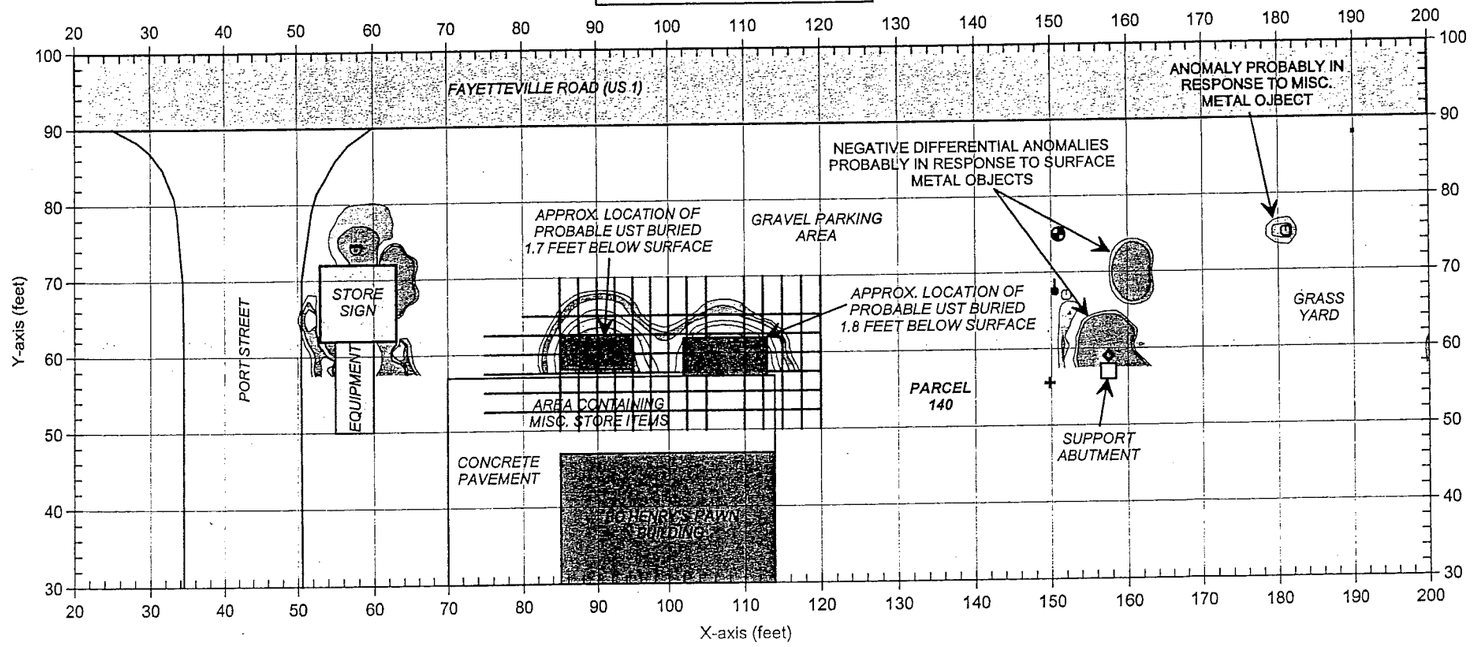
EM61 METAL DETECTION RESULTS

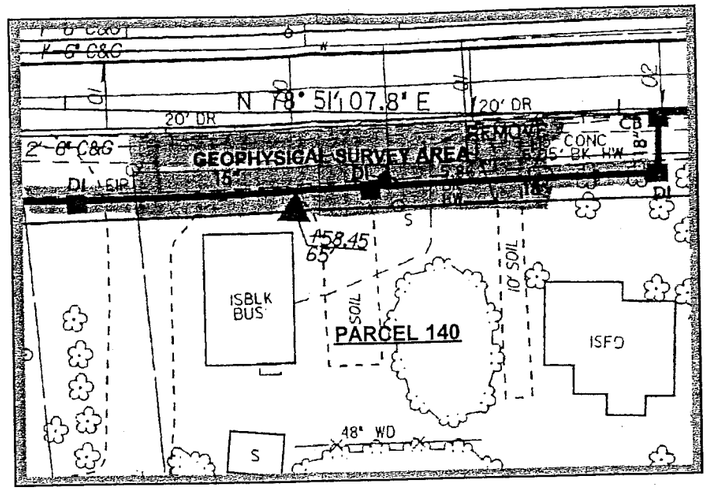
FIGURE 21

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -200 -100 -50 -20 -10 -5 0 5 10 20 50 100 200 400 800 1000

N W E S

APPROXIMATE NORTH

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- SIGN POLE
- STORM SEWER GRATE
- TRAFFIC SIGN
- FIBER OPTIC LINE SIGN
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: HENRY USSERY PROPERTY (PARCEL 140)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS
JOB NO.: 2005-292
FIGURE: 21
DWG:
CHKD:
DRWN: MJD
DATE: 11/25/05
DRAWING SCALE IN METERS

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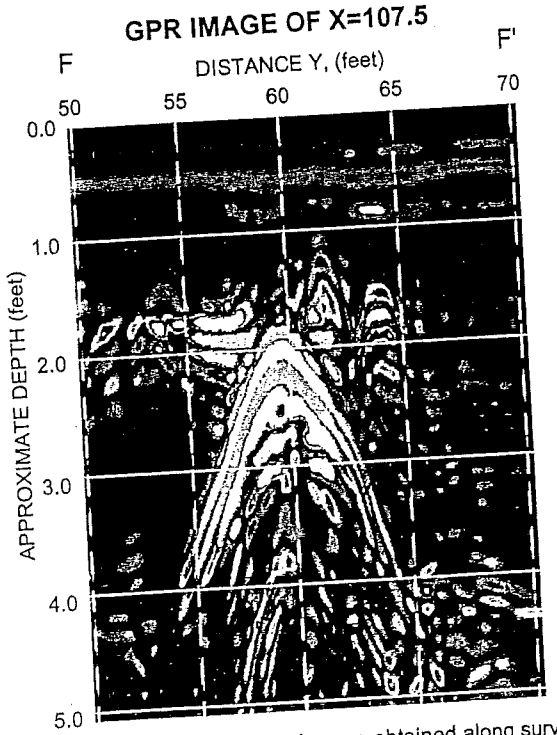
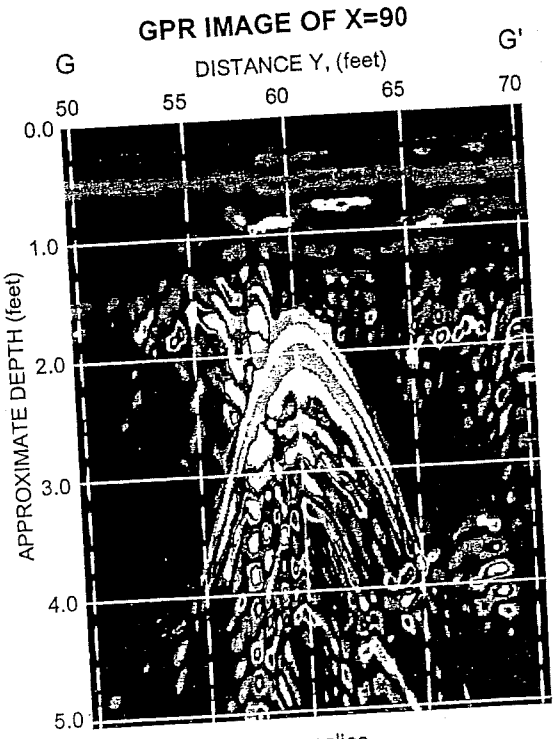
ENVIRONMENTAL & ENGINEERING, P.C.

The photo shows the approximate locations of the two UST's, as suggested by the geophysical results at Parcel 140. The UST's appear to be approximately 1.8 and 1.7 feet below surface.





The GPR images obtained along survey lines X=107.5 and X=90 show the anomalies that are probably in response to the two UST's buried at Parcel 140. The GPR data suggest the UST's are buried approximately 1.8 feet and 1.7 feet below surface, respectively.

PYRAMID

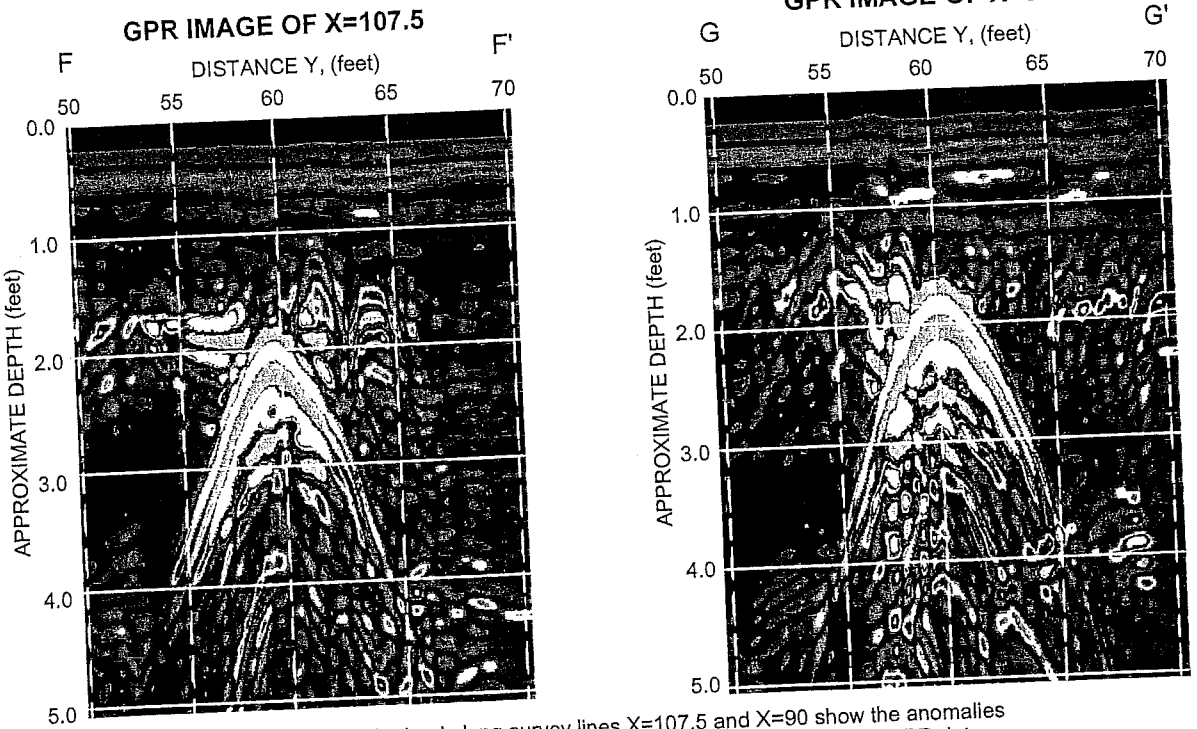
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE 11/28/05	DRWN
SITE	HENRY USSERY PROPERTY (PARCEL 140)	LAY	CHKD
CITY	ROCKINGHAM	STATE NORTH CAROLINA	PRO
	GEOPHYSICAL RESULTS	JOB 2005-292	APPR

GRAPHIC SCALE IN METERS

PHOTO & GPR IMAGES OF UST LOCATIONS

FIGURE 22

The photo shows the approximate locations of the two UST's, as suggested by the geophysical results at Parcel 140. The UST's appear to be approximately 1.8 and 1.7 feet below surface.



The GPR images obtained along survey lines X=107.5 and X=90 show the anomalies that are probably in response to the two UST's buried at Parcel 140. The GPR data suggest the UST's are buried approximately 1.8 feet and 1.7 feet below surface, respectively.

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CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE 11/28/05	DRWN
SITE	HENRY USSERY PROPERTY (PARCEL 140)	LAY	CHKD
CITY	ROCKINGHAM	STATE NORTH CAROLINA	DWG
TITLE	GEOPHYSICAL RESULTS	JNO 2005-292	SCALE

GRAPHIC SCALE IN METERS

PHOTO & GPR IMAGES OF UST LOCATIONS

FIGURE 22

APPENDIX C

BORING LOGS

Log of Soil Boring 21-1

Project: Rockingham Sites (Parcel 021) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 21-1

Client: NCDOT
TIP/WBS # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/05/05
Checked By: DH / SW

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A
Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen ppm (250 / 500 / 750)	FID Field Screen ppm (250 / 500 / 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface							
0		*Asphalt*							
1	SP	Dry, tan, fine sand		MC	100	82			
2	SP	Dry, tan, fine sand, slight petroleum odor		MC	100	183			
3 / 1									
4	CL	Dry, tan/orange, fine sandy clay, slight petroleum odor		MC	100	230			
6 / 2	CL	Dry, tan/orange, fine sandy clay		MC	100	13			
7									
8		Boring terminated at 8 feet.							
9 / 3									
10									
11									
12									
13 / 4									
14									
15									

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Log of Soil Boring 21-2

Project: Rockingham Sites (Parcel 021) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 21-2

Client: NCDOT
TIP/WBS # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/05/05
Checked By: DH / SWC

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A
Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750) / FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Asphalt*						
1	SP	*SP* Dry, tan, silty fine sand, with tree root		MC	100	0		
2	SP	*SP* Dry, tan, silty fine sand, with tree root		MC	100	0		
3 / 1	SP	*SP* Dry, tan, silty fine sand, with tree root		MC	100	0		
4	CL	*CL* Dry, tan/orange, fine sandy clay						
6 / 2	CL	*CL* Dry, tan/orange, fine sandy clay		MC	100	2		
8		Boring terminated at 8 feet.						
10 / 3								
12								
13 / 4								
14								
15								

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Log of Soil Boring 21-3

Project: Rockingham Sites (Parcel 021) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 21-3

Client: NCDOT
*S # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/05/05

Checked By: DH / SWL

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A

Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750	FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
		SUBSURFACE PROFILE	**SAMPLE**						
0 / 0		Ground Surface							
0		*Asphalt*							
1	SP	Dry, tan, fine sand		MC	100	0			
2	SP	Dry, tan, fine sand		MC	100	0			
3 / 1									
4	CL	Dry, tan/orange, fine sandy clay		MC	100	0			
6	CL	Dry, tan/orange, fine sandy clay		MC	100	0			
7 / 2									
8		Boring terminated at 8 feet.							
9									
10 / 3									
11									
12									
13 / 4									
14									
15									

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Log of Soil Boring 21-4

Project: Rockingham Sites (Parcel 021) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 21-4

Client: NCDOT
WBS # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/05/05

Checked By: DH/JVC

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A

Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750) / FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Asphalt*						
1	*SP*	Dry, tan, fine sand		MC	100	0		
2	*SP*	Dry, tan, fine sand		MC	100	0		
3 / 1	*SP*	Dry, tan, fine sand		MC	100	0		
4	*SP*	Dry, tan, fine sand		MC	100	0		
6 / 2	*CL*	Dry, tan/orange, fine sandy clay, black stains with strong petroleum odor		MC	100	391		
8		Boring terminated at 8 feet.						
10 / 3								
12								
13 / 4								
14								
15								

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Log of Soil Boring 21-5

Project: Rockingham Sites (Parcel 021) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 21-5

Client: NCDOT
WBS # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/05/05
Checked By: DH/SWC

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A
Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750	FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface							
0		*Asphalt*							
1	SP	*SP* Dry, tan, fine sand		MC	100	0			
2	SP	*SP* Dry, tan, fine sand		MC	100		0		
3 / 1	SP	*SP* Dry, tan, fine sand		MC	100		33		
6	CL	*CL* Dry, tan/orange, fine sandy clay, strong petroleum odor		MC	100		82		
8 / 2		Boring terminated at 8 feet.							
10 / 3									
13 / 4									
15									

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Log of Soil Boring 21-6

Project: Rockingham Sites (Parcel 021) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 21-6

Client: NCDOT
TIP/WBS # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/05/05
Checked By: DH / JCL

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A
Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750)	FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface							
0		*Asphalt*							
1	SP	*SP* Dry, tan, fine sand		MC	100	0			
2	SP	*SP* Dry, tan, fine sand		MC	100	0			
3 / 1	SP	*SP* Dry, tan, fine sand		MC	100	0			
4	SP	*SP* Dry, tan, fine sand		MC	100	0			
6 / 2	CL	*CL* Dry, tan/orange, fine sandy clay, strong petroleum odor		MC	100		508		
8		Boring terminated at 8 feet.							
10 / 3									
12									
13 / 4									
14									
15									

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Log of Soil Boring 21-7

Project: Rockingham Sites (Parcel 021) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 21-7

Client: NCDOT
WBS # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/05/05
Checked By: JH Isley

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A
Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750)	FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface							
0		*Asphalt*							
1	SP	Dry, tan, fine sand		MC	100		0		
2	SP	Dry, tan, fine sand		MC	100		0		
3 / 1	SP	Dry, tan, fine sand		MC	100		0		
4	CL	Dry, tan/orange, fine sandy clay, strong petroleum odor		MC	100		504		
6 / 2		Boring terminated at 8 feet.							
7									
8									
9									
10 / 3									
11									
12									
13 / 4									
14									
15									

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Log of Soil Boring 21-8

Project: Rockingham Sites (Parcel 021) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 21-8

Client: NCDOT
WBS # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/05/05
Checked By: DH | SCC

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A
Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750) / FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Asphalt*						
1	*SP*	Dry, tan, fine sand		MC	100	0		
2	*SP*	Dry, tan, fine sand		MC	100	0		
3 / 1								
4	*SC*	Dry, tan, clayey fine sand		MC	100	0		
6 / 2	*SC*	Dry, tan, clayey fine sand		MC	100	1		
7								
8		Boring terminated at 8 feet.						
9								
10 / 3								
11								
12								
13 / 4								
14								
15								

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Log of Soil Boring 21-9

Project: Rockingham Sites (Parcel 021) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 21-9

Client: NCDOT
WBS # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/05/05
Checked By: DH | SLL

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A
Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750) / FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Asphalt*						
1	*SP*	Dry, tan, fine sand		MC	100	0		
2	*SP*	Dry, tan, fine sand		MC	100	0		
3 / 1	*SC*	Dry, tan, clayey fine sand		MC	100	0		
4	*SC*	Dry, tan, clayey fine sand		MC	100	0		
6 / 2		Boring terminated at 8 feet.						
7								
8								
9								
10 / 3								
11								
12								
13 / 4								
14								
15								

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Log of Soil Boring 21-10

Project: Rockingham Sites (Parcel 021) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 21-10

Client: NCDOT
WBS # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/05/05
Checked By: DH / SW

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A

Total Depth of Boring: 8 feet

SUBSURFACE PROFILE			SAMPLE					
Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750) / FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0 – 1	SP	Dry, tan, fine sand		MC	100	0		
1 – 2	SP	Dry, tan, fine sand		MC	100	0		
2 – 3	SC	Dry, tan, clayey fine sand		MC	100	0		
3 – 4	SC	Dry, tan, clayey fine sand		MC	100	0		
4 – 8		Boring terminated at 8 feet.						

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Log of Soil Boring 21-11

Project: Rockingham Sites (Parcel 021) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 21-11

Client: NCDOT
WBS # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/05/05
Checked By: DH / SCV

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A
Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750	FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
Ground Surface									
0 – 0	SP	Dry, tan, fine sand		MC	100	0			
2 – 1	SP	Dry, tan, fine sand		MC	100	0			
4 – 1	SC	Dry, tan, clayey fine sand		MC	100	1			
6 – 2	SC	Dry, tan, clayey fine sand		MC	100		597		
8 – 3		Boring terminated at 8 feet.							
10 – 3									
12 – 4									
14 – 4									
15									

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Log of Soil Boring 21-12

Project: Rockingham Sites (Parcel 021) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 21-12

Client: NCDOT
*S # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/05/05
Checked By: /SCM

Initial Water Level: 8.92' bgs
Stabilized Water Level: 7.29' bgs
Cave In Depth: 10.5' - 12.0' bgs
Total Depth of Boring: 12 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen ppm (250 / 500 / 750)	FID Field Screen ppm (250 / 500 / 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface							
0 – 1 / 0	SP	Dry, tan, fine sand		MC	100	0			
1 – 3 / 1	SP	Dry, tan, fine sand,		MC	100	0			
3 – 4 / 1	SC	Dry, tan, clayey fine sand		MC	100	0			
4 – 7 / 2	SC	Dry, tan, clayey fine sand, petroleum odor		MC	100	2			
7 – 10 / 3	SC	Moist, tan, clayey fine sand, petroleum odor		MC	100				
10 – 12 / 3	SC	Wet, tan, clayey fine sand, petroleum odor		MC	100				
12 – 15 / 4		Boring terminated at 12 feet.							

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Log of Soil Boring 21-13

Project: Rockingham Sites (Parcel 021) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 21-13

Client: NCDOT
TIPS # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/05/05
Checked By: DJH

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A
Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750	FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
		Ground Surface							
0 / 0	SP	Dry, tan, fine sand		MC	100	3			
2 / 1	SP	Dry, tan, fine sand		MC	100	3			
4 / 1	SC	Dry, tan, clayey fine sand		MC	100	5			
6 / 2	SC	Dry, tan, clayey fine sand		MC	100	101			
8 / 3		Boring terminated at 8 feet.							
10 / 3									
12 / 4									
14 / 4									
15									

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Log of Soil Boring 21-14

Project: Rockingham Sites (Parcel 021) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 21-14

Client: NCDOT
TIP/WBS # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/05/05
Checked By: DH | SW

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A
Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750	FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface							
0–2	SP	Dry, tan, fine sand		MC	100	21			
2–4 / 1	SP	Dry, tan, fine sand		MC	100	197			
4–6	SC	Dry, tan, clayey fine sand		MC	100	108			
6–8 / 2	SC	Dry, tan, clayey fine sand		MC	100	10			
8 / 3		Boring terminated at 8 feet.							
10 / 4									
12									
14									
15									

Solutions-IES, Inc.
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Raleigh, NC 27607
(919) 873-1060

Solutions-IES
Industrial & Environmental Services

Log of Soil Boring 21-15

Project: Rockingham Sites (Parcel 021) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 21-15

Client: NCDOT
TIP/WBS # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/05/05
Checked By: DH SW

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A
Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm, 250 / 500 / 750) / FID Field Screen (ppm, 250 / 500 / 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0 – 2 / 0 – 1	SP	Dry, tan, fine sand		MC	100	28		
2 – 4 / 1	SP	Dry, tan, fine sand		MC	100	140		
4 – 6 / 1 – 2	SC	Dry, tan, clayey fine sand		MC	100	11		
6 – 8 / 2	SC	Dry, tan, clayey fine sand		MC	100	12		
8 – 15 / 2 – 4		Boring terminated at 8 feet.						

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APPENDIX D

LABORATORY ANALYTICAL REPORTS

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Fax: 828.252.4618

December 21, 2005

Ms. Sheri Knox
Solutions-IES
1101 Nowell Road
Raleigh, NC 27607

RE: Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Dear Ms. Knox:

Enclosed are the analytical results for sample(s) received by the laboratory on December 7, 2005. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Inorganic Wet Chemistry and Metals Analyses were performed at our Pace Asheville laboratory and Organic testing was performed at our Pace Charlotte laboratory unless otherwise footnoted.

If you have any questions concerning this report please feel free to contact me.

Sincerely,

Bonnie McKee

Bonnie McKee
Bonnie.McKee@pacelabs.com
Project Manager

Enclosures

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SAMPLE SUMMARY

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Project Sample Number	Sample Number	Client Sample ID	Matrix	Date Collected	Date Received
92108997-001	926419797	21-1(4-6)	Soil	12/06/05 08:20	12/07/05 15:30
92108997-002	926419813	21-14(4-6)	Soil	12/06/05 08:20	12/07/05 15:30
92108997-003	926419821	21-15(4-6)	Soil	12/06/05 08:25	12/07/05 15:30
92108997-004	926419839	21-3 (6-8)	Soil	12/06/05 08:25	12/07/05 15:30
92108997-005	926419854	21-4 (6-8)	Soil	12/06/05 08:30	12/07/05 15:30
92108997-006	926419862	21-5 (6-8)	Soil	12/06/05 08:30	12/07/05 15:30
92108997-007	926419870	21-6 (6-8)	Soil	12/06/05 08:35	12/07/05 15:30
92108997-008	926419896	21-7 (6-8)	Soil	12/06/05 08:35	12/07/05 15:30
92108997-009	926419904	21-11(6-8)	Soil	12/06/05 08:40	12/07/05 15:30
92108997-010	926419912	21-12(6-8)	Soil	12/06/05 08:40	12/07/05 15:30
92108997-011	926419920	21-12	Water	12/06/05 14:30	12/07/05 15:30

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SAMPLE ANALYTE COUNT

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Project Sample Number	Sample No	Client Sample ID	Analysis Code	Analysis Description	Analytes Reported
92108997-001	926419797	21-1(4-6)	%MOISTURE	Percent Moisture	1
			8015D SL92	TPH in Soil by 3545/8015	3
			8015N SL92	GAS, Soil, North Carolina	2
92108997-002	926419813	21-14(4-6)	%MOISTURE	Percent Moisture	1
			8015D SL92	TPH in Soil by 3545/8015	3
			8015N SL92	GAS, Soil, North Carolina	2
92108997-003	926419821	21-15(4-6)	%MOISTURE	Percent Moisture	1
			8015D SL92	TPH in Soil by 3545/8015	3
			8015N SL92	GAS, Soil, North Carolina	2
92108997-004	926419839	21-3 (6-8)	%MOISTURE	Percent Moisture	1
			8015D SL92	TPH in Soil by 3545/8015	3
			8015N SL92	GAS, Soil, North Carolina	2
92108997-005	926419854	21-4 (6-8)	%MOISTURE	Percent Moisture	1
			8015D SL92	TPH in Soil by 3545/8015	3
			8015N SL92	GAS, Soil, North Carolina	2
92108997-006	926419862	21-5 (6-8)	%MOISTURE	Percent Moisture	1
			8015D SL92	TPH in Soil by 3545/8015	3
			8015N SL92	GAS, Soil, North Carolina	2
92108997-007	926419870	21-6 (6-8)	%MOISTURE	Percent Moisture	1
			8015D SL92	TPH in Soil by 3545/8015	3
			8015N SL92	GAS, Soil, North Carolina	2
92108997-008	926419896	21-7 (6-8)	%MOISTURE	Percent Moisture	1
			8015D SL92	TPH in Soil by 3545/8015	3
			8015N SL92	GAS, Soil, North Carolina	2
92108997-009	926419904	21-11(6-8)	%MOISTURE	Percent Moisture	1
			8015D SL92	TPH in Soil by 3545/8015	3
			8015N SL92	GAS, Soil, North Carolina	2
92108997-010	926419912	21-12(6-8)	%MOISTURE	Percent Moisture	1
			8015D SL92	TPH in Soil by 3545/8015	3
			8015N SL92	GAS, Soil, North Carolina	2
92108997-011	926419920	21-12	207TC WL92	3030C Metals, ICP, Trace	3
			6012 WL92	Halogen. & Aromatic Vol. Orgs.	37
			625 WL92	Extractables in Water by 625	63
			EPH WL92	EPH in Water by Mass. Method	8
			VPH WL92	VPH in Water by Mass. Method	5

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Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Solid results are reported on a dry weight basis

Lab Sample No: 926419797
Client Sample ID: 21-1(4-6)

Project Sample Number: 92108997-001
Matrix: Soil

Date Collected: 12/06/05 08:20
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	MDL	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry									
Percent Moisture	Method: % Moisture								
Percent Moisture	13.0	%			12/07/05 20:32	KDF			
GC Semivolatiles									
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015								
Diesel Fuel	ND	mg/kg	5.7	5.7	12/16/05 21:25	KBS	68334-30-5		
n-Pentacosane (S)	58	%			12/16/05 21:25	KBS	629-99-2		
Date Extracted	12/14/05				12/14/05				
GC Volatiles									
GAS, Soil, North Carolina	Method: EPA 8015								
Gasoline	ND	mg/kg	4.2	2.9	12/10/05 05:39	DHW			
4-Bromofluorobenzene (S)	78	%			12/10/05 05:39	DHW	460-00-4		

Date: 12/21/05

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Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Lab Sample No: 926419813
Client Sample ID: 21-14(4-6)

Project Sample Number: 92108997-002
Matrix: Soil

Date Collected: 12/06/05 08:20
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	MDL	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry									
Percent Moisture	Method: % Moisture								
Percent Moisture	15.2	%			12/07/05 20:32	KDF			
GC Semivolatiles									
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015								
Diesel Fuel	ND	mg/kg	5.9	5.9	12/16/05 21:59	KBS	68334-30-5		
n-Pentacosane (S)	62	%			12/16/05 21:59	KBS	629-99-2		
Date Extracted	12/14/05				12/14/05				
GC Volatiles									
GAS, Soil, North Carolina	Method: EPA 8015								
Gasoline	ND	mg/kg	4.4	3.0	12/10/05 06:17	DHW			
4-Bromofluorobenzene (S)	74	%			12/10/05 06:17	DHW	460-00-4		

Date: 12/21/05

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Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Lab Sample No: 926419821
Client Sample ID: 21-15(4-6)

Project Sample Number: 92108997-003
Matrix: Soil

Date Collected: 12/06/05 08:25
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	MDL	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry									
Percent Moisture	Method: % Moisture								
Percent Moisture	14.9	%			12/07/05 20:32	KDF			
GC Semivolatiles									
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015								
Diesel Fuel	ND	mg/kg	5.9	5.9	12/16/05 22:34	KBS	68334-30-5		
n-Pentacosane (S)	60	%			12/16/05 22:34	KBS	629-99-2		
Date Extracted	12/14/05				12/14/05				
GC Volatiles									
GAS, Soil, North Carolina	Method: EPA 8015								
Gasoline	ND	mg/kg	4.2	2.9	12/10/05 06:53	DHW			
4-Bromofluorobenzene (S)	65	%			12/10/05 06:53	DHW	460-00-4		

Date: 12/21/05

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Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Lab Sample No: 926419839
Client Sample ID: 21-3 (6-8)

Project Sample Number: 92108997-004
Matrix: Soil

Date Collected: 12/06/05 08:25
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	MDL	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry									
Percent Moisture	Method: % Moisture								
Percent Moisture	15.9	%			12/07/05 20:33	KDF			
GC Semivolatiles									
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015								
Diesel Fuel	ND	mg/kg	5.9	5.9	12/16/05 23:09	KBS	68334-30-5		
n-Pentacosane (S)	60	%			12/16/05 23:09	KBS	629-99-2		
Date Extracted	12/14/05				12/14/05				
GC Volatiles									
GAS, Soil, North Carolina	Method: EPA 8015								
Gasoline	ND	mg/kg	4.1	2.8	12/10/05 09:54	DHW			
4-Bromofluorobenzene (S)	75	%			12/10/05 09:54	DHW	460-00-4		

Date: 12/21/05

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Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Lab Sample No: 926419854
Client Sample ID: 21-4 (6-8)

Project Sample Number: 92108997-005
Matrix: Soil

Date Collected: 12/06/05 08:30
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	MDL	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry									
Percent Moisture	Method: % Moisture								
Percent Moisture	15.7	%			12/07/05 20:33	KDF			
GC Semivolatiles									
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015								
Diesel Fuel	ND	mg/kg	5.9	5.9	12/16/05 16:50	KBS	68334-30-5		
n-Pentacosane (S)	53	%			12/16/05 16:50	KBS	629-99-2		
Date Extracted	12/14/05				12/14/05				
GC Volatiles									
GAS, Soil, North Carolina	Method: EPA 8015								
Gasoline	5.0	mg/kg	4.6	3.1	12/10/05 11:05	DHW			
4-Bromofluorobenzene (S)	96	%			12/10/05 11:05	DHW	460-00-4		

Date: 12/21/05

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Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Lab Sample No: 926419862 Project Sample Number: 92108997-006 Date Collected: 12/06/05 08:30
Client Sample ID: 21-5 (6-8) Matrix: Soil Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	MDL	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry									
Percent Moisture	Method: % Moisture								
Percent Moisture	13.0	%			12/07/05 20:33	KDF			
GC Semivolatiles									
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015								
Diesel Fuel	69.	mg/kg	5.7	5.7	12/16/05 17:24	KBS	68334-30-5		
n-Pentacosane (S)	64	%			12/16/05 17:24	KBS	629-99-2		
Date Extracted	12/14/05				12/14/05				
GC Volatiles									
GAS, Soil, North Carolina	Method: EPA 8015								
Gasoline	820	mg/kg	80.	54.	12/12/05 20:27	DHW			
4-Bromofluorobenzene (S)	130	%			12/12/05 20:27	DHW	460-00-4		

Date: 12/21/05

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Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Lab Sample No: 926419870
Client Sample ID: 21-6 (6-8)

Project Sample Number: 92108997-007
Matrix: Soil

Date Collected: 12/06/05 08:35
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	MDL	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry									
Percent Moisture	Method: % Moisture								
Percent Moisture	15.2	%			12/07/05 20:33	KDF			
GC Semivolatiles									
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015								
Diesel Fuel	62.	mg/kg	5.9	5.9	12/16/05 17:58	KBS	68334-30-5		
n-Pentacosane (S)	76	%			12/16/05 17:58	KBS	629-99-2		
Date Extracted	12/14/05				12/14/05				
GC Volatiles									
GAS, Soil, North Carolina	Method: EPA 8015								
Gasoline	660	mg/kg	81.	55.	12/12/05 20:56	DHW			
4-Bromofluorobenzene (S)	141	%			12/12/05 20:56	DHW	460-00-4	1	

Date: 12/21/05

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Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Lab Sample No: 926419896
Client Sample ID: 21-7 (6-8)

Project Sample Number: 92108997-008
Matrix: Soil

Date Collected: 12/06/05 08:35
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	MDL	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry									
Percent Moisture	Method: % Moisture								
Percent Moisture	14.7	%			12/07/05 20:34	KDF			
GC Semivolatiles									
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015								
Diesel Fuel	60.	mg/kg	5.9	5.9	12/16/05 18:32	KBS	68334-30-5		
n-Pentacosane (S)	74	%			12/16/05 18:32	KBS	629-99-2		
Date Extracted	12/14/05				12/14/05				
GC Volatiles									
GAS, Soil, North Carolina	Method: EPA 8015								
Gasoline	440	mg/kg	40.	27.	12/12/05 19:00	DHW			
4-Bromofluorobenzene (S)	116	%			12/12/05 19:00	DHW	460-00-4		

Date: 12/21/05

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Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Lab Sample No: 926419904
Client Sample ID: 21-11(6-8)

Project Sample Number: 92108997-009
Matrix: Soil

Date Collected: 12/06/05 08:40
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	MDL	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry									
Percent Moisture	Method: % Moisture								
Percent Moisture	13.1	%			12/07/05 20:34	KDF			
GC Semivolatiles									
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015								
Diesel Fuel	80.	mg/kg	5.8	5.8	12/16/05 19:06	KBS	68334-30-5		
n-Pentacosane (S)	82	%			12/16/05 19:06	KBS	629-99-2		
Date Extracted	12/14/05				12/14/05				
GC Volatiles									
GAS, Soil, North Carolina	Method: EPA 8015								
Gasoline	150	mg/kg	3.7	2.5	12/12/05 17:04	DHW			
4-Bromofluorobenzene (S)	277	%			12/12/05 17:04	DHW	460-00-4	1	

Date: 12/21/05

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Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Lab Sample No: 926419912
Client Sample ID: 21-12(6-8)

Project Sample Number: 92108997-010
Matrix: Soil

Date Collected: 12/06/05 08:40
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	MDL	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry									
Percent Moisture	Method: % Moisture								
Percent Moisture	15.5	%			12/07/05 20:34	KDF			
GC Semivolatiles									
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015								
Diesel Fuel	ND	mg/kg	5.9	5.9	12/16/05 19:40	KBS	68334-30-5		
n-Pentacosane (S)	87	%			12/16/05 19:40	KBS	629-99-2		
Date Extracted	12/14/05				12/14/05				
GC Volatiles									
GAS, Soil, North Carolina	Method: EPA 8015								
Gasoline	ND	mg/kg	4.2	2.8	12/13/05 16:38	DHW			
4-Bromofluorobenzene (S)	86	%			12/13/05 16:38	DHW	460-00-4		

Date: 12/21/05

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Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Lab Sample No: 926419920 Project Sample Number: 92108997-011 Date Collected: 12/06/05 14:30
Client Sample ID: 21-12 Matrix: Water Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	MDL	Analyzed	By	CAS No.	Qual	RegLmt
Metals									
3030C Metals, ICP, Trace	Prep/Method: SM 3030C / EPA 200.7								
Chromium, 3030C	2.6	mg/l	0.0020	0.000	12/16/05 21:18	ALV	7440-47-3		
Lead, 3030C	0.86	mg/l	0.0050	0.000	12/16/05 21:18	ALV	7439-92-1		
Date Digested	12/08/05 10:30				12/08/05 10:30				
GC/MS Semivolatiles									
Extractables in Water by 625	Prep/Method: EPA 625 SF / EPA 625								
Acenaphthene	ND	ug/l	10.	5.1	12/17/05 20:22	BET	83-32-9		
Acenaphthylene	ND	ug/l	10.	4.8	12/17/05 20:22	BET	208-96-8		
Anthracene	ND	ug/l	10.	4.3	12/17/05 20:22	BET	120-12-7		
Benzidine	ND	ug/l	100	30.	12/17/05 20:22	BET	92-87-5		
Benzo(k)fluoranthene	ND	ug/l	10.	4.0	12/17/05 20:22	BET	207-08-9		
Benzo(b)fluoranthene	ND	ug/l	10.	4.3	12/17/05 20:22	BET	205-99-2		
Benzo(a)anthracene	ND	ug/l	10.	3.0	12/17/05 20:22	BET	56-55-3		
Benzo(g,h,i)perylene	ND	ug/l	10.	9.4	12/17/05 20:22	BET	191-24-2		
Benzo(a)pyrene	ND	ug/l	10.	2.8	12/17/05 20:22	BET	50-32-8		
4-Bromophenylphenyl ether	ND	ug/l	10.	4.0	12/17/05 20:22	BET	101-55-3		
Butylbenzylphthalate	ND	ug/l	10.	3.9	12/17/05 20:22	BET	85-68-7		
4-Chloro-3-methylphenol	ND	ug/l	10.	7.2	12/17/05 20:22	BET	59-50-7		
bis(2-Chloroethoxy)methane	ND	ug/l	10.	5.8	12/17/05 20:22	BET	111-91-1		
bis(2-Chloroethyl) ether	ND	ug/l	10.	6.3	12/17/05 20:22	BET	111-44-4		
bis(2-Chloroisopropyl) ether	ND	ug/l	10.	6.5	12/17/05 20:22	BET	39638-32-9		
2-Chloronaphthalene	ND	ug/l	10.	5.1	12/17/05 20:22	BET	91-58-7		
2-Chlorophenol	ND	ug/l	10.	7.9	12/17/05 20:22	BET	95-57-8		
4-Chlorophenylphenyl ether	ND	ug/l	10.	4.4	12/17/05 20:22	BET	7005-72-3		
Chrysene	ND	ug/l	10.	2.4	12/17/05 20:22	BET	218-01-9		
Dibenz(a,h)anthracene	ND	ug/l	10.	7.7	12/17/05 20:22	BET	53-70-3		
1,2-Dichlorobenzene	ND	ug/l	10.	4.2	12/17/05 20:22	BET	95-50-1		
1,3-Dichlorobenzene	ND	ug/l	10.	3.6	12/17/05 20:22	BET	541-73-1		
1,4-Dichlorobenzene	ND	ug/l	10.	3.6	12/17/05 20:22	BET	106-46-7		
3,3'-Dichlorobenzidine	ND	ug/l	20.	9.2	12/17/05 20:22	BET	91-94-1		
2,4-Dichlorophenol	ND	ug/l	10.	6.8	12/17/05 20:22	BET	120-83-2		
Diethylphthalate	11.	ug/l	10.	5.4	12/17/05 20:22	BET	84-66-2		
2,4-Dimethylphenol	ND	ug/l	10.	7.4	12/17/05 20:22	BET	105-67-9		
Dimethylphthalate	ND	ug/l	10.	3.6	12/17/05 20:22	BET	131-11-3		
Di-n-butylphthalate	6.5	J ug/l	10.	4.7	12/17/05 20:22	BET	84-74-2		
4,6-Dinitro-2-methylphenol	ND	ug/l	50.	4.2	12/17/05 20:22	BET	534-52-1		
2,4-Dinitrophenol	ND	ug/l	50.	2.5	12/17/05 20:22	BET	51-28-5		

Date: 12/21/05

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Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Lab Sample No: 926419920
Client Sample ID: 21-12

Project Sample Number: 92108997-011
Matrix: Water

Date Collected: 12/06/05 14:30
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	MDL	Analyzed	By	CAS No.	Qual	RegLmt
2,4-Dinitrotoluene	ND	ug/l	10.	5.0	12/17/05 20:22	BET	121-14-2		
2,6-Dinitrotoluene	ND	ug/l	10.	4.7	12/17/05 20:22	BET	606-20-2		
Di-n-octylphthalate	ND	ug/l	10.	3.9	12/17/05 20:22	BET	117-84-0		
bis(2-Ethylhexyl)phthalate	ND	ug/l	10.	4.5	12/17/05 20:22	BET	117-81-7		
Fluoranthene	ND	ug/l	10.	3.6	12/17/05 20:22	BET	206-44-0		
Fluorene	ND	ug/l	10.	5.1	12/17/05 20:22	BET	86-73-7		
Hexachloro-1,3-butadiene	ND	ug/l	10.	4.5	12/17/05 20:22	BET	87-68-3		
Hexachlorobenzene	ND	ug/l	10.	5.6	12/17/05 20:22	BET	118-74-1		
Hexachlorocyclopentadiene	ND	ug/l	20.	3.4	12/17/05 20:22	BET	77-47-4		
Hexachloroethane	ND	ug/l	10.	3.7	12/17/05 20:22	BET	67-72-1		
Indeno(1,2,3-cd)pyrene	ND	ug/l	10.	6.6	12/17/05 20:22	BET	193-39-5		
Isophorone	ND	ug/l	10.	6.9	12/17/05 20:22	BET	78-59-1		
Naphthalene	59.	ug/l	10.	5.2	12/17/05 20:22	BET	91-20-3		
Nitrobenzene	ND	ug/l	10.	6.0	12/17/05 20:22	BET	98-95-3		
2-Nitrophenol	ND	ug/l	10.	4.5	12/17/05 20:22	BET	88-75-5		
4-Nitrophenol	ND	ug/l	50.	2.7	12/17/05 20:22	BET	100-02-7		
N-Nitrosodimethylamine	ND	ug/l	10.	2.9	12/17/05 20:22	BET	62-75-9		
N-Nitroso-di-n-propylamine	ND	ug/l	10.	5.4	12/17/05 20:22	BET	621-64-7		
N-Nitrosodiphenylamine	ND	ug/l	10.	4.5	12/17/05 20:22	BET	86-30-6		
Pentachlorophenol	ND	ug/l	50.	4.5	12/17/05 20:22	BET	87-86-5		
Phenanthrene	ND	ug/l	10.	4.2	12/17/05 20:22	BET	85-01-8		
Phenol	ND	ug/l	10.	3.1	12/17/05 20:22	BET	108-95-2		
Pyrene	ND	ug/l	10.	4.0	12/17/05 20:22	BET	129-00-0		
1,2,4-Trichlorobenzene	ND	ug/l	10.	4.4	12/17/05 20:22	BET	120-82-1		
2,4,6-Trichlorophenol	ND	ug/l	10.	3.9	12/17/05 20:22	BET	88-06-2		
Nitrobenzene-d5 (S)	67	%			12/17/05 20:22	BET	4165-60-0		
2-Fluorobiphenyl (S)	67	%			12/17/05 20:22	BET	321-60-8		
Terphenyl-d14 (S)	96	%			12/17/05 20:22	BET	1718-51-0		
Phenol-d5 (S)	50	%			12/17/05 20:22	BET	4165-62-2		
2-Fluorophenol (S)	5	%			12/17/05 20:22	BET	367-12-4	2	
2,4,6-Tribromophenol (S)	94	%			12/17/05 20:22	BET	118-79-6		
Date Extracted	12/12/05				12/12/05				

GC Semivolatiles

EPH in Water by Mass. Method	Prep/Method: EPA 3510 / EPH							
Aliphatic (C09-C18)	5.0	J ug/l	140	0.59	12/14/05 06:07	KBS		
Aliphatic (C19-C36)	ND	ug/l	140	0.35	12/14/05 06:07	KBS		
Aromatic (C11-22)	63.	J ug/l	140	0.31	12/14/05 06:07	KBS		
2-Fluorobiphenyl (S)	126	%			12/14/05 06:07	KBS	321-60-8	

Date: 12/21/05

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Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Lab Sample No: 926419920
Client Sample ID: 21-12

Project Sample Number: 92108997-011
Matrix: Water

Date Collected: 12/06/05 14:30
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	MDL	Analyzed	By	CAS No.	Qual	RegLmt
2-Bromonaphthalene (S)	157	%			12/14/05 06:07	KBS	580-13-2	3	
Nonatriacontane (S)	57	%			12/14/05 06:07	KBS	7194-86-7		
o-Terphenyl (S)	76	%			12/14/05 06:07	KBS	84-15-1		
Date Extracted	12/08/05				12/08/05				
GC Volatiles									
Halogen. & Aromatic Vol. Orgs.	Method: EPA 601/602								
Benzene	310	ug/l	100	11.	12/20/05 06:06	PPM	71-43-2		
Bromodichloromethane	ND	ug/l	100	72.	12/20/05 06:06	PPM	75-27-4		
Bromoform	ND	ug/l	100	49.	12/20/05 06:06	PPM	75-25-2		
Bromomethane	ND	ug/l	100	83.	12/20/05 06:06	PPM	74-83-9		
Carbon tetrachloride	ND	ug/l	100	84.	12/20/05 06:06	PPM	56-23-5		
Chlorobenzene	ND	ug/l	100	35.	12/20/05 06:06	PPM	108-90-7		
Chloroethane	ND	ug/l	100	57.	12/20/05 06:06	PPM	75-00-3		
Chloroform	ND	ug/l	100	39.	12/20/05 06:06	PPM	67-66-3		
Chloromethane	ND	ug/l	200	39.	12/20/05 06:06	PPM	74-87-3		
Dibromochloromethane	ND	ug/l	100	48.	12/20/05 06:06	PPM	124-48-1		
1,2-Dichlorobenzene	ND	ug/l	100	19.	12/20/05 06:06	PPM	95-50-1		
1,3-Dichlorobenzene	ND	ug/l	100	21.	12/20/05 06:06	PPM	541-73-1		
1,4-Dichlorobenzene	ND	ug/l	100	23.	12/20/05 06:06	PPM	106-46-7		
Dichlorodifluoromethane	ND	ug/l	100	84.	12/20/05 06:06	PPM	75-71-8		
1,1-Dichloroethane	ND	ug/l	100	67.	12/20/05 06:06	PPM	75-34-3		
1,2-Dichloroethane	ND	ug/l	100	31.	12/20/05 06:06	PPM	107-06-2		
1,1-Dichloroethene	ND	ug/l	100	84.	12/20/05 06:06	PPM	75-35-4		
trans-1,2-Dichloroethene	ND	ug/l	100	71.	12/20/05 06:06	PPM	156-60-5		
1,2-Dichloropropane	ND	ug/l	100	43.	12/20/05 06:06	PPM	78-87-5		
cis-1,3-Dichloropropene	ND	ug/l	100	55.	12/20/05 06:06	PPM	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/l	100	32.	12/20/05 06:06	PPM	10061-02-6		
Diisopropyl ether	ND	ug/l	100	25.	12/20/05 06:06	PPM	108-20-3		
Ethylbenzene	220	ug/l	100	17.	12/20/05 06:06	PPM	100-41-4		
Methylene chloride	ND	ug/l	200	110	12/20/05 06:06	PPM	75-09-2		
Methyl-tert-butyl ether	37.	J ug/l	100	53.	12/20/05 06:06	PPM	1634-04-4	4	
1,1,2,2-Tetrachloroethane	ND	ug/l	100	30.	12/20/05 06:06	PPM	79-34-5		
Tetrachloroethene	ND	ug/l	100	41.	12/20/05 06:06	PPM	127-18-4		
Toluene	ND	ug/l	100	16.	12/20/05 06:06	PPM	108-88-3		
1,1,1-Trichloroethane	ND	ug/l	100	82.	12/20/05 06:06	PPM	71-55-6		
1,1,2-Trichloroethane	ND	ug/l	100	54.	12/20/05 06:06	PPM	79-00-5		
Trichloroethene	ND	ug/l	100	69.	12/20/05 06:06	PPM	79-01-6		
Trichlorofluoromethane	ND	ug/l	100	80.	12/20/05 06:06	PPM	75-69-4		

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Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

Lab Sample No: 926419920
Client Sample ID: 21-12

Project Sample Number: 92108997-011
Matrix: Water

Date Collected: 12/06/05 14:30
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	MDL	Analyzed	By	CAS No.	Qual	RegLmt
Vinyl chloride	ND	ug/l	100	78.	12/20/05 06:06	PPM	75-01-4		
Xylene (Total)	91000	ug/l	100		12/20/05 06:06	PPM	1330-20-7		
m&p-Xylene	750	ug/l	200	25.	12/20/05 06:06	PPM			
o-Xylene	160	ug/l	100	14.	12/20/05 06:06	PPM	95-47-6		
1-Chloro-3-fluorobenzene (S)	97	%			12/20/05 06:06	PPM	625-98-9		
VPH in Water by Mass. Method	Method: VPH								
Aliphatic (C05-C08)	1400	ug/l	100	30.	12/08/05 16:50	DHW			
Aliphatic (C09-C12)	3500	ug/l	100	30.	12/08/05 16:50	DHW			
Aromatic (C09-C10)	910	ug/l	100	10.	12/08/05 16:50	DHW			
2,5-Dibromotoluene (FID)(S)	92	%			12/08/05 16:50	DHW			
2,5-Dibromotoluene (PID)(S)	109	%			12/08/05 16:50	DHW			

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Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

PARAMETER FOOTNOTES

Method 9071B modified to use ASE.

All pH, Free Chlorine, Total Chlorine and Ferrous Iron analyses conducted outside of EPA recommended immediate hold time.

Depending on the moisture content the PRLs can be elevated for all soil samples reported on a dry weight basis.

2-Chloroethyl vinyl ether has been shown to degrade in the presence of acid.

ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
(S)	Surrogate
[1]	High surrogate recovery was confirmed as a matrix effect by a second analysis.
[2]	Acid surrogate recovery outside of control limits. The data was accepted based on valid recovery of the two remaining acid surrogates.
[3]	The surrogate and/or spike recovery was outside acceptance limits.
[4]	Detected but below the PRL; therefore, result is an estimated concentration (CLP J-Flag).

Date: 12/21/05

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

QC Batch: 144579
QC Batch Method: EPA 3510
Associated Lab Samples: 926419920

Analysis Method: EPH
Analysis Description: EPH in Water by Mass. Method

METHOD BLANK: 926423856
Associated Lab Samples: 926419920

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Aliphatic (C09-C18)	ug/l	4.2	100	
Aliphatic (C19-C36)	ug/l	ND	100	
Aromatic (C11-22)	ug/l	6.8	100	
2-Fluorobiphenyl (S)	%	102		
2-Bromonaphthalene (S)	%	133		
Nonatriacontane (S)	%	59		
o-Terphenyl (S)	%	74		

LABORATORY CONTROL SAMPLE & LCSD: 926423864 926423872

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Footnotes
Aliphatic (C09-C18)	ug/l	300.00	122.4	121.7	41	41	40-140	1	30	
Aliphatic (C19-C36)	ug/l	400.00	277.2	273.9	69	68	40-140	1	30	
Aromatic (C11-22)	ug/l	850.00	606.5	523.1	71	62	40-140	15	30	
2-Fluorobiphenyl (S)					101	90	40-140			
2-Bromonaphthalene (S)					103	89	40-140			
Nonatriacontane (S)					58	49	40-140			
o-Terphenyl (S)					77	68	40-140			

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

QC Batch: 145042
QC Batch Method: EPA 3545
Analysis Method: EPA 8015
Analysis Description: TPH in Soil by 3545/8015
Associated Lab Samples: 926419797 926419813 926419821 926419839 926419854 926419862 926419870 926419896 926419904 926419912

METHOD BLANK: 926446337
Associated Lab Samples: 926419797 926419813 926419821 926419839 926419854 926419862 926419870 926419896 926419904 926419912

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Diesel Fuel	mg/kg	ND	5.0	
n-Pentacosane (S)	%	62		

LABORATORY CONTROL SAMPLE: 926446345

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Diesel Fuel	mg/kg	166.70	97.66	59	50-137	
n-Pentacosane (S)				91	50-150	

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

QC Batch: 144543
QC Batch Method: VPH
Associated Lab Samples: 926419920

Analysis Method: VPH
Analysis Description: VPH in Water by Mass. Method

METHOD BLANK: 926422445
Associated Lab Samples: 926419920

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Aliphatic (C05-C08)	ug/l	ND	100	
Aliphatic (C09-C12)	ug/l	ND	100	
Aromatic (C09-C10)	ug/l	ND	100	
2,5-Dibromotoluene (FID)(S)	%	108		
2,5-Dibromotoluene (PID)(S)	%	126		

LABORATORY CONTROL SAMPLE & LCSD: 926422452 926422460

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Footnotes
Aliphatic (C05-C08)	ug/l	400.00	440.4	425.8	110	106	70-130	3	30	
Aliphatic (C09-C12)	ug/l	100.00	110.5	110.0	110	110	70-130	0	30	
Aromatic (C09-C10)	ug/l	100.00	106.5	106.9	107	107	70-130	0	30	
2,5-Dibromotoluene (FID)(S)					96	100	70-130			
2,5-Dibromotoluene (PID)(S)					111	118	70-130			

SAMPLE DUPLICATE: 926422478

Parameter	Units	926420647 Result	DUP Result	RPD	Max RPD	Footnotes
Aliphatic (C05-C08)	ug/l	28000	30000	6	30	
Aliphatic (C09-C12)	ug/l	34000	36000	7	30	
Aromatic (C09-C10)	ug/l	9400	9500	1	30	
2,5-Dibromotoluene (FID)(S)	%	90	94			
2,5-Dibromotoluene (PID)(S)	%	117	125			

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

QC Batch: 144703
Analysis Method: EPA 8015
QC Batch Method: EPA 8015
Analysis Description: GAS, Soil, North Carolina
Associated Lab Samples: 926419797 926419813 926419821

METHOD BLANK: 926430570
Associated Lab Samples: 926419797 926419813 926419821

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Gasoline	mg/kg	ND	5.0	
4-Bromofluorobenzene (S)	%	66		

LABORATORY CONTROL SAMPLE: 926430588

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Gasoline	mg/kg	25.00	29.83	119	51-150	
4-Bromofluorobenzene (S)				76	50-134	

MATRIX SPIKE: 926430596

Parameter	Units	926416801 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Footnotes
Gasoline	mg/kg	0.2624	26.82	34.47	128	50-148	
4-Bromofluorobenzene (S)					77	50-134	

SAMPLE DUPLICATE: 926430604

Parameter	Units	926416827 Result	DUP Result	RPD	Max RPD	Footnotes
Gasoline	mg/kg	ND	ND	NC	30	
4-Bromofluorobenzene (S)	%	78	77			

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

QC Batch: 144711
Analysis Method: EPA 8015
QC Batch Method: EPA 8015
Analysis Description: GAS, Soil, North Carolina
Associated Lab Samples: 926419839 926419854 926419862 926419870 926419896 926419904 926419912

METHOD BLANK: 926431222
Associated Lab Samples: 926419839 926419854 926419862 926419870 926419896 926419904 926419912

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Gasoline	mg/kg	ND	5.0	
4-Bromofluorobenzene (S)	%	70		

LABORATORY CONTROL SAMPLE: 926431230

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Gasoline	mg/kg	25.00	27.78	111	51-150	
4-Bromofluorobenzene (S)				75	50-134	

MATRIX SPIKE: 926431248

Parameter	Units	926419839 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Footnotes
Gasoline	mg/kg	0.03725	20.55	24.16	117	50-148	
4-Bromofluorobenzene (S)					76	50-134	

SAMPLE DUPLICATE: 926431255

Parameter	Units	926419854 Result	DUP Result	RPD	Max RPD	Footnotes
Gasoline	mg/kg	5.000	5.300	6	30	
4-Bromofluorobenzene (S)	%	96	88			

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

QC Batch: 145380
QC Batch Method: EPA 601/602
Associated Lab Samples: 926419920

Analysis Method: EPA 601/602
Analysis Description: Halogen. & Aromatic Vol. Orgs.

METHOD BLANK: 926459249
Associated Lab Samples: 926419920

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Benzene	ug/l	ND	1.0	
Bromodichloromethane	ug/l	ND	1.0	
Bromoform	ug/l	ND	1.0	
Bromomethane	ug/l	ND	1.0	
Carbon tetrachloride	ug/l	ND	1.0	
Chlorobenzene	ug/l	ND	1.0	
Chloroethane	ug/l	ND	1.0	
Chloroform	ug/l	ND	2.0	
Chloromethane	ug/l	ND	1.0	
Dibromochloromethane	ug/l	ND	1.0	
-Dichlorobenzene	ug/l	ND	1.0	
,3-Dichlorobenzene	ug/l	ND	1.0	
1,4-Dichlorobenzene	ug/l	ND	1.0	
Dichlorodifluoromethane	ug/l	ND	1.0	
1,1-Dichloroethane	ug/l	ND	1.0	
1,2-Dichloroethane	ug/l	ND	1.0	
1,1-Dichloroethene	ug/l	ND	1.0	
trans-1,2-Dichloroethene	ug/l	ND	1.0	
1,2-Dichloropropane	ug/l	ND	1.0	
cis-1,3-Dichloropropene	ug/l	ND	1.0	
trans-1,3-Dichloropropene	ug/l	ND	1.0	
Diisopropyl ether	ug/l	ND	1.0	
Ethylbenzene	ug/l	ND	1.0	
Methylene chloride	ug/l	ND	2.0	
Methyl-tert-butyl ether	ug/l	ND	1.0	
1,1,2,2-Tetrachloroethane	ug/l	ND	1.0	
Tetrachloroethene	ug/l	ND	1.0	
Toluene	ug/l	ND	1.0	
1,1,1-Trichloroethane	ug/l	ND	1.0	
1,1,2-Trichloroethane	ug/l	ND	1.0	
Trichloroethene	ug/l	ND	1.0	

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

METHOD BLANK: 926459249
Associated Lab Samples: 926419920

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Trichlorofluoromethane	ug/l	ND	1.0	
Vinyl chloride	ug/l	ND	1.0	
Xylene (Total)	ug/l	ND	1.0	
m&p-Xylene	ug/l	ND	2.0	
o-Xylene	ug/l	ND	1.0	
1-Chloro-3-fluorobenzene (S)	%	105		

LABORATORY CONTROL SAMPLE: 926459256

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Benzene	ug/l	20.00	20.30	101	39-150	
Bromodichloromethane	ug/l	20.00	23.08	115	42-172	
Bromoform	ug/l	20.00	22.71	114	13-159	
[illegible]omomethane	ug/l	20.00	16.57	83	1-144	
[illegible]arbon tetrachloride	ug/l	20.00	20.53	103	43-143	
Chlorobenzene	ug/l	20.00	23.67	118	55-135	
Chloroethane	ug/l	20.00	16.74	84	46-137	
Chloroform	ug/l	20.00	16.06	80	49-133	
Chloromethane	ug/l	20.00	18.39	92	1-193	
Dibromochloromethane	ug/l	20.00	21.23	106	24-191	
1,2-Dichlorobenzene	ug/l	20.00	20.09	100	37-154	
1,3-Dichlorobenzene	ug/l	20.00	19.68	98	50-141	
1,4-Dichlorobenzene	ug/l	20.00	19.24	96	42-143	
Dichlorodifluoromethane	ug/l	20.00	18.11	91	50-150	
1,1-Dichloroethane	ug/l	20.00	17.00	85	47-132	
1,2-Dichloroethane	ug/l	20.00	21.74	109	51-147	
1,1-Dichloroethene	ug/l	20.00	20.01	100	28-167	
trans-1,2-Dichloroethene	ug/l	20.00	14.39	72	38-155	
1,2-Dichloropropane	ug/l	20.00	19.50	98	44-156	
cis-1,3-Dichloropropene	ug/l	20.00	20.42	102	22-178	
trans-1,3-Dichloropropene	ug/l	20.00	19.72	99	22-178	
Diisopropyl ether	ug/l	20.00	19.94	100	70-130	
Ethylbenzene	ug/l	20.00	20.83	104	63-137	
Methylene chloride	ug/l	20.00	17.86	89	25-162	

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

LABORATORY CONTROL SAMPLE: 926459256

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Methyl-tert-butyl ether	ug/l	20.00	19.94	100	63-123	
1,1,2,2-Tetrachloroethane	ug/l	20.00	21.60	108	8-184	
Tetrachloroethene	ug/l	20.00	19.88	99	26-162	
Toluene	ug/l	20.00	20.11	101	46-148	
1,1,1-Trichloroethane	ug/l	20.00	21.02	105	41-138	
1,1,2-Trichloroethane	ug/l	20.00	21.33	107	39-136	
Trichloroethene	ug/l	20.00	20.58	103	35-146	
Trichlorofluoromethane	ug/l	20.00	17.78	89	21-156	
Vinyl chloride	ug/l	20.00	21.40	107	28-163	
Xylene (Total)	ug/l	60.00	62.86	105		
m&p-Xylene	ug/l	40.00	41.55	104	82-124	
o-Xylene	ug/l	20.00	21.31	107	84-125	
1-Chloro-3-fluorobenzene (S)				107	67-138	

MATRIX SPIKE: 926459280

Parameter	Units	926440389 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Footnotes
Benzene	ug/l	0	20.00	20.08	100	80-119	
Bromodichloromethane	ug/l	0	20.00	22.51	112	78-125	
Bromoform	ug/l	0	20.00	20.66	103	76-123	
Bromomethane	ug/l	0	20.00	14.06	70	56-152	
Carbon tetrachloride	ug/l	0	20.00	20.65	103	73-127	
Chlorobenzene	ug/l	0	20.00	19.44	97	73-138	
Chloroethane	ug/l	0	20.00	16.65	83	61-142	
Chloroform	ug/l	0	20.00	18.50	92	76-144	
Chloromethane	ug/l	0	20.00	14.80	74	10-187	
Dibromochloromethane	ug/l	0	20.00	18.86	94	80-113	
1,2-Dichlorobenzene	ug/l	0	20.00	19.60	98	71-144	
1,3-Dichlorobenzene	ug/l	0	20.00	18.65	93	74-135	
1,4-Dichlorobenzene	ug/l	0	20.00	19.69	98	69-135	
Dichlorodifluoromethane	ug/l	0	20.00	16.79	84	25-156	
1,1-Dichloroethane	ug/l	0	20.00	19.53	98	82-133	
1,2-Dichloroethane	ug/l	8.590	20.00	28.68	100	77-120	
1,1-Dichloroethene	ug/l	0	20.00	28.79	144	11-174	
trans-1,2-Dichloroethene	ug/l	0	20.00	17.85	89	45-145	

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

MATRIX SPIKE: 926459280

Parameter	Units	926440389 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Footnotes
1,2-Dichloropropane	ug/l	0	20.00	19.39	97	83-125	
cis-1,3-Dichloropropene	ug/l	0	20.00	17.74	89	64-108	
trans-1,3-Dichloropropene	ug/l	0	20.00	18.13	91	69-110	
Diisopropyl ether	ug/l	0	20.00	22.97	115	72-131	
Ethylbenzene	ug/l	0	20.00	21.39	107	76-135	
Methylene chloride	ug/l	0	20.00	18.75	94	41-141	
Methyl-tert-butyl ether	ug/l	0	20.00	20.28	101	63-123	
1,1,2,2-Tetrachloroethane	ug/l	0	20.00	19.29	96	79-119	
Tetrachloroethene	ug/l	0	20.00	17.96	90	59-146	
Toluene	ug/l	0	20.00	20.20	101	69-148	
1,1,1-Trichloroethane	ug/l	0	20.00	21.17	106	73-135	
1,1,2-Trichloroethane	ug/l	0	20.00	18.35	92	84-126	
Trichloroethene	ug/l	0	20.00	18.87	94	77-133	
Trichlorofluoromethane	ug/l	0	20.00	17.90	90	72-132	
Vinyl chloride	ug/l	0	20.00	20.81	104	67-141	
Xylene (Total)	ug/l	0	60.00	63.11	105		
o-Xylene	ug/l	0	40.00	41.55	104	75-133	
Xylene	ug/l	0	20.00	21.57	108	74-140	
1-Chloro-3-fluorobenzene (S)					101	67-138	

SAMPLE DUPLICATE: 926459272

Parameter	Units	926438318 Result	DUP Result	RPD	Max RPD	Footnotes
Benzene	ug/l	ND	ND	NC	30	
Bromodichloromethane	ug/l	ND	ND	NC	30	
Bromoform	ug/l	ND	ND	NC	30	
Bromomethane	ug/l	ND	ND	NC	30	
Carbon tetrachloride	ug/l	ND	ND	NC	30	
Chlorobenzene	ug/l	ND	ND	NC	30	
Chloroethane	ug/l	ND	ND	NC	30	
Chloroform	ug/l	ND	ND	NC	30	
Chloromethane	ug/l	ND	ND	NC	30	
Dibromochloromethane	ug/l	ND	ND	NC	30	
1,2-Dichlorobenzene	ug/l	ND	ND	NC	30	
1,3-Dichlorobenzene	ug/l	ND	ND	NC	30	

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

SAMPLE DUPLICATE: 926459272

Parameter	Units	926438318 Result	DUP Result	RPD	Max RPD	Footnotes
1,4-Dichlorobenzene	ug/l	ND	ND	NC	30	
Dichlorodifluoromethane	ug/l	ND	ND	NC	30	
1,1-Dichloroethane	ug/l	ND	ND	NC	30	
1,2-Dichloroethane	ug/l	ND	ND	NC	30	
1,1-Dichloroethene	ug/l	ND	ND	NC	30	
trans-1,2-Dichloroethene	ug/l	ND	ND	NC	30	
1,2-Dichloropropane	ug/l	ND	ND	NC	30	
cis-1,3-Dichloropropene	ug/l	ND	ND	NC	30	
trans-1,3-Dichloropropene	ug/l	ND	ND	NC	30	
Diisopropyl ether	ug/l	ND	ND	NC	30	
Ethylbenzene	ug/l	ND	ND	NC	30	
Methylene chloride	ug/l	ND	ND	NC	30	
Methyl-tert-butyl ether	ug/l	ND	ND	NC	30	
1,1,2,2-Tetrachloroethane	ug/l	ND	ND	NC	30	
Tetrachloroethene	ug/l	ND	ND	NC	30	
Toluene	ug/l	ND	ND	NC	30	
1,1,1-Trichloroethane	ug/l	ND	ND	NC	30	
1,1,2-Trichloroethane	ug/l	ND	ND	NC	30	
Trichloroethene	ug/l	ND	ND	NC	30	
Trichlorofluoromethane	ug/l	ND	ND	NC	30	
Vinyl chloride	ug/l	ND	ND	NC	30	
Xylene (Total)	ug/l	2.300	2.200	2		
m&p-Xylene	ug/l	2.300	2.200	2	30	
o-Xylene	ug/l	ND	ND	NC	30	
1-Chloro-3-fluorobenzene (S)	%	100	105			

Date: 12/21/05

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

QC Batch: 143051
QC Batch Method: EPA 625 SF
Associated Lab Samples: 926419920

Analysis Method: EPA 625
Analysis Description: Extractables in Water by 625

METHOD BLANK: 926436411
Associated Lab Samples: 926419920

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Acenaphthene	ug/l	ND	5.0	
Acenaphthylene	ug/l	ND	5.0	
Anthracene	ug/l	ND	5.0	
Benzidine	ug/l	ND	50.	
Benzo(k)fluoranthene	ug/l	ND	5.0	
Benzo(b)fluoranthene	ug/l	ND	5.0	
Benzo(a)anthracene	ug/l	ND	5.0	
Benzo(g,h,i)perylene	ug/l	ND	5.0	
Benzo(a)pyrene	ug/l	ND	5.0	
4-Bromophenylphenyl ether	ug/l	ND	5.0	
tylbenzylphthalate	ug/l	ND	5.0	
-Chloro-3-methylphenol	ug/l	ND	5.0	
bis(2-Chloroethoxy)methane	ug/l	ND	5.0	
bis(2-Chloroethyl) ether	ug/l	ND	5.0	
bis(2-Chloroisopropyl) ether	ug/l	ND	5.0	
2-Chloronaphthalene	ug/l	ND	5.0	
2-Chlorophenol	ug/l	ND	5.0	
4-Chlorophenylphenyl ether	ug/l	ND	5.0	
Chrysene	ug/l	ND	5.0	
Dibenz(a,h)anthracene	ug/l	ND	5.0	
1,2-Dichlorobenzene	ug/l	ND	5.0	
1,3-Dichlorobenzene	ug/l	ND	5.0	
1,4-Dichlorobenzene	ug/l	ND	5.0	
3,3'-Dichlorobenzidine	ug/l	ND	10.	
2,4-Dichlorophenol	ug/l	ND	5.0	
Diethylphthalate	ug/l	ND	5.0	
2,4-Dimethylphenol	ug/l	ND	5.0	
Dimethylphthalate	ug/l	ND	5.0	
Di-n-butylphthalate	ug/l	ND	5.0	
4,6-Dinitro-2-methylphenol	ug/l	ND	25.	
2,4-Dinitrophenol	ug/l	ND	25.	

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

METHOD BLANK: 926436411
Associated Lab Samples: 926419920

Parameter	Units	Blank Result	Reporting Limit	Footnotes
2,4-Dinitrotoluene	ug/l	ND	5.0	
2,6-Dinitrotoluene	ug/l	ND	5.0	
Di-n-octylphthalate	ug/l	ND	5.0	
bis(2-Ethylhexyl)phthalate	ug/l	ND	5.0	
Fluoranthene	ug/l	ND	5.0	
Fluorene	ug/l	ND	5.0	
Hexachloro-1,3-butadiene	ug/l	ND	5.0	
Hexachlorobenzene	ug/l	ND	5.0	
Hexachlorocyclopentadiene	ug/l	ND	10.	
Hexachloroethane	ug/l	ND	5.0	
Indeno(1,2,3-cd)pyrene	ug/l	ND	5.0	
Isophorone	ug/l	ND	5.0	
Naphthalene	ug/l	ND	5.0	
Nitrobenzene	ug/l	ND	5.0	
2-Nitrophenol	ug/l	ND	5.0	
4-Nitrophenol	ug/l	ND	25.	
N-Nitrosodimethylamine	ug/l	ND	5.0	
N-Nitroso-di-n-propylamine	ug/l	ND	5.0	
N-Nitrosodiphenylamine	ug/l	ND	5.0	
Pentachlorophenol	ug/l	ND	25.	
Phenanthrene	ug/l	ND	5.0	
Phenol	ug/l	ND	5.0	
Pyrene	ug/l	ND	5.0	
1,2,4-Trichlorobenzene	ug/l	ND	5.0	
2,4,6-Trichlorophenol	ug/l	ND	5.0	
Nitrobenzene-d5 (S)	%	69		
2-Fluorobiphenyl (S)	%	58		
Terphenyl-d14 (S)	%	90		
Phenol-d5 (S)	%	26		
2-Fluorophenol (S)	%	50		
2,4,6-Tribromophenol (S)	%	97		

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

LABORATORY CONTROL SAMPLE: 926356130

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Acenaphthene	ug/l	50.00	30.64	61	47-145	
Acenaphthylene	ug/l	50.00	30.69	61	33-145	
Anthracene	ug/l	50.00	35.39	71	27-133	
Benzidine	ug/l	100.00	13.51	14	10-150	
Benzo(k)fluoranthene	ug/l	50.00	27.26	54	11-162	
Benzo(b)fluoranthene	ug/l	50.00	27.04	54	24-159	
Benzo(a)anthracene	ug/l	50.00	36.99	74	33-143	
Benzo(g,h,i)perylene	ug/l	50.00	54.54	109	1-219	
Benzo(a)pyrene	ug/l	50.00	32.93	66	17-163	
4-Bromophenylphenyl ether	ug/l	50.00	34.14	68	53-127	
Butylbenzylphthalate	ug/l	50.00	31.81	64	1-152	
4-Chloro-3-methylphenol	ug/l	50.00	30.89	62	22-147	
bis(2-Chloroethoxy)methane	ug/l	50.00	33.66	67	33-184	
bis(2-Chloroethyl) ether	ug/l	50.00	31.40	63	15-158	
bis(2-Chloroisopropyl) ether	ug/l	50.00	34.47	69	36-166	
2-Chloronaphthalene	ug/l	50.00	31.81	64	60-118	
2-Chlorophenol	ug/l	50.00	29.42	59	23-134	
4-Chlorophenylphenyl ether	ug/l	50.00	33.33	67	25-158	
Chrysene	ug/l	50.00	35.06	70	17-168	
Dibenz(a,h)anthracene	ug/l	50.00	41.72	83	1-227	
1,2-Dichlorobenzene	ug/l	50.00	21.26	42	32-129	
1,3-Dichlorobenzene	ug/l	50.00	19.41	39	1-172	
1,4-Dichlorobenzene	ug/l	50.00	19.59	39	20-124	
3,3'-Dichlorobenzidine	ug/l	100.00	35.83	36	1-262	
2,4-Dichlorophenol	ug/l	50.00	28.50	57	39-135	
Diethylphthalate	ug/l	50.00	37.06	74	1-114	
2,4-Dimethylphenol	ug/l	50.00	30.01	60	32-119	
Dimethylphthalate	ug/l	50.00	33.35	67	1-112	
Di-n-butylphthalate	ug/l	50.00	44.44	89	1-118	
4,6-Dinitro-2-methylphenol	ug/l	50.00	34.29	69	1-181	
2,4-Dinitrophenol	ug/l	50.00	25.67	51	1-191	
2,4-Dinitrotoluene	ug/l	50.00	11.81	24	39-139	1
2,6-Dinitrotoluene	ug/l	50.00	35.50	71	50-158	
Di-n-octylphthalate	ug/l	50.00	30.61	61	4-146	
bis(2-Ethylhexyl)phthalate	ug/l	50.00	32.31	65	8-158	
Fluoranthene	ug/l	50.00	42.03	84	26-137	
Fluorene	ug/l	50.00	31.21	62	51-121	

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

LABORATORY CONTROL SAMPLE: 926356130

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Hexachloro-1,3-butadiene	ug/l	50.00	20.71	41	24-116	
Hexachlorobenzene	ug/l	50.00	36.75	74	1-152	
Hexachlorocyclopentadiene	ug/l	50.00	23.65	47	12-125	
Hexachloroethane	ug/l	50.00	20.10	40	40-113	
Indeno(1,2,3-cd)pyrene	ug/l	50.00	41.18	82	1-171	
Isophorone	ug/l	50.00	80.95	162	21-196	
Naphthalene	ug/l	50.00	24.53	49	36-120	
Nitrobenzene	ug/l	50.00	34.27	68	35-180	
2-Nitrophenol	ug/l	50.00	27.81	56	29-182	
4-Nitrophenol	ug/l	50.00	15.54	31	1-132	
N-Nitrosodimethylamine	ug/l	50.00	23.34	47	10-125	
N-Nitroso-di-n-propylamine	ug/l	50.00	38.03	76	14-198	
N-Nitrosodiphenylamine	ug/l	50.00	31.91	64	31-123	
Pentachlorophenol	ug/l	50.00	32.28	65	39-152	
Phenanthrene	ug/l	50.00	32.17	64	54-120	
Phenol	ug/l	50.00	13.27	26	17-100	
[illegible]ene	ug/l	50.00	27.13	54	52-115	
,2,4-Trichlorobenzene	ug/l	50.00	22.06	44	44-142	
2,4,6-Trichlorophenol	ug/l	50.00	34.37	69	37-144	
Nitrobenzene-d5 (S)				75	23-125	
2-Fluorobiphenyl (S)				71	24-125	
Terphenyl-d14 (S)				71	10-125	
Phenol-d5 (S)				26	10-125	
2-Fluorophenol (S)				44	10-125	
2,4,6-Tribromophenol (S)				91	21-112	

LABORATORY CONTROL SAMPLE: 926387374

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Acenaphthene	ug/l	50.00	35.40	71	47-145	
Acenaphthylene	ug/l	50.00	35.41	71	33-145	
Anthracene	ug/l	50.00	38.02	76	27-133	
Benzidine	ug/l	100.00	5.079	5	10-150	1
Benzo(k)fluoranthene	ug/l	50.00	37.01	74	11-162	
Benzo(b)fluoranthene	ug/l	50.00	32.34	65	24-159	

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

LABORATORY CONTROL SAMPLE: 926387374

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Benzo(a)anthracene	ug/l	50.00	34.65	69	33-143	
Benzo(g,h,i)perylene	ug/l	50.00	21.29	43	1-219	
Benzo(a)pyrene	ug/l	50.00	37.21	74	17-163	
4-Bromophenylphenyl ether	ug/l	50.00	36.34	73	53-127	
Butylbenzylphthalate	ug/l	50.00	35.01	70	1-152	
4-Chloro-3-methylphenol	ug/l	50.00	37.18	74	22-147	
bis(2-Chloroethoxy)methane	ug/l	50.00	33.98	68	33-184	
bis(2-Chloroethyl) ether	ug/l	50.00	33.90	68	15-158	
bis(2-Chloroisopropyl) ether	ug/l	50.00	32.10	64	36-166	
2-Chloronaphthalene	ug/l	50.00	32.67	65	60-118	
2-Chlorophenol	ug/l	50.00	59.97	120	23-134	
4-Chlorophenylphenyl ether	ug/l	50.00	37.61	75	25-158	
Chrysene	ug/l	50.00	33.90	68	17-168	
Dibenz(a,h)anthracene	ug/l	50.00	24.90	50	1-227	
1,2-Dichlorobenzene	ug/l	50.00	20.87	42	32-129	
1,3-Dichlorobenzene	ug/l	50.00	20.31	41	1-172	
-Dichlorobenzene	ug/l	50.00	21.27	42	20-124	
,3'-Dichlorobenzidine	ug/l	100.00	23.19	23	1-262	
2,4-Dichlorophenol	ug/l	50.00	33.76	68	39-135	
Diethylphthalate	ug/l	50.00	39.20	78	1-114	
2,4-Dimethylphenol	ug/l	50.00	36.93	74	32-119	
Dimethylphthalate	ug/l	50.00	36.19	72	1-112	
Di-n-butylphthalate	ug/l	50.00	46.45	93	1-118	
4,6-Dinitro-2-methylphenol	ug/l	50.00	35.12	70	1-181	
2,4-Dinitrophenol	ug/l	50.00	27.36	55	1-191	
2,4-Dinitrotoluene	ug/l	50.00	36.87	74	39-139	
2,6-Dinitrotoluene	ug/l	50.00	37.37	75	50-158	
Di-n-octylphthalate	ug/l	50.00	29.90	60	4-146	
bis(2-Ethylhexyl)phthalate	ug/l	50.00	35.45	71	8-158	
Fluoranthene	ug/l	50.00	42.96	86	26-137	
Fluorene	ug/l	50.00	35.90	72	51-121	
Hexachloro-1,3-butadiene	ug/l	50.00	22.21	44	24-116	
Hexachlorobenzene	ug/l	50.00	37.36	75	1-152	
Hexachlorocyclopentadiene	ug/l	50.00	15.22	30	12-125	
Hexachloroethane	ug/l	50.00	21.08	42	40-113	
Indeno(1,2,3-cd)pyrene	ug/l	50.00	25.60	51	1-171	
Isophorone	ug/l	50.00	36.45	73	21-196	

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

LABORATORY CONTROL SAMPLE: 926387374

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Naphthalene	ug/l	50.00	29.93	60	36-120	
Nitrobenzene	ug/l	50.00	33.29	67	35-180	
2-Nitrophenol	ug/l	50.00	30.52	61	29-182	
4-Nitrophenol	ug/l	50.00	20.70	41	1-132	
N-Nitrosodimethylamine	ug/l	50.00	16.91	34	10-125	
N-Nitroso-di-n-propylamine	ug/l	50.00	37.90	76	14-198	
N-Nitrosodiphenylamine	ug/l	50.00	42.90	86	31-123	
Pentachlorophenol	ug/l	50.00	42.71	85	39-152	
Phenanthrene	ug/l	50.00	36.63	73	54-120	
Phenol	ug/l	50.00	14.62	29	17-100	
Pyrene	ug/l	50.00	35.58	71	52-115	
1,2,4-Trichlorobenzene	ug/l	50.00	25.23	50	44-142	
2,4,6-Trichlorophenol	ug/l	50.00	38.67	77	37-144	
Nitrobenzene-d5 (S)				70	23-125	
2-Fluorobiphenyl (S)				73	24-125	
Terphenyl-d14 (S)				80	10-125	
nol-d5 (S)				31	10-125	
-Fluorophenol (S)				40	10-125	
2,4,6-Tribromophenol (S)				101	21-112	

LABORATORY CONTROL SAMPLE: 926397787

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Acenaphthene	ug/l	50.00	36.44	73	47-145	
Acenaphthylene	ug/l	50.00	37.01	74	33-145	
Anthracene	ug/l	50.00	38.89	78	27-133	
Benzidine	ug/l	100.00	4.062	4	10-150	1
Benzo(k)fluoranthene	ug/l	50.00	41.05	82	11-162	
Benzo(b)fluoranthene	ug/l	50.00	33.61	67	24-159	
Benzo(a)anthracene	ug/l	50.00	39.69	79	33-143	
Benzo(g,h,i)perylene	ug/l	50.00	35.14	70	1-219	
Benzo(a)pyrene	ug/l	50.00	41.15	82	17-163	
4-Bromophenylphenyl ether	ug/l	50.00	34.90	70	53-127	
Butylbenzylphthalate	ug/l	50.00	39.00	78	1-152	
4-Chloro-3-methylphenol	ug/l	50.00	35.47	71	22-147	

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

LABORATORY CONTROL SAMPLE: 926397787

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
bis(2-Chloroethoxy)methane	ug/l	50.00	32.61	65	33-184	
bis(2-Chloroethyl) ether	ug/l	50.00	31.31	63	15-158	
bis(2-Chloroisopropyl) ether	ug/l	50.00	29.89	60	36-166	
2-Chloronaphthalene	ug/l	50.00	35.65	71	60-118	
2-Chlorophenol	ug/l	50.00	29.34	59	23-134	
4-Chlorophenylphenyl ether	ug/l	50.00	36.83	74	25-158	
Chrysene	ug/l	50.00	38.88	78	17-168	
Dibenz(a,h)anthracene	ug/l	50.00	38.03	76	1-227	
1,2-Dichlorobenzene	ug/l	50.00	25.46	51	32-129	
1,3-Dichlorobenzene	ug/l	50.00	24.26	48	1-172	
1,4-Dichlorobenzene	ug/l	50.00	24.70	49	20-124	
3,3'-Dichlorobenzidine	ug/l	100.00	31.93	32	1-262	
2,4-Dichlorophenol	ug/l	50.00	33.78	68	39-135	
Diethylphthalate	ug/l	50.00	38.21	76	1-114	
2,4-Dimethylphenol	ug/l	50.00	34.55	69	32-119	
Dimethylphthalate	ug/l	50.00	35.88	72	1-112	
n-butylphthalate	ug/l	50.00	44.67	89	1-118	
4,6-Dinitro-2-methylphenol	ug/l	50.00	37.53	75	1-181	
2,4-Dinitrophenol	ug/l	50.00	35.87	72	1-191	
2,4-Dinitrotoluene	ug/l	50.00	37.17	74	39-139	
2,6-Dinitrotoluene	ug/l	50.00	36.43	73	50-158	
Di-n-octylphthalate	ug/l	50.00	39.30	79	4-146	
bis(2-Ethylhexyl)phthalate	ug/l	50.00	41.46	83	8-158	
Fluoranthene	ug/l	50.00	38.93	78	26-137	
Fluorene	ug/l	50.00	37.21	74	51-121	
Hexachloro-1,3-butadiene	ug/l	50.00	23.45	47	24-116	
Hexachlorobenzene	ug/l	50.00	34.43	69	1-152	
Hexachlorocyclopentadiene	ug/l	50.00	24.55	49	12-125	
Hexachloroethane	ug/l	50.00	22.59	45	40-113	
Indeno(1,2,3-cd)pyrene	ug/l	50.00	36.90	74	1-171	
Isophorone	ug/l	50.00	39.40	79	21-196	
Naphthalene	ug/l	50.00	30.51	61	36-120	
Nitrobenzene	ug/l	50.00	31.90	64	35-180	
2-Nitrophenol	ug/l	50.00	30.99	62	29-182	
4-Nitrophenol	ug/l	50.00	12.33	25	1-132	
N-Nitrosodimethylamine	ug/l	50.00	19.12	38	10-125	
N-Nitroso-di-n-propylamine	ug/l	50.00	34.84	70	14-198	

Date: 12/21/05

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

LABORATORY CONTROL SAMPLE: 926397787

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
N-Nitrosodiphenylamine	ug/l	50.00	38.38	77	31-123	
Pentachlorophenol	ug/l	50.00	39.92	80	39-152	
Phenanthrene	ug/l	50.00	37.60	75	54-120	
Phenol	ug/l	50.00	12.52	25	17-100	
Pyrene	ug/l	50.00	40.82	82	52-115	
1,2,4-Trichlorobenzene	ug/l	50.00	27.03	54	44-142	
2,4,6-Trichlorophenol	ug/l	50.00	36.35	73	37-144	
Nitrobenzene-d5 (S)				70	23-125	
2-Fluorobiphenyl (S)				82	24-125	
Terphenyl-d14 (S)				86	10-125	
Phenol-d5 (S)				27	10-125	
2-Fluorophenol (S)				41	10-125	
2,4,6-Tribromophenol (S)				76	21-112	

LABORATORY CONTROL SAMPLE: 926421066

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Acenaphthene	ug/l	50.00	34.41	69	47-145	
Acenaphthylene	ug/l	50.00	35.43	71	33-145	
Anthracene	ug/l	50.00	37.43	75	27-133	
Benzidine	ug/l	100.00	23.87	24	10-150	
Benzo(k)fluoranthene	ug/l	50.00	36.07	72	11-162	
Benzo(b)fluoranthene	ug/l	50.00	34.14	68	24-159	
Benzo(a)anthracene	ug/l	50.00	37.50	75	33-143	
Benzo(g,h,i)perylene	ug/l	50.00	32.82	66	1-219	
Benzo(a)pyrene	ug/l	50.00	38.27	76	17-163	
4-Bromophenylphenyl ether	ug/l	50.00	32.87	66	53-127	
Butylbenzylphthalate	ug/l	50.00	36.53	73	1-152	
4-Chloro-3-methylphenol	ug/l	50.00	34.32	69	22-147	
bis(2-Chloroethoxy)methane	ug/l	50.00	30.51	61	33-184	
bis(2-Chloroethyl) ether	ug/l	50.00	29.50	59	15-158	
bis(2-Chloroisopropyl) ether	ug/l	50.00	27.66	55	36-166	
2-Chloronaphthalene	ug/l	50.00	32.67	65	60-118	
2-Chlorophenol	ug/l	50.00	27.19	54	23-134	
4-Chlorophenylphenyl ether	ug/l	50.00	35.47	71	25-158	

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

LABORATORY CONTROL SAMPLE: 926421066

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Chrysene	ug/l	50.00	35.82	72	17-168	
Dibenz(a,h)anthracene	ug/l	50.00	34.34	69	1-227	
1,2-Dichlorobenzene	ug/l	50.00	23.23	46	32-129	
1,3-Dichlorobenzene	ug/l	50.00	21.97	44	1-172	
1,4-Dichlorobenzene	ug/l	50.00	22.80	46	20-124	
3,3'-Dichlorobenzidine	ug/l	100.00	33.76	34	1-262	
2,4-Dichlorophenol	ug/l	50.00	31.37	63	39-135	
Diethylphthalate	ug/l	50.00	36.76	74	1-114	
2,4-Dimethylphenol	ug/l	50.00	31.63	63	32-119	
Dimethylphthalate	ug/l	50.00	34.25	68	1-112	
Di-n-butylphthalate	ug/l	50.00	39.29	79	1-118	
4,6-Dinitro-2-methylphenol	ug/l	50.00	36.51	73	1-181	
2,4-Dinitrophenol	ug/l	50.00	34.92	70	1-191	
2,4-Dinitrotoluene	ug/l	50.00	36.29	73	39-139	
2,6-Dinitrotoluene	ug/l	50.00	35.41	71	50-158	
Di-n-octylphthalate	ug/l	50.00	37.67	75	4-146	
bis(2-Ethylhexyl)phthalate	ug/l	50.00	38.09	76	8-158	
Fluoranthene	ug/l	50.00	37.05	74	26-137	
Fluorene	ug/l	50.00	35.58	71	51-121	
Hexachloro-1,3-butadiene	ug/l	50.00	20.55	41	24-116	
Hexachlorobenzene	ug/l	50.00	32.89	66	1-152	
Hexachlorocyclopentadiene	ug/l	50.00	21.65	43	12-125	
Hexachloroethane	ug/l	50.00	21.17	42	40-113	
Indeno(1,2,3-cd)pyrene	ug/l	50.00	33.95	68	1-171	
Isophorone	ug/l	50.00	36.72	73	21-196	
Naphthalene	ug/l	50.00	27.01	54	36-120	
Nitrobenzene	ug/l	50.00	29.26	58	35-180	
2-Nitrophenol	ug/l	50.00	28.02	56	29-182	
4-Nitrophenol	ug/l	50.00	14.33	29	1-132	
N-Nitrosodimethylamine	ug/l	50.00	19.34	39	10-125	
N-Nitroso-di-n-propylamine	ug/l	50.00	33.58	67	14-198	
N-Nitrosodiphenylamine	ug/l	50.00	38.08	76	31-123	
Pentachlorophenol	ug/l	50.00	39.10	78	39-152	
Phenanthrene	ug/l	50.00	36.36	73	54-120	
Phenol	ug/l	50.00	12.99	26	17-100	
Pyrene	ug/l	50.00	37.67	75	52-115	
1,2,4-Trichlorobenzene	ug/l	50.00	23.12	46	44-142	

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

LABORATORY CONTROL SAMPLE: 926421066

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
2,4,6-Trichlorophenol	ug/l	50.00	35.29	71	37-144	
Nitrobenzene-d5 (S)				61	23-125	
2-Fluorobiphenyl (S)				73	24-125	
Terphenyl-d14 (S)				77	10-125	
Phenol-d5 (S)				27	10-125	
2-Fluorophenol (S)				43	10-125	
2,4,6-Tribromophenol (S)				70	21-112	

LABORATORY CONTROL SAMPLE: 926436429

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Acenaphthene	ug/l	50.00	41.32	83	47-145	
Acenaphthylene	ug/l	50.00	41.57	83	33-145	
Anthracene	ug/l	50.00	45.55	91	27-133	
ızidine	ug/l	100.00	11.85	12	10-150	
enzo(k)fluoranthene	ug/l	50.00	43.19	86	11-162	
Benzo(b)fluoranthene	ug/l	50.00	38.05	76	24-159	
Benzo(a)anthracene	ug/l	50.00	43.67	87	33-143	
Benzo(g,h,i)perylene	ug/l	50.00	45.61	91	1-219	
Benzo(a)pyrene	ug/l	50.00	44.17	88	17-163	
4-Bromophenylphenyl ether	ug/l	50.00	41.55	83	53-127	
Butylbenzylphthalate	ug/l	50.00	41.10	82	1-152	
4-Chloro-3-methylphenol	ug/l	50.00	38.88	78	22-147	
bis(2-Chloroethoxy)methane	ug/l	50.00	37.96	76	33-184	
bis(2-Chloroethyl) ether	ug/l	50.00	37.50	75	15-158	
bis(2-Chloroisopropyl) ether	ug/l	50.00	37.99	76	36-166	
2-Chloronaphthalene	ug/l	50.00	37.20	74	60-118	
2-Chlorophenol	ug/l	50.00	35.08	70	23-134	
4-Chlorophenylphenyl ether	ug/l	50.00	41.20	82	25-158	
Chrysene	ug/l	50.00	45.36	91	17-168	
Dibenz(a,h)anthracene	ug/l	50.00	46.85	94	1-227	
1,2-Dichlorobenzene	ug/l	50.00	26.41	53	32-129	
1,3-Dichlorobenzene	ug/l	50.00	23.85	48	1-172	
1,4-Dichlorobenzene	ug/l	50.00	25.20	50	20-124	
3,3'-Dichlorobenzidine	ug/l	100.00	37.90	38	1-262	

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

LABORATORY CONTROL SAMPLE: 926436429

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
2,4-Dichlorophenol	ug/l	50.00	37.19	74	39-135	
Diethylphthalate	ug/l	50.00	43.15	86	1-114	
2,4-Dimethylphenol	ug/l	50.00	38.00	76	32-119	
Dimethylphthalate	ug/l	50.00	40.91	82	1-112	
Di-n-butylphthalate	ug/l	50.00	43.11	86	1-118	
4,6-Dinitro-2-methylphenol	ug/l	50.00	45.15	90	1-181	
2,4-Dinitrophenol	ug/l	50.00	36.40	73	1-191	
2,4-Dinitrotoluene	ug/l	50.00	44.79	90	39-139	
2,6-Dinitrotoluene	ug/l	50.00	42.64	85	50-158	
Di-n-octylphthalate	ug/l	50.00	40.45	81	4-146	
bis(2-Ethylhexyl)phthalate	ug/l	50.00	46.43	93	8-158	
Fluoranthene	ug/l	50.00	41.20	82	26-137	
Fluorene	ug/l	50.00	42.43	85	51-121	
Hexachloro-1,3-butadiene	ug/l	50.00	25.14	50	24-116	
Hexachlorobenzene	ug/l	50.00	40.85	82	1-152	
Hexachlorocyclopentadiene	ug/l	50.00	28.27	56	12-125	
xachloroethane	ug/l	50.00	23.77	48	40-113	
ndeno(1,2,3-cd)pyrene	ug/l	50.00	46.47	93	1-171	
Isophorone	ug/l	50.00	39.46	79	21-196	
Naphthalene	ug/l	50.00	34.21	68	36-120	
Nitrobenzene	ug/l	50.00	37.78	76	35-180	
2-Nitrophenol	ug/l	50.00	37.51	75	29-182	
4-Nitrophenol	ug/l	50.00	17.52	35	1-132	
N-Nitrosodimethylamine	ug/l	50.00	21.57	43	10-125	
N-Nitroso-di-n-propylamine	ug/l	50.00	47.05	94	14-198	
N-Nitrosodiphenylamine	ug/l	50.00	47.14	94	31-123	
Pentachlorophenol	ug/l	50.00	55.65	111	39-152	
Phenanthrene	ug/l	50.00	42.39	85	54-120	
Phenol	ug/l	50.00	14.94	30	17-100	
Pyrene	ug/l	50.00	42.29	85	52-115	
1,2,4-Trichlorobenzene	ug/l	50.00	29.55	59	44-142	
2,4,6-Trichlorophenol	ug/l	50.00	44.76	90	37-144	
Nitrobenzene-d5 (S)				79	23-125	
2-Fluorobiphenyl (S)				86	24-125	
Terphenyl-d14 (S)				95	10-125	
Phenol-d5 (S)				33	10-125	
2-Fluorophenol (S)				53	10-125	

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

LABORATORY CONTROL SAMPLE: 926436429

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
2,4,6-Tribromophenol (S)				113	21-112	2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 926356148 926356155

Parameter	Units	926345026 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Footnotes
Acenaphthene	ug/l	0	100.00	63.83	50.38	64	50	47-145	24	30	
Acenaphthylene	ug/l	0	100.00	63.48	53.48	64	54	33-145	17	30	
Anthracene	ug/l	0	100.00	70.68	64.02	71	64	27-133	10	30	
Benzidine	ug/l	0	200.00	25.67	28.57	13	14	10-150	11	30	
Benzo(k)fluoranthene	ug/l	0	100.00	52.35	49.51	52	50	11-162	6	30	
Benzo(b)fluoranthene	ug/l	0	100.00	56.43	48.76	56	49	24-159	15	30	
Benzo(a)anthracene	ug/l	0	100.00	76.11	68.95	76	69	33-143	10	30	
Benzo(g,h,i)perylene	ug/l	0	100.00	56.57	65.14	57	65	1-219	14	30	
Benzo(a)pyrene	ug/l	0	100.00	66.95	59.96	67	60	17-163	11	30	
4-Bromophenylphenyl ether	ug/l	0	100.00	69.97	61.78	70	62	53-127	12	30	
Butylbenzylphthalate	ug/l	0	100.00	66.54	63.30	66	63	1-152	5	30	
4-Chloro-3-methylphenol	ug/l	0	100.00	77.40	65.84	77	66	22-147	16	30	
bis(2-Chloroethoxy)methane	ug/l	0	100.00	72.16	57.85	72	58	33-184	22	30	
bis(2-Chloroethyl) ether	ug/l	0	100.00	70.16	46.02	70	46	15-158	42	30	3
bis(2-Chloroisopropyl) ether	ug/l	0	100.00	78.09	52.69	78	53	36-166	39	30	3
2-Chloronaphthalene	ug/l	0	100.00	62.58	45.04	63	45	60-118	33	30	1,4
2-Chlorophenol	ug/l	0	100.00	64.96	46.61	65	47	23-134	33	30	3
4-Chlorophenylphenyl ether	ug/l	0	100.00	70.62	58.50	71	58	25-158	19	30	
Chrysene	ug/l	0	100.00	70.67	65.23	71	65	17-168	8	30	
Dibenz(a,h)anthracene	ug/l	0	100.00	70.91	81.74	71	82	1-227	14	30	
1,2-Dichlorobenzene	ug/l	0	100.00	44.48	20.38	44	20	32-129	74	30	1,4
1,3-Dichlorobenzene	ug/l	0	100.00	41.54	17.85	42	18	1-172	80	30	3
1,4-Dichlorobenzene	ug/l	0	100.00	43.04	18.91	43	19	20-124	78	30	1,4
3,3'-Dichlorobenzidine	ug/l	0	100.00	63.32	63.09	63	63	1-262	0	30	
2,4-Dichlorophenol	ug/l	0	100.00	65.53	51.23	66	51	39-135	24	30	
Diethylphthalate	ug/l	0	100.00	77.35	70.65	77	71	1-114	9	30	
2,4-Dimethylphenol	ug/l	0	100.00	72.86	58.05	73	58	32-119	23	30	
Dimethylphthalate	ug/l	0	100.00	70.40	65.04	70	65	1-112	8	30	
Di-n-butylphthalate	ug/l	6.358	100.00	77.38	79.86	71	74	1-118	3	30	
4,6-Dinitro-2-methylphenol	ug/l	0	100.00	65.09	59.23	65	59	1-181	9	30	

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QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 926356148 926356155

Parameter	Units	926345026 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Footnotes
2,4-Dinitrophenol	ug/l	0	100.00	55.38	51.62	55	52	1-191	7	30	
2,4-Dinitrotoluene	ug/l	0	100.00	25.65	23.16	26	23	39-139	10	30	1,1
2,6-Dinitrotoluene	ug/l	0	100.00	74.35	69.20	74	69	50-158	7	30	
Di-n-octylphthalate	ug/l	0	100.00	65.42	61.30	65	61	4-146	7	30	
bis(2-Ethylhexyl)phthalate	ug/l	1.385	100.00	68.58	64.17	67	63	8-158	7	30	
Fluoranthene	ug/l	0	100.00	72.73	66.88	73	67	26-137	8	30	
Fluorene	ug/l	0	100.00	66.89	55.21	67	55	59-121	19	30	
Hexachloro-1,3-butadiene	ug/l	0	100.00	43.04	16.51	43	16	24-116	89	30	1,4
Hexachlorobenzene	ug/l	0	100.00	73.00	63.07	73	63	1-152	15	30	
Hexachlorocyclopentadiene	ug/l	0	100.00	37.96	27.22	38	27	12-125	33	30	3
Hexachloroethane	ug/l	0	100.00	43.60	16.65	44	17	40-113	89	30	1,4
Indeno(1,2,3-cd)pyrene	ug/l	0	100.00	63.58	68.48	64	68	1-171	7	30	
Isophorone	ug/l	0	100.00	178.6	147.1	179	147	21-196	19	30	
Naphthalene	ug/l	0	100.00	51.99	29.93	52	30	21-133	54	30	3
Nitrobenzene	ug/l	0	100.00	77.87	56.11	78	56	35-180	32	30	3
2-Nitrophenol	ug/l	0	100.00	61.60	45.95	62	46	29-182	29	30	
4-Nitrophenol	ug/l	0	100.00	36.30	33.45	36	34	1-132	8	30	
N-Nitrosodimethylamine	ug/l	0	100.00	47.34	35.86	47	36	10-125	28	30	
N-Nitroso-di-n-propylamine	ug/l	0	100.00	85.55	66.68	86	67	1-230	25	30	
N-Nitrosodiphenylamine	ug/l	0	100.00	71.92	62.98	72	63	31-123	13	30	
Pentachlorophenol	ug/l	0	100.00	78.27	72.22	78	72	14-176	8	30	
Phenanthrene	ug/l	0	100.00	65.83	58.26	66	58	54-120	12	30	
Phenol	ug/l	0	100.00	31.25	23.67	31	24	5-112	28	30	
Pyrene	ug/l	0	100.00	64.86	59.41	65	59	52-115	9	30	
1,2,4-Trichlorobenzene	ug/l	0	100.00	46.52	21.25	46	21	44-142	75	30	1,4
2,4,6-Trichlorophenol	ug/l	0	100.00	74.65	66.53	75	66	37-144	12	30	
Nitrobenzene-d5 (S)						86	63	23-125			
2-Fluorobiphenyl (S)						74	61	24-125			
Terphenyl-d14 (S)						82	75	10-125			
Phenol-d5 (S)						30	23	10-125			
2-Fluorophenol (S)						48	34	10-125			
2,4,6-Tribromophenol (S)						102	91	21-112			

Date: 12/21/05

Asheville Certification IDs
NC Wastewater 40
NC Drinking Water 37712
SC 99030
FL NELAP E87648

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SC 99006
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www.pacelabs.com

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
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Phone: 704.875.9092
Fax: 704.875.9091

Pace Analytical Services, Inc.
2225 Riverside Drive
Asheville, NC 28804
Phone: 828.254.7176
Fax: 828.252.4618

QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

QC Batch: 144527
QC Batch Method: SM 3030C
Associated Lab Samples: 926419920

Analysis Method: EPA 200.7
Analysis Description: 3030C Metals, ICP, Trace

METHOD BLANK: 926421645
Associated Lab Samples: 926419920

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Chromium, 3030C	mg/l	0.0015	0.0020	
Lead, 3030C	mg/l	0.0026	0.0050	

LABORATORY CONTROL SAMPLE: 926421652

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Chromium, 3030C	mg/l	0.5000	0.4480	90	85-115	
Lead, 3030C	mg/l	0.5000	0.4340	87	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 926421660 926421678

Parameter	Units	926419615 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Footnotes
Chromium, 3030C	mg/l	0.00193	0.5000	0.4950	0.4930	99	98	70-130	0	25	
Lead, 3030C	mg/l	0.00947	0.5000	0.4900	0.4890	96	96	70-130	0	25	

Date: 12/21/05

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2225 Riverside Drive
Asheville, NC 28804
Phone: 828.254.7176
Fax: 828.252.4618

QUALITY CONTROL DATA

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

QC Batch: 144515
Analysis Method: % Moisture
QC Batch Method:
Analysis Description: Percent Moisture
Associated Lab Samples: 926419797 926419813 926419821 926419839 926419854 926419862 926419870 926419896 926419904 926419912

SAMPLE DUPLICATE: 926421264

Parameter	Units	926417098 Result	DUP Result	RPD	RPD	Footnotes
Percent Moisture	%	13.80	14.00	2		

Date: 12/21/05

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Phone: 828.254.7176
Fax: 828.252.4618

Lab Project Number: 92108997
Client Project ID: NCDOT 34950.1.1 Parcel 21

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

LCS(D)	Laboratory Control Sample (Duplicate)
MS(D)	Matrix Spike (Duplicate)
DUP	Sample Duplicate
ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
RPD	Relative Percent Difference
(S)	Surrogate
[1]	The surrogate and/or spike recovery was outside acceptance limits.
[2]	Acid surrogate recovery outside of control limits. The data was accepted based on valid recovery of the two remaining acid surrogates.
[3]	RPD value was outside control limits, however both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
[4]	The calculated RPD was outside QC acceptance limits.

Date: 12/21/05

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Pace Analytical

Page: 1 of 1

897902

ection A
equired Client Information:

ompany

ddress

mail To:

hone | Fax

equested Due Date/TAT:

Section B
Required Project Information:

Report To:

Copy To:

Purchase Order No.:

Project Name:

Project Number:

Section C
Invoice Information:

Attention:

Company Name:

Address:

Pace Quote Reference:

Pace Project Manager:

Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☒ UST ☐ RCRA ☐ Other_____

SITE LOCATION ☐ GA ☐ IL ☐ IN ☐ MI ☐ MN ☒ NC ☐ OH ☐ SC ☐ WI ☐ OTHER _____

Section D Required Client Information

SAMPLE ID

One Character per box. (A-Z, 0-9 / .-)
Samples IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project Number / Lab I.D
1	21-1(4-6)																			
2	21-1(4-6)																			
3	21-1(4-6)																			
4	1-1(6-6)																			
5	1(6-6)																			
6	1(6-6)																			
7	1-6(6-6)																			
8	1-7(6-6)																			
9	1-1(6-6)																			
10	1-1(6-6)																			
11	1-1																			
12																				

Preservatives

Requested Analysis:

Additional Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature]	12-2-05	1830			

SAMPLE CONDITION

Temp in °C	Rec on	Custody Sealed Cooler	Samples Intact
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER:

DATE Signed (MM / DD / YY)

Data File: \\WT\chem\hpmsdi.i\121705.b\12170514.D
Report Date: 19-Dec-2005 13:41

Pace Analytical Services, Inc.

TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: 92-SOLUTIONS
Lab Smp Id: 926419920
Operator: BET
Sample Location:
Sample Matrix: WATER
Analysis Type: SV
Inj Date: 17-DEC-2005 20:22

Client SDG: 92108997
Client Smp ID: 21-12
Sample Date: 06-DEC-2005
Sample Point:
Date Received:07-DEC-2005 00:00
Level: LOW

Number TICs found: 25

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

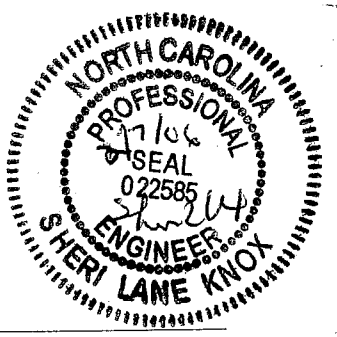
	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	3.523	24.8	J
2.		Unknown	3.833	38.9	J
3.		Unknown	4.107	9.38	J
4.		Unknown	4.196	37.5	J
5.	100-41-4	Ethylbenzene	4.351	46.8	91J
6.		Xylene isomer	4.403	935	95J
7.		Unknown	4.767	9.56	J
8.		C-3 substituted benzene	5.019	64.0	J
9.		Unknown	5.063	26.0	J
10.		C-3 substituted benzene	5.255	110	J
11.		C-3 substituted benzene	5.477	24.8	J
12.		Unknown	5.595	29.0	J
13.		Unknown	5.676	8.55	J
14.		C-4 substituted benzene	5.906	15.4	J
15.	824-90-8	1-Phenyl-1-butene	6.379	13.4	93J
16.		C-4 substituted benzene	6.475	21.6	J
17.		Unknown	7.177	20.9	J
18.		Unknown	7.281	16.3	J
19.	264-09-5	Benzocycloheptatriene	7.961	16.8	94J
20.		Unknown	8.064	16.3	J
21.		Unknown	8.293	14.7	J
22.		Unknown	8.656	16.4	J
23.	39627-61-7	7-Methylindan-1-one	8.811	13.5	NJ
24.		Unknown	9.247	11.2	J
25.		Unknown	9.373	13.4	J

PRELIMINARY SITE ASSESSMENT
PARCEL 117 – JAMES PORTER PROPERTY
874 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
NC DOT PROJECT: U-3456
WBS ELEMENT: 34950.1.1

Prepared for:
NC Department of Transportation
Geotechnical Engineering Unit
GeoEnvironmental Section
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Prepared by:
Solutions-IES
1101 Nowell Road
Raleigh, North Carolina 27607

Solutions-IES Project No. 2730.05A2.NDOT



Daniel K. Hirth
Hydrogeologist

Sheri L. Knox, P.E.
Project Manager

January 17, 2006

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2.0 BACKGROUND AND SITE DESCRIPTION 2

3.0 FIELD ACTIVITIES 2

4.0 SAMPLING RESULTS 5

5.0 DISCUSSION AND CONCLUSIONS 5

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TABLE 2 – SUMMARY OF SOIL ANALYTICAL RESULTS

TABLE 3 – SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

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FIGURE 2 – SITE MAP

FIGURE 3 –BORING LOCATIONS WITH ESTIMATED EXTENT OF SOIL CONTAMINATION

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APPENDIX A – PHOTOGRAPHS

APPENDIX B – GEOPHYSICAL INVESTIGATION

APPENDIX C – BORING LOGS

APPENDIX D – LABORATORY ANALYTICAL REPORTS

1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) is widening Fayetteville Road (US-1) in Rockingham, Richmond County, North Carolina. The project may require the NCDOT to acquire additional property for roadway construction. On November 3, 2005, Solutions-IES submitted a proposal to conduct Preliminary Site Assessments (PSAs) for 14 parcels of land within the proposed right of way that contain or reportedly contained underground storage tanks (USTs), or are situated within areas of interest identified by NCDOT. This report summarizes the results of field and laboratory activities conducted during the PSA of a portion of the James Porter property located at 874 Fayetteville Road (US Highway 1) in Rockingham, Richmond County, North Carolina. The location of Parcel 117 is dentified on Figures 1 and 2. The scope of work executed at the site was performed in general accordance with Solutions-IES proposal NC05449P dated November 3, 2005, and was initiated based on a Notice to Proceed issued by the NCDOT Geotechnical Engineering Unit on November 7, 2005 under contract 7000005553, dated May 9, 2005.

2.0 BACKGROUND AND SITE DESCRIPTION

Parcel 117 is located near the southeast intersection of School Road and Fayetteville Road east of the local high school. According to the NCDOT, Parcel 117 is presently developed with a vacant building which formerly housed a gasoline service station. NCDOT has noted the presence of a petroleum dispenser pump island and potential UST north of the vacant building on Parcel 117. The dispenser pump island is shown on Figures 2 and 3 and in Photograph 2 of Appendix A. Information regarding the site was not found in the NC DENR UST registry database. Additional information regarding the USTs or UST closure associated with the former service station was not available.

Preliminary observations suggest that land use in the immediate vicinity of the study area is commercial/industrial except for the local high school located south and west of the site. Photographs of the study area at the site are presented in Appendix A.

3.0 FIELD ACTIVITIES

Prior to mobilizing to the site to conduct subsurface sampling, Solutions-IES contacted North Carolina One Call to locate underground utilities in the study area of the site. Pyramid Environmental & Engineering, P.C. (Pyramid) was contracted to perform an electromagnetic survey of the subsurface in the

proposed right-of-way and easement area. The electromagnetic survey conducted at Parcel 117 was performed on November 14, 2005 using a Geonics EM61 instrument. According to Pyramid, the geophysical investigation of the Study Area of Parcel 117 suggests that the Study Area does not contain metallic USTs. The EM61 image is included as Figure 19 in Appendix B. A ground penetrating radar (GPR) survey was not performed because suspect anomalies were not identified by the electromagnetic survey.

After reviewing the geophysical report, Solutions-IES mobilized to the site on November 29, 2005 to collect soil samples from locations within the Study Area. A steady rain was falling during field work on this day. Eleven (11) soil borings (borings 117-1 through 117-11) were advanced in the Study Area in the locations depicted on Figure 3. Each of these borings, with the exception of boring 117-6 was advanced to total depth of 8 feet below ground surface (ft bgs) employing the use of a truck-mounted Geoprobe®. Boring 117-6 was advanced to a total depth of 12 ft bgs to facilitate the installation of a temporary groundwater monitoring well. Borings were generally spaced approximately 50 feet apart, except where additional soil samples were thought necessary to assess the extent of potential soil contamination. Borings 117-6, 117-8, 117-9, and 117-10 were located in close proximity to a concrete island identified in Figure 3 as a dispenser pump island.

A MacroCore® sampler, fitted with single-use, disposable polyvinyl chloride (PVC) liners, was used to collect soil samples at 4-foot intervals. Each soil sample was split into two aliquots. Each aliquot was placed in a separate resealable plastic bag. One bag was placed on ice for possible laboratory analysis, while the other bag was placed at ambient temperature for field screening with a flame ionization detector (FID). After approximately 20 minutes to allow accumulation of volatile organic compounds (VOCs) in the headspace of the latter bag, it was scanned with the FID. The FID readings were entered on the boring logs along with the soil description and indications of petroleum staining or odor, if present (Appendix C).

The subsurface soil at the site generally consisted of fine sand to coarse sand (Unified Soil Classification SP) or fine sand to coarse sand (Unified Soil Classification SP) underlain by clayey fine sand (Unified Soil Classification SC). However, soil samples collected from borings 117-7 and 117-9 consisted of fine sand to medium sand (Unified Soil Classification SP) interbedded with clayey fine sand (Unified Soil Classification SC).

Headspace screening of the soil samples collected from the Study Area ranged from not detected (0) to greater than 3,000 parts per million (ppm). The FID readings are shown on Table 1. The highest FID readings originated from soil samples collected from boring 117-6 (6-8 ft bgs) at concentrations greater than 3,820 ppm. Boring 117-6 is located in close proximity to the dispenser pump island. Soil samples with the highest FID readings from borings 117-6 (6-8) ft bgs, 117-8 (6-8) ft bgs, 117-9 (6-8) ft bgs, 117-10 (6-8) ft bgs, and 117-11(6-8) ft bgs were placed in laboratory-supplied jars and stored on ice pending shipment to Pace Analytical Services, Inc. (Pace) in Huntersville, NC under chain-of-custody control. The samples were submitted for analysis of gasoline range organics (GRO) and diesel range organics (DRO) total petroleum hydrocarbons (TPH) by EPA Modified Method 8015 with preparation methods 5030 and 3545, respectively.

Due to the possible impact to the soils in the Study Area, and the potential for groundwater contamination resulting from such impact, boring 117-6 was advanced to a depth of 12 ft bgs to facilitate the installation and sampling of a temporary groundwater monitoring well. Upon completion of the boring, a 2-foot section of 1-inch diameter PVC slotted well screen, joined with an approximate 10-foot section of 1-inch diameter PVC riser, was introduced into the boring. Washed #2 well sand was introduced into the annulus of the boring when possible, forming a sand pack around the screen from the base of the temporary well to within 1 foot of surface grade. The remainder of the annulus, from 1 foot bgs to surface grade, was filled with bentonite clay pellets, which were hydrated to ensure a firm seal at the surface. Appendix C contains boring log 117-6 and temporary well construction information. The initial water level within the temporary well was measured at 10.42 feet below the top of casing (TOC) or 9.42 ft bgs.

Solutions-IES returned to boring 117-6 on November 30, 2006, measured the water level in the temporary well at 2.73 feet bgs, and attempted to perform specific capacity testing on groundwater within the temporary well. The specific capacity test, as described by Wilson et al (1997), was performed by inserting a ¼ inch polyethylene tube to a known depth beneath the water surface. However, the water level within the temporary well could not be stabilized due to insufficient groundwater recovery and the test could not be completed. Therefore, a recovery rate could not be estimated.

After approximately 2 hours, the water level within the temporary well was gauged again. The water level was measured at 10.23 feet bgs. The well was then sampled with a peristaltic pump, utilizing 3/8-inch diameter disposable polyethylene tubing. Groundwater samples obtained from the well were submitted for analysis of volatile organic compounds (VOCs) by EPA Methods 601 and 602, aliphatic

and aromatic volatile petroleum hydrocarbons (VPH) by the Massachusetts Department of Environmental Protection (MADEP) method, semivolatile organic compounds (SVOCs) by EPA Method 625 (including the ten largest tentatively identified compounds or TICs), aliphatic and aromatic extractable petroleum hydrocarbons (EPH) by the MADEP method, and chromium (Cr) and lead (Pb) by EPA Method 200.7 (Standard Preparation Method 3030C). To obtain a stabilized water level from the temporary well installed in boring 117-6, Solutions-IES returned to the Study Area on December 6, 2005. The stabilized water level was measured at 4.01 feet bgs.

4.0 LABORATORY RESULTS

According to the laboratory analytical results, TPH DRO and GRO were detected in two of the five soil samples submitted for chemical analysis at concentrations exceeding the NCDENR UST Section Action Level of 10 mg/kg. These soil samples were collected from borings 117-6 (6-8 feet bgs) and 117-9 (6-8 feet bgs). TPH DRO and GRO were not detected in soil samples obtained from borings 117-8, 117-10, and 117-11 in concentrations above the laboratory method detection limits. The analytical results are summarized in Table 2 and the laboratory reports are included in Appendix D.

Laboratory analytical results for the groundwater sample obtained from the temporary monitoring well installed in boring 117-6 indicate that three volatile compounds (benzene, toluene and total xylenes), a semi-volatile compound (naphthalene), C9-C10 aliphatics, aromatics, and lead were detected in concentrations exceeding their respective NCAC 2L.0202 Groundwater Standard (2L Standard). The analytical results are summarized in Table 3 and the laboratory reports are included in Appendix D.

Laboratory results also show that 25 tentatively identified compounds (TICS) were detected in the groundwater sample collected from the temporary monitoring well installed in boring 117-6. Some of the TICS may be transformation and degradation products from petroleum hydrocarbons, and others are of unknown origin. The TICs are listed with the laboratory report in Appendix D.

5.0 DISCUSSION AND CONCLUSIONS

The electromagnetic survey conducted at Parcel 117 suggested that the Study Area does not contain metallic USTs. Solutions-IES advanced a total of 11 soil borings to determine if soil within the Study Area has been impacted by petroleum contamination. Headspace screening of soil from the boring 117-6 contained the highest concentration of volatile vapors (> 3,820 ppm) when compared to the soil samples

from the remaining borings. Boring 117-6 is located in close proximity to a dispenser pump island within the Study Area. According to the laboratory analytical results, TPH DRO and TPH GRO were detected in soil samples collected from borings 117-6 and 117-9 at concentrations exceeding the NCDENR UST Section Action Level of 10 mg/kg.

Based on assessment data, the lateral extent of petroleum-impacted soil encompasses an area of approximately 25 ft by 15 ft in the vicinity of borings 117-6 and 117-9, to a depth of approximately 4 ft bgs (stabilized water level). Based on this estimate, Solutions-IES calculated that a volume of impacted soil of approximately 1,500 cubic feet (55 cubic yards) has been impacted at concentrations in excess of the Action Level. Removal of the dispenser pump island and associated petroleum impacted soil may be necessary when roadway construction begins. At the time of roadway construction, the NCDOT transportation/disposal contactor may use different criteria for estimating the area of impacted soil.

Various petroleum constituents were detected in the groundwater collected from the temporary monitoring well installed in boring 117-6 at concentrations exceeding the 2L Standards. However, because there was insufficient recovery to perform specific capacity testing, it is possible that the water collected for laboratory analysis is unsaturated infiltration from the surface to the clayey fine sand identified at boring termination in boring 117-6, and not representative of actual groundwater conditions in the Study Area. Additional assessment would be necessary to investigate the vertical and lateral extent of groundwater contamination.

TABLES

TABLE 1
SUMMARY OF FIELD SCREENING RESULTS FOR SOIL
Parcel 117 – James Porter Property
874 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: November 29, 2005

Sample Depth Below Ground Surface	Soil Borings										
	117-1	117-2	117-3	117-4	117-5	117-6	117-7	117-8	117-9	117-10	117-11
	FID Reading (ppm)										
0 - 2 feet	0	0.2	0.6	0.9	1.3	1.0	3.3	1.2	1.5	1.4	0.8
2 - 4 feet	0	0.4	1.3	1.3	1.3	575	3.6	1.5	1.1	1.4	1.4
4 - 6 feet	0.8	2.2	1.4	8.6	1.3	389	2.5	1.4	1.6	1.4	1.0
6 - 8 feet	0.5	0.2	0.6	1.4	2.5	>3,820	2.2	1.5	5.4	1.5	1.6
8 - 10 feet	N/A	N/A	N/A	N/A	N/A	2,615	N/A	N/A	N/A	N/A	N/A
10 - 12 feet	N/A	N/A	N/A	N/A	N/A	1,736	N/A	N/A	N/A	N/A	N/A

Notes:

1. FID readings were obtained with a Photovac MicroFID Flame Ionization Detector.
2. Samples denoted by shaded cells were submitted for laboratory analysis.

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS
Parcel 117 – James Porter Property
874 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: November 29, 2005

Sample Information		Total Petroleum Hydrocarbons	
Boring Number	Depth (Feet)	Gasoline Range[1] (mg/kg)	Diesel Range[2] (mg/kg)
117-6	6-8	720	690
117-8	6-8	<4.5	<6.0
117-9	6-8	11	200
117-10	6-8	<4.9	<6.1
117-11	6-8	<4.7	<5.6

Notes:

1. Total Petroleum Hydrocarbons (TPH) Method 5030/8015MOD - Gasoline Range Hydrocarbons
2. Total Petroleum Hydrocarbons (TPH) Method 3545/8015MOD - Diesel Range Hydrocarbons
3. Shaded concentrations exceed the NCDENR UST Section Action Level of 10 mg/kg.

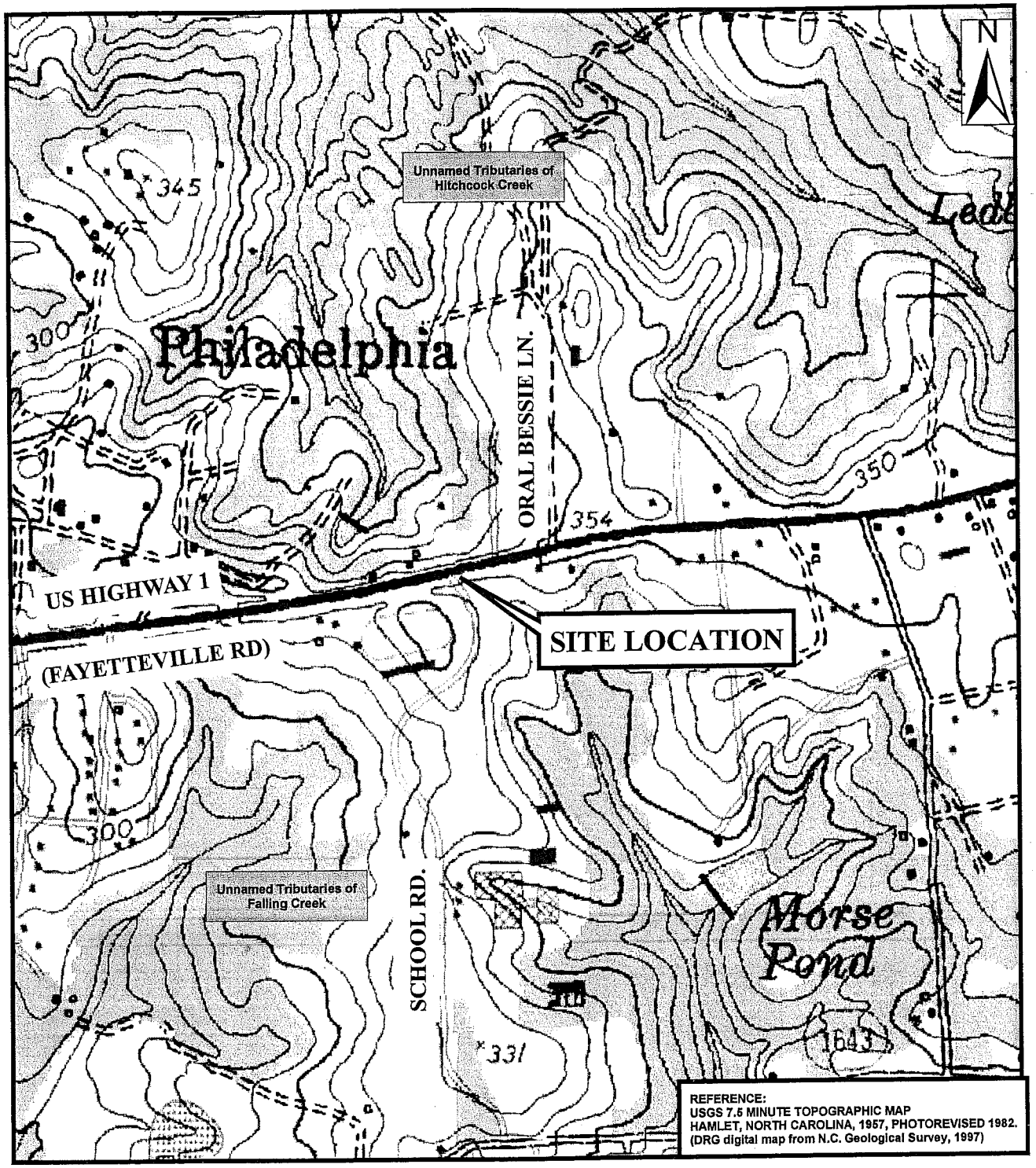
TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
Parcel 117 – James Porter Property
874 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)

Water Sample ID	117-6	2L Standards
Well Location	Parcel 117	
Hydrocarbon Constituents		
EPA Method 601/602 - Volatile Organics (µg/L)		
Benzene	13	1
Ethylbenzene	380	550
Toluene	1200	1000
Xylenes (total)	2400	530
EPA Method 625/625SF - Semi-Volatile Organics (µg/L)		
Di-n-butylphthalate	5.8	700
Naphthalene	220	21
MADEP VPH and EPH (µg/L)		
C5-C8 Aliphatics	2,700	420
C9-C18 Aliphatics	9,500	4,200
C9-C22 Aromatics	4,300	210
Metals by Trace ICP (EPA Method 6010 / 3010) (mg/L)		
Chromium	0.011	0.05
Total Lead	**0.024**	0.015

Notes:

1. Analytes not shown were not detected above the laboratory method detection limits.
2. Shaded concentrations exceed the 15A NCAC 2L Groundwater Standards.
3. 25 TICs (Semi-volatile organics) were also detected in the groundwater sample collected from the Study Area. The TICs are listed in Appendix D.
4. C9-C18 Aliphatics represent the combined totals of C9-C12 Aliphatics and C9-C18 Aliphatics (EPH).
5. C9-C22 Aromatics represent the combined totals for C9-C10 Aromatics (VPH) and C11-C22 Aromatics (EPH).
6. VOC, Semi-VOCs, MADEP VPH and EPH samples collected November 24, 2005.
7. Metals samples collected December 12, 2005.

FIGURES



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SITE LOCATION MAP
PARCEL 117 - JAMES PORTER PROPERTY
874 FAYETTEVILLE ROAD (US HIGHWAY 1)
WBS ELEMENT NO. 34950.1.1(NCDOT PROJECT: U-3456)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA

Solutions-IES
Industrial & Environmental Services

1101 Nowell Road, Raleigh, NC 27609
Phone (919) 873-1060, Fax (919) 873-1074

Created by:	KBB	Project:	2730.05A2.NCDO
Checked by:	BR	Date:	12/15/05
File:	FIG1.mxd		
Software:	ESRI ArcMap 9.0	FIGURE	1

PROJECT NUMBER 2730.05A2.NCDO
DRAFTER KB/HM
CHECKED BY SK
PROJECT MANAGER SK
DATE 12/15/05
FILE PARCEL 117 FIGURE 2.DGN

DB 1053 PG 448
DB 1088 PG 159

PS 602 - E

20' BST

RIP RAP APRON
1 TNS CLASS B
5 SY FF

BEG TAPER +10

END TAPER +90

ORAL BESSIE LN 16' SOIL

BL-118 PINC 112+23.85 =
BY14-118 POT 5+00.00
-L- 119+04.42 OFF 23.97'

RIP RAP APRON
2 TNS CLASS B
7 SY FF

+05 85' & R/W
+40 85' & EXIST
+40 75'
+20 EXIST
+40 65'
+10 80' & EXIST
+40 80' & EXIST
+10 70'
+10 65'
+40 65'
+90 65'
+77.78 65'
+10 65' & EXIST
+10 58'
+95 58'

EXISTING R/W
F
10
15"
CB
2'-6" C&G
MTL
FIP
36" DR
VARIABLE R
27' BST
US 1 FAYETTEVILLE RD
N 78° 40' 20.1" E
N 77° 11' 40.5" E
6" CONC CURB
EXISTING R/W
FIP
CB
20' DR
CONC
GRAU 350
+50 50'
+00 55'
+60 70'
+00 85'
72" WD
36" CONC
S
CONC
G
ISBKD
WD
15.20'
+82.04
223.06'
S11°29'59"E
+97.03
15.16'
+77.78 45'
+80 60'
ISFBUS ABAND
BS
F
GR
C
4' MONO ISLAND WITH 9' OFFSETS
72" CHL & 3SBW
2'-6" C&G
20' DR
EXISTING R/W
2' R
CONC
RET
-L-
+60
12'
12'
REM 18' OF EX 15" PIPE
15" CONC
CB
+40 65'
+20 EXIST
+40 85' & R/W
+40 75'
+10 80' & EXIST
+40 80' & EXIST
+10 70'
+10 65'
+40 65'
+90 65'
+77.78 65'
+10 65' & EXIST
+10 58'
+95 58'
55.78'
+13.55
30' DR
24'
60.00' R
2' R
+90
15' R
+10
8' R
+10
1' R
+40
+20
36'
EXISTING R/W
+70
+40
+50
+60
+00
+82.04
+00
+50
+65
+65 80' & 45'
+40 80' & 51.67'
40'-120' 8' OFFSET
PREFORMED SCOUR HOLE LINER: CLASS B RIP RAP 1' THICK W/FILTER FABRIC
COLLAR
CCFR
RET
15" CONC
CONC
3.5' R
+27'
+50
WCR
4' FOD
EXIST
2' R
BST
S 24° 41' 27.2" E
52' MTL
MTL
8' BK WALL
SCHOOL RD
EXIST
MTL
+05-Y14- EXIST BEG C & G -Y14- STA.+05.00
762.26'
+59.40
12" CHL
8' BK WALL
EXISTING R/W
S05°11'57"E
-L- POT Sta. 118+15.00
-Y14- POT Sta. 10+00.00
POT Sta. 11+05.00
END CONSTRUCTION

DISPENSER PUMP ISLAND

STUDY AREA

(117)
JAMES PORTER
DB 670 PG 708

(118)
JAMES PORTER
DB 780 PG 808

S12°29'59"E
225.16'
185.00'
S78°30'01"W
PCSta. 122+77.78
EIP

0 50 100
SCALE IN FEET

Solutions-IES
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1101 NOWELL ROAD
RALEIGH, NORTH CAROLINA 27607
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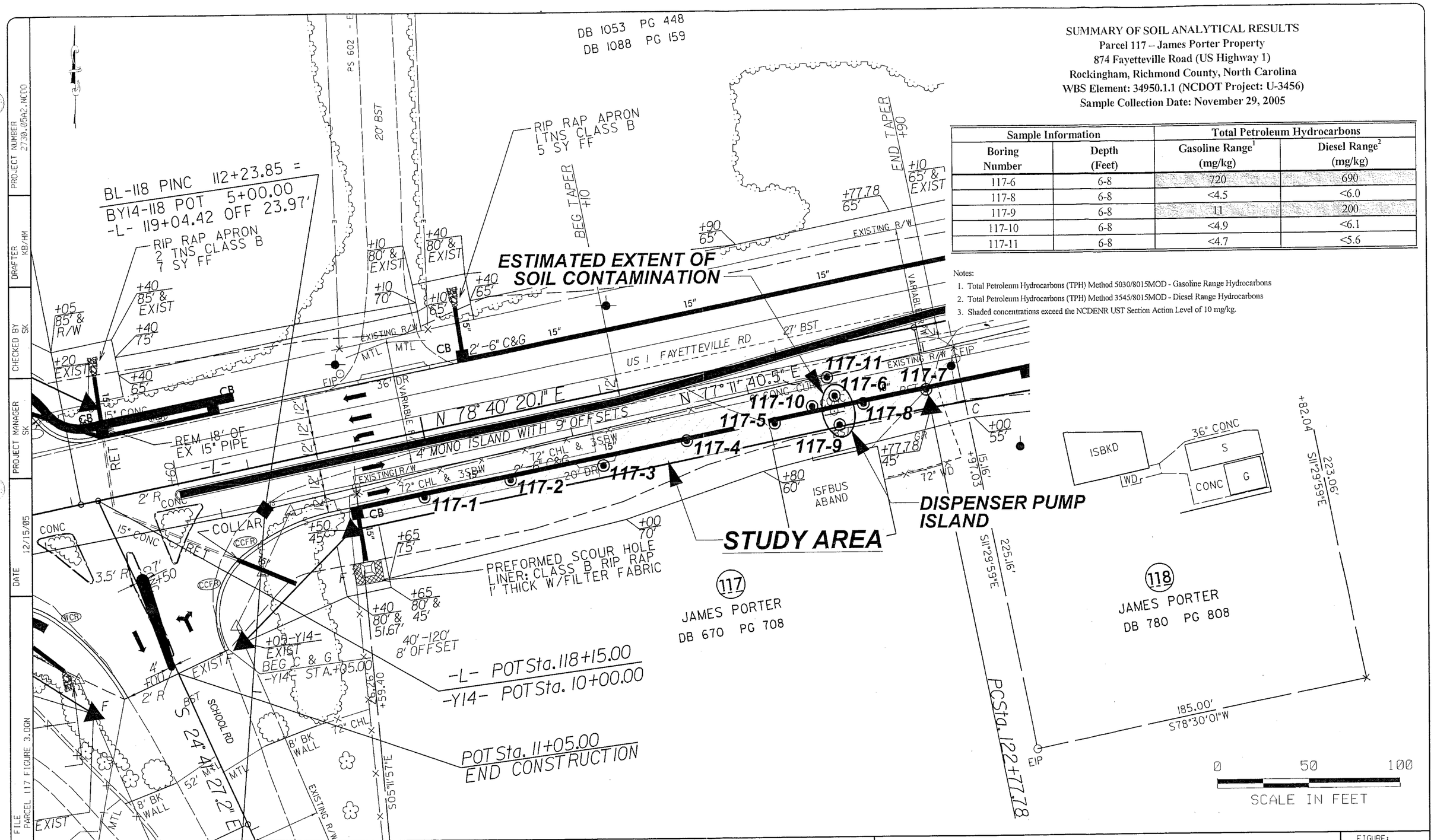
SITE MAP
PARCEL 117 - JAMES PORTER PROPERTY
874 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
WBS ELEMENT NO. 34950.1.1 (NCDOT PROJECT: U-3456)

FIGURE:
2

SUMMARY OF SOIL ANALYTICAL RESULTS
Parcel 117 – James Porter Property
874 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: November 29, 2005

Sample Information		Total Petroleum Hydrocarbons	
Boring Number	Depth (Feet)	Gasoline Range[1] (mg/kg)	Diesel Range[2] (mg/kg)
117-6	6-8	720	690
117-8	6-8	<4.5	<6.0
117-9	6-8	11	200
117-10	6-8	<4.9	<6.1
117-11	6-8	<4.7	<5.6

Notes:
1. Total Petroleum Hydrocarbons (TPH) Method 5030/8015MOD - Gasoline Range Hydrocarbons
2. Total Petroleum Hydrocarbons (TPH) Method 3545/8015MOD - Diesel Range Hydrocarbons
3. Shaded concentrations exceed the NCDENR UST Section Action Level of 10 mg/kg.



PROJECT NUMBER 2730.05A2.NCDO
DRAFTER KB/HM
CHECKED BY SK
PROJECT MANAGER SK
DATE 12/15/05
FILE PARCEL 117 FIGURE 3.DGN

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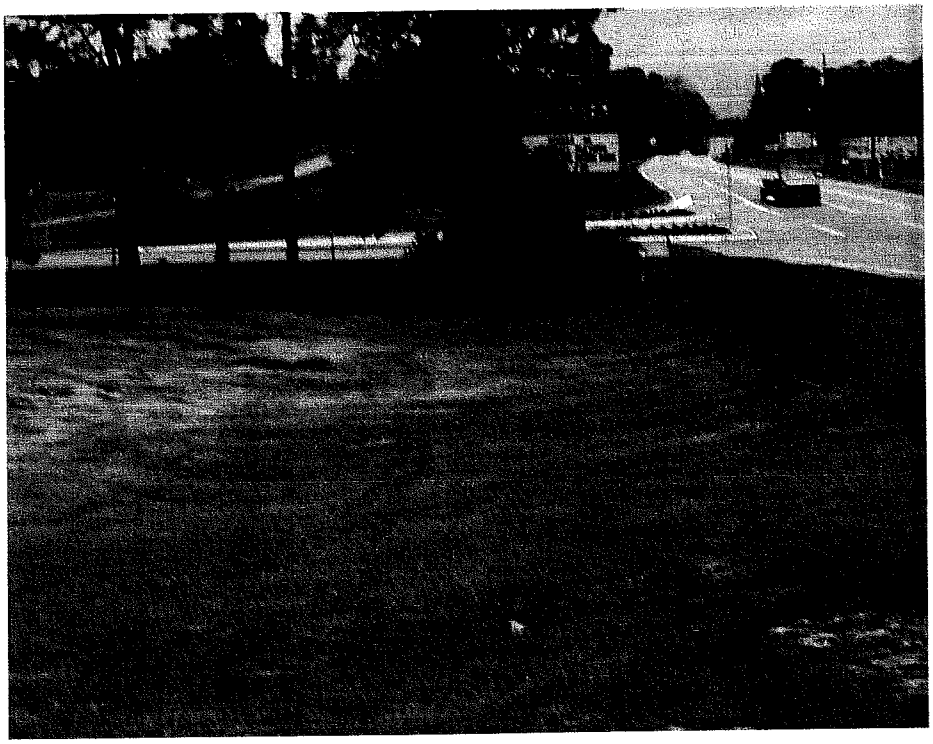
BORING LOCATIONS WITH ESTIMATED EXTENT OF SOIL CONTAMINATION
PARCEL 117 - JAMES PORTER PROPERTY
874 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
WBS ELEMENT NO. 34950.1.1 (NCDOT PROJECT: U-3456)

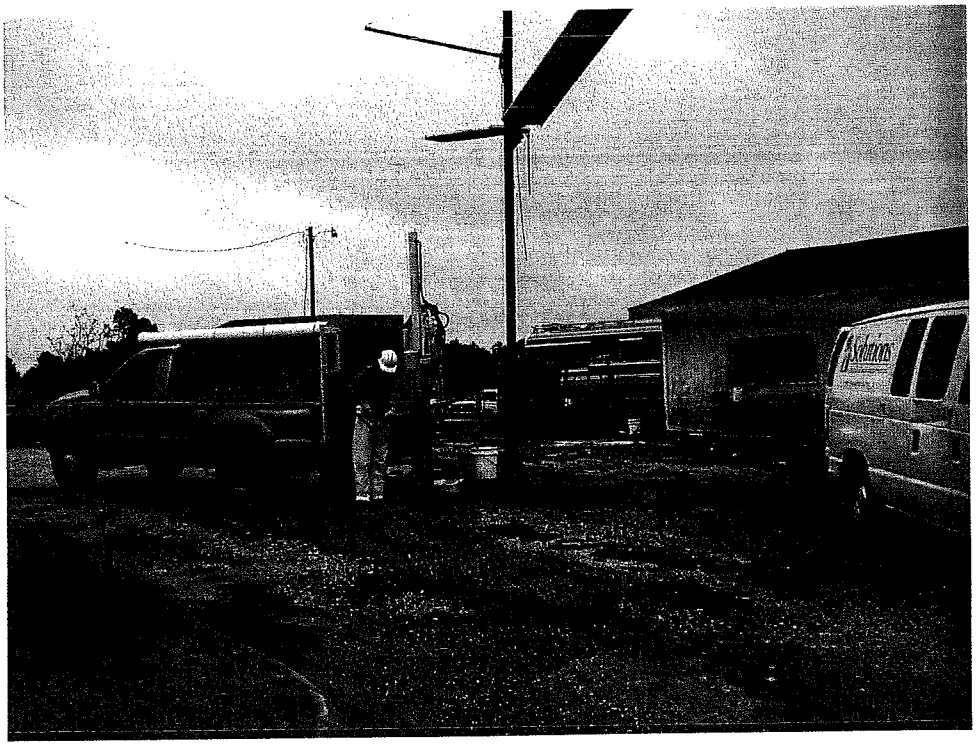
FIGURE: 3

APPENDIX A

PHOTOGRAPHS



Photograph 1 – View looking west at flagged boring locations along Fayetteville Road.



Photograph 2 – View looking northwest at concrete island within the Study Area

APPENDIX B

GEOPHYSICAL INVESTIGATION

Pyramid Project # 2005292

GEOPHYSICAL INVESTIGATION REPORT

GEOPHYSICAL SURVEYS FOR THE DETECTION OF METALLIC UST'S

Rockingham, US 1 (Fayetteville Road) Sites

Rockingham, North Carolina
State Project Number U-3456

November 30, 2005

Report prepared for: Sheri Knox & Daniel Hirth
Solutions Industrial & Environmental Services Inc.
1101 Nowell Rd.
Raleigh, NC 27607

Prepared by: _____
Douglas Canavello, PG

Reviewed by: _____
Brett S. Higgins

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Solutions Industrial & Environmental Services Inc.
GEOPHYSICAL SURVEYS FOR THE DETECTION OF METALLIC UST'S
Rockingham, US 1 (Fayetteville Road) Sites
State Project Number U-3456

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1.0 INTRODUCTION

Pyramid Environmental & Engineering, PC conducted geophysical investigations for Solutions Industrial & Environmental Services, Inc. during the period of November 11-23, 2005, within the proposed Right-of-Way (ROW) areas at 13 sites in Rockingham, North Carolina. The work was done as part of the North Carolina Department of Transportation (NCDOT) road-widening project under State Project number U-3456 and WBS Element 34950.1.1. The sites are located along the north or south sides of US 1 (Fayetteville Road) from 0.25 miles west of SR-1424 (Roberdell Road) to 0.25 miles west of SR 1640 (Wiregrass Road). The geophysical surveys were conducted to determine if unknown metallic underground storage tanks (UST's) were present beneath the proposed ROW area of each site.

Solutions IES representative Mr. Walt Beckwith, PG provided maps during the week of November 1, 2005 that outlined the geophysical survey areas of each site. Solutions IES representatives, Ms. Sheri Knox, PE and Mr. Daniel Hirth, PG provided guidance during the geophysical investigations. Geophysical surveys were conducted at the following 13 sites:

Property Owner	Parcel	Present Use of Property
W. J. Barnhart Property	(Parcel 4)	Used Car Lot & Auto Repair Garage
Julia M. Ratliff Property	(Parcel 7)	Vacant Lot
Samuel D. Tanner Property	(Parcel 15)	Vacant Building & Lot
Harvey E. Melton Property	(Parcel 17)	BP Gas Station
Samuel D. Tanner Property	(Parcel 21)	Strip Mall
W. J. Barnhart Property	(Parcel 41A)	Vacant Building & Lot
Wesly Denham Property	(Parcel 42)	Havoline Carolina Quick Lube
William Ussery Property	(Parcel 57)	Vacant Building & Lot
Walter McCain Property	(Parcel 80)	Vacant Buildings & Lot
Leon Wall Property	(Parcel 99)	Vacant Building & Lot
James Porter Property	(Parcel 117)	Vacant Building & Lot
John Evans Property	(Parcel 126)	Custom Monument Company
Henry Ussery Property	(Parcel 140)	Bo Henry's Pawn Shop

Photos of the above sites are presented in **Figure 1.**

2.0 FIELD METHODOLOGY

Prior to conducting the geophysical investigations, a 10-foot by 10-foot survey grid was established across the proposed ROW areas of the 13 sites using water-based marking paint. These marks were used as X-Y coordinates for location control when collecting the geophysical data and establishing base maps for the geophysical results.

The geophysical investigations consisted of electromagnetic (EM) induction-metal detection surveys and ground penetrating radar (GPR) surveys. The EM surveys were performed using a Geonics EM61-MK1 metal detection instrument. According to the manufacture's specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. The EM61 data were digitally collected at each site along parallel northerly-southerly or easterly-westerly trending survey lines spaced five feet apart. The data were downloaded to a computer and reviewed in the office using the Geonics DAT61W and Surfer for Windows Version 7.0 software programs.

Contour plots of the EM61 bottom coil results and the EM61 differential results for each site are included in this report. The bottom coil results represent the most sensitive component of the EM61 instrument and detect metal objects regardless of size. The bottom coil response can be used to delineate metal conduits or utility lines, small, isolated metal objects, and areas containing insignificant metal debris.

The differential results are obtained from the difference between the top and bottom coils of the EM61 instrument. The differential results focus on the larger metal objects such as drums and UST's and ignore the smaller insignificant metal objects.

GPR surveys were conducted across selected EM61 differential anomalies and steel-reinforced concrete using a GSSI SIR-2000 unit equipped with a 400 MHz antenna. Surveys were also performed across several areas where parked vehicles that obstructed the EM61 survey had since been removed. GPR data were digitally collected in a continuous mode along X and/or Y survey lines, spaced two to five feet apart using a vertical scan of 512 samples, at a rate of 24 scans per second. A 110 MHz high pass filter and an 800 MHz low pass filter were used during data

acquisition with the 400 MHz antenna. GPR data were collected down to a maximum depth of approximately seven feet, based on an estimated two-way travel time of 7 nanoseconds per foot.

The GPR data were downloaded to a field computer and later reviewed in the office using Radprint software. The locations of GPR survey areas or individual GPR survey lines are shown as dashed, purple rectangles or solid purple lines, respectively on the EM61 differential contour plots. Photos of the EM61 and GPR instruments are shown in **Figure 2**. The approximate perimeters of probable or possible UST's , based on the geophysical results, were marked and labeled in the field using orange, water-based marking paint and pin flags when possible. The approximate locations of probable or possible UST's are shown on the EM61 contour plots as magenta-shaded rectangles.

During the weeks of November 14 and November 23, 2005, preliminary contour plots of the EM61 bottom coil and the differential results were emailed to Ms. Knox and Mr. Hirth.

3.0 DISCUSSION OF RESULTS

3.1 Parcel 4 - W. J. Barnhart Property

Parcel 4 is located on the southern side of Fayetteville Road and contains an active used car lot and auto repair garage. The western portion of the ROW area consists of asphalt with a concrete pad and the eastern portion of the ROW area consists of a sandy surface.

The bottom coil results and the differential results are presented in **Figure 3**. The linear anomaly intersecting grid coordinates X=50 Y=26, is probably in response to a buried utility line or conduit. The high amplitude anomaly centered near the former pump island area is probably in response to the steel-reinforced concrete pad. GPR surveys conducted across the steel-reinforced concrete pad did not detect any large metal objects. The geophysical results suggest that the ROW area at Parcel 4 does not contain metallic UST's.

3.2 Parcel 7 - Julia M. Ratliff Property

The Ratliff property is located northwest of the Fayetteville Road and Roberdell Road intersection. The parcel consists of an open, asphalt and grass-covered lot. The EM61 bottom coil results and the differential results are presented in **Figure 4**. The linear bottom coil, EM61 anomalies, such as the ones intersecting grid coordinates X=100 Y=60, X=110 Y=74, and X=130 Y=104, are probably in response to utility lines or conduits. GPR surveys conducted across a portion of the EM anomaly centered near grid coordinates X=65 Y=35, suggest the presence of at least one UST centered near X=71 Y=35, and buried approximately 3.2 feet below surface. Based on the GPR results, the probable UST appears to be approximately 10 feet long and 4 feet wide.

A large water puddle was present across the western portion of the EM anomaly when the GPR surveys were conducted that prevented GPR data to be collected across the entire anomaly. However, based on the location of the probable UST, the size of the EM61 anomaly suggests that a second UST may be centered near grid coordinates X=64 Y=32. Concrete was encountered approximately three inches below surface across this area, which prevented probing with a steel rod to determine whether a second UST exists. A photo showing the approximate location of the probable and possible UST's along with a GPR image obtained along survey line Y=35 are presented in **Figure 5**.

The geophysical results suggest that the remaining portion of the proposed ROW area at Parcel 7 does not contain metallic UST's.

3.3 Parcels 15 & 21 – Samuel D. Tanner Properties

Parcels 15 and 21 are located immediately southwest and southeast, respectively of the Fayetteville Road and Skyline Drive intersection. Parcel 15 consists primarily of grass and gravel surfaces, whereas the front portion of Parcel 21 consists of an asphalt-covered parking area. The EM61 bottom coil results and the differential results are presented in **Figures 6 and 7**, respectively.

GPR surveys across the EM61 anomaly centered near grid coordinates X=188 Y=135, (on Parcel 15) suggest the presence of a UST centered near X=188 Y=137, and buried approximately 1.4 feet below

surface. The surveys also suggest that the probable tank is approximately 10 feet long and 3.5 feet wide.

At Parcel 21, GPR surveys acquired across the EM anomaly centered near grid coordinates X=269 Y=173, suggest the presence of a UST buried approximately 1.7 feet below surface. The UST appears to be approximately 10 feet long and 5 feet wide. Photos showing the approximate locations of the probable UST's at Parcels 15 and 21, along with corresponding GPR images are presented in Figures **8 and 9**, respectively.

3.4 Harvey E. Melton Property (Parcel 17)

The Melton property is an active BP gas station and store located northeast of the Fayetteville Road and Roberdell Road intersection. The pump island area consists of a steel-reinforced concrete surface that overlies the known and active UST's, whereas the parking area adjacent to the store consists of asphalt pavement. A grass yard surrounds the back portion of the site.

The EM61 bottom coil results and the differential results are presented in Figures **10 and 11**, respectively. The linear bottom coil, EM anomalies are probably in response to utility lines or conduits. The majority of non-linear anomalies are probably in response to cultural features such as storm drains, signs, utility-related objects, buildings, metal fence, and steel-reinforced concrete.

GPR surveys were conducted across the concrete pavement and across the area containing the active UST's. The surveys delineated the footprint of the three and possibly four active UST's that are centered near grid coordinates X=54 Y=53, X=50 Y=43, and X=50 Y=34, respectively. The UST centered near grid coordinates X=54 Y=53, appears to be approximately 35 feet long and probably consists of two UST's instead of one. A GPR image obtained across the UST area is presented in **Figure 12** and suggests that the tanks lie approximately 3.5 to 3.9 feet below surface.

GPR data acquired across the EM61 anomaly centered near X=155 Y=144, delineated the footprint of the kerosene tank that is buried approximately 1.7 feet below surface. The kerosene tank appears to be approximately 9 to 10 feet long and 3.5 to 4 feet wide. A photo showing the location of the

tank is presented in Figure 12. The geophysical results suggest that the remainder of the surveyed area at Parcel 17 does not contain UST's.

3.5 W. J. Barnhart Property (Parcel 41A)

Parcel 41A is a former gas station site located on the north side of Fayetteville Road approximately 300 feet west of Lawson Street. The geophysical survey area consists of asphalt and grass-covered surfaces with a concrete pad located around a former pump island. The EM61 bottom coil results and the differential results are presented in **Figure 13**. The linear bottom coil, EM anomalies, such as the ones intersecting grid coordinates X=40 Y=50, X=45 Y=95, and X=70 Y=40, are probably in response to utility lines or conduits.

GPR surveys conducted across a portion of the linear anomaly centered at X=37 Y=22, suggest the probable presence of a wide-diameter (more than 2.5 feet wide) conduit or possibly a UST that is approximately 15 to 17 feet long and buried approximately 4.5 feet below surface. This probable wide-diameter conduit (centered near X=38 Y=25) is located parallel and contingent with the probable utility line identified by the EM61 survey, suggesting that the probable conduit is a utility-related object. However, the footprint of this probable utility-related conduit or possible UST was marked in the field with spray paint and pin flags.

GPR surveys conducted across the concrete pad adjacent to the pump island suggest that the EM61 anomalies recorded in this area are probable in response to steel-reinforcement in the concrete. With the exception of the probable utility-related feature found at X=38 Y=25, the geophysical findings obtained within the survey area at Parcel 41A suggest that the ROW area does not contain metallic UST's.

3.6 Wesly Denham Property (Parcel 42)

The Havoline Carolina Kwik Lube garage operates at Parcel 42, which is located on the south side of Fayetteville Road. Asphalt and grass surfaces cover much of the proposed ROW area with a small concrete pad located in front of the building. The EM61 bottom coil results and the differential

results are presented in **Figure 14**. The linear bottom coil, EM anomalies, such as the ones intersecting grid coordinates X=60 Y=58, and X=80 Y=85, are probably in response to utility lines or conduits. The high amplitude anomaly centered near grid coordinates X=40 Y=40, is in response to a vehicle that could not be moved for the geophysical investigations. The anomalies centered near X=40 Y=12, and X=120 Y=55, are in response to a nearby vehicle and steel-reinforced concrete, respectively.

The geophysical results obtained within the surveyed portion of Parcel 42 suggest that the proposed ROW area does not contain metallic UST's.

3.7 William Ussery Property (Parcel 57)

Parcel 57 is located on the north side of Fayetteville Road approximately 0.2 miles east of Old Aberdeen Road. The EM61 bottom coil results and the differential results are presented in **Figure 15**. A series of small, bottom coil anomalies were recorded along survey line Y=25 from grid coordinate X=5 to X=115, which may be in response to an east-west trending, buried utility line or conduit. Several other bottom coil anomalies were recorded across the survey area that are probably in response to miscellaneous metal debris.

All of the differential anomalies are probably in response to known cultural features or buried debris, suggesting that the proposed ROW area at Parcel 57 does not contain metallic UST's.

3.8 Walter McCain Property (Parcel 80)

Parcel 80 is located immediately northwest of the Fayetteville Road and Philadelphia Road intersection and consists of two vacant buildings surrounded by sandy or grass surfaces. A former pump island pad is located south of the eastern-most building. The EM61 bottom coil results and the differential results are presented in **Figure 16**.

GPR surveys conducted across the EM61 anomalies centered near grid coordinates X=170 Y=35, and X=194 Y=32, suggest the presence of two metallic UST's. The probable UST centered near X=170

Y=35, appears to be approximately 13 feet long, 3.5 feet wide, and buried approximately 1.1 feet below surface. The probable UST centered near grid coordinates X=192 Y=32 appears to be10 feet long, 3.5 feet wide, and buried approximately 1.9 feet below surface. The two probable UST's are separated by the former pump island pad. Photos of the UST locations along with an image of GPR survey line X=167.5 are presented in **Figure 17**.

Based upon the geophysical results, the remaining portion of the proposed ROW area does not appear to contain metallic UST's.

3.9 Leon Wall Property (Parcel 99)

Parcel 99 is located immediately southwest of the Fayetteville Road and Patterson Road intersection and consists mostly of a grass yard surrounding a vacant building. The EM61 bottom coil results and the differential results are presented in **Figure 18** in which a bottom coil, linear anomaly is recorded along survey line Y=230. This linear anomaly is probably in response to a utility line. GPR surveys conducted across the differential EM61 anomaly centered near X=92 Y=165, is probably in response to a water line adjoining the vacant building. GPR surveys were also conducted between the building and the former pump island pad that is centered near coordinates X=84 Y=222. The surveys suggest that the EM anomalies recorded in this portion of the survey area are probably in response to miscellaneous metal debris.

Based upon the geophysical results, the proposed ROW area at Parcel 99 does not appear to contain metallic UST's.

3.10 James Porter Property (Parcel 117)

Parcel 117 is a former gas station site located on the south side of Fayetteville Road approximately 0.25 miles west of Locklear Drive. The site consists primarily of grass and asphalt surfaces with a former pump island pad located in front of the vacant building. The EM61 bottom coil results and the differential results are presented in **Figure 19**. The linear, bottom coil anomaly intersecting grid coordinates X=130 Y=54, is probably in response to a buried utility line or conduit. The linear

anomaly intersecting X=40 Y=74, is probably in response to a metal fence. The remaining EM61 anomalies are probably in response to known cultural features and miscellaneous metal debris.

The geophysical investigation across the survey area of Parcel 117 suggests that the proposed ROW area does not appear to contain metallic UST's.

3.11 John Evans Property (Parcel 126)

The active Custom Monument Company operates on Parcel 126, which is located immediately northeast of the Fayetteville Road and LockLear Drive intersection. The geophysical survey area consists of grass and asphalt surfaces and the EM61 bottom coil results and the differential results are presented in **Figure 20**. All of the EM61 anomalies recorded across the surveyed portion of the site are probably in response to known cultural features, suggesting that the proposed ROW area does not contain metallic UST's.

3.12 Henry Ussery Property (Parcel 140)

Parcel 140 is a former gas station site, which is presently occupied by Bo Henry's Pawn Shop. The property is located immediately southeast of the Fayetteville Road and Port Street intersection. Much of the proposed ROW area consists of sandy or grass-covered surfaces. A concrete pad surrounds the north and west sides of the building. The EM61 bottom coil results and the differential results are presented in **Figure 21**. The linear bottom coil anomaly intersecting grid coordinates X=80 Y=80, is probably in response to a buried utility line.

GPR surveys conducted across the differential anomalies centered near coordinates X=90 Y=60, and X=107 Y=59, suggest the presence of two UST's buried approximately 1.7 feet and 1.8 feet below surface, respectively. Both probable UST's appear to be approximately 10 to 11 feet long and 4 to 4.5 feet wide. Probing with a steel rod across this area suggest the presence of a concrete slab buried approximately 0.3 feet below surface and overlying the UST's. A photo showing the locations of the probable UST along with GPR images are presented in **Figure 22**.

4.0 SUMMARY & CONCLUSIONS

Our evaluation of the EM61 and GPR data collected across the proposed ROW areas at the 13 sites along Fayetteville Road (US 1) in Rockingham, North Carolina provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic UST's within the surveyed portions of the proposed ROW areas of each site.

- GPR surveys were conducted across selected EM61 differential anomalies and across areas containing steel reinforced concrete.

- Linear EM61 anomalies at the 13 sites are probably in response to buried utility lines and/or conduits. The majority of non-linear anomalies are probably in response to known cultural features or miscellaneous metal objects.

- The geophysical results did not detect the presence of unknown metallic UST's within the surveyed portions of the proposed ROW areas at the following sites:

W. J. Barnhart Property	(Parcel 4)
W. J. Barnhart Property	(Parcel 41A)
Wesly Denham Property	(Parcel 42)
William Ussery Property	(Parcel 57)
Leon Wall Property	(Parcel 99)
James Porter Property	(Parcel 117)
John Evans Property	(Parcel 126)

- Julia M. Ratliff Property (Parcel 7): Geophysical results suggest the presence of a UST centered near X=71 Y=35, and buried approximately 3.2 feet below surface. Based on the GPR results, the probable UST appears to be approximately 10 feet long and 4 feet wide. A second UST may be present immediately west of this UST.

- Samuel D. Tanner Property (Parcel 15): Geophysical results suggest the presence of a UST centered near X=188 Y=137, and buried approximately 1.4 feet below surface. GPR surveys suggest that the probable tank is approximately 10 feet long and 3.5 feet wide.

- Harvey E. Melton Property (Parcel 17): Three and probably four active UST's are centered near grid coordinates X=54 Y=53, X=50 Y=43, and X=50 Y=34, respectively. The UST centered near grid coordinates X=54 Y=53, appears to be approximately 35 feet long and probably consists of two UST's instead of one. The known kerosene UST is centered near X=155 Y=144, and is buried approximately 1.7 feet below surface. The kerosene tank appears to be approximately 9 to 10 feet long and 3.5 to 4 feet wide.

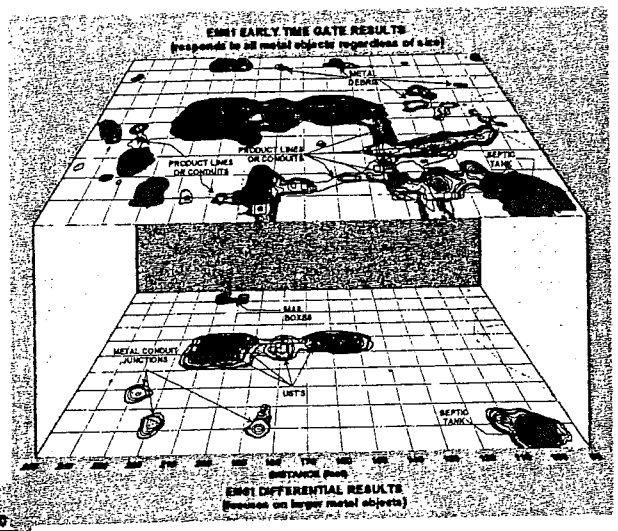
- Samuel D. Tanner Property (Parcel 21): Geophysical results suggest the presence of a UST centered near grid coordinates X=269 Y=173, and buried approximately 1.7 feet below surface. The UST appears to be approximately 10 feet long and 5 feet wide.

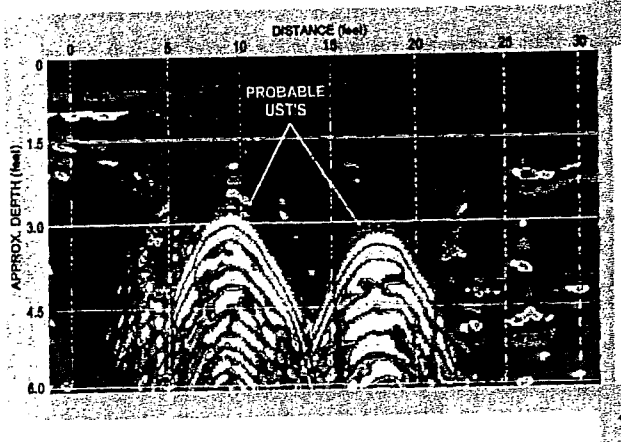
- Walter McCain Property (Parcel 80): Geophysical results suggest the presence of two UST's centered near grid coordinates X=170 Y=35, and X=194 Y=32. The probable UST centered near X=170 Y=35, appears to be approximately 13 feet long, 3.5 feet wide, and buried approximately 1.1 feet below surface. The probable UST centered near grid coordinates X=192 Y=32, appears to be 10 feet long, 3.5 feet wide, and buried approximately 1.9 feet below surface. The two probable UST's are separated by a former pump island pad.

- Henry Ussery Property (Parcel 140): Geophysical results suggest the presence of two UST's centered near coordinates X=90 Y=60, and X=107 Y=59, and buried approximately 1.7 feet and 1.8 feet below surface, respectively. Both probable UST's appear to be approximately 10 to 11 feet long and 4 to 4.5 feet wide.

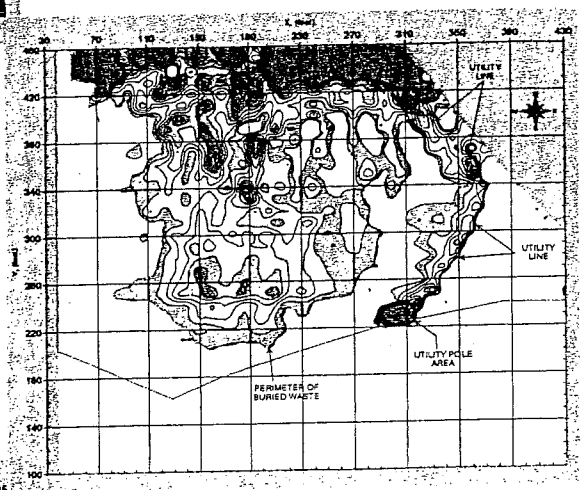
5.0 LIMITATIONS

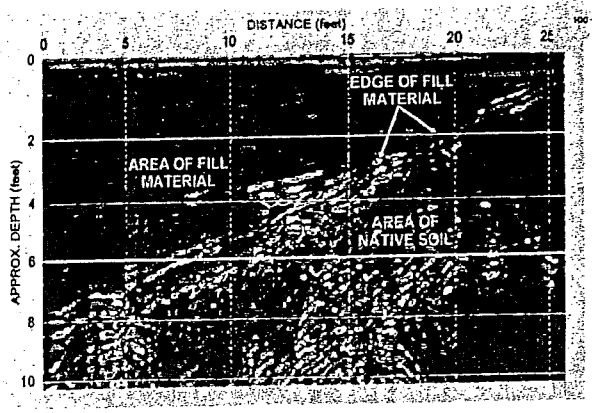
EM61 and GPR surveys have been performed and this report prepared for Solutions Industrial & Environmental Services, Inc. in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project do not conclusively define the locations of all metallic UST's but only suggest where some of the metallic UST's may be present. The EM61 and GPR anomalies, interpreted as possible UST's or tanks, may be attributed to other surface or subsurface conditions or cultural interference.


EM61 EARLY TIME GATE RESULTS
(responds to all metal objects regardless of size)
METAL DEBRIS
PRODUCT LINES OR CONDUITS
SEPTIC TANK
MAN BOX(S)
METAL CONDUIT JUNCTIONS
UST'S
SEPTIC TANK
DISTANCE (feet)
EM61 DIFFERENTIAL RESULTS
(focuses on larger metal objects)

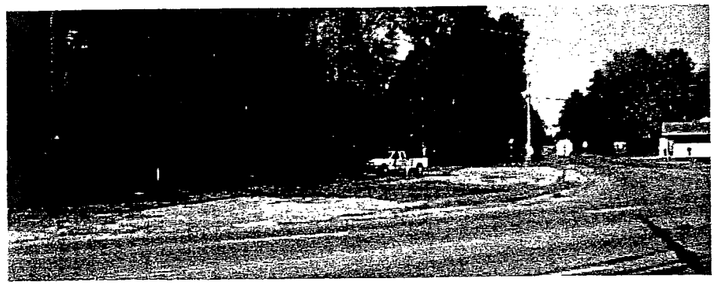

DISTANCE (feet)
0
5
10
15
20
25
30
APPROX. DEPTH (feet)
0
1.5
3.0
4.5
6.0
PROBABLE UST'S

FIGURES


UTILITY LINE
UTILITY LINE
UTILITY POLE AREA
PERIMETER OF BURIED WASTE

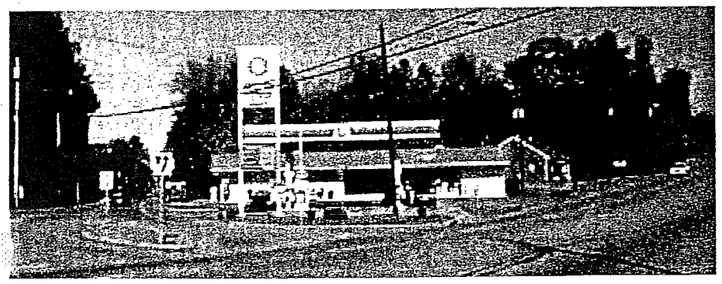

DISTANCE (feet)
0
5
10
15
20
25
APPROX. DEPTH (feet)
0
2
4
6
8
10
EDGE OF FILL MATERIAL
AREA OF FILL MATERIAL
AREA OF NATIVE SOIL

Parcel 4 - W. J. Barnhart Property

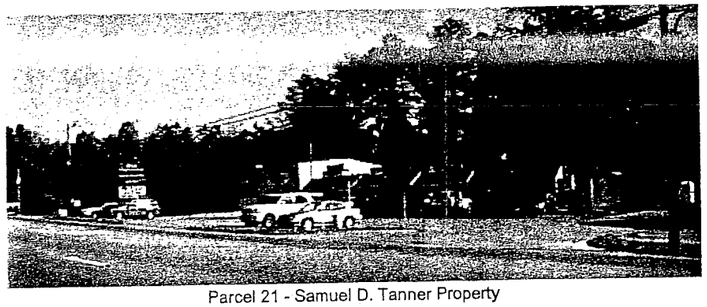


Parcel 7 - Julia M. Ratliff Property

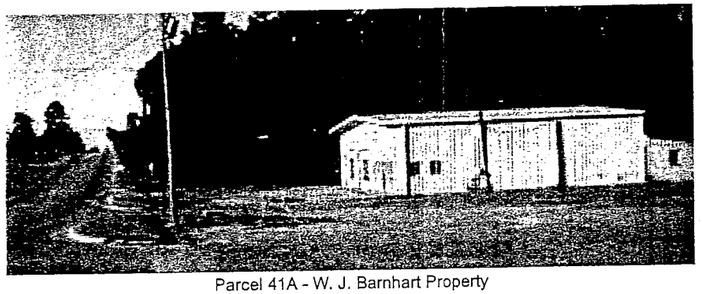
Parcel 15 - Samuel D. Tanner Property



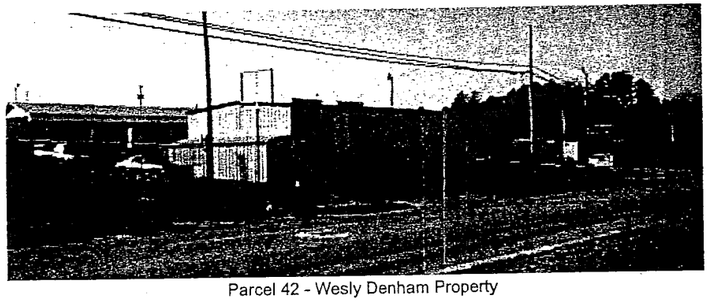
Parcel 17 - Harvey E. Melton Property



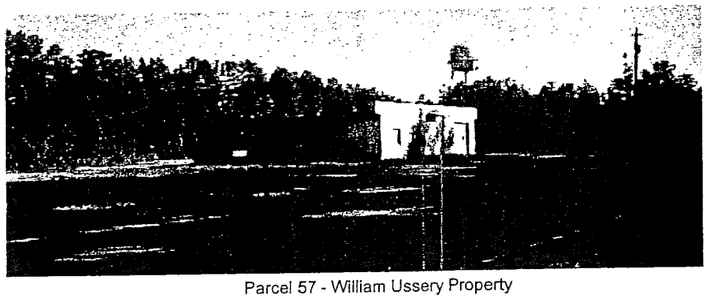
Parcel 21 - Samuel D. Tanner Property



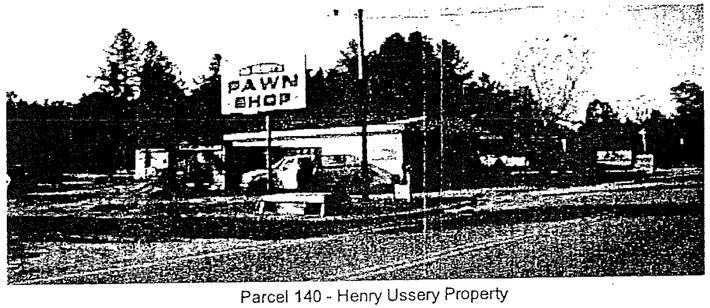
Parcel 41A - W. J. Barnhart Property



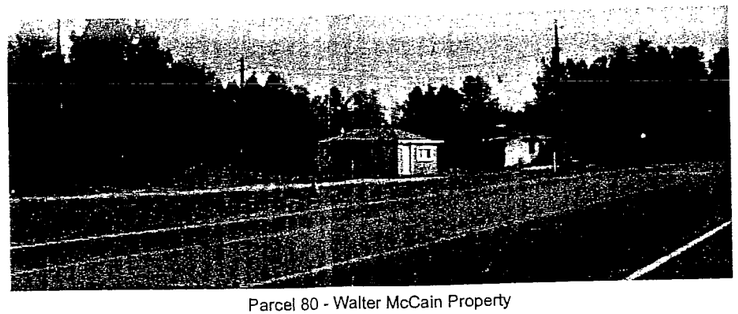
Parcel 42 - Wesly Denham Property



Parcel 57 - William Ussery Property

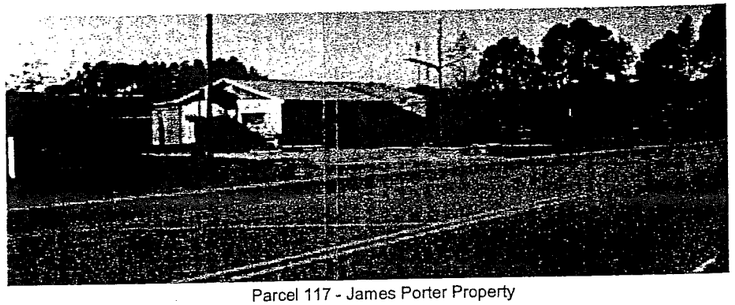


Parcel 140 - Henry Ussery Property

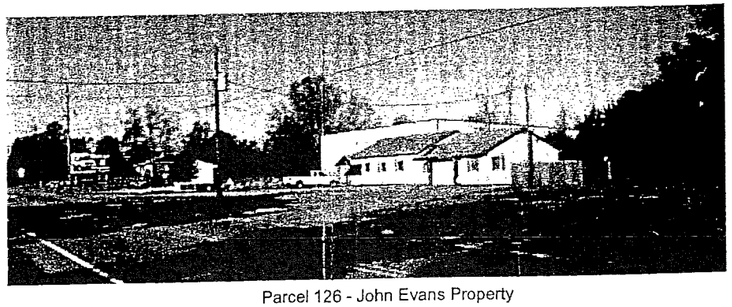


Parcel 80 - Walter McCain Property

Parcel 99 - Leon Wall Property



Parcel 117 - James Porter Property



Parcel 126 - John Evans Property

SITE PHOTOS

FIGURE 1

GRAPHIC SCALE IN METERS

DRWN	CHKD		FIGURE
MJD			
DATE	LAY	DWG	JOB NO.
11/28/05			2005-292

SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

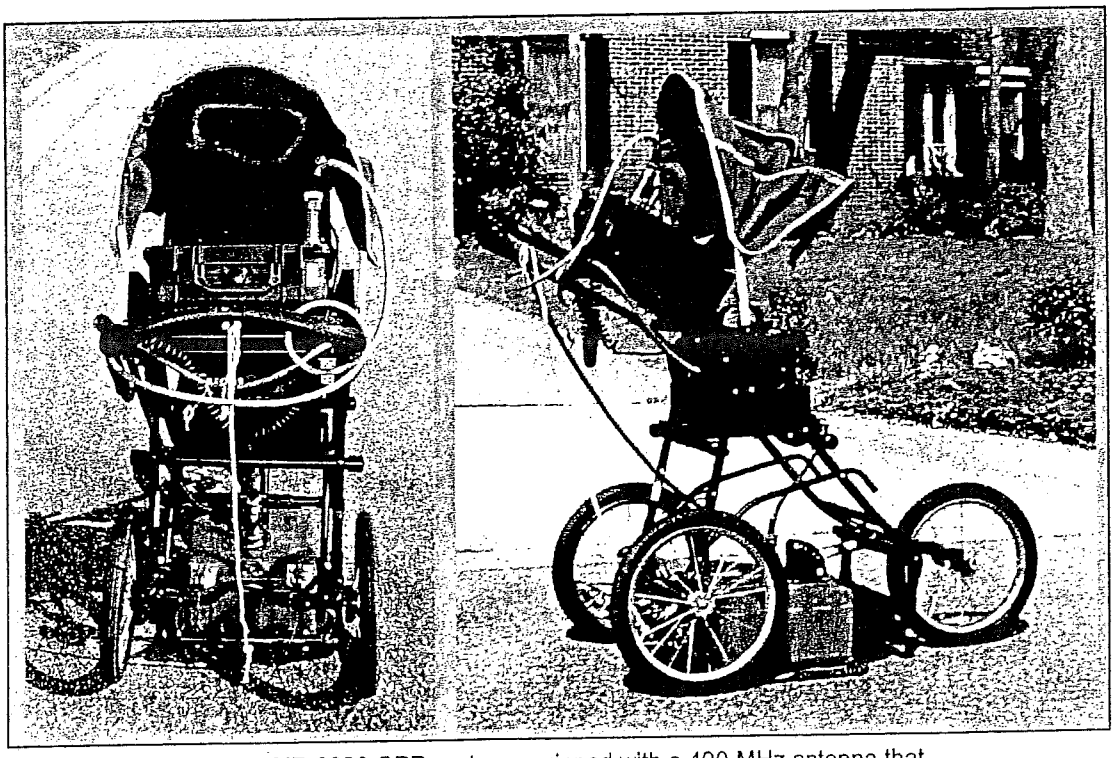
ROCKINGHAM SITES

ROCKINGHAM | NORTH CAROLINA

GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

The Geonics EM61 metal detector was used to conduct the metal detection surveys at the Rockingham sites in November 2005.



The SIR-2000 GPR system equipped with a 400 MHz antenna that was used at the Rockingham sites in November 2005.

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

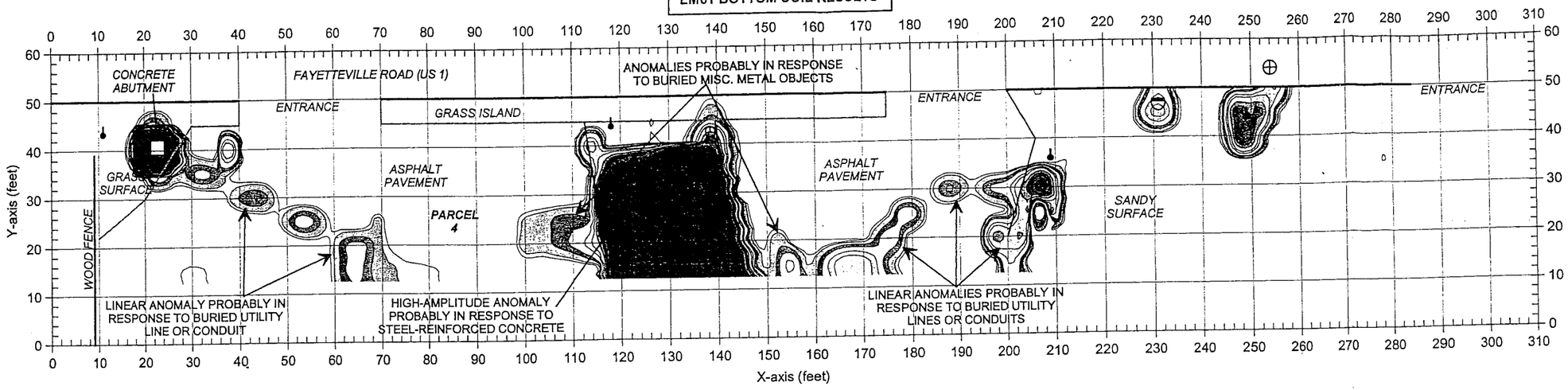
SUBMIT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05	DRWN	
SITE	ROCKINGHAM SITES	LAY		CHKD	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JNO	2005-292	REVNO	

GRAPHIC SCALE IN METERS

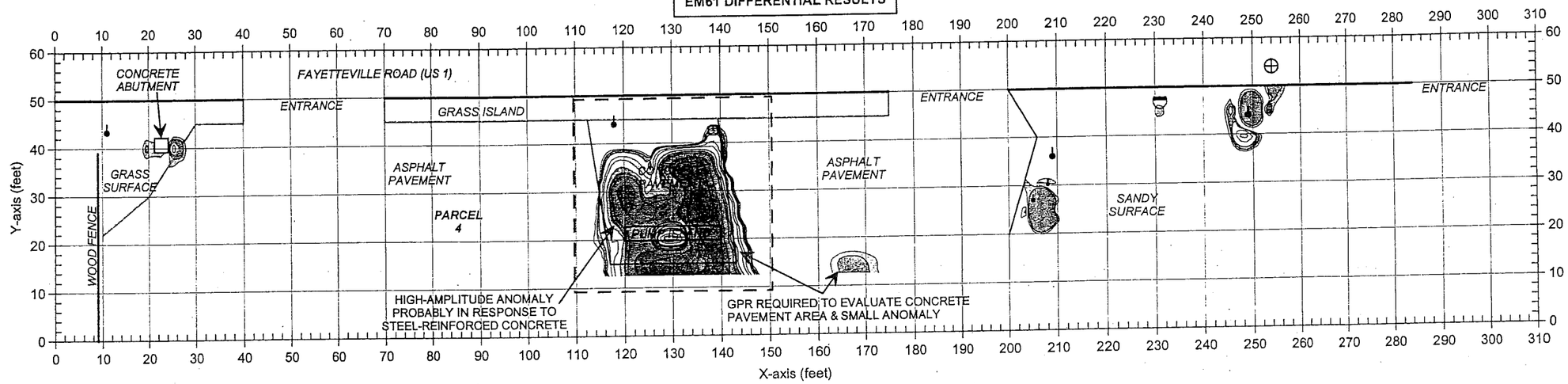
GEOPHYSICAL EQUIPMENT

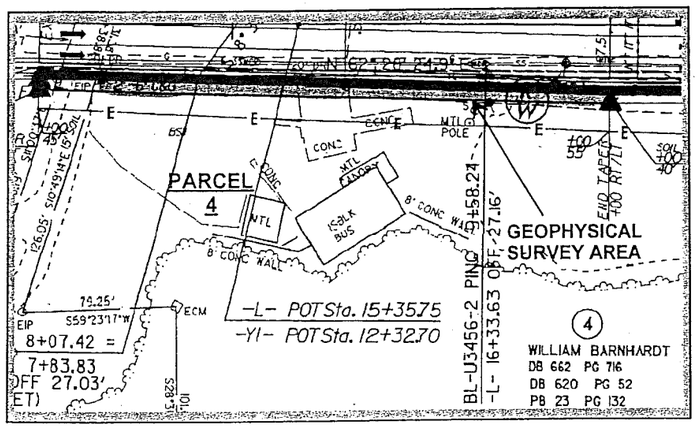
FIGURE 2

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-4000

APPROXIMATE NORTH

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- MONITORING WELL
- WATER METER OR VALVE COVER
- GUY WIRE
- UTILITY POLE OR LIGHT POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- MANHOLE COVER
- GPR SURVEY AREA

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61
METAL DETECTION
RESULTS

FIGURE 3

GRAPHIC SCALE IN METERS

DRAWN	CHKD	FIGURE
MJD		
DATE	LAY	DWG	JOB NO.
11/26/05			2005-292

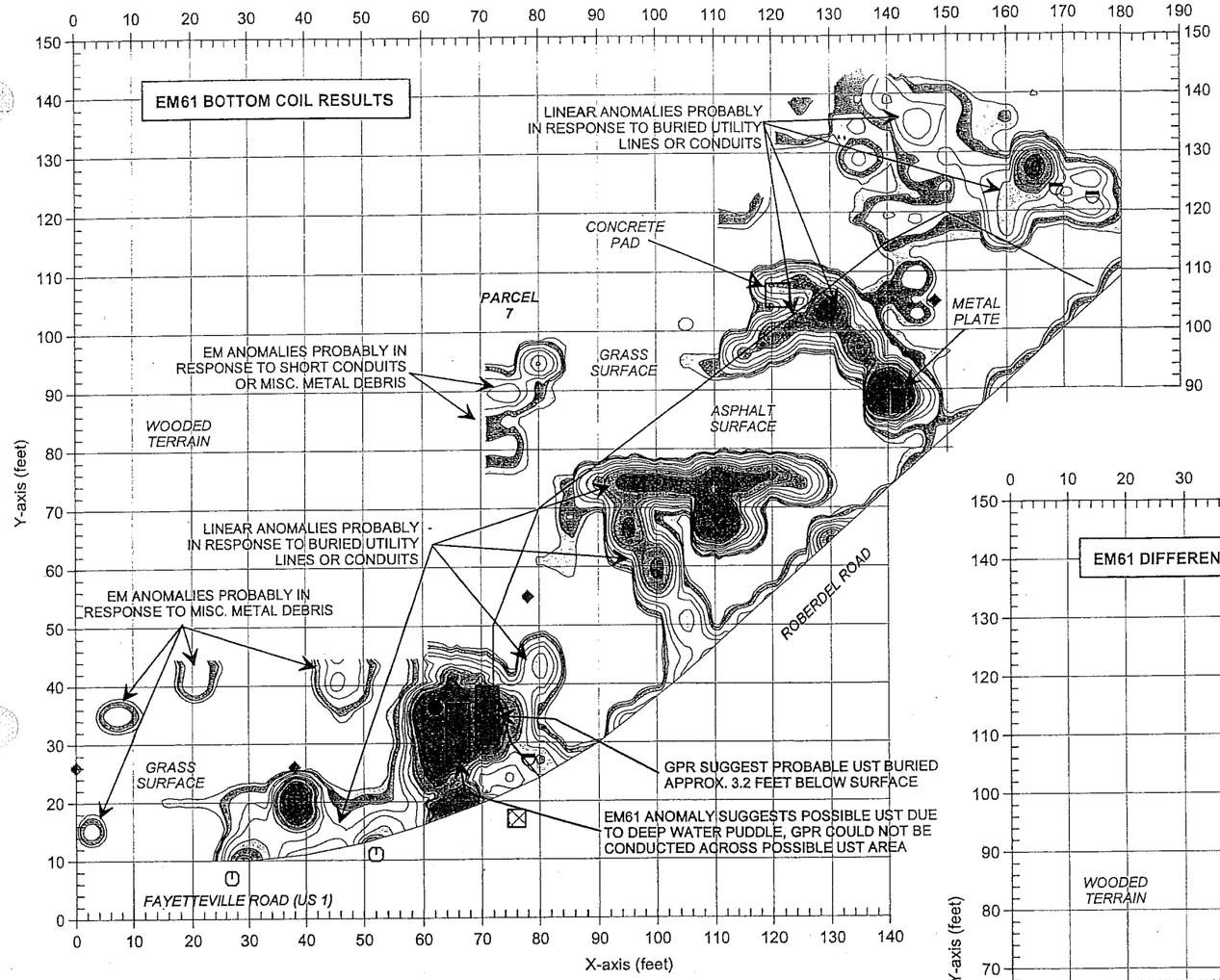
CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: W. J. BARNHART PROPERTY (PARCEL 4)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 METAL DETECTION RESULTS

FIGURE 4

EM61 BOTTOM COIL RESULTS



LEGEND

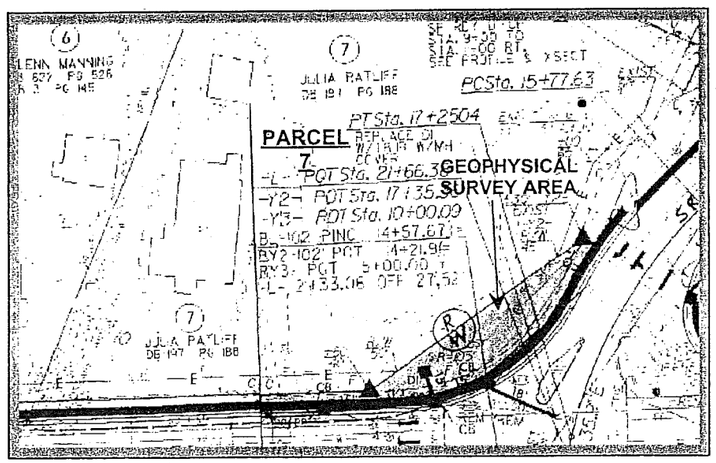
- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH & EAST-WEST TRENDING LINES SPACED 5 FEET APART
- MONITORING WELL
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- MANHOLE COVER
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

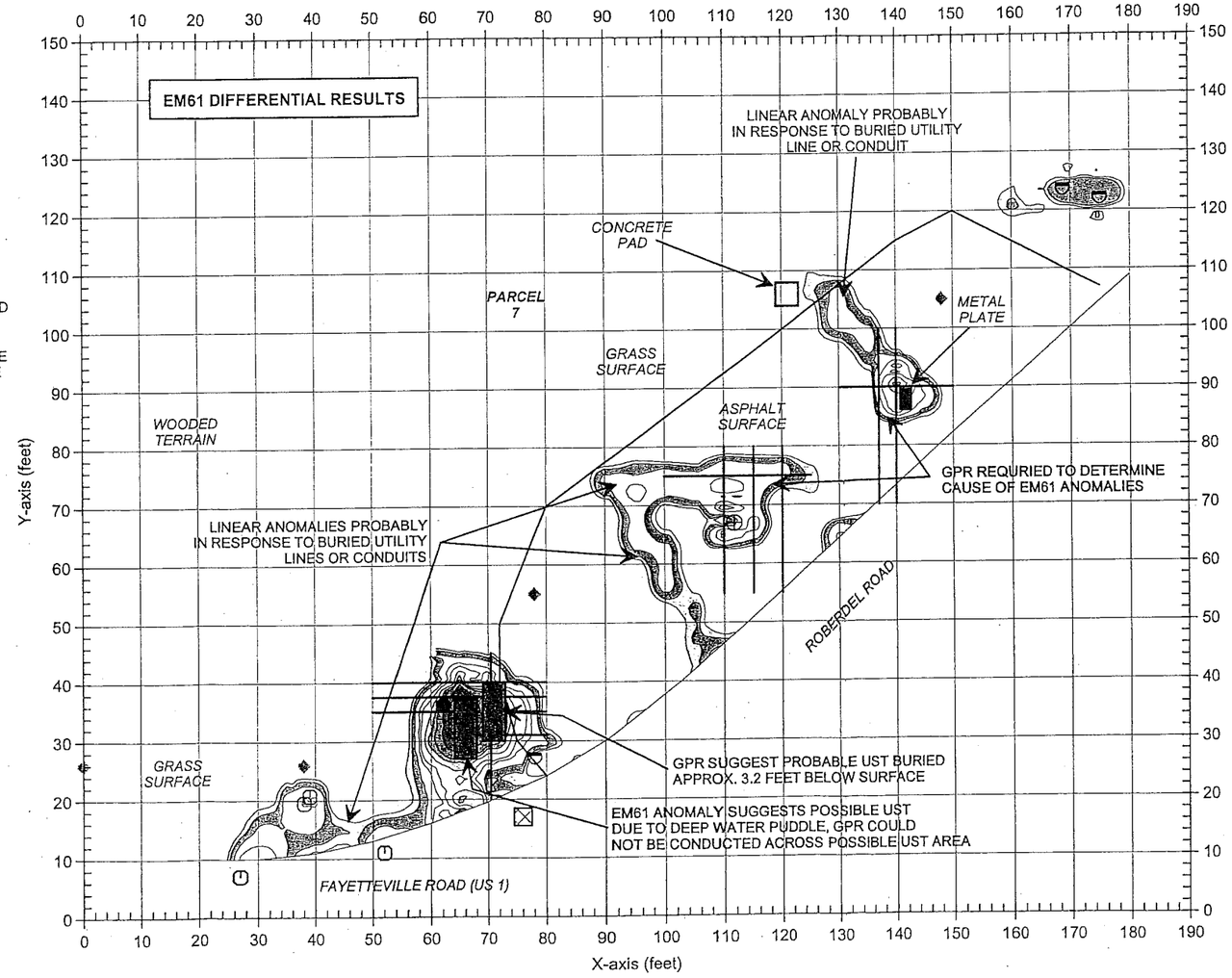
EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -80 -50 -60 -75 -100 -150 -200 -300 -400 -500 -750 -1000



APPROXIMATE NORTH

EM61 DIFFERENTIAL RESULTS



GRAPHIC SCALE IN METERS

DRWN	MJD	FIGURE	
CHKD			
DATE	11/25/05	J.NO.	2005-292
LAY		DWG	

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

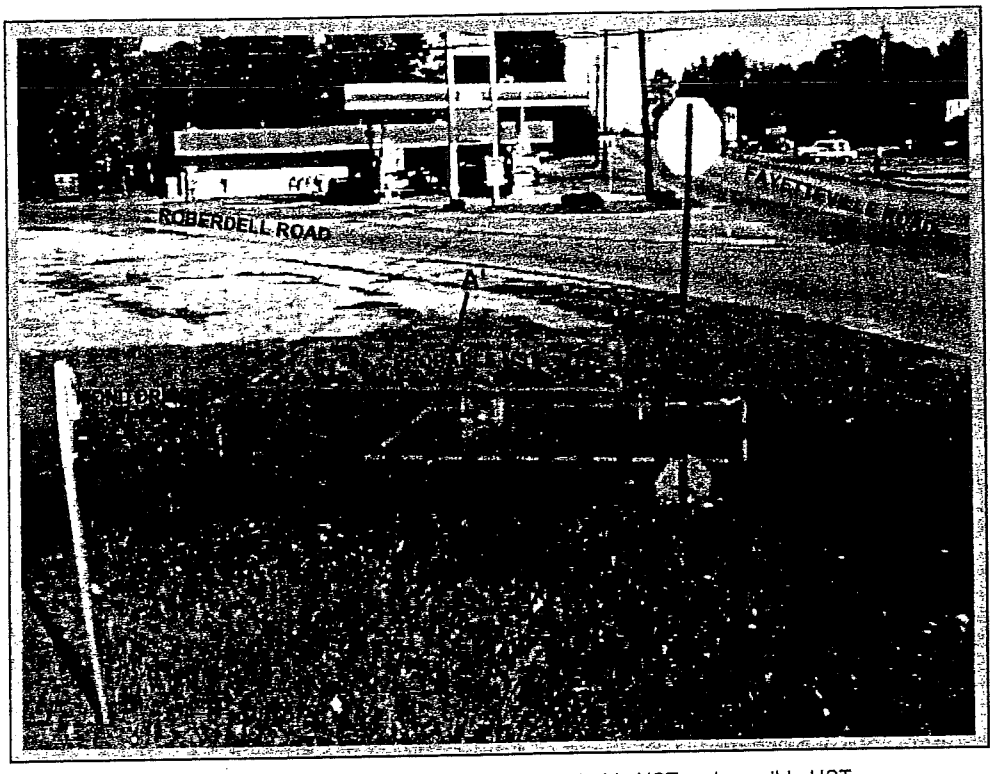
SITE: JULIA M. RATLIFF PROPERTY (PARCEL 7)

CITY: ROCKINGHAM

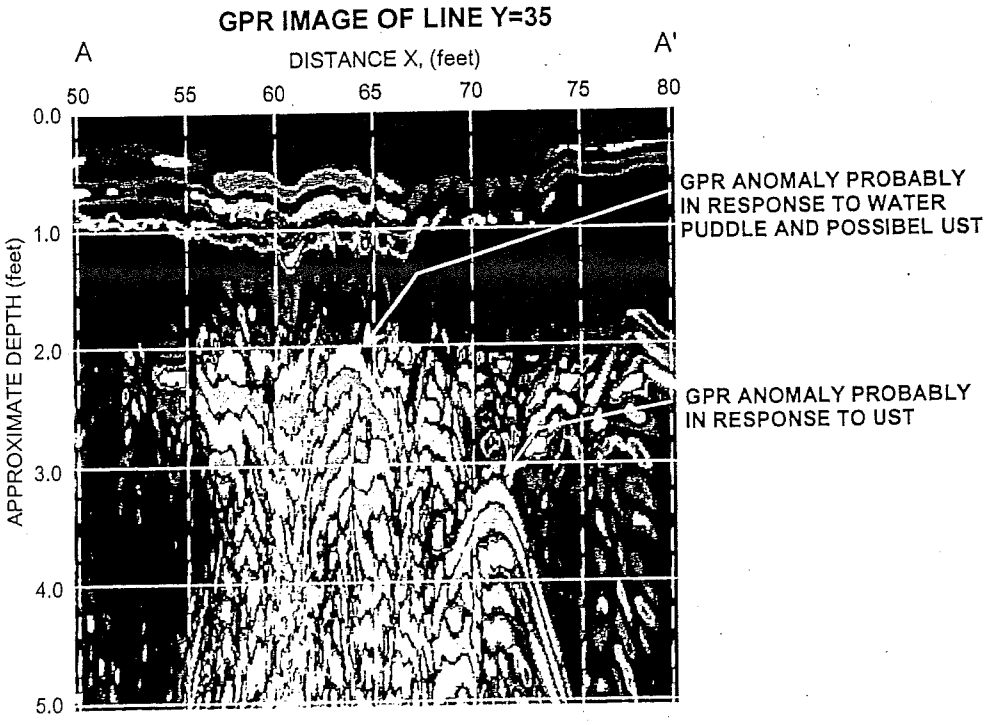
STATE: NORTH CAROLINA

TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the location of the probable UST and possible UST, as suggested by the geophysical results at Parcel 7.



The GPR image obtained along a portion of survey line Y=35 shows the anomaly that is probably in response to a UST near X=71 and buried approximately 3.2 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL		DATE	11/28/05	DRWN
SITE	JULIA M. RATLIFF PROPERTY (PARCEL 7)		LAY		CHKD
CITY	ROCKINGHAM	STATE NORTH CAROLINA	CHKD		
TITLE	GEOPHYSICAL RESULTS		JOB	2005-292	SHT

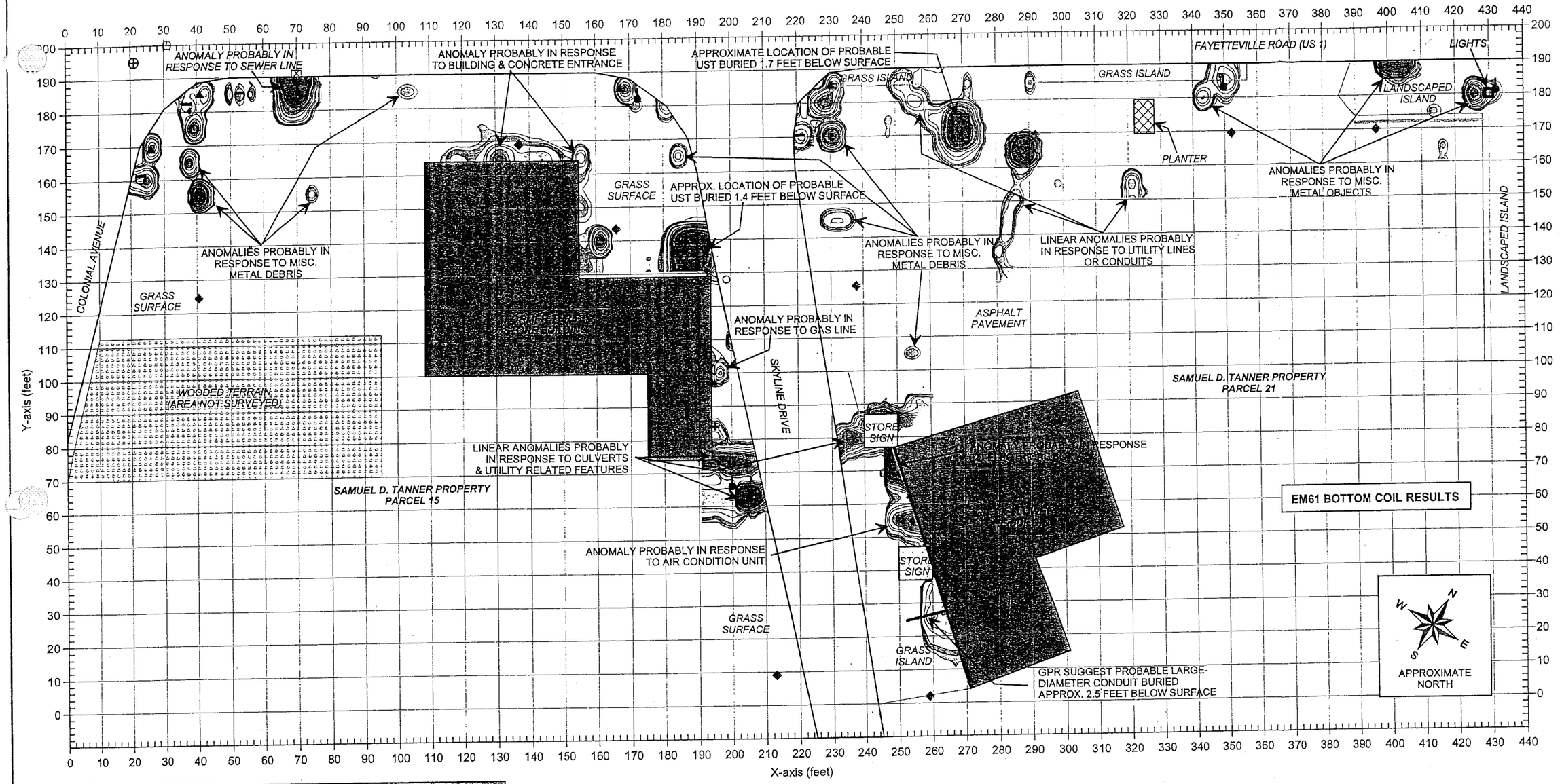
GRAPHIC SCALE IN METERS

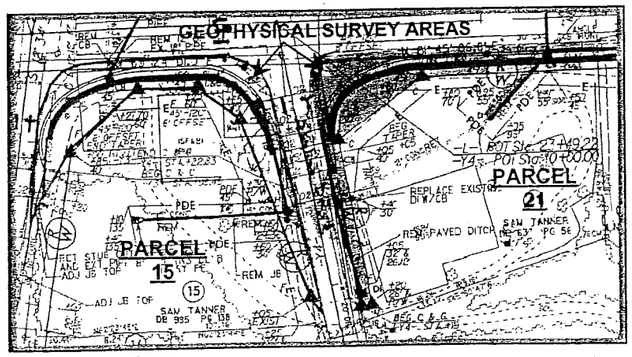
PHOTO & GPR IMAGE OF UST LOCATION

FIGURE 5

EM61 BOTTOM COIL RESULTS

FIGURE 6





EM61 BOTTOM COIL RESPONSE (MILLIVOLTS): 1000, 750, 500, 400, 300, 200, 150, 100, 75, 60, 20, -90, -100, -200, -400

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST & NORTH-SOUTH TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CONCRETE R/W MARKER
- GAS METER
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVER
- MANHOLE COVER
- MONITORING WELL
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

DRAWN	CHKD	FIGURE
MJD		
DATE	LAY	DWG	JOB NO.
11/25/05			2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: SAMUEL D. TANNER PROPERTY (PARCELS 15 & 21)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 DIFFERENTIAL RESULTS

FIGURE 7

ANOMALY PROBABLY IN RESPONSE TO SEWER LINE

ANOMALY PROBABLY IN RESPONSE TO BUILDING & CONCRETE ENTRANCE

FAYETTEVILLE ROAD (US 1)

LIGHTS

GRASS ISLAND

GRASS ISLAND

LANDSCAPED ISLAND

PLANTER

ANOMALIES PROBABLY IN RESPONSE TO MISC. METAL OBJECTS

APPROXIMATE LOCATION OF PROBABLE UST BURIED 1.7 FEET BELOW SURFACE

GRASS SURFACE

APPROXIMATE LOCATION OF PROBABLE UST BURIED 1.4 FEET BELOW SURFACE

COLONIAL AVENUE

GRASS SURFACE

ANOMALY PROBABLY IN RESPONSE TO GAS LINE

ASPHALT PAVEMENT

LANDSCAPED ISLAND

SKYLINE DRIVE

WOODED TERRAIN (AREA NOT SURVEYED)

SAMUEL D. TANNER PROPERTY PARCEL 21

STORE SIGN

LINEAR ANOMALIES PROBABLY IN RESPONSE TO CULVERTS & UTILITY RELATED FEATURES

SAMUEL D. TANNER PROPERTY PARCEL 15

ANOMALY PROBABLY IN RESPONSE TO AIR CONDITION UNIT

STORE SIGN

GRASS SURFACE

GRASS ISLAND

GPR SUGGEST PROBABLE LARGE-DIAMETER CONDUIT BURIED APPROX. 2.5 FEET BELOW SURFACE

EM61 DIFFERENTIAL RESULTS

N

W

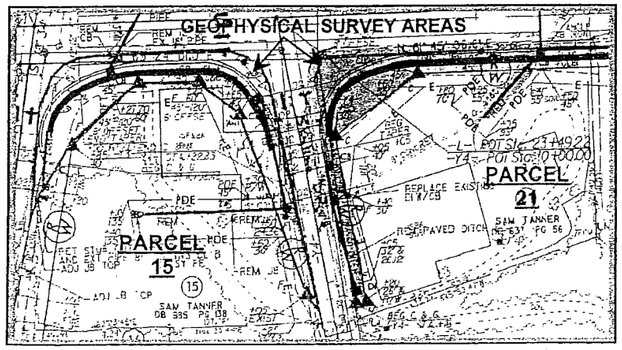
E

S

APPROXIMATE NORTH

Y-axis (feet)

X-axis (feet)



EM61 DIFFERENTIAL RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
50
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST & NORTH-SOUTH TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CONCRETE R/W MARKER
- GAS METER
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVER
- MANHOLE COVER
- MONITORING WELL
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the differential results of the EM61 metal detection survey in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

DRWN	MJD
CHKD	
DATE	11/25/05
LAY	
DWG	
JOB NO.	2005-292
FIGURE	

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

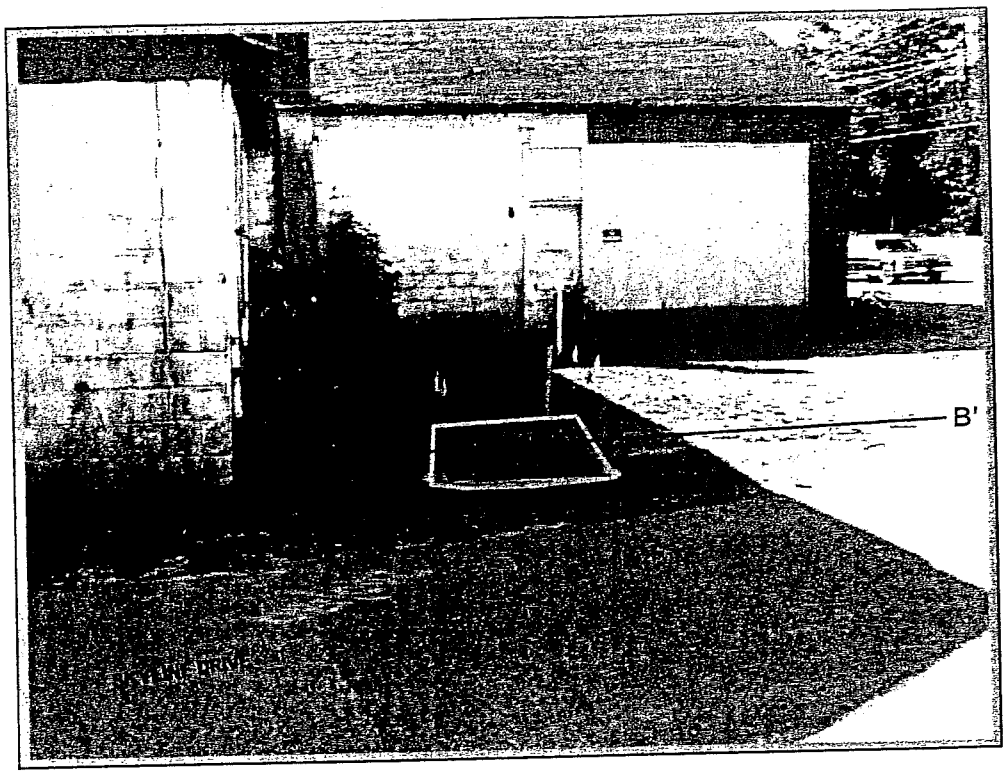
SITE: SAMUEL D. TANNER PROPERTY (PARCELS 15 & 21)

CITY: ROCKINGHAM

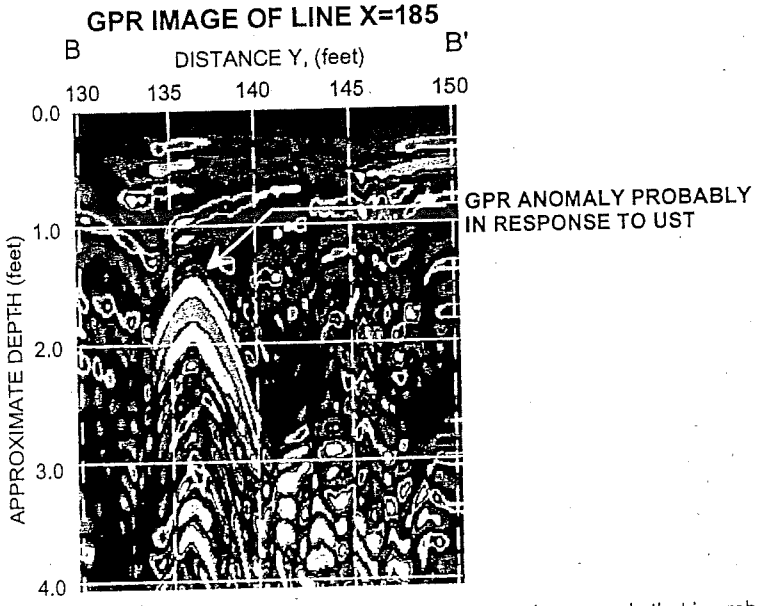
STATE: NORTH CAROLINA

TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the location of the probable UST,
as suggested by the geophysical results at Parcel 15.



The GPR image obtained along a portion of survey line X=185 shows the anomaly that is probably in response to a UST near Y=137 and buried approximately 1.4 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

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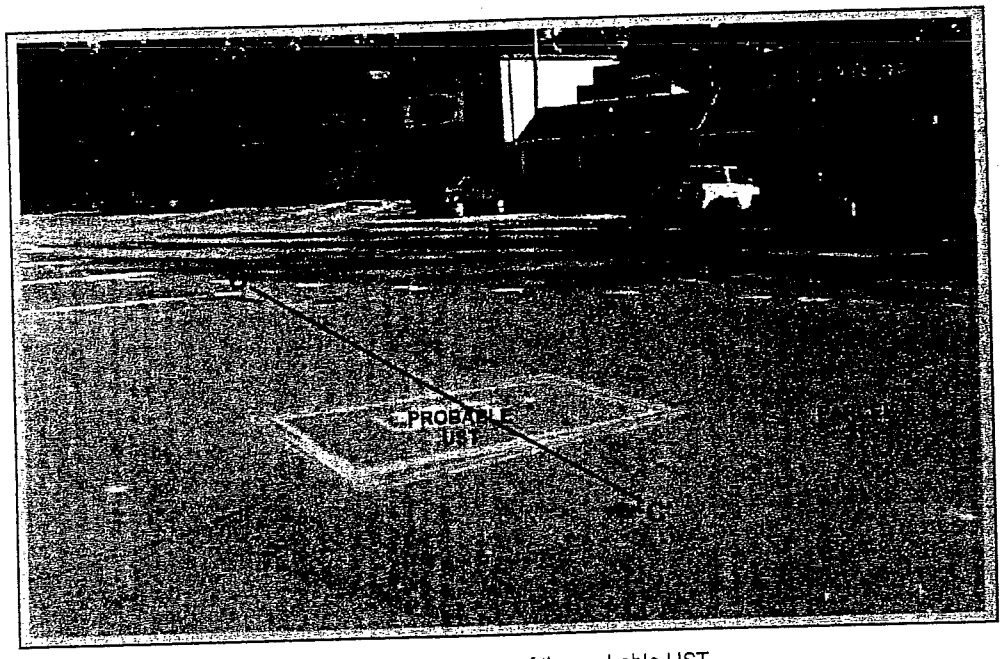
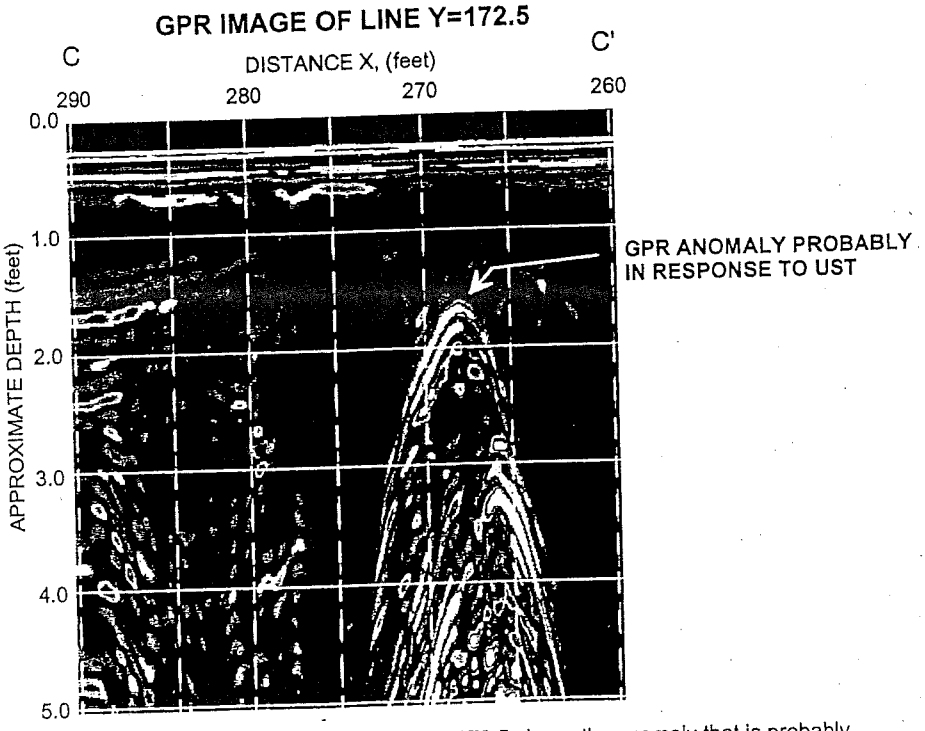
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05	DRWN	
SITE	SAMUEL D. TANNER PROPERTY (PARCEL 15)	LAT		CHKD	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JOB NO.	2005-292	SCALE	GRAPHIC SCALE IN METERS

PHOTO & GPR IMAGE
OF UST LOCATION

FIGURE 8



The photo shows the location of the probable UST,
as suggested by the geophysical results at Parcel 21.



The GPR image obtained along a portion of survey line Y=172.5 shows the anomaly that is probably in response to a UST near X=268 and buried approximately 1.7 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

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CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05	DRWN	
SITE	SAMUEL D. TANNER PROPERTY (PARCEL 21)	LAY		CHKD	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JOB	2005-292	SCALE	

GRAPHIC SCALE IN METERS

PHOTO & GPR IMAGE
OF UST LOCATION

FIGURE 9

FIGURE 10

EM61 BOTTOM COIL RESULTS

EM61 BOTTOM COIL RESULTS

ANOMALIES PROBABLY IN RESPONSE TO METAL FENCE, BUILDINGS AND BURIED UTILITY LINE

METAL FENCE

RESIDENTIAL AREA

ASPHALT PAVEMENT

EDGE OF ROAD

ROBERDEL ROAD

LINEAR ANOMALIES PROBABLY IN RESPONSE TO UTILITY LINES OR CONDUITS

PARCEL 17

ANOMALY PROBABLY IN RESPONSE TO AIR CONDITION UNIT

LENGTH SUGGESTS PROBABLY TWO UST'S INSTEAD OF ONE UST

ASPHALT PAVEMENT

CONCRETE WALKWAY

GRASS YARD

LINEAR ANOMALIES PROBABLY IN RESPONSE TO UTILITY LINE OR CONDUIT

GRASS ISLAND

ASPHALT PAVEMENT

ISOLATED ANOMALIES PROBABLY IN RESPONSE TO MISC. METAL DEBRIS

GRASS ISLAND

GRASS ISLAND

ENTRANCE

GRASS ISLAND

APPROX. LOCATIONS OF KNOWN UST'S BURIED 3.5 TO 3.9 FEET BELOW SURFACE

LINEAR ANOMALY PROBABLY IN RESPONSE TO UTILITY LINE

FAYETTEVILLE ROAD (US 1)

APPROXIMATE NORTH

EM61 BOTTOM COIL RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- UST COVERS
- WATER METER OR VALVE COVER
- GUY WIRE
- METAL SIGN POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVERS
- GAS METER
- AIR CONDITION UNIT
- DUMPSTER
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Y-axis (feet)

X-axis (feet)

Note: The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

DRWN	MJD
DATE	11/25/05
DWG	2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: HARVEY E. MELTON PROPERTY (PARCEL 17)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

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EM61 DIFFERENTIAL RESULTS

ANOMALIES PROBABLY IN RESPONSE TO METAL FENCE, BUILDINGS AND BURIED UTILITY LINE

METAL FENCE

RESIDENTIAL AREA

ASPHALT PAVEMENT

ROBERDEL ROAD

EDGE OF ROAD

LINEAR ANOMALIES PROBABLY IN RESPONSE TO UTILITY LINES OR CONDUITS

PARCEL 17

ANOMALY PROBABLY IN RESPONSE TO AIR CONDITION UNIT

ASPHALT PAVEMENT

LENGTH SUGGESTS PROBABLY TWO UST'S INSTEAD OF ONE UST.

CONCRETE WALKWAY

GRASS YARD

LINEAR ANOMALIES PROBABLY IN RESPONSE TO UTILITY LINES OR CONDUITS

GRASS ISLAND

APPROX. LOCATIONS OF UST'S BURIED 3.5 TO 3.9 FEET BELOW SURFACE

GRASS ISLAND

GRASS ISLAND

ENTRANCE

GRASS ISLAND

FAYETTEVILLE ROAD (US 1)

Y-axis (feet)

X-axis (feet)

APPROXIMATE NORTH

EM61 DIFFERENTIAL RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- UST COVERS
- WATER METER OR VALVE COVER
- GUY WIRE
- METAL SIGN POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVERS
- GAS METER
- AIR CONDITION UNIT
- DUMPSTER
- GPR SURVEY AREA
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris. The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

FIGURE 11

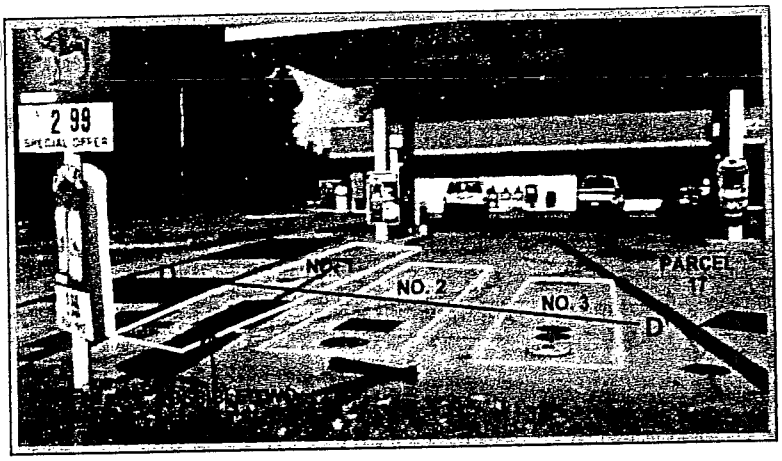
EM61 DIFFERENTIAL RESULTS

GRAPHIC SCALE IN METERS

DATE	DRAWN	FIGURE
11/25/05	MJD	
SAY	CHKD	
DWG		
J-NO.	2005-292	

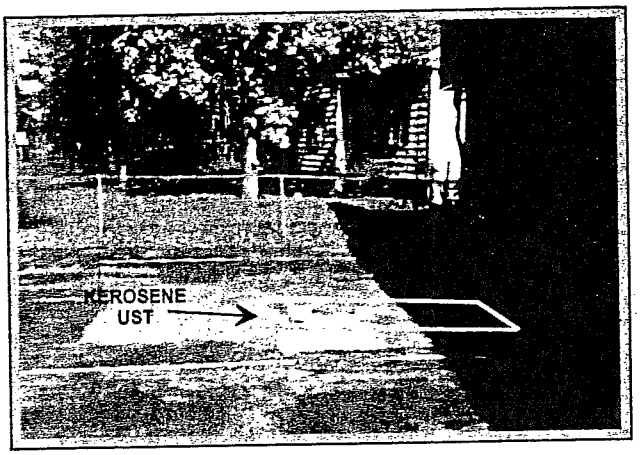
CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: HARVEY E. MELTON PROPERTY (PARCEL 17)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

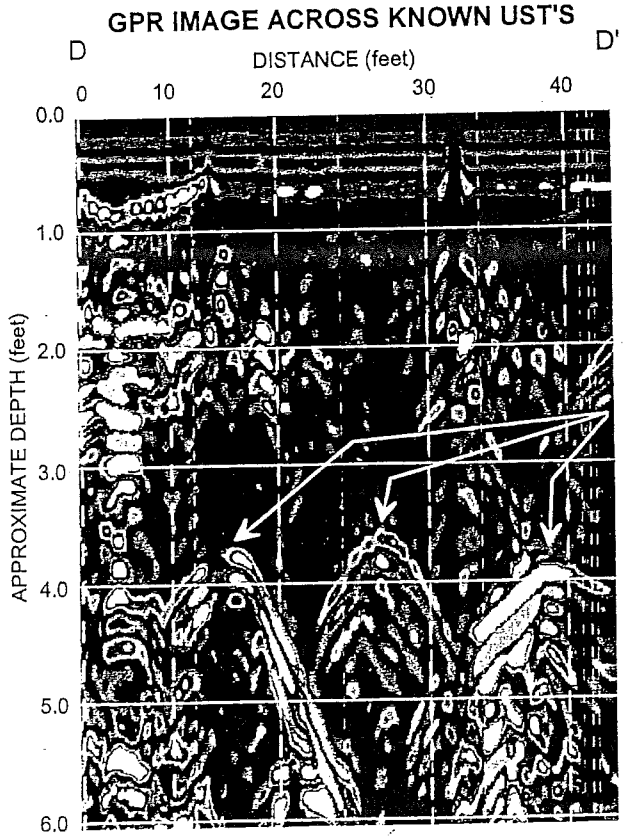
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the approxiamte location of the three or four known and active UST's, as suggested by the geophysical results, at Parcel 17. The UST's appear to be approximately 3.5 to 3.9 feet below surface.

The photo shows the approximate location of the kerosene UST, as suggested by the geophysical results, at Parcel 17. The UST is located along the northwest wall of the store and is buried approximately 2.4 feet below surface.





GPR ANOMALIES PROBABLY IN RESPONSE TO THREE UST'S BURIED 3.5 TO 3.9 FEET BELOW SURFACE

The GPR image is obtained along a traverse line oriented perpendicular to the axis of the UST's. The three GPR anomalies in response to the probable UST's suggest that the UST's are buried approximately 3.5 to 3.9 feet below surface.

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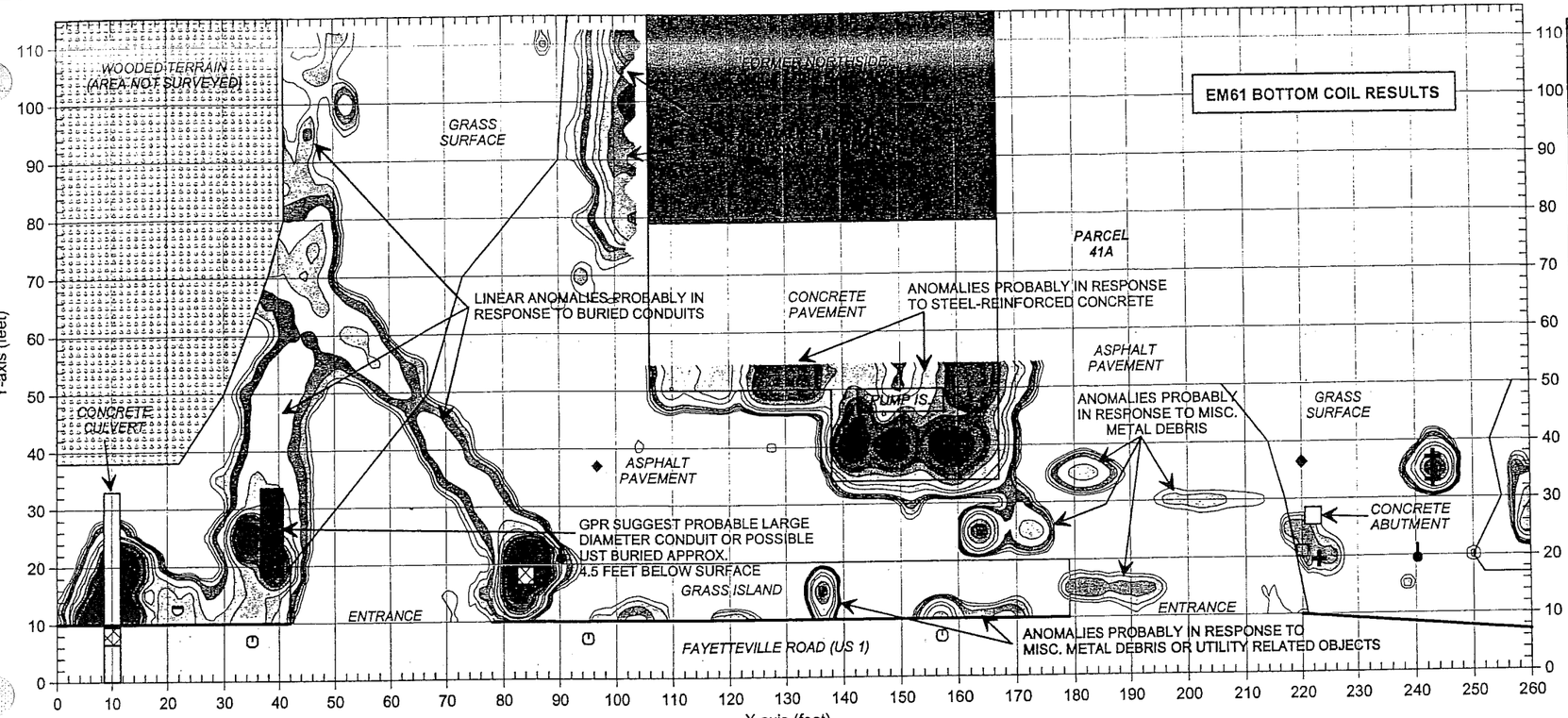
SUBMIT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL		DATE	11/28/05	DRWN
SITE	HARVEY E. MELTON PROPERTY (PARCEL 17)		LAY		CKED
CITY	ROCKINGHAM	STATE NORTH CAROLINA	DWG		
TITLE	GEOPHYSICAL RESULTS		JOB	2005-292	SCALE

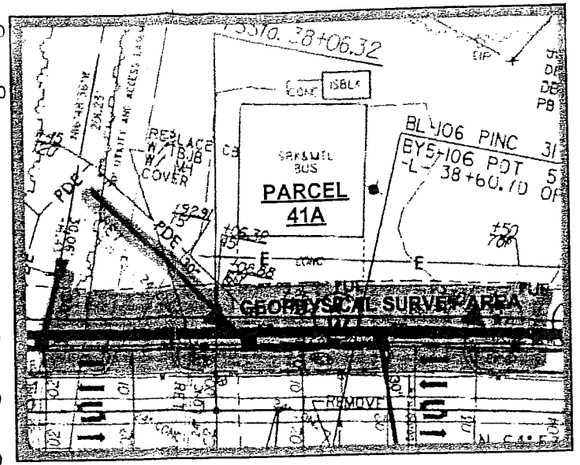
PHOTOS & GPR IMAGE OF UST LOCATIONS

FIGURE 12

EM61 METAL DETECTION RESULTS

FIGURE 13

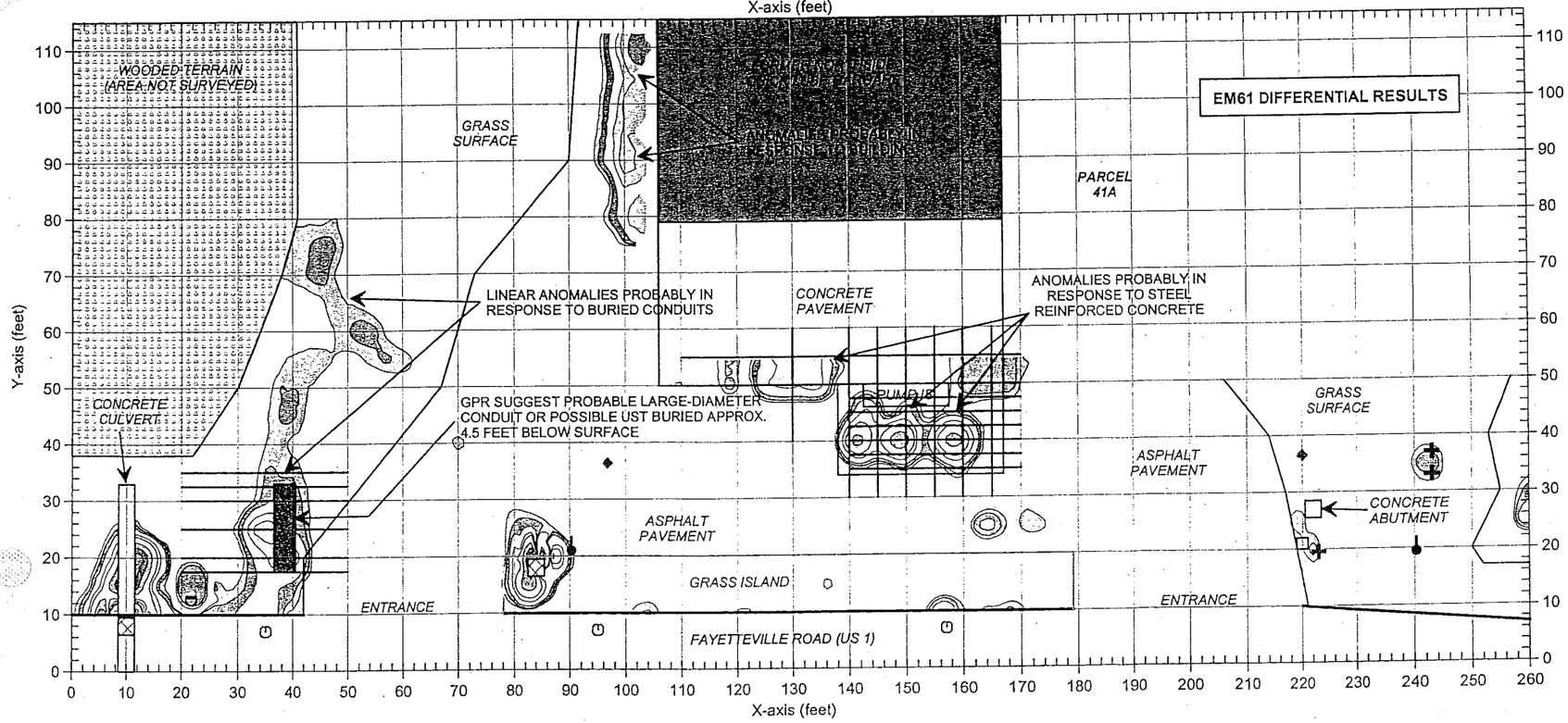




APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -200 -100 -90 -80 -75 -100 -150 200 300 400 500 750 1000



LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- MAIL BOX
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE LARGE DIAMETER CONDUIT OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

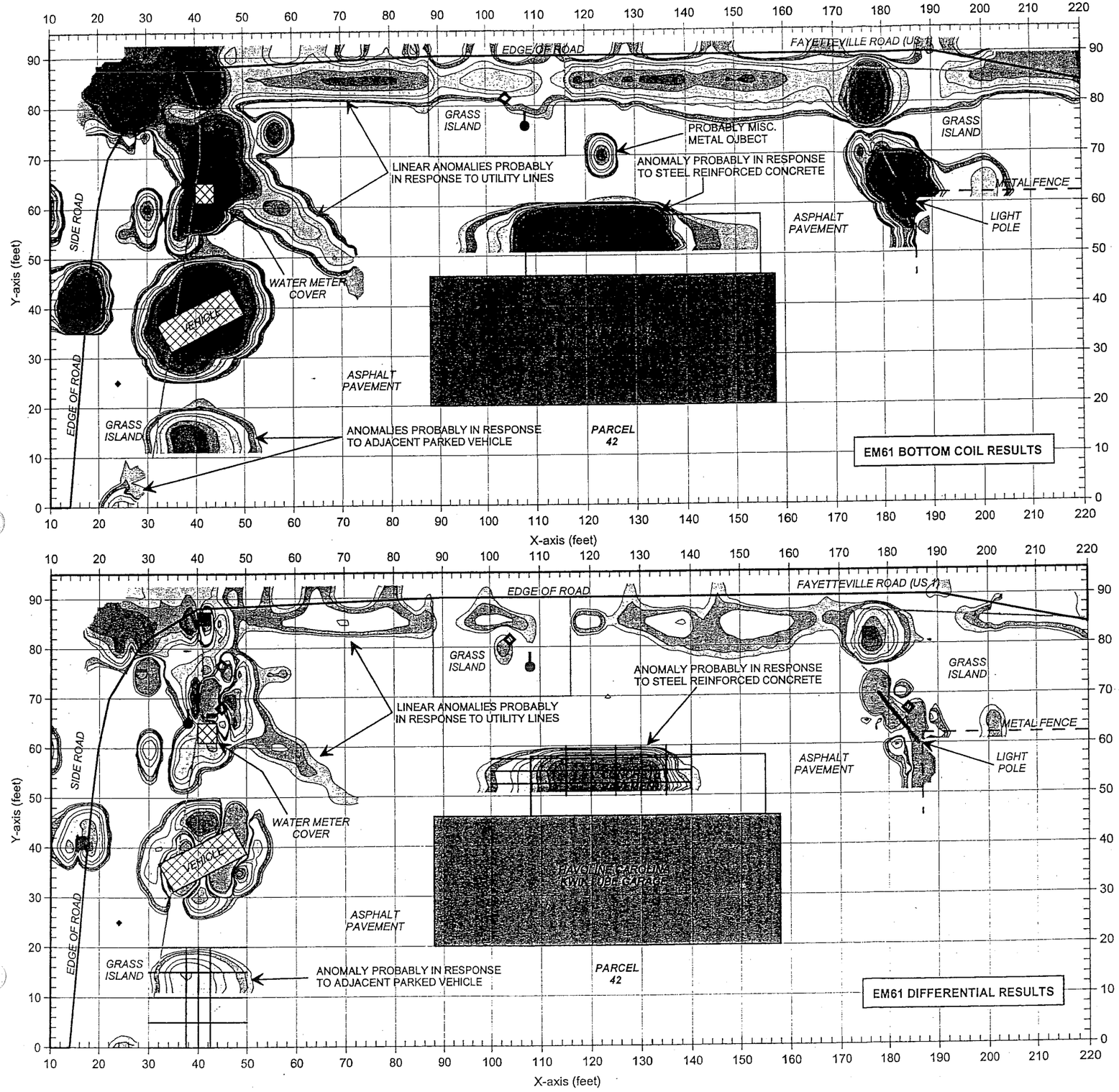
Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

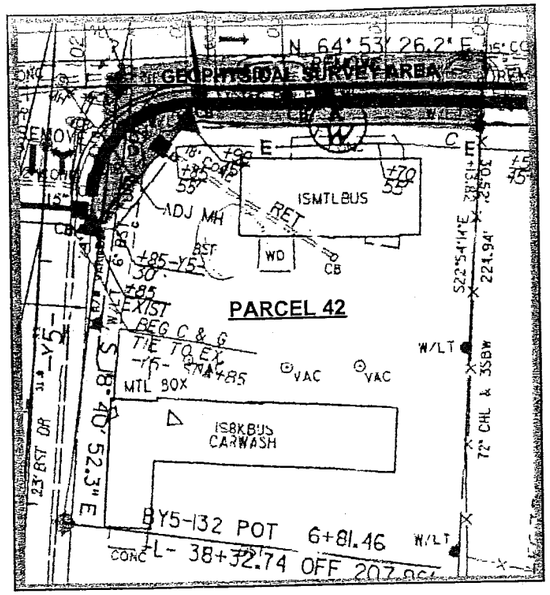
The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

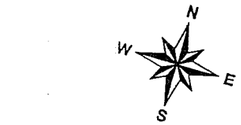
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	W.J. BARNHART PROPERTY (PARCEL 41A)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
JOB NO.	2005-292
DWG	
DRAWN	MJD
CHKD	
DATE	11/26/05
LAY	
FIGURE	

GRAPHIC SCALE IN METERS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.







APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-1000 -500 -100 -50 -20 -10 -5 5 10 20 50 100 200 500 1000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- METAL SIGN POLE
- STORM SEWER GRATE
- GPR SURVEY LINE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 15, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

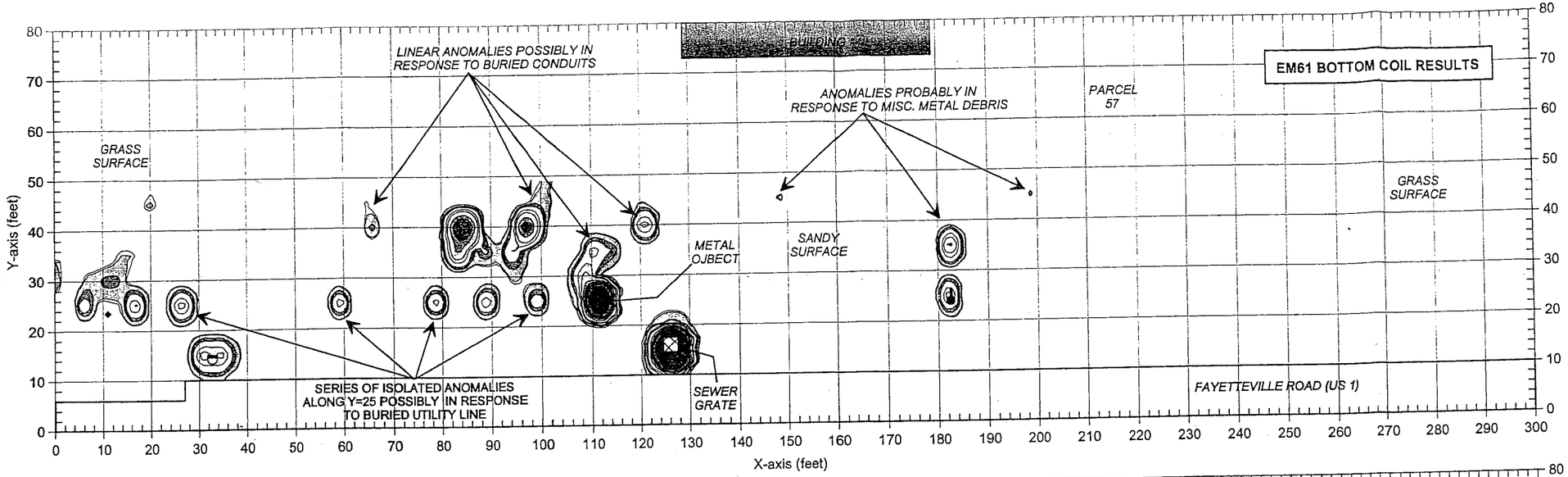
EM61 METAL DETECTION RESULTS

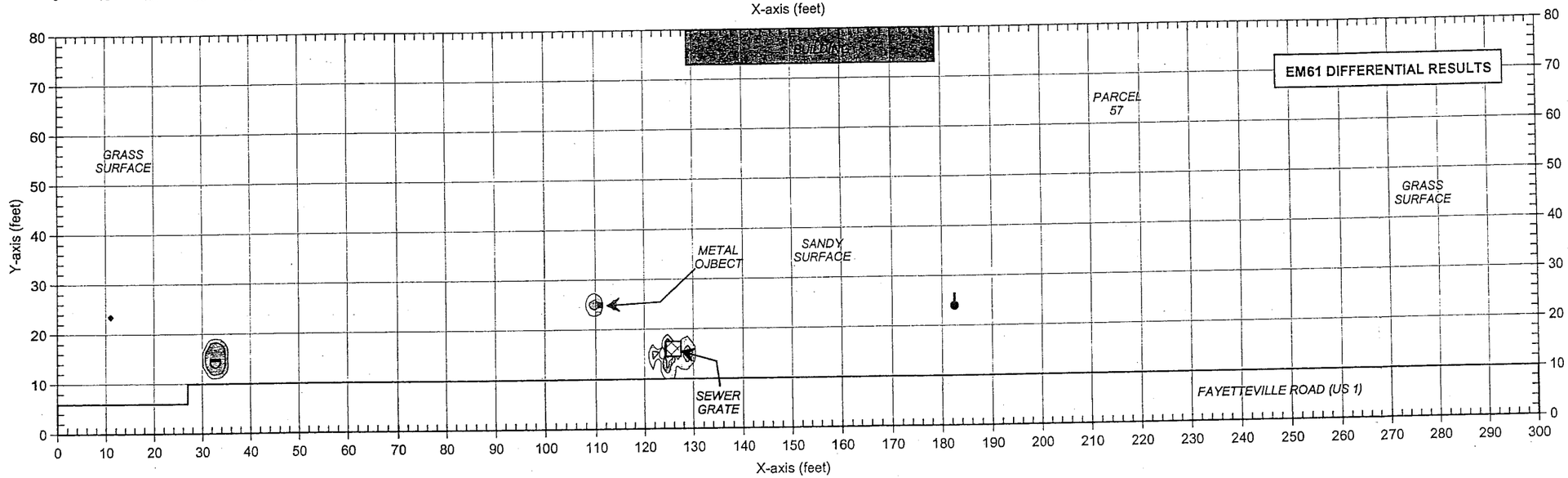
FIGURE 14

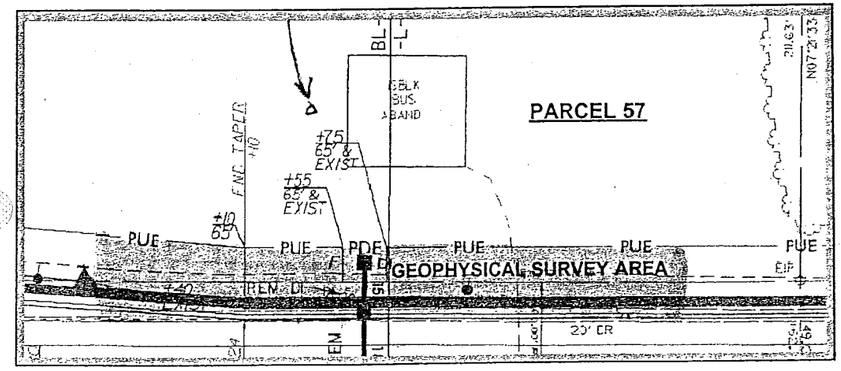
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	WESLEY DENHAM PROPERTY (PARCEL 42)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
JOB NO.	2005-292
FIGURE	
DWG	
LAY	
DATE	11/26/05
DRWN	MJD
CHKD	

GRAPHIC SCALE IN METERS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.







LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-100 -80 -60 -40 -20 0 20 40 60 80 100 120 140 160 180 200

N
W E
S

APPROXIMATE NORTH

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) surveys were not conducted at this site.

EM61 METAL DETECTION RESULTS

FIGURE 15

GRAPHIC SCALE IN METERS

DRWN	MJD
CHKD	
DATE	11/18/05
LAY	
DWG	
FIGURE	
JOB NO.	2005-292

SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

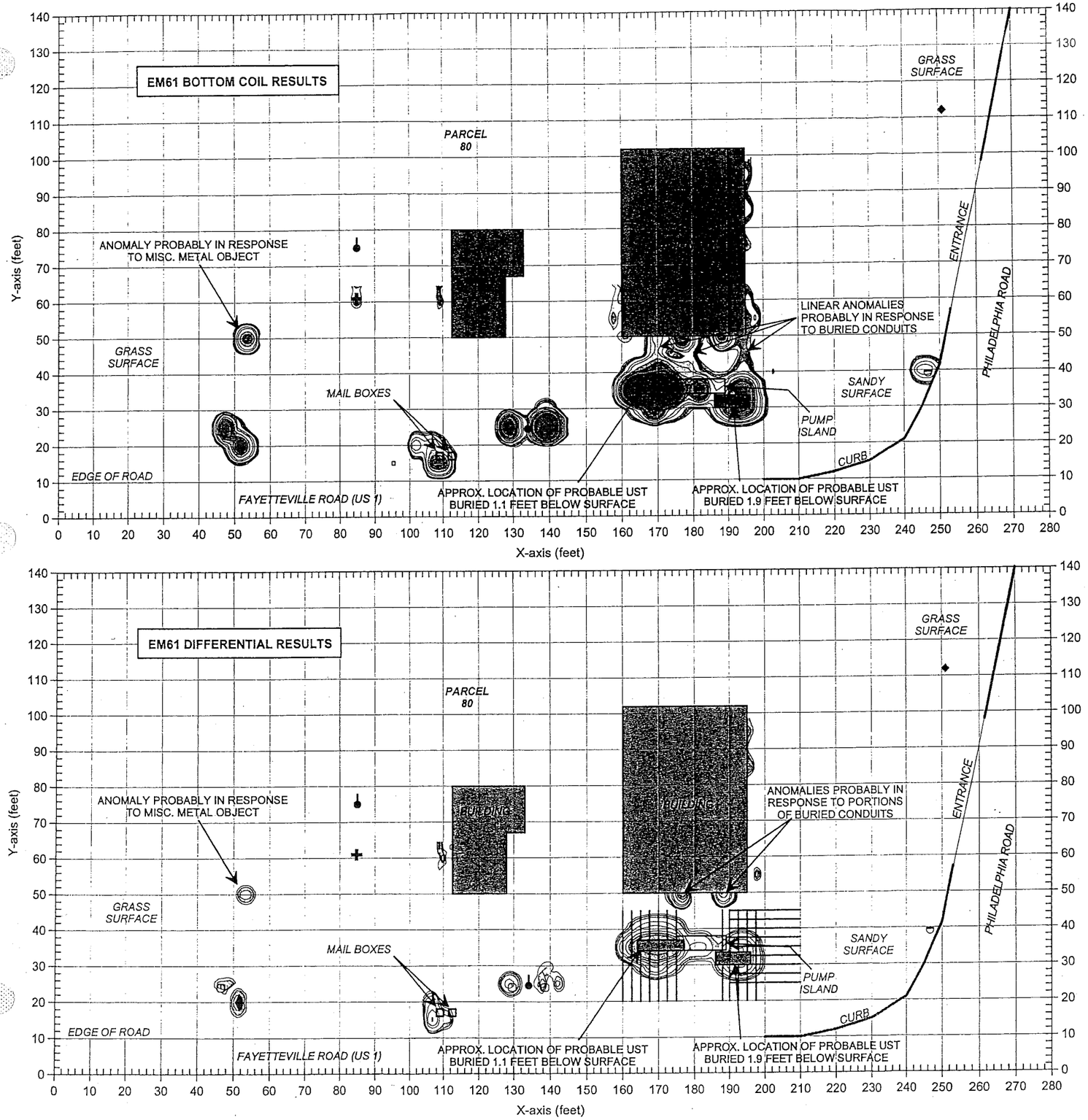
WILLIAM USSERY PROPERTY (PARCEL 57)

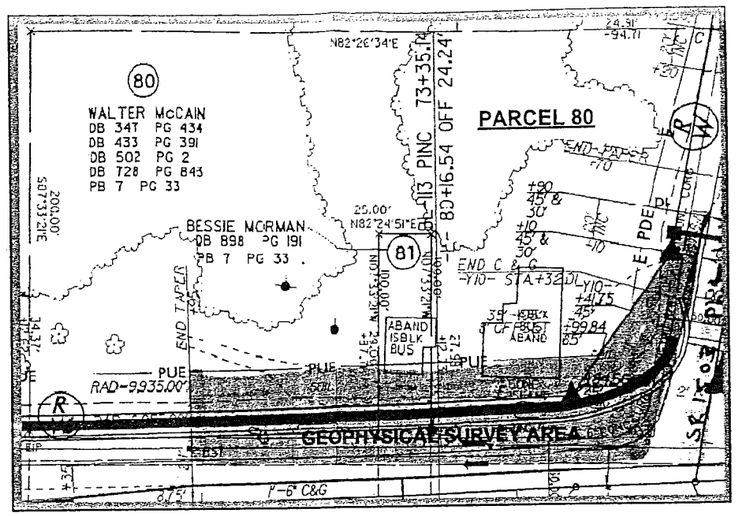
ROCKINGHAM | NORTH CAROLINA

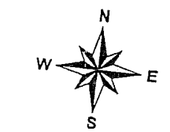
GEOPHYSICAL RESULTS

CLIENT | SITE | CITY | STATE | TITLE

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.







APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -200 -100 -50 -30 -20 -10 -5 5 10 15 20 30 50 100 200 400 750 1000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- FIRE HYDRANT
- TRAFFIC SIGN
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESULTS

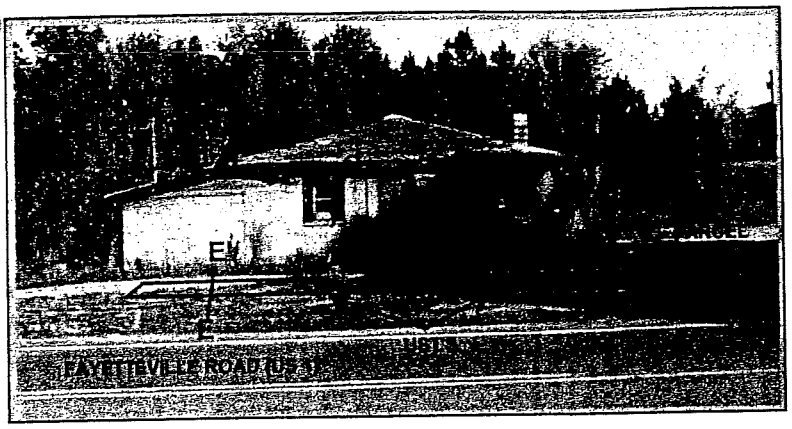
FIGURE 16

GRAPHIC SCALE IN METERS

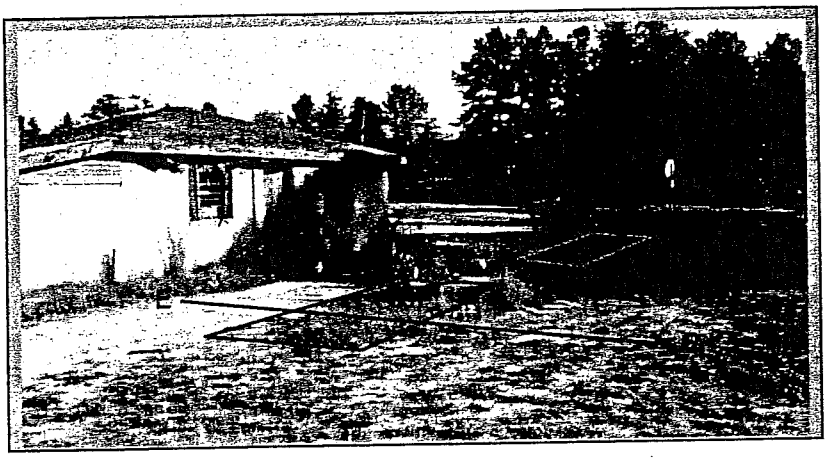
DRAWN	MJD
CHKD	
DATE	11/25/05
LAY	
DWG	
FIGURE	
J-NO.	2005-292

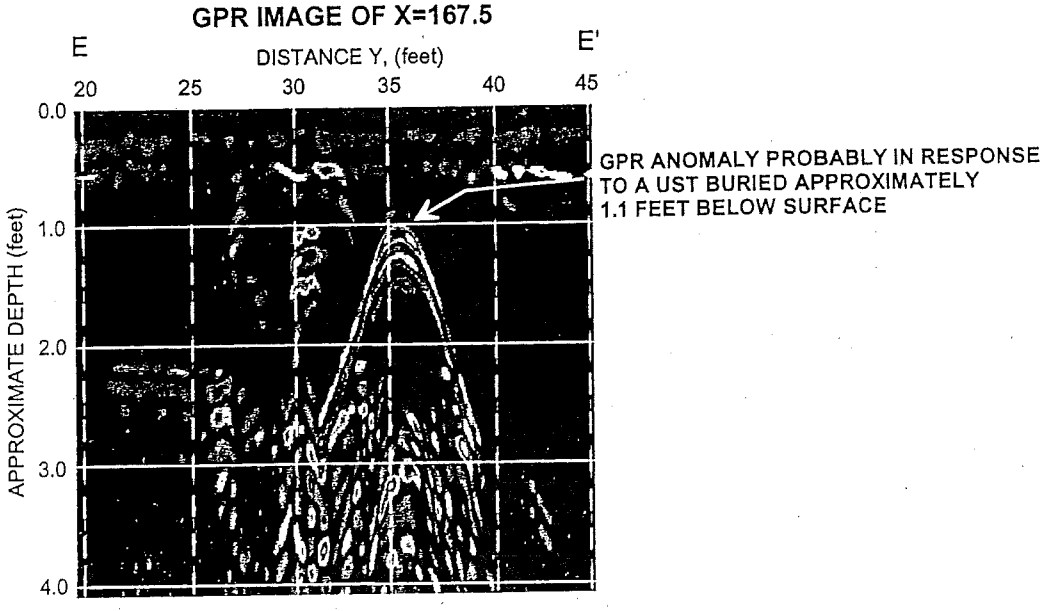
CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: WALTER McCAIN PROPERTY (PARCEL 80)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The two photos show the approximate locations of the two probable UST's at Parcel 80, as suggested by the geophysical results. The UST's appear to be buried approximately 1 to 2 feet below surface. A former pump island lies between the two probable UST's.





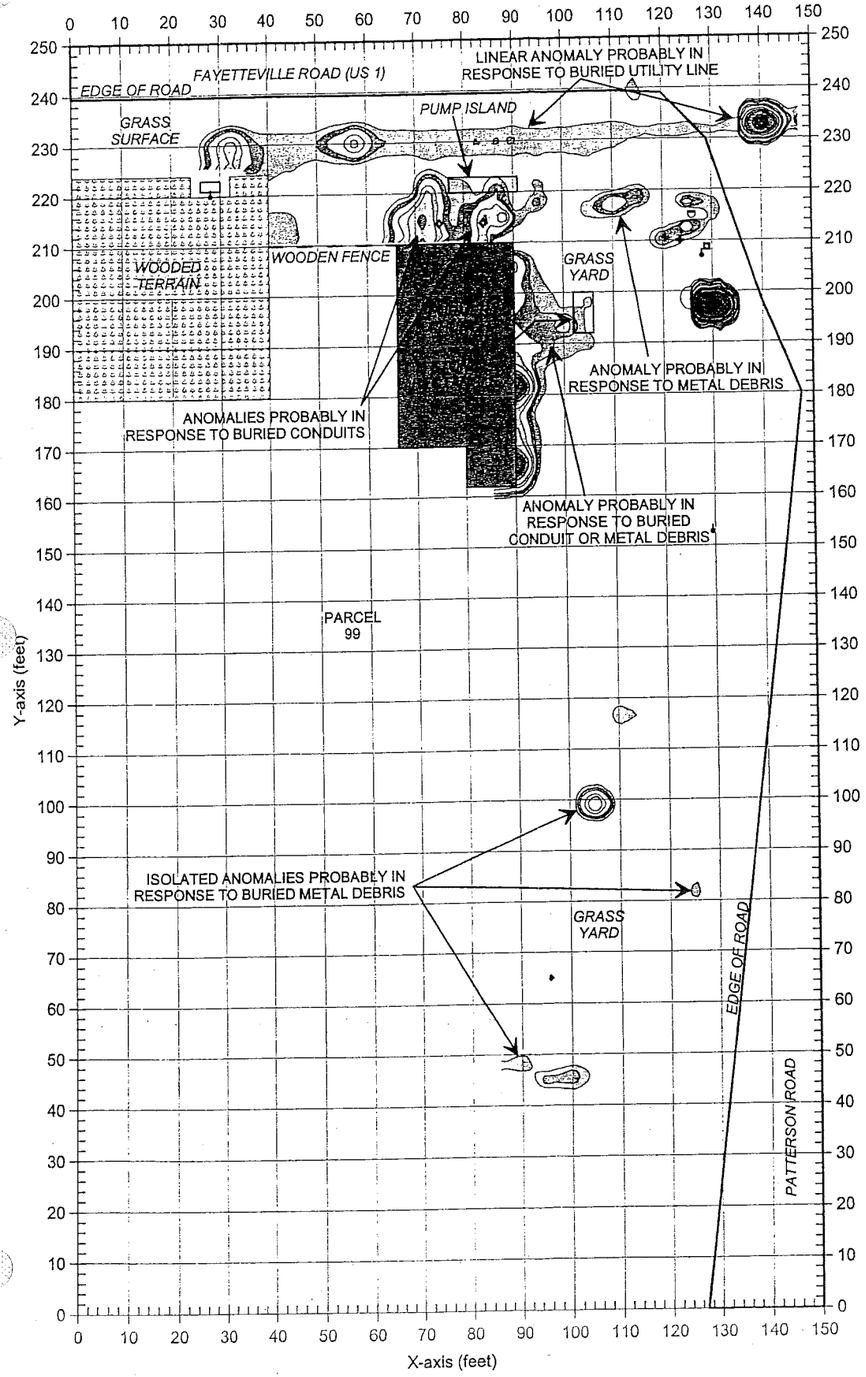
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

SUBMIT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	WALTER McCAIN PROPERTY (PARCEL 80)	LAY	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA
	GEOPHYSICAL RESULTS	NO	2005-282

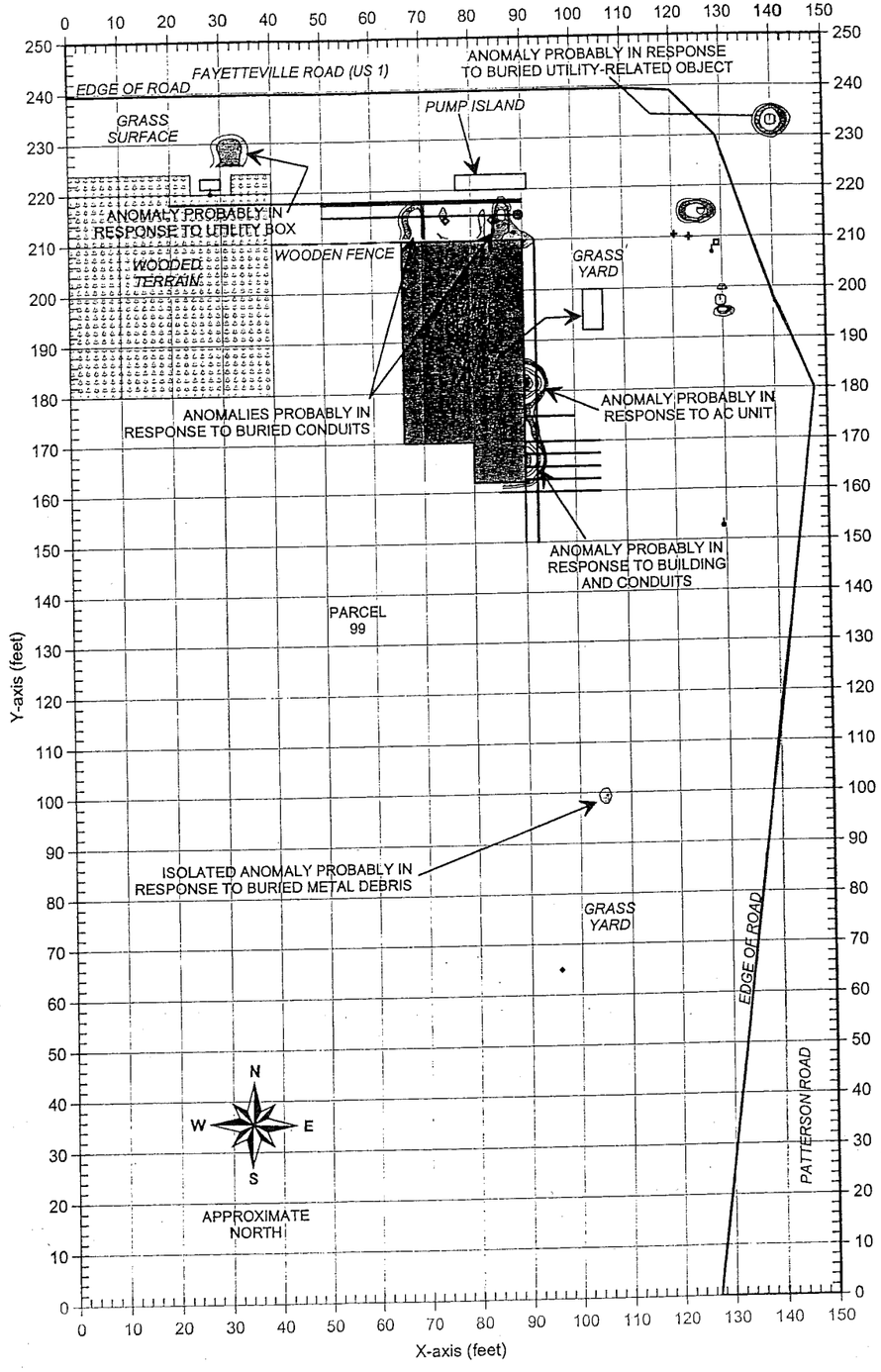
PHOTOS & GPR IMAGE OF UST LOCATIONS

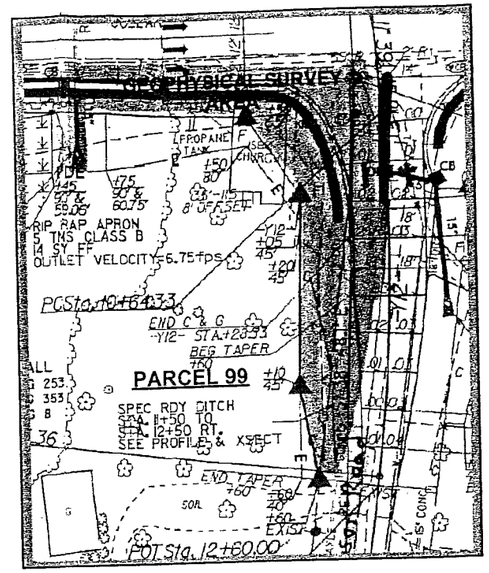
FIGURE 17

EM61 BOTTOM COIL RESULTS

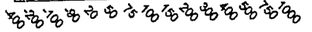


EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)



LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CANOPY POLE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- GPR SURVEY LINE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESULTS

FIGURE 18

DRAWING SCALE IN METERS

DRAWN	MJD		
DATE	11/26/05	DWG	2005-292

SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

LEON WALL PROPERTY (PARCEL 99)

ROCKINGHAM, NORTH CAROLINA

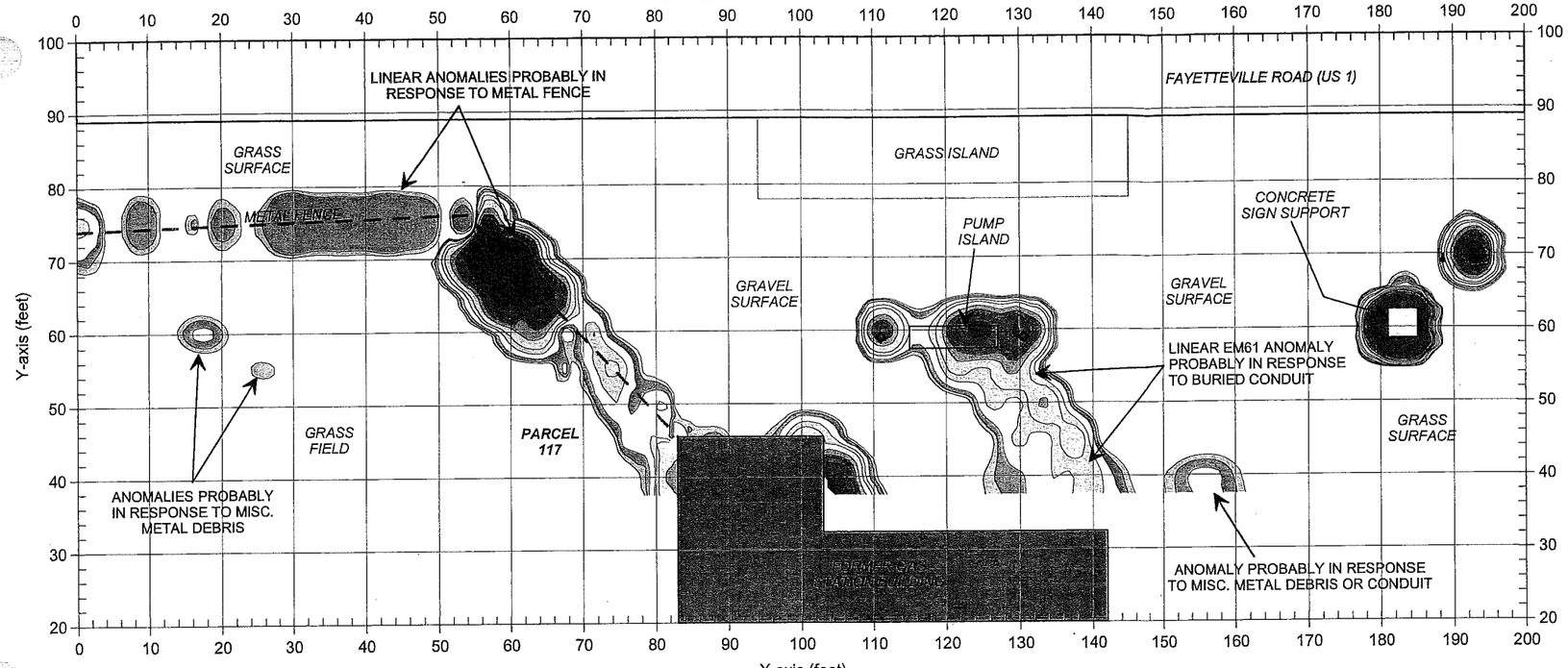
GEOPHYSICAL RESULTS

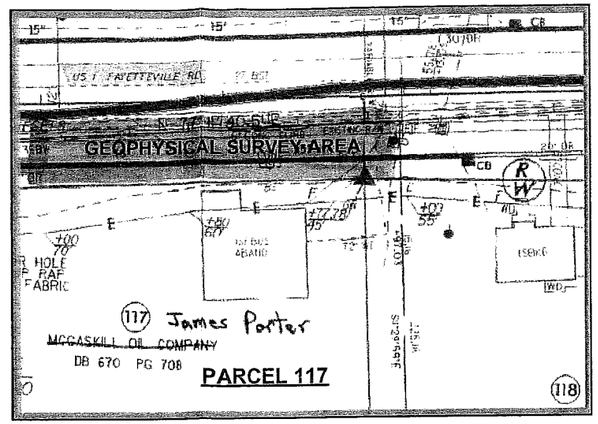
PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

EM61 METAL DETECTION RESULTS

FIGURE 19

EM61 BOTTOM COIL RESULTS



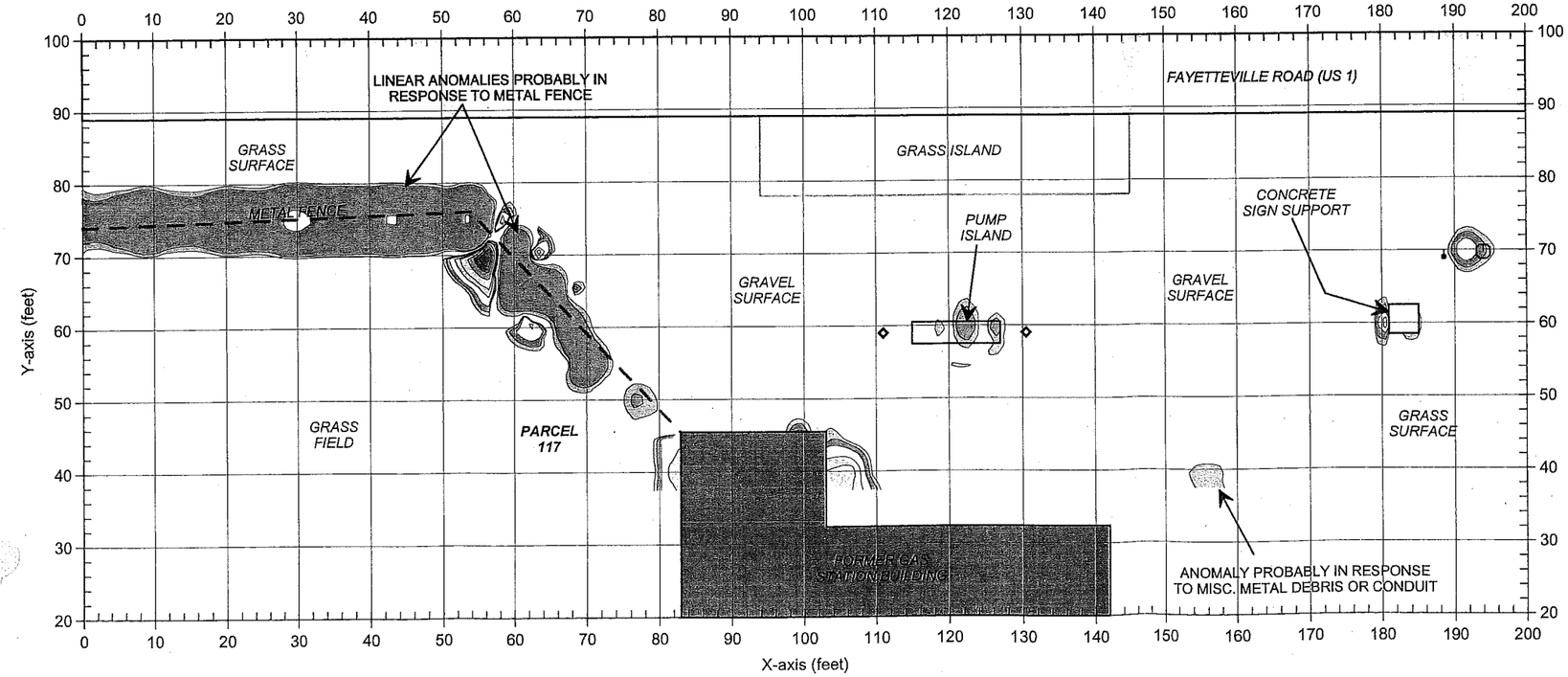


APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -80 -20 -60 -75 -100 -150 -200 -300 -400 -500 -750 -1000

EM61 DIFFERENTIAL RESULTS



LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- SUPPORT POLE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar surveys were not conducted at this site.

GRAPHIC SCALE IN METERS

DRAWN	CHKD	SOURCE
MJD		

DATE	LAY	DWG	J-NO.
11/26/05			2005-292

CLIENT	SITE	CITY	STATE
SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	JAMES PORTER PROPERTY (PARCEL 117)	ROCKINGHAM	NORTH CAROLINA

TITLE: GEOPHYSICAL RESULTS

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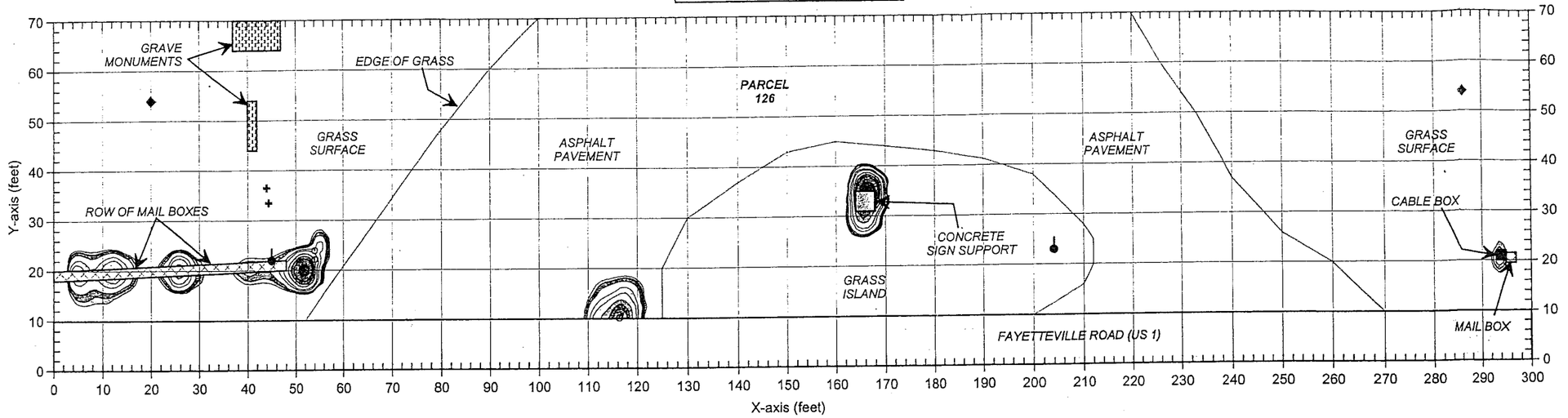
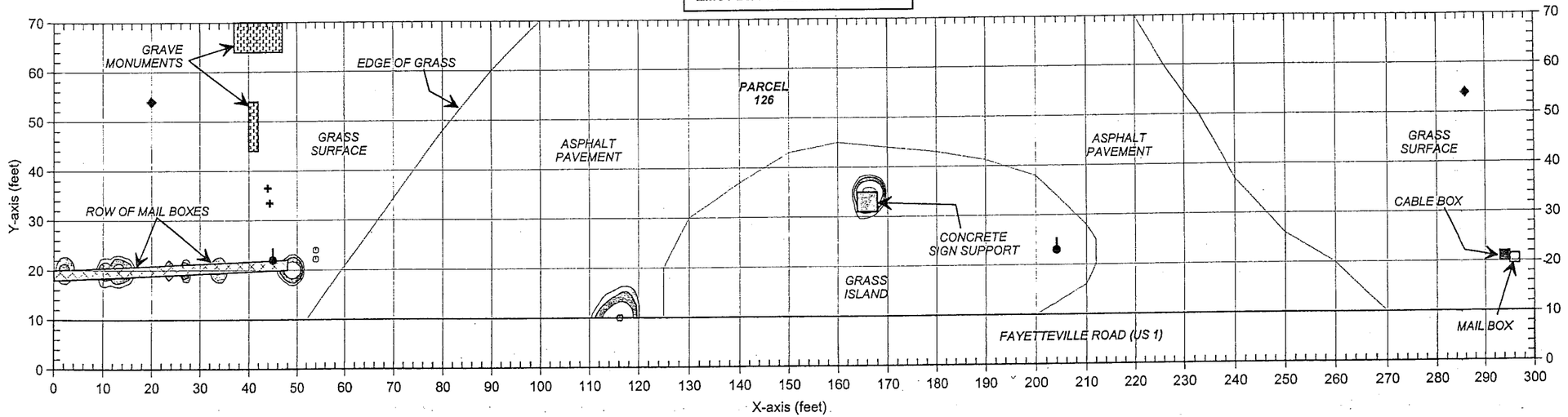
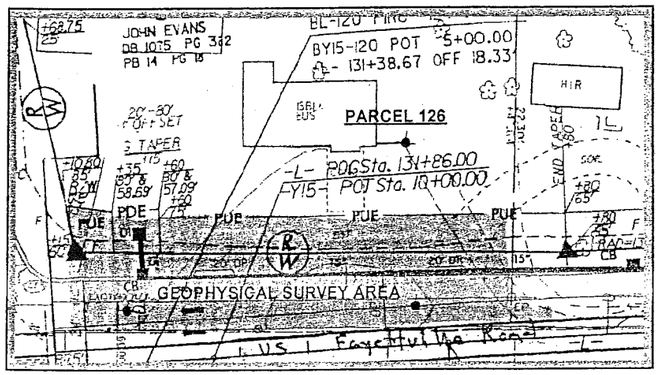
EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- RIGHT-OF-WAY MARKER
- UTILITY POLE
- WATER METER OR VALVE COVER
- SIGN POLE
- STORM SEWER GRATE
- TRAFFIC SIGN
- GUY WIRE

APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

1000, 750, 500, 400, 300, 200, 150, 100, 75, 60, 20, -90, -100, -200, -400

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data surveys were not conducted at this site

FIGURE 20

EM61
METAL DETECTION
RESULTS

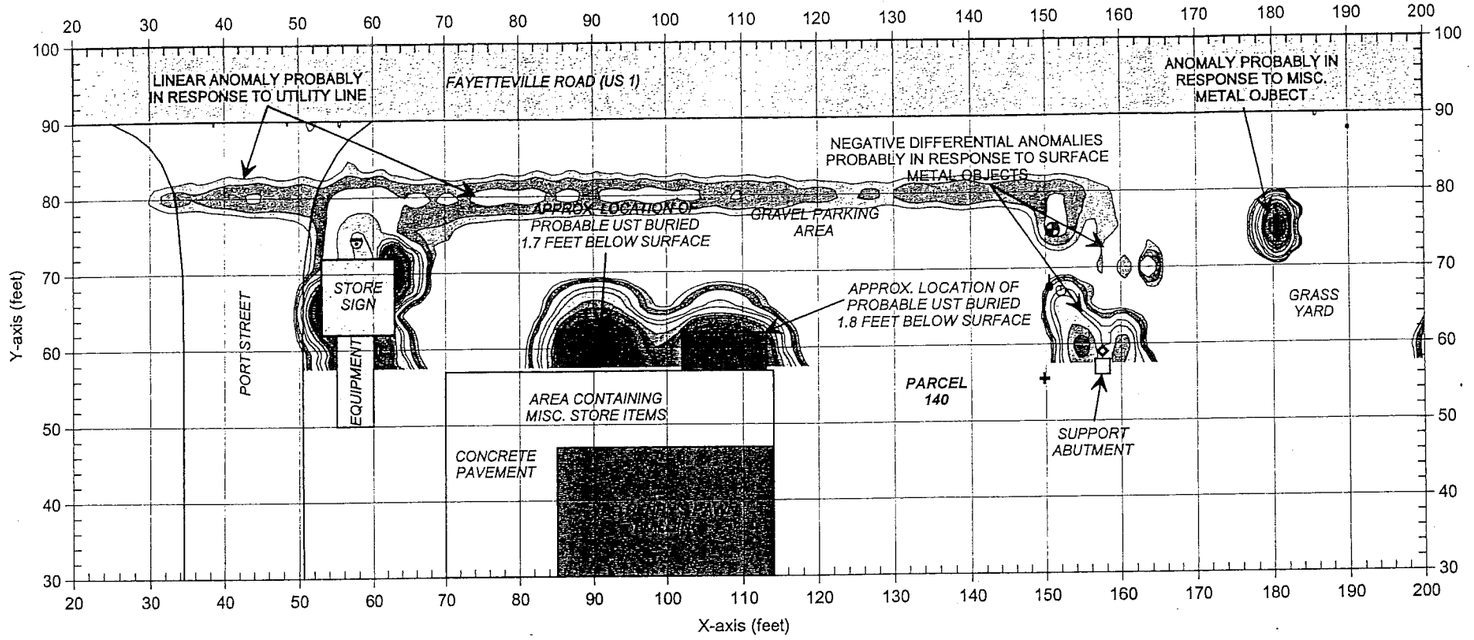
GRAPHIC SCALE IN METERS

DRAWN	CHKD	FIGURE
MJD		
DATE	LAY	DWG	JOB NO.
11/26/05			2005-292

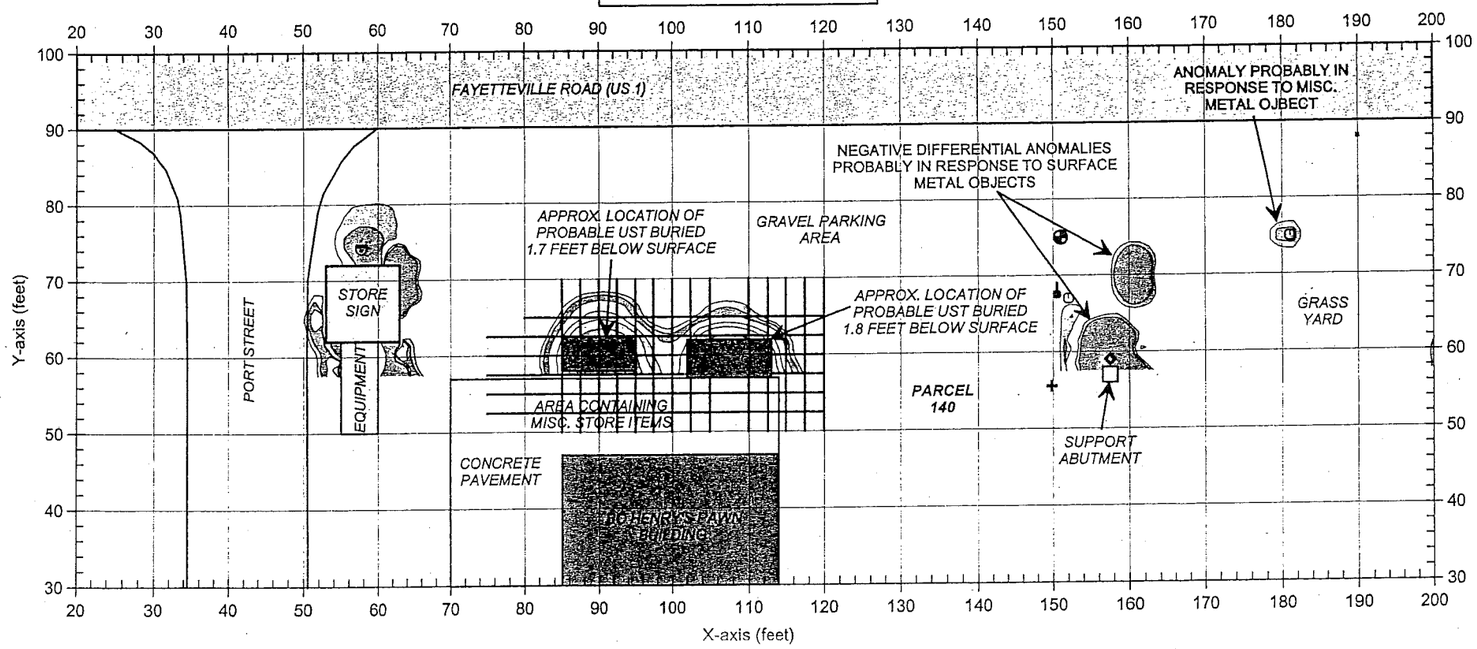
CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: JOHN EVANS PROPERTY (PARCEL 126)
CITY: ROCKINGHAM | STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

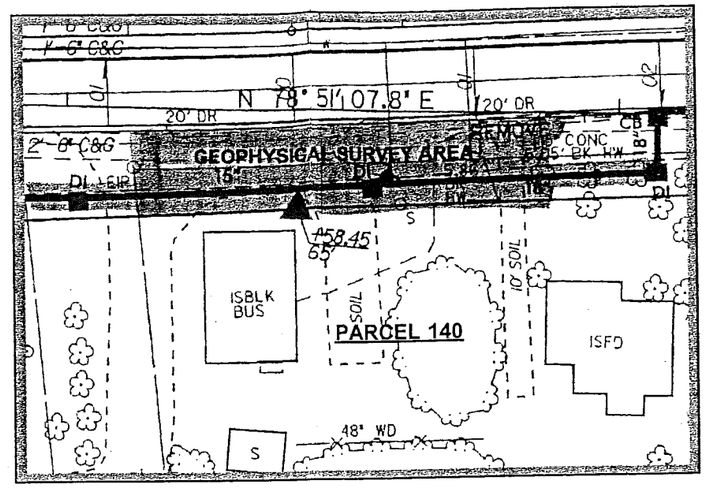
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -80 -20 -80 -75 -100 -150 -200 -300 -400 -500 -750 -1000

N
W E
S

APPROXIMATE NORTH

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- SIGN POLE
- STORM SEWER GRATE
- TRAFFIC SIGN
- FIBER OPTIC LINE SIGN
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESULTS

FIGURE 21

GRAPHIC SCALE IN METERS

DRAWN	MJD
CHKD	
DATE	11/25/05
LAY	
DWG	
JOB NO.	2005-292

SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

HENRY USSERY PROPERTY (PARCEL 140)

ROCKINGHAM, NORTH CAROLINA

GEOPHYSICAL RESULTS

PYRAMID
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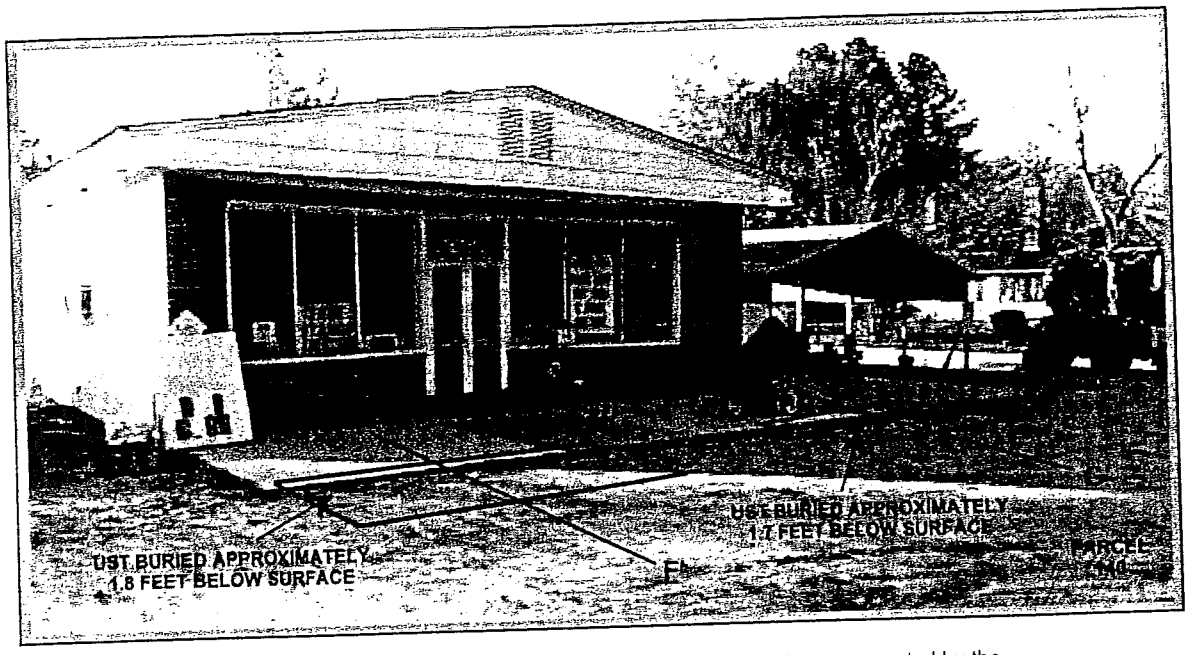
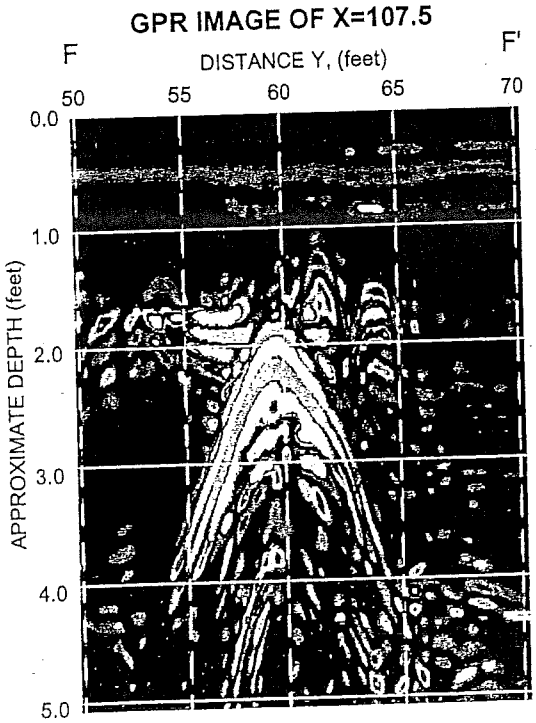
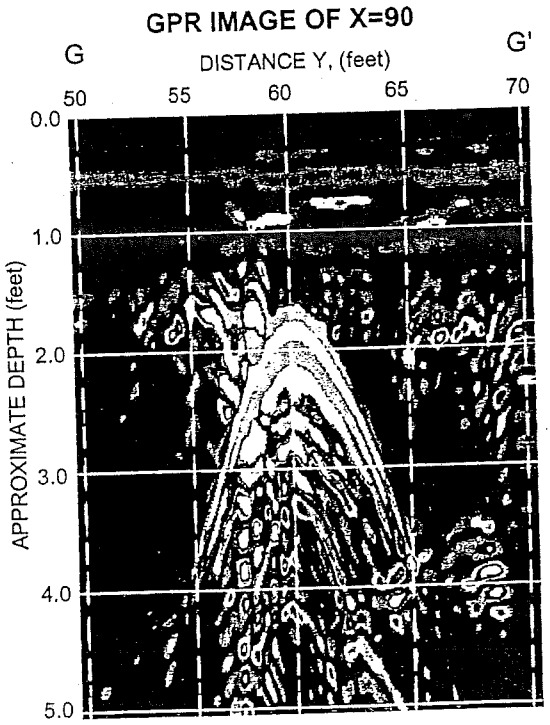


The photo shows the approximate locations of the two UST's, as suggested by the geophysical results at Parcel 140. The UST's appear to be approximately 1.8 and 1.7 feet below surface.





The GPR images obtained along survey lines X=107.5 and X=90 show the anomalies that are probably in response to the two UST's buried at Parcel 140. The GPR data suggest the UST's are buried approximately 1.8 feet and 1.7 feet below surface, respectively.

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	HENRY USSERY PROPERTY (PARCEL 140)		
CITY	ROCKINGHAM	STATE	NORTH CAROLINA
	GEOPHYSICAL RESULTS	NO	2005-292

PHOTO & GPR IMAGES OF UST LOCATIONS

FIGURE 22

APPENDIX C

BORING LOGS

Log of Soil Boring 117-1

Project: Rockingham Sites (Parcel 117) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 117-1

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 11/29/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* BH/SLW *Total Depth of Boring:* 8 feet

SUBSURFACE PROFILE			SAMPLE					
Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750) / FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0–1.5		*SP* Dry, brown, fine sand, some organic matter		MC	100	0		
1.5–2		*SP* Dry, tan, fine sand						
2–4		No recovery		MC	0	0		
4–6		*SP* Dry, tan, fine sand		MC	100	1		
6–8		*SC* Dry, tan, clayey fine sand		MC	100	1		
8 / 2.5		Boring terminated at 8 feet.						
15 / 4								

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Log of Soil Boring 117-2

Project: Rockingham Sites (Parcel 117) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 117-2

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 11/29/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH/SWL *Total Depth of Boring:* 8 feet

SUBSURFACE PROFILE			SAMPLE					
Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm: 250 500 750) / FID Field Screen (ppm: 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0 – 1	*SP*	Moist, brown, fine sand, some organic matter		MC	100	0		
1 – 2	*SP*	Moist, tan, fine sand						
2 – 3 / 1	*SP*	Moist, tan, fine sand		MC	100	0		
4 – 5	*SP*	Moist, tan and white, fine sand		MC	100	2		
6 – 7 / 2	*SP*	Moist, tan, red, orange and brown, fine sand		MC	100	0		
8 – 9		Boring terminated at 8 feet.						
10 / 3								
12								
13 / 4								
14								
15								

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Log of Soil Boring 117-3

Project: Rockingham Sites (Parcel 117) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 117-3

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 11/29/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH KW *Total Depth of Boring:* 8 feet

SUBSURFACE PROFILE			SAMPLE					
Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750) / FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0	SP	Dry, brown, fine sand, some organic matter		MC	100	1		
1	SP	Dry, tan, fine sand						
2	SC	Dry, tan/orange, clayey fine sand		MC	100	1		
3 / 1								
4	SC	Dry, tan/orange, clayey fine sand		MC	100	1		
5								
6	SC	Dry, tan/orange, clayey fine sand		MC	100	1		
7 / 2	SC	Dry, tan/white and maroon, clayey fine sand						
8		Boring terminated at 8 feet.						
9								
10 / 3								
11								
12								
13 / 4								
14								
15								

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Log of Soil Boring 117-4

Project: Rockingham Sites (Parcel 117) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 117-4

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 11/29/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Sean Jarvah *Checked By:* DH/SJH *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
		SUBSURFACE PROFILE	**SAMPLE**					
0 / 0		Ground Surface						
0–2 / 0–1	SP	Dry, brown, fine sand		MC	100	1		
2–4 / 1–2	SP	Dry, tan, fine sand		MC	100	1		
4–6 / 2–3	SP	Dry, tan, brown, and red, fine sand		MC	100	9		
6–8 / 2–3	SP	Dry, tan, fine to medium sand		MC	100	1		
8 / 3		Boring terminated at 8 feet.						

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Log of Soil Boring 117-5

Project: Rockingham Sites (Parcel 117) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 117-5

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 11/29/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* [illegible] *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750) / FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
		Ground Surface						
0 – 1	SP	Dry, brown, fine sand, with some organic matter		MC	75	1		
2	SP	Dry, tan, fine sand						
3 – 1	SP	Dry, tan, brown, and red, fine sand		MC	75	1		
4	SP	Dry, tan/orange, fine sand		MC	100	1		
6 – 2	SP	Dry, tan/orange, fine sand		MC	100	3		
8		Boring terminated at 8 feet.						
9								
10 – 3								
11								
12								
13 – 4								
14								
15								

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Log of Soil Boring 117-6

Project: Rockingham Sites (Parcel 117) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 117-6
Client: NCDOT
WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* 10.42' TOC
State Project # U-3456 *County:* Richmond *Stabilized Water Level:* 4.01 ' bgs
Drilling Method: Direct push *Boring Date:* 11/29/05 *Cave In Depth:* 10.5' bgs
Sampler Type: Macro Core
Logged By: Dan Hirth *Checked By:* *Total Depth of Boring:* 12 ft bgs

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen ppm (250 500 750) / FID Field Screen ppm (250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0 – 1	SP	Dry, tan, fine sand, with some asphalt		MC	100	1		
1 – 2	SC	Dry, tan, clayey fine sand						
2 – 3 / 1	SC	Dry, tan/orange, clayey fine sand, petroleum odor		MC	100	575		
4 – 5	SC	Wet, tan/orange, clayey fine sand, petroleum odor		MC	100	389		
6 – 7 / 2	SC	Wet, tan/orange, clayey fine sand, petroleum odor		MC	100	>1000		
8 – 9	SC	Wet, tan/orange, clayey fine sand, petroleum odor		MC	100	>1000		
9 – 10 / 3	SC	Wet, tan/orange, clayey fine sand, petroleum odor						
10 – 11	SC	Wet, tan/orange, clayey fine sand, petroleum odor		MC	100	>1000		
12		Boring terminated at 12 feet.						
13 – 14 / 4								
15								

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Log of Soil Boring 117-7

Project: Rockingham Sites (Parcel 117) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 117-7
Client: NCDOT
WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A
State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A
Drilling Method: Direct push *Boring Date:* 11/29/05 *Cave In Depth:* N/A
Sampler Type: Macro Core
Logged By: Dan Hirth *Checked By:* DH Scott *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750) / FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
		SUBSURFACE PROFILE	**SAMPLE**					
0 / 0		Ground Surface						
0–2 / 0–1	SP	Dry, tan, fine sand		MC	100	3		
2–4 / 1–2	SC	Dry, brown, clayey fine sand		MC	100	4		
4–6 / 2	SC	Dry, tan/orange, clayey fine sand		MC	100	3		
6–8 / 2–3	SP	Dry, tan/orange, fine to medium sand		MC	100	2		
8–15 / 3–4		Boring terminated at 8 feet.						

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Log of Soil Boring 117-8

Project: Rockingham Sites (Parcel 117) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 117-8

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 11/29/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH JWK *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm: 250 500 750) / FID Field Screen (ppm: 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0–2 / 0–1	SP	Dry, tan, fine sand		MC	100	1		
2–4 / 1	SP	Dry, tan, fine sand		MC	100	2		
4–6 / 1–2	SP	Dry, tan, fine sand		MC	100	1		
6–8 / 2	SP	Dry, tan, fine sand		MC	100	2		
8–15 / 3–4		Boring terminated at 8 feet.						

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Log of Soil Boring 117-9

Project: Rockingham Sites (Parcel 117) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 117-9

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 11/29/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Sean Jarvah *Checked By:* [illegible] *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0–1 / 0	SP	Dry, tan, fine sand		MC	100	2		
2–3 / 1	SC	Dry, tan, clayey fine sand		MC	100	1		
3–4 / 1	SP	Dry, tan, fine sand						
5 / 1	SP	Dry, tan, fine sand		MC	100	2		
6–7 / 2	SP	Dry, tan, fine sand, with petroleum odor		MC	100	5		
8 / 2		Boring terminated at 8 feet.						
10 / 3								
13 / 4								
15								

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Log of Soil Boring 117-10

Project: Rockingham Sites (Parcel 117) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 117-10

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 11/29/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Sean Jarvah *Checked By:* BH 1/3/06 *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0	SP	*SP* Dry, tan, fine sand, with some asphalt		MC	100	1		
1	SP	*SP* Dry, tan/orange, fine sand						
2	SP	*SP* Dry, tan, fine to coarse sand		MC	100	1		
3 / 1								
4	SC	*SC* Dry, tan and white, clayey fine sand		MC	100	1		
6	SC	*SC* Dry, tan and white, clayey fine sand		MC	100	2		
7 / 2								
8		Boring terminated at 8 feet.						
9								
10 / 3								
11								
12								
13 / 4								
14								
15								

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1101 Nowell Road
Raleigh, NC 27607
(919) 873-1060

Solutions-IES
Industrial & Environmental Services

Log of Soil Boring 117-11

Project: Rockingham Sites (Parcel 117) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 117-11

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 11/29/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Sean Jarvah *Checked By:* [illegible] *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm: 250 500 750) / FID Field Screen (ppm: 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0–2 / 0–1	SP	Dry, tan, fine sand, with some asphalt		MC	100	1		
2–4 / 1–1	SP	Dry, tan, fine sand		MC	100	1		
4–6 / 1–2	SP	Dry, tan, fine to coarse sand		MC	100	1		
6–8 / 2–3	SP	Dry, tan, fine to coarse sand		MC	100	2		
8–15 / 3–4		Boring terminated at 8 feet.						

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APPENDIX D

LABORATORY ANALYTICAL REPORTS

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Fax: 828.252.4618

December 15, 2005

Ms. Sheri Knox
Solutions-IES
1101 Nowell Road
Raleigh, NC 27607

RE: Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

Dear Ms. Knox:

Enclosed are the analytical results for sample(s) received by the laboratory on December 1, 2005. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Inorganic Wet Chemistry and Metals Analyses were performed at our Pace Asheville laboratory and Organic testing was performed at our Pace Charlotte laboratory unless otherwise footnoted.

If you have any questions concerning this report please feel free to contact me.

Sincerely,

Bonnie McKee

Bonnie McKee
Bonnie.McKee@pacelabs.com
Project Manager

Enclosures

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Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

Solid results are reported on a dry weight basis

Lab Sample No: 926398462 Project Sample Number: 92108541-001 Date Collected: 11/29/05 11:50
Client Sample ID: 117-6(6-8) Matrix: Soil Date Received: 12/01/05 13:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	11.7	%		12/01/05 16:29	TNS			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	690	mg/kg	110	12/09/05 15:53	KBS	68334-30-5		
n-Pentacosane (S)	0	%		12/09/05 15:53	KBS	629-99-2	1	
Date Extracted	12/06/05			12/06/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	720	mg/kg	48.	12/06/05 18:51	DHW			
4-Bromofluorobenzene (S)	112	%		12/06/05 18:51	DHW	460-00-4		

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Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

Lab Sample No: 926398470
Client Sample ID: 117-8(6-8)

Project Sample Number: 92108541-002
Matrix: Soil

Date Collected: 11/29/05 11:55
Date Received: 12/01/05 13:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	16.0	%		12/01/05 16:30	TNS			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	6.0	12/09/05 01:20	KBS	68334-30-5		
n-Pentacosane (S)	102	%		12/09/05 01:20	KBS	629-99-2		
Date Extracted	12/06/05			12/06/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	4.5	12/06/05 18:22	DHW			
4-Bromofluorobenzene (S)	74	%		12/06/05 18:22	DHW	460-00-4		

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Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

Lab Sample No: 926398488 Project Sample Number: 92108541-003 Date Collected: 11/29/05 12:00
Client Sample ID: 117-9(6-8) Matrix: Soil Date Received: 12/01/05 13:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	10.8	%		12/01/05 16:30	TNS			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	200	mg/kg	5.6	12/09/05 01:59	KBS	68334-30-5		
n-Pentacosane (S)	99	%		12/09/05 01:59	KBS	629-99-2		
Date Extracted	12/06/05			12/06/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	11.	mg/kg	4.0	12/06/05 06:36	DHW			
4-Bromofluorobenzene (S)	111	%		12/06/05 06:36	DHW	460-00-4		

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Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

Lab Sample No: 926398496
Client Sample ID: 117-10(6-8)

Project Sample Number: 92108541-004
Matrix: Soil

Date Collected: 11/29/05 12:05
Date Received: 12/01/05 13:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	17.6	%		12/01/05 16:30	TNS			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	6.1	12/08/05 23:24	KBS	68334-30-5		
n-Pentacosane (S)	111	%		12/08/05 23:24	KBS	629-99-2		
Date Extracted	12/06/05			12/06/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	4.9	12/06/05 08:06	DHW			
4-Bromofluorobenzene (S)	88	%		12/06/05 08:06	DHW	460-00-4		

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Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

Lab Sample No: 926398512
Client Sample ID: 117-11(6-8)

Project Sample Number: 92108541-005
Matrix: Soil

Date Collected: 11/29/05 12:10
Date Received: 12/01/05 13:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	10.6	%		12/01/05 16:30	TNS			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	5.6	12/09/05 00:03	KBS	68334-30-5		
n-Pentacosane (S)	108	%		12/09/05 00:03	KBS	629-99-2		
Date Extracted	12/06/05			12/06/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	4.7	12/06/05 08:36	DHW			
4-Bromofluorobenzene (S)	78	%		12/06/05 08:36	DHW	460-00-4		

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Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

Lab Sample No: 926398520 Project Sample Number: 92108541-006 Date Collected: 11/29/05 00:00
Client Sample ID: 117-6 Matrix: Water Date Received: 12/01/05 13:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
GC/MS Semivolatiles								
Extractables in Water by 625	Prep/Method: EPA 625 SF / EPA 625							
Acenaphthene	ND	ug/l	5.3	12/08/05 03:02	BET	83-32-9		
Acenaphthylene	ND	ug/l	5.3	12/08/05 03:02	BET	208-96-8		
Anthracene	ND	ug/l	5.3	12/08/05 03:02	BET	120-12-7		
Benzidine	ND	ug/l	53.	12/08/05 03:02	BET	92-87-5		
Benzo(k)fluoranthene	ND	ug/l	5.3	12/08/05 03:02	BET	207-08-9		
Benzo(b)fluoranthene	ND	ug/l	5.3	12/08/05 03:02	BET	205-99-2		
Benzo(a)anthracene	ND	ug/l	5.3	12/08/05 03:02	BET	56-55-3		
Benzo(g,h,i)perylene	ND	ug/l	5.3	12/08/05 03:02	BET	191-24-2		
Benzo(a)pyrene	ND	ug/l	5.3	12/08/05 03:02	BET	50-32-8		
4-Bromophenylphenyl ether	ND	ug/l	5.3	12/08/05 03:02	BET	101-55-3		
Butylbenzylphthalate	ND	ug/l	5.3	12/08/05 03:02	BET	85-68-7		
4-Chloro-3-methylphenol	ND	ug/l	5.3	12/08/05 03:02	BET	59-50-7		
bis(2-Chloroethoxy)methane	ND	ug/l	5.3	12/08/05 03:02	BET	111-91-1		
bis(2-Chloroethyl) ether	ND	ug/l	5.3	12/08/05 03:02	BET	111-44-4		
bis(2-Chloroisopropyl) ether	ND	ug/l	5.3	12/08/05 03:02	BET	39638-32-9		
2-Chloronaphthalene	ND	ug/l	5.3	12/08/05 03:02	BET	91-58-7		
2-Chlorophenol	ND	ug/l	5.3	12/08/05 03:02	BET	95-57-8		
4-Chlorophenylphenyl ether	ND	ug/l	5.3	12/08/05 03:02	BET	7005-72-3		
Chrysene	ND	ug/l	5.3	12/08/05 03:02	BET	218-01-9		
Dibenz(a,h)anthracene	ND	ug/l	5.3	12/08/05 03:02	BET	53-70-3		
1,2-Dichlorobenzene	ND	ug/l	5.3	12/08/05 03:02	BET	95-50-1		
1,3-Dichlorobenzene	ND	ug/l	5.3	12/08/05 03:02	BET	541-73-1		
1,4-Dichlorobenzene	ND	ug/l	5.3	12/08/05 03:02	BET	106-46-7		
3,3'-Dichlorobenzidine	ND	ug/l	11.	12/08/05 03:02	BET	91-94-1		
2,4-Dichlorophenol	ND	ug/l	5.3	12/08/05 03:02	BET	120-83-2		
Diethylphthalate	ND	ug/l	5.3	12/08/05 03:02	BET	84-66-2		
2,4-Dimethylphenol	ND	ug/l	5.3	12/08/05 03:02	BET	105-67-9		
Dimethylphthalate	ND	ug/l	5.3	12/08/05 03:02	BET	131-11-3		
Di-n-butylphthalate	5.8	ug/l	5.3	12/08/05 03:02	BET	84-74-2		
4,6-Dinitro-2-methylphenol	ND	ug/l	26.	12/08/05 03:02	BET	534-52-1		
2,4-Dinitrophenol	ND	ug/l	26.	12/08/05 03:02	BET	51-28-5		
2,4-Dinitrotoluene	ND	ug/l	5.3	12/08/05 03:02	BET	121-14-2		
2,6-Dinitrotoluene	ND	ug/l	5.3	12/08/05 03:02	BET	606-20-2		
Di-n-octylphthalate	ND	ug/l	5.3	12/08/05 03:02	BET	117-84-0		
bis(2-Ethylhexyl)phthalate	ND	ug/l	5.3	12/08/05 03:02	BET	117-81-7		
Fluoranthene	ND	ug/l	5.3	12/08/05 03:02	BET	206-44-0		
Fluorene	ND	ug/l	5.3	12/08/05 03:02	BET	86-73-7		

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Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

Lab Sample No: 926398520 Project Sample Number: 92108541-006 Date Collected: 11/29/05 00:00
Client Sample ID: 117-6 Matrix: Water Date Received: 12/01/05 13:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Hexachloro-1,3-butadiene	ND	ug/l	5.3	12/08/05 03:02	BET	87-68-3		
Hexachlorobenzene	ND	ug/l	5.3	12/08/05 03:02	BET	118-74-1		
Hexachlorocyclopentadiene	ND	ug/l	11.	12/08/05 03:02	BET	77-47-4		
Hexachloroethane	ND	ug/l	5.3	12/08/05 03:02	BET	67-72-1		
Indeno(1,2,3-cd)pyrene	ND	ug/l	5.3	12/08/05 03:02	BET	193-39-5		
Isophorone	ND	ug/l	5.3	12/08/05 03:02	BET	78-59-1		
Naphthalene	220	ug/l	26.	12/08/05 03:02	BET	91-20-3		
Nitrobenzene	ND	ug/l	5.3	12/08/05 03:02	BET	98-95-3		
2-Nitrophenol	ND	ug/l	5.3	12/08/05 03:02	BET	88-75-5		
4-Nitrophenol	ND	ug/l	26.	12/08/05 03:02	BET	100-02-7		
N-Nitrosodimethylamine	ND	ug/l	5.3	12/08/05 03:02	BET	62-75-9		
N-Nitroso-di-n-propylamine	ND	ug/l	5.3	12/08/05 03:02	BET	621-64-7		
N-Nitrosodiphenylamine	ND	ug/l	5.3	12/08/05 03:02	BET	86-30-6		
Pentachlorophenol	ND	ug/l	26.	12/08/05 03:02	BET	87-86-5		
Phenanthrene	ND	ug/l	5.3	12/08/05 03:02	BET	85-01-8		
Phenol	ND	ug/l	5.3	12/08/05 03:02	BET	108-95-2		
Pyrene	ND	ug/l	5.3	12/08/05 03:02	BET	129-00-0		
1,2,4-Trichlorobenzene	ND	ug/l	5.3	12/08/05 03:02	BET	120-82-1		
2,4,6-Trichlorophenol	ND	ug/l	5.3	12/08/05 03:02	BET	88-06-2		
Nitrobenzene-d5 (S)	60	%		12/08/05 03:02	BET	4165-60-0		
2-Fluorobiphenyl (S)	80	%		12/08/05 03:02	BET	321-60-8		
Terphenyl-d14 (S)	105	%		12/08/05 03:02	BET	1718-51-0		
Phenol-d5 (S)	34	%		12/08/05 03:02	BET	4165-62-2		
2-Fluorophenol (S)	32	%		12/08/05 03:02	BET	367-12-4		
2,4,6-Tribromophenol (S)	49	%		12/08/05 03:02	BET	118-79-6		
Date Extracted	12/06/05			12/06/05				
GC Volatiles								
Halogen. & Aromatic Vol. Orgs.	Method: EPA 601/602							
Benzene	13.	ug/l	1.0	12/07/05 23:58	PPM	71-43-2		
Bromodichloromethane	ND	ug/l	1.0	12/07/05 23:58	PPM	75-27-4		
Bromoform	ND	ug/l	1.0	12/07/05 23:58	PPM	75-25-2		
Bromomethane	ND	ug/l	1.0	12/07/05 23:58	PPM	74-83-9		
Carbon tetrachloride	ND	ug/l	1.0	12/07/05 23:58	PPM	56-23-5		
Chlorobenzene	ND	ug/l	1.0	12/07/05 23:58	PPM	108-90-7		
Chloroethane	ND	ug/l	1.0	12/07/05 23:58	PPM	75-00-3		
Chloroform	ND	ug/l	1.0	12/07/05 23:58	PPM	67-66-3		
Chloromethane	ND	ug/l	2.0	12/07/05 23:58	PPM	74-87-3		
Dibromochloromethane	ND	ug/l	1.0	12/07/05 23:58	PPM	124-48-1		

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Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

Lab Sample No: 926398520
Client Sample ID: 117-6

Project Sample Number: 92108541-006
Matrix: Water

Date Collected: 11/29/05 00:00
Date Received: 12/01/05 13:15

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
1,2-Dichlorobenzene	ND	ug/l	1.0	12/07/05 23:58	PPM	95-50-1		
1,3-Dichlorobenzene	ND	ug/l	1.0	12/07/05 23:58	PPM	541-73-1		
1,4-Dichlorobenzene	ND	ug/l	1.0	12/07/05 23:58	PPM	106-46-7		
Dichlorodifluoromethane	ND	ug/l	1.0	12/07/05 23:58	PPM	75-71-8		
1,1-Dichloroethane	ND	ug/l	1.0	12/07/05 23:58	PPM	75-34-3		
1,2-Dichloroethane	ND	ug/l	1.0	12/07/05 23:58	PPM	107-06-2		
1,1-Dichloroethene	ND	ug/l	1.0	12/07/05 23:58	PPM	75-35-4		
trans-1,2-Dichloroethene	ND	ug/l	1.0	12/07/05 23:58	PPM	156-60-5		
1,2-Dichloropropane	ND	ug/l	1.0	12/07/05 23:58	PPM	78-87-5		
cis-1,3-Dichloropropene	ND	ug/l	1.0	12/07/05 23:58	PPM	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/l	1.0	12/07/05 23:58	PPM	10061-02-6		
Diisopropyl ether	ND	ug/l	1.0	12/07/05 23:58	PPM	108-20-3		
Ethylbenzene	380	ug/l	25.	12/07/05 23:58	PPM	100-41-4		
Methylene chloride	ND	ug/l	2.0	12/07/05 23:58	PPM	75-09-2		
Methyl-tert-butyl ether	ND	ug/l	1.0	12/07/05 23:58	PPM	1634-04-4		
1,1,2,2-Tetrachloroethane	ND	ug/l	1.0	12/07/05 23:58	PPM	79-34-5		
Tetrachloroethene	ND	ug/l	1.0	12/07/05 23:58	PPM	127-18-4		
Toluene	1200	ug/l	25.	12/07/05 23:58	PPM	108-88-3		
1,1,1-Trichloroethane	ND	ug/l	1.0	12/07/05 23:58	PPM	71-55-6		
1,1,2-Trichloroethane	ND	ug/l	1.0	12/07/05 23:58	PPM	79-00-5		
Trichloroethene	ND	ug/l	1.0	12/07/05 23:58	PPM	79-01-6		
Trichlorofluoromethane	ND	ug/l	1.0	12/07/05 23:58	PPM	75-69-4		
Vinyl chloride	ND	ug/l	1.0	12/07/05 23:58	PPM	75-01-4		
Xylene (Total)	2400	ug/l	1.0	12/07/05 23:58	PPM	1330-20-7		
m&p-Xylene	1600	ug/l	50.	12/07/05 23:58	PPM			
o-Xylene	800	ug/l	25.	12/07/05 23:58	PPM	95-47-6		
1-Chloro-3-fluorobenzene (S)	102	%		12/07/05 23:58	PPM	625-98-9		
VPH in Water by Mass. Method	Method: VPH							
Aliphatic (C05-C08)	2700	ug/l	1000	12/08/05 13:55	DHW			
Aliphatic (C09-C12)	9500	ug/l	1000	12/08/05 13:55	DHW			
Aromatic (C09-C10)	4200	ug/l	1000	12/08/05 13:55	DHW			
2,5-Dibromotoluene (FID)(S)	94	%		12/08/05 13:55	DHW			
2,5-Dibromotoluene (PID)(S)	114	%		12/08/05 13:55	DHW			

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Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

PARAMETER FOOTNOTES

Method 9071B modified to use ASE.

All pH, Free Chlorine, Total Chlorine and Ferrous Iron analyses conducted outside of EPA recommended immediate hold time.

Depending on the moisture content the PRLs can be elevated for all soil samples reported on a dry weight basis.

2-Chloroethyl vinyl ether has been shown to degrade in the presence of acid.

ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
(S)	Surrogate
[1]	Surrogate standards were not recovered due to sample dilution.

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QUALITY CONTROL DATA

Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

QC Batch: 144394
QC Batch Method: EPA 3545
Analysis Method: EPA 8015
Analysis Description: TPH in Soil by 3545/8015
Associated Lab Samples: 926398462 926398470 926398488 926398496 926398512

METHOD BLANK: 926413055
Associated Lab Samples: 926398462 926398470 926398488 926398496 926398512

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Diesel Fuel	mg/kg	ND	5.0	
n-Pentacosane (S)	%	88		

LABORATORY CONTROL SAMPLE: 926413063

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Diesel Fuel	mg/kg	166.70	143.9	86	
n-Pentacosane (S)				116	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 926413071 926413089

Parameter	Units	926398934 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
Diesel Fuel	mg/kg	2.124	172.30	144.5	131.5	83	75	9	
n-Pentacosane (S)						120	110		

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QUALITY CONTROL DATA

Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

QC Batch: 144144
QC Batch Method: VPH
Associated Lab Samples: 926398520

Analysis Method: VPH
Analysis Description: VPH in Water by Mass. Method

METHOD BLANK: 926402231
Associated Lab Samples: 926398520

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Aliphatic (C05-C08)	ug/l	ND	100	
Aliphatic (C09-C12)	ug/l	ND	100	
Aromatic (C09-C10)	ug/l	ND	100	
2,5-Dibromotoluene (FID)(S)	%	106		
2,5-Dibromotoluene (PID)(S)	%	108		

LABORATORY CONTROL SAMPLE: 926402249

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Aliphatic (C05-C08)	ug/l	400.00	486.3	122	
Aliphatic (C09-C12)	ug/l	100.00	118.8	119	
Aromatic (C09-C10)	ug/l	100.00	106.2	106	
2,5-Dibromotoluene (FID)(S)				103	
2,5-Dibromotoluene (PID)(S)				112	

SAMPLE DUPLICATE: 926402264

Parameter	Units	926399171 Result	DUP Result	RPD	Footnotes
Aliphatic (C05-C08)	ug/l	ND	ND	NC	
Aliphatic (C09-C12)	ug/l	ND	ND	NC	
Aromatic (C09-C10)	ug/l	ND	ND	NC	
2,5-Dibromotoluene (FID)(S)	%	106	107		
2,5-Dibromotoluene (PID)(S)	%	111	109		

Date: 12/15/05

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QUALITY CONTROL DATA

Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

QC Batch: 144145
QC Batch Method: EPA 8015
Analysis Method: EPA 8015
Analysis Description: GAS, Soil, North Carolina
Associated Lab Samples: 926398462 926398470 926398488 926398496 926398512

METHOD BLANK: 926402280
Associated Lab Samples: 926398462 926398470 926398488 926398496 926398512

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Gasoline	mg/kg	ND	5.0	
4-Bromofluorobenzene (S)	%	72		

LABORATORY CONTROL SAMPLE: 926402298

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Gasoline	mg/kg	25.00	27.64	111	
4-Bromofluorobenzene (S)				74	

MATRIX SPIKE: 926402306

Parameter	Units	926400300 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
Gasoline	mg/kg	1.154	30.64	38.17	121	
4-Bromofluorobenzene (S)					76	

SAMPLE DUPLICATE: 926402314

Parameter	Units	926400318 Result	DUP Result	RPD	Footnotes
Gasoline	mg/kg	6.300	8.900	34	1
4-Bromofluorobenzene (S)	%	96	111		

Date: 12/15/05

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QUALITY CONTROL DATA

Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

QC Batch: 144456
QC Batch Method: EPA 601/602
Associated Lab Samples: 926398520

Analysis Method: EPA 601/602
Analysis Description: Halogen. & Aromatic Vol. Orgs.

METHOD BLANK: 926415340
Associated Lab Samples: 926398520

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Benzene	ug/l	ND	1.0	
Bromodichloromethane	ug/l	ND	1.0	
Bromoform	ug/l	ND	1.0	
Bromomethane	ug/l	ND	1.0	
Carbon tetrachloride	ug/l	ND	1.0	
Chlorobenzene	ug/l	ND	1.0	
Chloroethane	ug/l	ND	1.0	
Chloroform	ug/l	ND	1.0	
Chloromethane	ug/l	ND	2.0	
Dibromochloromethane	ug/l	ND	1.0	
1,2-Dichlorobenzene	ug/l	ND	1.0	
1,3-Dichlorobenzene	ug/l	ND	1.0	
1,4-Dichlorobenzene	ug/l	ND	1.0	
Dichlorodifluoromethane	ug/l	ND	1.0	
1,1-Dichloroethane	ug/l	ND	1.0	
1,2-Dichloroethane	ug/l	ND	1.0	
1,1-Dichloroethene	ug/l	ND	1.0	
trans-1,2-Dichloroethene	ug/l	ND	1.0	
1,2-Dichloropropane	ug/l	ND	1.0	
cis-1,3-Dichloropropene	ug/l	ND	1.0	
trans-1,3-Dichloropropene	ug/l	ND	1.0	
Diisopropyl ether	ug/l	ND	1.0	
Ethylbenzene	ug/l	ND	1.0	
Methylene chloride	ug/l	ND	2.0	
Methyl-tert-butyl ether	ug/l	ND	1.0	
1,1,2,2-Tetrachloroethane	ug/l	ND	1.0	
Tetrachloroethene	ug/l	ND	1.0	
Toluene	ug/l	ND	1.0	
1,1,1-Trichloroethane	ug/l	ND	1.0	
1,1,2-Trichloroethane	ug/l	ND	1.0	
Trichloroethene	ug/l	ND	1.0	

Date: 12/15/05

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QUALITY CONTROL DATA

Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

METHOD BLANK: 926415340
Associated Lab Samples: 926398520

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Trichlorofluoromethane	ug/l	ND	1.0	
Vinyl chloride	ug/l	ND	1.0	
Xylene (Total)	ug/l	ND	1.0	
m&p-Xylene	ug/l	ND	2.0	
o-Xylene	ug/l	ND	1.0	
1-Chloro-3-fluorobenzene (S)	%	100		

LABORATORY CONTROL SAMPLE: 926415357

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Benzene	ug/l	20.00	20.79	104	
Bromodichloromethane	ug/l	20.00	21.00	105	
Bromoform	ug/l	20.00	16.88	84	
Bromomethane	ug/l	20.00	24.63	123	
Carbon tetrachloride	ug/l	20.00	17.66	88	
Chlorobenzene	ug/l	20.00	19.71	99	
Chloroethane	ug/l	20.00	18.57	93	
Chloroform	ug/l	20.00	17.74	89	
Chloromethane	ug/l	20.00	23.35	117	
Dibromochloromethane	ug/l	20.00	19.65	98	
1,2-Dichlorobenzene	ug/l	20.00	20.25	101	
1,3-Dichlorobenzene	ug/l	20.00	19.88	99	
1,4-Dichlorobenzene	ug/l	20.00	19.97	100	
Dichlorodifluoromethane	ug/l	20.00	23.12	116	
1,1-Dichloroethane	ug/l	20.00	18.71	94	
1,2-Dichloroethane	ug/l	20.00	13.27	66	
1,1-Dichloroethene	ug/l	20.00	19.47	97	
trans-1,2-Dichloroethene	ug/l	20.00	17.27	86	
1,2-Dichloropropane	ug/l	20.00	20.76	104	
cis-1,3-Dichloropropene	ug/l	20.00	19.66	98	
trans-1,3-Dichloropropene	ug/l	20.00	18.52	93	
Diisopropyl ether	ug/l	20.00	20.34	102	
Ethylbenzene	ug/l	20.00	21.43	107	
Methylene chloride	ug/l	20.00	21.59	108	

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QUALITY CONTROL DATA

Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

LABORATORY CONTROL SAMPLE: 926415357

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Methyl-tert-butyl ether	ug/l	20.00	20.36	102	
1,1,2,2-Tetrachloroethane	ug/l	20.00	18.84	94	
Tetrachloroethene	ug/l	20.00	19.90	100	
Toluene	ug/l	20.00	20.74	104	
1,1,1-Trichloroethane	ug/l	20.00	16.81	84	
1,1,2-Trichloroethane	ug/l	20.00	20.37	102	
Trichloroethene	ug/l	20.00	22.15	111	
Trichlorofluoromethane	ug/l	20.00	17.38	87	
Vinyl chloride	ug/l	20.00	20.90	104	
Xylene (Total)	ug/l	60.00	62.43	104	
m&p-Xylene	ug/l	40.00	42.37	106	
o-Xylene	ug/l	20.00	20.06	100	
1-Chloro-3-fluorobenzene (S)				100	

MATRIX SPIKE: 926415365

Parameter	Units	926397522 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
Benzene	ug/l	0	20.00	20.52	103	
Bromodichloromethane	ug/l	0	20.00	21.39	107	
Bromoform	ug/l	0	20.00	20.78	104	
Bromomethane	ug/l	0	20.00	22.96	115	
Carbon tetrachloride	ug/l	0	20.00	20.55	103	
Chlorobenzene	ug/l	0	20.00	18.98	95	
Chloroethane	ug/l	0	20.00	18.41	92	
Chloroform	ug/l	0	20.00	19.71	99	
Chloromethane	ug/l	0	20.00	22.92	115	
Dibromochloromethane	ug/l	0	20.00	19.66	98	
1,2-Dichlorobenzene	ug/l	0	20.00	19.20	96	
1,3-Dichlorobenzene	ug/l	0	20.00	19.05	95	
1,4-Dichlorobenzene	ug/l	0	20.00	19.15	96	
Dichlorodifluoromethane	ug/l	0	20.00	21.69	108	
1,1-Dichloroethane	ug/l	0	20.00	18.94	95	
1,2-Dichloroethane	ug/l	3.004	20.00	23.48	102	
1,1-Dichloroethene	ug/l	0	20.00	19.51	98	
trans-1,2-Dichloroethene	ug/l	0	20.00	17.11	86	

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QUALITY CONTROL DATA

Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

MATRIX SPIKE: 926415365

Parameter	Units	926397522 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
1,2-Dichloropropane	ug/l	0	20.00	22.28	111	
cis-1,3-Dichloropropene	ug/l	0	20.00	18.36	92	
trans-1,3-Dichloropropene	ug/l	0	20.00	19.29	96	
Diisopropyl ether	ug/l	8.682	20.00	28.70	100	
Ethylbenzene	ug/l	0	20.00	20.78	104	
Methylene chloride	ug/l	0	20.00	19.83	99	
Methyl-tert-butyl ether	ug/l	11.91	20.00	32.28	102	
1,1,2,2-Tetrachloroethane	ug/l	0	20.00	19.18	96	
Tetrachloroethene	ug/l	0	20.00	19.90	100	
Toluene	ug/l	0	20.00	19.81	99	
1,1,1-Trichloroethane	ug/l	0	20.00	20.00	100	
1,1,2-Trichloroethane	ug/l	0	20.00	19.49	98	
Trichloroethene	ug/l	0	20.00	21.96	110	
Trichlorofluoromethane	ug/l	0	20.00	18.10	90	
Vinyl chloride	ug/l	0	20.00	20.92	105	
Xylene (Total)	ug/l	0	60.00	60.28	100	
m&p-Xylene	ug/l	0	40.00	41.02	102	
o-Xylene	ug/l	0	20.00	19.26	96	
1-Chloro-3-fluorobenzene (S)					105	

MATRIX SPIKE: 926415381

Parameter	Units	926413022 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
Benzene	ug/l	0	20.00	19.12	96	
Bromodichloromethane	ug/l	0	20.00	20.45	102	
Bromoform	ug/l	0	20.00	19.55	98	
Bromomethane	ug/l	0	20.00	17.14	86	
Carbon tetrachloride	ug/l	0	20.00	20.82	104	
Chlorobenzene	ug/l	0	20.00	19.83	99	
Chloroethane	ug/l	0	20.00	18.27	91	
Chloroform	ug/l	0	20.00	20.11	100	
Chloromethane	ug/l	0	20.00	22.55	113	
Dibromochloromethane	ug/l	0	20.00	18.74	94	
1,2-Dichlorobenzene	ug/l	0	20.00	20.09	100	
1,3-Dichlorobenzene	ug/l	0	20.00	18.82	94	

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QUALITY CONTROL DATA

Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

MATRIX SPIKE: 926415381

Parameter	Units	926413022 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
1,4-Dichlorobenzene	ug/l	0	20.00	19.87	99	
Dichlorodifluoromethane	ug/l	0	20.00	21.47	107	
1,1-Dichloroethane	ug/l	0	20.00	20.80	104	
1,2-Dichloroethane	ug/l	0	20.00	21.59	108	
1,1-Dichloroethene	ug/l	0	20.00	20.28	101	
trans-1,2-Dichloroethene	ug/l	0	20.00	18.47	92	
1,2-Dichloropropane	ug/l	0	20.00	20.09	100	
cis-1,3-Dichloropropene	ug/l	0	20.00	17.12	86	
trans-1,3-Dichloropropene	ug/l	0	20.00	16.84	84	
Diisopropyl ether	ug/l	0	20.00	20.52	103	
Ethylbenzene	ug/l	0	20.00	21.84	109	
Methylene chloride	ug/l	0	20.00	20.77	104	
Methyl-tert-butyl ether	ug/l	0	20.00	20.47	102	
1,1,2,2-Tetrachloroethane	ug/l	0	20.00	19.95	100	
Tetrachloroethene	ug/l	0	20.00	18.78	94	
Toluene	ug/l	0	20.00	21.14	106	
1,1,1-Trichloroethane	ug/l	0	20.00	18.10	90	
1,1,2-Trichloroethane	ug/l	0	20.00	19.73	99	
Trichloroethene	ug/l	0	20.00	23.54	118	
Trichlorofluoromethane	ug/l	0	20.00	18.92	95	
Vinyl chloride	ug/l	0	20.00	20.98	105	
Xylene (Total)	ug/l	0	60.00	63.84	106	
m&p-Xylene	ug/l	0	40.00	43.08	108	
o-Xylene	ug/l	0	20.00	20.76	104	
1-Chloro-3-fluorobenzene (S)					101	

SAMPLE DUPLICATE: 926415373

Parameter	Units	926394412 Result	DUP Result	RPD	Footnotes
Benzene	ug/l	ND	ND	NC	
Bromodichloromethane	ug/l	ND	ND	NC	
Bromoform	ug/l	ND	ND	NC	
Bromomethane	ug/l	ND	ND	NC	
Carbon tetrachloride	ug/l	ND	ND	NC	
Chlorobenzene	ug/l	ND	ND	NC	

Date: 12/15/05

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Phone: 828.254.7176
Fax: 828.252.4618

QUALITY CONTROL DATA

Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

SAMPLE DUPLICATE: 926415373

Parameter	Units	926394412 Result	DUP Result	RPD	Footnotes
Chloroethane	ug/l	ND	ND	NC	
Chloroform	ug/l	ND	ND	NC	
Chloromethane	ug/l	ND	ND	NC	
Dibromochloromethane	ug/l	ND	ND	NC	
1,2-Dichlorobenzene	ug/l	ND	ND	NC	
1,3-Dichlorobenzene	ug/l	ND	ND	NC	
1,4-Dichlorobenzene	ug/l	ND	ND	NC	
Dichlorodifluoromethane	ug/l	ND	ND	NC	
1,1-Dichloroethane	ug/l	ND	ND	NC	
1,2-Dichloroethane	ug/l	ND	ND	NC	
1,1-Dichloroethene	ug/l	ND	ND	NC	
trans-1,2-Dichloroethene	ug/l	ND	ND	NC	
1,2-Dichloropropane	ug/l	ND	ND	NC	
cis-1,3-Dichloropropene	ug/l	ND	ND	NC	
trans-1,3-Dichloropropene	ug/l	ND	ND	NC	
Diisopropyl ether	ug/l	ND	ND	NC	
Ethylbenzene	ug/l	ND	ND	NC	
Methylene chloride	ug/l	ND	ND	NC	
Methyl-tert-butyl ether	ug/l	ND	ND	NC	
1,1,2,2-Tetrachloroethane	ug/l	ND	ND	NC	
Tetrachloroethene	ug/l	ND	ND	NC	
Toluene	ug/l	ND	1.200	0	
1,1,1-Trichloroethane	ug/l	ND	ND	NC	
1,1,2-Trichloroethane	ug/l	ND	ND	NC	
Trichloroethene	ug/l	ND	ND	NC	
Trichlorofluoromethane	ug/l	ND	ND	NC	
Vinyl chloride	ug/l	ND	ND	NC	
Xylene (Total)	ug/l	ND	ND	NC	
m&p-Xylene	ug/l	ND	ND	NC	
o-Xylene	ug/l	ND	ND	NC	
1-Chloro-3-fluorobenzene (S)	%	100	99		

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QUALITY CONTROL DATA

Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

QC Batch: 144371
QC Batch Method: EPA 625 SF
Associated Lab Samples: 926398520

Analysis Method: EPA 625
Analysis Description: Extractables in Water by 625

METHOD BLANK: 926412099
Associated Lab Samples: 926398520

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Acenaphthene	ug/l	ND	5.0	
Acenaphthylene	ug/l	ND	5.0	
Anthracene	ug/l	ND	5.0	
Benzidine	ug/l	ND	50.	
Benzo(k)fluoranthene	ug/l	ND	5.0	
Benzo(b)fluoranthene	ug/l	ND	5.0	
Benzo(a)anthracene	ug/l	ND	5.0	
Benzo(g,h,i)perylene	ug/l	ND	5.0	
Benzo(a)pyrene	ug/l	ND	5.0	
4-Bromophenylphenyl ether	ug/l	ND	5.0	
tylbenzylphthalate	ug/l	ND	5.0	
-Chloro-3-methylphenol	ug/l	ND	5.0	
bis(2-Chloroethoxy)methane	ug/l	ND	5.0	
bis(2-Chloroethyl) ether	ug/l	ND	5.0	
bis(2-Chloroisopropyl) ether	ug/l	ND	5.0	
2-Chloronaphthalene	ug/l	ND	5.0	
2-Chlorophenol	ug/l	ND	5.0	
4-Chlorophenylphenyl ether	ug/l	ND	5.0	
Chrysene	ug/l	ND	5.0	
Dibenz(a,h)anthracene	ug/l	ND	5.0	
1,2-Dichlorobenzene	ug/l	ND	5.0	
1,3-Dichlorobenzene	ug/l	ND	5.0	
1,4-Dichlorobenzene	ug/l	ND	5.0	
3,3'-Dichlorobenzidine	ug/l	ND	10.	
2,4-Dichlorophenol	ug/l	ND	5.0	
Diethylphthalate	ug/l	ND	5.0	
2,4-Dimethylphenol	ug/l	ND	5.0	
Dimethylphthalate	ug/l	ND	5.0	
Di-n-butylphthalate	ug/l	ND	5.0	
4,6-Dinitro-2-methylphenol	ug/l	ND	25.	
2,4-Dinitrophenol	ug/l	ND	25.	

Date: 12/15/05

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QUALITY CONTROL DATA

Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

METHOD BLANK: 926412099
Associated Lab Samples: 926398520

Parameter	Units	Blank Result	Reporting Limit	Footnotes
2,4-Dinitrotoluene	ug/l	ND	5.0	
2,6-Dinitrotoluene	ug/l	ND	5.0	
Di-n-octylphthalate	ug/l	ND	5.0	
bis(2-Ethylhexyl)phthalate	ug/l	ND	5.0	
Fluoranthene	ug/l	ND	5.0	
Fluorene	ug/l	ND	5.0	
Hexachloro-1,3-butadiene	ug/l	ND	5.0	
Hexachlorobenzene	ug/l	ND	5.0	
Hexachlorocyclopentadiene	ug/l	ND	10.	
Hexachloroethane	ug/l	ND	5.0	
Indeno(1,2,3-cd)pyrene	ug/l	ND	5.0	
Isophorone	ug/l	ND	5.0	
Naphthalene	ug/l	ND	5.0	
Nitrobenzene	ug/l	ND	5.0	
2-Nitrophenol	ug/l	ND	5.0	
4-Nitrophenol	ug/l	ND	25.	
N-Nitrosodimethylamine	ug/l	ND	5.0	
N-Nitroso-di-n-propylamine	ug/l	ND	5.0	
N-Nitrosodiphenylamine	ug/l	ND	5.0	
Pentachlorophenol	ug/l	ND	25.	
Phenanthrene	ug/l	ND	5.0	
Phenol	ug/l	ND	5.0	
Pyrene	ug/l	ND	5.0	
1,2,4-Trichlorobenzene	ug/l	ND	5.0	
2,4,6-Trichlorophenol	ug/l	ND	5.0	
Nitrobenzene-d5 (S)	%	60		
2-Fluorobiphenyl (S)	%	67		
Terphenyl-d14 (S)	%	78		
Phenol-d5 (S)	%	26		
2-Fluorophenol (S)	%	44		
2,4,6-Tribromophenol (S)	%	69		

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QUALITY CONTROL DATA

Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

LABORATORY CONTROL SAMPLE: 926412107

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Acenaphthene	ug/l	50.00	37.14	74	
Acenaphthylene	ug/l	50.00	38.08	76	
Anthracene	ug/l	50.00	39.23	78	
Benzidine	ug/l	100.00	24.27	24	
Benzo(k)fluoranthene	ug/l	50.00	43.27	86	
Benzo(b)fluoranthene	ug/l	50.00	34.90	70	
Benzo(a)anthracene	ug/l	50.00	39.22	78	
Benzo(g,h,i)perylene	ug/l	50.00	36.97	74	
Benzo(a)pyrene	ug/l	50.00	41.48	83	
4-Bromophenylphenyl ether	ug/l	50.00	36.03	72	
Butylbenzylphthalate	ug/l	50.00	38.69	77	
4-Chloro-3-methylphenol	ug/l	50.00	39.19	78	
bis(2-Chloroethoxy)methane	ug/l	50.00	39.48	79	
bis(2-Chloroethyl) ether	ug/l	50.00	35.86	72	
bis(2-Chloroisopropyl) ether	ug/l	50.00	34.01	68	
2-Chloronaphthalene	ug/l	50.00	37.29	75	
2-Chlorophenol	ug/l	50.00	34.58	69	
4-Chlorophenylphenyl ether	ug/l	50.00	37.10	74	
Chrysene	ug/l	50.00	38.05	76	
Dibenz(a,h)anthracene	ug/l	50.00	38.27	76	
1,2-Dichlorobenzene	ug/l	50.00	30.62	61	
1,3-Dichlorobenzene	ug/l	50.00	29.58	59	
1,4-Dichlorobenzene	ug/l	50.00	29.24	58	
3,3'-Dichlorobenzidine	ug/l	100.00	34.81	35	
2,4-Dichlorophenol	ug/l	50.00	38.99	78	
Diethylphthalate	ug/l	50.00	36.97	74	
2,4-Dimethylphenol	ug/l	50.00	40.19	80	
Dimethylphthalate	ug/l	50.00	35.58	71	
Di-n-butylphthalate	ug/l	50.00	41.54	83	
4,6-Dinitro-2-methylphenol	ug/l	50.00	39.16	78	
2,4-Dinitrophenol	ug/l	50.00	36.84	74	
2,4-Dinitrotoluene	ug/l	50.00	37.40	75	
2,6-Dinitrotoluene	ug/l	50.00	36.81	74	
Di-n-octylphthalate	ug/l	50.00	38.20	76	
bis(2-Ethylhexyl)phthalate	ug/l	50.00	40.05	80	
Fluoranthene	ug/l	50.00	38.78	78	
Fluorene	ug/l	50.00	37.66	75	

Date: 12/15/05

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QUALITY CONTROL DATA

Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

LABORATORY CONTROL SAMPLE: 926412107

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Hexachloro-1,3-butadiene	ug/l	50.00	29.36	59	
Hexachlorobenzene	ug/l	50.00	35.26	70	
Hexachlorocyclopentadiene	ug/l	50.00	27.79	56	
Hexachloroethane	ug/l	50.00	28.31	57	
Indeno(1,2,3-cd)pyrene	ug/l	50.00	37.13	74	
Isophorone	ug/l	50.00	44.60	89	
Naphthalene	ug/l	50.00	36.16	72	
Nitrobenzene	ug/l	50.00	37.47	75	
2-Nitrophenol	ug/l	50.00	36.71	73	
4-Nitrophenol	ug/l	50.00	12.53	25	
N-Nitrosodimethylamine	ug/l	50.00	23.84	48	
N-Nitroso-di-n-propylamine	ug/l	50.00	39.97	80	
N-Nitrosodiphenylamine	ug/l	50.00	39.71	79	
Pentachlorophenol	ug/l	50.00	41.93	84	
Phenanthrene	ug/l	50.00	38.23	76	
Phenol	ug/l	50.00	14.91	30	
rene	ug/l	50.00	40.71	81	
2,4-Trichlorobenzene	ug/l	50.00	32.23	64	
2,4,6-Trichlorophenol	ug/l	50.00	37.29	75	
Nitrobenzene-d5 (S)				80	
2-Fluorobiphenyl (S)				81	
Terphenyl-d14 (S)				82	
Phenol-d5 (S)				32	
2-Fluorophenol (S)				52	
2,4,6-Tribromophenol (S)				74	

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QUALITY CONTROL DATA

Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

QC Batch: 144072
Analysis Method: % Moisture
QC Batch Method:
Analysis Description: Percent Moisture
Associated Lab Samples: 926398462 926398470 926398488 926398496 926398512

SAMPLE DUPLICATE: 926399494

Parameter	Units	926399072 Result	DUP Result	RPD	Footnotes
Percent Moisture	%	15.60	15.50	0	

Date: 12/15/05

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Lab Project Number: 92108541
Client Project ID: NCDOT 34950.1.1 Parcel #117

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

LCS(D)	Laboratory Control Sample (Duplicate)
MS(D)	Matrix Spike (Duplicate)
DUP	Sample Duplicate
ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
RPD	Relative Percent Difference
(S)	Surrogate
[1]	Sample re-analysis confirmed the sample is not homogeneous.

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Page: 1 of 1

897909

Section A
Required Client Information:

Company	
Address	
Email To:	
Phone	Fax
Requested Due Date/TAT:	

Section B
Required Project Information:

Report To:	
Copy To:	
Purchase Order No.:	
Project Name:	
Project Number:	

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☒ UST ☐ RCRA ☐ Other _____

SITE LOCATION ☐GA ☐IL ☐IN ☐MI ☐MN ☐NC ☐OH ☐SC ☐WI ☐OTHER _____

Section D Required Client Information

SAMPLE ID

One Character per box.
(A-Z, 0-9 / -)
Samples IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Filtered (Y/N)	Requested Analysis:	Residual Chlorine (Y/N)	Pace Project Number / Lab I.D
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Additional Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	12-1-21	1315			

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM / DD / YY)

SAMPLE CONDITION

	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact

SEE REVERSE SIDE FOR INSTRUCTIONS

Data File: \\WT\chem\hpmsd6.i\120705.b\12070528.D
Report Date: 08-Dec-2005 11:42

Pace Analytical Services, Inc.

TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: 92-SOLUTIONS
Lab Smp Id: 926398520
Operator : BET
Sample Location:
Sample Matrix: WATER
Analysis Type: SV
Inj Date: 08-DEC-2005 03:02

Client SDG: 92108541
Client Smp ID: 117-6
Sample Date: 29-NOV-2005
Sample Point:
Date Received:01-DEC-2005 00:00
Level: LOW

Number TICs found: 25

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

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	108-88-3	Toluene	5.119	322	97J_
2.	100-41-4	Ethylbenzene	5.874	136	95J_
3.		Xylene isomer	6.141	267	94J_
4.		C-3 substituted benzene	6.363	14.8	_J__
5.		C-3 substituted benzene	6.600	36.2	_J__
6.		C-3 substituted benzene	6.666	213	_J__
7.		C-3 substituted benzene	6.829	80.7	_J__
8.		C-3 substituted benzene	6.948	247	_J__
9.		C-3 substituted benzene	7.207	98.0	_J__
10.		C-3 substituted benzene	7.355	107	_J__
11.		Unknown	7.436	53.3	_J__
12.		C-4 substituted benzene	7.547	9.49	_J__
13.		C-4 substituted benzene	7.621	29.7	_J__
14.		Unknown	7.643	36.8	_J__
15.		C-4 substituted benzene	7.695	40.0	_J__
16.		C-4 substituted benzene	7.902	33.4	_J__
17.		C-4 substituted benzene	7.976	70.6	_J__
18.		C-4 substituted benzene	8.021	91.7	_J__
19.		Unknown	8.235	82.2	_J__
20.		Unknown	8.346	173	_J__
21.		Unknown	8.398	32.1	_J__
22.		Unknown	8.480	37.3	_J__
23.		Unknown	9.390	37.0	_J__
24.		Methylnaphthalene isomer	9.716	130	93J_
25.		Unknown	9.886	102	_J__

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Pace Analytical Services, Inc.
2225 Riverside Drive
Asheville, NC 28804
Phone: 828.254.7176
Fax: 828.252.4618

December 19, 2005

Ms. Sheri Knox
Solutions-IES
1101 Nowell Road
Raleigh, NC 27607

RE: Lab Project Number: 92108991
Client Project ID: NCDOT 34950.1.1 Parcel 117

Dear Ms. Knox:

Enclosed are the analytical results for sample(s) received by the laboratory on December 7, 2005. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Inorganic Wet Chemistry and Metals Analyses were performed at our Pace Asheville laboratory and Organic testing was performed at our Pace Charlotte laboratory unless otherwise footnoted.

If you have any questions concerning this report please feel free to contact me.

Sincerely,

Bonnie McKee

Bonnie McKee
Bonnie.McKee@pacelabs.com
Project Manager

Enclosures

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Lab Project Number: 92108991
Client Project ID: NCDOT 34950.1.1 Parcel 117

Lab Sample No: 926419623
Client Sample ID: 117-6

Project Sample Number: 92108991-001
Matrix: Water

Date Collected: 12/06/05 14:00
Date Received: 12/07/05 15:30

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Metals								
3030C Metals, ICP, Trace	Prep/Method: SM 3030C / EPA 200.7							
Chromium, 3030C	0.011	mg/l	0.0020	12/16/05 21:13	ALV	7440-47-3		
Lead, 3030C	0.024	mg/l	0.0050	12/16/05 21:13	ALV	7439-92-1		
Date Digested	12/08/05 10:30			12/08/05 10:30				
GC Semivolatiles								
EPH in Water by Mass. Method	Prep/Method: EPA 3510 / EPH							
Aliphatic (C09-C18)	ND	ug/l	100	12/14/05 05:25	KBS			
Aliphatic (C19-C36)	ND	ug/l	100	12/14/05 05:25	KBS			
Aromatic (C11-22)	100	ug/l	100	12/14/05 05:25	KBS			
2-Fluorobiphenyl (S)	98	%		12/14/05 05:25	KBS	321-60-8		
2-Bromonaphthalene (S)	130	%		12/14/05 05:25	KBS	580-13-2		
Nonatriacontane (S)	63	%		12/14/05 05:25	KBS	7194-86-7		
o-Terphenyl (S)	61	%		12/14/05 05:25	KBS	84-15-1		
Date Extracted	12/08/05			12/08/05				

Date: 12/19/05

Asheville Certification IDs
NC Wastewater 40
NC Drinking Water 37712
SC 99030
FL NELAP E87648

REPORT OF LABORATORY ANALYSIS

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Lab Project Number: 92108991
Client Project ID: NCDOT 34950.1.1 Parcel 117

PARAMETER FOOTNOTES

Method 9071B modified to use ASE.

All pH, Free Chlorine, Total Chlorine and Ferrous Iron analyses conducted outside of EPA recommended immediate hold time.

Depending on the moisture content the PRLs can be elevated for all soil samples reported on a dry weight basis.

2-Chloroethyl vinyl ether has been shown to degrade in the presence of acid.

ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
(S)	Surrogate

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QUALITY CONTROL DATA

Lab Project Number: 92108991
Client Project ID: NCDOT 34950.1.1 Parcel 117

QC Batch: 144579
QC Batch Method: EPA 3510
Associated Lab Samples: 926419623

Analysis Method: EPH
Analysis Description: EPH in Water by Mass. Method

METHOD BLANK: 926423856
Associated Lab Samples: 926419623

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Aliphatic (C09-C18)	ug/l	ND	100	
Aliphatic (C19-C36)	ug/l	ND	100	
Aromatic (C11-22)	ug/l	ND	100	
2-Fluorobiphenyl (S)	%	102		
2-Bromonaphthalene (S)	%	133		
Nonatriacontane (S)	%	59		
o-Terphenyl (S)	%	74		

LABORATORY CONTROL SAMPLE & LCSD: 926423864 926423872

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	RPD	Footnotes
Aliphatic (C09-C18)	ug/l	300.00	122.4	121.7	41	41	1	
Aliphatic (C19-C36)	ug/l	400.00	277.2	273.9	69	68	1	
Aromatic (C11-22)	ug/l	850.00	606.5	523.1	71	62	15	
2-Fluorobiphenyl (S)					101	90		
2-Bromonaphthalene (S)					103	89		
Nonatriacontane (S)					58	49		
o-Terphenyl (S)					77	68		

Date: 12/19/05

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Fax: 828.252.4618

QUALITY CONTROL DATA

Lab Project Number: 92108991
Client Project ID: NCDOT 34950.1.1 Parcel 117

QC Batch: 144527
QC Batch Method: SM 3030C
Associated Lab Samples: 926419623

Analysis Method: EPA 200.7
Analysis Description: 3030C Metals, ICP, Trace

METHOD BLANK: 926421645
Associated Lab Samples: 926419623

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Chromium, 3030C	mg/l	ND	0.0020	
Lead, 3030C	mg/l	ND	0.0050	

LABORATORY CONTROL SAMPLE: 926421652

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Chromium, 3030C	mg/l	0.5000	0.4480	90	
Lead, 3030C	mg/l	0.5000	0.4340	87	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 926421660 926421678

Parameter	Units	926419615 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
Chromium, 3030C	mg/l	0.00193	0.5000	0.4950	0.4930	99	98	0	
Lead, 3030C	mg/l	0.00947	0.5000	0.4900	0.4890	96	96	0	

Date: 12/19/05

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Phone: 828.254.7176
Fax: 828.252.4618

Lab Project Number: 92108991
Client Project ID: NCDOT 34950.1.1 Parcel 117

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

LCS(D)	Laboratory Control Sample (Duplicate)
MS(D)	Matrix Spike (Duplicate)
DUP	Sample Duplicate
ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
RPD	Relative Percent Difference
(S)	Surrogate

Date: 12/19/05

Asheville Certification IDs
NC Wastewater 40
NC Drinking Water 37712
SC 99030
FL NELAP E87648

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The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Page: 1 of 1

897905

Section A
Required Client Information:

Company: Solutions-IES	
Address: 160 Zillicoa St Suite 250 Asheville NC 28801	
Email To: akinz@solutions-ies.com	
Phone: 704-873-1060	Fax: 704-873-1076
Requested Due Date/TAT: 5 Day Rush	

Section B
Required Project Information:

Report To: Alan Kinz	
Copy To:	
Purchase Order No.: WBS 34950.1.1	
Project Name: NC DOT Project 117	
Project Number: 2.150.0542 NDOT	

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager: LBKM	
Pace Profile #: 38109-7	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☒ UST ☐ RCRA ☐ Other_____

SITE LOCATION ☐GA ☐IL ☐IN ☐MI ☐MN ☒NC ☐OH ☐SC ☐WI ☐OTHER_____

Section D
Required Client Information

SAMPLE ID

One Character per box.
(A-Z, 0-9 / -)
Samples IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Filtered (Y/N)	Requested Analysis: EPH, PB+C, 30-30C	Residual Chlorine (Y/N)	Pace Project Number / Lab I.D
1	117-6	WT	G	12/6	1400				2	1		1							11		24019623
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Additional Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITION
[illegible]	12/7	1200	[illegible]	12-7-05	1200	Y/N Y/N Y/N
[illegible]	12-7-05	1530	[illegible]	12/7	1530	Y/N Y/N Y/N
						Y/N Y/N Y/N
						Y/N Y/N N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: [illegible]

SIGNATURE of SAMPLER: [illegible]

DATE Signed (MM / DD / YY): [illegible]

Temp in °C

SEE REVERSE SIDE FOR INSTRUCTIONS

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Page: 1 of 1

897905

Section A Required Client Information:

Company: Solutions [illegible]

Address: [illegible] Rd, Raleigh NC 27607

Email To: [illegible]@solutions[illegible].com

Phone: 919 873 1060 Fax: 919-873 1074

Requested Due Date/TAT: Standard

Section B Required Project Information:

Report To: Sheri Knox

Copy To:

Purchase Order No.: WBS 34950.1.1

Project Name: NC DOT Parcel 117

Project Number: 2730.05AZ NDOT

Section C Invoice Information:

Attention:

Company Name:

Address:

Pace Quote Reference:

Pace Project Manager: LBKM

Pace Profile #: 3869-7

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☒ UST ☐ RCRA ☐ Other

SITE LOCATION ☐GA ☐IL ☐IN ☐MI ☐MN ☒NC ☐OH ☐SC ☐WI ☐OTHER

Section D Required Client Information

SAMPLE ID

One Character per box. (A-Z, 0-9 / .-) Samples IDs MUST BE UNIQUE

Valid Matrix Codes: MATRIX / DRINKING WATER / WATER / WASTE WATER / PRODUCT / SOIL/SOLID / OIL / WIPE / AIR / OTHER / TISSUE — CODE: DW / WT / WW / P / SL / OL / WP / AR / OT / TS

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	COLLECTED 2005 COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Filtered (Y/N) / Requested Analysis: FPH	Pb+Cl 3030C	Residual Chlorine (Y/N)	Pace Project Number / Lab I.D
1	117-6	WT	G	12/6	1400				2	1		1						1	1		92[illegible]19623
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Additional Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[illegible]	12/7	1200	[illegible]	12-7-05	1200
[illegible]	12-7-05	1530	[illegible]	12/7	15:30

SAMPLE CONDITION

Temp in °C	Custody Sealed Cooler	Samples Intact
Y/N	Y/N	Y/N
Y/N	Y/N	Y/N
Y/N	Y/N	Y/N
Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: [illegible]

SIGNATURE of SAMPLER: [illegible]

DATE Signed (MM / DD / YY): [illegible]

REVERSE SIDE FOR INSTRUCTIONS

PRELIMINARY SITE ASSESSMENT
PARCEL 041A, W.J. BARNHARDT PROPERTY
2133 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
NCDOT PROJECT: U-3456
WBS ELEMENT: 34950.1.1

Prepared for:
NC Department of Transportation
Geotechnical Engineering Unit
GeoEnvironmental Section
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Prepared by:
Solutions-IES
1101 Nowell Road
Raleigh, North Carolina 27607

Solutions-IES Project No. 2730.05A2.NDOT

NORTH CAROLINA PROFESSIONAL SEAL 022585 ENGINEER SHERI LANE KNOX 2/3/06

Kevin B. Buchanan
Environmental Specialist

Sheri L. Knox, P.E.
Project Manager

January 17, 2006

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APPENDIX B – GEOPHYSICAL INVESTIGATION

APPENDIX C – BORING LOGS

APPENDIX D – SPECIFIC CAPACITY SPREADSHEET

APPENDIX E – LABORATORY ANALYTICAL REPORTS

1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) is widening Fayetteville Road (US-1) in Rockingham, Richmond County, North Carolina. The project may require the NCDOT to acquire additional property for roadway construction. On November 3, 2005, Solutions-IES submitted a proposal to conduct Preliminary Site Assessments (PSAs) for 14 parcels of land within the proposed right of way that contain or reportedly contained underground storage tanks (USTs), or are situated within areas of concern identified by NCDOT. This report summarizes the results of field and laboratory activities conducted during the PSA of a portion of the property located at 2133 Fayetteville Road (US Highway 1) in Rockingham, Richmond County, North Carolina (Figure 1). The site is identified by the NCDOT as Parcel 041 on Figure 2 and shown as owned by James Mabe. However, according to the NCDOT, the Study Area is in a part of the parcel designated 041A, which is now owned by W. J. Barnhardt. The scope of work executed at the site was performed in general accordance with Solutions-IES proposal NC05449P dated November 3, 2005, and was initiated based on a Notice to Proceed issued by the NCDOT Geotechnical Engineering Unit on November 7, 2005 under contract 7000005553, dated May 9, 2005.

2.0 BACKGROUND AND SITE DESCRIPTION

Parcel 041A is located at the north-northwestern side of Fayetteville Road (US Highway 1) in Rockingham, North Carolina approximately 300 feet west of the intersection of Fayetteville Road and Lawson Street. According to the NCDOT, Parcel 041A is presently developed with an automotive repair facility which once housed a former gasoline service station. NCDOT noted the presence of a former petroleum dispenser pump island south of the building on the site. NCDOT reviewed the NCDENR UST registry database and found record of a Mabe's Gulf Service (Facility ID # 0-018323) that is likely the former gasoline service station located on Parcel 041A. The UST registry database showed that three USTs were reportedly removed from the site in 1993, but the NCDOT could not locate a closure report in the Fayetteville Regional Office of the NCDENR-DWM.

Preliminary observations suggest that land in the immediate vicinity of the study area is undeveloped or developed with commercial and residential properties. A photograph of the Study Area at the site is presented in Appendix A.

3.0 FIELD ACTIVITIES

Prior to mobilizing to the site to conduct subsurface sampling, Solutions-IES contacted North Carolina One Call to locate underground utilities in the study area of the site. Pyramid Environmental & Engineering, P.C. (Pyramid) was contracted to perform an electromagnetic survey of the subsurface in the proposed right-of-way and easement area. The electromagnetic survey conducted at Parcel 041A was performed on November 12, 2005. The electromagnetic survey equipment (EM61) identified various magnetic anomalies within the study area, and Pyramid returned to the study area on November 22, 2005 to perform a ground penetrating radar (GPR) survey utilizing a "Geophysical Survey Systems SIR 2000" instrument. The survey suggested the possible presence of large-diameter conduit or a UST located in the southwestern corner of the parcel. The EM61 images are included on Figure 13 in Appendix B. A GPR image was not included in the geophysical report. Solutions-IES observed several subsurface drainage and sewer lines existing in this area and it is possible that the anomaly identified during the GPR survey is a drainage or sewer line, rather than a UST.

After reviewing the geophysical report, Solutions-IES mobilized to the site on December 7, 2005 to obtain soil samples from locations within the proposed right-of-way. A total of eight (8) soil borings (borings 41A-1 through 41A-8) were advanced at the site in the locations depicted on Figure 3. Each of these borings, with the exception of boring 41A-3, was advanced to a total depth of 8 feet below ground surface (ft bgs) employing the use of a truck-mounted Geoprobe®. Boring 41A-3 was advanced to a total depth of 12 ft bgs to ultimately facilitate the installation of a temporary groundwater monitoring well. Borings were generally spaced approximately 50 feet apart, except where additional borings were thought necessary to assess the extent of potential soil contamination. Borings 41A-3 and 41A-4 were located in close proximity to a concrete pad and fuel dispenser pump island that may have been associated with the UST system reportedly closed in 1993.

Soil samples were obtained within each boring using a MacroCore® sampler fitted with single-use, disposable polyvinyl chloride (PVC) liners. Each soil sample was split into two aliquots. Each aliquot was placed in a separate resealable plastic bag. One bag was placed on ice for possible laboratory analysis. while the remaining bag was sealed and placed at ambient temperature for field screening with a flame ionization detector (FID).

Volatile organic compounds (VOCs) were allowed to accumulate in the headspace of each bag for approximately 20 minutes, after which time each sealed bag was scanned with the FID. The FID readings were entered on the boring logs along with the soil description and indications of petroleum staining or odor, if present (Appendix C).

Soils within borings 41A-1 and 41A-2 consisted of dry, orange fine sand (Unified Soil Classification SP) to depths of 4 ft bgs, underlain to depths of 8 ft bgs by dry, tan, clayey fine sand (Unified Soil Classification SC). Soils noted within boring 41A-3 and 41A-7 were characterized as clayey fine sand (SP) from surface grade to boring termination. Soils observed within borings 41A-4 and 8 were identified as dry, orange fine sand (SP) from surface grade to 8 ft bgs. Soils identified within boring 41A-5 consisted of, clayey fine sand (SC) in varying color, dry from surface to 4 ft bgs, and wet from 4 to 8 ft bgs. Soils of boring 41A-6 included dry, orange clayey fine sand (SC) from surface to 4 ft bgs, underlain by dry, tan and black fine sand (SP). Soils of each boring, except those of 41A-8, were thought to be representative of native soils for the site. Borings 41A-2 and 41A-3 were both advanced from surface grade through 3 inches of asphalt. Remaining borings were advanced from grade through surficial soils.

Headspace screening of soils with the FID revealed the presence of volatile vapors in samples obtained from each of the borings performed at the site. Values measured in samples from these borings ranged from 0.1 parts per million (ppm) [41A-2, 2-4 ft bgs] to 4,088 ppm (41A-4, 4-6 ft bgs). Although FID measurements in numerous samples were in excess of 1,000 ppm, these concentrations of volatile vapors may be due to the possible presence of methane in the soils, possibly originating from the drainage or sewer lines in the vicinity. These measurements are presented in Table 1.

Soil samples for laboratory analysis were retained from borings 41A-2 (2-4 ft bgs), 41A-3 (2-4 ft bgs), 41A-4 (4-6 ft bgs), 41A-5 (4-6 ft bgs), 41A-6 (6-8 ft bgs), 41A-7 (2-4 ft bgs), and 41A-8 (4-6 ft bgs). These samples were selected for analysis as they presented the highest FID measurements within the borings. A soil sample was not submitted to the laboratory from boring 41A-1 because appreciable volatile vapors were not measured in the soil samples with the FID, and an obvious potential source for a release was not observed near the location of the boring. The samples were placed in laboratory-supplied containers and stored on ice pending shipment to Pace Analytical Services, Inc. (Pace) in Huntersville, NC. Samples collected from these borings were recorded on the chain-of-custody and submitted for chemical analysis of total petroleum hydrocarbons (TPH) gasoline range organics (GRO) by Modified EPA Method 5030/8015 and TPH diesel range organics (DRO) by Modified EPA Method 3545/8015.

Due to the possible impact to the soils in the Study Area, and the potential for groundwater contamination resulting from such impact, boring 41A-3 was advanced to a depth of 12 ft bgs to facilitate the installation and sampling of a temporary groundwater monitoring well. Upon completion of the boring, a 10-foot section of 1-inch diameter PVC slotted well screen, joined to an approximate 2-foot section of 1-inch diameter PVC riser, was emplaced into the boring. Washed #2 well sand was introduced into the annulus of the boring, extending from the base of the temporary well to within 1-foot of surface grade. The remainder of the boring, from 1-foot bgs to surface grade, was filled with bentonite clay pellets, which were hydrated to ensure a firm seal at the surface. Temporary well construction information is on the boring log for 41A-3 in Appendix C.

Subsequent to installation of the temporary well, the water level within the well was gauged with an electronic water level indicator and found to lie 3.28 ft bgs. The water level in this well may represent perched conditions rather than actual aquifer groundwater levels on and adjacent to the site, as numerous drainage structures and sewer lines exist on and near the site, which, if leaking, might contribute to this observed condition. The well was purged and sampled with a peristaltic pump, utilizing 3/8-inch diameter disposable polyethylene tubing. A groundwater sample from the well was submitted for analysis of volatile organic compounds (VOCs) by EPA Methods 601 and 602, aliphatic and aromatic volatile petroleum hydrocarbons (VPH) by the Massachusetts Department of Environmental Protection (MADEP) method, semivolatile organic compounds (SVOCs) by EPA Method 625 (including the ten largest tentatively identified compounds or TICs), aliphatic and aromatic extractable petroleum hydrocarbons (EPH) by the MADEP method, and chromium (Cr) and lead (Pb) by EPA Method 200.7 (Standard Preparation Method 3030C).

Specific capacity testing was also performed on groundwater within the temporary well. The specific capacity, as described by Wilson et al.(1997), was performed by inserting a ¼-inch polyethylene tube to a known depth beneath the water surface. From the specific capacity, the hydraulic conductivity (K) was estimated to be 3.5 ft/day (Appendix D).

4.0 SAMPLING RESULTS

According to laboratory analytical results, TPH GRO was detected in soil samples collected from borings 41A-3 (62 mg/kg) and 41A-4 (13 mg/kg) at depths of 2-4 ft bgs and 4-6 ft bgs, respectively. These concentrations are above the NCDENR Action Level of 10 mg/kg. TPH GRO was detected in the soil sample submitted from 41A-7, and TPH DRO was detected in the soil sample submitted from boring

41A-8 at concentrations greater than the laboratory detection limit, but less than the Action Level. Results from soil samples obtained from borings 41A-2, 41A-5 and 41A-6 did not indicate the presence of TPH GRO or DRO TPH at concentrations above the respective reporting limits for Modified EPA Methods 5030/8015 or 3550/8015. These data are summarized in Table 2.

Analysis of the groundwater sample obtained from the temporary monitoring well installed in boring 41A-3 revealed the presence of several petroleum-related compounds. Benzene, tetrachloroethene, chromium and lead were detected at concentrations exceeding their respective 15A NCAC 2L.0202 Standards (2L Standards). Other compounds were detected, including chloromethane, ethylbenzene, methyl-tert-butyl-ether (MTBE), toluene, xylenes, naphthalene, C5-C8 and C9-C12 aliphatic hydrocarbons, but concentrations were not in excess of their respective 2L Standards. These data are presented in Table 3. Laboratory reports associated with the groundwater sample are presented in Appendix E.

The laboratory analysis also detected 13 (TICs) in the groundwater sample (Appendix E). Some of the TICs may be transformation/degradation products from petroleum fuel, and others are of unknown origin.

5.0 DISCUSSION AND CONCLUSIONS

The geophysical survey conducted at the site revealed the possible location of large diameter conduit or a UST situated near the southwestern corner of the parcel. During Solutions-IES visit to the site on December 7, 2005, no evidence (e.g., fill port, drop tube, vent line) was observed to indicate the presence of a UST at this location. However, there are several subsurface drainage and sewer lines situated in this area of the site, that might account for the anomaly as noted in the geophysical survey.

Solutions-IES installed a total of eight (8) soil borings at the site, in an effort to determine the presence or absence of petroleum contamination in the Study Area on the parcel, as well as document soil conditions. Soil samples obtained from the borings and screened with an FID revealed the presence of volatile vapors in samples at levels ranging from 0.1 to 4,088 ppm. Although FID measurements in numerous samples were in excess of 1,000 ppm, these VOC concentrations may be associated with the possible presence of methane in the soils. which may be present if one or more of the drainage or sewer lines in the vicinity are leaking.

Analytical data for soil samples retained from the site which were submitted for chemical analysis revealed the presence of TPH GRO at concentrations in excess of the NCDENR-UST Section Action Level of 10 mg/kg in two of the seven samples (41A-3, 2-4 ft bgs and 41A-4, 4-6 ft bgs) submitted for analysis. The presence of TPH GRO and TPH DRO in soil is typically associated with an impact to soil from petroleum hydrocarbons such as gasoline and diesel fuel. The borings were located near a former pump island located within the study area of Parcel 041A. TPH GRO was also detected in the sample submitted from 41A-7, and TPH DRO was detected in the sample submitted from boring 41A-8, but concentrations detected in these samples were not in excess of the Action Levels of 10 mg/kg. Borings 41A-2, 41A-5 and 41A-6 did not contain detectable concentrations of TPH GRO or DRO.

Based on the assessment data, Solutions-IES estimates the lateral extent of soil contamination within the Study Area of the site to measure approximately 70 ft by 30 ft, with an estimated vertical extent between 2 and 6 ft bgs. This estimate encompasses an area of contaminated soil at concentrations greater than the Action Level, generally in close proximity of the fuel dispenser pump island. Based on this estimate, Solutions-IES calculated an estimated volume of 8,400 cubic feet (ft^3) or 311 cubic yards (yd^3) of soil within the Study Area of the site have been impacted at levels in excess of the Action Level. Removal of the pump island and associated petroleum impacted soil may be necessary when roadway construction begins. At the time of roadway construction, the transportation/disposal company may use different criteria for estimating the area of impacted soil. Because the soil sample collected from borings 41A-7 and 41A-8 contained TPH GRO or DRO at a concentration greater than the laboratory method detection limit, but less than the Action Level, soil that may be excavated in vicinity of these borings should be properly transported and disposed of.

Some shallow possibly perched groundwater was observed in the temporary monitoring well at boring location 41A-3 about 3 feet beneath surface grade. However, the water within the well may not be representative of actual aquifer groundwater on and adjacent to the site, as numerous drainage structures and sewer lines exist on and near the site, which, if leaking, might contribute to this condition.

The groundwater sample contained benzene, PCE, chromium and lead at concentrations in excess of the 2L Standards. Other petroleum-related compounds detected in the samples including chloromethane, ethylbenzene, MTBE, toluene, xylenes, naphthalene, C5-C8 and C9-C12 aliphatic hydrocarbons did not exceed their respective 2L Standards. The presence of benzene and lead may be associated with the presence of petroleum hydrocarbon fuels. The source of PCE and chromium is unknown.

To estimate the volume of water that may need to be removed from an excavation in the Study Area, the volumetric flow rate (Q) was calculated. Assuming that the volumetric discharge is equal to the volumetric recharge, the area of groundwater impact is equal to the maximum area of saturated thickness of soil contamination (A), and the hydraulic gradient (I) is flat (0.5 ft/100 ft) over the estimated area of soil contamination, the volumetric flow rate is calculated as shown below.

$Q = KIA$ where

$K = 3.5$ ft/day (based on specific capacity);

$I = 0.005$

$A = 70$ ft (maximum length) x 2.72 ft (6 ft utility ditch – 3.28 ft depth to groundwater)

$Q =$ approximately 4 ft^3/day

Assuming one day of de-watering is required to install the proposed drainage system, the estimated quantity of contaminated water to remove is 4 ft^3 or 30 gallons.

In conclusion, the extent of soil contamination has been identified. However, additional assessment would be necessary to further investigate the vertical and lateral extent of groundwater contamination.

TABLES

TABLE 1
SUMMARY OF FIELD SCREENING RESULTS FOR SOIL
Parcel 041A – W.J. Barnhardt Property
2133 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: December 7, 2005

Sample Depth Below Ground Surface	Soil Borings							
	41A-1	41A-2	41A-3	41A-4	41A-5[1]	41A-6[1]	41A-7	41A-8
	FID Reading (ppm)							
0 - 2 feet	0.3	1.0	693	490	280	70	223	0.9
2 - 4 feet	0.2	0.1	2,015	1,468	510	1,052	2,296	0.8
4 - 6 feet	0.4	0.5	1,742	4,088	3,071	1,297	47	2,725
6 - 8 feet	1.0	0.3	498	3,610	>4,263	3,868	21.1	2,115
8 - 10 feet	NS[3]	NS	482	NS	>500	NS	NS	NS
10 - 12 feet	NS	NS	28	NS	NS	NS	NS	NS

Notes:

1. FID readings possibly influenced by the proximity to a sewer line.
2. Samples denoted by shaded cells were submitted for laboratory analysis.
3. NS - Denotes not sampled.
4. FID readings were obtained with a Photovac MicroFID Flame Ionization Detector.

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS
Parcel 041A – W.J. Barnhardt Property
2133 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: December 7, 2005

Sample Information		Total Petroleum Hydrocarbons	
Boring Number	Depth (Feet)	Gasoline Range[1] (mg/kg)	Diesel Range[2] (mg/kg)
41A-2	2 - 4	<5.4	<5.4
41A-3	2 - 4	62	<5.9
41A-4	4 - 6	13	<5.9
41A-5	4 - 6	<4.8	<6.1
41A-6	6 - 8	<5.0	<6.1
41A-7	2 - 4	8	6.5
41A-8	4 - 6	<4.4	

Notes:
1. Total Petroleum Hydrocarbons (TPH) Method 5030/8015MOD - Gasoline Range Hydrocarbons
2. Total Petroleum Hydrocarbons (TPH) Method 3545/8015MOD - Diesel Range Hydrocarbons
3. Shaded cells denote values in excess of the minimum reportable concentration.

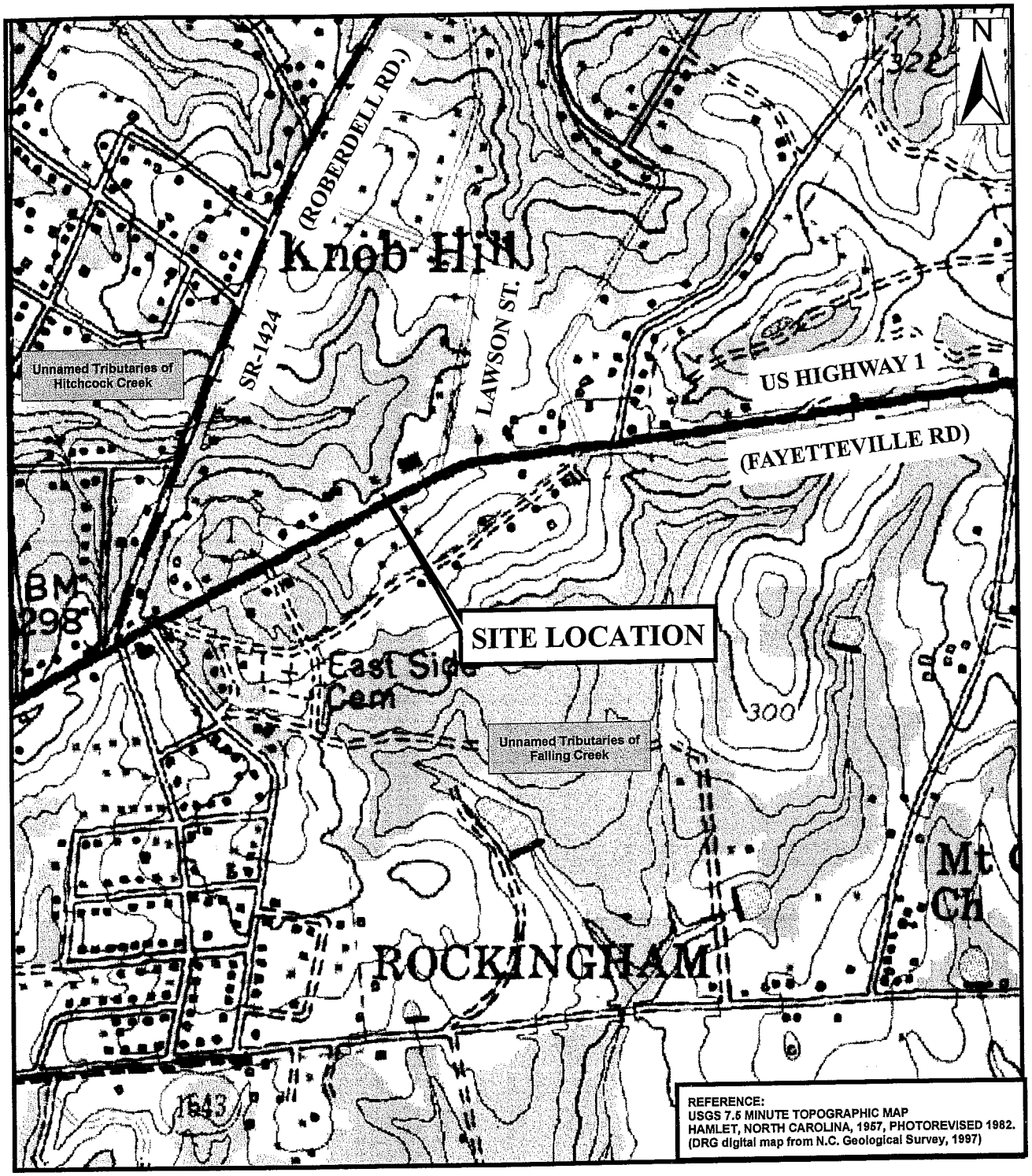
TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
Parcel 041A – W.J. Barnhardt Property
2133 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: December 7, 2005

Temporary Well Location	41A-3	2L Standards
Hydrocarbon Constituent		
EPA Method 601/602 - Volatile Organics (µg/L)		
Benzene	**9.3**	1
Chloromethane	**2.1**	2.60
Ethylbenzene	**20**	550
Methyl-tert-butyl ether	**3.5**	200
Tetrachloroethene	**3.1**	0.7
Toluene	**2.3**	1,000
Xylenes (Total)	**18**	530
EPA Method 625/625SF - Semi-Volatile Organics (µg/L)		
Naphthalene	**5.9**	21
MADEP VPH and EPH (µg/l)		
C5-C8 Aliphatics	**230**	420
C9-C12 Aliphatics	**230**	4,200
C9-C22 Aromatics	<140	210
Metals by Trace ICP (EPA Method 3030C) (mg/L)		
Chromium	**0.12**	0.05
Total Lead	**0.32**	0.015

Notes:

1. Analytes not shown were not detected above the laboratory method detection limits.
2. Shaded concentrations exceed the 15A NCAC 2L Groundwater Standards.
3. C9-C22 Aromatics represent the combined totals of C9-C10 aromatics (VPH) and C11-C22 Aromatics (EPH)
4. 13 TICs (Semi-volatile organics) were also detected in the groundwater sample collection from the Study Area. The TICs are listed in Appendix D.

FIGURES



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SITE LOCATION MAP
PARCEL 41 (41A) - W.J. BARNHARDT PROPERTY
2133 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
WBS ELEMENT NO. 34950.1.1(NCDOT PROJECT: U-3456)

Solutions
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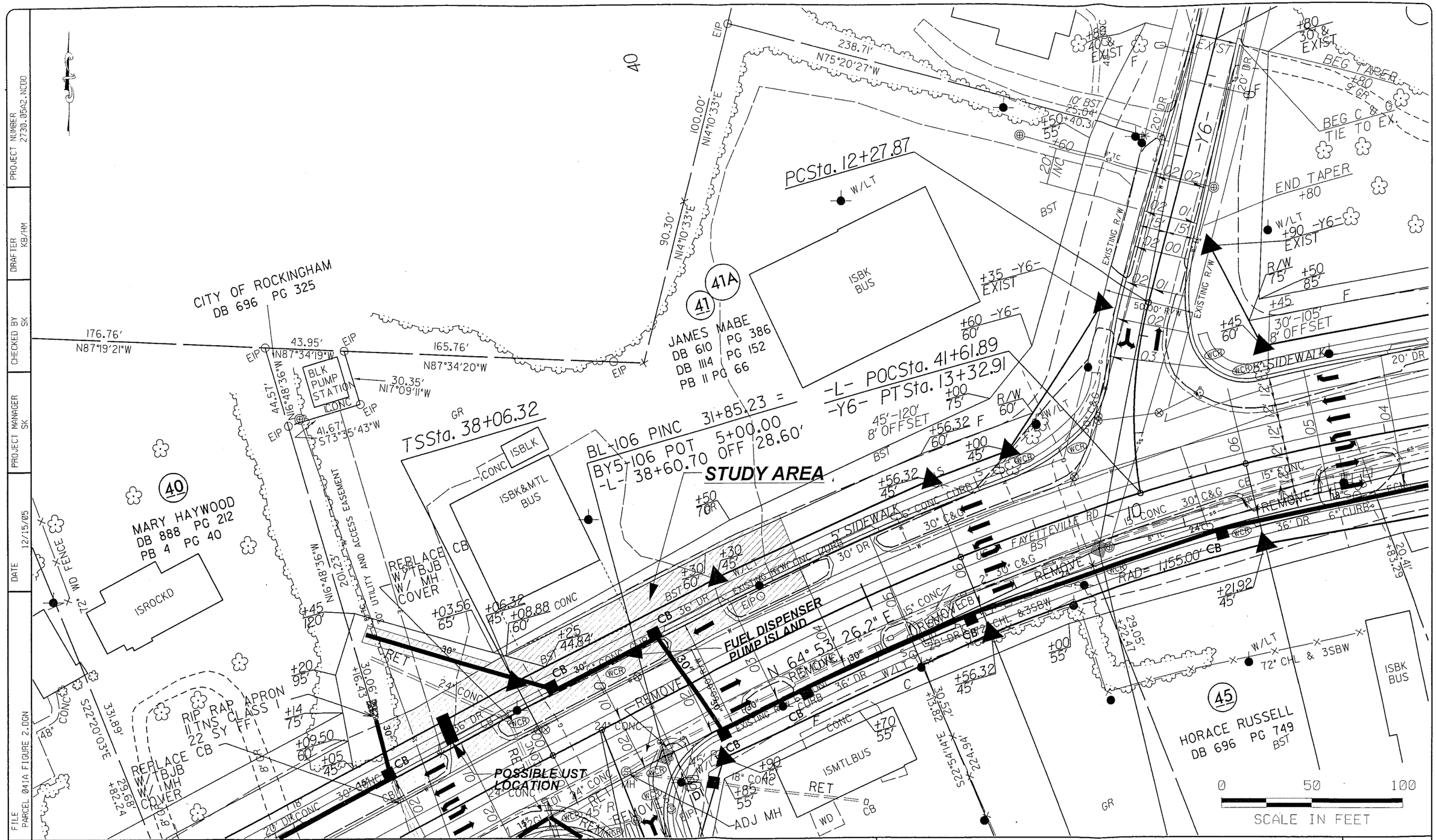
1101 Nowell Road, Raleigh, NC 27609
Phone (919) 873-1060, Fax (919) 873-1074

Created by:	KBB	Project:	2730.05A2.NCDO
Checked by:	BR	Date:	12/15/05
File:	FIG1.mxd		
Software:	ESRI ArcMap 9.0	FIGURE	1

PROJECT NUMBER 2738.05A2.NCDO | DRAFTER KB/HM | CHECKED BY SK | PROJECT MANAGER SK | DATE 12/15/05 | FILE PARCEL 041A FIGURE 2.DGN



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RALEIGH, NORTH CAROLINA 27607
TEL.: (919) 873-1060 FAX.: (919) 873-1074

SITE MAP
PARCEL 41 (41A) - W.J. BARNHARDT PROPERTY
2133 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
WBS ELEMENT NO. 34950.1.1 (NCDOT PROJECT: U-3456)

FIGURE: 2

PROJECT NUMBER 27330.05A2.NCDO

DRAFTER KB/HM

CHECKED BY SK

PROJECT MANAGER SK

DATE

PARCEL 041A FIGURES/DIVISION

FILE

SUMMARY OF SOIL ANALYTICAL RESULTS

Parcel 041A – W.J. Barnhardt Property
2133 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NCDOT Project: U-3456)
Sample Collection Date: December 7, 2005

Sample Information		Total Petroleum Hydrocarbons	
Boring Number	Depth (Feet)	Gasoline Range[1] (mg/kg)	Diesel Range[2] (mg/kg)
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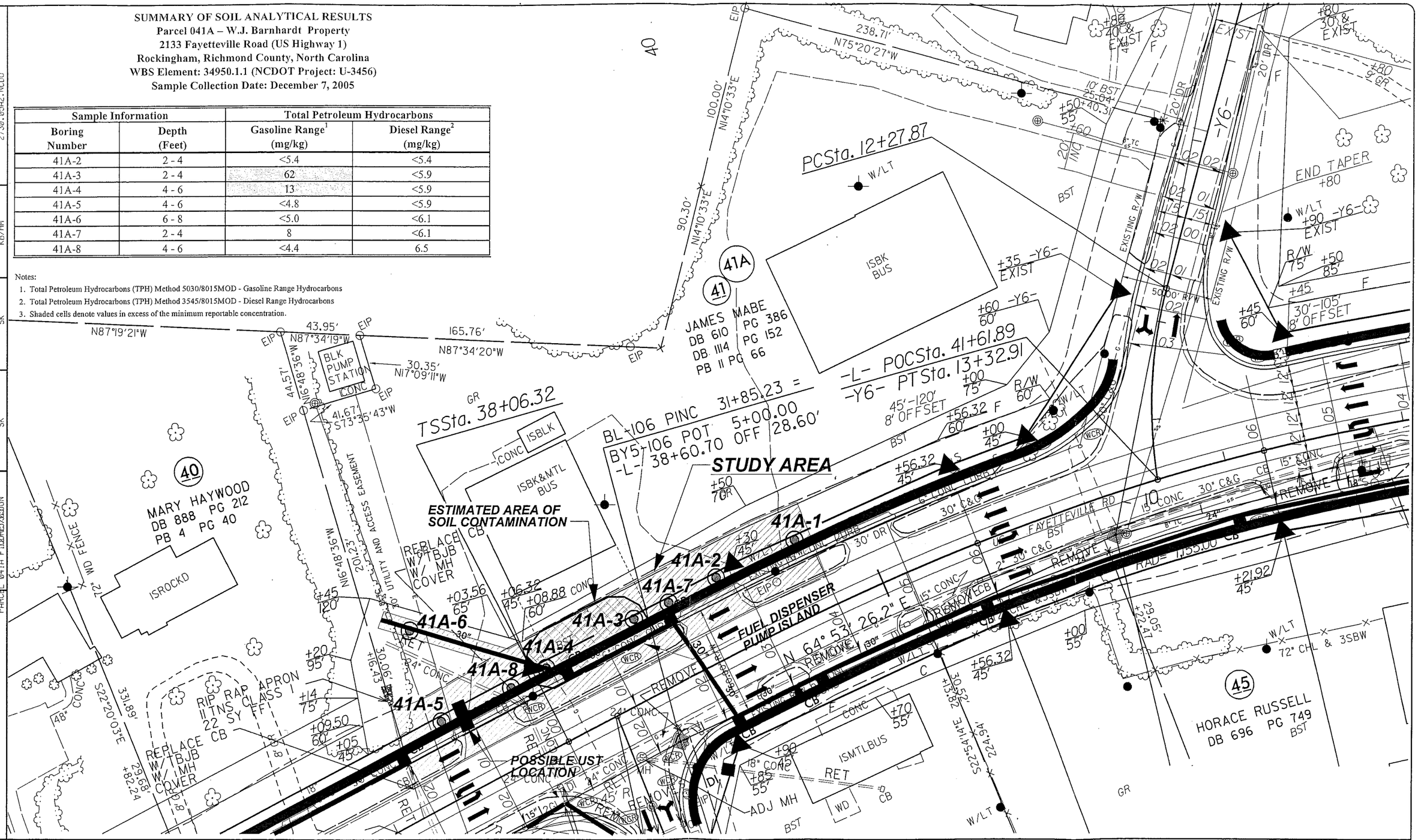
41A-4	4 - 6	13	<5.9
41A-5	4 - 6	<4.8	<5.9
41A-6	6 - 8	<5.0	<6.1
41A-7	2 - 4	8	<6.1
41A-8	4 - 6	<4.4	6.5

Notes:
1. Total Petroleum Hydrocarbons (TPH) Method 5030/8015MOD - Gasoline Range Hydrocarbons
2. Total Petroleum Hydrocarbons (TPH) Method 3545/8015MOD - Diesel Range Hydrocarbons
3. Shaded cells denote values in excess of the minimum reportable concentration.



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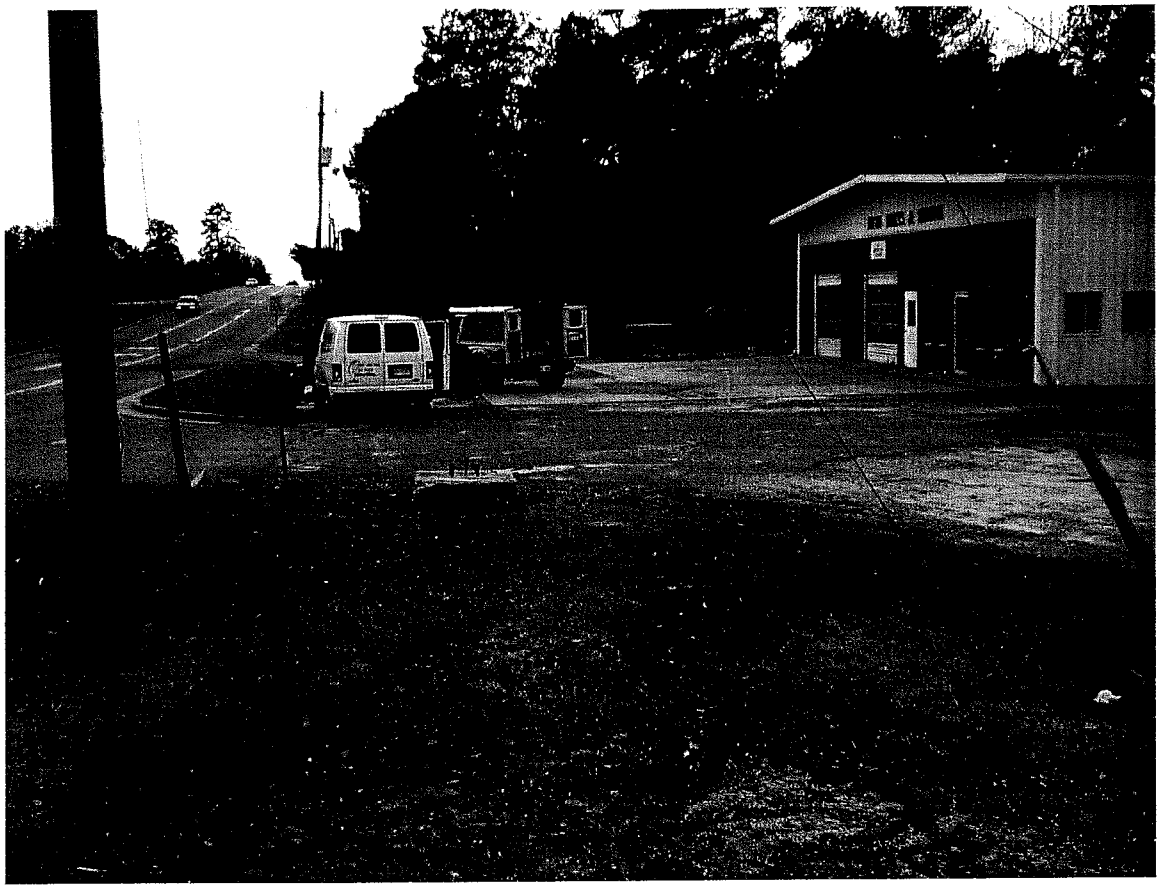
BORING LOCATIONS AND ESTIMATED EXTENT OF SOIL CONTAMINATION
PARCEL 41 (41A) - W.J. BARNHARDT PROPERTY
2133 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
WBS ELEMENT NO. 34950.1.1 (NCDOT PROJECT: U-3456)

FIGURE: 3

APPENDIX A

PHOTOGRAPH



Photograph – View from east to west along Fayetteville Road. Study Area in foreground along southern boundary of site.

Photograph – View from east to west along Fayetteville Road. Study Area in foreground along southern boundary of site.

APPENDIX B

GEOPHYSICAL DATA

Pyramid Project # 2005292

GEOPHYSICAL INVESTIGATION REPORT

GEOPHYSICAL SURVEYS FOR THE DETECTION OF METALLIC UST'S

Rockingham, US 1 (Fayetteville Road) Sites
Rockingham, North Carolina
State Project Number U-3456

November 30, 2005

Report prepared for: Sheri Knox & Daniel Hirth
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Raleigh, NC 27607

Prepared by: Doug Canavello
Douglas Canavello, PG

Reviewed by: Brett S. Higgins
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GEOPHYSICAL SURVEYS FOR THE DETECTION OF METALLIC UST'S
Rockingham, US 1 (Fayetteville Road) Sites
State Project Number U-3456

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FIGURES (continued)

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1.0 INTRODUCTION

Pyramid Environmental & Engineering, PC conducted geophysical investigations for Solutions Industrial & Environmental Services, Inc. during the period of November 11-23, 2005, within the proposed Right-of-Way (ROW) areas at 13 sites in Rockingham, North Carolina. The work was done as part of the North Carolina Department of Transportation (NCDOT) road-widening project under State Project number U-3456 and WBS Element 34950.1.1. The sites are located along the north or south sides of US 1 (Fayetteville Road) from 0.25 miles west of SR-1424 (Roberdell Road) to 0.25 miles west of SR 1640 (Wiregrass Road). The geophysical surveys were conducted to determine if unknown metallic underground storage tanks (UST's) were present beneath the proposed ROW area of each site.

Solutions IES representative Mr. Walt Beckwith, PG provided maps during the week of November 1, 2005 that outlined the geophysical survey areas of each site. Solutions IES representatives, Ms. Sheri Knox, PE and Mr. Daniel Hirth, PG provided guidance during the geophysical investigations. Geophysical surveys were conducted at the following 13 sites:

Property Owner	Parcel	Present Use of Property
W. J. Barnhart Property	(Parcel 4)	Used Car Lot & Auto Repair Garage
Julia M. Ratliff Property	(Parcel 7)	Vacant Lot
Samuel D. Tanner Property	(Parcel 15)	Vacant Building & Lot
Harvey E. Melton Property	(Parcel 17)	BP Gas Station
Samuel D. Tanner Property	(Parcel 21)	Strip Mall
W. J. Barnhart Property	(Parcel 41A)	Vacant Building & Lot
Wesly Denham Property	(Parcel 42)	Havoline Carolina Quick Lube
William Ussery Property	(Parcel 57)	Vacant Building & Lot
Walter McCain Property	(Parcel 80)	Vacant Buildings & Lot
Leon Wall Property	(Parcel 99)	Vacant Building & Lot
James Porter Property	(Parcel 117)	Vacant Building & Lot
John Evans Property	(Parcel 126)	Custom Monument Company
Henry Ussery Property	(Parcel 140)	Bo Henry's Pawn Shop

Photos of the above sites are presented in **Figure 1**.

2.0 FIELD METHODOLOGY

Prior to conducting the geophysical investigations, a 10-foot by 10-foot survey grid was established across the proposed ROW areas of the 13 sites using water-based marking paint. These marks were used as X-Y coordinates for location control when collecting the geophysical data and establishing base maps for the geophysical results.

The geophysical investigations consisted of electromagnetic (EM) induction-metal detection surveys and ground penetrating radar (GPR) surveys. The EM surveys were performed using a Geonics EM61-MK1 metal detection instrument. According to the manufacture's specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. The EM61 data were digitally collected at each site along parallel northerly-southerly or easterly-westerly trending survey lines spaced five feet apart. The data were downloaded to a computer and reviewed in the office using the Geonics DAT61W and Surfer for Windows Version 7.0 software programs.

Contour plots of the EM61 bottom coil results and the EM61 differential results for each site are included in this report. The bottom coil results represent the most sensitive component of the EM61 instrument and detect metal objects regardless of size. The bottom coil response can be used to delineate metal conduits or utility lines, small, isolated metal objects, and areas containing insignificant metal debris.

The differential results are obtained from the difference between the top and bottom coils of the EM61 instrument. The differential results focus on the larger metal objects such as drums and UST's and ignore the smaller insignificant metal objects.

GPR surveys were conducted across selected EM61 differential anomalies and steel-reinforced concrete using a GSSI SIR-2000 unit equipped with a 400 MHz antenna. Surveys were also performed across several areas where parked vehicles that obstructed the EM61 survey had since been removed. GPR data were digitally collected in a continuous mode along X and/or Y survey lines, spaced two to five feet apart using a vertical scan of 512 samples, at a rate of 24 scans per second. A 110 MHz high pass filter and an 800 MHz low pass filter were used during data

acquisition with the 400 MHz antenna. GPR data were collected down to a maximum depth of approximately seven feet, based on an estimated two-way travel time of 7 nanoseconds per foot.

The GPR data were downloaded to a field computer and later reviewed in the office using Radprint software. The locations of GPR survey areas or individual GPR survey lines are shown as dashed, purple rectangles or solid purple lines, respectively on the EM61 differential contour plots. Photos of the EM61 and GPR instruments are shown in **Figure 2**. The approximate perimeters of probable or possible UST's , based on the geophysical results, were marked and labeled in the field using orange, water-based marking paint and pin flags when possible. The approximate locations of probable or possible UST's are shown on the EM61 contour plots as magenta-shaded rectangles.

During the weeks of November 14 and November 23, 2005, preliminary contour plots of the EM61 bottom coil and the differential results were emailed to Ms. Knox and Mr. Hirth.

3.0 DISCUSSION OF RESULTS

3.1 Parcel 4 - W. J. Barnhart Property

Parcel 4 is located on the southern side of Fayetteville Road and contains an active used car lot and auto repair garage. The western portion of the ROW area consists of asphalt with a concrete pad and the eastern portion of the ROW area consists of a sandy surface.

The bottom coil results and the differential results are presented in **Figure 3**. The linear anomaly intersecting grid coordinates X=50 Y=26, is probably in response to a buried utility line or conduit. The high amplitude anomaly centered near the former pump island area is probably in response to the steel-reinforced concrete pad. GPR surveys conducted across the steel-reinforced concrete pad did not detect any large metal objects. The geophysical results suggest that the ROW area at Parcel 4 does not contain metallic UST's.

3.2 Parcel 7 - Julia M. Ratliff Property

The Ratliff property is located northwest of the Fayetteville Road and Roberdell Road intersection. The parcel consists of an open, asphalt and grass-covered lot. The EM61 bottom coil results and the differential results are presented in **Figure 4**. The linear bottom coil, EM61 anomalies, such as the ones intersecting grid coordinates X=100 Y=60, X=110 Y=74, and X=130 Y=104, are probably in response to utility lines or conduits. GPR surveys conducted across a portion of the EM anomaly centered near grid coordinates X=65 Y=35, suggest the presence of at least one UST centered near X=71 Y=35, and buried approximately 3.2 feet below surface. Based on the GPR results, the probable UST appears to be approximately 10 feet long and 4 feet wide.

A large water puddle was present across the western portion of the EM anomaly when the GPR surveys were conducted that prevented GPR data to be collected across the entire anomaly. However, based on the location of the probable UST, the size of the EM61 anomaly suggests that a second UST may be centered near grid coordinates X=64 Y=32. Concrete was encountered approximately three inches below surface across this area, which prevented probing with a steel rod to determine whether a second UST exists. A photo showing the approximate location of the probable and possible UST's along with a GPR image obtained along survey line Y=35 are presented in **Figure 5**.

The geophysical results suggest that the remaining portion of the proposed ROW area at Parcel 7 does not contain metallic UST's.

3.3 Parcels 15 & 21 – Samuel D. Tanner Properties

Parcels 15 and 21 are located immediately southwest and southeast, respectively of the Fayetteville Road and Skyline Drive intersection. Parcel 15 consists primarily of grass and gravel surfaces, whereas the front portion of Parcel 21 consists of an asphalt-covered parking area. The EM61 bottom coil results and the differential results are presented in **Figures 6 and 7**, respectively.

GPR surveys across the EM61 anomaly centered near grid coordinates X=188 Y=135, (on Parcel 15) suggest the presence of a UST centered near X=188 Y=137, and buried approximately 1.4 feet below

surface. The surveys also suggest that the probable tank is approximately 10 feet long and 3.5 feet wide.

At Parcel 21, GPR surveys acquired across the EM anomaly centered near grid coordinates X=269 Y=173, suggest the presence of a UST buried approximately 1.7 feet below surface. The UST appears to be approximately 10 feet long and 5 feet wide. Photos showing the approximate locations of the probable UST's at Parcels 15 and 21, along with corresponding GPR images are presented in Figures **8 and 9**, respectively.

3.4 Harvey E. Melton Property (Parcel 17)

The Melton property is an active BP gas station and store located northeast of the Fayetteville Road and Roberdell Road intersection. The pump island area consists of a steel-reinforced concrete surface that overlies the known and active UST's, whereas the parking area adjacent to the store consists of asphalt pavement. A grass yard surrounds the back portion of the site.

The EM61 bottom coil results and the differential results are presented in Figures **10 and 11**, respectively. The linear bottom coil, EM anomalies are probably in response to utility lines or conduits. The majority of non-linear anomalies are probably in response to cultural features such as storm drains, signs, utility-related objects, buildings, metal fence, and steel-reinforced concrete.

GPR surveys were conducted across the concrete pavement and across the area containing the active UST's. The surveys delineated the footprint of the three and possibly four active UST's that are centered near grid coordinates X=54 Y=53, X=50 Y=43, and X=50 Y=34, respectively. The UST centered near grid coordinates X=54 Y=53, appears to be approximately 35 feet long and probably consists of two UST's instead of one. A GPR image obtained across the UST area is presented in **Figure 12** and suggests that the tanks lie approximately 3.5 to 3.9 feet below surface.

GPR data acquired across the EM61 anomaly centered near X=155 Y=144, delineated the footprint of the kerosene tank that is buried approximately 1.7 feet below surface. The kerosene tank appears to be approximately 9 to 10 feet long and 3.5 to 4 feet wide. A photo showing the location of the

tank is presented in Figure 12. The geophysical results suggest that the remainder of the surveyed area at Parcel 17 does not contain UST's.

3.5 W. J. Barnhart Property (Parcel 41A)

Parcel 41A is a former gas station site located on the north side of Fayetteville Road approximately 300 feet west of Lawson Street. The geophysical survey area consists of asphalt and grass-covered surfaces with a concrete pad located around a former pump island. The EM61 bottom coil results and the differential results are presented in **Figure 13**. The linear bottom coil, EM anomalies, such as the ones intersecting grid coordinates X=40 Y=50, X=45 Y=95, and X=70 Y=40, are probably in response to utility lines or conduits.

GPR surveys conducted across a portion of the linear anomaly centered at X=37 Y=22, suggest the probable presence of a wide-diameter (more than 2.5 feet wide) conduit or possibly a UST that is approximately 15 to 17 feet long and buried approximately 4.5 feet below surface. This probable wide-diameter conduit (centered near X=38 Y=25) is located parallel and contingent with the probable utility line identified by the EM61 survey, suggesting that the probable conduit is a utility-related object. However, the footprint of this probable utility-related conduit or possible UST was marked in the field with spray paint and pin flags.

GPR surveys conducted across the concrete pad adjacent to the pump island suggest that the EM61 anomalies recorded in this area are probable in response to steel-reinforcement in the concrete. With the exception of the probable utility-related feature found at X=38 Y=25, the geophysical findings obtained within the survey area at Parcel 41A suggest that the ROW area does not contain metallic UST's.

3.6 Wesly Denham Property (Parcel 42)

The Havoline Carolina Kwik Lube garage operates at Parcel 42, which is located on the south side of Fayetteville Road. Asphalt and grass surfaces cover much of the proposed ROW area with a small concrete pad located in front of the building. The EM61 bottom coil results and the differential

results are presented in **Figure 14**. The linear bottom coil, EM anomalies, such as the ones intersecting grid coordinates X=60 Y=58, and X=80 Y=85, are probably in response to utility lines or conduits. The high amplitude anomaly centered near grid coordinates X=40 Y=40, is in response to a vehicle that could not be moved for the geophysical investigations. The anomalies centered near X=40 Y=12, and X=120 Y=55, are in response to a nearby vehicle and steel-reinforced concrete, respectively.

The geophysical results obtained within the surveyed portion of Parcel 42 suggest that the proposed ROW area does not contain metallic UST's.

3.7 William Ussery Property (Parcel 57)

Parcel 57 is located on the north side of Fayetteville Road approximately 0.2 miles east of Old Aberdeen Road. The EM61 bottom coil results and the differential results are presented in **Figure 15**. A series of small, bottom coil anomalies were recorded along survey line Y=25 from grid coordinate X=5 to X=115, which may be in response to an east-west trending, buried utility line or conduit. Several other bottom coil anomalies were recorded across the survey area that are probably in response to miscellaneous metal debris.

All of the differential anomalies are probably in response to known cultural features or buried debris, suggesting that the proposed ROW area at Parcel 57 does not contain metallic UST's.

3.8 Walter McCain Property (Parcel 80)

Parcel 80 is located immediately northwest of the Fayetteville Road and Philadelphia Road intersection and consists of two vacant buildings surrounded by sandy or grass surfaces. A former pump island pad is located south of the eastern-most building. The EM61 bottom coil results and the differential results are presented in **Figure 16**.

GPR surveys conducted across the EM61 anomalies centered near grid coordinates X=170 Y=35, and X=194 Y=32, suggest the presence of two metallic UST's. The probable UST centered near X=170

Y=35, appears to be approximately 13 feet long, 3.5 feet wide, and buried approximately 1.1 feet below surface. The probable UST centered near grid coordinates X=192 Y=32 appears to be10 feet long, 3.5 feet wide, and buried approximately 1.9 feet below surface. The two probable UST's are separated by the former pump island pad. Photos of the UST locations along with an image of GPR survey line X=167.5 are presented in **Figure 17**.

Based upon the geophysical results, the remaining portion of the proposed ROW area does not appear to contain metallic UST's.

3.9 Leon Wall Property (Parcel 99)

Parcel 99 is located immediately southwest of the Fayetteville Road and Patterson Road intersection and consists mostly of a grass yard surrounding a vacant building. The EM61 bottom coil results and the differential results are presented in **Figure 18** in which a bottom coil, linear anomaly is recorded along survey line Y=230. This linear anomaly is probably in response to a utility line. GPR surveys conducted across the differential EM61 anomaly centered near X=92 Y=165, is probably in response to a water line adjoining the vacant building. GPR surveys were also conducted between the building and the former pump island pad that is centered near coordinates X=84 Y=222. The surveys suggest that the EM anomalies recorded in this portion of the survey area are probably in response to miscellaneous metal debris.

Based upon the geophysical results, the proposed ROW area at Parcel 99 does not appear to contain metallic UST's.

3.10 James Porter Property (Parcel 117)

Parcel 117 is a former gas station site located on the south side of Fayetteville Road approximately 0.25 miles west of Locklear Drive. The site consists primarily of grass and asphalt surfaces with a former pump island pad located in front of the vacant building. The EM61 bottom coil results and the differential results are presented in **Figure 19**. The linear, bottom coil anomaly intersecting grid coordinates X=130 Y=54, is probably in response to a buried utility line or conduit. The linear

anomaly intersecting X=40 Y=74, is probably in response to a metal fence. The remaining EM61 anomalies are probably in response to known cultural features and miscellaneous metal debris.

The geophysical investigation across the survey area of Parcel 117 suggests that the proposed ROW area does not appear to contain metallic UST's.

3.11 John Evans Property (Parcel 126)

The active Custom Monument Company operates on Parcel 126, which is located immediately northeast of the Fayetteville Road and LockLear Drive intersection. The geophysical survey area consists of grass and asphalt surfaces and the EM61 bottom coil results and the differential results are presented in **Figure 20**. All of the EM61 anomalies recorded across the surveyed portion of the site are probably in response to known cultural features, suggesting that the proposed ROW area does not contain metallic UST's.

3.12 Henry Ussery Property (Parcel 140)

Parcel 140 is a former gas station site, which is presently occupied by Bo Henry's Pawn Shop. The property is located immediately southeast of the Fayetteville Road and Port Street intersection. Much of the proposed ROW area consists of sandy or grass-covered surfaces. A concrete pad surrounds the north and west sides of the building. The EM61 bottom coil results and the differential results are presented in **Figure 21**. The linear bottom coil anomaly intersecting grid coordinates X=80 Y=80, is probably in response to a buried utility line.

GPR surveys conducted across the differential anomalies centered near coordinates X=90 Y=60, and X=107 Y=59, suggest the presence of two UST's buried approximately 1.7 feet and 1.8 feet below surface, respectively. Both probable UST's appear to be approximately 10 to 11 feet long and 4 to 4.5 feet wide. Probing with a steel rod across this area suggest the presence of a concrete slab buried approximately 0.3 feet below surface and overlying the UST's. A photo showing the locations of the probable UST along with GPR images are presented in **Figure 22**.

4.0 SUMMARY & CONCLUSIONS

Our evaluation of the EM61 and GPR data collected across the proposed ROW areas at the 13 sites along Fayetteville Road (US 1) in Rockingham, North Carolina provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic UST's within the surveyed portions of the proposed ROW areas of each site.

- GPR surveys were conducted across selected EM61 differential anomalies and across areas containing steel reinforced concrete.

- Linear EM61 anomalies at the 13 sites are probably in response to buried utility lines and/or conduits. The majority of non-linear anomalies are probably in response to known cultural features or miscellaneous metal objects.

- The geophysical results did not detect the presence of unknown metallic UST's within the surveyed portions of the proposed ROW areas at the following sites:

W. J. Barnhart Property	(Parcel 4)
W. J. Barnhart Property	(Parcel 41A)
Wesly Denham Property	(Parcel 42)
William Ussery Property	(Parcel 57)
Leon Wall Property	(Parcel 99)
James Porter Property	(Parcel 117)
John Evans Property	(Parcel 126)

- Julia M. Ratliff Property (Parcel 7): Geophysical results suggest the presence of a UST centered near X=71 Y=35, and buried approximately 3.2 feet below surface. Based on the GPR results, the probable UST appears to be approximately 10 feet long and 4 feet wide. A second UST may be present immediately west of this UST.

- Samuel D. Tanner Property (Parcel 15): Geophysical results suggest the presence of a UST centered near X=188 Y=137, and buried approximately 1.4 feet below surface. GPR surveys suggest that the probable tank is approximately 10 feet long and 3.5 feet wide.

- Harvey E. Melton Property (Parcel 17): Three and probably four active UST's are centered near grid coordinates X=54 Y=53, X=50 Y=43, and X=50 Y=34, respectively. The UST centered near grid coordinates X=54 Y=53, appears to be approximately 35 feet long and probably consists of two UST's instead of one. The known kerosene UST is centered near X=155 Y=144, and is buried approximately 1.7 feet below surface. The kerosene tank appears to be approximately 9 to 10 feet long and 3.5 to 4 feet wide.

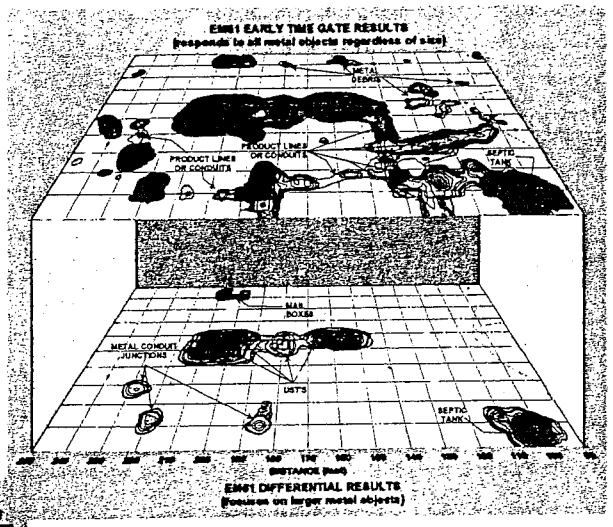
- Samuel D. Tanner Property (Parcel 21): Geophysical results suggest the presence of a UST centered near grid coordinates X=269 Y=173, and buried approximately 1.7 feet below surface. The UST appears to be approximately 10 feet long and 5 feet wide.

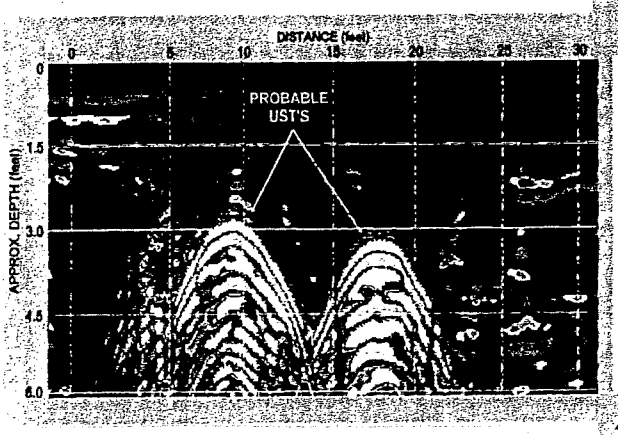
- Walter McCain Property (Parcel 80): Geophysical results suggest the presence of two UST's centered near grid coordinates X=170 Y=35, and X=194 Y=32. The probable UST centered near X=170 Y=35, appears to be approximately 13 feet long, 3.5 feet wide, and buried approximately 1.1 feet below surface. The probable UST centered near grid coordinates X=192 Y=32, appears to be 10 feet long, 3.5 feet wide, and buried approximately 1.9 feet below surface. The two probable UST's are separated by a former pump island pad.

- Henry Ussery Property (Parcel 140): Geophysical results suggest the presence of two UST's centered near coordinates X=90 Y=60, and X=107 Y=59, and buried approximately 1.7 feet and 1.8 feet below surface, respectively. Both probable UST's appear to be approximately 10 to 11 feet long and 4 to 4.5 feet wide.

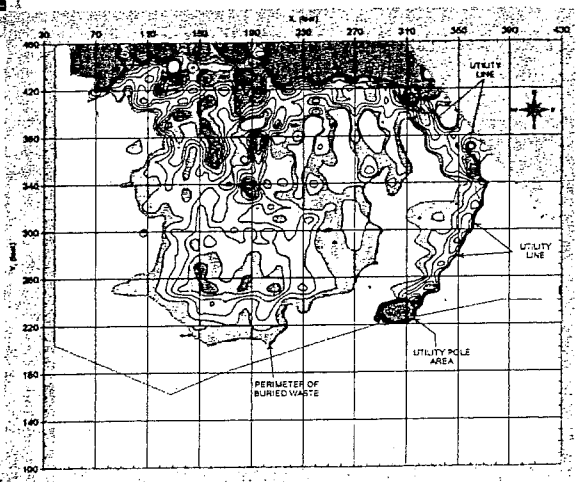
5.0 LIMITATIONS

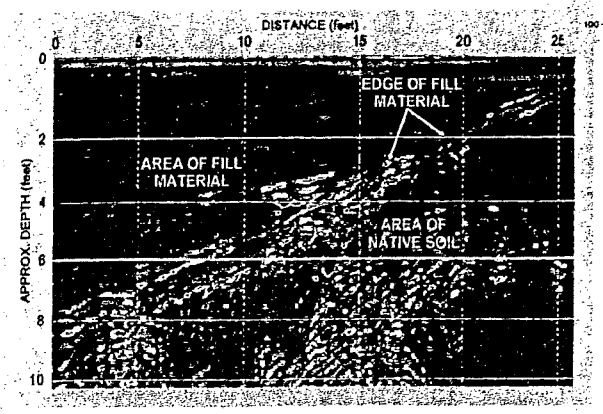
EM61 and GPR surveys have been performed and this report prepared for Solutions Industrial & Environmental Services, Inc. in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project do not conclusively define the locations of all metallic UST's but only suggest where some of the metallic UST's may be present. The EM61 and GPR anomalies, interpreted as possible UST's or tanks, may be attributed to other surface or subsurface conditions or cultural interference.


EM61 EARLY TIME GATE RESULTS
(responds to all metal objects regardless of size)
METAL DEBRIS
PRODUCT LINES OR CONDUITS
SEPTIC TANK
MAN BOXES
METAL CONDUIT JUNCTIONS
USTS
SEPTIC TANK
DISTANCE (feet)
EM61 DIFFERENTIAL RESULTS
(focuses on larger metal objects)

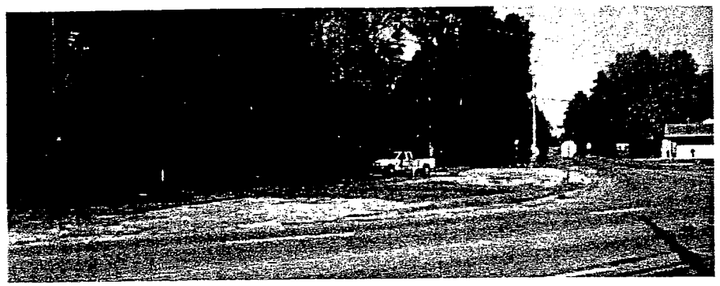

DISTANCE (feet)
0
5
10
15
20
25
30
PROBABLE UST'S
APPROX. DEPTH (feet)
0
1.5
3.0
4.5
6.0

FIGURES


UTILITY LINE
UTILITY LINE
UTILITY POLE AREA
PERIMETER OF BURIED WASTE

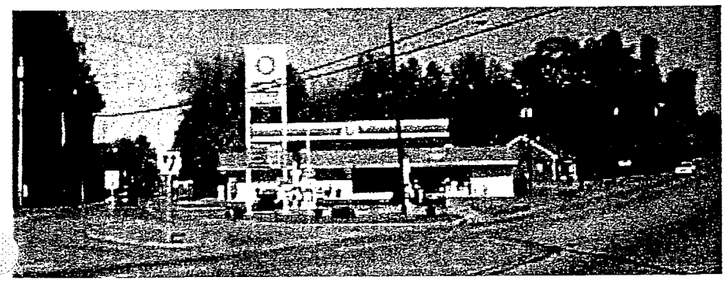

DISTANCE (feet)
0
5
10
15
20
EDGE OF FILL MATERIAL
AREA OF FILL MATERIAL
AREA OF NATIVE SOIL
APPROX. DEPTH (feet)
0
2
4
6
8
10

Parcel 4 - W. J. Barnhart Property

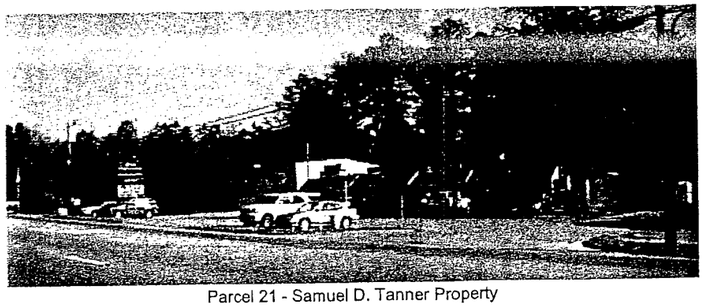


Parcel 7 - Julia M. Ratliff Property

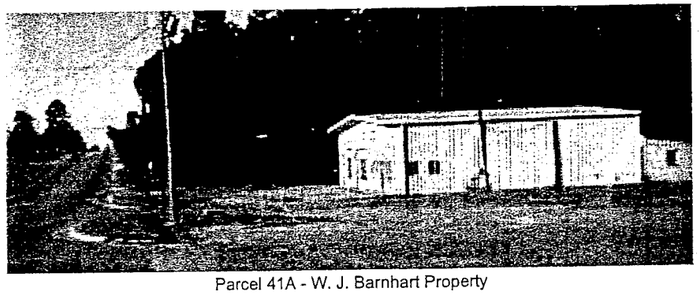
Parcel 15 - Samuel D. Tanner Property



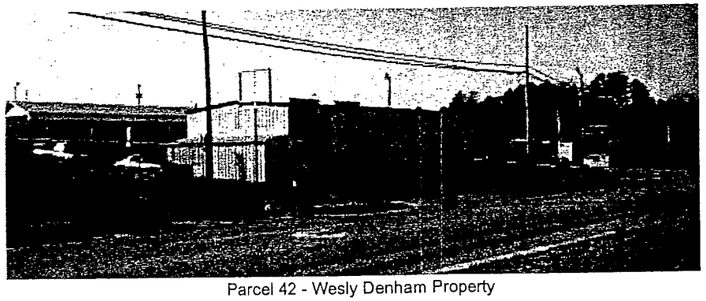
Parcel 17 - Harvey E. Melton Property



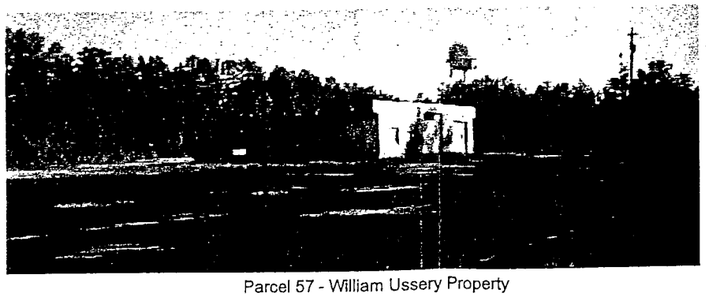
Parcel 21 - Samuel D. Tanner Property



Parcel 41A - W. J. Barnhart Property

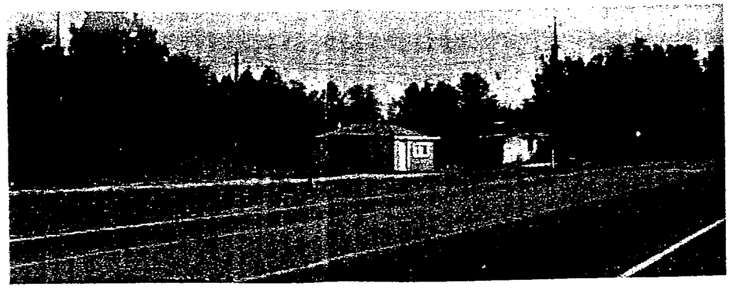


Parcel 42 - Wesly Denham Property



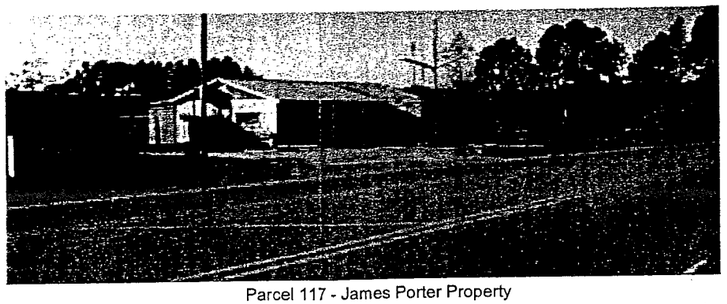
Parcel 57 - William Ussery Property

Parcel 140 - Henry Ussery Property

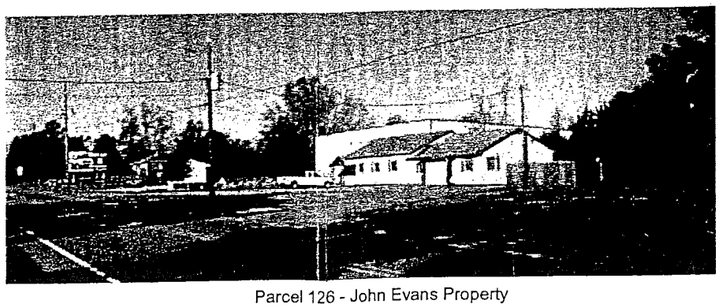


Parcel 80 - Walter McCain Property

Parcel 99 - Leon Wall Property



Parcel 117 - James Porter Property



Parcel 126 - John Evans Property

SITE PHOTOS

FIGURE 1

GRAPHIC SCALE IN METERS

DRAWN	MJD	FIGURE	
CHKD			
DATE	11/28/05	JOB NO.	2005-292
LAY		DWG	

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

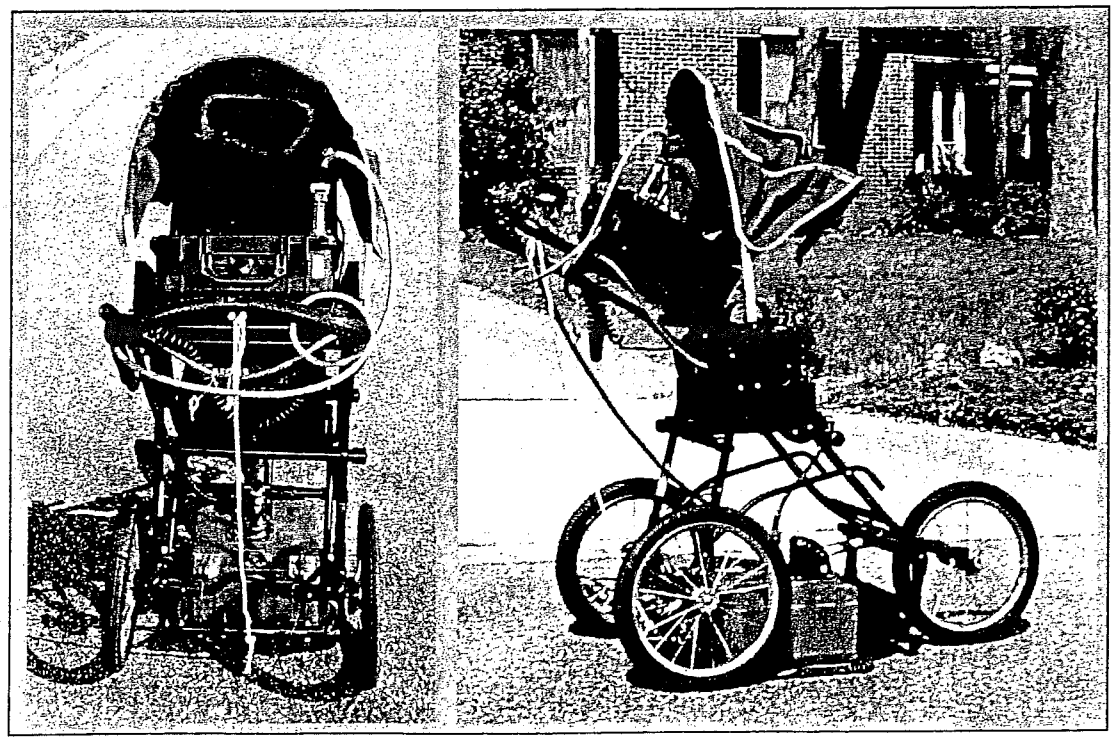
SITE: ROCKINGHAM SITES

CITY: ROCKINGHAM STATE: NORTH CAROLINA

TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

The Geonics EM61 metal detector was used to conduct the metal detection surveys at the Rockingham sites in November 2005.



The SIR-2000 GPR system equipped with a 400 MHz antenna that was used at the Rockingham sites in November 2005.

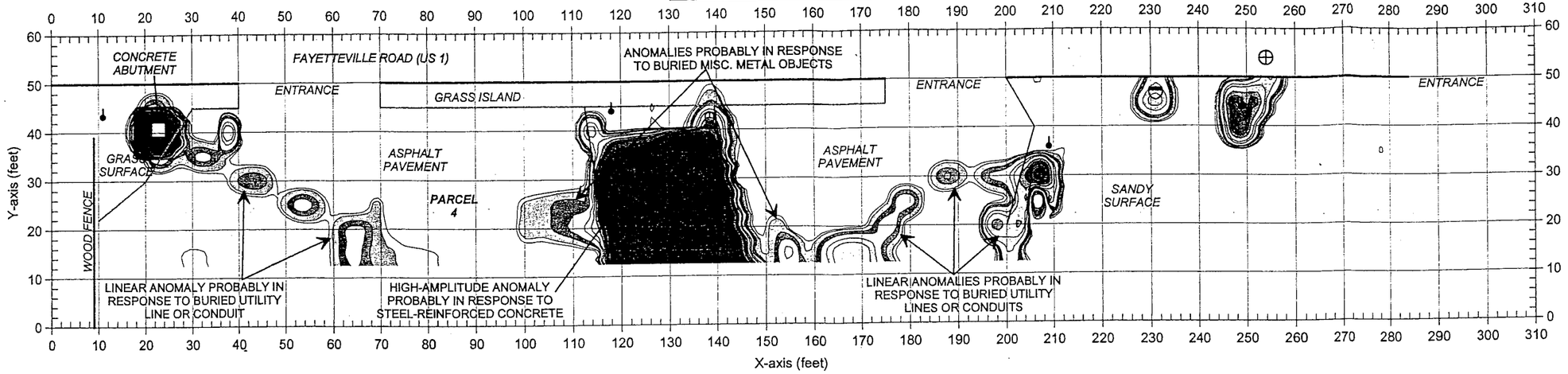
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05	DRWN	
SITE	ROCKINGHAM SITES	LAY		CHKD	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JOB	2005-292	SCALE	GRAPHIC SCALE IN METERS

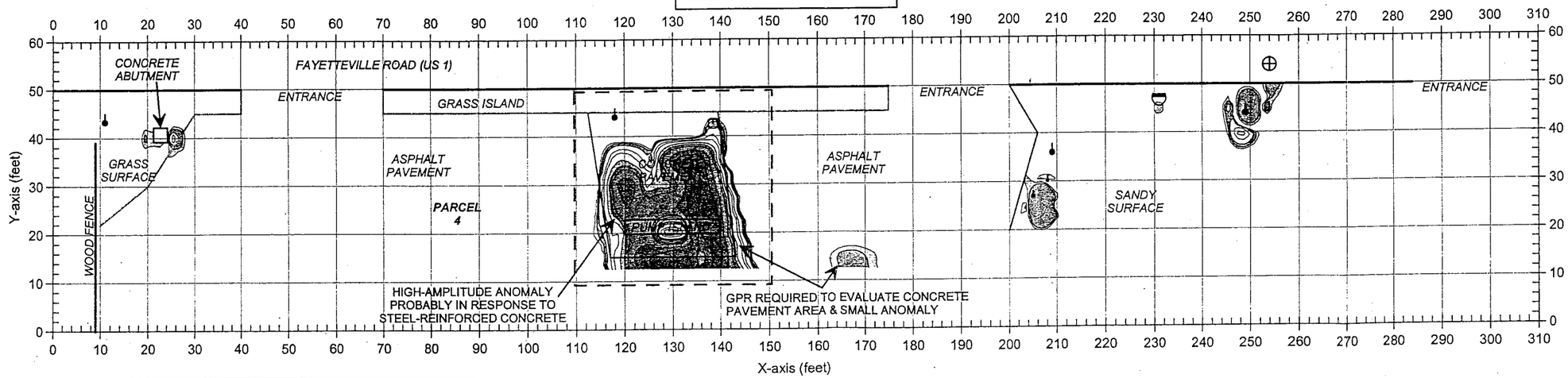
GEOPHYSICAL EQUIPMENT

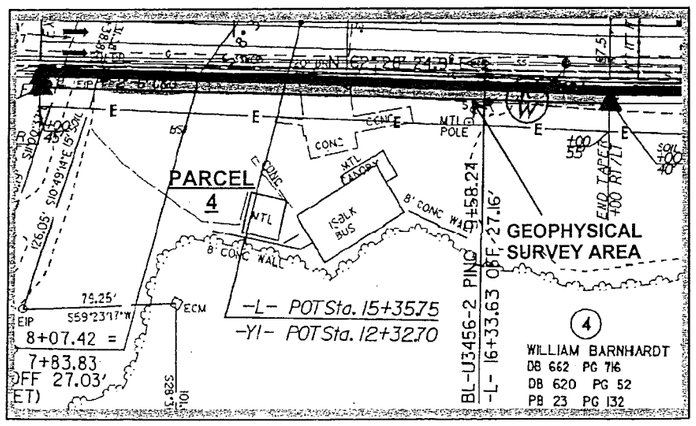
FIGURE 2

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-4000

APPROXIMATE NORTH

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- MONITORING WELL
- WATER METER OR VALVE COVER
- GUY WIRE
- UTILITY POLE OR LIGHT POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- MANHOLE COVER
- GPR SURVEY AREA

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

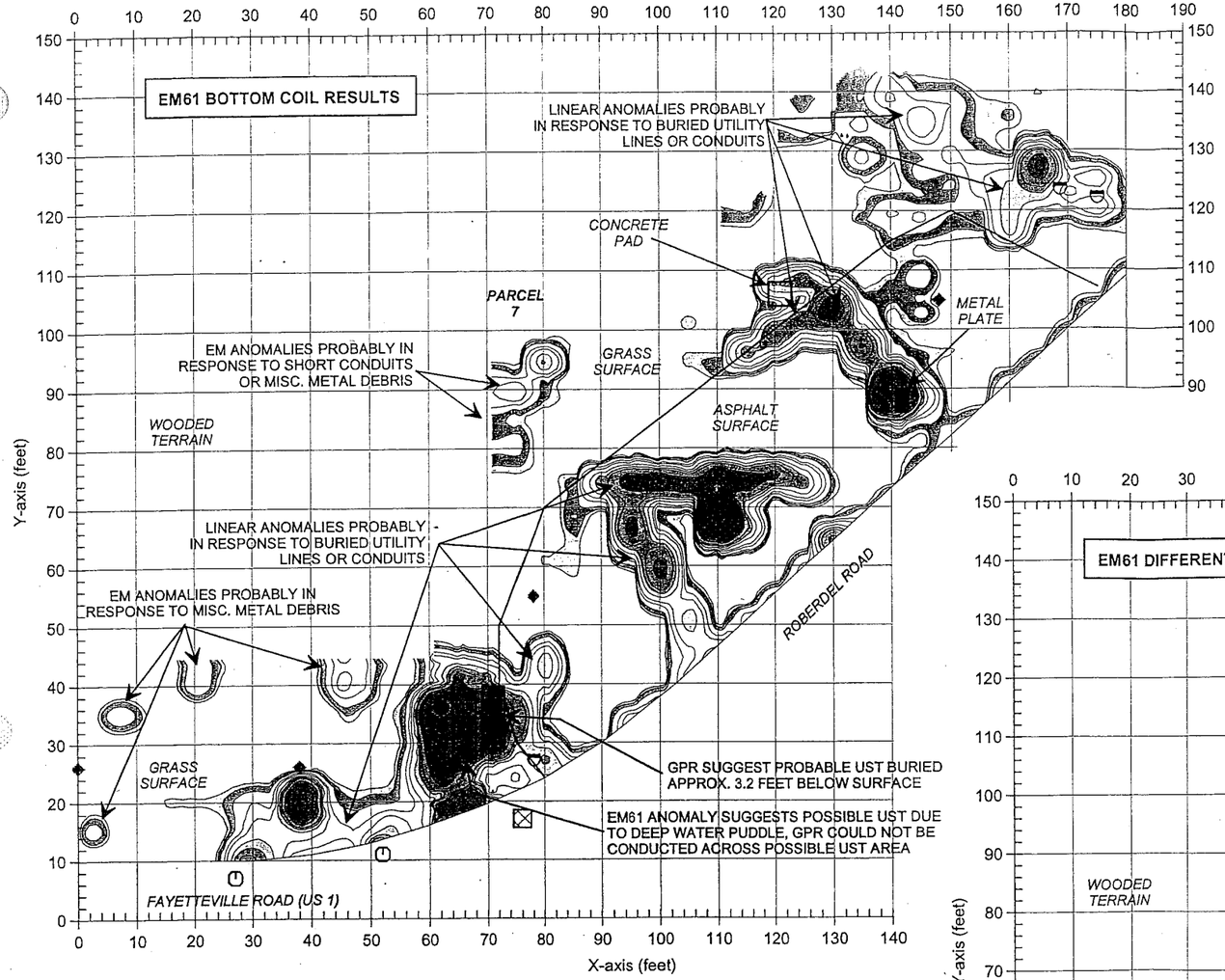
EM61 METAL DETECTION RESULTS

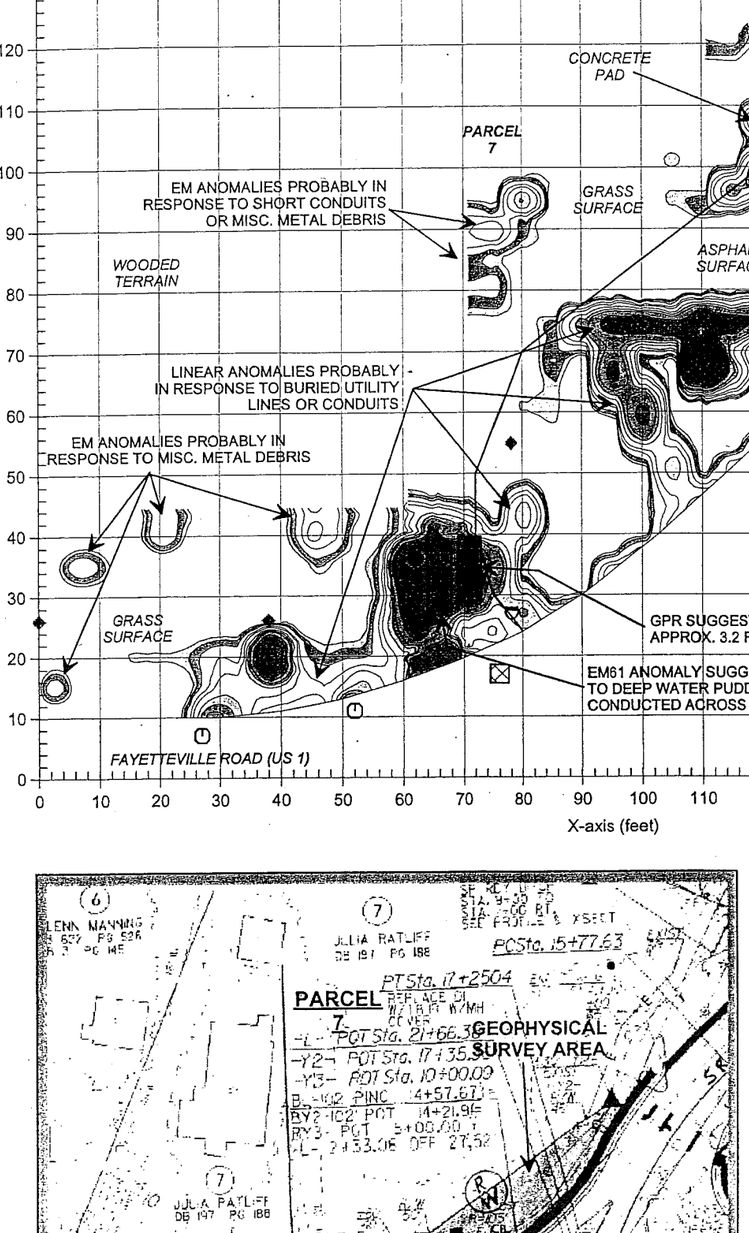
FIGURE 3

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	W. J. BARNHART PROPERTY (PARCEL 4)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
JOB NO.	2005-292
FIGURE	
DWG	
LAY	
DATE	11/26/05
DRWN	MJD
CHKD	

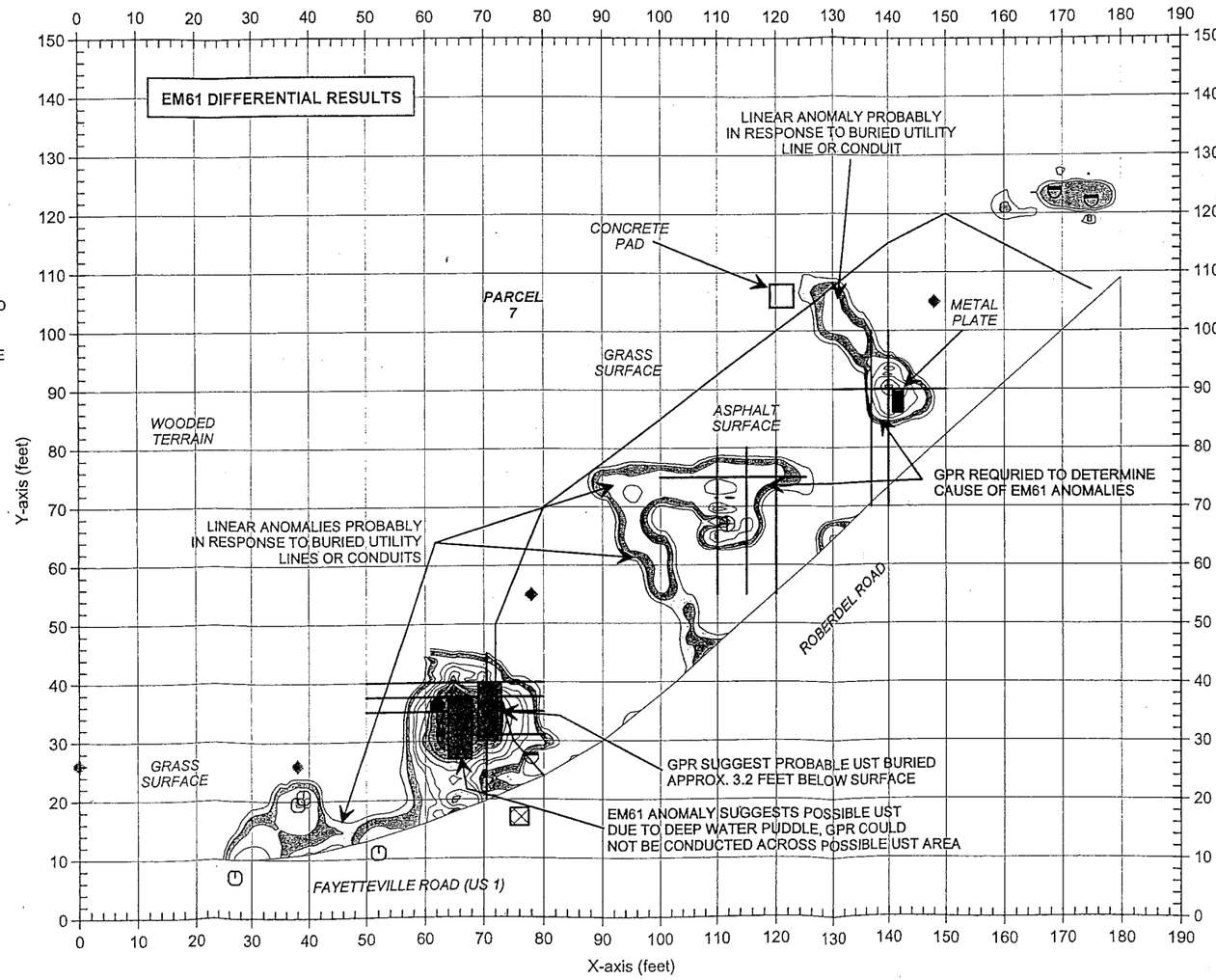
GRAPHIC SCALE IN METERS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.





APPROXIMATE NORTH



LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH & EAST-WEST TRENDING LINES SPACED 5 FEET APART
- MONITORING WELL
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- MANHOLE COVER
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -50 -25 -10 -7.5 -5 -2.5 2.5 5 7.5 10 25 50 100 200 400 1000

FIGURE 4

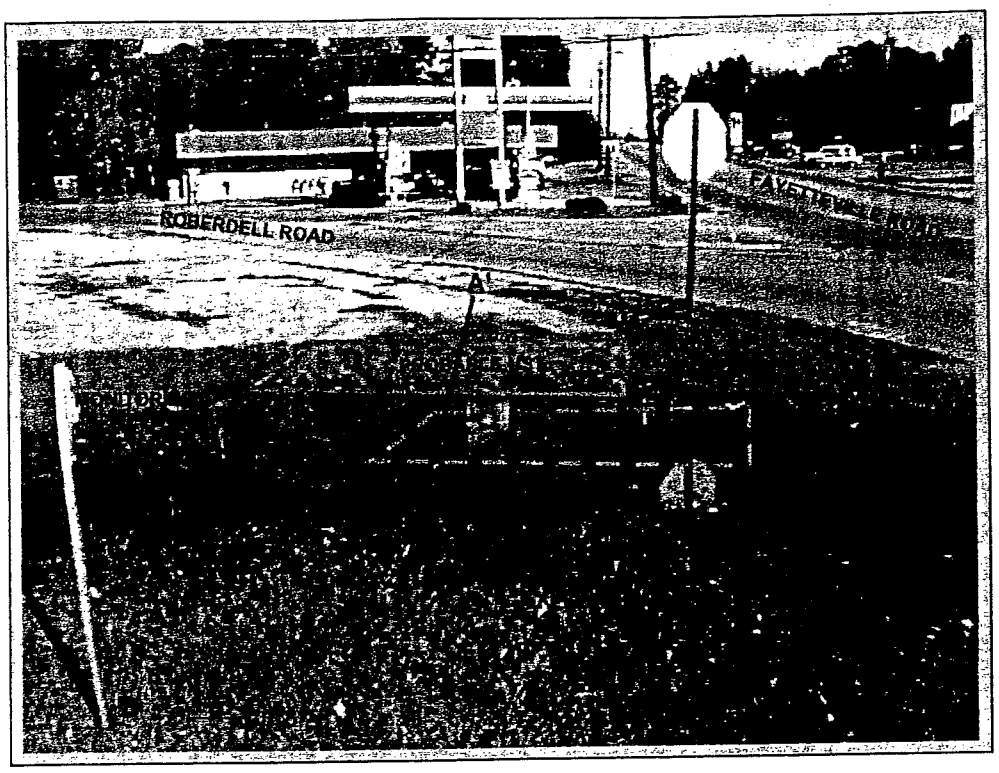
EM61 METAL DETECTION RESULTS

GRAPHIC SCALE IN METERS

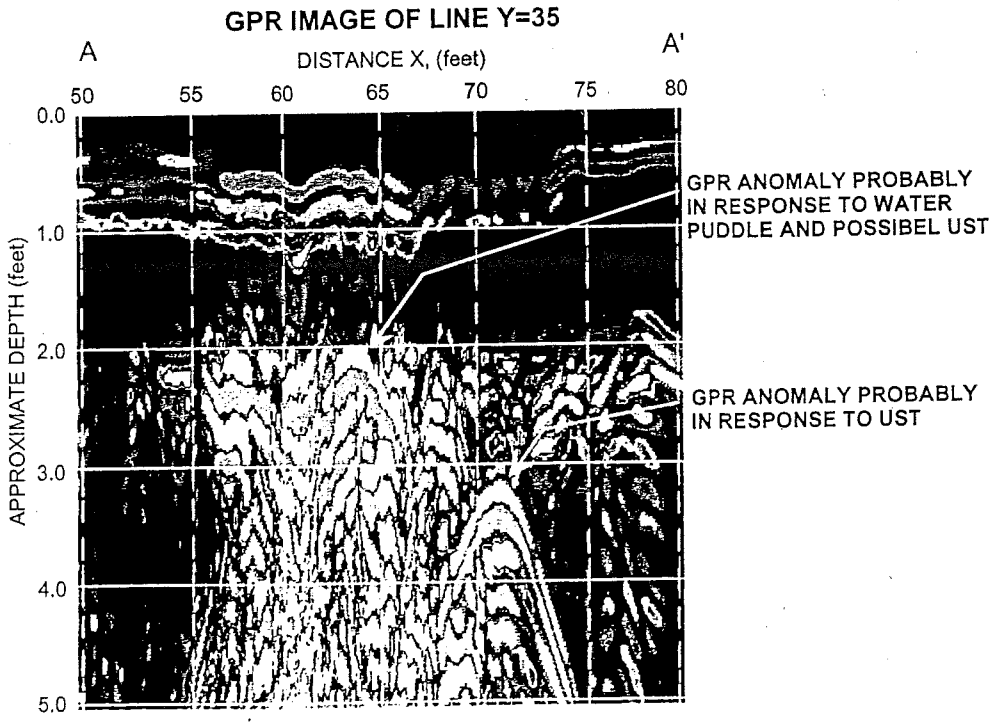
DRAWN	MJD	FIGURE	
CHKD			
DATE	11/25/05	LAY	
DWG		JOB NO.	2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: JULIA M. RATLIFF PROPERTY (PARCEL 7)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the location of the probable UST and possible UST, as suggested by the geophysical results at Parcel 7.



The GPR image obtained along a portion of survey line Y=35 shows the anomaly that is probably in response to a UST near X=71 and buried approximately 3.2 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

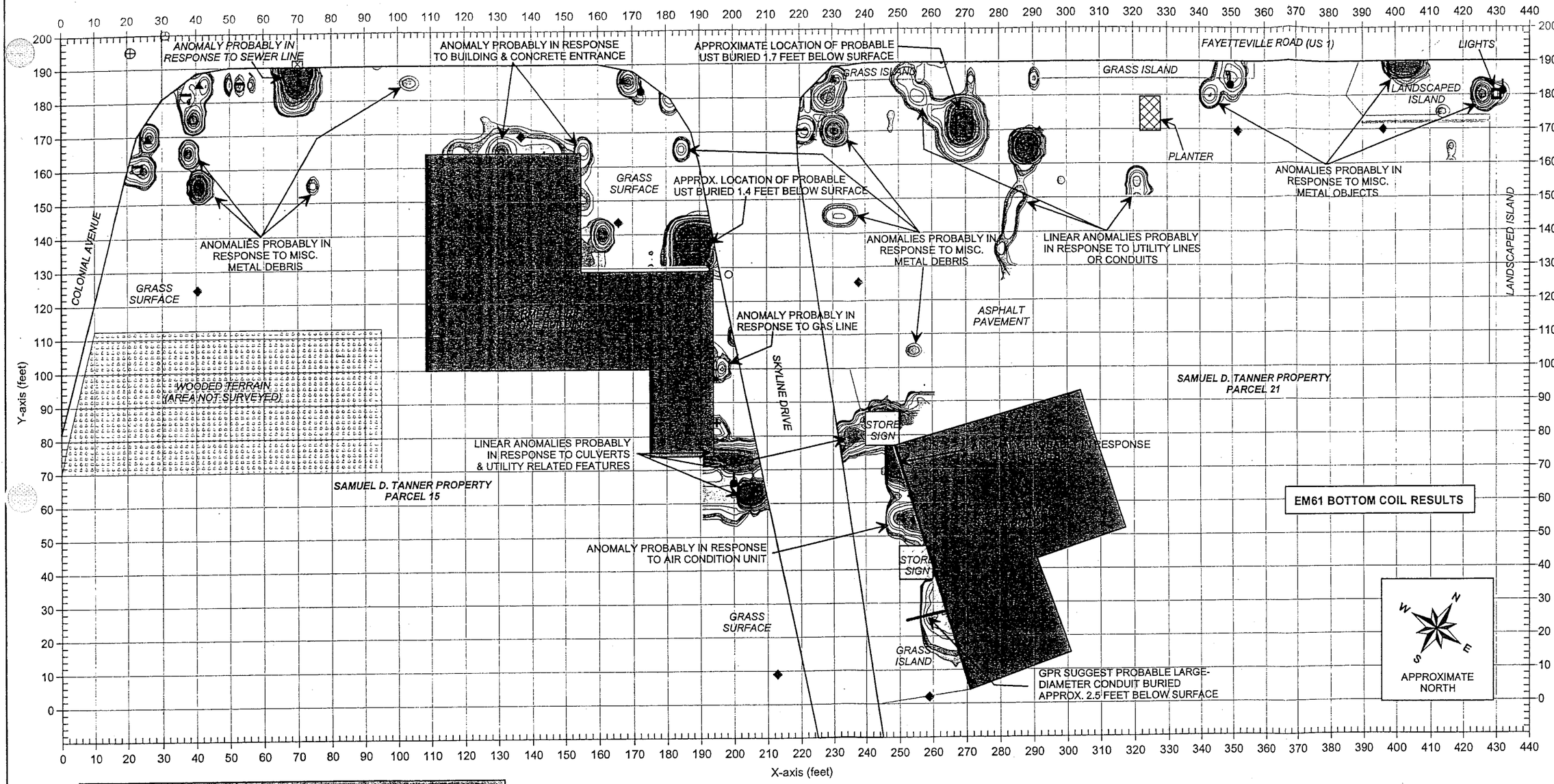
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL		DATE	11/28/05	DRWN
SITE	JULIA M. RATLIFF PROPERTY (PARCEL 7)		LAY		CHKD
CITY	ROCKINGHAM	STATE NORTH CAROLINA			DWG
TITLE	GEOPHYSICAL RESULTS		PRO	2005-292	REVISE

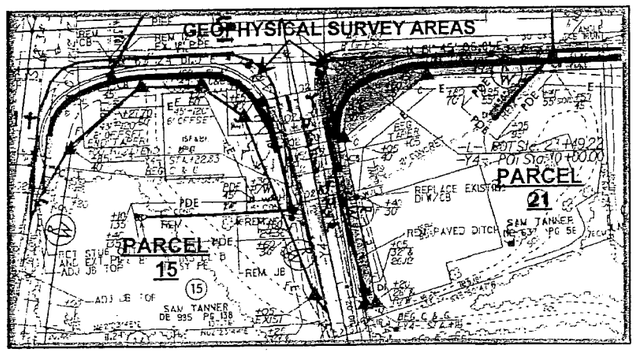
PHOTO & GPR IMAGE OF UST LOCATION

FIGURE 5

FIGURE 6

EM61 BOTTOM COIL RESULTS





EM61 BOTTOM COIL RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-400

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST & NORTH-SOUTH TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CONCRETE R/W MARKER
- GAS METER
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVER
- MANHOLE COVER
- MONITORING WELL
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

DRAWN	MJD		
CHKD			FIGURE
DATE	11/25/05		2005-292
LAY		DWG	JOB NO.

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: SAMUEL D. TANNER PROPERTY (PARCELS 15 & 21)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 DIFFERENTIAL RESULTS

FIGURE 7

ANOMALY PROBABLY IN RESPONSE TO SEWER LINE

ANOMALY PROBABLY IN RESPONSE TO BUILDING & CONCRETE ENTRANCE

FAYETTEVILLE ROAD (US 1)

GRASS ISLAND

GRASS ISLAND

LIGHTS

LANDSCAPED ISLAND

PLANTER

ANOMALIES PROBABLY IN RESPONSE TO MISC. METAL OBJECTS

APPROXIMATE LOCATION OF PROBABLE UST BURIED 1.7 FEET BELOW SURFACE

GRASS SURFACE

APPROXIMATE LOCATION OF PROBABLE UST BURIED 1.4 FEET BELOW SURFACE

COLONIAL AVENUE

GRASS SURFACE

ANOMALY PROBABLY IN RESPONSE TO GAS LINE

ASPHALT PAVEMENT

LANDSCAPED ISLAND

SKYLINE DRIVE

WOODED TERRAIN (AREA NOT SURVEYED)

SAMUEL D. TANNER PROPERTY PARCEL 21

STORE SIGN

LINEAR ANOMALIES PROBABLY IN RESPONSE TO CULVERTS & UTILITY RELATED FEATURES

SAMUEL D. TANNER PROPERTY PARCEL 15

ANOMALY PROBABLY IN RESPONSE TO AIR CONDITION UNIT

STORE SIGN

GRASS SURFACE

GRASS ISLAND

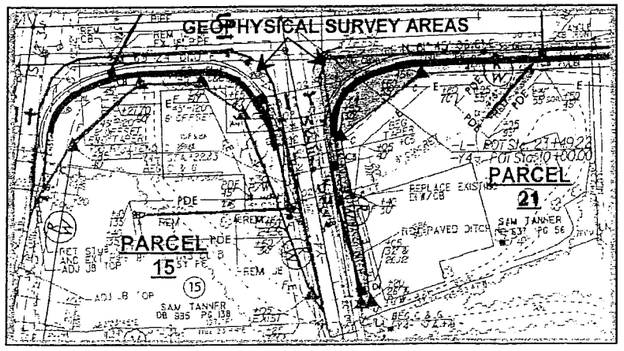
GPR SUGGEST PROBABLE LARGE-DIAMETER CONDUIT BURIED APPROX. 2.5 FEET BELOW SURFACE

EM61 DIFFERENTIAL RESULTS

APPROXIMATE NORTH

Y-axis (feet)

X-axis (feet)



EM61 DIFFERENTIAL RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
50
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST & NORTH-SOUTH TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CONCRETE R/W MARKER
- GAS METER
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVER
- MANHOLE COVER
- MONITORING WELL
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

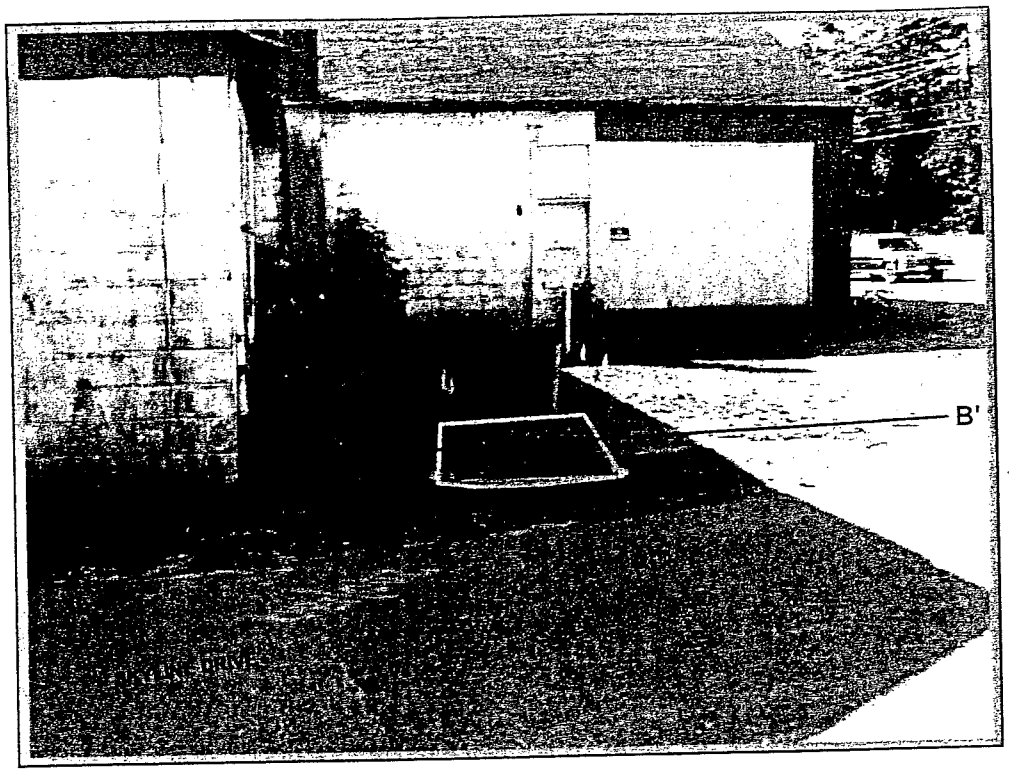
Note: The contour plot shows the differential results of the EM61 metal detection survey in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

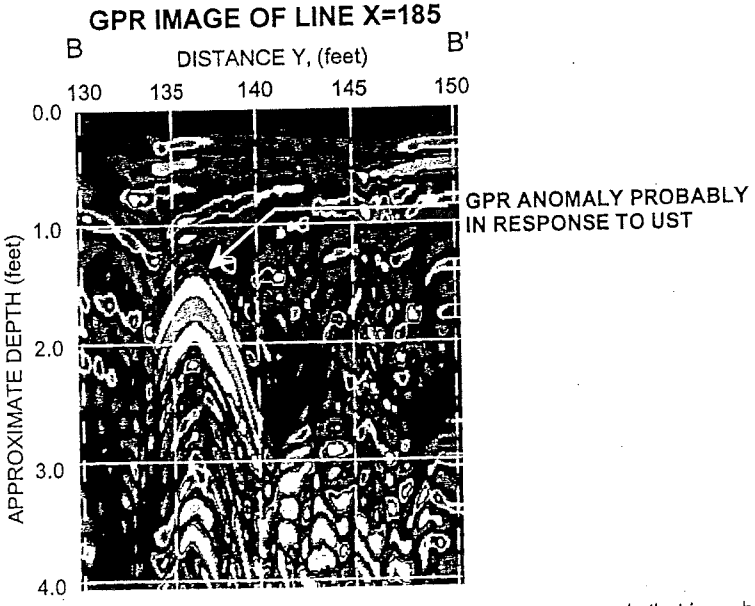
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	SAMUEL D. TANNER PROPERTY (PARCELS 15 & 21)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
JOB NO.	2005-292
FIGURE	
DWG	
DATE	11/25/05
DRAWN	MJD
CHKD	
APVD	

GRAPHIC SCALE IN METERS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the location of the probable UST,
as suggested by the geophysical results at Parcel 15.



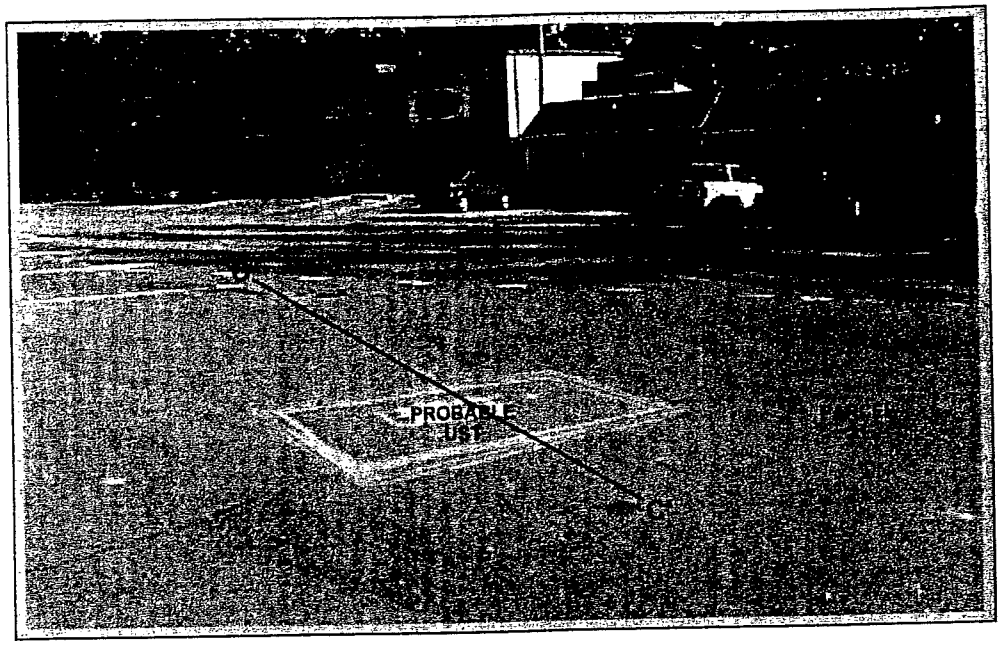
The GPR image obtained along a portion of survey line X=185 shows the anomaly that is probably in response to a UST near Y=137 and buried approximately 1.4 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

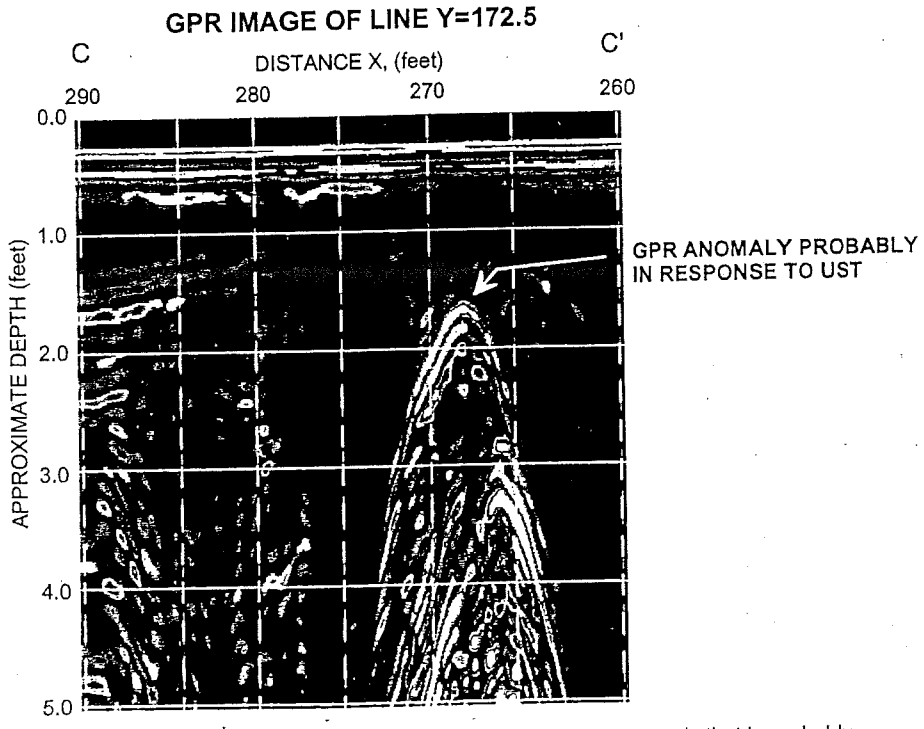
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05	DRWN	
SITE	SAMUEL D. TANNER PROPERTY (PARCEL 15)	LAY		CHKD	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JOB#	2005-292	SCALE	

PHOTO & GPR IMAGE
OF UST LOCATION

FIGURE 8



The photo shows the location of the probable UST,
as suggested by the geophysical results at Parcel 21.



The GPR image obtained along a portion of survey line Y=172.5 shows the anomaly that is probably in response to a UST near X=268 and buried approximately 1.7 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

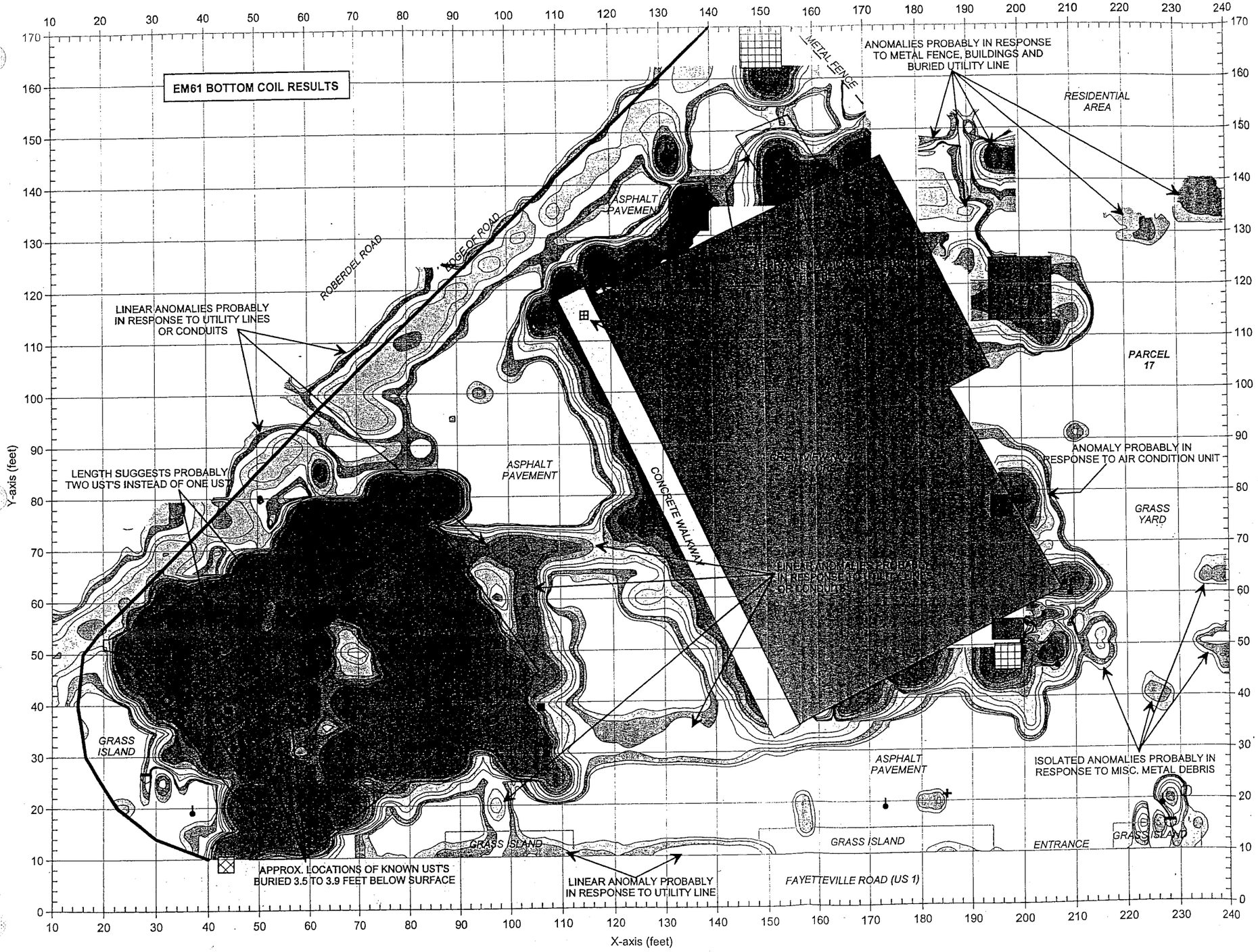
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	SAMUEL D. TANNER PROPERTY (PARCEL 21)		
CITY	ROCKINGHAM	STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS	JOB NO.	2005-292

PHOTO & GPR IMAGE
OF UST LOCATION

FIGURE 9

EM61 BOTTOM COIL RESULTS



APPROXIMATE NORTH

EM61 BOTTOM COIL RESPONSE (MILLIVOLTS)
1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- UST COVERS
- WATER METER OR VALVE COVER
- GUY WIRE
- METAL SIGN POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVERS
- GAS METER
- AIR CONDITION UNIT
- DUMPSTER
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

FIGURE 10

EM61
BOTTOM COIL
RESULTS

GRAPHIC SCALE IN METERS

DRAWN	CHKD	FIGURE
MJD		
DATE	LAY	DWG	JOB NO.
11/25/05			2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: HARVEY E. MELTON PROPERTY (PARCEL 17)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 DIFFERENTIAL RESULTS

FIGURE 11

EM61 DIFFERENTIAL RESULTS

ANOMALIES PROBABLY IN RESPONSE TO METAL FENCE, BUILDINGS AND BURIED UTILITY LINE

METAL FENCE

RESIDENTIAL AREA

ASPHALT PAVEMENT

ROBERDEL ROAD

EDGE OF ROAD

LINEAR ANOMALIES PROBABLY IN RESPONSE TO UTILITY LINES OR CONDUITS

PARCEL 17

ANOMALY PROBABLY IN RESPONSE TO AIR CONDITION UNIT

ASPHALT PAVEMENT

LENGTH SUGGESTS PROBABLY TWO UST'S INSTEAD OF ONE UST.

CONCRETE WALKWAY

GRASS YARD

GRASS ISLAND

ASPHALT PAVEMENT

GRASS ISLAND

GRASS ISLAND

ENTRANCE

APPROX. LOCATIONS OF UST'S BURIED 3.5 TO 3.9 FEET BELOW SURFACE

FAYETTEVILLE ROAD (US 1)

Y-axis (feet)

X-axis (feet)

APPROXIMATE NORTH

EM61 DIFFERENTIAL RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- UST COVERS
- WATER METER OR VALVE COVER
- GUY WIRE
- METAL SIGN POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVERS
- GAS METER
- AIR CONDITION UNIT
- DUMPSTER
- GPR SURVEY AREA
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris. The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

DRAWING SCALE IN METERS

J.NO.	2005-292
DWG	
DATE	11/25/05
DRAWN	MJD
CHKD	
APPVD	

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

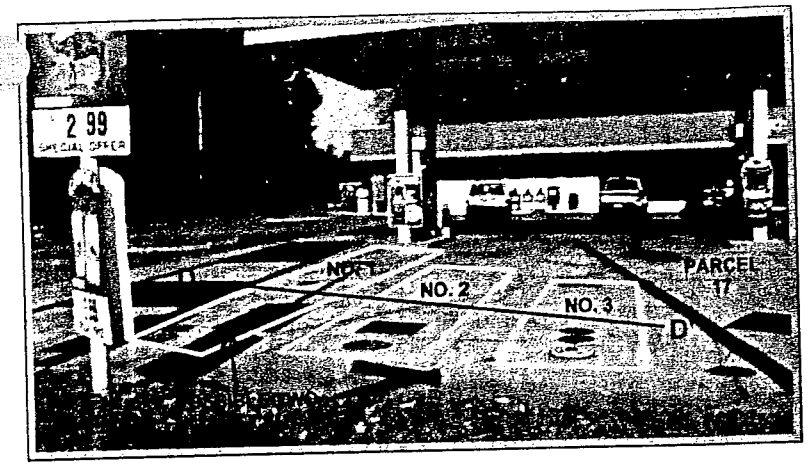
SITE: HARVEY E. MELTON PROPERTY (PARCEL 17)

CITY: ROCKINGHAM

STATE: NORTH CAROLINA

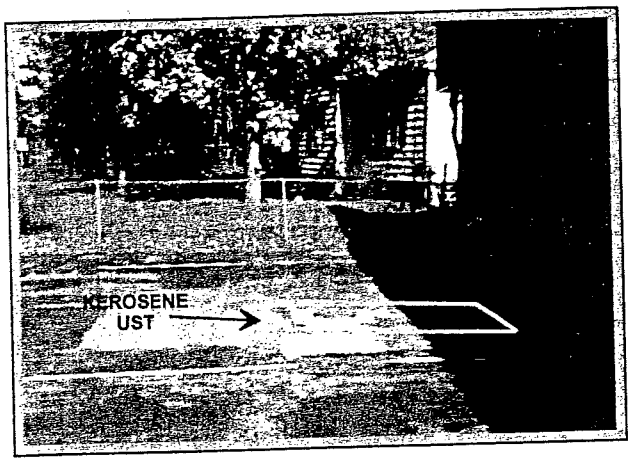
TITLE: GEOPHYSICAL RESULTS

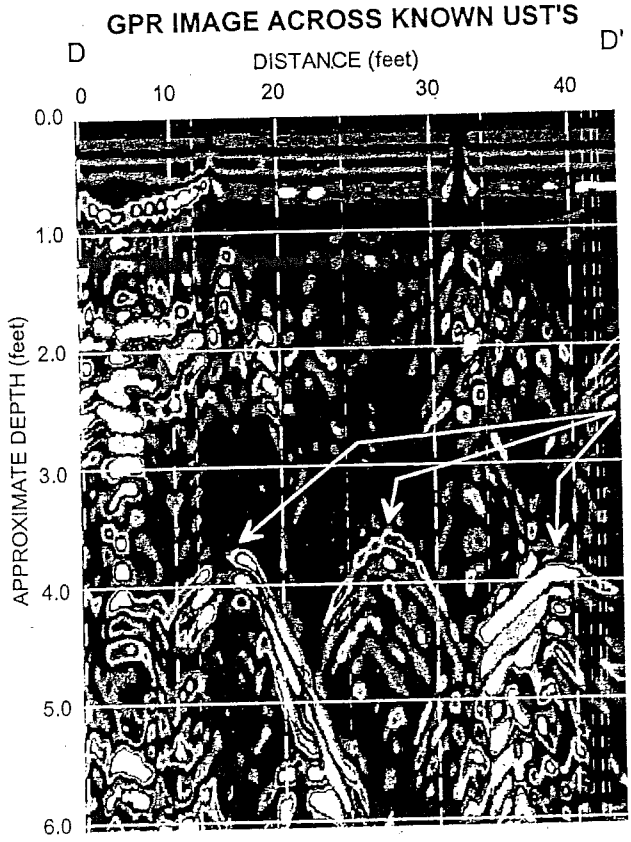
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the approxiamte location of the three or four known and active UST's, as suggested by the geophysical results, at Parcel 17. The UST's appear to be approximately 3.5 to 3.9 feet below surface.

The photo shows the approximate location of the kerosene UST, as suggested by the geophysical results, at Parcel 17. The UST is located along the northwest wall of the store and is buried approximately 2.4 feet below surface.





GPR ANOMALIES PROBABLY IN RESPONSE TO THREE UST'S BURIED 3.5 TO 3.9 FEET BELOW SURFACE

The GPR image is obtained along a traverse line oriented perpendicular to the axis of the UST's. The three GPR anomalies in response to the probable UST's suggest that the UST's are buried approximately 3.5 to 3.9 feet below surface.

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

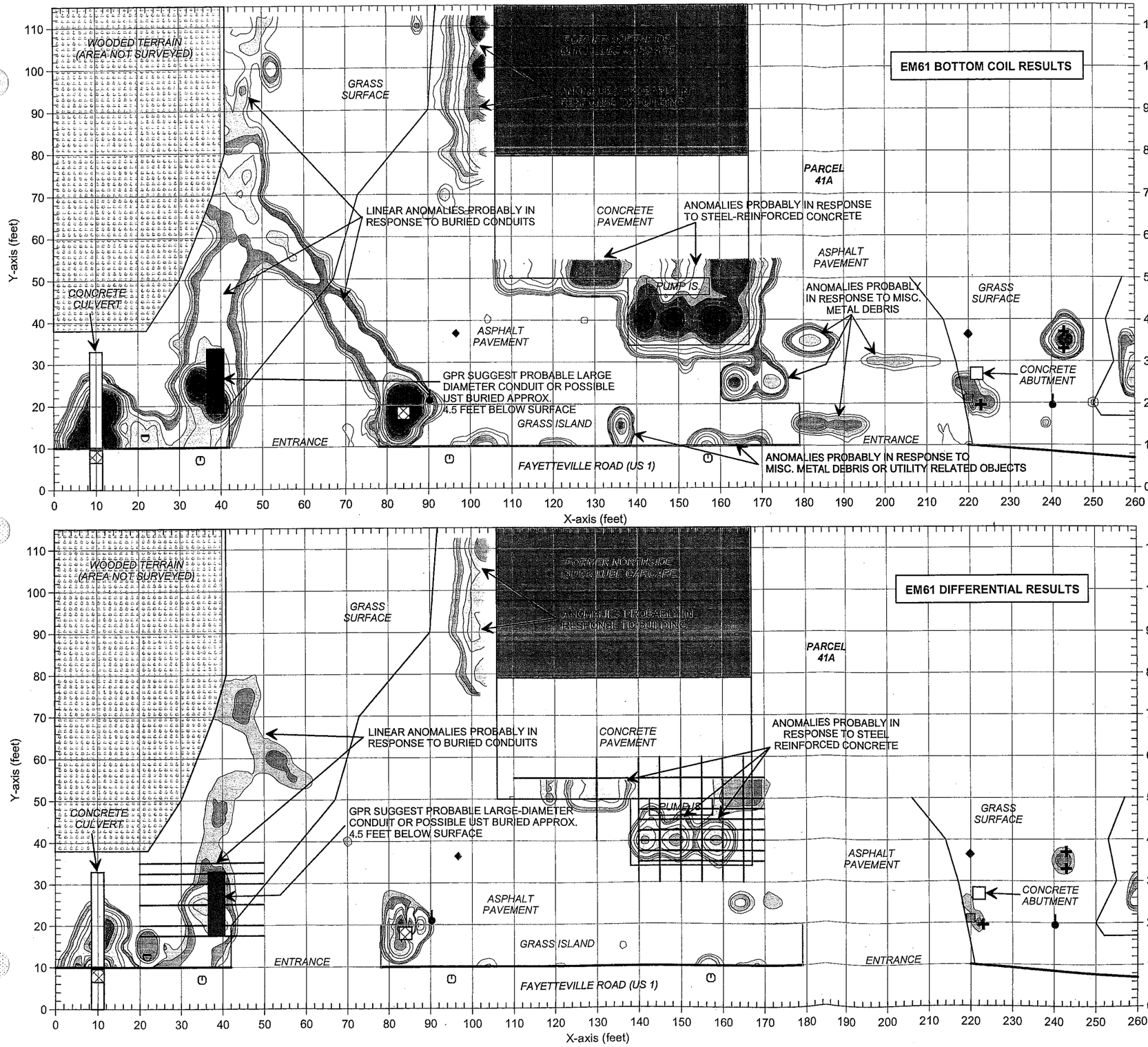
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	HARVEY E. MELTON PROPERTY (PARCEL 17)		
CITY	ROCKINGHAM	STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS	JOB	2005-292

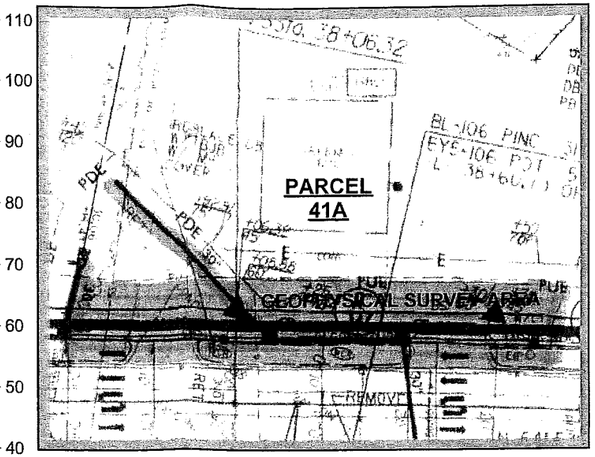
PHOTOS & GPR IMAGE OF UST LOCATIONS

FIGURE 12

EM61 METAL DETECTION RESULTS

FIGURE 13





APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -200 -100 -90 -50 -60 -75 -100 -150 -200 -300 -400 -500 -750 -1000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- MAIL BOX
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE LARGE DIAMETER CONDUIT OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

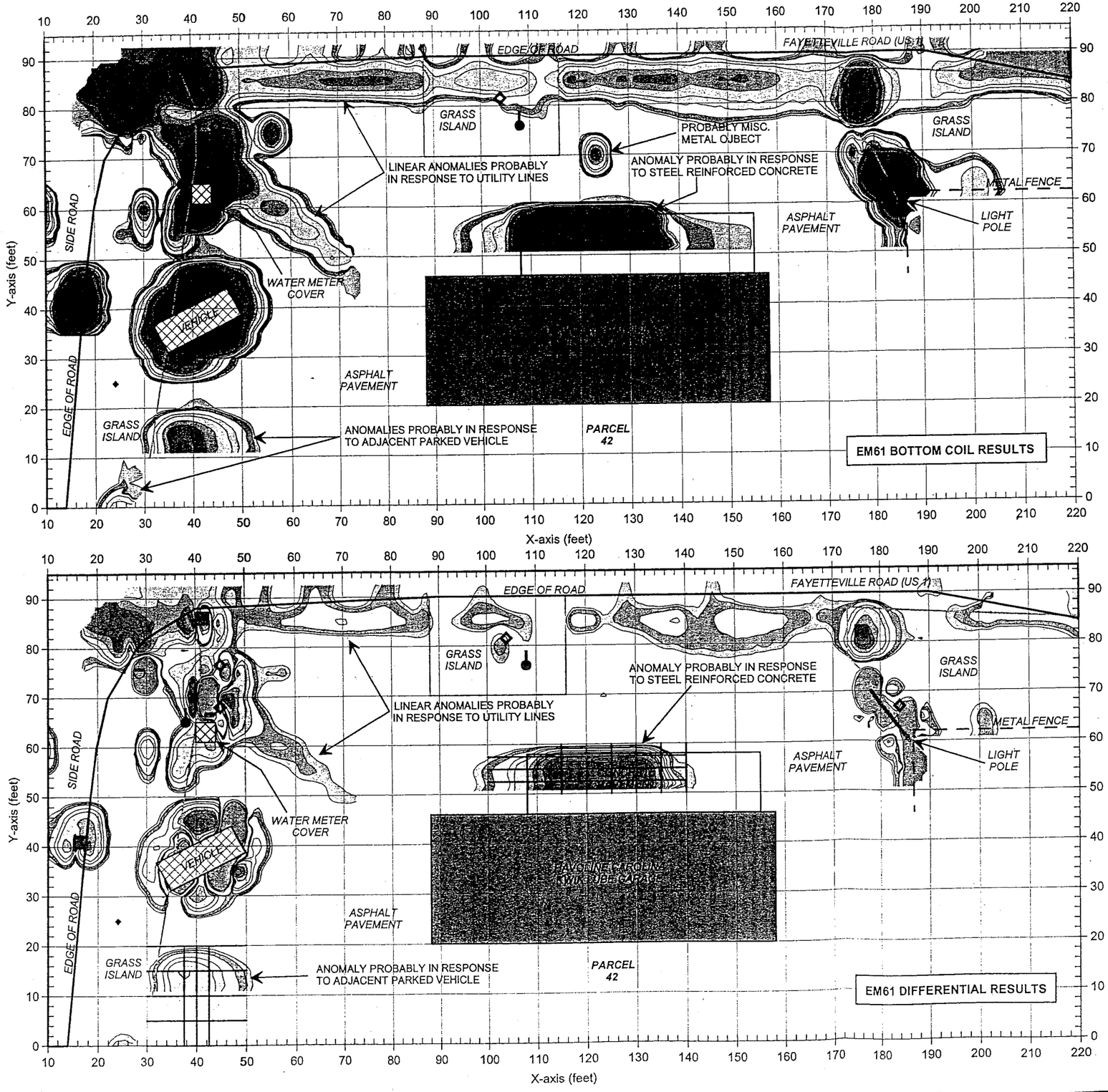
The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

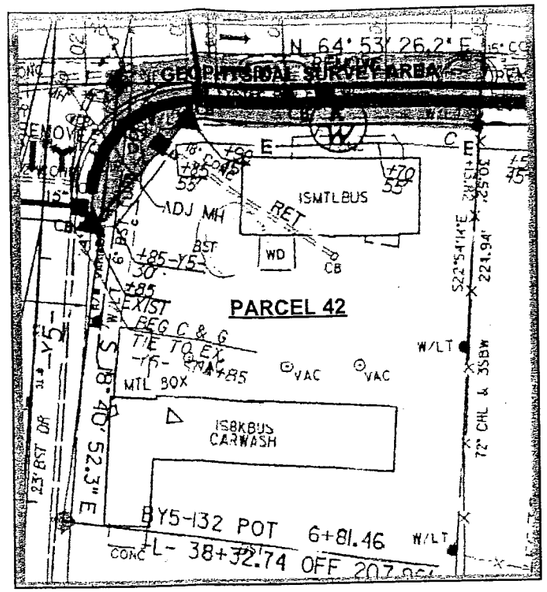
GRAPHIC SCALE IN METERS

DRWN	MJD
CHKD	
DATE	11/26/05
LAY	
DWG	
FIGURE	
J-NO.	2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: W.J. BARNHART PROPERTY (PARCEL 41A)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.





APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -200 -100 -50 -20 -10 -5 5 10 20 50 100 200 400 750 1000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- METAL SIGN POLE
- STORM SEWER GRATE
- GPR SURVEY LINE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 15, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESULTS

FIGURE 14

GRAPHIC SCALE IN METERS

DRAWN	MJD		
CHKD			FIGURE
DATE	11/26/05		2005-292
LAY		DWG	JOB NO.

SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

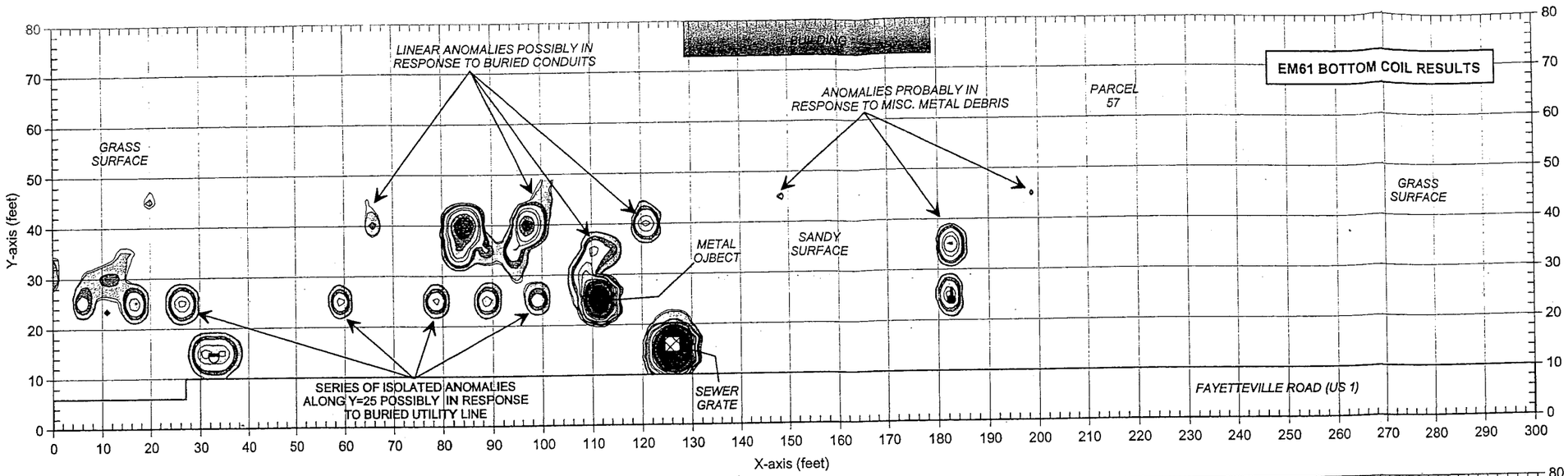
WESLEY DENHAM PROPERTY (PARCEL 42)

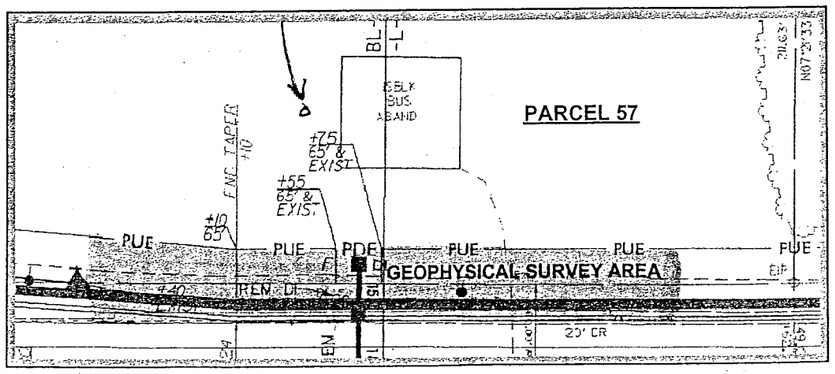
ROCKINGHAM — NORTH CAROLINA

GEOPHYSICAL RESULTS

CLIENT | SITE | CITY | STATE | TITLE

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.





LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -50 -25 -10 -5 0 5 10 15 20 25 30 40 50 60 75 100 150 200 300 400 500 750 1000

N W E S

APPROXIMATE NORTH

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) surveys were not conducted at this site.

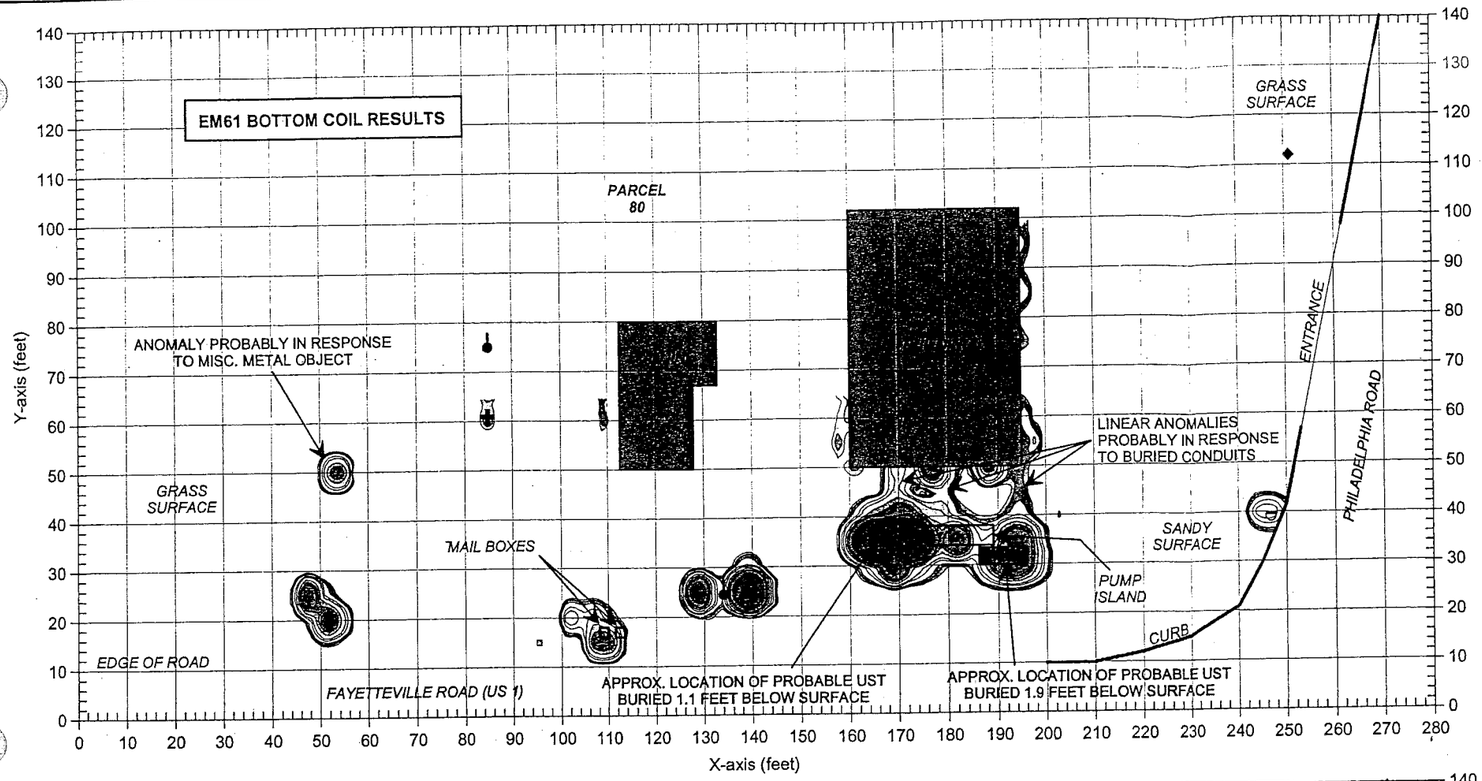
EM61 METAL DETECTION RESULTS

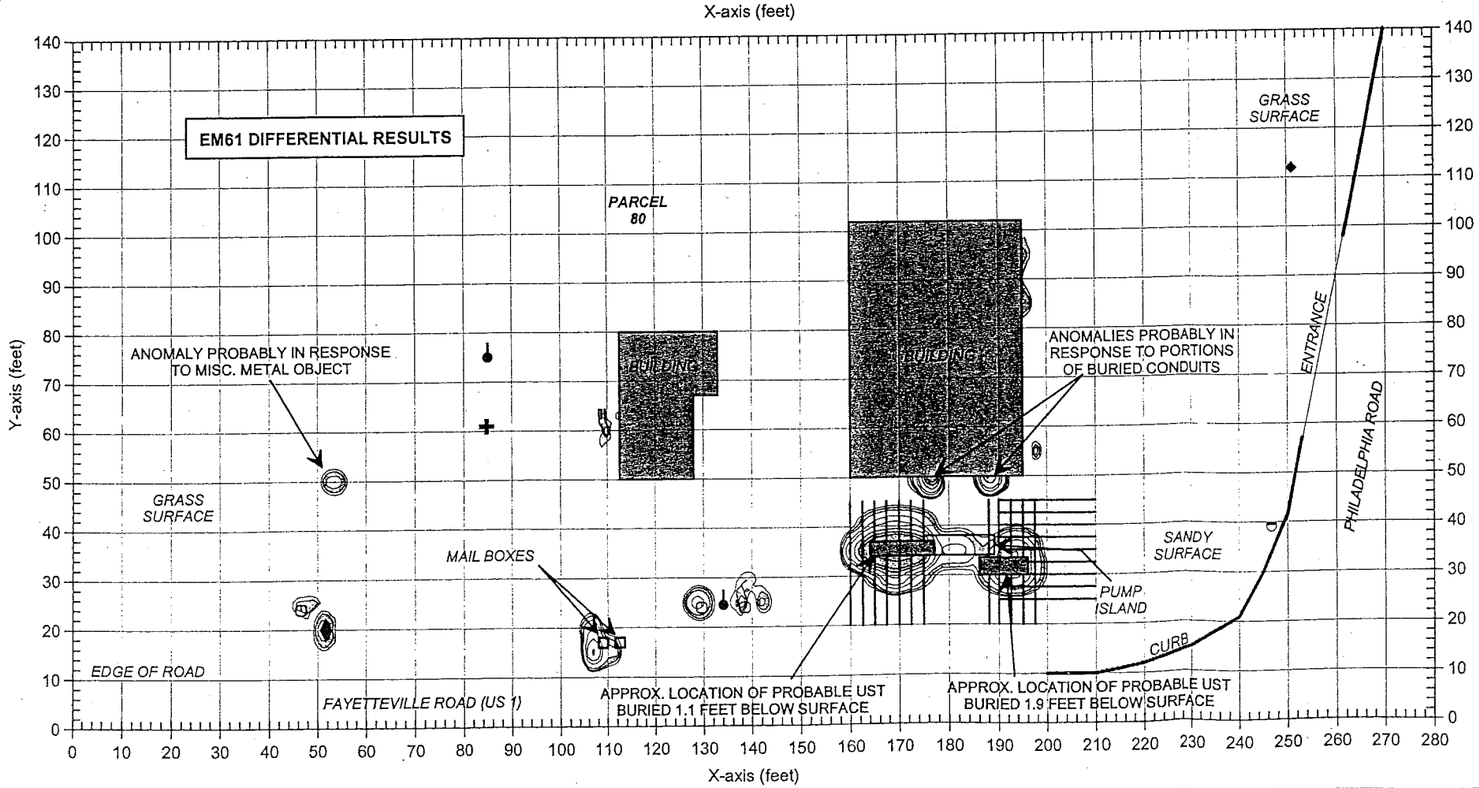
FIGURE 15

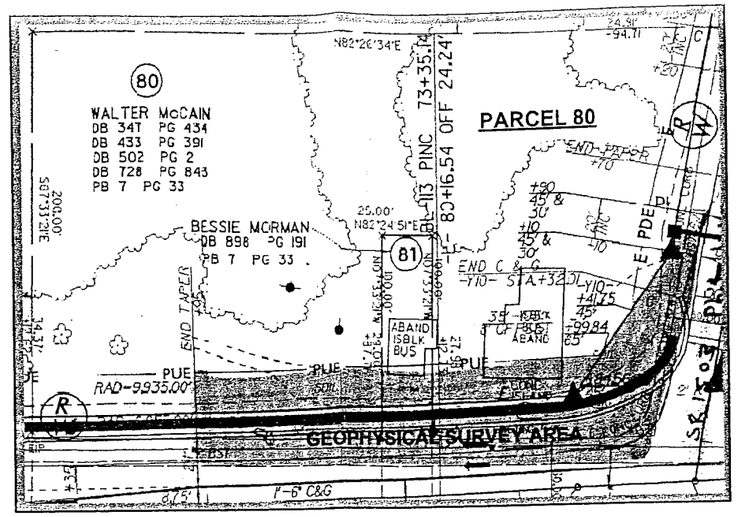
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	WILLIAM USSERY PROPERTY (PARCEL 57)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
DATE	11/18/05
DRAWN	MJD
LAY	
CHKD	
DWG	
FIGURE	
J.NO.	2005-292

GRAPHIC SCALE IN METERS

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.







LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- FIRE HYDRANT
- TRAFFIC SIGN
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

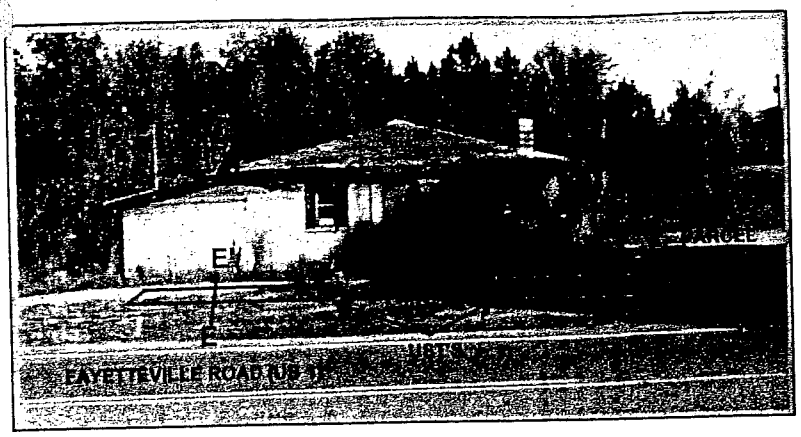
EM61
METAL DETECTION
RESULTS

FIGURE 16

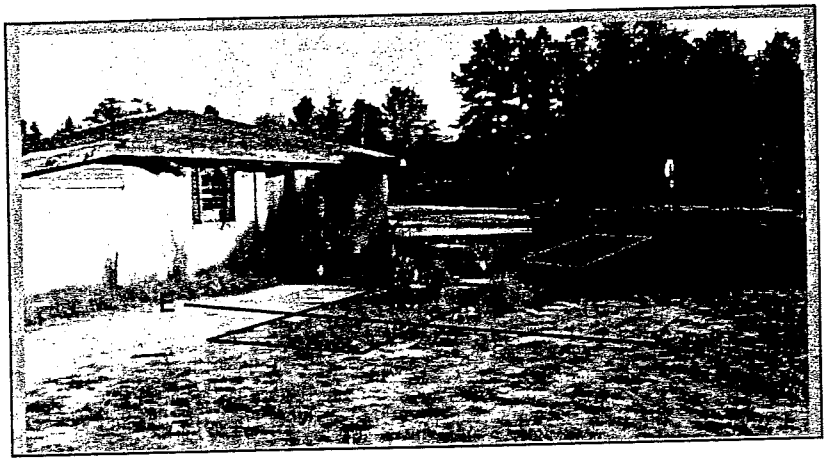
GRAPHIC SCALE IN METERS

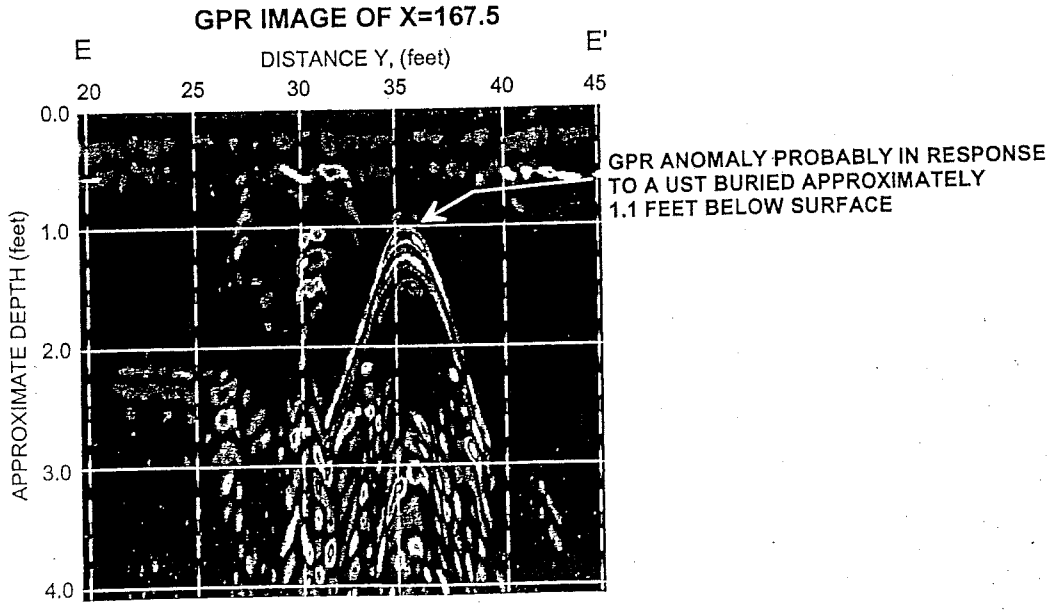
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	WALTER McCAIN PROPERTY (PARCEL 80)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
DATE	11/25/05
DRAWN	MJD
LAY	
CHKD	
DWG	
FIGURE	
JNO.	2005-292

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The two photos show the approximate locations of the two probable UST's at Parcel 80, as suggested by the geophysical results. The UST's appear to be buried approximately 1 to 2 feet below surface. A former pump island lies between the two probable UST's.





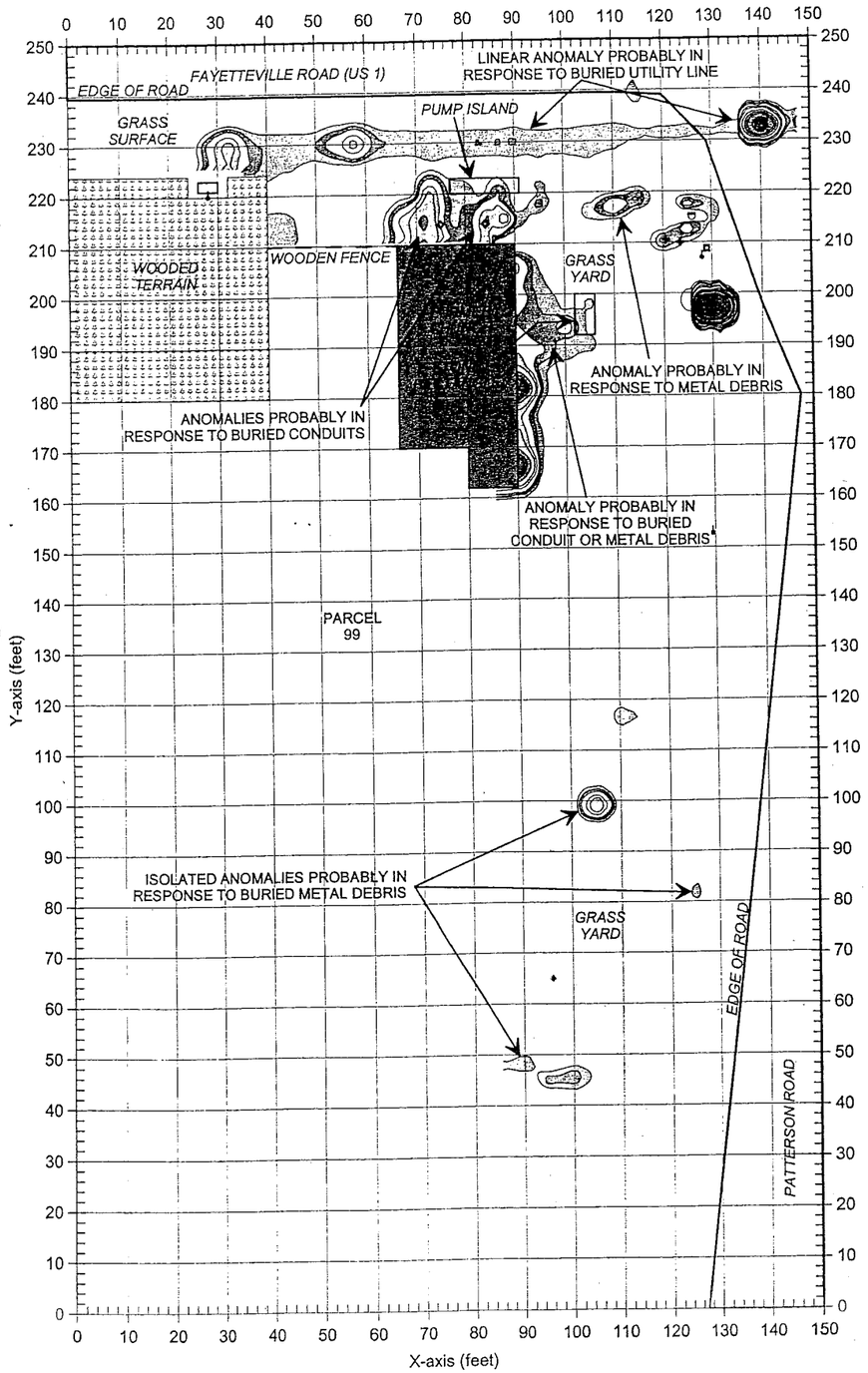
PYRAMID

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	WALTER McCAIN PROPERTY (PARCEL 80)		
CITY	ROCKINGHAM	STATE	NORTH CAROLINA

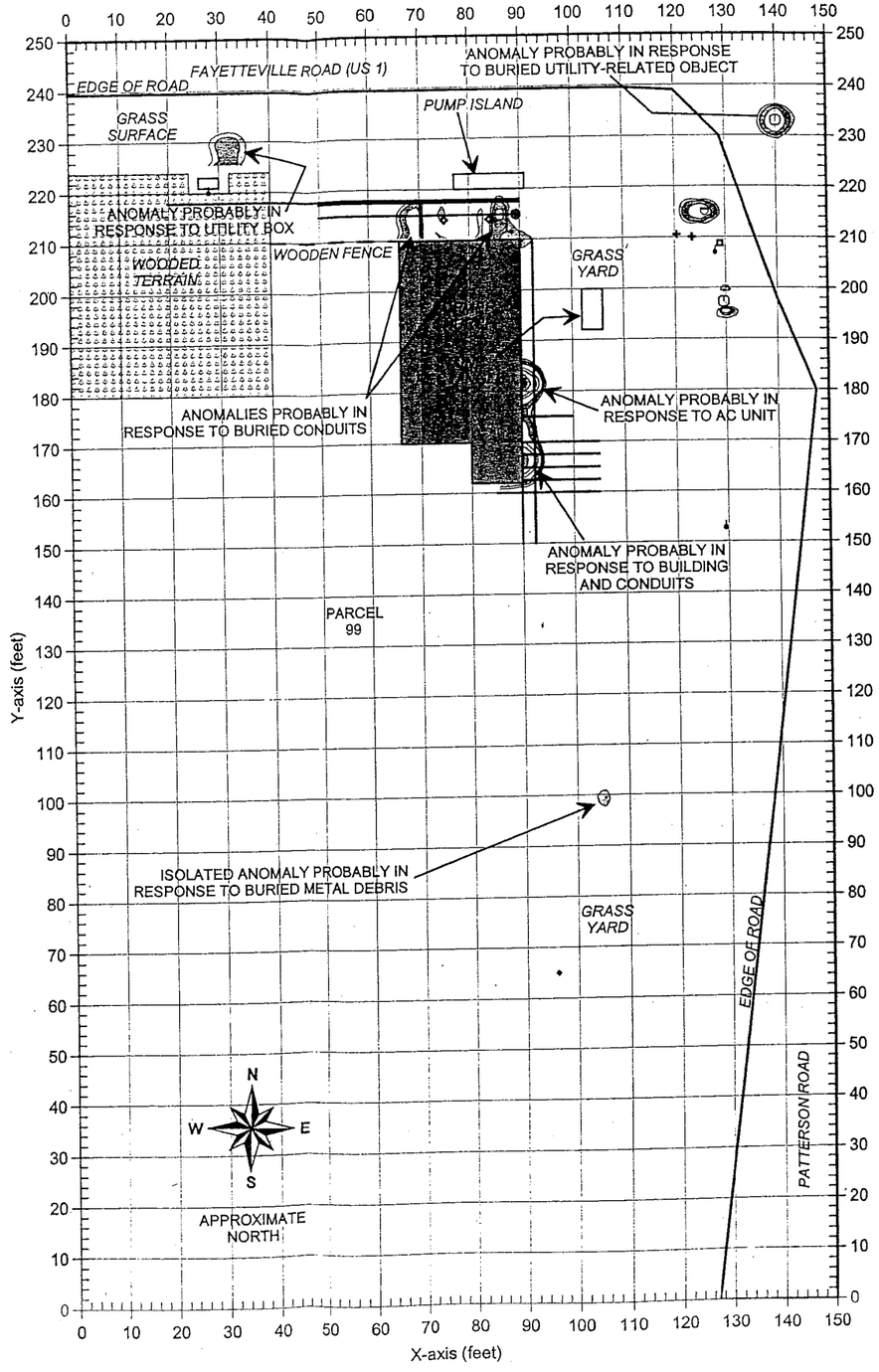
PHOTOS & GPR IMAGE OF UST LOCATIONS

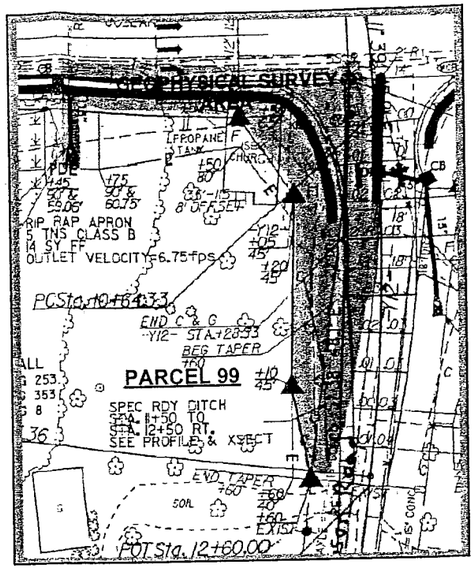
FIGURE 17

EM61 BOTTOM COIL RESULTS

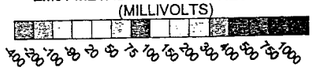


EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)



LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CANOPY POLE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- GPR SURVEY LINE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESULTS

FIGURE 18

GRAPHIC SCALE IN METERS

DRWN	DATE	DWG	JOB NO.
MJD	11/26/05		2005-292

CHKD	LAY		

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: LEON WALL PROPERTY (PARCEL 99)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

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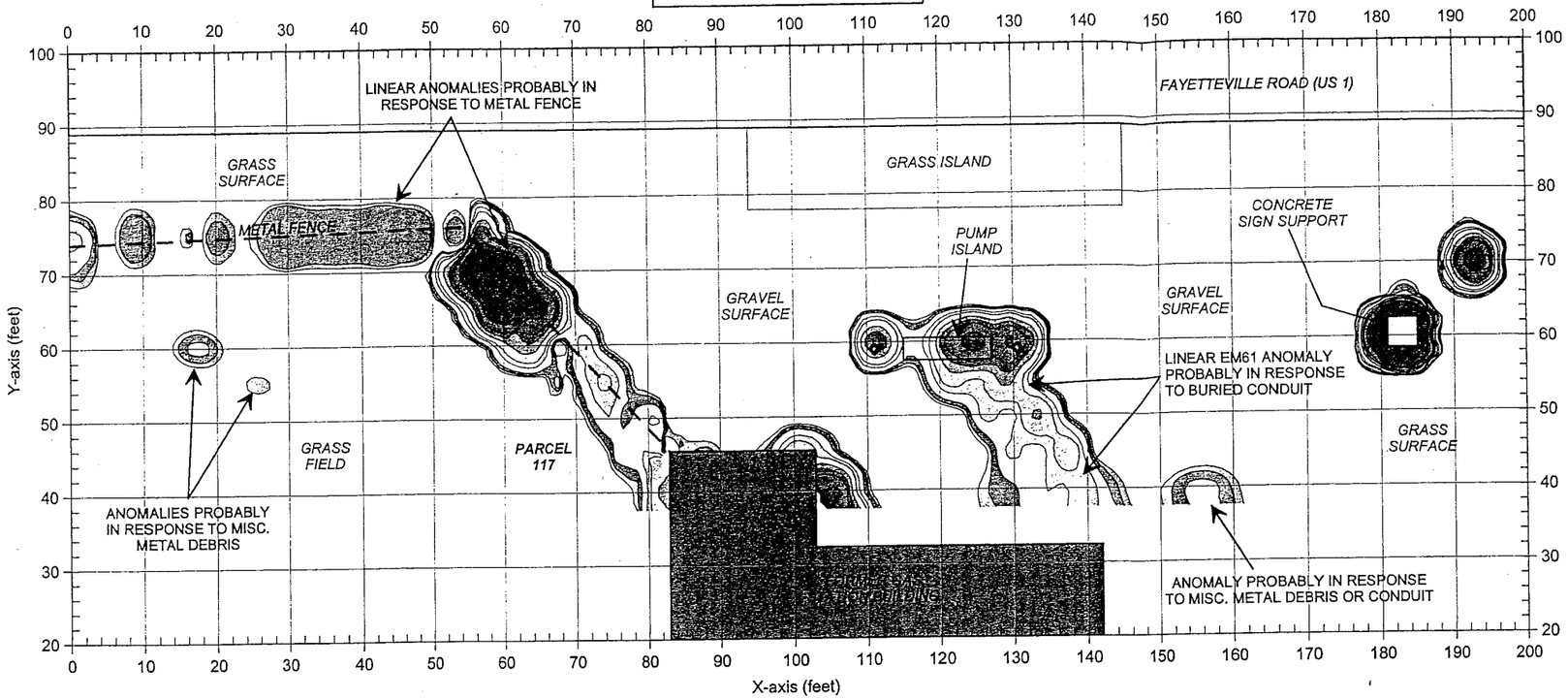
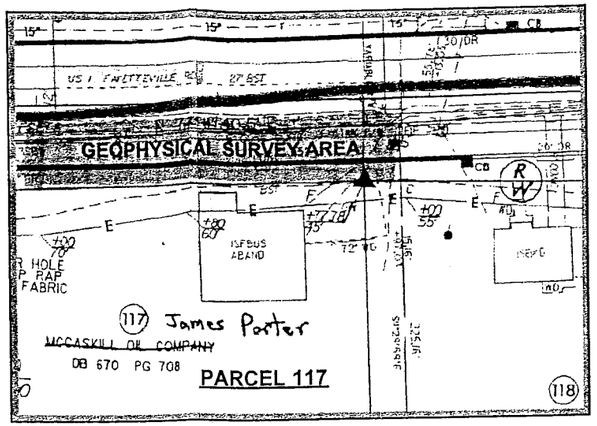
EM61 BOTTOM COIL RESULTS





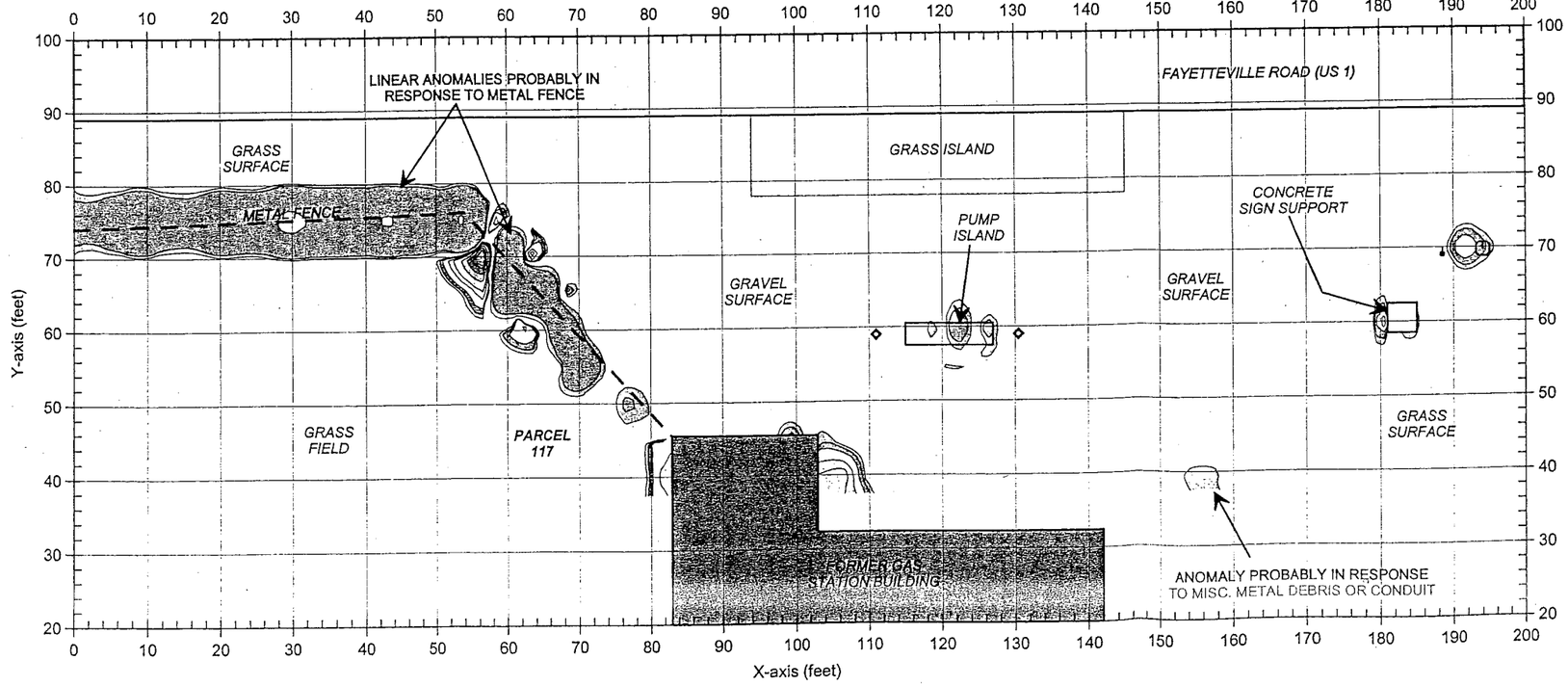
N
W E
S

APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -200 -100 -50 -30 -20 -10 -7.5 -5 -3 3 5 7.5 10 15 20 30 40 50 75 100 200 400

EM61 DIFFERENTIAL RESULTS



LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- SUPPORT POLE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar surveys were not conducted at this site.

EM61
METAL DETECTION
RESULTS

FIGURE 19

GRAPHIC SCALE IN METERS

DRAWN	MJD
DATE	11/26/05
DWG	2005-292
JOB NO.	

SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

JAMES PORTER PROPERTY (PARCEL 117)

ROCKINGHAM, NORTH CAROLINA

GEOPHYSICAL RESULTS

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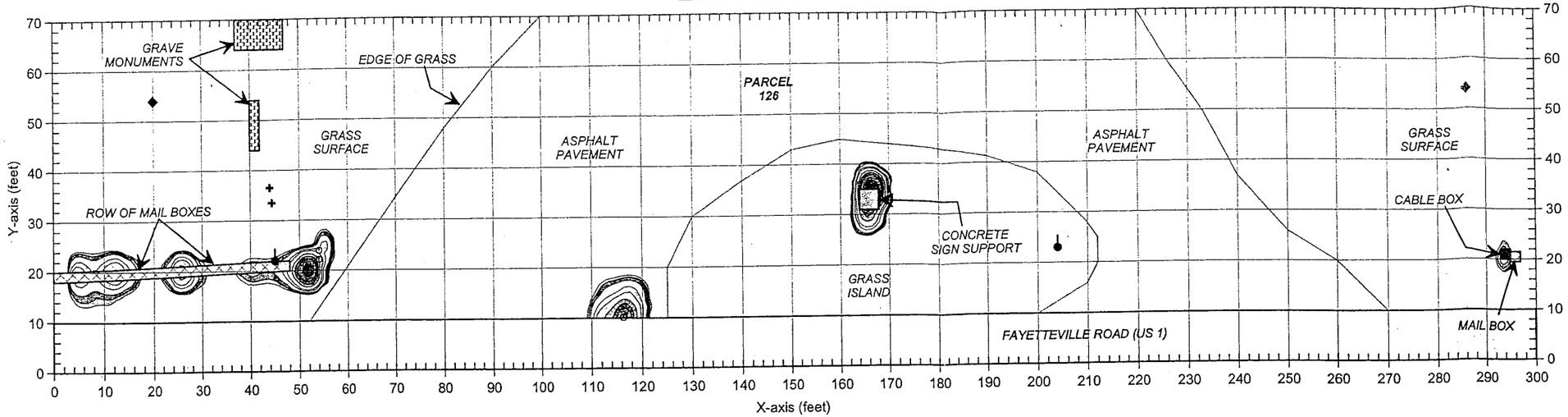
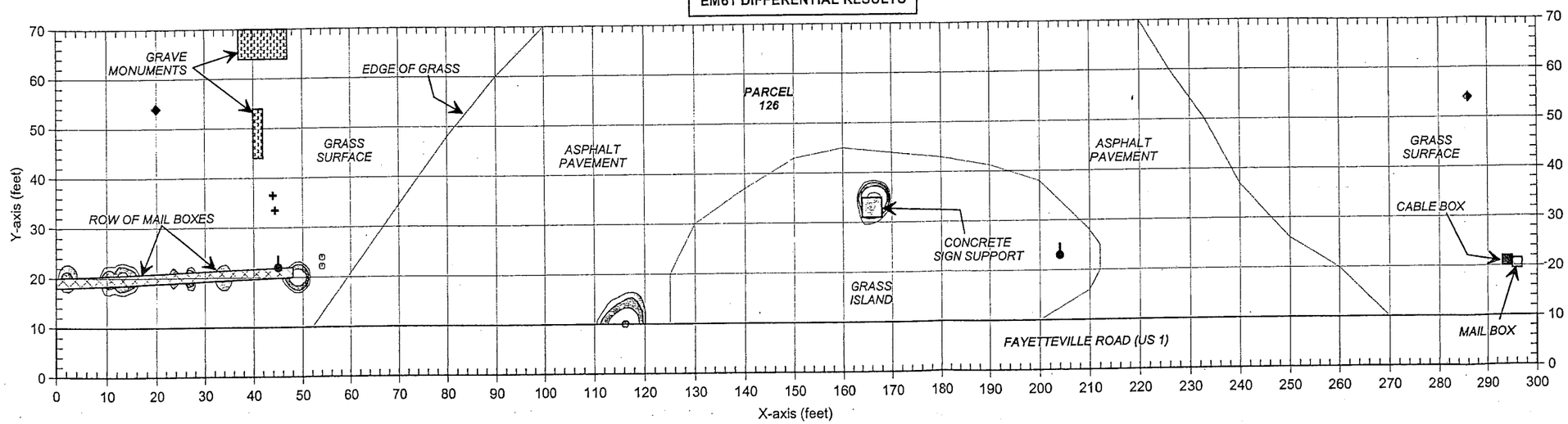
EM61 BOTTOM COIL RESULTS



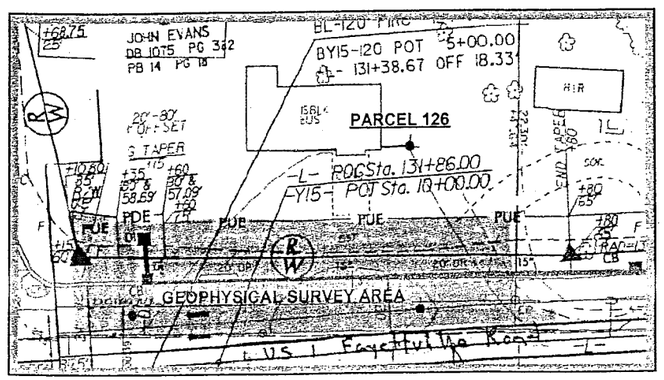
EM61 DIFFERENTIAL RESULTS



N
W E
S

APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)
1000 750 500 400 300 200 150 100 75 60 20 -90 -100 -200 -400



LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- RIGHT-OF-WAY MARKER
- UTILITY POLE
- WATER METER OR VALVE COVER
- SIGN POLE
- STORM SEWER GRATE
- TRAFFIC SIGN
- GUY WIRE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data surveys were not conducted at this site

FIGURE 20

EM61
METAL DETECTION
RESULTS

GRAPHIC SCALE IN METERS

DRAWN	CHKD	FIGURE
MJD		
DATE	LAY	DWG	LMO
11/26/05			2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: JOHN EVANS PROPERTY (PARCEL 126)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

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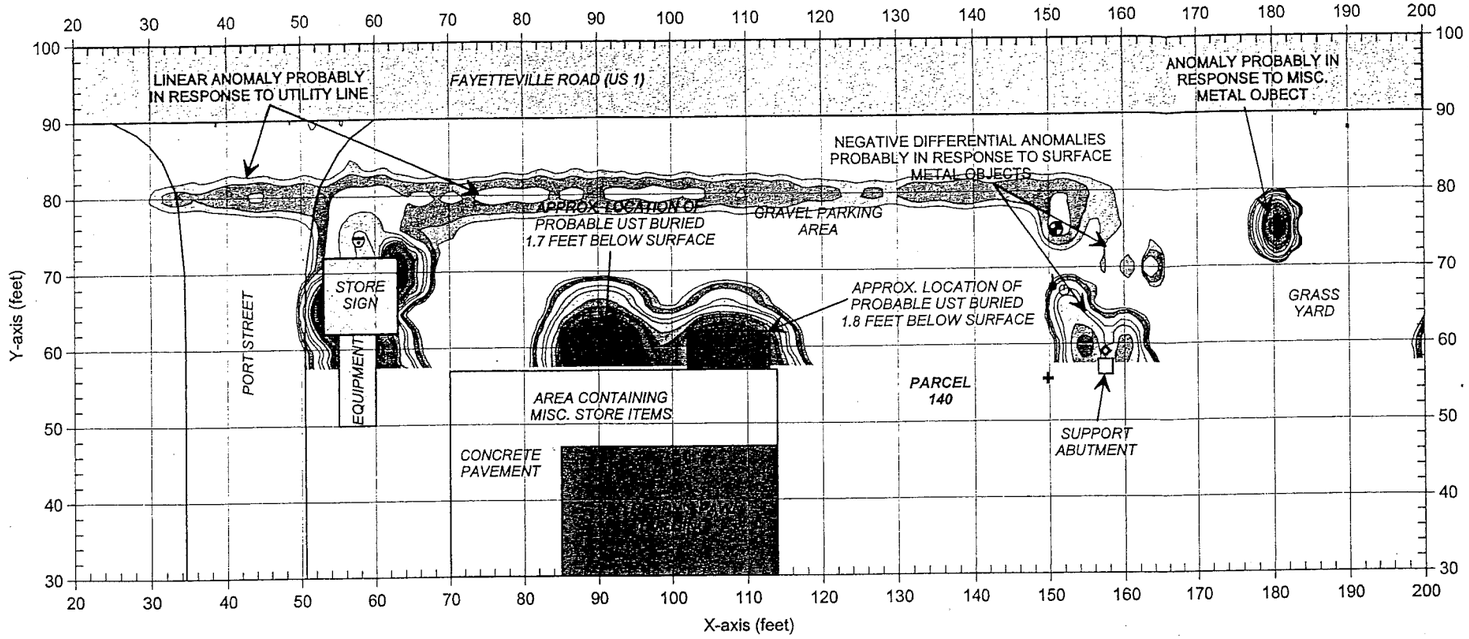
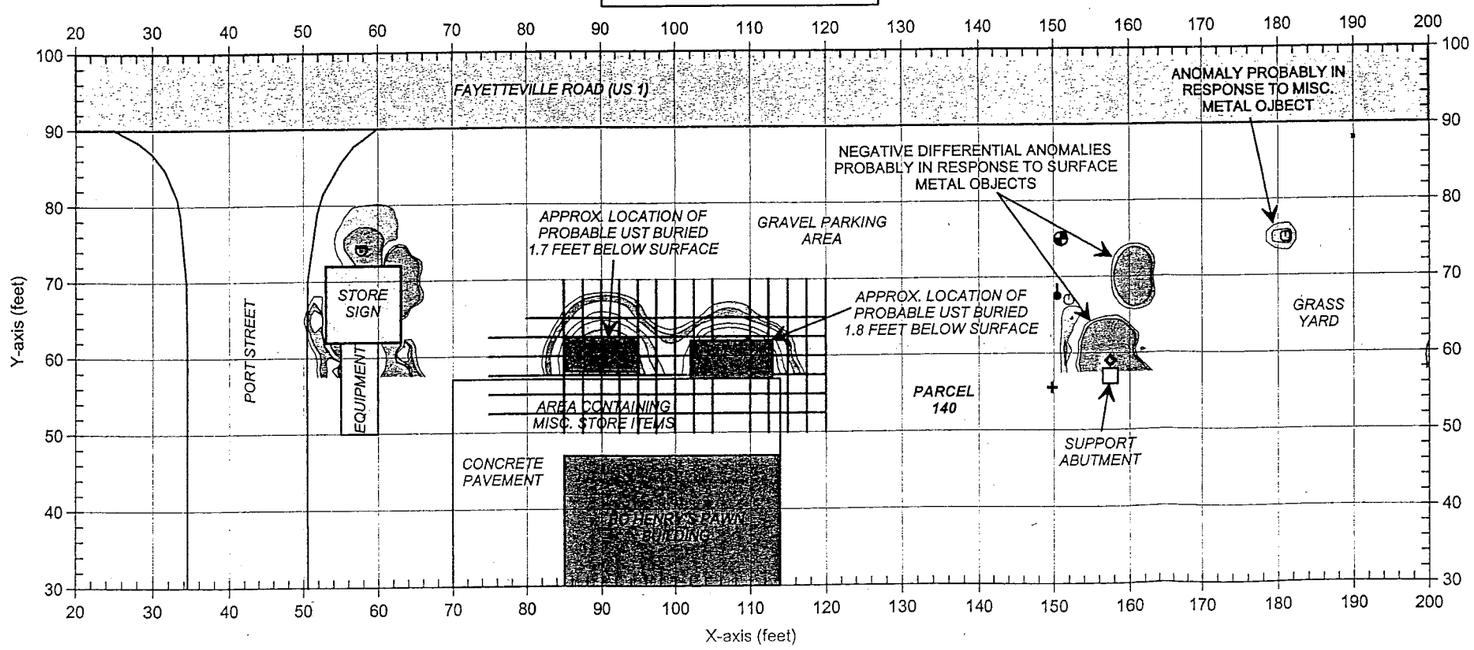
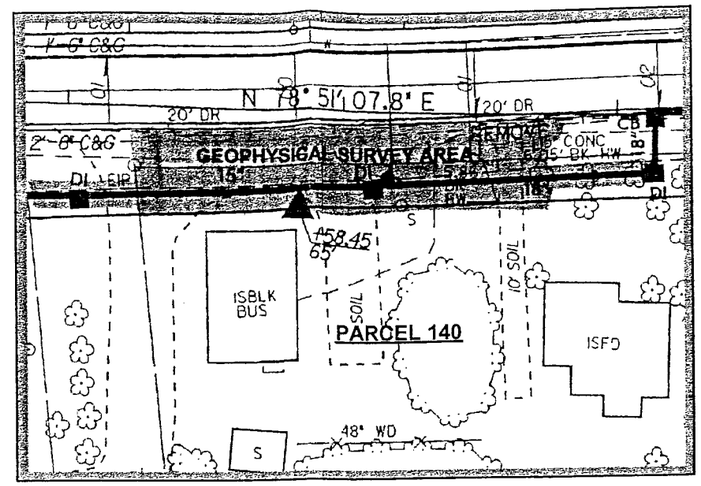
EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -50 -20 -10 -5 5 10 20 50 100 200 400 1000

N W E S

APPROXIMATE NORTH

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- SIGN POLE
- STORM SEWER GRATE
- TRAFFIC SIGN
- FIBER OPTIC LINE SIGN
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESULTS

FIGURE 21

GRAPHIC SCALE IN METERS

DRWN	CHKD	SQUARE
MJD		
DATE	DWG	JOB NO.
11/25/05		2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: HENRY USSERY PROPERTY (PARCEL 140)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

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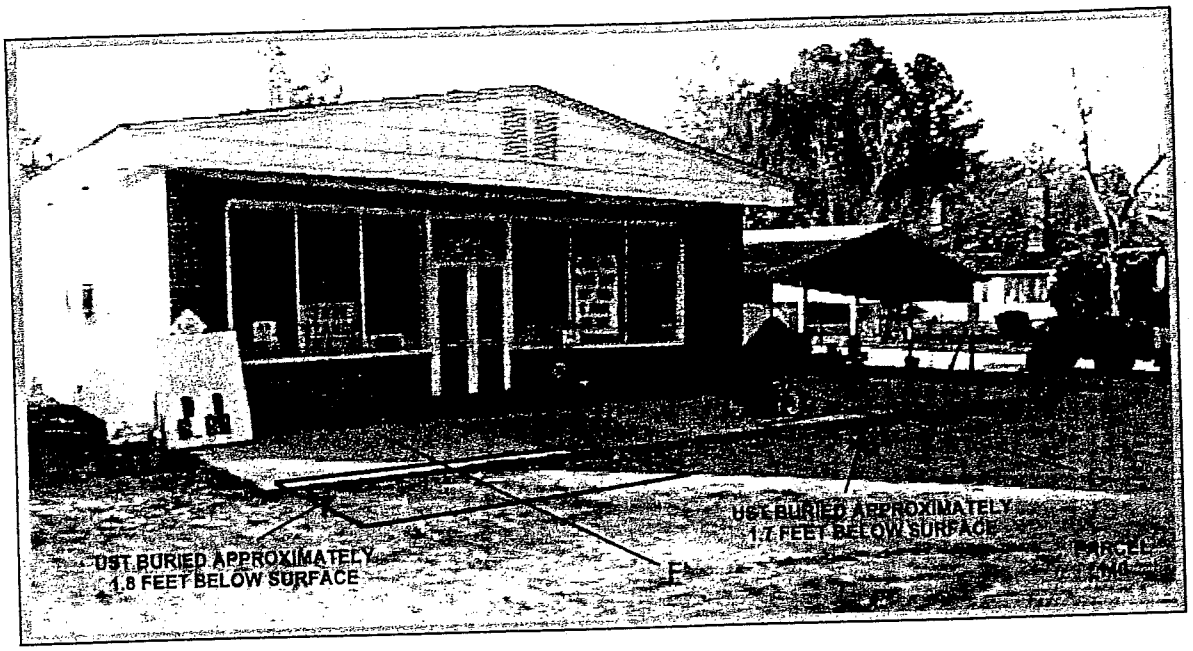
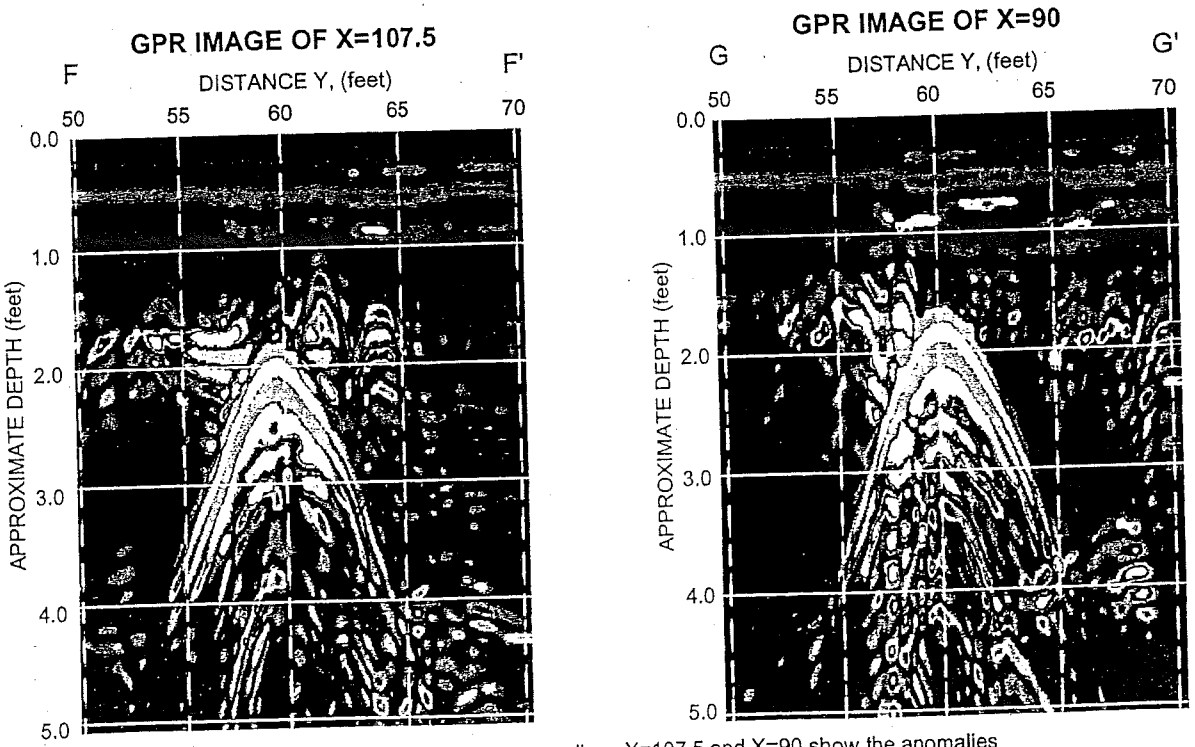


The photo shows the approximate locations of the two UST's, as suggested by the geophysical results at Parcel 140. The UST's appear to be approximately 1.8 and 1.7 feet below surface.



The GPR images obtained along survey lines X=107.5 and X=90 show the anomalies that are probably in response to the two UST's buried at Parcel 140. The GPR data suggest the UST's are buried approximately 1.8 feet and 1.7 feet below surface, respectively.

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CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	HENRY USSERY PROPERTY (PARCEL 140)	LAT	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA
	GEOPHYSICAL RESULTS	JOB	2005-292

PHOTO & GPR IMAGES OF UST LOCATIONS

FIGURE 22

APPENDIX C

BORING LOGS

Log of Soil Boring 41A-1

Project: Rockingham Sites (Parcel 041A) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 41A-1

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/07/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH ISW *Total Depth of Boring:* 8 feet

SUBSURFACE PROFILE			SAMPLE					
Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen • ppm • 250 500 750 / FID Field Screen ■ ppm ■ 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0–1 / 0	SP	Dry, orange, fine sand		MC	100	0		
2–3 / 1	SP	Dry, orange, fine sand		MC	100	0		
4–5 / 1	SC	Dry, tan, clayey fine sand		MC	100	0		
6–7 / 2	SC	Dry, tan, clayey fine sand		MC	100	1		
8 / 2		Boring terminated at 8 feet.						
9 / 3								
10 / 3								
11 / 3								
12 / 4								
13 / 4								
14 / 4								
15 / 4								

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Log of Soil Boring 41A-2

Project: Rockingham Sites (Parcel 041A) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 41A-2
Client: NCDOT
WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A
State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A
Drilling Method: Direct push *Boring Date:* 12/07/05 *Cave In Depth:* N/A
Sampler Type: Macro Core
Logged By: Dan Hirth *Checked By:* [illegible] *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0		Ground Surface						
0		*Asphalt*						
1		*SP* Dry, orange, fine sand		MC	100	1		
2–3		*SP* Dry, orange, fine sand		MC	100	0		
4–5		*SC* Dry, tan, clayey fine sand		MC	100	1		
6–7		*SC* Dry, tan, clayey fine sand		MC	100	0		
8		Boring terminated at 8 feet.						

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Log of Soil Boring 41A-3

Project: Rockingham Sites (Parcel 041A) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 41A-3
Client: NCDOT
WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A
State Project # U-3456 *County:* Richmond *Stabilized Water Level:* 3.28 ft bgs
Drilling Method: Direct push *Boring Date:* 12/07/05 *Cave In Depth:* N/A
Sampler Type: Macro Core
Logged By: Dan Hirth *Checked By:* SLK *Total Depth of Boring:* 12 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen ppm (250 500 750) / FID Field Screen ppm (250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Asphalt*						
1	SC	Dry, tan, clayey fine sand		MC	100	694		
2	SC	Dry, tan, clayey fine sand		MC	100	>1000		
3 / 1								
4	SC	Wet, gray, clayey fine sand, petroleum odor		MC	100	>1000		
5								
6	SC	Wet, gray, clayey fine sand, petroleum odor		MC	100	499		
7 / 2								
8	SC	Wet, gray, clayey fine sand, petroleum odor		MC	100	483		
9								
10 / 3	SC	Dry, orange and white, clayey fine sand		SS	100	29		
11								
12		Boring terminated at 12 feet.						
13 / 4								
14								
15								

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Log of Soil Boring 41A-4

Project: Rockingham Sites (Parcel 041A) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 41A-4

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/07/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH Jsw *Total Depth of Boring:* 8 feet

SUBSURFACE PROFILE			SAMPLE					
Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (• ppm 250 500 750) / FID Field Screen (■ ppm 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0–1	*SP*	Dry, red, fine sand		MC	100	490		
1–2	*SP*	Dry, gray, fine sand, petroleum odor						
2–3 / 1	*SP*	Dry, gray, fine sand, petroleum odor		MC	100		>1000	
4–5	*SP*	Dry, gray, fine sand, petroleum odor		MC	100		>1000	
6–7 / 2	*SC*	Dry, gray, clayey fine sand, with tree roots		MC	100		>1000	
7–8	*SP*	Dry, gray, fine to medium sand						
8		Boring terminated at 8 feet.						
10 / 3								
13 / 4								
15								

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Log of Soil Boring 41A-5

Project: Rockingham Sites (Parcel 041A) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 41A-5
Client: NCDOT
WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A
State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A
Drilling Method: Direct push *Boring Date:* 12/07/05 *Cave In Depth:* N/A
Sampler Type: Macro Core
Logged By: Dan Hirth *Checked By:* [illegible] *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen ppm (250 500 750) / FID Field Screen ppm (250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0–2 / 0–1	SC	Dry, orange, clayey fine sand		MC	100	281		
2–4 / 1–1	SC	Dry, orange, clayey fine sand		MC	100	510		
4–6 / 1–2	SC	Wet, tan, clayey fine sand		MC	100	>1000		
6–8 / 2–3	SC	Wet, tan, clayey fine sand		MC	100	>1000		
8 / 3		Boring terminated at 8 feet.						
9–15 / 3–4								

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Log of Soil Boring 41A-6

Project: Rockingham Sites (Parcel 041A) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 41A-6

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/07/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH/SW *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750) / FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0–2	SC	Dry, orange, clayey fine sand		MC	100	70		
2–4 / 1	SC	Dry, orange, clayey fine sand		MC	100	>1000		
4–6	SP	Dry, tan and black, fine sand, with organic odor		MC	100	>1000		
6–8 / 2	SP	Dry, tan and black, fine sand, with organic odor		MC	100	>1000		
8 / 3		Boring terminated at 8 feet.						
10 / 3								
13 / 4								
15								

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Log of Soil Boring 41A-7

Project: Rockingham Sites (Parcel 041A) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 41A-7
Client: NCDOT
WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A
State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A
Drilling Method: Direct push *Boring Date:* 12/07/05 *Cave In Depth:* N/A
Sampler Type: Macro Core
Logged By: Dan Hirth *Checked By:* DH / [illegible] *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0		Ground Surface						
0–2		SC Dry, orange, clayey fine sand		MC	100	224		
2–4		SC Dry, tan/orange, clayey fine sand		MC	100		>1000	
4–6		SC Dry, tan, clayey fine sand		MC	100	47		
6–8		SC Dry, tan, clayey fine sand		MC	100	21		
8		Boring terminated at 8 feet.						

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Log of Soil Boring 41A-8

Project: Rockingham Sites (Parcel 041A) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 41A-8

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/07/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH/SW *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm: 250 500 750) / FID Field Screen (ppm: 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0–2 / 0–1	SP	Dry, tan/orange, fine sand		MC	100	1		
2–4 / 1–1	SP	Dry, tan, fine sand		MC	100	1		
4–6 / 1–2	SP	Dry, tan, fine sand		MC	100	>1000		
6–7 / 2	SP	Dry, gray, fine sand, petroleum odor		MC	100	>1000		
7–8 / 2	SP	Dry, black, fine sand						
8–15 / 3–4		Boring terminated at 8 feet.						

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APPENDIX D

SPECIFIC CAPACITY SPREADSHEET

Specific Capacity Test Work Sheet

Project: Parcel 41A
Location: Rockingham, NC
Project Number: 2730.05A2.NDOT
Date: January 10, 2006

Personnel: D. Hirth
B. Rebar

Results:
K= 1.23E-03 cm/sec
or approximately
3.50 feet/day

Well Number: 041A-3 Test Zone 2 to 12 ft bgs

Screen Diameter: 1.0 inches Screen Length: 10 feet

Screen Type: Geoprobe SP16 Groundwater Sampler

Stabilized Depth to Water 3.28 feet bgs Time: 16:30

Purge Start _____ Purge Stop _____ Gallons Purged _____

Pump type Peristaltic Pump Capacity 1 L/min

Depth Intake Below Surface 12.00 inches

Start Time: _____ End Time: _____

Time	Trial #	Volume	Time	Flow Rate
	1	400 ml	47 sec	0.13 gpm
	2	400 ml	49 sec	0.13 gpm
	3	400 ml	52 sec	0.12 gpm

Average Flow Rate

Average Flow Rate 400 ml for 49.3333 seconds
Equivalent Average Flow Rate 0.48648649 liters per minute
Equivalent Average Flow Rate 0.13 gallons per minute

Confined Aquifer: _____ Unconfined Aquifer: yes

Calculation of Hydraulic Conductivity (K)

For Unconfined Aquifer and 1-inch Well, C=1.153

K=C*Q/^H*Screen Length in feet
Where Q is in gallons per minute and ^H is in inches.
C(1.153)*Q(0.12853012)/^H(12)*Scrn(10) ft

K = 0.00123 cm/sec or approximately 3.501 ft/day

Reference: Wilson, 1997

APPENDIX E

LABORATORY ANALYTICAL REPORTS

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

Pace Analytical Services, Inc.
2225 Riverside Drive
Asheville, NC 28804
Phone: 828.254.7176
Fax: 828.252.4618

December 22, 2005

Ms. Sheri Knox
Solutions-IES
1101 Nowell Road
Raleigh, NC 27607

RE: Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

Dear Ms. Knox:

Enclosed are the analytical results for sample(s) received by the laboratory on December 9, 2005. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Inorganic Wet Chemistry and Metals Analyses were performed at our Pace Asheville laboratory and Organic testing was performed at our Pace Charlotte laboratory unless otherwise footnoted.

If you have any questions concerning this report please feel free to contact me.

Sincerely,

Bonnie McKee

Bonnie McKee
Bonnie.McKee@pacelabs.com
Project Manager

Enclosures

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Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

Solid results are reported on a dry weight basis

Lab Sample No: 926432477 Project Sample Number: 92109230-001 Date Collected: 12/07/05 16:00
Client Sample ID: 41A-2(2-4) Matrix: Soil Date Received: 12/09/05 16:05

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	7.8	%		12/12/05 09:56				
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	5.4	12/19/05 16:29	KBS	68334-30-5		
n-Pentacosane (S)	82	%		12/19/05 16:29	KBS	629-99-2		
Date Extracted	12/16/05			12/16/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	5.4	12/15/05 00:04	DHW			
4-Bromofluorobenzene (S)	110	%		12/15/05 00:04	DHW	460-00-4		

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Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

Lab Sample No: 926432485 Project Sample Number: 92109230-002 Date Collected: 12/07/05 16:00
Client Sample ID: 41A-3(2-4) Matrix: Soil Date Received: 12/09/05 16:05

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	15.2	%		12/12/05 09:57				
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	5.9	12/19/05 17:03	KBS	68334-30-5		
n-Pentacosane (S)	86	%		12/19/05 17:03	KBS	629-99-2		
Date Extracted	12/16/05			12/16/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	62.	mg/kg	4.9	12/15/05 01:02	DHW			
4-Bromofluorobenzene (S)	145	%		12/15/05 01:02	DHW	460-00-4	1	

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Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

Lab Sample No: 926432493 Project Sample Number: 92109230-003 Date Collected: 12/07/05 16:05
Client Sample ID: 41A-4(4-6) Matrix: Soil Date Received: 12/09/05 16:05

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	15.5	%		12/12/05 09:57				
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	5.9	12/19/05 17:37	KBS	68334-30-5		
n-Pentacosane (S)	98	%		12/19/05 17:37	KBS	629-99-2		
Date Extracted	12/16/05			12/16/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	13.	mg/kg	4.9	12/15/05 02:00	DHW			
4-Bromofluorobenzene (S)	94	%		12/15/05 02:00	DHW	460-00-4		

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Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

Lab Sample No: 926432519 Project Sample Number: 92109230-004 Date Collected: 12/07/05 16:05
Client Sample ID: 41A-5(4-6) Matrix: Soil Date Received: 12/09/05 16:05

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	15.1	%		12/12/05 09:57				
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel.Fuel	ND	mg/kg	5.9	12/19/05 17:03	KBS	68334-30-5		
n-Pentacosane (S)	101	%		12/19/05 17:03	KBS	629-99-2		
Date Extracted	12/16/05			12/16/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	4.8	12/15/05 02:29	DHW			
4-Bromofluorobenzene (S)	117	%		12/15/05 02:29	DHW	460-00-4		

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Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

Lab Sample No: 926432527 Project Sample Number: 92109230-005 Date Collected: 12/07/05 16:10
Client Sample ID: 41A-6(6-8) Matrix: Soil Date Received: 12/09/05 16:05

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	17.8	%		12/12/05 09:58				
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	6.1	12/19/05 17:37	KBS	68334-30-5		
n-Pentacosane (S)	87	%		12/19/05 17:37	KBS	629-99-2		
Date Extracted	12/16/05			12/16/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	5.0	12/15/05 02:58	DHW			
4-Bromofluorobenzene (S)	104	%		12/15/05 02:58	DHW	460-00-4		

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Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

Lab Sample No: 926432535 Project Sample Number: 92109230-006 Date Collected: 12/07/05 16:10
Client Sample ID: 41A-7(2-4) Matrix: Soil Date Received: 12/09/05 16:05

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	17.7	%		12/12/05 09:58				
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	6.1	12/19/05 23:23	KBS	68334-30-5		
n-Pentacosane (S)	63	%		12/19/05 23:23	KBS	629-99-2		
Date Extracted	12/17/05			12/17/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	8.0	mg/kg	4.5	12/15/05 03:27	DHW			
4-Bromofluorobenzene (S)	96	%		12/15/05 03:27	DHW	460-00-4		

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Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

Lab Sample No: 926432543
Client Sample ID: 41A-8(4-6)

Project Sample Number: 92109230-007
Matrix: Soil

Date Collected: 12/07/05 16:15
Date Received: 12/09/05 16:05

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	11.6	%		12/12/05 09:59				
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	6.5	mg/kg	5.7	12/19/05 23:58	KBS	68334-30-5		
n-Pentacosane (S)	62	%		12/19/05 23:58	KBS	629-99-2		
Date Extracted	12/17/05			12/17/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	4.4	12/15/05 03:55	DHW			
4-Bromofluorobenzene (S)	92	%		12/15/05 03:55	DHW	460-00-4		

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Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

Lab Sample No: 926432568 Project Sample Number: 92109230-008 Date Collected: 12/07/05 16:30
Client Sample ID: 41A-3 Matrix: Water Date Received: 12/09/05 16:05

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Metals								
3030C Metals, ICP, Trace	Prep/Method: SM 3030C / EPA 200.7							
Chromium, 3030C	0.12	mg/l	0.0020	12/14/05 20:08	ARH	7440-47-3		
Lead, 3030C	0.32	mg/l	0.0050	12/14/05 20:08	ARH	7439-92-1		
Date Digested	12/10/05 06:00			12/10/05 06:00				
GC/MS Semivolatiles								
Extractables in Water by 625	Prep/Method: EPA 625 SF / EPA 625							
Acenaphthene	ND	ug/l	5.8	12/17/05 20:57	BET	83-32-9		
Acenaphthylene	ND	ug/l	5.8	12/17/05 20:57	BET	208-96-8		
Anthracene	ND	ug/l	5.8	12/17/05 20:57	BET	120-12-7		
Benzidine	ND	ug/l	58.	12/17/05 20:57	BET	92-87-5		
Benzo(k)fluoranthene	ND	ug/l	5.8	12/17/05 20:57	BET	207-08-9		
Benzo(b)fluoranthene	ND	ug/l	5.8	12/17/05 20:57	BET	205-99-2		
Benzo(a)anthracene	ND	ug/l	5.8	12/17/05 20:57	BET	56-55-3		
Benzo(g,h,i)perylene	ND	ug/l	5.8	12/17/05 20:57	BET	191-24-2		
Benzo(a)pyrene	ND	ug/l	5.8	12/17/05 20:57	BET	50-32-8		
4-Bromophenylphenyl ether	ND	ug/l	5.8	12/17/05 20:57	BET	101-55-3		
Butylbenzylphthalate	ND	ug/l	5.8	12/17/05 20:57	BET	85-68-7		
4-Chloro-3-methylphenol	ND	ug/l	5.8	12/17/05 20:57	BET	59-50-7		
bis(2-Chloroethoxy)methane	ND	ug/l	5.8	12/17/05 20:57	BET	111-91-1		
bis(2-Chloroethyl) ether	ND	ug/l	5.8	12/17/05 20:57	BET	111-44-4		
bis(2-Chloroisopropyl) ether	ND	ug/l	5.8	12/17/05 20:57	BET	39638-32-9		
2-Chloronaphthalene	ND	ug/l	5.8	12/17/05 20:57	BET	91-58-7		
2-Chlorophenol	ND	ug/l	5.8	12/17/05 20:57	BET	95-57-8		
4-Chlorophenylphenyl ether	ND	ug/l	5.8	12/17/05 20:57	BET	7005-72-3		
Chrysene	ND	ug/l	5.8	12/17/05 20:57	BET	218-01-9		
Dibenz(a,h)anthracene	ND	ug/l	5.8	12/17/05 20:57	BET	53-70-3		
1,2-Dichlorobenzene	ND	ug/l	5.8	12/17/05 20:57	BET	95-50-1		
1,3-Dichlorobenzene	ND	ug/l	5.8	12/17/05 20:57	BET	541-73-1		
1,4-Dichlorobenzene	ND	ug/l	5.8	12/17/05 20:57	BET	106-46-7		
3,3'-Dichlorobenzidine	ND	ug/l	12.	12/17/05 20:57	BET	91-94-1		
2,4-Dichlorophenol	ND	ug/l	5.8	12/17/05 20:57	BET	120-83-2		
Diethylphthalate	ND	ug/l	5.8	12/17/05 20:57	BET	84-66-2		
2,4-Dimethylphenol	ND	ug/l	5.8	12/17/05 20:57	BET	105-67-9		
Dimethylphthalate	ND	ug/l	5.8	12/17/05 20:57	BET	131-11-3		
Di-n-butylphthalate	ND	ug/l	5.8	12/17/05 20:57	BET	84-74-2		
4,6-Dinitro-2-methylphenol	ND	ug/l	29.	12/17/05 20:57	BET	534-52-1		
2,4-Dinitrophenol	ND	ug/l	29.	12/17/05 20:57	BET	51-28-5		

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Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

Lab Sample No: 926432568 Project Sample Number: 92109230-008 Date Collected: 12/07/05 16:30
Client Sample ID: 41A-3 Matrix: Water Date Received: 12/09/05 16:05

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
2,4-Dinitrotoluene	ND	ug/l	5.8	12/17/05 20:57	BET	121-14-2		
2,6-Dinitrotoluene	ND	ug/l	5.8	12/17/05 20:57	BET	606-20-2		
Di-n-octylphthalate	ND	ug/l	5.8	12/17/05 20:57	BET	117-84-0		
bis(2-Ethylhexyl)phthalate	ND	ug/l	5.8	12/17/05 20:57	BET	117-81-7		
Fluoranthene	ND	ug/l	5.8	12/17/05 20:57	BET	206-44-0		
Fluorene	ND	ug/l	5.8	12/17/05 20:57	BET	86-73-7		
Hexachloro-1,3-butadiene	ND	ug/l	5.8	12/17/05 20:57	BET	87-68-3		
Hexachlorobenzene	ND	ug/l	5.8	12/17/05 20:57	BET	118-74-1		
Hexachlorocyclopentadiene	ND	ug/l	12.	12/17/05 20:57	BET	77-47-4		
Hexachloroethane	ND	ug/l	5.8	12/17/05 20:57	BET	67-72-1		
Indeno(1,2,3-cd)pyrene	ND	ug/l	5.8	12/17/05 20:57	BET	193-39-5		
Isophorone	ND	ug/l	5.8	12/17/05 20:57	BET	78-59-1		
Naphthalene	5.9	ug/l	5.8	12/17/05 20:57	BET	91-20-3		
Nitrobenzene	ND	ug/l	5.8	12/17/05 20:57	BET	98-95-3		
2-Nitrophenol	ND	ug/l	5.8	12/17/05 20:57	BET	88-75-5		
4-Nitrophenol	ND	ug/l	29.	12/17/05 20:57	BET	100-02-7		
N-Nitrosodimethylamine	ND	ug/l	5.8	12/17/05 20:57	BET	62-75-9		
N-Nitroso-di-n-propylamine	ND	ug/l	5.8	12/17/05 20:57	BET	621-64-7		
N-Nitrosodiphenylamine	ND	ug/l	5.8	12/17/05 20:57	BET	86-30-6		
Pentachlorophenol	ND	ug/l	29.	12/17/05 20:57	BET	87-86-5		
Phenanthrene	ND	ug/l	5.8	12/17/05 20:57	BET	85-01-8		
Phenol	ND	ug/l	5.8	12/17/05 20:57	BET	108-95-2		
Pyrene	ND	ug/l	5.8	12/17/05 20:57	BET	129-00-0		
1,2,4-Trichlorobenzene	ND	ug/l	5.8	12/17/05 20:57	BET	120-82-1		
2,4,6-Trichlorophenol	ND	ug/l	5.8	12/17/05 20:57	BET	88-06-2		
Nitrobenzene-d5 (S)	71	%		12/17/05 20:57	BET	4165-60-0		
2-Fluorobiphenyl (S)	72	%		12/17/05 20:57	BET	321-60-8		
Terphenyl-d14 (S)	103	%		12/17/05 20:57	BET	1718-51-0		
Phenol-d5 (S)	34	%		12/17/05 20:57	BET	4165-62-2		
2-Fluorophenol (S)	51	%		12/17/05 20:57	BET	367-12-4		
2,4,6-Tribromophenol (S)	110	%		12/17/05 20:57	BET	118-79-6		
Date Extracted	12/12/05			12/12/05				

GC Semivolatiles

EPH in Water by Mass. Method	Prep/Method: EPA 3510 / EPH							
Aliphatic (C09-C18)	ND	ug/l	140	12/21/05 09:39	KBS			
Aliphatic (C19-C36)	ND	ug/l	140	12/21/05 09:39	KBS			
Aromatic (C11-22)	ND	ug/l	140	12/21/05 09:39	KBS			
2-Fluorobiphenyl (S)	90	%		12/21/05 09:39	KBS	321-60-8		

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Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

Lab Sample No: 926432568
Client Sample ID: 41A-3

Project Sample Number: 92109230-008
Matrix: Water

Date Collected: 12/07/05 16:30
Date Received: 12/09/05 16:05

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
2-Bromonaphthalene (S)	126	%		12/21/05 09:39	KBS	580-13-2		
Nonatriacontane (S)	55	%		12/21/05 09:39	KBS	7194-86-7		
o-Terphenyl (S)	53	%		12/21/05 09:39	KBS	84-15-1		
Date Extracted	12/19/05			12/19/05				

GC Volatiles

Halogen. & Aromatic Vol. Orgs.	Method: EPA 601/602							
Benzene	9.3	ug/l	1.0	12/20/05 09:35	PPM	71-43-2		
Bromodichloromethane	ND	ug/l	1.0	12/20/05 09:35	PPM	75-27-4		
Bromoform	ND	ug/l	1.0	12/20/05 09:35	PPM	75-25-2		
Bromomethane	ND	ug/l	1.0	12/20/05 09:35	PPM	74-83-9		
Carbon tetrachloride	ND	ug/l	1.0	12/20/05 09:35	PPM	56-23-5		
Chlorobenzene	ND	ug/l	1.0	12/20/05 09:35	PPM	108-90-7		
Chloroethane	ND	ug/l	1.0	12/20/05 09:35	PPM	75-00-3		
Chloroform	ND	ug/l	1.0	12/20/05 09:35	PPM	67-66-3		
Chloromethane	2.1	ug/l	2.0	12/20/05 09:35	PPM	74-87-3		
Dibromochloromethane	ND	ug/l	1.0	12/20/05 09:35	PPM	124-48-1		
1,2-Dichlorobenzene	ND	ug/l	1.0	12/20/05 09:35	PPM	95-50-1		
1,3-Dichlorobenzene	ND	ug/l	1.0	12/20/05 09:35	PPM	541-73-1		
1,4-Dichlorobenzene	ND	ug/l	1.0	12/20/05 09:35	PPM	106-46-7		
Dichlorodifluoromethane	ND	ug/l	1.0	12/20/05 09:35	PPM	75-71-8		
1,1-Dichloroethane	ND	ug/l	1.0	12/20/05 09:35	PPM	75-34-3		
1,2-Dichloroethane	ND	ug/l	1.0	12/20/05 09:35	PPM	107-06-2		
1,1-Dichloroethene	ND	ug/l	1.0	12/20/05 09:35	PPM	75-35-4		
trans-1,2-Dichloroethene	ND	ug/l	1.0	12/20/05 09:35	PPM	156-60-5		
1,2-Dichloropropane	ND	ug/l	1.0	12/20/05 09:35	PPM	78-87-5		
cis-1,3-Dichloropropene	ND	ug/l	1.0	12/20/05 09:35	PPM	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/l	1.0	12/20/05 09:35	PPM	10061-02-6		
Diisopropyl ether	ND	ug/l	1.0	12/20/05 09:35	PPM	108-20-3		
Ethylbenzene	20.	ug/l	1.0	12/20/05 09:35	PPM	100-41-4		
Methylene chloride	ND	ug/l	2.0	12/20/05 09:35	PPM	75-09-2		
Methyl-tert-butyl ether	3.5	ug/l	1.0	12/20/05 09:35	PPM	1634-04-4		
1,1,2,2-Tetrachloroethane	ND	ug/l	1.0	12/20/05 09:35	PPM	79-34-5		
Tetrachloroethene	3.1	ug/l	1.0	12/20/05 09:35	PPM	127-18-4		
Toluene	2.3	ug/l	1.0	12/20/05 09:35	PPM	108-88-3		
1,1,1-Trichloroethane	ND	ug/l	1.0	12/20/05 09:35	PPM	71-55-6		
1,1,2-Trichloroethane	ND	ug/l	1.0	12/20/05 09:35	PPM	79-00-5		
Trichloroethene	ND	ug/l	1.0	12/20/05 09:35	PPM	79-01-6		
Trichlorofluoromethane	ND	ug/l	1.0	12/20/05 09:35	PPM	75-69-4		

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Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

Lab Sample No: 926432568
Client Sample ID: 41A-3

Project Sample Number: 92109230-008
Matrix: Water

Date Collected: 12/07/05 16:30
Date Received: 12/09/05 16:05

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Vinyl chloride	ND	ug/l	1.0	12/20/05 09:35	PPM	75-01-4		
Xylene (Total)	18.	ug/l	1.0	12/20/05 09:35	PPM	1330-20-7		
m&p-Xylene	16.	ug/l	2.0	12/20/05 09:35	PPM			
o-Xylene	1.3	ug/l	1.0	12/20/05 09:35	PPM	95-47-6		
1-Chloro-3-fluorobenzene (S)	121	%		12/20/05 09:35	PPM	625-98-9		
VPH in Water by Mass. Method	Method: VPH							
Aliphatic (C05-C08)	230	ug/l	100	12/12/05 20:34	DHW			
Aliphatic (C09-C12)	230	ug/l	100	12/12/05 20:34	DHW			
Aromatic (C09-C10)	ND	ug/l	100	12/12/05 20:34	DHW			
2,5-Dibromotoluene (FID)(S)	100	%		12/12/05 20:34	DHW			
2,5-Dibromotoluene (PID)(S)	129	%		12/12/05 20:34	DHW			

Date: 12/22/05

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Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

PARAMETER FOOTNOTES

Method 9071B modified to use ASE.

All pH, Free Chlorine, Total Chlorine and Ferrous Iron analyses conducted outside of EPA recommended immediate hold time.

Depending on the moisture content the PRLs can be elevated for all soil samples reported on a dry weight basis.

2-Chloroethyl vinyl ether has been shown to degrade in the presence of acid.

ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
(S)	Surrogate
[1]	High surrogate recovery was confirmed as a matrix effect by a second analysis.

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

QC Batch: 145256
QC Batch Method: EPA 3545
Analysis Method: EPA 8015
Analysis Description: TPH in Soil by 3545/8015
Associated Lab Samples: 926432477 926432485 926432493 926432519 926432527

METHOD BLANK: 926454893
Associated Lab Samples: 926432477 926432485 926432493 926432519 926432527

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Diesel Fuel	mg/kg	ND	5.0	
n-Pentacosane (S)	%	89		

LABORATORY CONTROL SAMPLE: 926454901

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Diesel Fuel	mg/kg	166.70	137.2	82	
n-Pentacosane (S)				98	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 926454919 926454927

Parameter	Units	926440710 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
Diesel Fuel	mg/kg	7.728	219.50	181.9	165.2	79	72	10	
n-Pentacosane (S)						101	92		

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

QC Batch: 145308 Analysis Method: EPA 8015
QC Batch Method: EPA 3545 Analysis Description: TPH in Soil by 3545/8015
Associated Lab Samples: 926432535 926432543

METHOD BLANK: 926457805
Associated Lab Samples: 926432535 926432543

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Diesel Fuel	mg/kg	ND	5.0	
n-Pentacosane (S)	%	71		

LABORATORY CONTROL SAMPLE: 926457813

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Diesel Fuel	mg/kg	166.70	97.42	58	
n-Pentacosane (S)				69	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 926457821 926457839

Parameter	Units	926456104 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
Diesel Fuel	mg/kg	0	187.30	103.2	125.4	55	67	19	
n-Pentacosane (S)						64	76		

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

QC Batch: 145379 Analysis Method: EPH
QC Batch Method: EPA 3510 Analysis Description: EPH in Water by Mass. Method
Associated Lab Samples: 926432568

METHOD BLANK: 926459173
Associated Lab Samples: 926432568

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Aliphatic (C09-C18)	ug/l	ND	100	
Aliphatic (C19-C36)	ug/l	ND	100	
Aromatic (C11-22)	ug/l	ND	100	
2-Fluorobiphenyl (S)	%	88		
2-Bromonaphthalene (S)	%	117		
Nonatriacontane (S)	%	43		
o-Terphenyl (S)	%	48		

LABORATORY CONTROL SAMPLE & LCSD: 926459181 926459199

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	RPD	Footnotes
Aliphatic (C09-C18)	ug/l	300.00	170.3	119.7	57	40	35	
Aliphatic (C19-C36)	ug/l	400.00	293.5	243.0	73	61	19	
Aromatic (C11-22)	ug/l	850.00	620.1	427.0	73	50	37	
2-Fluorobiphenyl (S)					90	66		
2-Bromonaphthalene (S)					91	68		
Nonatriacontane (S)					73	45		
o-Terphenyl (S)					70	48		

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

QC Batch: 144829
QC Batch Method: VPH
Associated Lab Samples: 926432568

Analysis Method: VPH
Analysis Description: VPH in Water by Mass. Method

METHOD BLANK: 926436684
Associated Lab Samples: 926432568

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Aliphatic (C05-C08)	ug/l	ND	100	
Aliphatic (C09-C12)	ug/l	ND	100	
Aromatic (C09-C10)	ug/l	ND	100	
2,5-Dibromotoluene (FID)(S)	%	99		
2,5-Dibromotoluene (PID)(S)	%	123		

LABORATORY CONTROL SAMPLE & LCSD: 926436692 926436700

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	RPD	Footnotes
Aliphatic (C05-C08)	ug/l	400.00	471.8	436.5	118	109	8	
Aliphatic (C09-C12)	ug/l	100.00	118.1	109.6	118	110	7	
Aromatic (C09-C10)	ug/l	100.00	111.5	116.3	112	116	4	
2,5-Dibromotoluene (FID)(S)					102	105		
2,5-Dibromotoluene (PID)(S)					128	129		

SAMPLE DUPLICATE: 926436718

Parameter	Units	926432584 Result	DUP Result	RPD	Footnotes
Aliphatic (C05-C08)	ug/l	ND	ND	NC	
Aliphatic (C09-C12)	ug/l	ND	ND	NC	
Aromatic (C09-C10)	ug/l	ND	ND	NC	
2,5-Dibromotoluene (FID)(S)	%	99	104		
2,5-Dibromotoluene (PID)(S)	%	124	122		

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

QC Batch: 144975 — Analysis Method: EPA 8015
QC Batch Method: EPA 8015 — Analysis Description: GAS, Soil, North Carolina
Associated Lab Samples: 926432477 926432485 926432493 926432519 926432527 926432535 926432543

METHOD BLANK: 926442385
Associated Lab Samples: 926432477 926432485 926432493 926432519 926432527 926432535 926432543

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Gasoline	mg/kg	ND	5.0	
4-Bromofluorobenzene (S)	%	98		

LABORATORY CONTROL SAMPLE: 926442393

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Gasoline	mg/kg	25.00	30.78	123	
4-Bromofluorobenzene (S)				120	

MATRIX SPIKE: 926442401

Parameter	Units	926432477 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
Gasoline	mg/kg	2.867	27.11	31.72	106	
4-Bromofluorobenzene (S)					110	

SAMPLE DUPLICATE: 926442419

Parameter	Units	926432485 Result	DUP Result	RPD	Footnotes
Gasoline	mg/kg	62.00	65.00	4	
4-Bromofluorobenzene (S)	%	145	145		1

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

QC Batch: 145380 Analysis Method: EPA 601/602
QC Batch Method: EPA 601/602 Analysis Description: Halogen. & Aromatic Vol. Orgs.
Associated Lab Samples: 926432568

METHOD BLANK: 926459249
Associated Lab Samples: 926432568

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Benzene	ug/l	ND	1.0	
Bromodichloromethane	ug/l	ND	1.0	
Bromoform	ug/l	ND	1.0	
Bromomethane	ug/l	ND	1.0	
Carbon tetrachloride	ug/l	ND	1.0	
Chlorobenzene	ug/l	ND	1.0	
Chloroethane	ug/l	ND	1.0	
Chloroform	ug/l	ND	1.0	
Chloromethane	ug/l	ND	2.0	
Dibromochloromethane	ug/l	ND	1.0	
1,2-Dichlorobenzene	ug/l	ND	1.0	
1,3-Dichlorobenzene	ug/l	ND	1.0	
1,4-Dichlorobenzene	ug/l	ND	1.0	
Dichlorodifluoromethane	ug/l	ND	1.0	
1,1-Dichloroethane	ug/l	ND	1.0	
1,2-Dichloroethane	ug/l	ND	1.0	
1,1-Dichloroethene	ug/l	ND	1.0	
trans-1,2-Dichloroethene	ug/l	ND	1.0	
1,2-Dichloropropane	ug/l	ND	1.0	
cis-1,3-Dichloropropene	ug/l	ND	1.0	
trans-1,3-Dichloropropene	ug/l	ND	1.0	
Diisopropyl ether	ug/l	ND	1.0	
Ethylbenzene	ug/l	ND	1.0	
Methylene chloride	ug/l	ND	2.0	
Methyl-tert-butyl ether	ug/l	ND	1.0	
1,1,2,2-Tetrachloroethane	ug/l	ND	1.0	
Tetrachloroethene	ug/l	ND	1.0	
Toluene	ug/l	ND	1.0	
1,1,1-Trichloroethane	ug/l	ND	1.0	
1,1,2-Trichloroethane	ug/l	ND	1.0	
Trichloroethene	ug/l	ND	1.0	

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

METHOD BLANK: 926459249
Associated Lab Samples: 926432568

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Trichlorofluoromethane	ug/l	ND	1.0	
Vinyl chloride	ug/l	ND	1.0	
Xylene (Total)	ug/l	ND	1.0	
m&p-Xylene	ug/l	ND	2.0	
o-Xylene	ug/l	ND	1.0	
1-Chloro-3-fluorobenzene (S)	%	105		

LABORATORY CONTROL SAMPLE: 926459256

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Benzene	ug/l	20.00	20.30	101	
Bromodichloromethane	ug/l	20.00	23.08	115	
Bromoform	ug/l	20.00	22.71	114	
Bromomethane	ug/l	20.00	16.57	83	
Carbon tetrachloride	ug/l	20.00	20.53	103	
Chlorobenzene	ug/l	20.00	23.67	118	
Chloroethane	ug/l	20.00	16.74	84	
Chloroform	ug/l	20.00	16.06	80	
Chloromethane	ug/l	20.00	18.39	92	
Dibromochloromethane	ug/l	20.00	21.23	106	
1,2-Dichlorobenzene	ug/l	20.00	20.09	100	
1,3-Dichlorobenzene	ug/l	20.00	19.68	98	
1,4-Dichlorobenzene	ug/l	20.00	19.24	96	
Dichlorodifluoromethane	ug/l	20.00	18.11	91	
1,1-Dichloroethane	ug/l	20.00	17.00	85	
1,2-Dichloroethane	ug/l	20.00	21.74	109	
1,1-Dichloroethene	ug/l	20.00	20.01	100	
trans-1,2-Dichloroethene	ug/l	20.00	14.39	72	
1,2-Dichloropropane	ug/l	20.00	19.50	98	
cis-1,3-Dichloropropene	ug/l	20.00	20.42	102	
trans-1,3-Dichloropropene	ug/l	20.00	19.72	99	
Diisopropyl ether	ug/l	20.00	19.94	100	
Ethylbenzene	ug/l	20.00	20.83	104	
Methylene chloride	ug/l	20.00	17.86	89	

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

LABORATORY CONTROL SAMPLE: 926459256

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Methyl-tert-butyl ether	ug/l	20.00	19.94	100	
1,1,2,2-Tetrachloroethane	ug/l	20.00	21.60	108	
Tetrachloroethene	ug/l	20.00	19.88	99	
Toluene	ug/l	20.00	20.11	101	
1,1,1-Trichloroethane	ug/l	20.00	21.02	105	
1,1,2-Trichloroethane	ug/l	20.00	21.33	107	
Trichloroethene	ug/l	20.00	20.58	103	
Trichlorofluoromethane	ug/l	20.00	17.78	89	
Vinyl chloride	ug/l	20.00	21.40	107	
Xylene (Total)	ug/l	60.00	62.86	105	
m&p-Xylene	ug/l	40.00	41.55	104	
o-Xylene	ug/l	20.00	21.31	107	
1-Chloro-3-fluorobenzene (S)				107	

MATRIX SPIKE: 926459280

Parameter	Units	926440389 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
Benzene	ug/l	0	20.00	20.08	100	
Bromodichloromethane	ug/l	0	20.00	22.51	112	
Bromoform	ug/l	0	20.00	20.66	103	
Bromomethane	ug/l	0	20.00	14.06	70	
Carbon tetrachloride	ug/l	0	20.00	20.65	103	
Chlorobenzene	ug/l	0	20.00	19.44	97	
Chloroethane	ug/l	0	20.00	16.65	83	
Chloroform	ug/l	0	20.00	18.50	92	
Chloromethane	ug/l	0	20.00	14.80	74	
Dibromochloromethane	ug/l	0	20.00	18.86	94	
1,2-Dichlorobenzene	ug/l	0	20.00	19.60	98	
1,3-Dichlorobenzene	ug/l	0	20.00	18.65	93	
1,4-Dichlorobenzene	ug/l	0	20.00	19.69	98	
Dichlorodifluoromethane	ug/l	0	20.00	16.79	84	
1,1-Dichloroethane	ug/l	0	20.00	19.53	98	
1,2-Dichloroethane	ug/l	8.590	20.00	28.68	100	
1,1-Dichloroethene	ug/l	0	20.00	28.79	144	
trans-1,2-Dichloroethene	ug/l	0	20.00	17.85	89	

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

MATRIX SPIKE: 926459280

Parameter	Units	926440389 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
1,2-Dichloropropane	ug/l	0	20.00	19.39	97	
cis-1,3-Dichloropropene	ug/l	0	20.00	17.74	89	
trans-1,3-Dichloropropene	ug/l	0	20.00	18.13	91	
Diisopropyl ether	ug/l	0	20.00	22.97	115	
Ethylbenzene	ug/l	0	20.00	21.39	107	
Methylene chloride	ug/l	0	20.00	18.75	94	
Methyl-tert-butyl ether	ug/l	0	20.00	20.28	101	
1,1,2,2-Tetrachloroethane	ug/l	0	20.00	19.29	96	
Tetrachloroethene	ug/l	0	20.00	17.96	90	
Toluene	ug/l	0	20.00	20.20	101	
1,1,1-Trichloroethane	ug/l	0	20.00	21.17	106	
1,1,2-Trichloroethane	ug/l	0	20.00	18.35	92	
Trichloroethene	ug/l	0	20.00	18.87	94	
Trichlorofluoromethane	ug/l	0	20.00	17.90	90	
Vinyl chloride	ug/l	0	20.00	20.81	104	
Xylene (Total)	ug/l	0	60.00	63.11	105	
m&p-Xylene	ug/l	0	40.00	41.55	104	
o-Xylene	ug/l	0	20.00	21.57	108	
1-Chloro-3-fluorobenzene (S)					101	

SAMPLE DUPLICATE: 926459272

Parameter	Units	926438318 Result	DUP Result	RPD	Footnotes
Benzene	ug/l	ND	ND	NC	
Bromodichloromethane	ug/l	ND	ND	NC	
Bromoform	ug/l	ND	ND	NC	
Bromomethane	ug/l	ND	ND	NC	
Carbon tetrachloride	ug/l	ND	ND	NC	
Chlorobenzene	ug/l	ND	ND	NC	
Chloroethane	ug/l	ND	ND	NC	
Chloroform	ug/l	ND	ND	NC	
Chloromethane	ug/l	ND	ND	NC	
Dibromochloromethane	ug/l	ND	ND	NC	
1,2-Dichlorobenzene	ug/l	ND	ND	NC	
1,3-Dichlorobenzene	ug/l	ND	ND	NC	

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

SAMPLE DUPLICATE: 926459272

Parameter	Units	926438318 Result	DUP Result	RPD	Footnotes
1,4-Dichlorobenzene	ug/l	ND	ND	NC	
Dichlorodifluoromethane	ug/l	ND	ND	NC	
1,1-Dichloroethane	ug/l	ND	ND	NC	
1,2-Dichloroethane	ug/l	ND	ND	NC	
1,1-Dichloroethene	ug/l	ND	ND	NC	
trans-1,2-Dichloroethene	ug/l	ND	ND	NC	
1,2-Dichloropropane	ug/l	ND	ND	NC	
cis-1,3-Dichloropropene	ug/l	ND	ND	NC	
trans-1,3-Dichloropropene	ug/l	ND	ND	NC	
Diisopropyl ether	ug/l	ND	ND	NC	
Ethylbenzene	ug/l	ND	ND	NC	
Methylene chloride	ug/l	ND	ND	NC	
Methyl-tert-butyl ether	ug/l	ND	ND	NC	
1,1,2,2-Tetrachloroethane	ug/l	ND	ND	NC	
Tetrachloroethene	ug/l	ND	ND	NC	
Toluene	ug/l	ND	ND	NC	
1,1,1-Trichloroethane	ug/l	ND	ND	NC	
1,1,2-Trichloroethane	ug/l	ND	ND	NC	
Trichloroethene	ug/l	ND	ND	NC	
Trichlorofluoromethane	ug/l	ND	ND	NC	
Vinyl chloride	ug/l	ND	ND	NC	
Xylene (Total)	ug/l	2.300	2.200	2	
m&p-Xylene	ug/l	2.300	2.200	2	
o-Xylene	ug/l	ND	ND	NC	
1-Chloro-3-fluorobenzene (S)	%	100	105		

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

QC Batch: 143051
QC Batch Method: EPA 625 SF
Associated Lab Samples: 926432568

Analysis Method: EPA 625
Analysis Description: Extractables in Water by 625

METHOD BLANK: 926436411
Associated Lab Samples: 926432568

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Acenaphthene	ug/l	ND	5.0	
Acenaphthylene	ug/l	ND	5.0	
Anthracene	ug/l	ND	5.0	
Benzidine	ug/l	ND	50.	
Benzo(k)fluoranthene	ug/l	ND	5.0	
Benzo(b)fluoranthene	ug/l	ND	5.0	
Benzo(a)anthracene	ug/l	ND	5.0	
Benzo(g,h,i)perylene	ug/l	ND	5.0	
Benzo(a)pyrene	ug/l	ND	5.0	
4-Bromophenylphenyl ether	ug/l	ND	5.0	
Butylbenzylphthalate	ug/l	ND	5.0	
4-Chloro-3-methylphenol	ug/l	ND	5.0	
bis(2-Chloroethoxy)methane	ug/l	ND	5.0	
bis(2-Chloroethyl) ether	ug/l	ND	5.0	
bis(2-Chloroisopropyl) ether	ug/l	ND	5.0	
2-Chloronaphthalene	ug/l	ND	5.0	
2-Chlorophenol	ug/l	ND	5.0	
4-Chlorophenylphenyl ether	ug/l	ND	5.0	
Chrysene	ug/l	ND	5.0	
Dibenz(a,h)anthracene	ug/l	ND	5.0	
1,2-Dichlorobenzene	ug/l	ND	5.0	
1,3-Dichlorobenzene	ug/l	ND	5.0	
1,4-Dichlorobenzene	ug/l	ND	5.0	
3,3'-Dichlorobenzidine	ug/l	ND	10.	
2,4-Dichlorophenol	ug/l	ND	5.0	
Diethylphthalate	ug/l	ND	5.0	
2,4-Dimethylphenol	ug/l	ND	5.0	
Dimethylphthalate	ug/l	ND	5.0	
Di-n-butylphthalate	ug/l	ND	5.0	
4,6-Dinitro-2-methylphenol	ug/l	ND	25.	
2,4-Dinitrophenol	ug/l	ND	25.	

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

METHOD BLANK: 926436411
Associated Lab Samples: 926432568

Parameter	Units	Blank Result	Reporting Limit	Footnotes
2,4-Dinitrotoluene	ug/l	ND	5.0	
2,6-Dinitrotoluene	ug/l	ND	5.0	
Di-n-octylphthalate	ug/l	ND	5.0	
bis(2-Ethylhexyl)phthalate	ug/l	ND	5.0	
Fluoranthene	ug/l	ND	5.0	
Fluorene	ug/l	ND	5.0	
Hexachloro-1,3-butadiene	ug/l	ND	5.0	
Hexachlorobenzene	ug/l	ND	5.0	
Hexachlorocyclopentadiene	ug/l	ND	10.	
Hexachloroethane	ug/l	ND	5.0	
Indeno(1,2,3-cd)pyrene	ug/l	ND	5.0	
Isophorone	ug/l	ND	5.0	
Naphthalene	ug/l	ND	5.0	
Nitrobenzene	ug/l	ND	5.0	
2-Nitrophenol	ug/l	ND	5.0	
4-Nitrophenol	ug/l	ND	25.	
N-Nitrosodimethylamine	ug/l	ND	5.0	
N-Nitroso-di-n-propylamine	ug/l	ND	5.0	
N-Nitrosodiphenylamine	ug/l	ND	5.0	
Pentachlorophenol	ug/l	ND	25.	
Phenanthrene	ug/l	ND	5.0	
Phenol	ug/l	ND	5.0	
Pyrene	ug/l	ND	5.0	
1,2,4-Trichlorobenzene	ug/l	ND	5.0	
2,4,6-Trichlorophenol	ug/l	ND	5.0	
Nitrobenzene-d5 (S)	%	69		
2-Fluorobiphenyl (S)	%	58		
Terphenyl-d14 (S)	%	90		
Phenol-d5 (S)	%	26		
2-Fluorophenol (S)	%	50		
2,4,6-Tribromophenol (S)	%	97		

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

LABORATORY CONTROL SAMPLE: 926356130

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Acenaphthene	ug/l	50.00	30.64	61	
Acenaphthylene	ug/l	50.00	30.69	61	
Anthracene	ug/l	50.00	35.39	71	
Benzidine	ug/l	100.00	13.51	14	
Benzo(k)fluoranthene	ug/l	50.00	27.26	54	
Benzo(b)fluoranthene	ug/l	50.00	27.04	54	
Benzo(a)anthracene	ug/l	50.00	36.99	74	
Benzo(g,h,i)perylene	ug/l	50.00	54.54	109	
Benzo(a)pyrene	ug/l	50.00	32.93	66	
4-Bromophenylphenyl ether	ug/l	50.00	34.14	68	
Butylbenzylphthalate	ug/l	50.00	31.81	64	
4-Chloro-3-methylphenol	ug/l	50.00	30.89	62	
bis(2-Chloroethoxy)methane	ug/l	50.00	33.66	67	
bis(2-Chloroethyl) ether	ug/l	50.00	31.40	63	
bis(2-Chloroisopropyl) ether	ug/l	50.00	34.47	69	
2-Chloronaphthalene	ug/l	50.00	31.81	64	
2-Chlorophenol	ug/l	50.00	29.42	59	
4-Chlorophenylphenyl ether	ug/l	50.00	33.33	67	
Chrysene	ug/l	50.00	35.06	70	
Dibenz(a,h)anthracene	ug/l	50.00	41.72	83	
1,2-Dichlorobenzene	ug/l	50.00	21.26	42	
1,3-Dichlorobenzene	ug/l	50.00	19.41	39	
1,4-Dichlorobenzene	ug/l	50.00	19.59	39	
3,3'-Dichlorobenzidine	ug/l	100.00	35.83	36	
2,4-Dichlorophenol	ug/l	50.00	28.50	57	
Diethylphthalate	ug/l	50.00	37.06	74	
2,4-Dimethylphenol	ug/l	50.00	30.01	60	
Dimethylphthalate	ug/l	50.00	33.35	67	
Di-n-butylphthalate	ug/l	50.00	44.44	89	
4,6-Dinitro-2-methylphenol	ug/l	50.00	34.29	69	
2,4-Dinitrophenol	ug/l	50.00	25.67	51	
2,4-Dinitrotoluene	ug/l	50.00	11.81	24	2
2,6-Dinitrotoluene	ug/l	50.00	35.50	71	
Di-n-octylphthalate	ug/l	50.00	30.61	61	
bis(2-Ethylhexyl)phthalate	ug/l	50.00	32.31	65	
Fluoranthene	ug/l	50.00	42.03	84	
Fluorene	ug/l	50.00	31.21	62	

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

LABORATORY CONTROL SAMPLE: 926356130

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Hexachloro-1,3-butadiene	ug/l	50.00	20.71	41	
Hexachlorobenzene	ug/l	50.00	36.75	74	
Hexachlorocyclopentadiene	ug/l	50.00	23.65	47	
Hexachloroethane	ug/l	50.00	20.10	40	
Indeno(1,2,3-cd)pyrene	ug/l	50.00	41.18	82	
Isophorone	ug/l	50.00	80.95	162	
Naphthalene	ug/l	50.00	24.53	49	
Nitrobenzene	ug/l	50.00	34.27	68	
2-Nitrophenol	ug/l	50.00	27.81	56	
4-Nitrophenol	ug/l	50.00	15.54	31	
N-Nitrosodimethylamine	ug/l	50.00	23.34	47	
N-Nitroso-di-n-propylamine	ug/l	50.00	38.03	76	
N-Nitrosodiphenylamine	ug/l	50.00	31.91	64	
Pentachlorophenol	ug/l	50.00	32.28	65	
Phenanthrene	ug/l	50.00	32.17	64	
Phenol	ug/l	50.00	13.27	26	
Pyrene	ug/l	50.00	27.13	54	
1,2,4-Trichlorobenzene	ug/l	50.00	22.06	44	
2,4,6-Trichlorophenol	ug/l	50.00	34.37	69	
Nitrobenzene-d5 (S)				75	
2-Fluorobiphenyl (S)				71	
Terphenyl-d14 (S)				71	
Phenol-d5 (S)				26	
2-Fluorophenol (S)				44	
2,4,6-Tribromophenol (S)				91	

LABORATORY CONTROL SAMPLE: 926387374

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Acenaphthene	ug/l	50.00	35.40	71	
Acenaphthylene	ug/l	50.00	35.41	71	
Anthracene	ug/l	50.00	38.02	76	
Benzidine	ug/l	100.00	5.079	5	2
Benzo(k)fluoranthene	ug/l	50.00	37.01	74	
Benzo(b)fluoranthene	ug/l	50.00	32.34	65	

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

LABORATORY CONTROL SAMPLE: 926387374

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Benzo(a)anthracene	ug/l	50.00	34.65	69	
Benzo(g,h,i)perylene	ug/l	50.00	21.29	43	
Benzo(a)pyrene	ug/l	50.00	37.21	74	
4-Bromophenylphenyl ether	ug/l	50.00	36.34	73	
Butylbenzylphthalate	ug/l	50.00	35.01	70	
4-Chloro-3-methylphenol	ug/l	50.00	37.18	74	
bis(2-Chloroethoxy)methane	ug/l	50.00	33.98	68	
bis(2-Chloroethyl) ether	ug/l	50.00	33.90	68	
bis(2-Chloroisopropyl) ether	ug/l	50.00	32.10	64	
2-Chloronaphthalene	ug/l	50.00	32.67	65	
2-Chlorophenol	ug/l	50.00	59.97	120	
4-Chlorophenylphenyl ether	ug/l	50.00	37.61	75	
Chrysene	ug/l	50.00	33.90	68	
Dibenz(a,h)anthracene	ug/l	50.00	24.90	50	
1,2-Dichlorobenzene	ug/l	50.00	20.87	42	
1,3-Dichlorobenzene	ug/l	50.00	20.31	41	
1,4-Dichlorobenzene	ug/l	50.00	21.27	42	
3,3'-Dichlorobenzidine	ug/l	100.00	23.19	23	
2,4-Dichlorophenol	ug/l	50.00	33.76	68	
Diethylphthalate	ug/l	50.00	39.20	78	
2,4-Dimethylphenol	ug/l	50.00	36.93	74	
Dimethylphthalate	ug/l	50.00	36.19	72	
Di-n-butylphthalate	ug/l	50.00	46.45	93	
4,6-Dinitro-2-methylphenol	ug/l	50.00	35.12	70	
2,4-Dinitrophenol	ug/l	50.00	27.36	55	
2,4-Dinitrotoluene	ug/l	50.00	36.87	74	
2,6-Dinitrotoluene	ug/l	50.00	37.37	75	
Di-n-octylphthalate	ug/l	50.00	29.90	60	
bis(2-Ethylhexyl)phthalate	ug/l	50.00	35.45	71	
Fluoranthene	ug/l	50.00	42.96	86	
Fluorene	ug/l	50.00	35.90	72	
Hexachloro-1,3-butadiene	ug/l	50.00	22.21	44	
Hexachlorobenzene	ug/l	50.00	37.36	75	
Hexachlorocyclopentadiene	ug/l	50.00	15.22	30	
Hexachloroethane	ug/l	50.00	21.08	42	
Indeno(1,2,3-cd)pyrene	ug/l	50.00	25.60	51	
Isophorone	ug/l	50.00	36.45	73	

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SC 99030
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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

LABORATORY CONTROL SAMPLE: 926387374

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Naphthalene	ug/l	50.00	29.93	60	
Nitrobenzene	ug/l	50.00	33.29	67	
2-Nitrophenol	ug/l	50.00	30.52	61	
4-Nitrophenol	ug/l	50.00	20.70	41	
N-Nitrosodimethylamine	ug/l	50.00	16.91	34	
N-Nitroso-di-n-propylamine	ug/l	50.00	37.90	76	
N-Nitrosodiphenylamine	ug/l	50.00	42.90	86	
Pentachlorophenol	ug/l	50.00	42.71	85	
Phenanthrene	ug/l	50.00	36.63	73	
Phenol	ug/l	50.00	14.62	29	
Pyrene	ug/l	50.00	35.58	71	
1,2,4-Trichlorobenzene	ug/l	50.00	25.23	50	
2,4,6-Trichlorophenol	ug/l	50.00	38.67	77	
Nitrobenzene-d5 (S)				70	
2-Fluorobiphenyl (S)				73	
Terphenyl-d14 (S)				80	
Phenol-d5 (S)				31	
Fluorophenol (S)				40	
2,4,6-Tribromophenol (S)				101	

LABORATORY CONTROL SAMPLE: 926397787

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Acenaphthene	ug/l	50.00	36.44	73	
Acenaphthylene	ug/l	50.00	37.01	74	
Anthracene	ug/l	50.00	38.89	78	
Benzidine	ug/l	100.00	4.062	4	2
Benzo(k)fluoranthene	ug/l	50.00	41.05	82	
Benzo(b)fluoranthene	ug/l	50.00	33.61	67	
Benzo(a)anthracene	ug/l	50.00	39.69	79	
Benzo(g,h,i)perylene	ug/l	50.00	35.14	70	
Benzo(a)pyrene	ug/l	50.00	41.15	82	
4-Bromophenylphenyl ether	ug/l	50.00	34.90	70	
Butylbenzylphthalate	ug/l	50.00	39.00	78	
4-Chloro-3-methylphenol	ug/l	50.00	35.47	71	

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

LABORATORY CONTROL SAMPLE: 926397787

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
bis(2-Chloroethoxy)methane	ug/l	50.00	32.61	65	
bis(2-Chloroethyl) ether	ug/l	50.00	31.31	63	
bis(2-Chloroisopropyl) ether	ug/l	50.00	29.89	60	
2-Chloronaphthalene	ug/l	50.00	35.65	71	
2-Chlorophenol	ug/l	50.00	29.34	59	
4-Chlorophenylphenyl ether	ug/l	50.00	36.83	74	
Chrysene	ug/l	50.00	38.88	78	
Dibenz(a,h)anthracene	ug/l	50.00	38.03	76	
1,2-Dichlorobenzene	ug/l	50.00	25.46	51	
1,3-Dichlorobenzene	ug/l	50.00	24.26	48	
1,4-Dichlorobenzene	ug/l	50.00	24.70	49	
3,3'-Dichlorobenzidine	ug/l	100.00	31.93	32	
2,4-Dichlorophenol	ug/l	50.00	33.78	68	
Diethylphthalate	ug/l	50.00	38.21	76	
2,4-Dimethylphenol	ug/l	50.00	34.55	69	
Dimethylphthalate	ug/l	50.00	35.88	72	
Di-n-butylphthalate	ug/l	50.00	44.67	89	
4,6-Dinitro-2-methylphenol	ug/l	50.00	37.53	75	
2,4-Dinitrophenol	ug/l	50.00	35.87	72	
2,4-Dinitrotoluene	ug/l	50.00	37.17	74	
2,6-Dinitrotoluene	ug/l	50.00	36.43	73	
Di-n-octylphthalate	ug/l	50.00	39.30	79	
bis(2-Ethylhexyl)phthalate	ug/l	50.00	41.46	83	
Fluoranthene	ug/l	50.00	38.93	78	
Fluorene	ug/l	50.00	37.21	74	
Hexachloro-1,3-butadiene	ug/l	50.00	23.45	47	
Hexachlorobenzene	ug/l	50.00	34.43	69	
Hexachlorocyclopentadiene	ug/l	50.00	24.55	49	
Hexachloroethane	ug/l	50.00	22.59	45	
Indeno(1,2,3-cd)pyrene	ug/l	50.00	36.90	74	
Isophorone	ug/l	50.00	39.40	79	
Naphthalene	ug/l	50.00	30.51	61	
Nitrobenzene	ug/l	50.00	31.90	64	
2-Nitrophenol	ug/l	50.00	30.99	62	
4-Nitrophenol	ug/l	50.00	12.33	25	
N-Nitrosodimethylamine	ug/l	50.00	19.12	38	
N-Nitroso-di-n-propylamine	ug/l	50.00	34.84	70	

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

LABORATORY CONTROL SAMPLE: 926397787

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
N-Nitrosodiphenylamine	ug/l	50.00	38.38	77	
Pentachlorophenol	ug/l	50.00	39.92	80	
Phenanthrene	ug/l	50.00	37.60	75	
Phenol	ug/l	50.00	12.52	25	
Pyrene	ug/l	50.00	40.82	82	
1,2,4-Trichlorobenzene	ug/l	50.00	27.03	54	
2,4,6-Trichlorophenol	ug/l	50.00	36.35	73	
Nitrobenzene-d5 (S)				70	
2-Fluorobiphenyl (S)				82	
Terphenyl-d14 (S)				86	
Phenol-d5 (S)				27	
2-Fluorophenol (S)				41	
2,4,6-Tribromophenol (S)				76	

LABORATORY CONTROL SAMPLE: 926421066

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Acenaphthene	ug/l	50.00	34.41	69	
Acenaphthylene	ug/l	50.00	35.43	71	
Anthracene	ug/l	50.00	37.43	75	
Benzidine	ug/l	100.00	23.87	24	
Benzo(k)fluoranthene	ug/l	50.00	36.07	72	
Benzo(b)fluoranthene	ug/l	50.00	34.14	68	
Benzo(a)anthracene	ug/l	50.00	37.50	75	
Benzo(g,h,i)perylene	ug/l	50.00	32.82	66	
Benzo(a)pyrene	ug/l	50.00	38.27	76	
4-Bromophenylphenyl ether	ug/l	50.00	32.87	66	
Butylbenzylphthalate	ug/l	50.00	36.53	73	
4-Chloro-3-methylphenol	ug/l	50.00	34.32	69	
bis(2-Chloroethoxy)methane	ug/l	50.00	30.51	61	
bis(2-Chloroethyl) ether	ug/l	50.00	29.50	59	
bis(2-Chloroisopropyl) ether	ug/l	50.00	27.66	55	
2-Chloronaphthalene	ug/l	50.00	32.67	65	
2-Chlorophenol	ug/l	50.00	27.19	54	
4-Chlorophenylphenyl ether	ug/l	50.00	35.47	71	

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

LABORATORY CONTROL SAMPLE: 926421066

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Chrysene	ug/l	50.00	35.82	72	
Dibenz(a,h)anthracene	ug/l	50.00	34.34	69	
1,2-Dichlorobenzene	ug/l	50.00	23.23	46	
1,3-Dichlorobenzene	ug/l	50.00	21.97	44	
1,4-Dichlorobenzene	ug/l	50.00	22.80	46	
3,3'-Dichlorobenzidine	ug/l	100.00	33.76	34	
2,4-Dichlorophenol	ug/l	50.00	31.37	63	
Diethylphthalate	ug/l	50.00	36.76	74	
2,4-Dimethylphenol	ug/l	50.00	31.63	63	
Dimethylphthalate	ug/l	50.00	34.25	68	
Di-n-butylphthalate	ug/l	50.00	39.29	79	
4,6-Dinitro-2-methylphenol	ug/l	50.00	36.51	73	
2,4-Dinitrophenol	ug/l	50.00	34.92	70	
2,4-Dinitrotoluene	ug/l	50.00	36.29	73	
2,6-Dinitrotoluene	ug/l	50.00	35.41	71	
Di-n-octylphthalate	ug/l	50.00	37.67	75	
bis(2-Ethylhexyl)phthalate	ug/l	50.00	38.09	76	
uoranthene	ug/l	50.00	37.05	74	
Fluorene	ug/l	50.00	35.58	71	
Hexachloro-1,3-butadiene	ug/l	50.00	20.55	41	
Hexachlorobenzene	ug/l	50.00	32.89	66	
Hexachlorocyclopentadiene	ug/l	50.00	21.65	43	
Hexachloroethane	ug/l	50.00	21.17	42	
Indeno(1,2,3-cd)pyrene	ug/l	50.00	33.95	68	
Isophorone	ug/l	50.00	36.72	73	
Naphthalene	ug/l	50.00	27.01	54	
Nitrobenzene	ug/l	50.00	29.26	58	
2-Nitrophenol	ug/l	50.00	28.02	56	
4-Nitrophenol	ug/l	50.00	14.33	29	
N-Nitrosodimethylamine	ug/l	50.00	19.34	39	
N-Nitroso-di-n-propylamine	ug/l	50.00	33.58	67	
N-Nitrosodiphenylamine	ug/l	50.00	38.08	76	
Pentachlorophenol	ug/l	50.00	39.10	78	
Phenanthrene	ug/l	50.00	36.36	73	
Phenol	ug/l	50.00	12.99	26	
Pyrene	ug/l	50.00	37.67	75	
1,2,4-Trichlorobenzene	ug/l	50.00	23.12	46	

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QUALITY CONTROL DATA

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Client Project ID: NCDOT 34950.1.1 Parcel 41A

LABORATORY CONTROL SAMPLE: 926421066

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
2,4,6-Trichlorophenol	ug/l	50.00	35.29	71	
Nitrobenzene-d5 (S)				61	
2-Fluorobiphenyl (S)				73	
Terphenyl-d14 (S)				77	
Phenol-d5 (S)				27	
2-Fluorophenol (S)				43	
2,4,6-Tribromophenol (S)				70	

LABORATORY CONTROL SAMPLE: 926436429

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Acenaphthene	ug/l	50.00	41.32	83	
Acenaphthylene	ug/l	50.00	41.57	83	
Anthracene	ug/l	50.00	45.55	91	
Benzidine	ug/l	100.00	11.85	12	
Benzo(k)fluoranthene	ug/l	50.00	43.19	86	
Benzo(b)fluoranthene	ug/l	50.00	38.05	76	
Benzo(a)anthracene	ug/l	50.00	43.67	87	
Benzo(g,h,i)perylene	ug/l	50.00	45.61	91	
Benzo(a)pyrene	ug/l	50.00	44.17	88	
4-Bromophenylphenyl ether	ug/l	50.00	41.55	83	
Butylbenzylphthalate	ug/l	50.00	41.10	82	
4-Chloro-3-methylphenol	ug/l	50.00	38.88	78	
bis(2-Chloroethoxy)methane	ug/l	50.00	37.96	76	
bis(2-Chloroethyl) ether	ug/l	50.00	37.50	75	
bis(2-Chloroisopropyl) ether	ug/l	50.00	37.99	76	
2-Chloronaphthalene	ug/l	50.00	37.20	74	
2-Chlorophenol	ug/l	50.00	35.08	70	
4-Chlorophenylphenyl ether	ug/l	50.00	41.20	82	
Chrysene	ug/l	50.00	45.36	91	
Dibenz(a,h)anthracene	ug/l	50.00	46.85	94	
1,2-Dichlorobenzene	ug/l	50.00	26.41	53	
1,3-Dichlorobenzene	ug/l	50.00	23.85	48	
1,4-Dichlorobenzene	ug/l	50.00	25.20	50	
3,3'-Dichlorobenzidine	ug/l	100.00	37.90	38	

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

LABORATORY CONTROL SAMPLE: 926436429

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
2,4-Dichlorophenol	ug/l	50.00	37.19	74	
Diethylphthalate	ug/l	50.00	43.15	86	
2,4-Dimethylphenol	ug/l	50.00	38.00	76	
Dimethylphthalate	ug/l	50.00	40.91	82	
Di-n-butylphthalate	ug/l	50.00	43.11	86	
4,6-Dinitro-2-methylphenol	ug/l	50.00	45.15	90	
2,4-Dinitrophenol	ug/l	50.00	36.40	73	
2,4-Dinitrotoluene	ug/l	50.00	44.79	90	
2,6-Dinitrotoluene	ug/l	50.00	42.64	85	
Di-n-octylphthalate	ug/l	50.00	40.45	81	
bis(2-Ethylhexyl)phthalate	ug/l	50.00	46.43	93	
Fluoranthene	ug/l	50.00	41.20	82	
Fluorene	ug/l	50.00	42.43	85	
Hexachloro-1,3-butadiene	ug/l	50.00	25.14	50	
Hexachlorobenzene	ug/l	50.00	40.85	82	
Hexachlorocyclopentadiene	ug/l	50.00	28.27	56	
Hexachloroethane	ug/l	50.00	23.77	48	
deno(1,2,3-cd)pyrene	ug/l	50.00	46.47	93	
Isophorone	ug/l	50.00	39.46	79	
Naphthalene	ug/l	50.00	34.21	68	
Nitrobenzene	ug/l	50.00	37.78	76	
2-Nitrophenol	ug/l	50.00	37.51	75	
4-Nitrophenol	ug/l	50.00	17.52	35	
N-Nitrosodimethylamine	ug/l	50.00	21.57	43	
N-Nitroso-di-n-propylamine	ug/l	50.00	47.05	94	
N-Nitrosodiphenylamine	ug/l	50.00	47.14	94	
Pentachlorophenol	ug/l	50.00	55.65	111	
Phenanthrene	ug/l	50.00	42.39	85	
Phenol	ug/l	50.00	14.94	30	
Pyrene	ug/l	50.00	42.29	85	
1,2,4-Trichlorobenzene	ug/l	50.00	29.55	59	
2,4,6-Trichlorophenol	ug/l	50.00	44.76	90	
Nitrobenzene-d5 (S)				79	
2-Fluorobiphenyl (S)				86	
Terphenyl-d14 (S)				95	
Phenol-d5 (S)				33	
2-Fluorophenol (S)				53	

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QUALITY CONTROL DATA

Lab Project Number: 92109230
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LABORATORY CONTROL SAMPLE: 926436429

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
2,4,6-Tribromophenol (S)				113	3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 926356148 926356155

Parameter	Units	926345026 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
Acenaphthene	ug/l	0	100.00	63.83	50.38	64	50	24	
Acenaphthylene	ug/l	0	100.00	63.48	53.48	64	54	17	
Anthracene	ug/l	0	100.00	70.68	64.02	71	64	10	
Benzidine	ug/l	0	200.00	25.67	28.57	13	14	11	
Benzo(k)fluoranthene	ug/l	0	100.00	52.35	49.51	52	50	6	
Benzo(b)fluoranthene	ug/l	0	100.00	56.43	48.76	56	49	15	
Benzo(a)anthracene	ug/l	0	100.00	76.11	68.95	76	69	10	
Benzo(g,h,i)perylene	ug/l	0	100.00	56.57	65.14	57	65	14	
Benzo(a)pyrene	ug/l	0	100.00	66.95	59.96	67	60	11	
4-Bromophenylphenyl ether	ug/l	0	100.00	69.97	61.78	70	62	12	
Butylbenzylphthalate	ug/l	0	100.00	66.54	63.30	66	63	5	
4-Chloro-3-methylphenol	ug/l	0	100.00	77.40	65.84	77	66	16	
bis(2-Chloroethoxy)methane	ug/l	0	100.00	72.16	57.85	72	58	22	
bis(2-Chloroethyl) ether	ug/l	0	100.00	70.16	46.02	70	46	42	4
bis(2-Chloroisopropyl) ether	ug/l	0	100.00	78.09	52.69	78	53	39	4
2-Chloronaphthalene	ug/l	0	100.00	62.58	45.04	63	45	33	2,5
2-Chlorophenol	ug/l	0	100.00	64.96	46.61	65	47	33	4
4-Chlorophenylphenyl ether	ug/l	0	100.00	70.62	58.50	71	58	19	
Chrysene	ug/l	0	100.00	70.67	65.23	71	65	8	
Dibenz(a,h)anthracene	ug/l	0	100.00	70.91	81.74	71	82	14	
1,2-Dichlorobenzene	ug/l	0	100.00	44.48	20.38	44	20	74	2,5
1,3-Dichlorobenzene	ug/l	0	100.00	41.54	17.85	42	18	80	4
1,4-Dichlorobenzene	ug/l	0	100.00	43.04	18.91	43	19	78	2,5
3,3'-Dichlorobenzidine	ug/l	0	100.00	63.32	63.09	63	63	0	
2,4-Dichlorophenol	ug/l	0	100.00	65.53	51.23	66	51	24	
Diethylphthalate	ug/l	0	100.00	77.35	70.65	77	71	9	
2,4-Dimethylphenol	ug/l	0	100.00	72.86	58.05	73	58	23	
Dimethylphthalate	ug/l	0	100.00	70.40	65.04	70	65	8	
Di-n-butylphthalate	ug/l	6.358	100.00	77.38	79.86	71	74	3	
4,6-Dinitro-2-methylphenol	ug/l	0	100.00	65.09	59.23	65	59	9	

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Asheville, NC 28804
Phone: 828.254.7176
Fax: 828.252.4618

QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 926356148 926356155

Parameter	Units	926345026 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
2,4-Dinitrophenol	ug/l	0	100.00	55.38	51.62	55	52	7	
2,4-Dinitrotoluene	ug/l	0	100.00	25.65	23.16	26	23	10	2,2
2,6-Dinitrotoluene	ug/l	0	100.00	74.35	69.20	74	69	7	
Di-n-octylphthalate	ug/l	0	100.00	65.42	61.30	65	61	7	
bis(2-Ethylhexyl)phthalate	ug/l	1.385	100.00	68.58	64.17	67	63	7	
Fluoranthene	ug/l	0	100.00	72.73	66.88	73	67	8	
Fluorene	ug/l	0	100.00	66.89	55.21	67	55	19	
Hexachloro-1,3-butadiene	ug/l	0	100.00	43.04	16.51	43	16	89	2,5
Hexachlorobenzene	ug/l	0	100.00	73.00	63.07	73	63	15	
Hexachlorocyclopentadiene	ug/l	0	100.00	37.96	27.22	38	27	33	4
Hexachloroethane	ug/l	0	100.00	43.60	16.65	44	17	89	2,5
Indeno(1,2,3-cd)pyrene	ug/l	0	100.00	63.58	68.48	64	68	7	
Isophorone	ug/l	0	100.00	178.6	147.1	179	147	19	
Naphthalene	ug/l	0	100.00	51.99	29.93	52	30	54	4
Nitrobenzene	ug/l	0	100.00	77.87	56.11	78	56	32	4
2-Nitrophenol	ug/l	0	100.00	61.60	45.95	62	46	29	
4-Nitrophenol	ug/l	0	100.00	36.30	33.45	36	34	8	
N-Nitrosodimethylamine	ug/l	0	100.00	47.34	35.86	47	36	28	
N-Nitroso-di-n-propylamine	ug/l	0	100.00	85.55	66.68	86	67	25	
N-Nitrosodiphenylamine	ug/l	0	100.00	71.92	62.98	72	63	13	
Pentachlorophenol	ug/l	0	100.00	78.27	72.22	78	72	8	
Phenanthrene	ug/l	0	100.00	65.83	58.26	66	58	12	
Phenol	ug/l	0	100.00	31.25	23.67	31	24	28	
Pyrene	ug/l	0	100.00	64.86	59.41	65	59	9	
1,2,4-Trichlorobenzene	ug/l	0	100.00	46.52	21.25	46	21	75	2,5
2,4,6-Trichlorophenol	ug/l	0	100.00	74.65	66.53	75	66	12	
Nitrobenzene-d5 (S)						86	63		
2-Fluorobiphenyl (S)						74	61		
Terphenyl-d14 (S)						82	75		
Phenol-d5 (S)						30	23		
2-Fluorophenol (S)						48	34		
2,4,6-Tribromophenol (S)						102	91		

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Fax: 828.252.4618

QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

QC Batch: 144730 Analysis Method: EPA 200.7
QC Batch Method: SM 3030C Analysis Description: 3030C Metals, ICP, Trace
Associated Lab Samples: 926432568

METHOD BLANK: 926433665
Associated Lab Samples: 926432568

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Chromium, 3030C	mg/l	ND	0.0020	
Lead, 3030C	mg/l	ND	0.0050	

LABORATORY CONTROL SAMPLE: 926433673

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Chromium, 3030C	mg/l	0.5000	0.4790	96	
Lead, 3030C	mg/l	0.5000	0.4770	95	

MATRIX SPIKE: 926434002

Parameter	Units	926430489 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
Chromium, 3030C	mg/l	0.01150	0.5000	0.4690	92	
Lead, 3030C	mg/l	0	0.5000	0.4620	92	

SAMPLE DUPLICATE: 926434010

Parameter	Units	926432584 Result	DUP Result	RPD	Footnotes
Chromium, 3030C	mg/l	0.03200	0.03200	1	
Lead, 3030C	mg/l	ND	ND	NC	

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QUALITY CONTROL DATA

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

QC Batch: 144771 Analysis Method: % Moisture
QC Batch Method: Analysis Description: Percent Moisture
Associated Lab Samples: 926432477 926432485 926432493 926432519 926432527 926432535 926432543

SAMPLE DUPLICATE: 926435561

Parameter	Units	926432873 Result	DUP Result	RPD	Footnotes
Percent Moisture	%	16.20	20.90	25	

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Fax: 828.252.4618

Lab Project Number: 92109230
Client Project ID: NCDOT 34950.1.1 Parcel 41A

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

LCS(D)	Laboratory Control Sample (Duplicate)
MS(D)	Matrix Spike (Duplicate)
DUP	Sample Duplicate
ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
RPD	Relative Percent Difference
(S)	Surrogate
[1]	High surrogate recovery was confirmed as a matrix effect by a second analysis.
[2]	The surrogate and/or spike recovery was outside acceptance limits.
[3]	Acid surrogate recovery outside of control limits. The data was accepted based on valid recovery of the two remaining acid surrogates.
[4]	RPD value was outside control limits, however both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
[5]	The calculated RPD was outside QC acceptance limits.

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Pace Analytical

Page: 1 of 1

895491

Section A
Required Client Information:

Company	
Address	
Email To:	
Phone / Fax	
Requested Due Date/TAT:	

Section B
Required Project Information:

Report To:	
Copy To:	
Purchase Order No.:	
Project Name:	
Project Number:	

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	3869-6,3

REGULATORY AGENCY

[ ] NPDES [ ] GROUND WATER [ ] DRINKING WATER
[X] UST [ ] RCRA [ ] Other_____

SITE LOCATION [ ] GA [ ] IL [ ] IN [ ] MI [ ] MN [X] NC [ ] OH [ ] SC [ ] WI [ ] OTHER _____

Section D **Required** Client Information

SAMPLE ID

One Character per box.
(A-Z, 0-9 / ,-)
Samples IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Filtered (Y/N)	Requested Analysis:	Residual Chlorine (Y/N)	Pace Project Number / Lab I.D
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Additional Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME

SAMPLE CONDITION

	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

Temp in °C | Received on Ice | Custody Sealed Cooler | Samples Intact

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: | DATE Signed (MM / DD / YY)

SEE REVERSE SIDE FOR INSTRUCTIONS

Pace Analytical Services, Inc.

TENTATIVELY IDENTIFIED COMPOUNDS

Client Name: 92-SOLUTIONS
Lab Smp Id: 926432568
Operator : BET
Sample Location:
Sample Matrix: WATER
Analysis Type: SV
Inj Date: 17-DEC-2005 20:57

Client SDG: 92109230
Client Smp ID: 41A-3
Sample Date: 07-DEC-2005
Sample Point:
Date Received:09-DEC-2005 00:00
Level: LOW

Number TICs found: 13

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

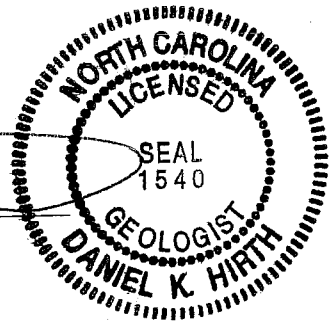
	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		Unknown	3.523	5.13	J
2.		Unknown	4.100	5.77	J
3.		Unknown	4.196	9.92	J
4.	100-41-4	Ethylbenzene	4.351	16.1	87J
5.		Xylene isomer	4.403	10.8	95J
6.		C-3 substituted benzene	4.772	10.1	J
7.		Unknown	4.876	5.42	J
8.		C-3 substituted benzene	4.972	13.9	J
9.		C-3 substituted benzene	5.245	9.68	J
10.		C-3 substituted benzene	5.475	14.8	J
11.		Unknown	5.593	36.2	J
12.		C-4 substituted benzene	5.903	14.8	J
13.		Unknown	19.432	8.09	J

PRELIMINARY SITE ASSESSMENT
PARCEL 017, HARVEY MELTON PROPERTY
2005 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
NC DOT PROJECT: U-3456
WBS ELEMENT: 34950.1.1

Prepared for:
NC Department of Transportation
Geotechnical Engineering Unit
GeoEnvironmental Section
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Prepared by:
Solutions-IES
1101 Nowell Road
Raleigh, North Carolina 27607

Solutions-IES Project No. 2730.05A2.NDOT



Daniel K. Hirth, PG
Hydrogeologist

Sheri L. Knox
Project Manager

January 18, 2006

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3.0 FIELD ACTIVITIES 2

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APPENDIX A – PHOTOGRAPHS

APPENDIX B – GEOPHYSICAL DATA

APPENDIX C – BORING LOGS

APPENDIX D – LABORATORY ANALYTICAL REPORT

1.0 INRODUCTION

The North Carolina Department of Transportation (NCDOT) is widening Fayetteville Road (US-1) in Rockingham, Richmond County, North Carolina. The project may require the NCDOT to acquire additional property for roadway construction. On November 3, 2005, Solutions-IES submitted a proposal to conduct Preliminary Site Assessments (PSAs) for 14 parcels of land that contain or reportedly contained underground storage tanks (USTs), or are areas of interest identified by NCDOT. This report summarizes the results of field and laboratory activities conducted during the PSA of a portion of the Harvey Melton property located at 2005 Fayetteville Road (US Highway 1) in Rockingham, Richmond County, North Carolina (Figure 1). The location of Parcel 017 is also identified on Figures 2 and 3. The scope of work executed at the site was performed in general accordance with Solutions-IES proposal NC05449P dated November 3, 2005, and a Notice to Proceed issued by the NCDOT Geotechnical Engineering Unit dated November 7, 2005, under contract 7000005553 dated May 9, 2005.

2.0 BACKGROUND AND SITE DESCRIPTION

Parcel 017 is located northwest of Fayetteville Road (US Highway 1) on the east side of the intersection with Roberdell Road in Rockingham, North Carolina. The Study Area includes land occupied by an existing convenience store, but does not include the two structures on the northeast half of the property that currently contain a hair salon and residence. The BP gas station faces the intersection of Fayetteville Road and Roberdell Road, and has fuel pumps and a canopy located between the building and intersection. According to the NCDENR Registered Tanks Database and NCDOT, the gas station is known as "Crestview #2", Facility ID# 0-019347. The database indicates the presence of four USTs registered by Quality Oil Company of Rockingham, NC. The tanks are listed as a 1,000 gallon kerosene UST, two 4,000 gallon gasoline USTs, and one 6,000 gallon gasoline UST. The site is listed in the NCDENR Pollution Incident Database as "Texaco Sandwich Hut--Rockingha[m]", Incident Number 3273. According to the database, the Responsible Party is Swink Quality Oil of Rockingham, NC. The pollution incident was reported on August 19, 1986 and the file was closed by NCDENR on May 14, 1995.

Groundwater contamination was noted in the Pollution Incident Database. Several monitor wells are located on nearby parcels, that may be related to prior assessment activities at the Harvey Melton property.

The site is bordered to the east, west and south by commercial properties, and to the north by a residential property. Allegedly, three other gas stations had existed on other parcels near the Roberdell and Fayetteville Road intersection. Photographs of the Study Area on the site are presented in Appendix A.

3.0 FIELD ACTIVITIES

Prior to mobilizing to the site to conduct subsurface sampling, Solutions-IES contacted North Carolina One Call to locate underground utilities in the assessment area of the site. Additionally, KCI Associates of North Carolina, PA were contracted to locate utilities within in the Study Area.

Pyramid Environmental & Engineering, P.C. (Pyramid) was contracted to perform an electromagnetic survey of the subsurface in the proposed right-of-way and easement area. The survey was performed on November 14, 2005. The electromagnetic survey equipment (EM61) identified various magnetic anomalies within the Study Area, and the locations of the four USTs described previously (see Section 2). A ground penetrating radar (GPR) survey was performed on November 23, 2005 utilizing a Geophysical Survey Systems SIR 2000 instrument to confirm the locations of the USTs. Three, and possibly four, USTs were identified between pump islands beneath the canopy and the intersection of Fayetteville and Roberdell Roads. A kerosene UST was identified on the northwest side of a structure identified as Crestview No. 2 BP Store. The results of the electromagnetic survey are included as figures 10 and 11 in Appendix B. Additional site photos and the GPR survey results are included as figure 12 in Appendix B.

After reviewing the geophysical report, Solutions-IES mobilized to the site on December 1, 2005 to obtain soil samples from locations within the proposed right-of-way. A total of 14 soil borings were advanced at the site in the locations depicted on Figure 3. Each of these borings (17-1 through 17-14) were advanced to a depth of either 8 or 12 feet below ground surface (ft bgs) employing the use of a truck-mounted Geoprobe®. Borings 17-4, 17-5 17-6, 17-7, 17-8, 17-9, 17-10 and 17-11 spaced approximately 50 feet apart. Borings 17-1, 17-2, and 17-3 were located near the kerosene UST. Borings 17-12, 17-13, and 17-14 were located to delineate suspected soil contamination (Figure 3). Samples could not be collected between the canopy and the convenience store building due to the presence of active underground utilities, nor could samples be collected beneath the convenience store structure.

Soil samples were obtained within each boring using a MacroCore® sampler fitted with single-use disposable polyvinyl chloride (PVC) liners. Each soil sample was split into two aliquots. Each aliquot was placed in a separate resealable plastic bag. One bag was placed on ice for possible laboratory

analysis, while the remaining bag was placed at ambient temperature for field screening with a flame ionization detector (FID). After approximately 20 minutes to allow accumulation of volatile organic compounds (VOCs) in the headspace of the latter bag, it was scanned with the FID. The FID readings were rounded to the nearest whole number and entered on the boring logs along with the soil description and any indications of petroleum staining or odor, if present (Appendix C).

Each boring was advanced from surface grade through as much as 6 inches of asphalt or concrete. Soil observed in some borings (17-5, 17-7, 17-8, 17-9, 17-10) in the Study Area consisted of fine sand (Unified Soil Classification SP) underlain by sandy clay (Unified Soil Classification CL). However, this same type strata was often interbedded with clayey sand (Unified Soil Classification SC) as in borings 17-1, 17-2, 17-3, 17-4, 17-12, and 17-13. Soil from borings 17-11 and 17-14 consisted of fine sand underlain by clayey sand, and soil from 17-6 consisted of clayey sand underlain by sandy clay. Soils identified within each boring were thought to represent native soils.

Screening of soils with the FID revealed the presence of volatile vapors in samples obtained from eight of 14 of the borings advanced at the Study Area, except for borings 17-1, 17-2, 17-3, 17-4, 17-9, and 17-10. Several of the borings contained strong to faint petroleum odors and petroleum stained soil. Values measured in samples from these borings ranged from not detected (0) to greater than 3,933 parts per million (ppm). These values are presented in Table 1.

Soil samples for laboratory analysis were retained from borings 17-5 (6-8 feet), 17-6 (4-6 feet), 17-7 (8-10 feet), 17-8 (6-8 feet), 17-11 (6-8 feet), 17-12 (8-10 feet), 17-13 (10-12 feet) and 17-14 (6-8 feet). These samples were selected for analysis because of their elevated FID readings or to delineate suspected soil contamination. The samples were placed in laboratory-supplied containers and stored on ice pending shipment to Pace Analytical Services, Inc. (Pace) in Huntersville, NC, under chain-of-custody control. The soil samples were submitted for chemical analysis of total petroleum hydrocarbons (TPH), gasoline range organics (GRO) by Modified EPA Method 5030/8015 and TPH, diesel range organics (DRO) by Modified EPA Method 3545/8015.

Groundwater was not encountered in the borings advanced on the site on December 1, 2005; therefore, groundwater samples were not collected from the Study Area for chemical analysis.

4.0 LABORATORY RESULTS

According to the laboratory analytical results, TPH DRO and/or GRO were detected in seven of eight samples submitted for chemical analyses at concentrations exceeding the NCDENR Action Level. TPH GRO was detected in the soil sample submitted from 17-14 at concentrations greater than the laboratory detection limit, but less than the Action Level. Laboratory analytical results from sample 17-8 did not indicate the presence of TPH GRO or TPH DRO at concentrations exceeding their respective laboratory method detection limits. These data are summarized in Table 2. Laboratory reports associated with the analysis of these samples are presented in Appendix D.

5.0 DISCUSSION AND CONCLUSIONS

Pyramid identified three, possibly four, petroleum underground storage tanks within the Study Area at the Parcel 017 site, located at 2005 Fayetteville Road in Rockingham, NC. Results of the electromagnetic survey conducted did not suggest, the presence of any other subsurface structures which might be identified as USTs, nor did Solutions-IES personnel observe any other obvious structures (vent pipes, fill ports, etc.) which would be indicative of a UST system or systems. Solutions-IES observed three product dispenser islands within the Study Area.

Solutions-IES advanced a total of 14 soil borings to assess if soil within the Study Area has been impacted by petroleum contamination. FID readings at many boring locations suggested a release within the Study Area. Laboratory results from seven soil samples show concentration of TPH GRO and/or TPH DRO above the NCDENR Action Level of 10 mg/kg. These data tend to indicate that impacted soils are associated with the three gasoline USTs near the canopy. The estimated area of petroleum impacted soil is shown in Figure 3. The area is roughly triangular in shape with an area of approximately 5,500 square feet (1/2 bh; b= 100 ft, h= 110 ft). Based on FID readings, the depth of impacted soil is estimated to be at least 12 ft bgs. Therefore the volume of impacted soil is calculated as 5,500 square feet by 12 feet thick, or 66,000 cubic feet (approximately 2,400 cubic yards).

The laboratory analytical data from boring 17-14 suggests a potential release from the kerosene dispenser at the west side of the convenience store. The area is elliptical in shape and has an area of approximately 470 square feet. Based upon FID readings, the depth of impacted soil is greater than 6 ft bgs. Based on a depth of 12 ft bgs, the volume of impacted soil is estimated at 5,600 cubic feet (207 cubic yards).

The total volume of petroleum impacted soil within the Study Area is estimated as 2,607 cubic yards. Removal of the dispenser pump island and associated petroleum impacted soil may be necessary when roadway construction begins. At the time of roadway construction, the NDOT transportation/disposal contractor may use different criteria for estimating the area of impacted soil. Because soil samples collected from boring 17-14 contained TPH GRO at a concentration greater than the laboratory method detection limit, but less than the Action Level, soil that may be excavated in vicinity of this boring should be properly transported and disposed of.

Based on field observation and laboratory analytical results, Solutions-IES concludes that petroleum hydrocarbons have impacted two locations within the Study Area. Additional assessment would be necessary, possibly upon demolition of existing structures, to further delineate the area of impacted soil.

TABLES

TABLE 1
SUMMARY OF SOIL FIELD SCREENING
Parcel 017 - Harvey Melton Property
2005 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NC DOT Project: U-3456)
Sample Collection Date: December 1, 2005

Sample Depth Below Ground Surface	Soil Borings													
	17-1	17-2	17-3	17-4	17-5	17-6	17-7	17-8	17-9	17-10	17-11	17-12	17-13	17-14
	FID Reading (ppm)													
0 - 2 feet	0	0	0	0	0	0	8.4	0.6	0	0	1.6	0	0	0
2 - 4 feet	0	0	0	0	0	41.1	76.2	0	0	0	365.2	3.9	0	0
4 - 6 feet	0	0	0	0	0	957.3	183.7	0	0	0	815.7	33.1	2.0	0
6 - 8 feet	0	0	0	0	1,270	51.6	70.0	0	0	0	>3,933	43.2	0	6.0
8 - 10 feet	NC	NC	NC	NC	6.3	90.3	347.0	NC	NC	NC	>3,933	1,958	7.3	NC
10 - 12 feet	NC	NC	NC	NC	1.6	13.0	253.0	NC	NC	NC	304.4	100.8	23.2	NC

Notes:

1. FID readings were obtained with a Photovac MicroFID Flame Ionization Detector.
2. Samples denoted by shaded cells were submitted for laboratory analysis.
3. NC denotes that soil samples were not collected.

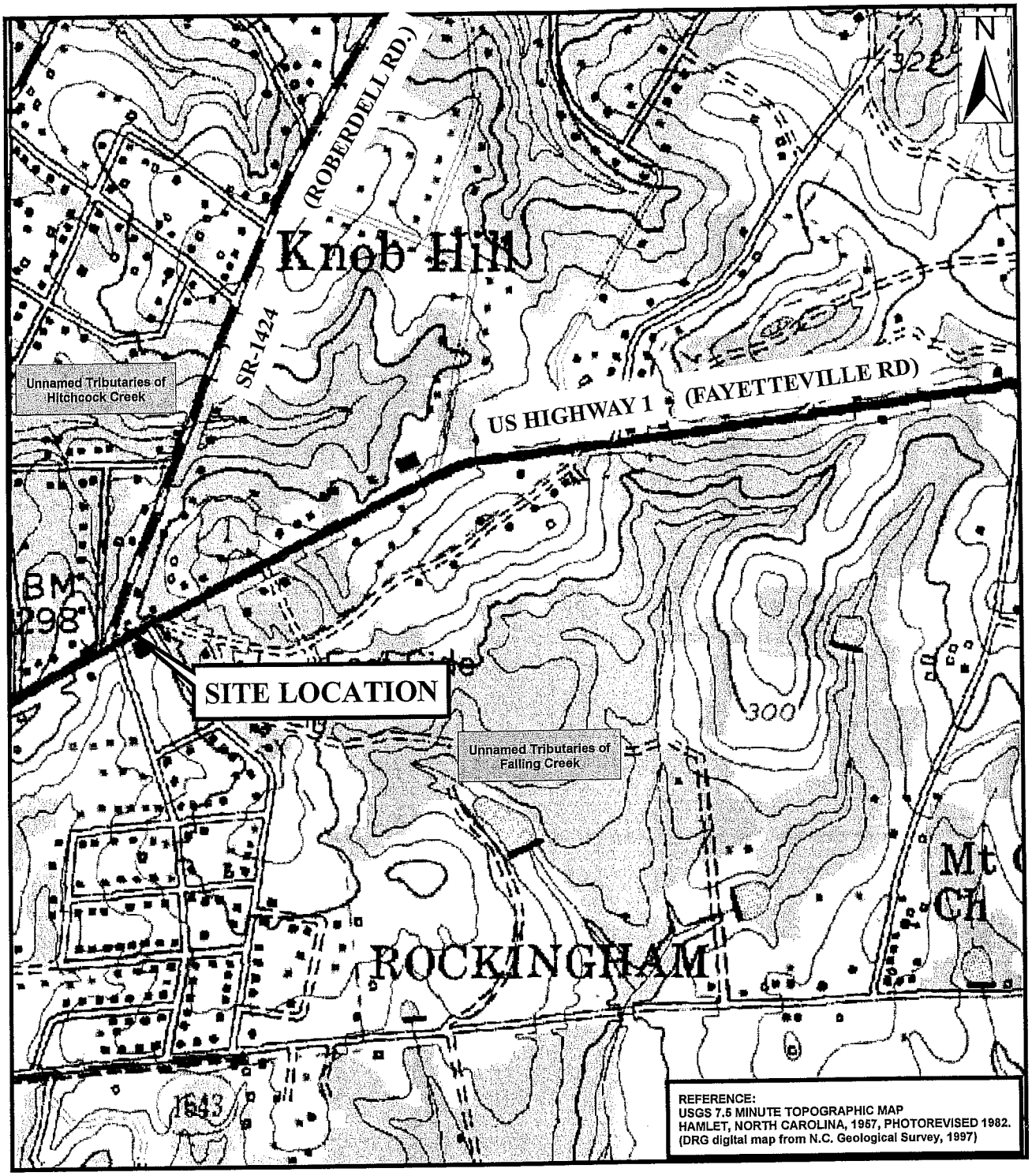
TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS
Parcel 017 - Harvey Melton Property
2005 Fayetteville Road (US Highway 1)
Rockingham, Richmond County, North Carolina
WBS Element: 34950.1.1 (NC DOT Project: U-3456)
Sample Collection Date: December 1, 2005

Sample Information		Total Petroleum Hydrocarbons	
Boring Number	Depth (Feet)	Gasoline Range[1] (mg/kg)	Diesel Range[2] (mg/kg)
17-5	6-8	480	300
17-6	4-6	590	61
17-7	8-10	50	47
17-8	6-8	<3.9	<5.7
17-11	6-8	250	25
17-12	8-10	120	12
17-13	10-12	11	<5.7
17-14	6-8	6.5	13

Notes:

1. Total Petroleum Hydrocarbons (TPH) Method 5030/8015MOD - Gasoline Range Hydrocarbons
2. Total Petroleum Hydrocarbons (TPH) Method 3545/8015MOD - Diesel Range Hydrocarbons
3. Shaded cells indicate concentrations above the NCDENR Action Levels.

FIGURES



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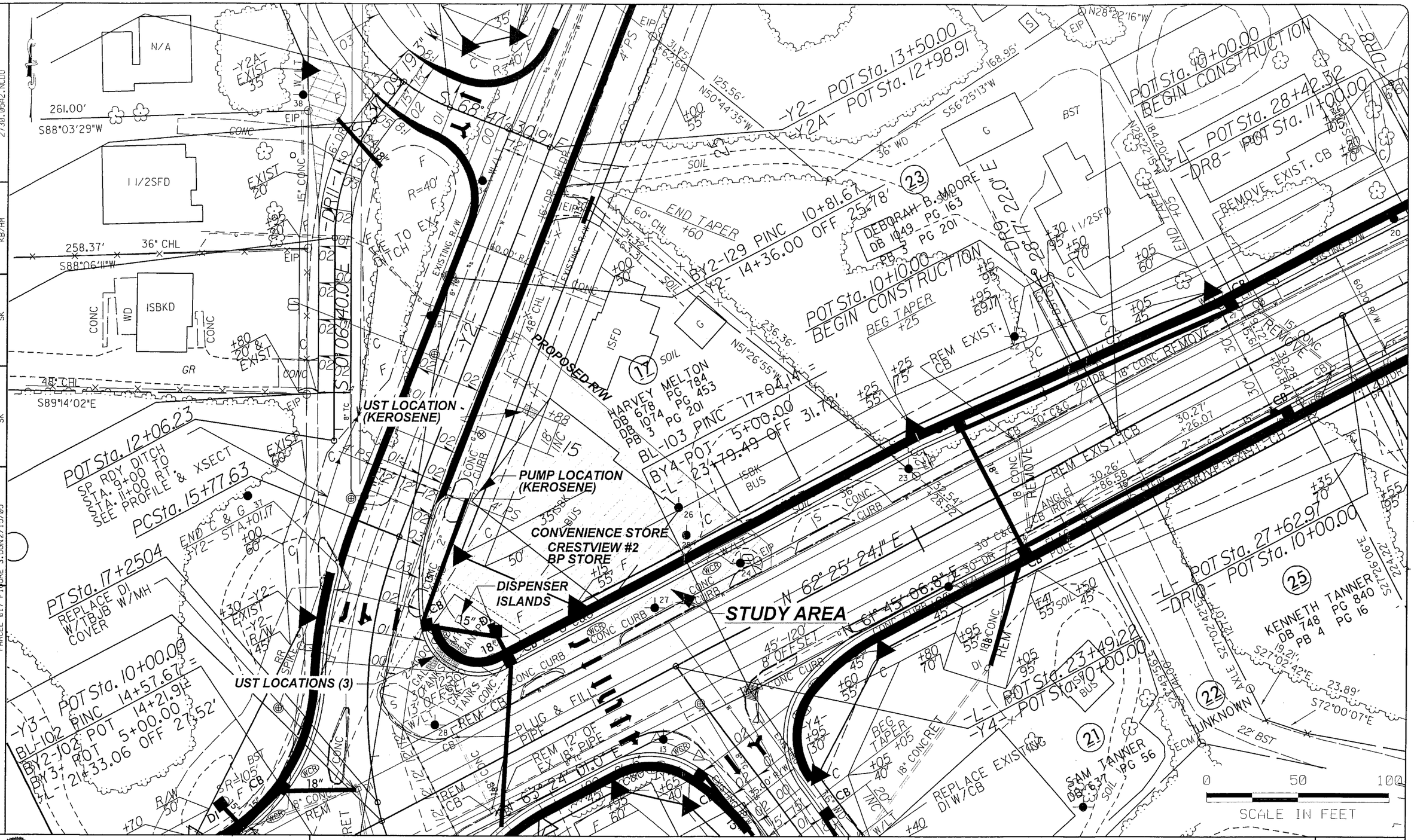
SITE LOCATION MAP
PARCEL # 017 - HARVEY MELTON PROPERTY
2005 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
NCDOT WBS ELEMENT NO. 34950.1.1(TIP # U-3456)

Solutions-IES
Industrial & Environmental Services
1101 Nowell Road, Raleigh, NC 27609
Phone (919) 873-1060, Fax (919) 873-1074

Created by:	KBB	Project:	2730.05A2.NCDO
Checked by:	BR	Date:	12/15/05
File:	FIG1.mxd		
Software:	ESRI ArcMap 9.0	FIGURE	1

PROJECT NUMBER 2730.05A2.NCDO
DRAFTER KB/HM
CHECKED BY SK
PROJECT MANAGER SK
DATE
PARCEL 017 FIGURE 3.DGN 2/15/05
FILE



Solutions-IES
Industrial & Environmental Services
1101 NOWELL ROAD
RALEIGH, NORTH CAROLINA 27607
TEL.: (919) 873-1060 FAX.: (919) 873-1074

SITE MAP
PARCEL # 017 - HARVEY MELTON PROPERTY
2005 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
WBS ELEMENT NO. 34950.1.1 (NCDOT PROJECT: U-3456)

FIGURE:
2

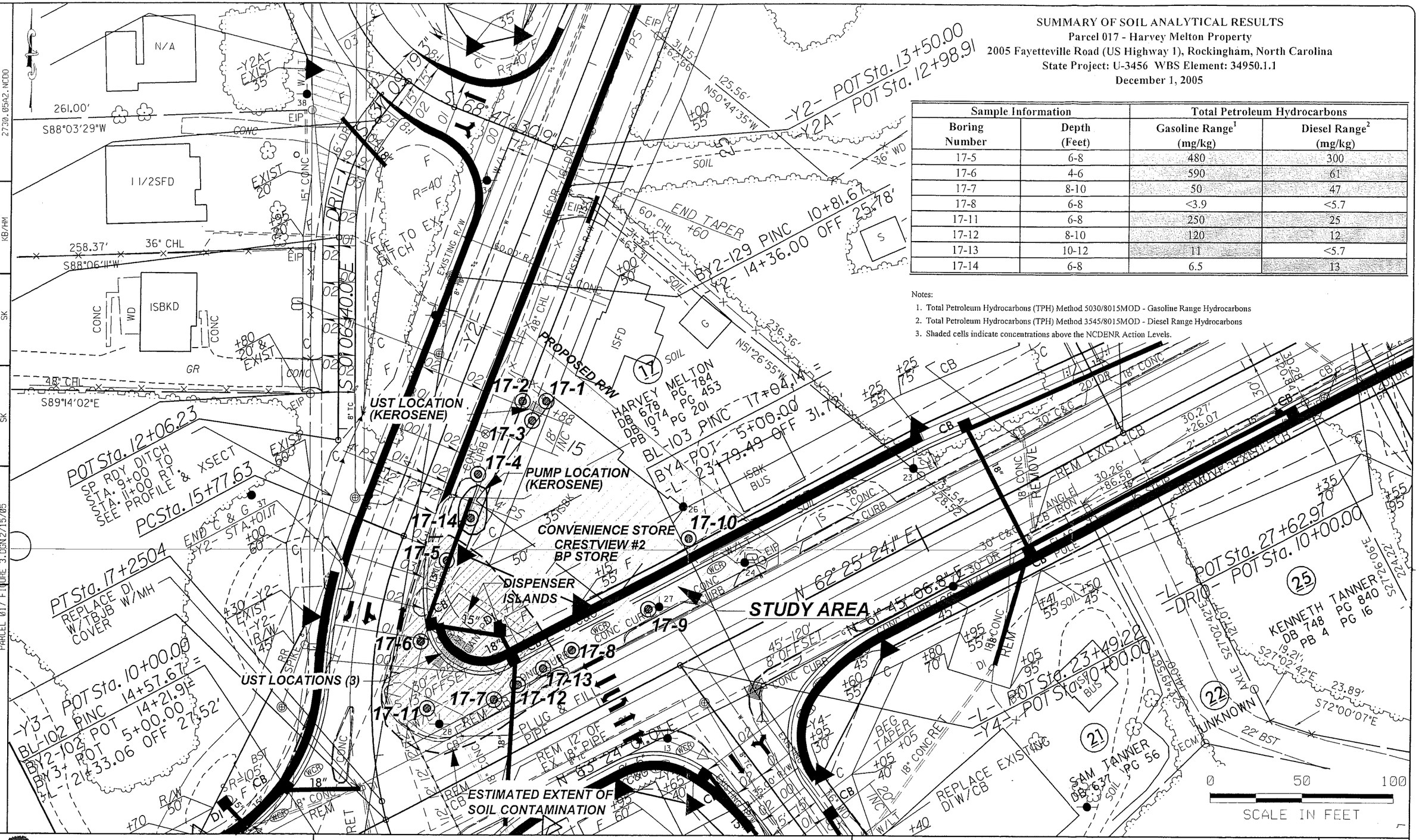
PROJECT NUMBER 2730.05A2.NCDO
DRAFTER KB/HM
CHECKED BY SK
PROJECT MANAGER SK
DATE
PARCEL 017 FIGURE 3.DGN2/15/05
FILE

SUMMARY OF SOIL ANALYTICAL RESULTS

Parcel 017 - Harvey Melton Property
2005 Fayetteville Road (US Highway 1), Rockingham, North Carolina
State Project: U-3456 WBS Element: 34950.1.1
December 1, 2005

Sample Information		Total Petroleum Hydrocarbons	
Boring Number	Depth (Feet)	Gasoline Range[1] (mg/kg)	Diesel Range[2] (mg/kg)
17-5	6-8	480	300
17-6	4-6	590	61
17-7	8-10	50	47
17-8	6-8	<3.9	<5.7
17-11	6-8	250	25
17-12	8-10	120	12
17-13	10-12	11	<5.7
17-14	6-8	6.5	13

Notes:
1. Total Petroleum Hydrocarbons (TPH) Method 5030/8015MOD - Gasoline Range Hydrocarbons
2. Total Petroleum Hydrocarbons (TPH) Method 3545/8015MOD - Diesel Range Hydrocarbons
3. Shaded cells indicate concentrations above the NCDENR Action Levels.



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1101 NOWELL ROAD
RALEIGH, NORTH CAROLINA 27607
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◎17-8 LEGEND
BORING LOCATION

BORING LOCATIONS AND ESTIMATED EXTENT OF SOIL CONTAMINATION
PARCEL # 017 - HARVEY MELTON PROPERTY
2005 FAYETTEVILLE ROAD (US HIGHWAY 1)
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
WBS ELEMENT NO. 34950.1.1 (NCDOT PROJECT: U-3456)

FIGURE: 3

APPENDIX A

PHOTOGRAPHS

Photograph 1 – View from southwest to northeast along Roberdell Road. Study Area in foreground along southwest boundary of site. Geoprobe in operation installing boring 17-6.

Photograph 2 – View from southeast to northwest along Roberdell Road. Kerosene pump in foreground with the 1,000 gallon kerosene UST in the background.

APPENDIX B

GEOPHYSICAL INVESTIGATION

Pyramid Project # 2005292

GEOPHYSICAL INVESTIGATION REPORT

GEOPHYSICAL SURVEYS FOR THE DETECTION OF METALLIC UST'S

Rockingham, US 1 (Fayetteville Road) Sites
Rockingham, North Carolina
State Project Number U-3456

November 30, 2005

Report prepared for: Sheri Knox & Daniel Hirth
Solutions Industrial & Environmental Services Inc.
1101 Nowell Rd.
Raleigh, NC 27607

Prepared by: _____
Douglas Canavello, PG

Reviewed by: _____
Brett S. Higgins

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.
700 NORTH EUGENE ST.
GREENSBORO, NC 27401
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Solutions Industrial & Environmental Services Inc.
GEOPHYSICAL SURVEYS FOR THE DETECTION OF METALLIC UST'S
Rockingham, US 1 (Fayetteville Road) Sites
State Project Number U-3456

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1.0 INTRODUCTION

Pyramid Environmental & Engineering, PC conducted geophysical investigations for Solutions Industrial & Environmental Services, Inc. during the period of November 11-23, 2005, within the proposed Right-of-Way (ROW) areas at 13 sites in Rockingham, North Carolina. The work was done as part of the North Carolina Department of Transportation (NCDOT) road-widening project under State Project number U-3456 and WBS Element 34950.1.1. The sites are located along the north or south sides of US 1 (Fayetteville Road) from 0.25 miles west of SR-1424 (Roberdell Road) to 0.25 miles west of SR 1640 (Wiregrass Road). The geophysical surveys were conducted to determine if unknown metallic underground storage tanks (UST's) were present beneath the proposed ROW area of each site.

Solutions IES representative Mr. Walt Beckwith, PG provided maps during the week of November 1, 2005 that outlined the geophysical survey areas of each site. Solutions IES representatives, Ms. Sheri Knox, PE and Mr. Daniel Hirth, PG provided guidance during the geophysical investigations. Geophysical surveys were conducted at the following 13 sites:

Property Owner	Parcel	Present Use of Property
W. J. Barnhart Property	(Parcel 4)	Used Car Lot & Auto Repair Garage
Julia M. Ratliff Property	(Parcel 7)	Vacant Lot
Samuel D. Tanner Property	(Parcel 15)	Vacant Building & Lot
Harvey E. Melton Property	(Parcel 17)	BP Gas Station
Samuel D. Tanner Property	(Parcel 21)	Strip Mall
W. J. Barnhart Property	(Parcel 41A)	Vacant Building & Lot
Wesly Denham Property	(Parcel 42)	Havoline Carolina Quick Lube
William Ussery Property	(Parcel 57)	Vacant Building & Lot
Walter McCain Property	(Parcel 80)	Vacant Buildings & Lot
Leon Wall Property	(Parcel 99)	Vacant Building & Lot
James Porter Property	(Parcel 117)	Vacant Building & Lot
John Evans Property	(Parcel 126)	Custom Monument Company
Henry Ussery Property	(Parcel 140)	Bo Henry's Pawn Shop

Photos of the above sites are presented in **Figure 1**.

2.0 FIELD METHODOLOGY

Prior to conducting the geophysical investigations, a 10-foot by 10-foot survey grid was established across the proposed ROW areas of the 13 sites using water-based marking paint. These marks were used as X-Y coordinates for location control when collecting the geophysical data and establishing base maps for the geophysical results.

The geophysical investigations consisted of electromagnetic (EM) induction-metal detection surveys and ground penetrating radar (GPR) surveys. The EM surveys were performed using a Geonics EM61-MK1 metal detection instrument. According to the manufacture's specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. The EM61 data were digitally collected at each site along parallel northerly-southerly or easterly-westerly trending survey lines spaced five feet apart. The data were downloaded to a computer and reviewed in the office using the Geonics DAT61W and Surfer for Windows Version 7.0 software programs.

Contour plots of the EM61 bottom coil results and the EM61 differential results for each site are included in this report. The bottom coil results represent the most sensitive component of the EM61 instrument and detect metal objects regardless of size. The bottom coil response can be used to delineate metal conduits or utility lines, small, isolated metal objects, and areas containing insignificant metal debris.

The differential results are obtained from the difference between the top and bottom coils of the EM61 instrument. The differential results focus on the larger metal objects such as drums and UST's and ignore the smaller insignificant metal objects.

GPR surveys were conducted across selected EM61 differential anomalies and steel-reinforced concrete using a GSSI SIR-2000 unit equipped with a 400 MHz antenna. Surveys were also performed across several areas where parked vehicles that obstructed the EM61 survey had since been removed. GPR data were digitally collected in a continuous mode along X and/or Y survey lines, spaced two to five feet apart using a vertical scan of 512 samples, at a rate of 24 scans per second. A 110 MHz high pass filter and an 800 MHz low pass filter were used during data

acquisition with the 400 MHz antenna. GPR data were collected down to a maximum depth of approximately seven feet, based on an estimated two-way travel time of 7 nanoseconds per foot.

The GPR data were downloaded to a field computer and later reviewed in the office using Radprint software. The locations of GPR survey areas or individual GPR survey lines are shown as dashed, purple rectangles or solid purple lines, respectively on the EM61 differential contour plots. Photos of the EM61 and GPR instruments are shown in **Figure 2**. The approximate perimeters of probable or possible UST's , based on the geophysical results, were marked and labeled in the field using orange, water-based marking paint and pin flags when possible. The approximate locations of probable or possible UST's are shown on the EM61 contour plots as magenta-shaded rectangles.

During the weeks of November 14 and November 23, 2005, preliminary contour plots of the EM61 bottom coil and the differential results were emailed to Ms. Knox and Mr. Hirth.

3.0 DISCUSSION OF RESULTS

3.1 Parcel 4 - W. J. Barnhart Property

Parcel 4 is located on the southern side of Fayetteville Road and contains an active used car lot and auto repair garage. The western portion of the ROW area consists of asphalt with a concrete pad and the eastern portion of the ROW area consists of a sandy surface.

The bottom coil results and the differential results are presented in **Figure 3**. The linear anomaly intersecting grid coordinates X=50 Y=26, is probably in response to a buried utility line or conduit. The high amplitude anomaly centered near the former pump island area is probably in response to the steel-reinforced concrete pad. GPR surveys conducted across the steel-reinforced concrete pad did not detect any large metal objects. The geophysical results suggest that the ROW area at Parcel 4 does not contain metallic UST's.

3.2 Parcel 7 - Julia M. Ratliff Property

The Ratliff property is located northwest of the Fayetteville Road and Roberdell Road intersection. The parcel consists of an open, asphalt and grass-covered lot. The EM61 bottom coil results and the differential results are presented in **Figure 4**. The linear bottom coil, EM61 anomalies, such as the ones intersecting grid coordinates X=100 Y=60, X=110 Y=74, and X=130 Y=104, are probably in response to utility lines or conduits. GPR surveys conducted across a portion of the EM anomaly centered near grid coordinates X=65 Y=35, suggest the presence of at least one UST centered near X=71 Y=35, and buried approximately 3.2 feet below surface. Based on the GPR results, the probable UST appears to be approximately 10 feet long and 4 feet wide.

A large water puddle was present across the western portion of the EM anomaly when the GPR surveys were conducted that prevented GPR data to be collected across the entire anomaly. However, based on the location of the probable UST, the size of the EM61 anomaly suggests that a second UST may be centered near grid coordinates X=64 Y=32. Concrete was encountered approximately three inches below surface across this area, which prevented probing with a steel rod to determine whether a second UST exists. A photo showing the approximate location of the probable and possible UST's along with a GPR image obtained along survey line Y=35 are presented in **Figure 5**.

The geophysical results suggest that the remaining portion of the proposed ROW area at Parcel 7 does not contain metallic UST's.

3.3 Parcels 15 & 21 – Samuel D. Tanner Properties

Parcels 15 and 21 are located immediately southwest and southeast, respectively of the Fayetteville Road and Skyline Drive intersection. Parcel 15 consists primarily of grass and gravel surfaces, whereas the front portion of Parcel 21 consists of an asphalt-covered parking area. The EM61 bottom coil results and the differential results are presented in **Figures 6 and 7**, respectively.

GPR surveys across the EM61 anomaly centered near grid coordinates X=188 Y=135, (on Parcel 15) suggest the presence of a UST centered near X=188 Y=137, and buried approximately 1.4 feet below

surface. The surveys also suggest that the probable tank is approximately 10 feet long and 3.5 feet wide.

At Parcel 21, GPR surveys acquired across the EM anomaly centered near grid coordinates X=269 Y=173, suggest the presence of a UST buried approximately 1.7 feet below surface. The UST appears to be approximately 10 feet long and 5 feet wide. Photos showing the approximate locations of the probable UST's at Parcels 15 and 21, along with corresponding GPR images are presented in Figures **8 and 9**, respectively.

3.4 Harvey E. Melton Property (Parcel 17)

The Melton property is an active BP gas station and store located northeast of the Fayetteville Road and Roberdell Road intersection. The pump island area consists of a steel-reinforced concrete surface that overlies the known and active UST's, whereas the parking area adjacent to the store consists of asphalt pavement. A grass yard surrounds the back portion of the site.

The EM61 bottom coil results and the differential results are presented in Figures **10 and 11**, respectively. The linear bottom coil, EM anomalies are probably in response to utility lines or conduits. The majority of non-linear anomalies are probably in response to cultural features such as storm drains, signs, utility-related objects, buildings, metal fence, and steel-reinforced concrete.

GPR surveys were conducted across the concrete pavement and across the area containing the active UST's. The surveys delineated the footprint of the three and possibly four active UST's that are centered near grid coordinates X=54 Y=53, X=50 Y=43, and X=50 Y=34, respectively. The UST centered near grid coordinates X=54 Y=53, appears to be approximately 35 feet long and probably consists of two UST's instead of one. A GPR image obtained across the UST area is presented in **Figure 12** and suggests that the tanks lie approximately 3.5 to 3.9 feet below surface.

GPR data acquired across the EM61 anomaly centered near X=155 Y=144, delineated the footprint of the kerosene tank that is buried approximately 1.7 feet below surface. The kerosene tank appears to be approximately 9 to 10 feet long and 3.5 to 4 feet wide. A photo showing the location of the

tank is presented in Figure 12. The geophysical results suggest that the remainder of the surveyed area at Parcel 17 does not contain UST's.

3.5 W. J. Barnhart Property (Parcel 41A)

Parcel 41A is a former gas station site located on the north side of Fayetteville Road approximately 300 feet west of Lawson Street. The geophysical survey area consists of asphalt and grass-covered surfaces with a concrete pad located around a former pump island. The EM61 bottom coil results and the differential results are presented in **Figure 13**. The linear bottom coil, EM anomalies, such as the ones intersecting grid coordinates X=40 Y=50, X=45 Y=95, and X=70 Y=40, are probably in response to utility lines or conduits.

GPR surveys conducted across a portion of the linear anomaly centered at X=37 Y=22, suggest the probable presence of a wide-diameter (more than 2.5 feet wide) conduit or possibly a UST that is approximately 15 to 17 feet long and buried approximately 4.5 feet below surface. This probable wide-diameter conduit (centered near X=38 Y=25) is located parallel and contingent with the probable utility line identified by the EM61 survey, suggesting that the probable conduit is a utility-related object. However, the footprint of this probable utility-related conduit or possible UST was marked in the field with spray paint and pin flags.

GPR surveys conducted across the concrete pad adjacent to the pump island suggest that the EM61 anomalies recorded in this area are probable in response to steel-reinforcement in the concrete. With the exception of the probable utility-related feature found at X=38 Y=25, the geophysical findings obtained within the survey area at Parcel 41A suggest that the ROW area does not contain metallic UST's.

3.6 Wesly Denham Property (Parcel 42)

The Havoline Carolina Kwik Lube garage operates at Parcel 42, which is located on the south side of Fayetteville Road. Asphalt and grass surfaces cover much of the proposed ROW area with a small concrete pad located in front of the building. The EM61 bottom coil results and the differential

results are presented in **Figure 14**. The linear bottom coil, EM anomalies, such as the ones intersecting grid coordinates X=60 Y=58, and X=80 Y=85, are probably in response to utility lines or conduits. The high amplitude anomaly centered near grid coordinates X=40 Y=40, is in response to a vehicle that could not be moved for the geophysical investigations. The anomalies centered near X=40 Y=12, and X=120 Y=55, are in response to a nearby vehicle and steel-reinforced concrete, respectively.

The geophysical results obtained within the surveyed portion of Parcel 42 suggest that the proposed ROW area does not contain metallic UST's.

3.7 William Ussery Property (Parcel 57)

Parcel 57 is located on the north side of Fayetteville Road approximately 0.2 miles east of Old Aberdeen Road. The EM61 bottom coil results and the differential results are presented in **Figure 15**. A series of small, bottom coil anomalies were recorded along survey line Y=25 from grid coordinate X=5 to X=115, which may be in response to an east-west trending, buried utility line or conduit. Several other bottom coil anomalies were recorded across the survey area that are probably in response to miscellaneous metal debris.

All of the differential anomalies are probably in response to known cultural features or buried debris, suggesting that the proposed ROW area at Parcel 57 does not contain metallic UST's.

3.8 Walter McCain Property (Parcel 80)

Parcel 80 is located immediately northwest of the Fayetteville Road and Philadelphia Road intersection and consists of two vacant buildings surrounded by sandy or grass surfaces. A former pump island pad is located south of the eastern-most building. The EM61 bottom coil results and the differential results are presented in **Figure 16**.

GPR surveys conducted across the EM61 anomalies centered near grid coordinates X=170 Y=35, and X=194 Y=32, suggest the presence of two metallic UST's. The probable UST centered near X=170

Y=35, appears to be approximately 13 feet long, 3.5 feet wide, and buried approximately 1.1 feet below surface. The probable UST centered near grid coordinates X=192 Y=32 appears to be10 feet long, 3.5 feet wide, and buried approximately 1.9 feet below surface. The two probable UST's are separated by the former pump island pad. Photos of the UST locations along with an image of GPR survey line X=167.5 are presented in **Figure 17**.

Based upon the geophysical results, the remaining portion of the proposed ROW area does not appear to contain metallic UST's.

3.9 Leon Wall Property (Parcel 99)

Parcel 99 is located immediately southwest of the Fayetteville Road and Patterson Road intersection and consists mostly of a grass yard surrounding a vacant building. The EM61 bottom coil results and the differential results are presented in **Figure 18** in which a bottom coil, linear anomaly is recorded along survey line Y=230. This linear anomaly is probably in response to a utility line. GPR surveys conducted across the differential EM61 anomaly centered near X=92 Y=165, is probably in response to a water line adjoining the vacant building. GPR surveys were also conducted between the building and the former pump island pad that is centered near coordinates X=84 Y=222. The surveys suggest that the EM anomalies recorded in this portion of the survey area are probably in response to miscellaneous metal debris.

Based upon the geophysical results, the proposed ROW area at Parcel 99 does not appear to contain metallic UST's.

3.10 James Porter Property (Parcel 117)

Parcel 117 is a former gas station site located on the south side of Fayetteville Road approximately 0.25 miles west of Locklear Drive. The site consists primarily of grass and asphalt surfaces with a former pump island pad located in front of the vacant building. The EM61 bottom coil results and the differential results are presented in **Figure 19**. The linear, bottom coil anomaly intersecting grid coordinates X=130 Y=54, is probably in response to a buried utility line or conduit. The linear

anomaly intersecting X=40 Y=74, is probably in response to a metal fence. The remaining EM61 anomalies are probably in response to known cultural features and miscellaneous metal debris.

The geophysical investigation across the survey area of Parcel 117 suggests that the proposed ROW area does not appear to contain metallic UST's.

3.11 John Evans Property (Parcel 126)

The active Custom Monument Company operates on Parcel 126, which is located immediately northeast of the Fayetteville Road and LockLear Drive intersection. The geophysical survey area consists of grass and asphalt surfaces and the EM61 bottom coil results and the differential results are presented in **Figure 20**. All of the EM61 anomalies recorded across the surveyed portion of the site are probably in response to known cultural features, suggesting that the proposed ROW area does not contain metallic UST's.

3.12 Henry Ussery Property (Parcel 140)

Parcel 140 is a former gas station site, which is presently occupied by Bo Henry's Pawn Shop. The property is located immediately southeast of the Fayetteville Road and Port Street intersection. Much of the proposed ROW area consists of sandy or grass-covered surfaces. A concrete pad surrounds the north and west sides of the building. The EM61 bottom coil results and the differential results are presented in **Figure 21**. The linear bottom coil anomaly intersecting grid coordinates X=80 Y=80, is probably in response to a buried utility line.

GPR surveys conducted across the differential anomalies centered near coordinates X=90 Y=60, and X=107 Y=59, suggest the presence of two UST's buried approximately 1.7 feet and 1.8 feet below surface, respectively. Both probable UST's appear to be approximately 10 to 11 feet long and 4 to 4.5 feet wide. Probing with a steel rod across this area suggest the presence of a concrete slab buried approximately 0.3 feet below surface and overlying the UST's. A photo showing the locations of the probable UST along with GPR images are presented in **Figure 22**.

4.0 SUMMARY & CONCLUSIONS

Our evaluation of the EM61 and GPR data collected across the proposed ROW areas at the 13 sites along Fayetteville Road (US 1) in Rockingham, North Carolina provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic UST's within the surveyed portions of the proposed ROW areas of each site.

- GPR surveys were conducted across selected EM61 differential anomalies and across areas containing steel reinforced concrete.

- Linear EM61 anomalies at the 13 sites are probably in response to buried utility lines and/or conduits. The majority of non-linear anomalies are probably in response to known cultural features or miscellaneous metal objects.

- The geophysical results did not detect the presence of unknown metallic UST's within the surveyed portions of the proposed ROW areas at the following sites:

W. J. Barnhart Property	(Parcel 4)
W. J. Barnhart Property	(Parcel 41A)
Wesly Denham Property	(Parcel 42)
William Ussery Property	(Parcel 57)
Leon Wall Property	(Parcel 99)
James Porter Property	(Parcel 117)
John Evans Property	(Parcel 126)

- Julia M. Ratliff Property (Parcel 7): Geophysical results suggest the presence of a UST centered near X=71 Y=35, and buried approximately 3.2 feet below surface. Based on the GPR results, the probable UST appears to be approximately 10 feet long and 4 feet wide. A second UST may be present immediately west of this UST.

- Samuel D. Tanner Property (Parcel 15): Geophysical results suggest the presence of a UST centered near X=188 Y=137, and buried approximately 1.4 feet below surface. GPR surveys suggest that the probable tank is approximately 10 feet long and 3.5 feet wide.

- Harvey E. Melton Property (Parcel 17): Three and probably four active UST's are centered near grid coordinates X=54 Y=53, X=50 Y=43, and X=50 Y=34, respectively. The UST centered near grid coordinates X=54 Y=53, appears to be approximately 35 feet long and probably consists of two UST's instead of one. The known kerosene UST is centered near X=155 Y=144, and is buried approximately 1.7 feet below surface. The kerosene tank appears to be approximately 9 to 10 feet long and 3.5 to 4 feet wide.

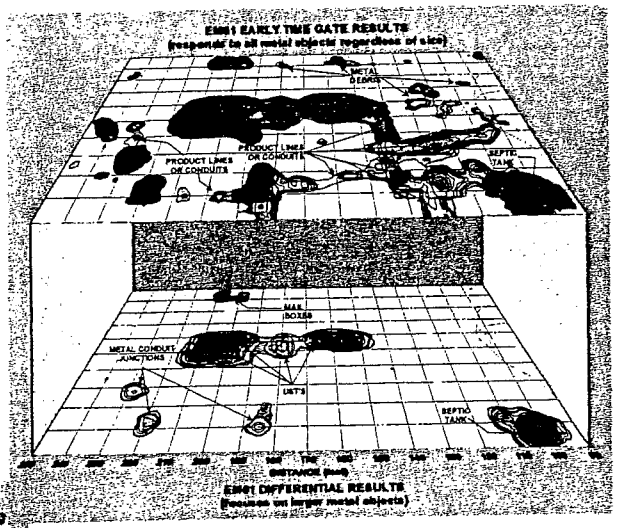
- Samuel D. Tanner Property (Parcel 21): Geophysical results suggest the presence of a UST centered near grid coordinates X=269 Y=173, and buried approximately 1.7 feet below surface. The UST appears to be approximately 10 feet long and 5 feet wide.

- Walter McCain Property (Parcel 80): Geophysical results suggest the presence of two UST's centered near grid coordinates X=170 Y=35, and X=194 Y=32. The probable UST centered near X=170 Y=35, appears to be approximately 13 feet long, 3.5 feet wide, and buried approximately 1.1 feet below surface. The probable UST centered near grid coordinates X=192 Y=32, appears to be 10 feet long, 3.5 feet wide, and buried approximately 1.9 feet below surface. The two probable UST's are separated by a former pump island pad.

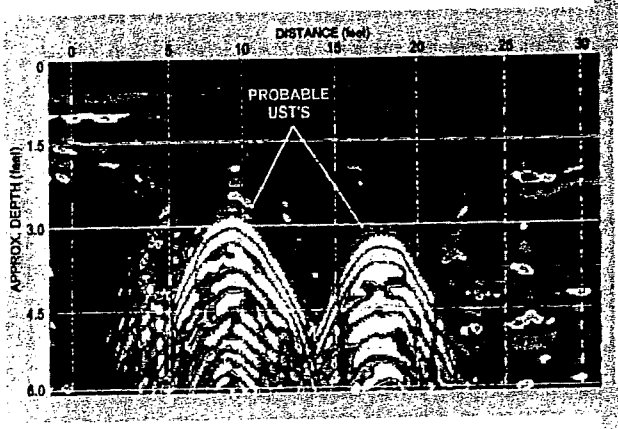
- Henry Ussery Property (Parcel 140): Geophysical results suggest the presence of two UST's centered near coordinates X=90 Y=60, and X=107 Y=59, and buried approximately 1.7 feet and 1.8 feet below surface, respectively. Both probable UST's appear to be approximately 10 to 11 feet long and 4 to 4.5 feet wide.

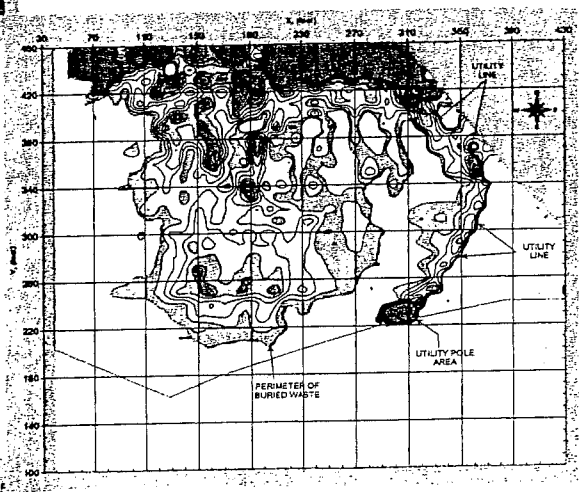
5.0 LIMITATIONS

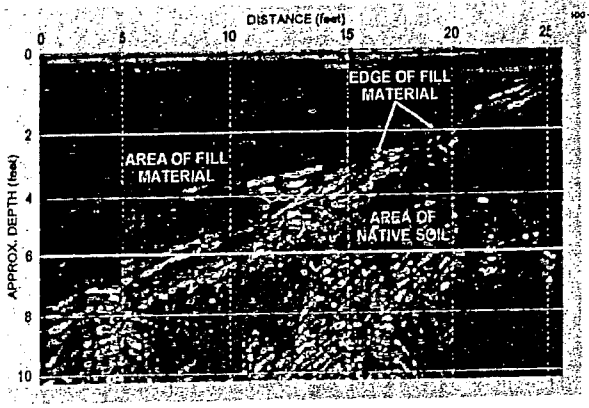
EM61 and GPR surveys have been performed and this report prepared for Solutions Industrial & Environmental Services, Inc. in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project do not conclusively define the locations of all metallic UST's but only suggest where some of the metallic UST's may be present. The EM61 and GPR anomalies, interpreted as possible UST's or tanks, may be attributed to other surface or subsurface conditions or cultural interference.


EM61 EARLY TIME GATE RESULTS
(responds to all metal objects regardless of size)
METAL DRUMS
PRODUCT LINES OR CONDUITS
PRODUCT LINES OR CONDUITS
SEPTIC TANK
MAN BOXES
METAL CONDUIT JUNCTIONS
UST'S
SEPTIC TANK
DISTANCE (feet)
EM61 DIFFERENTIAL RESULTS
(Focuses on larger metal objects)

FIGURES


DISTANCE (feet)
0
5
10
15
20
25
30
PROBABLE UST'S
APPROX. DEPTH (feet)
0
1.5
3.0
4.5
6.0

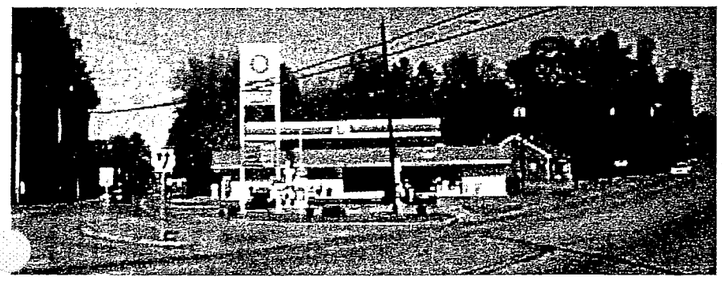

UTILITY LINE
UTILITY LINE
UTILITY POLE AREA
PERIMETER OF BURIED WASTE


DISTANCE (feet)
0
5
10
15
20
25
EDGE OF FILL MATERIAL
AREA OF FILL MATERIAL
AREA OF NATIVE SOIL
APPROX. DEPTH (feet)
0
2
4
6
8
10

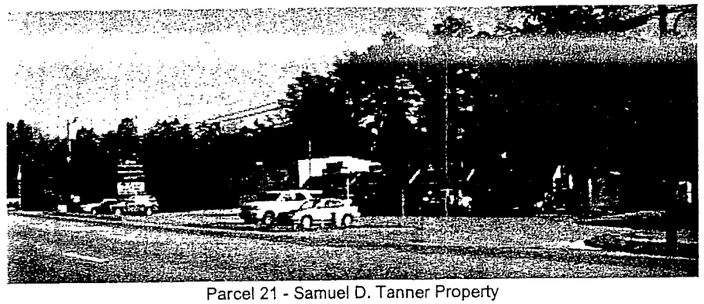
Parcel 4 - W. J. Barnhart Property

Parcel 7 - Julia M. Ratliff Property

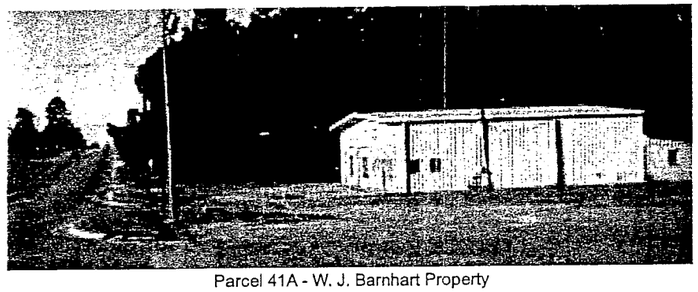
Parcel 15 - Samuel D. Tanner Property



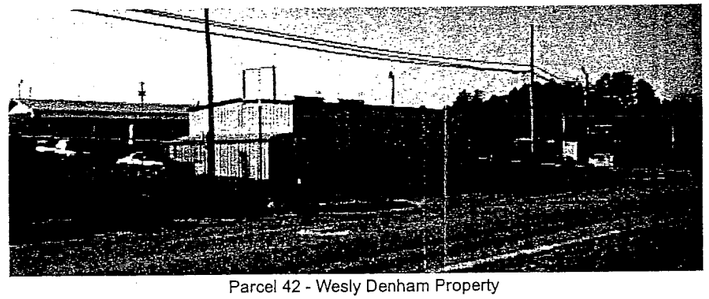
Parcel 17 - Harvey E. Melton Property



Parcel 21 - Samuel D. Tanner Property



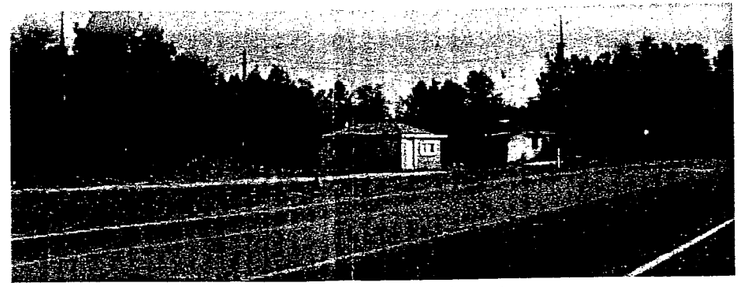
Parcel 41A - W. J. Barnhart Property



Parcel 42 - Wesly Denham Property

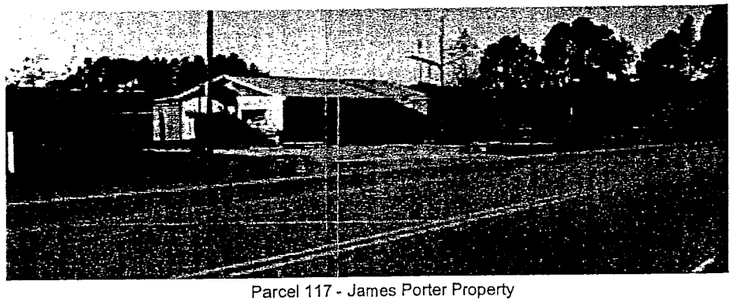
Parcel 57 - William Ussery Property

Parcel 140 - Henry Ussery Property

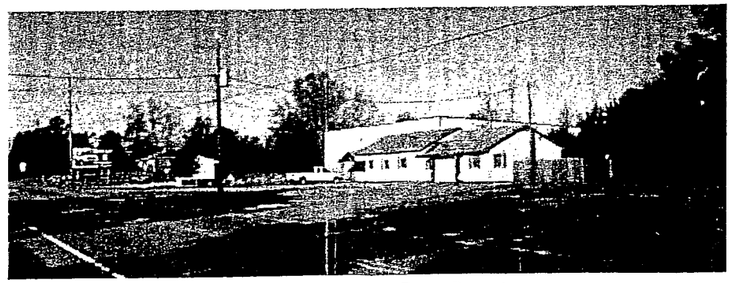


Parcel 80 - Walter McCain Property

Parcel 99 - Leon Wall Property



Parcel 117 - James Porter Property



Parcel 126 - John Evans Property

SITE PHOTOS

FIGURE 1

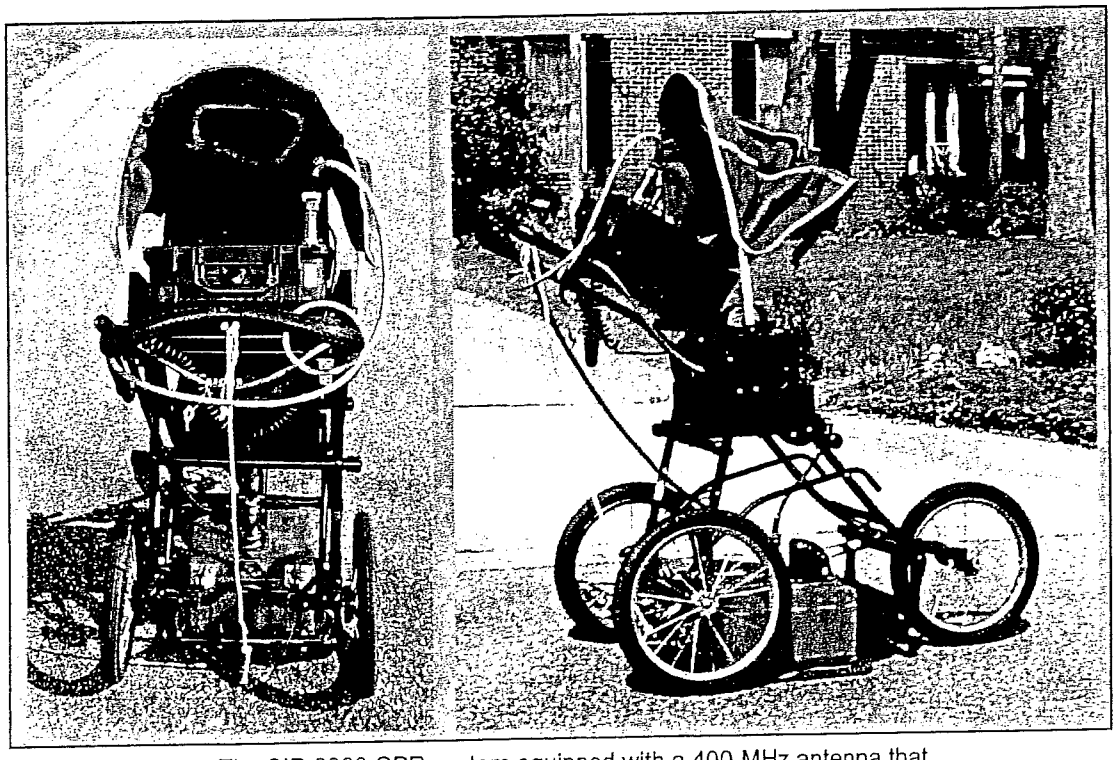
GRAPHIC SCALE IN METERS

DRWN	CHKD		FIGURE
MJD			
DATE	LAY	DWG	J.NO.
11/28/05			2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: ROCKINGHAM SITES
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

The Geonics EM61 metal detector was used to conduct the metal detection surveys at the Rockingham sites in November 2005.



The SIR-2000 GPR system equipped with a 400 MHz antenna that was used at the Rockingham sites in November 2005.

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

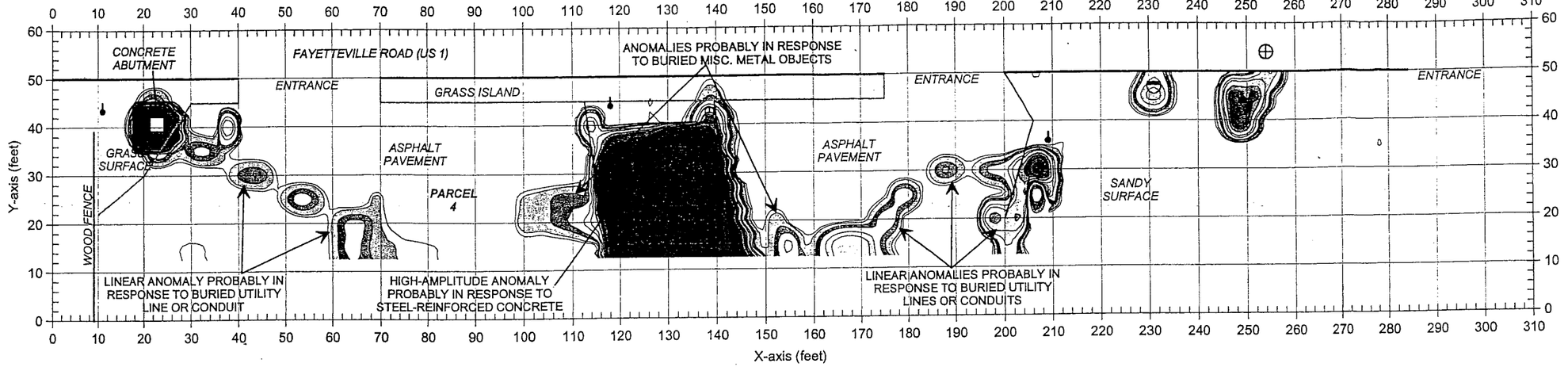
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05	DRWN	
SITE	ROCKINGHAM SITES	LAY		CHKD	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JOB	2005-292	SCALE	

GRAPHIC SCALE IN METERS

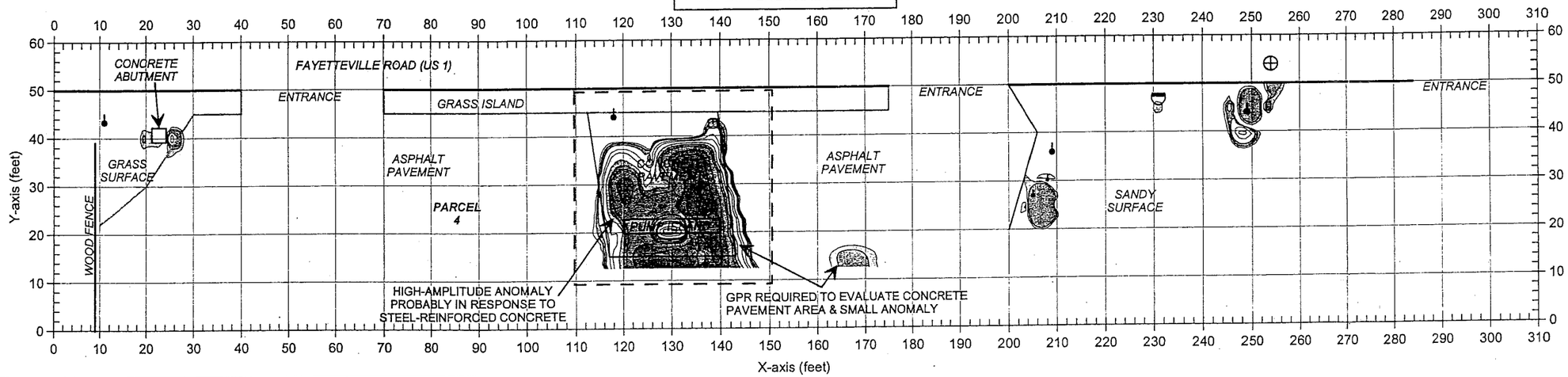
GEOPHYSICAL EQUIPMENT

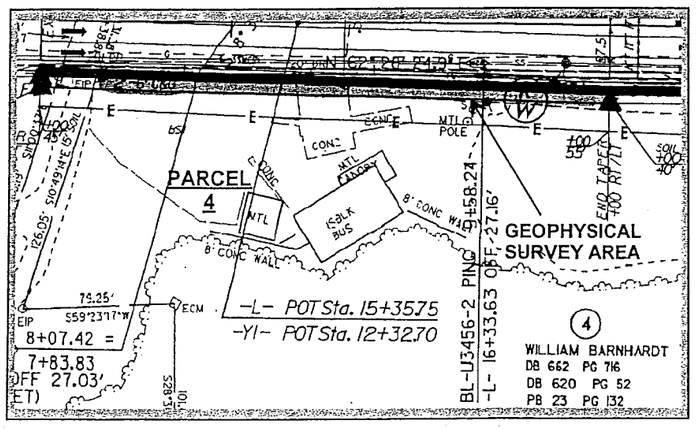
FIGURE 2

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

1000 750 500 400 300 200 150 100 75 60 20 -90 -100 -200 -4000

APPROXIMATE NORTH

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- MONITORING WELL
- WATER METER OR VALVE COVER
- GUY WIRE
- UTILITY POLE OR LIGHT POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- MANHOLE COVER
- GPR SURVEY AREA

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESULTS

FIGURE 3

GRAPHIC SCALE IN METERS

DRWN	CHKD		FIGURE
MJD			
DATE	LAY	DWG	JOB NO.
11/26/05			2005-292

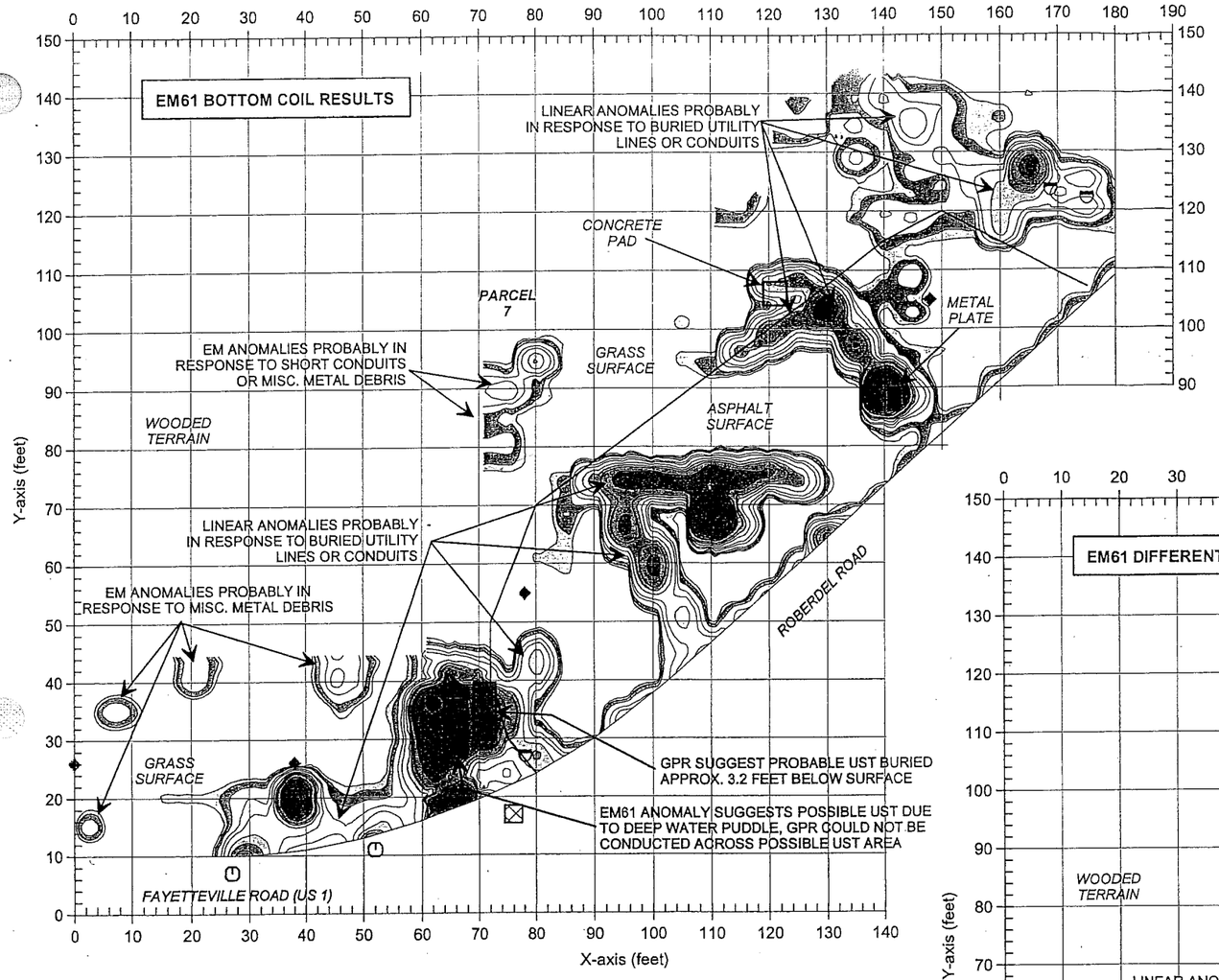
SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

W. J. BARNHART PROPERTY (PARCEL 4)

ROCKINGHAM — NORTH CAROLINA

GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



LEGEND

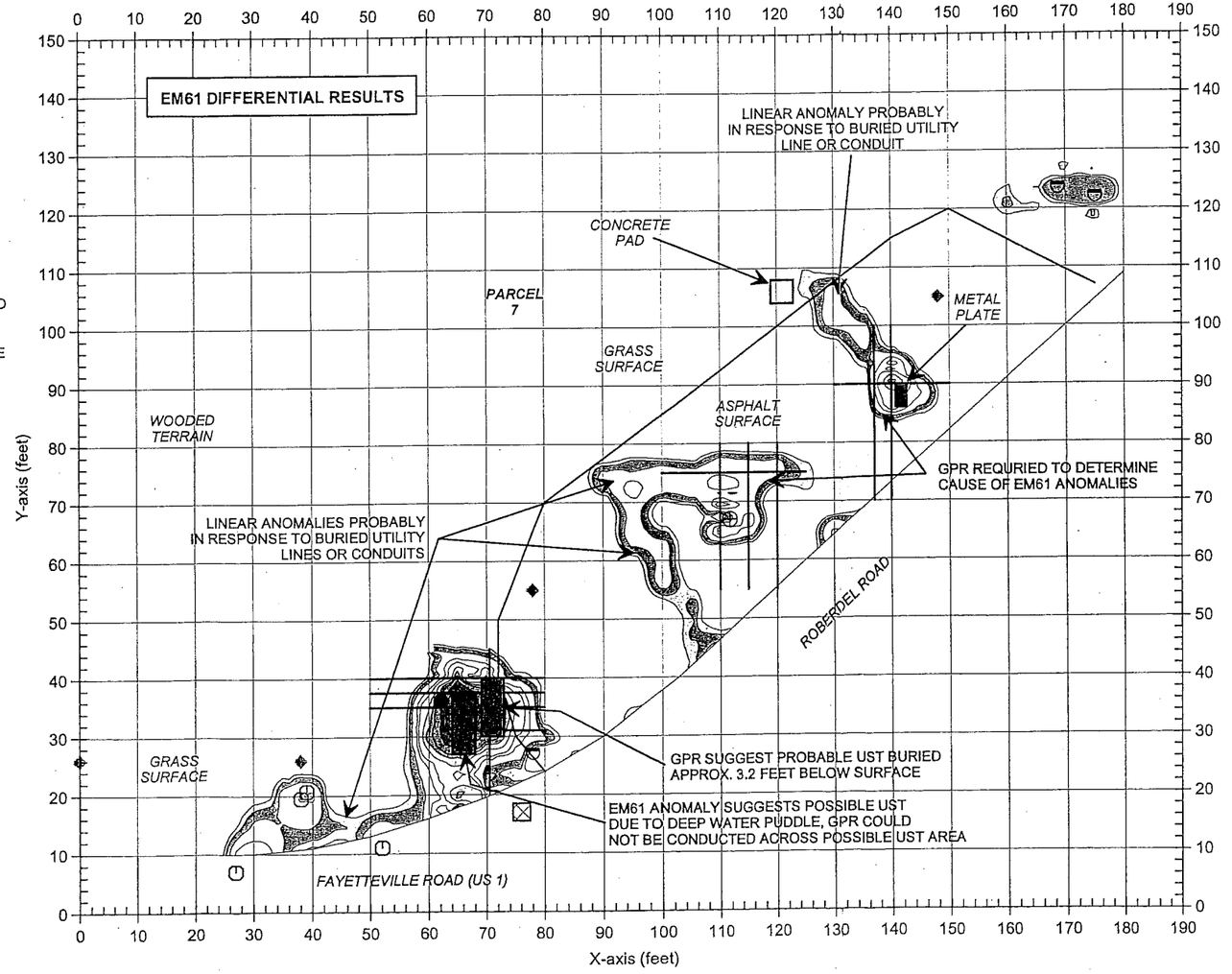
- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH & EAST-WEST TRENDING LINES SPACED 5 FEET APART
- MONITORING WELL
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- MANHOLE COVER
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

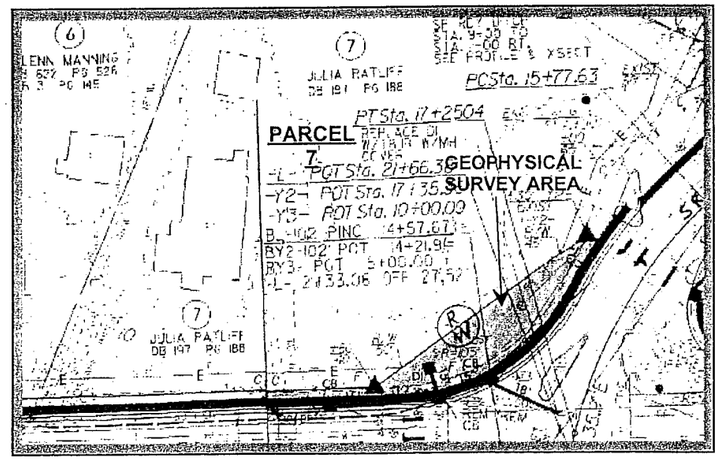
Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -50 50 60 75 100 150 200 300 400 500 750 1000





APPROXIMATE NORTH

FIGURE 4

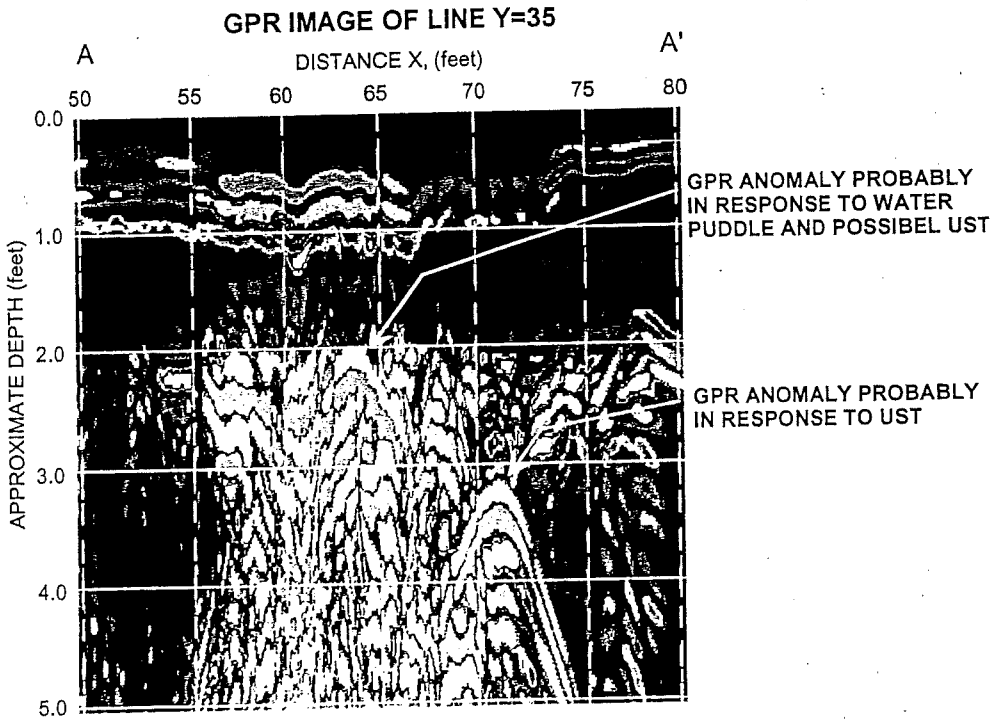
EM61 METAL DETECTION RESULTS

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	JULIA M. RATLIFF PROPERTY (PARCEL 7)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
DATE	11/25/05
DRWN	MJD
LAY	
CHKD	
DWG	
FIGURE	
J.NO.	2005-292

GRAPHIC SCALE IN METERS

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

The photo shows the location of the probable UST and possible UST, as suggested by the geophysical results at Parcel 7.



The GPR image obtained along a portion of survey line Y=35 shows the anomaly that is probably in response to a UST near X=71 and buried approximately 3.2 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05	DRWN	
SITE	JULIA M. RATLIFF PROPERTY (PARCEL 7)	LAY		CHKD	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JOB	2005-292	SHEET	

PHOTO & GPR IMAGE OF UST LOCATION

FIGURE 5

EM61 BOTTOM COIL RESULTS

FIGURE 6

ANOMALY PROBABLY IN RESPONSE TO SEWER LINE

ANOMALY PROBABLY IN RESPONSE TO BUILDING & CONCRETE ENTRANCE

APPROXIMATE LOCATION OF PROBABLE UST BURIED 1.7 FEET BELOW SURFACE

FAYETTEVILLE ROAD (US 1)

LIGHTS

GRASS ISLAND

GRASS ISLAND

LANDSCAPED ISLAND

PLANTER

ANOMALIES PROBABLY IN RESPONSE TO MISC. METAL OBJECTS

COLONIAL AVENUE

ANOMALIES PROBABLY IN RESPONSE TO MISC. METAL DEBRIS

GRASS SURFACE

GRASS SURFACE

APPROX. LOCATION OF PROBABLE UST BURIED 1.4 FEET BELOW SURFACE

ANOMALIES PROBABLY IN RESPONSE TO MISC. METAL DEBRIS

LINEAR ANOMALIES PROBABLY IN RESPONSE TO UTILITY LINES OR CONDUITS

LANDSCAPED ISLAND

ANOMALY PROBABLY IN RESPONSE TO GAS LINE

ASPHALT PAVEMENT

SKYLINE DRIVE

WOODED TERRAIN (AREA NOT SURVEYED)

SAMUEL D. TANNER PROPERTY PARCEL 21

STORE SIGN

LINEAR ANOMALIES PROBABLY IN RESPONSE TO CULVERTS & UTILITY RELATED FEATURES

SAMUEL D. TANNER PROPERTY PARCEL 15

EM61 BOTTOM COIL RESULTS

ANOMALY PROBABLY IN RESPONSE TO AIR CONDITION UNIT

GRASS SURFACE

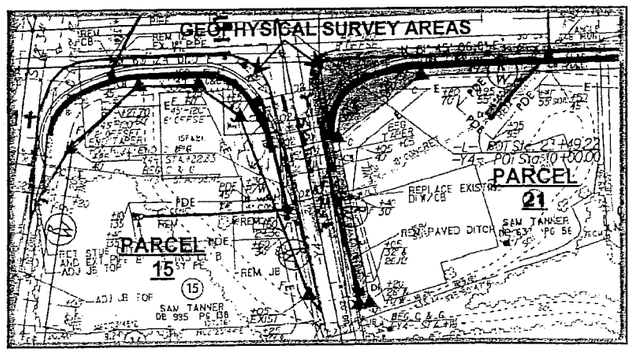
GRASS ISLAND

GPR SUGGEST PROBABLE LARGE-DIAMETER CONDUIT BURIED APPROX. 2.5 FEET BELOW SURFACE

APPROXIMATE NORTH

Y-axis (feet)

X-axis (feet)



EM61 BOTTOM COIL RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-400

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST & NORTH-SOUTH TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CONCRETE R/W MARKER
- GAS METER
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVER
- MANHOLE COVER
- MONITORING WELL
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

DRWN	CHKD	DATE	DWG	FIGURE
MJD		11/25/05	2005-292	

LAY	J.NO.

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

SITE: SAMUEL D. TANNER PROPERTY (PARCELS 15 & 21)

CITY: ROCKINGHAM

STATE: NORTH CAROLINA

TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

FIGURE 7

EM61 DIFFERENTIAL RESULTS

ANOMALY PROBABLY IN RESPONSE TO SEWER LINE

ANOMALY PROBABLY IN RESPONSE TO BUILDING & CONCRETE ENTRANCE

FAYETTEVILLE ROAD (US 1)

GRASS ISLAND

GRASS ISLAND

LIGHTS

LANDSCAPED ISLAND

PLANTER

ANOMALIES PROBABLY IN RESPONSE TO MISC. METAL OBJECTS

APPROXIMATE LOCATION OF PROBABLE UST BURIED 1.7 FEET BELOW SURFACE

APPROXIMATE LOCATION OF PROBABLE UST BURIED 1.4 FEET BELOW SURFACE

COLONIAL AVENUE

GRASS SURFACE

GRASS SURFACE

ANOMALY PROBABLY IN RESPONSE TO GAS LINE

ASPHALT PAVEMENT

LANDSCAPED ISLAND

SKYLINE DRIVE

WOODED TERRAIN (AREA NOT SURVEYED)

SAMUEL D. TANNER PROPERTY PARCEL 21

STORE SIGN

LINEAR ANOMALIES PROBABLY IN RESPONSE TO CULVERTS & UTILITY RELATED FEATURES

SAMUEL D. TANNER PROPERTY PARCEL 15

ANOMALY PROBABLY IN RESPONSE TO AIR CONDITION UNIT

STORE SIGN

GRASS SURFACE

GRASS ISLAND

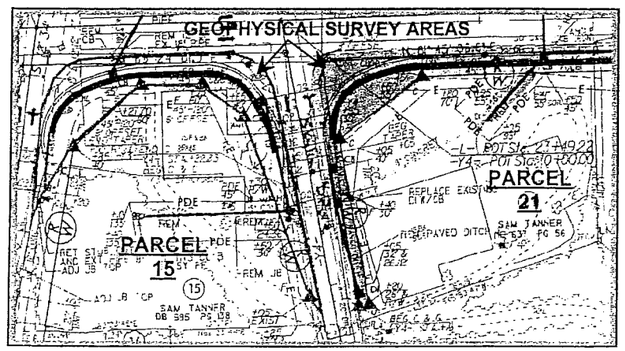
GPR SUGGEST PROBABLE LARGE-DIAMETER CONDUIT BURIED APPROX. 2.5 FEET BELOW SURFACE

EM61 DIFFERENTIAL RESULTS

APPROXIMATE NORTH

Y-axis (feet)

X-axis (feet)



EM61 DIFFERENTIAL RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
50
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST & NORTH-SOUTH TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CONCRETE R/W MARKER
- GAS METER
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVER
- MANHOLE COVER
- MONITORING WELL
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the differential results of the EM61 metal detection survey in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

DRWN	CHKD	FIGURE
MJD		
DATE	LAY	JOB NO.
11/25/05		2005-292
DWG		

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

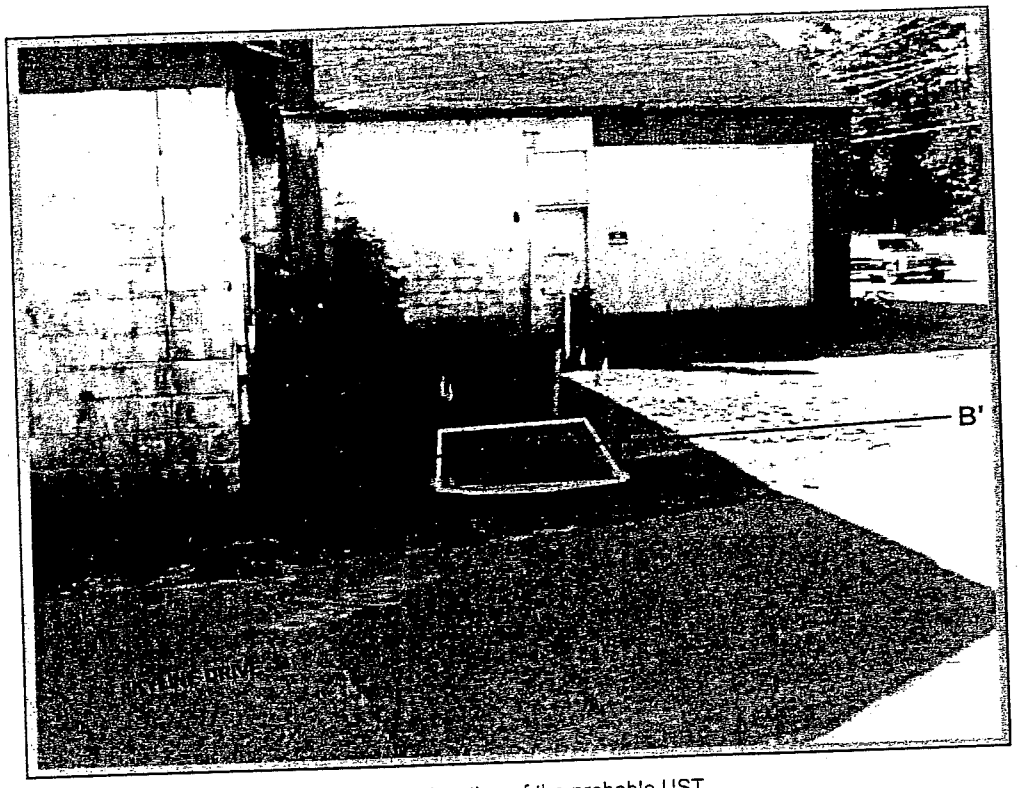
SITE: SAMUEL D. TANNER PROPERTY (PARCELS 15 & 21)

CITY: ROCKINGHAM

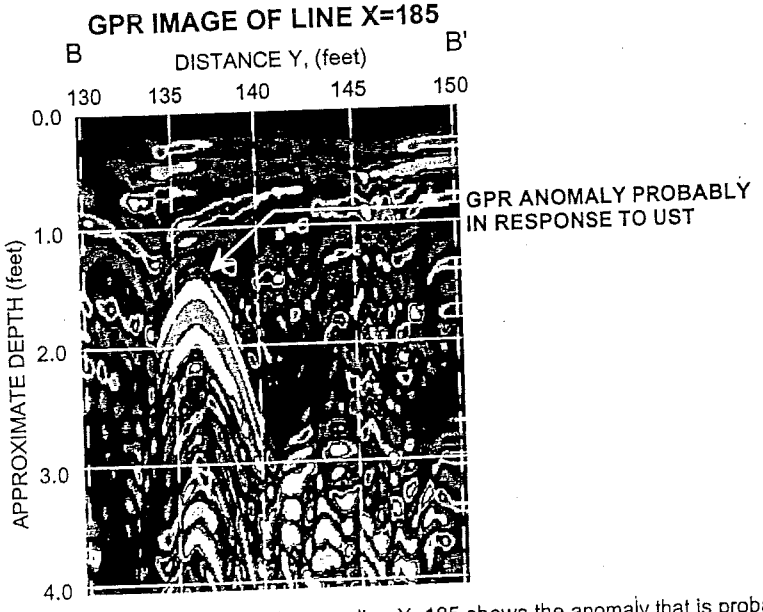
STATE: NORTH CAROLINA

TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the location of the probable UST, as suggested by the geophysical results at Parcel 15.



The GPR image obtained along a portion of survey line X=185 shows the anomaly that is probably in response to a UST near Y=137 and buried approximately 1.4 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

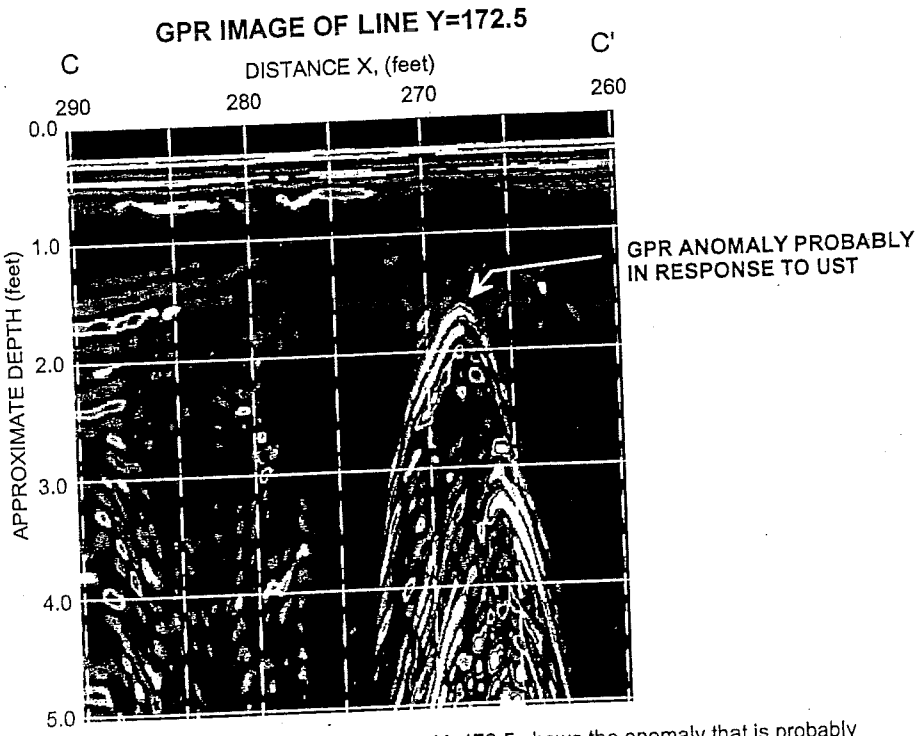
PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	SAMUEL D. TANNER PROPERTY (PARCEL 15)		
CITY	ROCKINGHAM	STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS	JOB NO.	2005-292

PHOTO & GPR IMAGE OF UST LOCATION

FIGURE 8

The photo shows the location of the probable UST,
as suggested by the geophysical results at Parcel 21.



The GPR image obtained along a portion of survey line Y=172.5 shows the anomaly that is probably in response to a UST near X=268 and buried approximately 1.7 feet below surface. The location of this GPR image is shown with a solid purple line in the above photo.

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

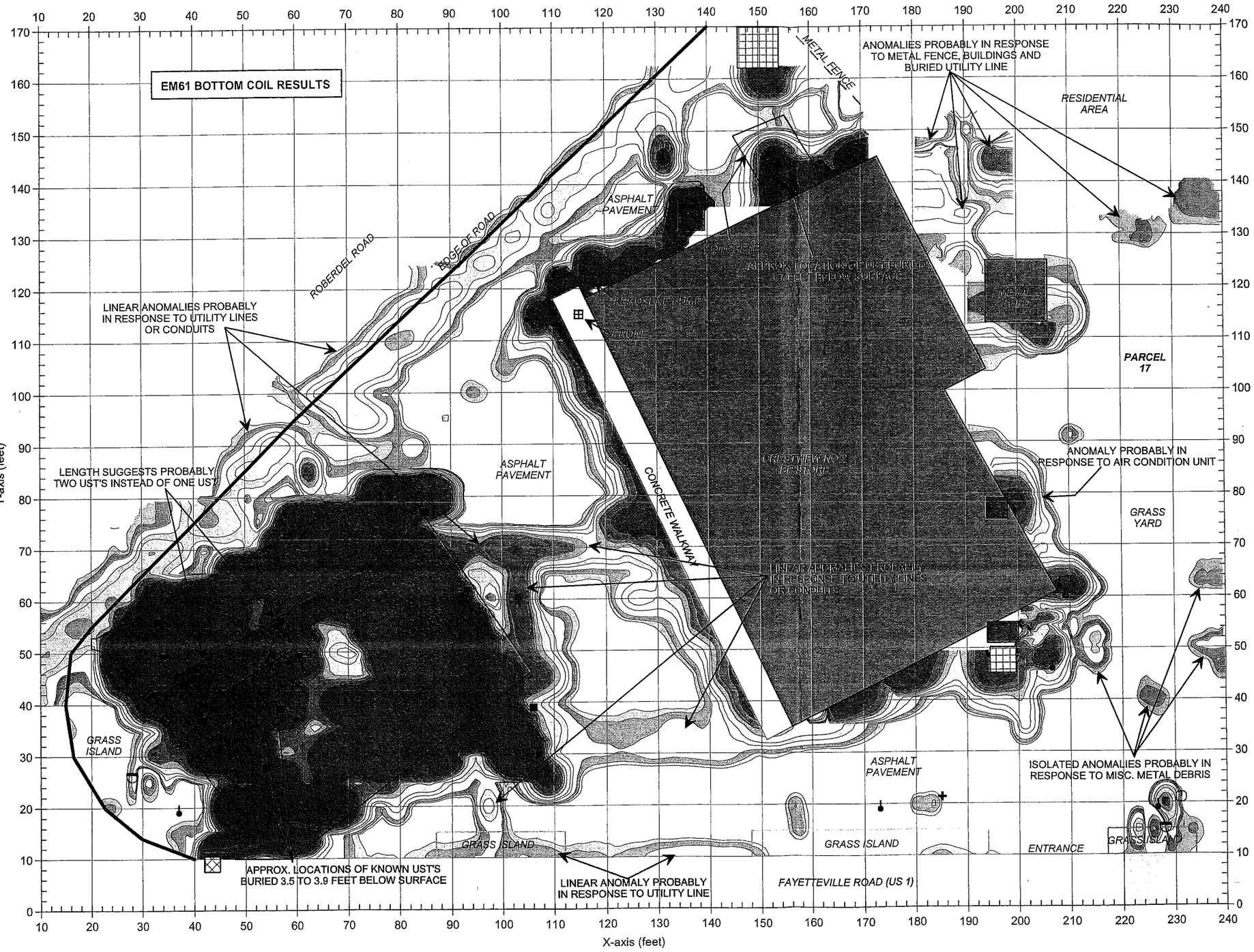
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE 11/28/05	DWNR
SITE	SAMUEL D. TANNER PROPERTY (PARCEL 21)	LAY	CHKD
CITY	ROCKINGHAM	STATE NORTH CAROLINA	DWG
TITLE	GEOPHYSICAL RESULTS	LNG 2005-292	SUBS

GRAPHIC SCALE IN METERS

PHOTO & GPR IMAGE
OF UST LOCATION

FIGURE 9

EM61 BOTTOM COIL RESULTS



APPROXIMATE NORTH

EM61 BOTTOM COIL RESPONSE (MILLIVOLTS)
1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- UST COVERS
- WATER METER OR VALVE COVER
- GUY WIRE
- METAL SIGN POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVERS
- GAS METER
- AIR CONDITION UNIT
- DUMPSTER
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

FIGURE 10

EM61
BOTTOM COIL
RESULTS

GRAPHIC SCALE IN METERS

DRWN	CHKD	FIGURE
MJD		
DATE	LAY	OWG	J-NO.
11/25/05			2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: HARVEY E. MELTON PROPERTY (PARCEL 17)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 DIFFERENTIAL RESULTS

FIGURE 11

EM61 DIFFERENTIAL RESULTS

ANOMALIES PROBABLY IN RESPONSE TO METAL FENCE, BUILDINGS AND BURIED UTILITY LINE

METAL FENCE

RESIDENTIAL AREA

ASPHALT PAVEMENT

CONCRETE

APPROX. LOCATION OF UST BURIED 1.7 FEET BELOW SURFACE

MICROWAVE DISH

SHED

PARCEL 17

ROBERDEL ROAD

EDGE OF ROAD

LINEAR ANOMALIES PROBABLY IN RESPONSE TO UTILITY LINES OR CONDUITS

ANOMALY PROBABLY IN RESPONSE TO AIR CONDITION UNIT

LENGTH SUGGESTS PROBABLY TWO UST'S INSTEAD OF ONE UST.

CRESTVIEW NO 2 BP STORE

CONCRETE WALKWAY

GRASS YARD

LINEAR ANOMALIES PROBABLY IN RESPONSE TO UTILITY LINES OR CONDUITS

GRASS ISLAND

ASPHALT PAVEMENT

GRASS ISLAND

GRASS ISLAND

ENTRANCE

GRASS ISLAND

APPROX. LOCATIONS OF UST'S BURIED 3.5 TO 3.9 FEET BELOW SURFACE

FAYETTEVILLE ROAD (US 1)

Y-axis (feet)

X-axis (feet)

APPROXIMATE NORTH

EM61 DIFFERENTIAL RESPONSE (MILLIVOLTS)

1000
750
500
400
300
200
150
100
75
60
20
-90
-100
-200
-4000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- UST COVERS
- WATER METER OR VALVE COVER
- GUY WIRE
- METAL SIGN POLE
- TRAFFIC SIGN
- STORM SEWER GRATE
- VALVE COVERS
- GAS METER
- AIR CONDITION UNIT
- DUMPSTER
- GPR SURVEY AREA
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris. The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

GRAPHIC SCALE IN METERS

DRAWN	MJD		
CHKD			FIGURE
DATE	11/25/05		J.NO. 2005-292
LAY		DWG	

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

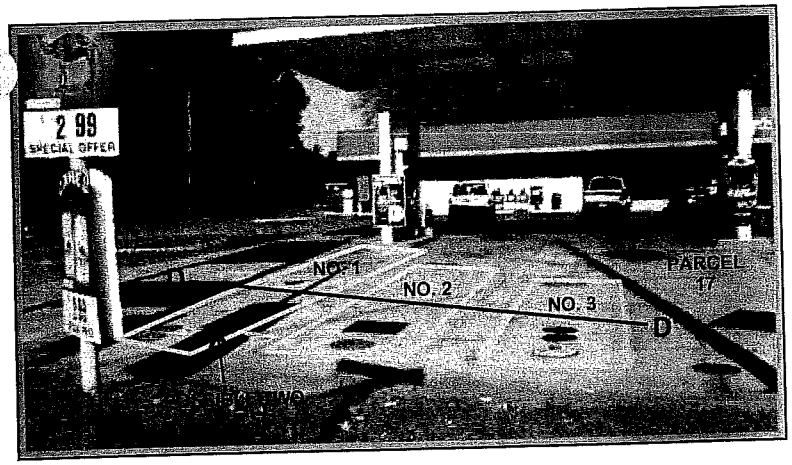
SITE: HARVEY E. MELTON PROPERTY (PARCEL 17)

CITY: ROCKINGHAM

STATE: NORTH CAROLINA

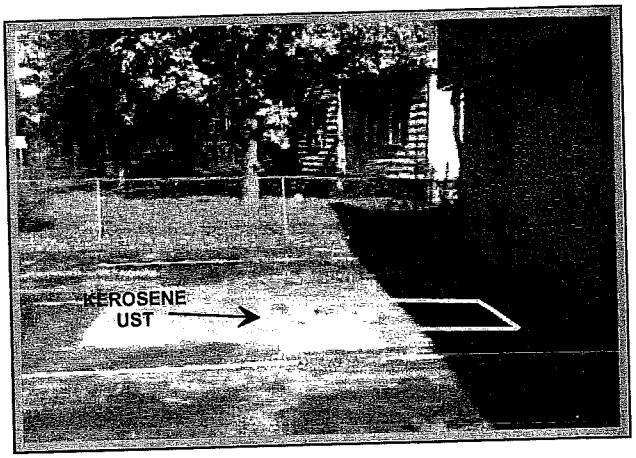
TITLE: GEOPHYSICAL RESULTS

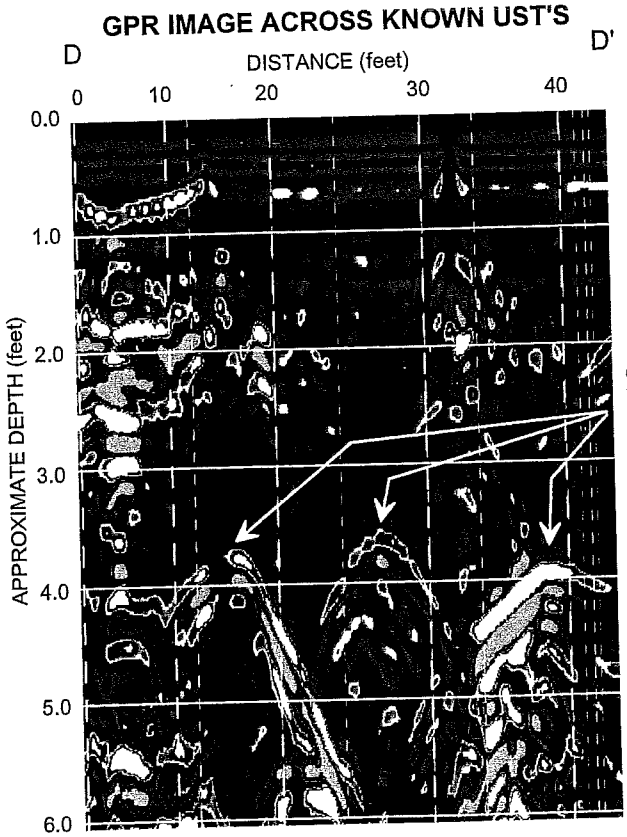
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The photo shows the approxiamte location of the three or four known and active UST's, as suggested by the geophysical results, at Parcel 17. The UST's appear to be approximately 3.5 to 3.9 feet below surface.

The photo shows the approximate location of the kerosene UST, as suggested by the geophysical results, at Parcel 17. The UST is located along the northwest wall of the store and is buried approximately 2.4 feet below surface.





GPR ANOMALIES PROBABLY IN RESPONSE TO THREE UST'S BURIED 3.5 TO 3.9 FEET BELOW SURFACE

The GPR image is obtained along a traverse line oriented perpendicular to the axis of the UST's. The three GPR anomalies in response to the probable UST's suggest that the UST's are buried approximately 3.5 to 3.9 feet below surface.

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CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05	DRWN	
SITE	HARVEY E. MELTON PROPERTY (PARCEL 17)	LAY		CHKD	
CITY	ROCKINGHAM	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	J.NO.	2005-292	FIGURE	

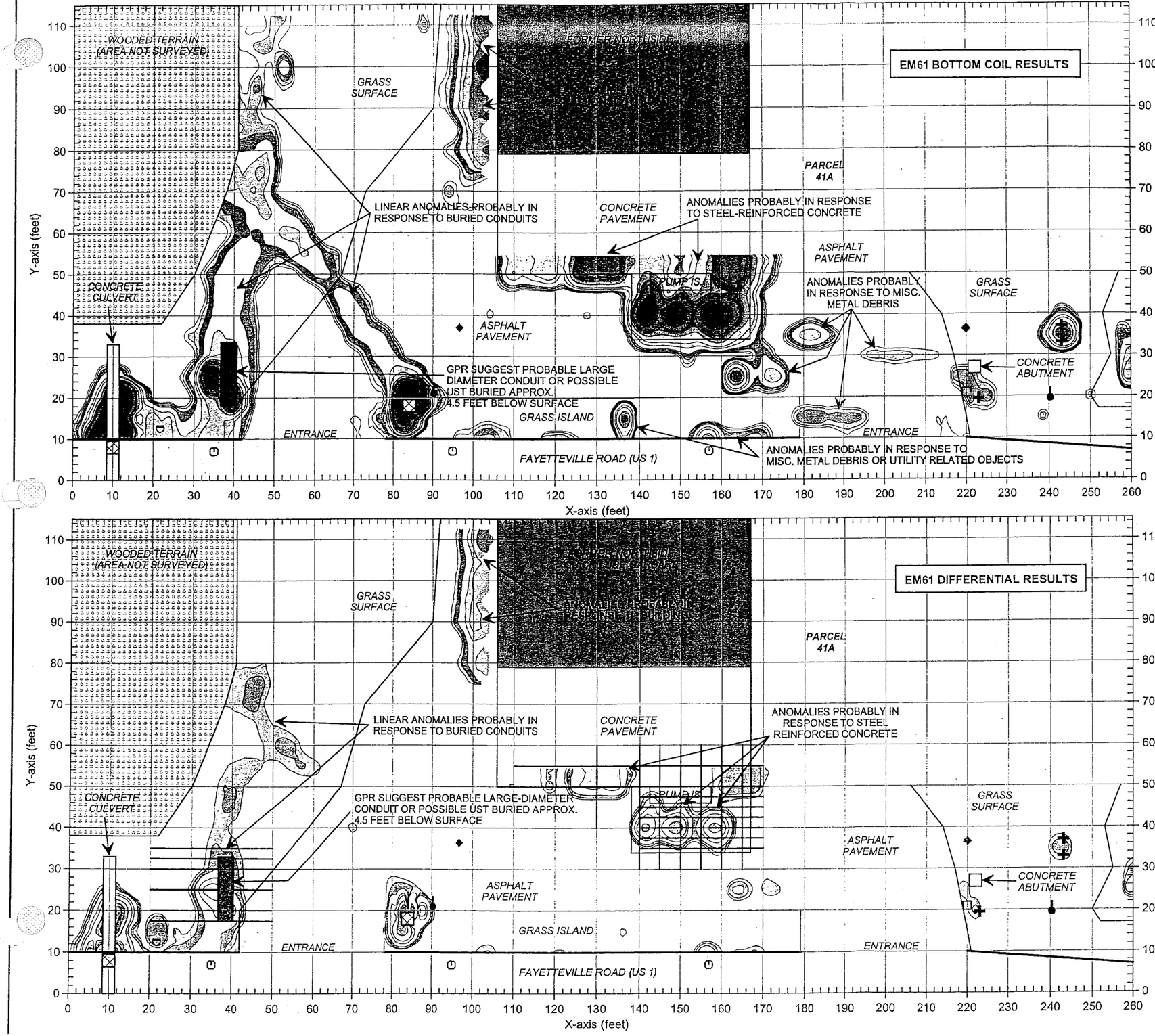
GRAPHIC SCALE IN METERS

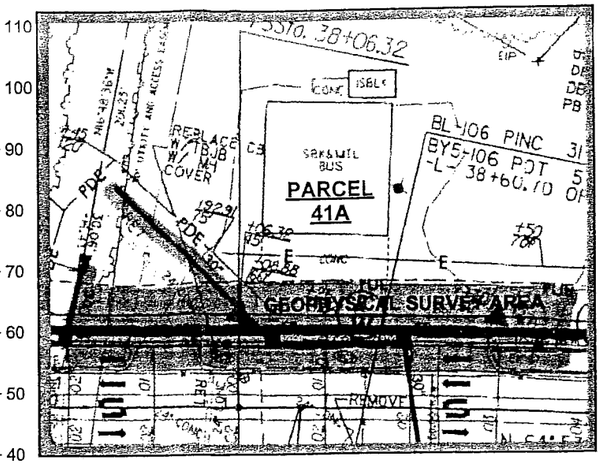
PHOTOS & GPR IMAGE OF UST LOCATIONS

FIGURE 12

EM61 METAL DETECTION RESULTS

FIGURE 13





APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -200 -100 -90 -50 -60 -75 -100 -150 -200 -300 -400 -500 -750 -1000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- STORM SEWER GRATE
- MAIL BOX
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE LARGE DIAMETER CONDUIT OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

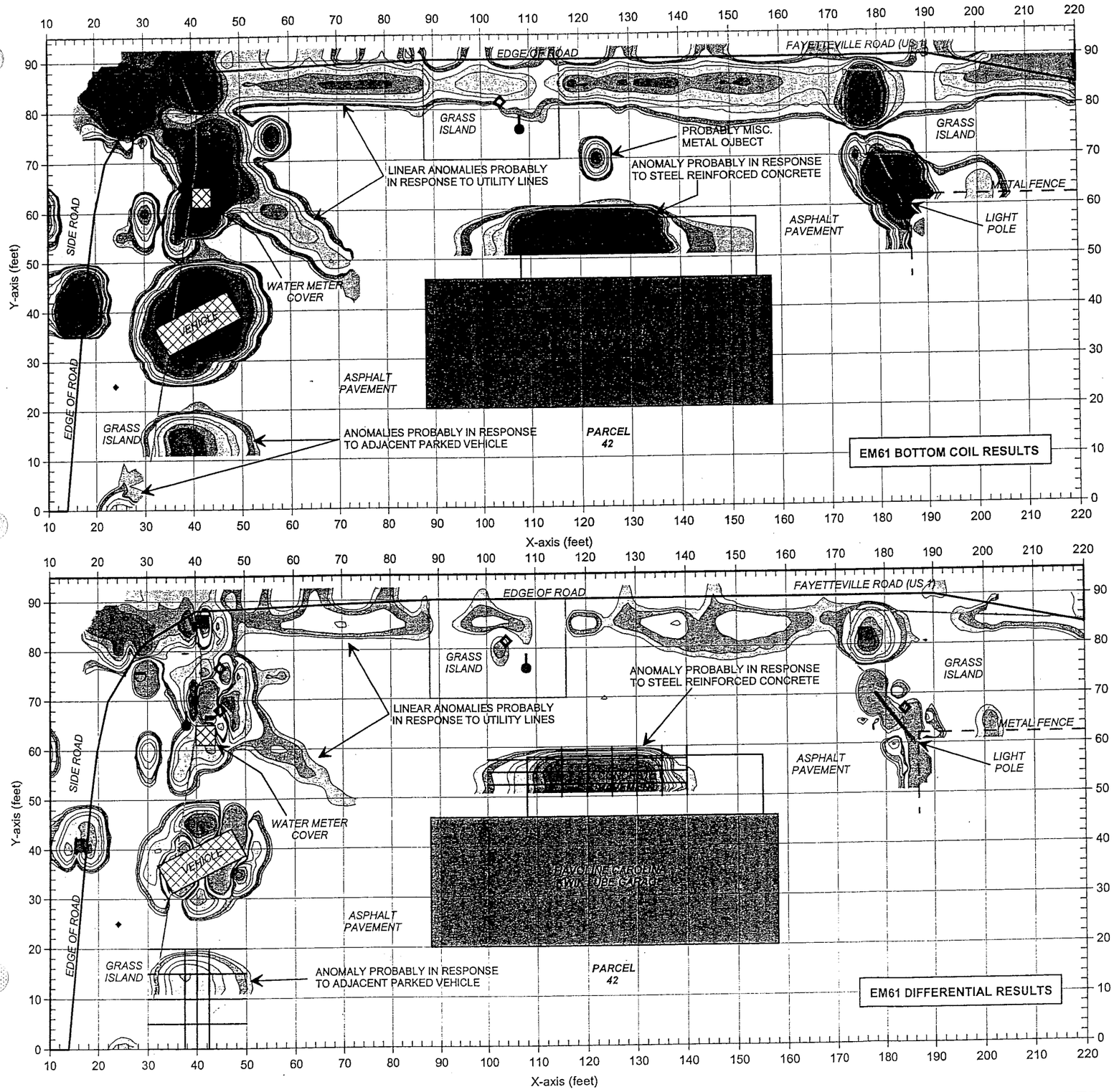
Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

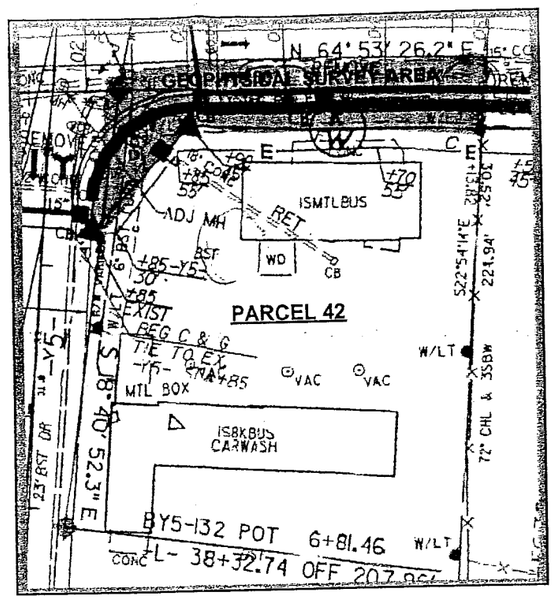
The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

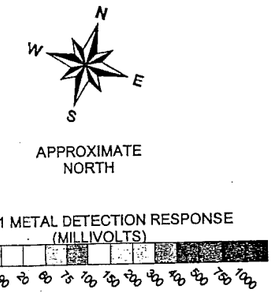
SUBJECT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	W.J. BARNHART PROPERTY (PARCEL 41A)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
JOB NO.	2005-292
DWG	
LAY	
DATE	11/26/05
DRWN	MJD
CHKD	
SOURCE	

GRAPHIC SCALE IN METERS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.







APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -50 -25 -10 -5 5 10 25 50 100 200 400 750 1000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- METAL SIGN POLE
- STORM SEWER GRATE
- GPR SURVEY LINE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 15, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESULTS

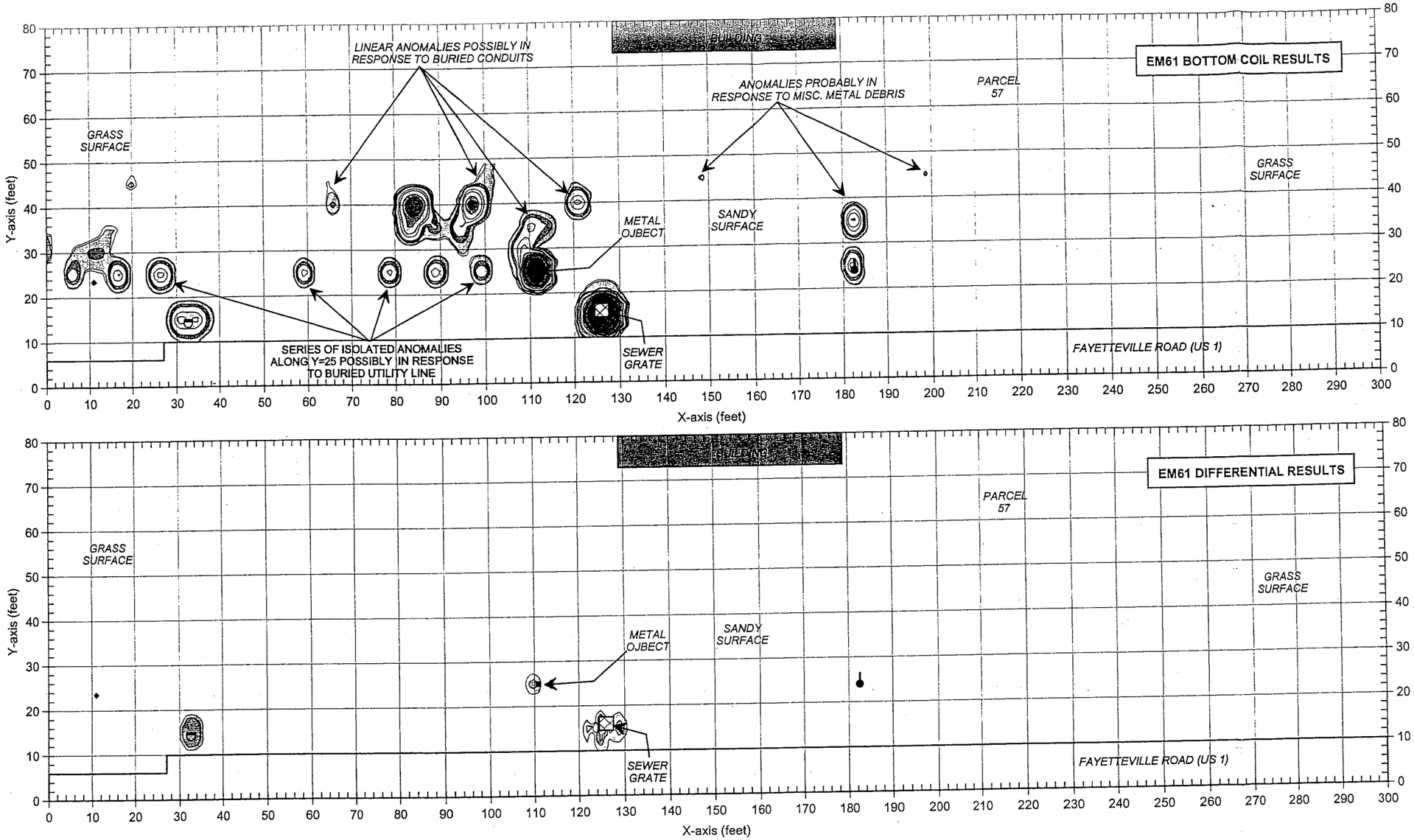
FIGURE 14

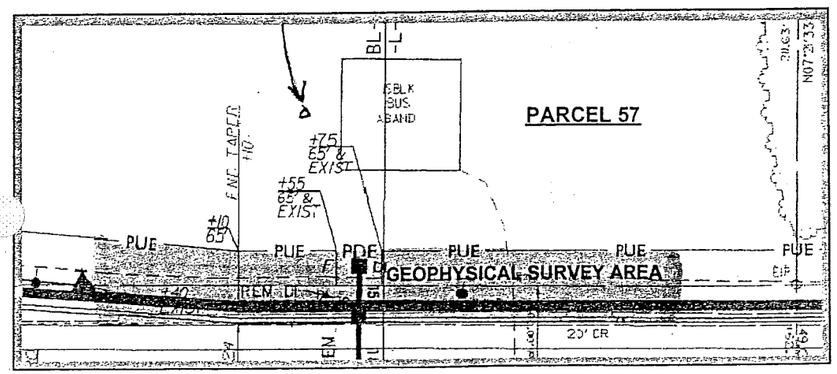
GRAPHIC SCALE IN METERS

DRAWN	MJD
CHKD	
DATE	11/26/05
LAY	
DWG	
FIGURE	
J-NO.	2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: WESLEY DENHAM PROPERTY (PARCEL 42)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.





LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-1000 -500 -100 -80 -45 -50 -75 -100 -150 -200 -300 -400 -600 -750 -1000

N
W E
S

APPROXIMATE NORTH

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) surveys were not conducted at this site.

EM61 METAL DETECTION RESULTS

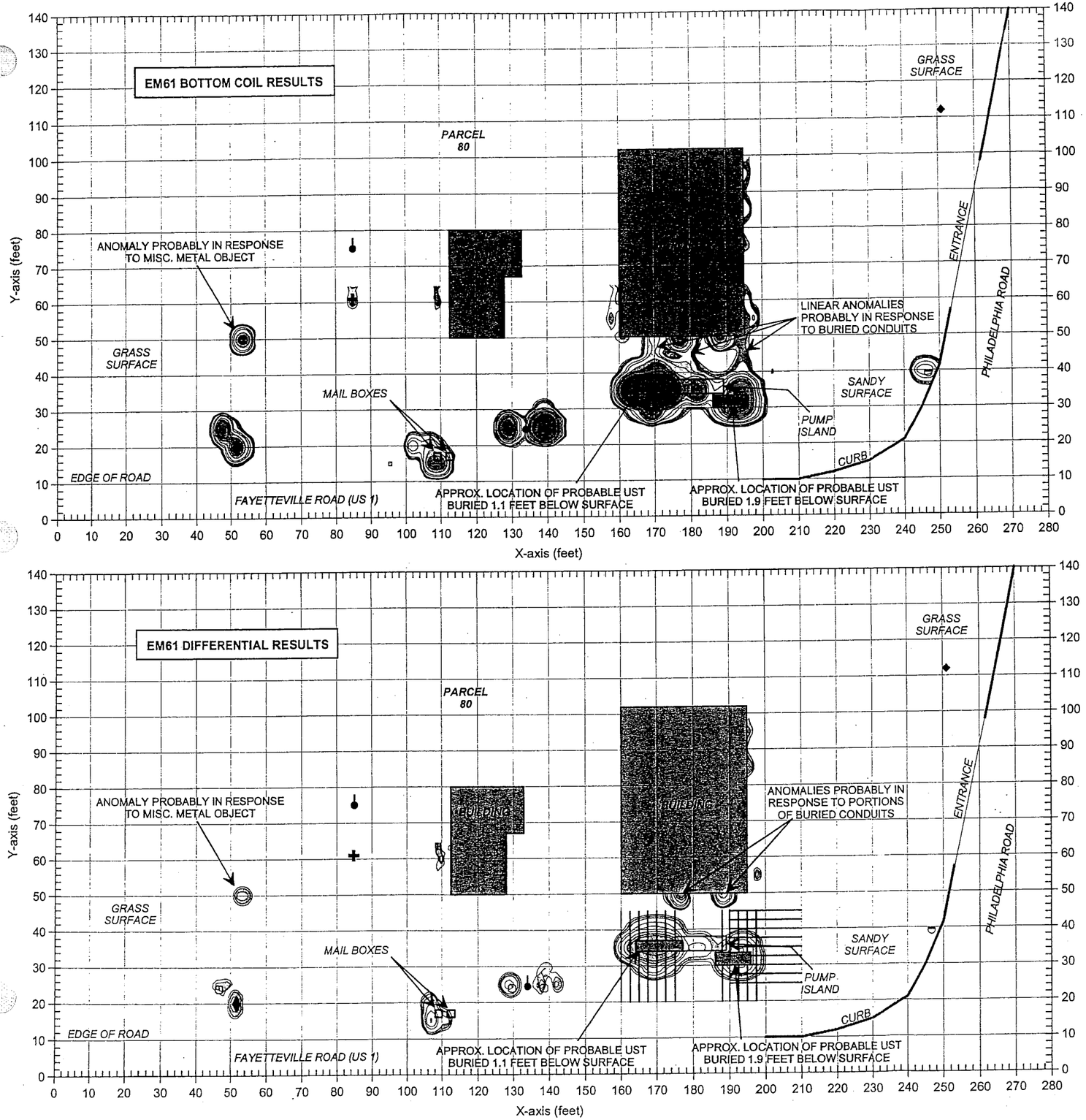
FIGURE 15

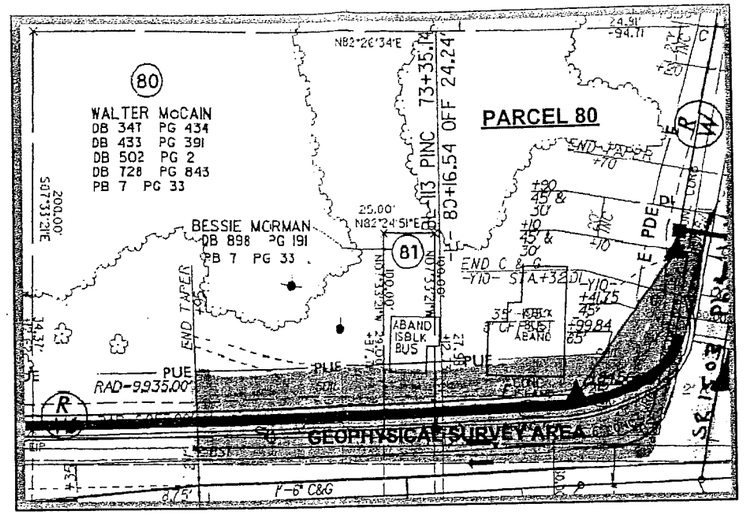
GRAPHIC SCALE IN METERS

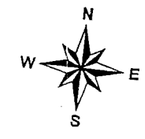
DRAWN	MJD
CHKD	
DATE	11/18/05
LAY	
DWG	
FIGURE	
JOB NO.	2005-292

CLIENT: SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE: WILLIAM USSERY PROPERTY (PARCEL 57)
CITY: ROCKINGHAM
STATE: NORTH CAROLINA
TITLE: GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

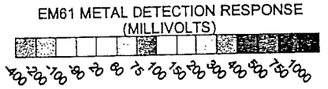






APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)



LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- RIGHT-OF-WAY MARKER
- FIRE HYDRANT
- TRAFFIC SIGN
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

FIGURE 16

EM61
METAL DETECTION
RESULTS

GRAPHIC SCALE IN METERS	
DRAWN	MJD
CHKD	
DATE	11/25/05
LAY	
DWG	
FIGURE	
JOB NO.	2005-292

SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

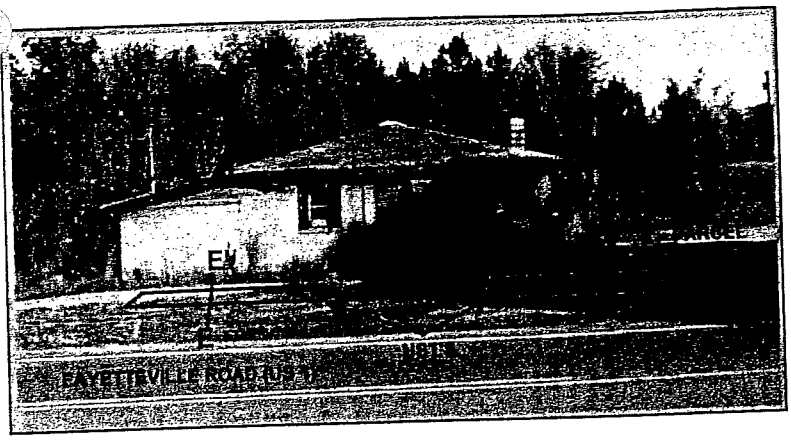
WALTER McCAIN PROPERTY (PARCEL 80)

ROCKINGHAM — NORTH CAROLINA

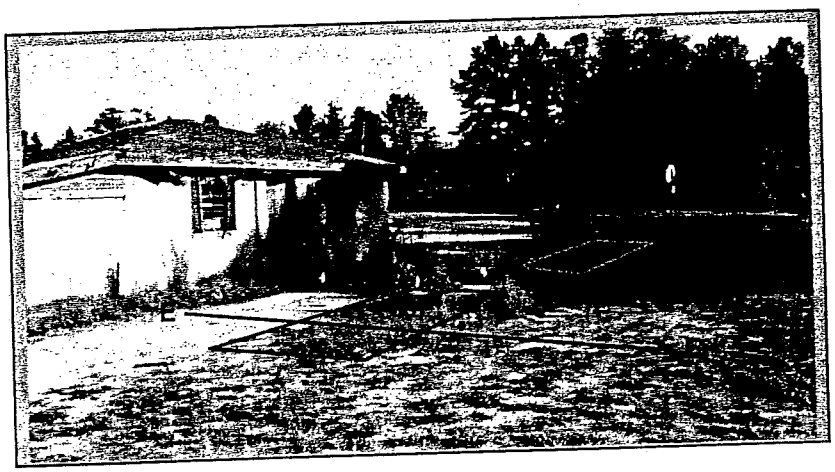
GEOPHYSICAL RESULTS

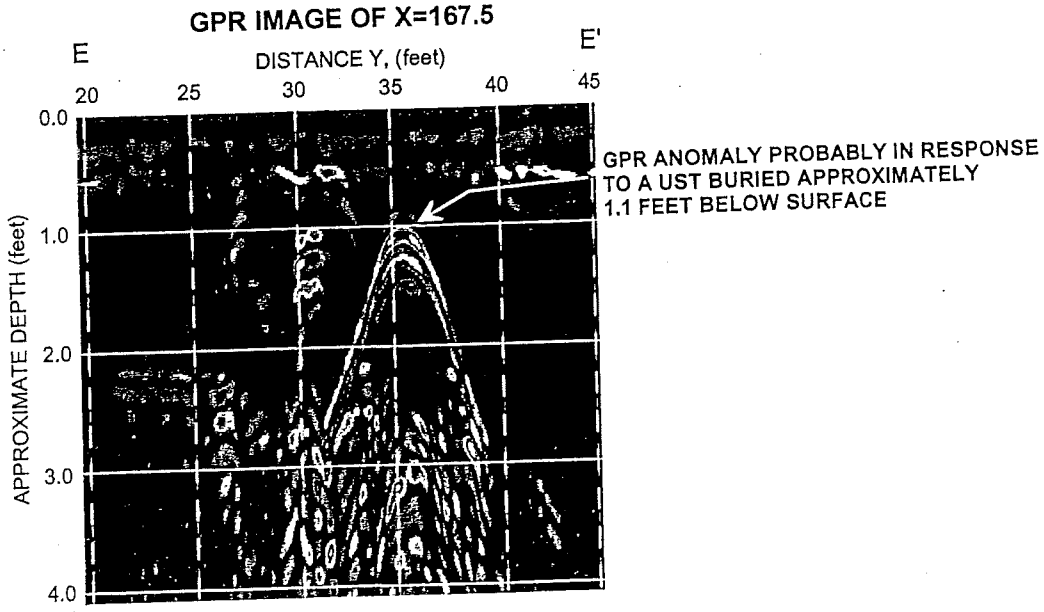
CLIENT | SITE | CITY | STATE | TITLE

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.



The two photos show the approximate locations of the two probable UST's at Parcel 80, as suggested by the geophysical results. The UST's appear to be buried approximately 1 to 2 feet below surface. A former pump island lies between the two probable UST's.





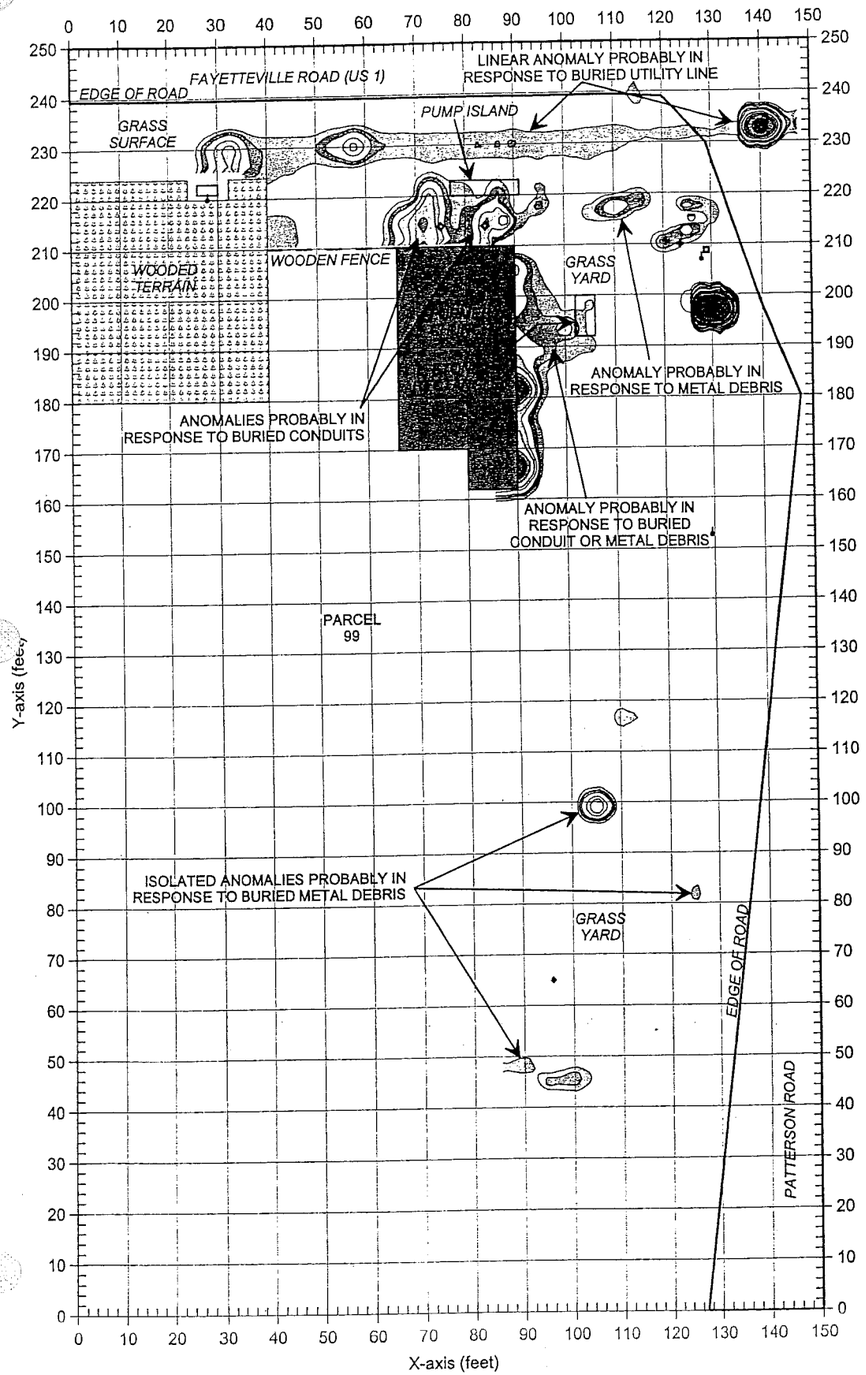
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	WALTER McCAIN PROPERTY (PARCEL 80)		
CITY	ROCKINGHAM	STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS	JNO.	2005-292

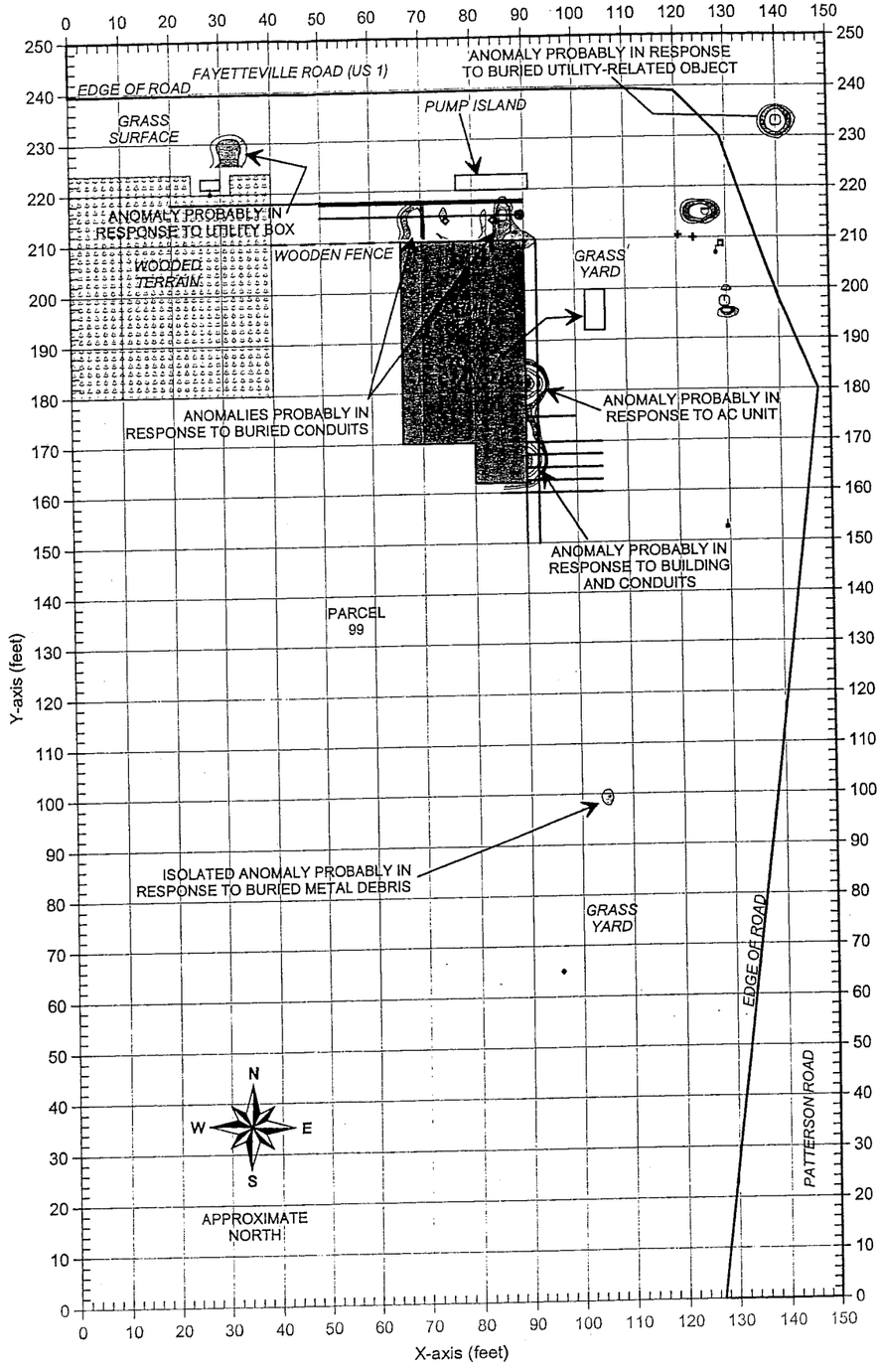
PHOTOS & GPR IMAGE OF UST LOCATIONS

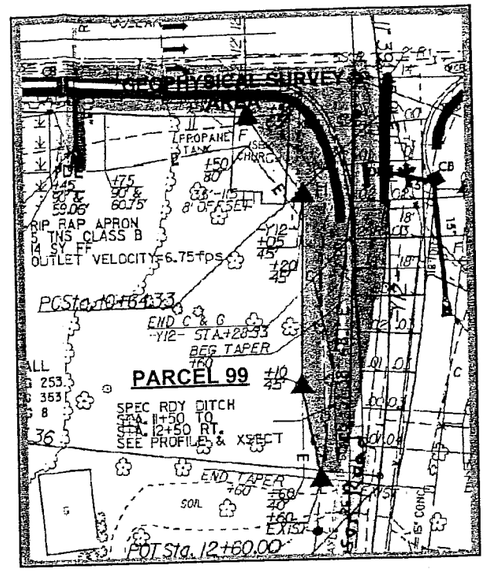
FIGURE 17

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-400 -200 -100 -50 20 50 75 100 150 200 300 400 500 750 1000

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTH-SOUTH OR EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- CANOPY POLE
- RIGHT-OF-WAY MARKER
- TRAFFIC SIGN
- GPR SURVEY LINE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

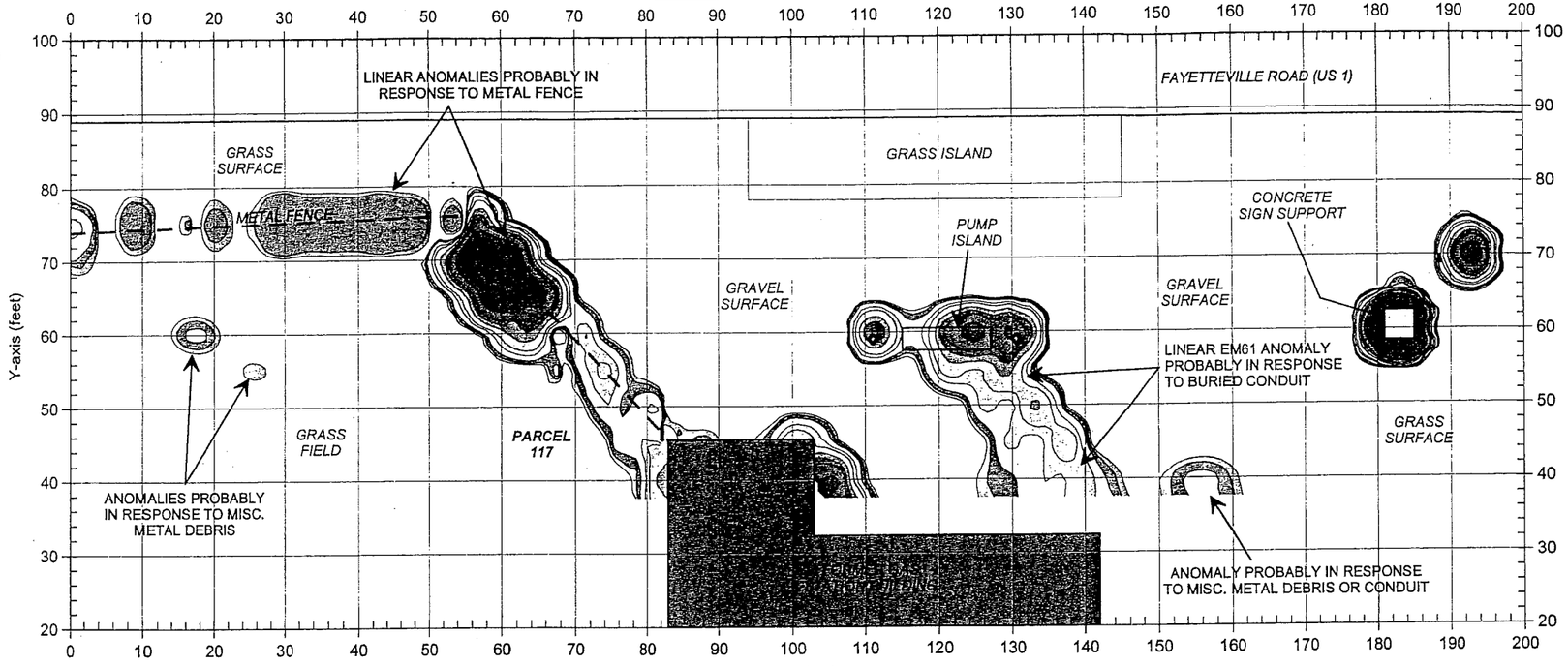
The EM metal detection data were collected on November 12, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 22, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

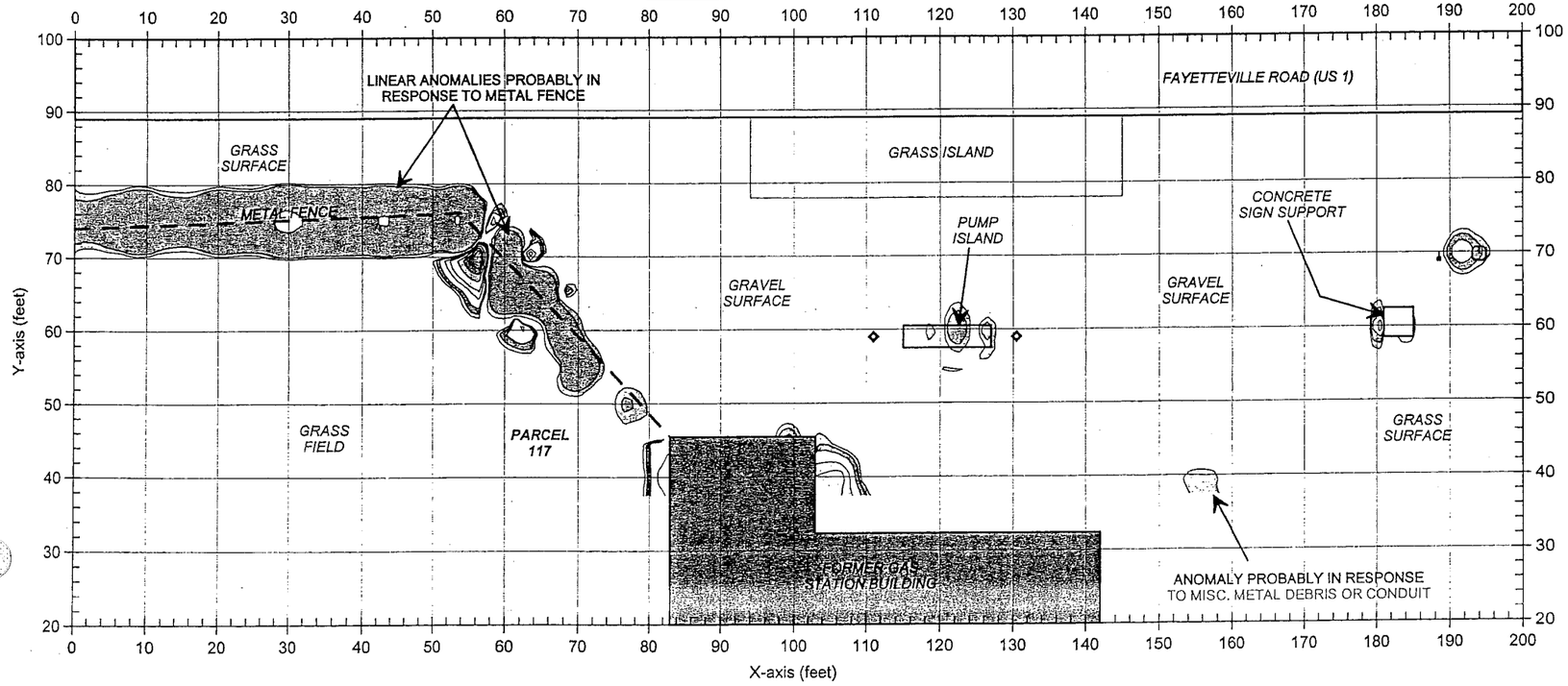
FIGURE 18

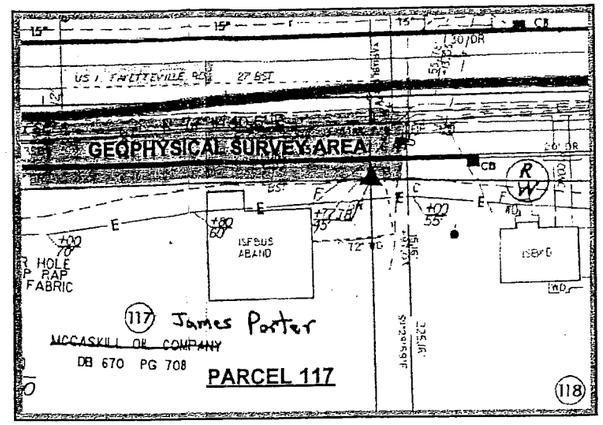
EM61 METAL DETECTION RESULTS

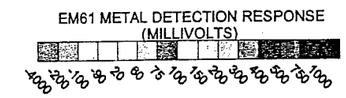
CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	LEON WALL PROPERTY (PARCEL 99)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
DATE	11/26/05
DRWN	MJD
CHKD	
DWG	
FIGURE	2005-292
GRAPHIC SCALE IN METERS	

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.


EM61 BOTTOM COIL RESULTS


EM61 DIFFERENTIAL RESULTS





LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- SUPPORT POLE

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar surveys were not conducted at this site.

EM61
METAL DETECTION
RESULTS

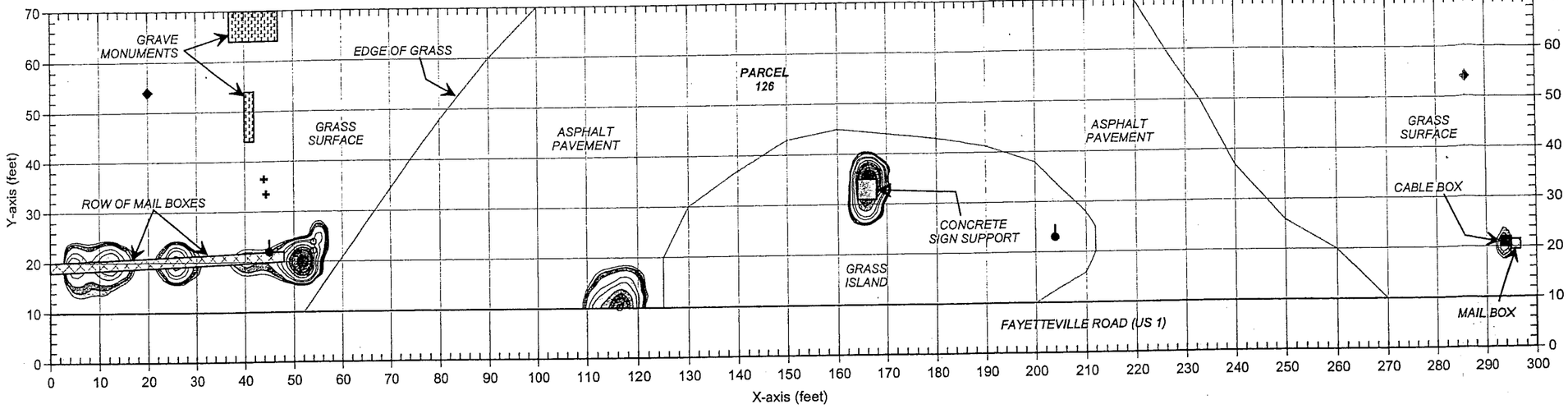
FIGURE 19

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	JAMES PORTER PROPERTY (PARCEL 117)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
DATE	11/26/05
DRWN	MJD
LAY	
CHKD	
DWG	
FIGURE	2005-292
J.NO.	

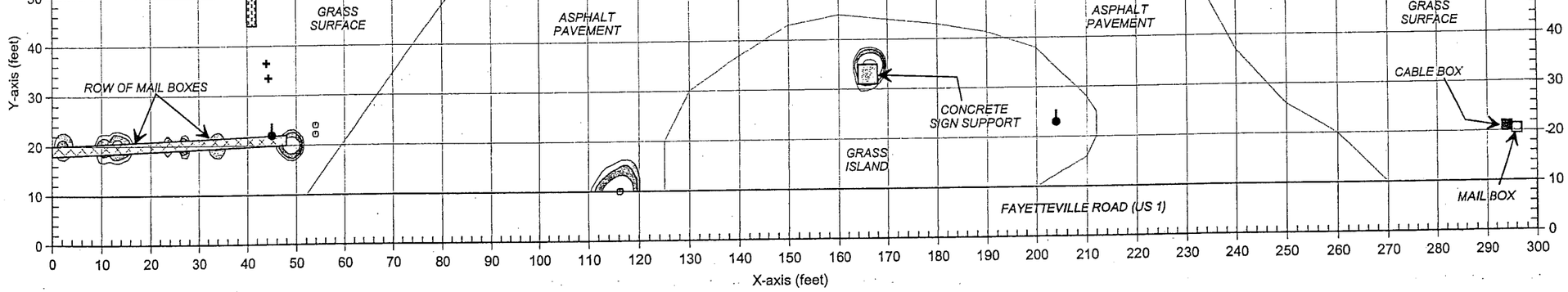
GRAPHIC SCALE IN METERS

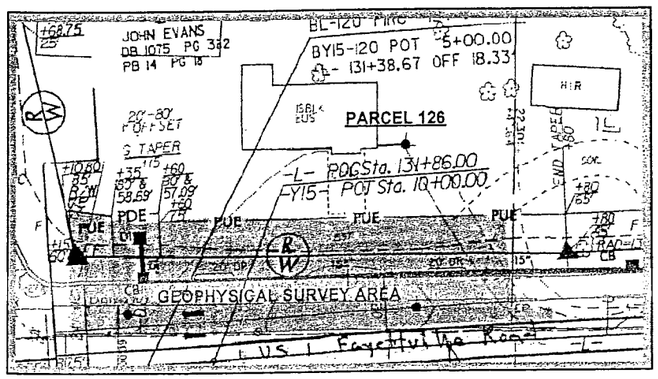
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- RIGHT-OF-WAY MARKER
- UTILITY POLE
- WATER METER OR VALVE COVER
- SIGN POLE
- STORM SEWER GRATE
- TRAFFIC SIGN
- GUY WIRE

APPROXIMATE NORTH

EM61 METAL DETECTION RESPONSE (MILLIVOLTS)
1000, 750, 500, 400, 300, 200, 150, 100, 75, 60, 20, -90, -100, -200, -400

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data surveys were not conducted at this site

EM61 METAL DETECTION RESULTS

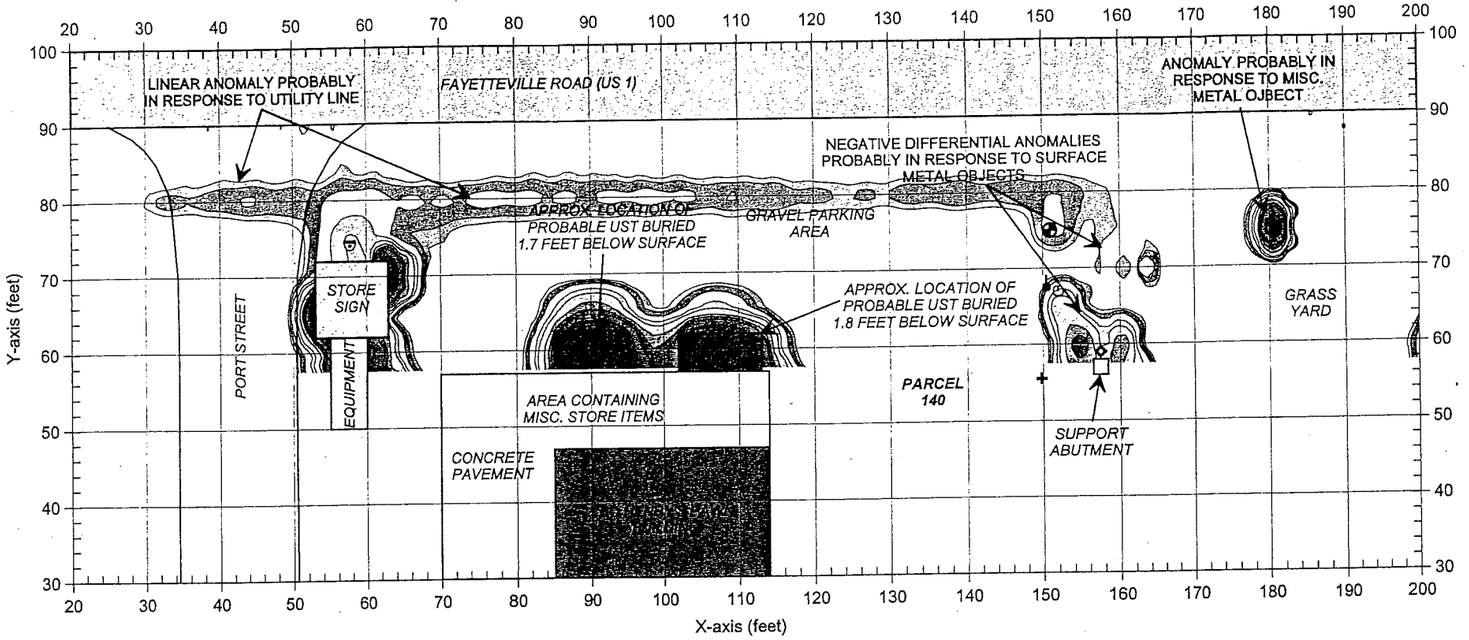
FIGURE 20

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL
SITE	JOHN EVANS PROPERTY (PARCEL 126)
CITY	ROCKINGHAM
STATE	NORTH CAROLINA
TITLE	GEOPHYSICAL RESULTS
JOB NO.	2005-292
FIGURE	
DWG	
LAY	
DATE	11/26/05
DRWN	MJD
CHKD	

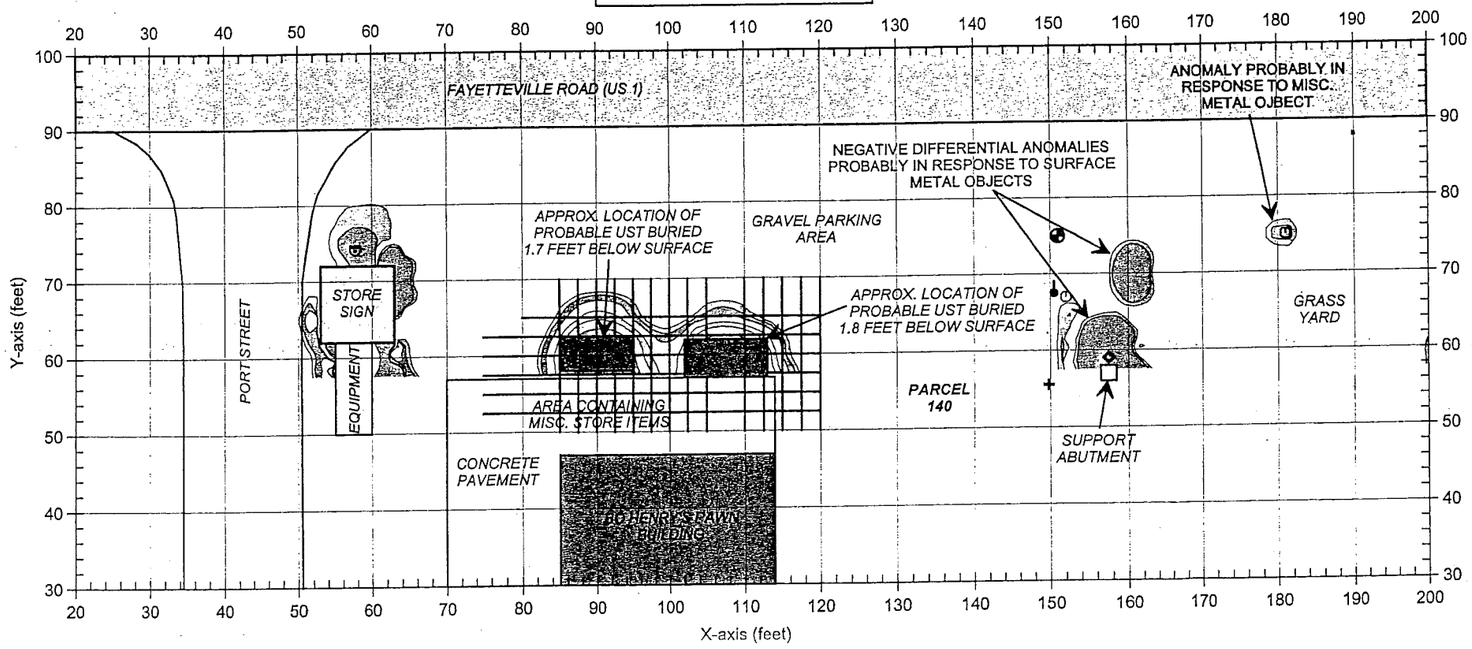
DRAWING SCALE IN METERS

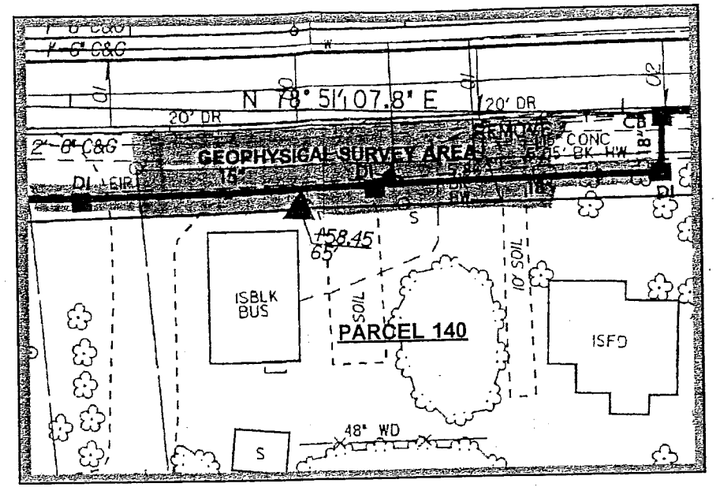
PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

EM61 BOTTOM COIL RESULTS



EM61 DIFFERENTIAL RESULTS





EM61 METAL DETECTION RESPONSE (MILLIVOLTS)

-4000 -200 -100 -50 -20 -10 -5 5 10 50 100 200 400 1000

N
W E
S

APPROXIMATE NORTH

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG EAST-WEST TRENDING LINES SPACED 5 FEET APART
- BUILDING
- UTILITY POLE
- WATER METER OR VALVE COVER
- GUY WIRE
- SIGN POLE
- STORM SEWER GRATE
- TRAFFIC SIGN
- FIBER OPTIC LINE SIGN
- GPR SURVEY LINE
- APPROXIMATE LOCATION OF PROBABLE OR POSSIBLE UST AS SUGGESTED BY GEOPHYSICAL SURVEYS

Note: The contour plots show the bottom coil (most sensitive) response of the EM61 instrument and the differential results in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and UST's and ignores smaller miscellaneous, buried, metal debris.

The EM metal detection data were collected on November 14, 2005 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on November 23, 2005 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

EM61 METAL DETECTION RESULTS

FIGURE 21

GRAPHIC SCALE IN METERS

DRAWN	MJD		
DATE	11/25/05	LAY	
CHKD		DWG	
FIGURE	2005-292	JOB NO.	

SOLUTIONS INDUSTRIAL & ENVIRONMENTAL

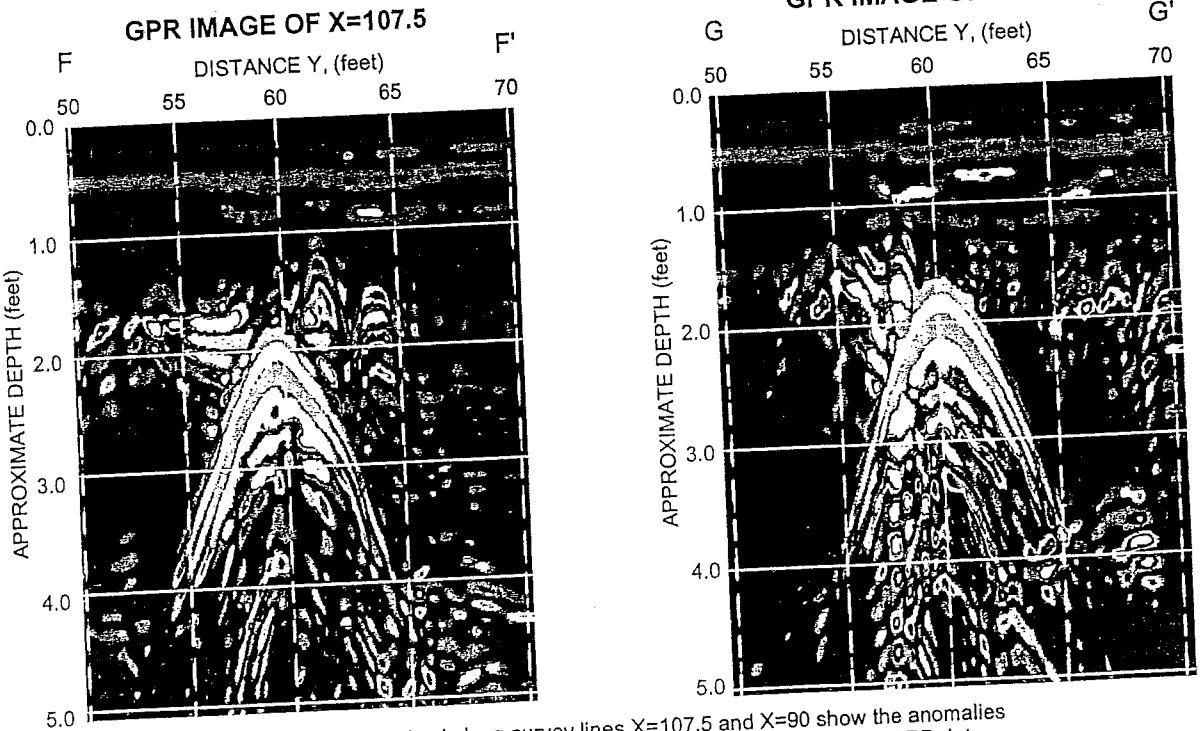
HENRY USSERY PROPERTY (PARCEL 140)

ROCKINGHAM — NORTH CAROLINA

GEOPHYSICAL RESULTS

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

The photo shows the approximate locations of the two UST's, as suggested by the geophysical results at Parcel 140. The UST's appear to be approximately 1.8 and 1.7 feet below surface.



The GPR images obtained along survey lines X=107.5 and X=90 show the anomalies that are probably in response to the two UST's buried at Parcel 140. The GPR data suggest the UST's are buried approximately 1.8 feet and 1.7 feet below surface, respectively.

PYRAMID

CLIENT	SOLUTIONS INDUSTRIAL & ENVIRONMENTAL	DATE	11/28/05
SITE	HENRY USSERY PROPERTY (PARCEL 140)	CITY	ROCKINGHAM
STATE	NORTH CAROLINA	JOB NO.	2005-292

PHOTO & GPR IMAGES OF UST LOCATIONS

FIGURE 22

APPENDIX C

BORING LOGS

Log of Soil Boring 17-1

Project: Rockingham Sites (Parcel 017) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 17-1

Client: NCDOT

TIP/WBS # 34950.1.1

State Project # U-3456

Drilling Method: Direct push

Sampler Type: Macro Core

Logged By: Dan Hirth

City: Rockingham

County: Richmond

Boring Date: 12/1/05

Checked By: DH/SCL

Initial Water Level: N/A

Stabilized Water Level: N/A

Cave In Depth: N/A

Total Depth of Boring: 8 feet

SUBSURFACE PROFILE			SAMPLE					
Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Asphalt*		MC	100	0		
1	*SP*	Dry, tan, fine sand						
2	*SP*	Dry, tan, fine sand		MC	100	0		
3 / 1	*SC*	Dry, tan, clayey fine sand						
4	*CL*	Dry, light gray, fine sandy clay		MC	100	0		
6 / 2	*CL*	Dry, light gray, fine sandy clay		MC	100	0		
8		Boring terminated at 8 feet.						
10 / 3								
12								
13 / 4								
14								
15								

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Log of Soil Boring 17-2

Project: Rockingham Sites (Parcel 017) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 17-2

Client: NCDOT

WBS # 34950.1.1

State Project # U-3456

Drilling Method: Direct push

Sampler Type: Macro Core

Logged By: Dan Hirth

City: Rockingham

County: Richmond

Boring Date: 12/1/05

Checked By: DH/SVK

Initial Water Level: N/A

Stabilized Water Level: N/A

Cave In Depth: N/A

Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750	FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
		SUBSURFACE PROFILE	**SAMPLE**						
0 / 0		Ground Surface							
0		*Asphalt*							
1	SP	*SP* Dry, tan, fine sand		MC	100	0			
2	SC	*SC* Dry, tan/orange, clayey fine sand		MC	100	0			
3 / 1									
4	SC	*SC* Dry, tan/orange, clayey fine sand		MC	100	0			
6	CL	*CL* Dry, light gray, fine sandy clay		MC	100	0			
7 / 2									
8		Boring terminated at 8 feet.							
9									
10 / 3									
11									
12									
13 / 4									
14									
15									

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Log of Soil Boring 17-3

Project: Rockingham Sites (Parcel 017) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 17-3

Client: NCDOT
WBS # 34950.1.1
State Project # U-3456
Drilling Method: Direct push
Sampler Type: Macro Core
Logged By: Dan Hirth

City: Rockingham
County: Richmond
Boring Date: 12/1/05

Checked By: DH/SLK

Initial Water Level: N/A
Stabilized Water Level: N/A
Cave In Depth: N/A

Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750) / FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
		SUBSURFACE PROFILE	**SAMPLE**					
0 / 0		Ground Surface						
0		*Asphalt*						
1	SP	Dry, tan, fine sand		MC	100	0		
2	SC	Dry, tan, clayey fine sand		MC	100	0		
3 / 1								
4	CL	Dry, light gray and orange, fine sandy clay		MC	100	0		
6	CL	Dry, light gray and orange/red, fine sandy clay		MC	100	0		
7 / 2								
8		Boring terminated at 8 feet.						
9 / 3								
10								
11								
12								
13 / 4								
14								
15								

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Log of Soil Boring 17-4

Project: Rockingham Sites (Parcel 017) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 17-4

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/1/05 *Cave In Depth:* N/A

Sampler Type: Macro Core *Checked By:* DH *Total Depth of Boring:* 8 feet

Logged By: Sean Jarvah

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750) / FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
		SUBSURFACE PROFILE	**SAMPLE**					
0 / 0		Ground Surface						
0 / 0		*Asphalt*						
1	SP	*SP* Dry, tan, fine sand		MC	100	0		
2	SC	*SC* Dry, tan, clayey fine sand		MC	100	0		
3 / 1								
4	CL	*CL* Dry, light gray and orange, fine sandy clay		MC	100	0		
6	CL	*CL* Dry, light gray and orange/red, fine sandy clay		MC	100	0		
7 / 2								
8		Boring terminated at 8 feet.						
9								
10 / 3								
11								
12								
13 / 4								
14								
15								

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Log of Soil Boring 17-5

Project: Rockingham Sites (Parcel 017) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 17-5

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/1/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Sean Jarvah *Checked By:* DH Isw *Total Depth of Boring:* 12 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750	FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
		SUBSURFACE PROFILE	**SAMPLE**						
0 / 0		Ground Surface							
0 / 0		*Asphalt*							
1	SP	Dry, tan and gray, fine sand		MC	100	0			
2	SP	Dry, tan, fine sand		MC	100	0			
3 / 1									
4	CL	Dry, tan, fine sandy clay		MC	100	0			
6 / 2	CL	Dry, tan, fine sandy clay		MC	100			>1000	
7									
8	CL	Dry, tan, fine sandy clay		MC	100	6			
9									
10 / 3	CL	Dry, tan, fine sandy clay		MC	100	2			
11									
12		Boring terminated at 12 feet.							
13 / 4									
14									
15									

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Log of Soil Boring 17-6

Project: Rockingham Sites (Parcel 017) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 17-6

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/1/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH / SM *Total Depth of Boring:* 12 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750	FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface							
0		*Asphalt*							
1	SC	Dry, tan, clayey fine sand		MC	100	0			
2	CL	Dry, tan, fine sandy clay		MC	100	41			
3 / 1									
4	CL	Dry, tan, fine sandy clay		MC	100			957	
6	CL	Dry, tan, fine sandy clay		MC	100	52			
7 / 2									
8	CL	Dry, tan and orange/red, fine sandy clay		MC	100	90			
9									
10 / 3	CL	Dry, tan and orange/red, fine sandy clay		MC	100	13			
11									
12		Boring terminated at 12 feet.							
13 / 4									
14									
15									

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Log of Soil Boring 17-7

Project: Rockingham Sites (Parcel 017) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 17-7

Client: NCDOT

WBS # 34950.1.1

State Project # U-3456

Drilling Method: Direct push

Sampler Type: Macro Core

Logged By: Sean Jarvah

City: Rockingham

County: Richmond

Boring Date: 12/1/05

Checked By: [illegible]

Initial Water Level: N/A

Stabilized Water Level: N/A

Cave In Depth: N/A

Total Depth of Boring: 12 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen ppm (250 500 750) / FID Field Screen ppm (250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Concrete*						
1	*SP*	Dry, tan, fine sand		MC	100	8		
2	*SP*	Dry, dark gray, fine sand, petroleum odor		MC	100	76		
3 / 1								
4	*SP*	Dry, dark gray, fine sand, petroleum odor		MC	100	184		
6	*SP*	Dry, tan, fine sand, petroleum odor		MC	100	70		
7 / 2								
8	*SP*	Dry, tan, fine sand, petroleum odor		MC	100	347		
9								
10 / 3	*CL*	Dry, tan and gray, fine sandy clay, petroleum odor		MC	100	253		
11								
12		Boring terminated at 12 feet.						
13 / 4								
14								
15								

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Log of Soil Boring 17-8

Project: Rockingham Sites (Parcel 017) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 17-8

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/1/05 *Cave In Depth:* N/A

Sampler Type: Macro Core *Checked By:* DH *Total Depth of Boring:* 8 feet

Logged By: Sean Jarvah

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750	FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface							
0		*Concrete*							
1	*SP*	Dry, tan, fine sand		MC	100	1			
2	*SP*	Dry, tan, fine sand		MC	100	0			
3 / 1									
4	*CL*	Dry, tan/orange, fine sandy clay		MC	100	0			
6	*CL*	Dry, tan/orange, fine sandy clay		MC	100	0			
7 / 2									
8		Boring terminated at 8 feet.							
9									
10 / 3									
11									
12									
13 / 4									
14									
15									

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Log of Soil Boring 17-9

Project: Rockingham Sites (Parcel 017) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 17-9

Client: NCDOT

WBS # 34950.1.1

State Project # U-3456

Drilling Method: Direct push

Sampler Type: Macro Core

Logged By: Sean Jarvah

City: Rockingham

County: Richmond

Boring Date: 12/1/05

Checked By: DH JSK

Initial Water Level: N/A

Stabilized Water Level: N/A

Cave In Depth: N/A

Total Depth of Boring: 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750)	FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
		SUBSURFACE PROFILE	**SAMPLE**						
0 / 0		Ground Surface							
0		*Asphalt*							
1	SP	*SP* Dry, tan, fine sand		MC	100	0			
2	SP	*SP* Dry, tan, fine sand		MC	100	0			
3 / 1	CL	*CL* Dry, tan/orange, fine sandy clay		MC	100	0			
6	CL	*CL* Dry, tan/orange, fine sandy clay		MC	100	0			
7 / 2									
8		Boring terminated at 8 feet.							
9									
10 / 3									
11									
12									
13 / 4									
14									
15									

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Log of Soil Boring 17-10

Project: Rockingham Sites (Parcel 017) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 17-10

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/1/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Sean Jarvah *Checked By:* DH/SJ *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750	FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
		SUBSURFACE PROFILE	**SAMPLE**						
0 / 0		Ground Surface							
0		*Asphalt*							
1	*SP*	Dry, tan and gray, fine sand		MC	100	0			
2	*SP*	Dry, tan, fine sand		MC	100	0			
3 / 1	*CL*	Dry, tan, fine sandy clay		MC	100	0			
6 / 2	*CL*	Dry, tan, orange, and white, fine sandy clay		MC	100	0			
8		Boring terminated at 8 feet.							
10 / 3									
13 / 4									
15									

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Log of Soil Boring 17-11

Project: Rockingham Sites (Parcel 017) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 17-11

Client: NCDOT

TIP/WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/1/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Sean Jarvah *Checked By:* DH/SWA *Total Depth of Boring:* 12 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm)	FID Field Screen (ppm)	Lab Sample Depth	Well Data
0 / 0		Ground Surface							
0		*Asphalt*							
1	*SP*	Dry, brown, fine sand		MC	100	2			
2	*SP*	Dry, tan, fine sand, petroleum odor		MC	100		365		
3 / 1									
4	*SP*	Dry, tan, fine sand, petroleum odor		MC	100		816		
6	*SC*	Dry, tan, clayey fine sand, petroleum odor		MC	100		>1000		
7 / 2									
8	*SC*	Dry, tan and gray, clayey fine sand,petroleum odor		MC	100		>1000		
9									
10 / 3	*SC*	Dry, tan, clayey fine sand, petroleum odor		MC	100		304		
11									
12		Boring terminated at 12 feet.							
13 / 4									
14									
15									

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Log of Soil Boring 17-12

Project: Rockingham Sites (Parcel 017) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 17-12

Client: NCDOT

TIP # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/1/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Sean Jarvah *Checked By:* DH/SJA *Total Depth of Boring:* 12 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750	FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface							
0		***Concrete***							
1		***SP*** Dry, tan and gray, fine sand		MC	100	0			
2		***SP*** Dry, brown, fine sand		MC	100	4			
3 / 1									
4		***SP*** Dry, tan and brown, fine sand		MC	100	33			
6		***SP*** Dry, tan, fine sand		MC	100	43			
7 / 2									
8		***SC*** Dry, tan and brown, clayey fine sand, faint petroleum odor		MC	100			>1000	
9									
10 / 3		***CL*** Dry, tan/orange, fine sandy clay		MC	100	101			
11									
12		Boring terminated at 12 feet.							
13 / 4									
14									
15									

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Log of Soil Boring 17-13

Project: Rockingham Sites (Parcel 017) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 17-13

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/1/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Sean Jarvah *Checked By:* JH/SM *Total Depth of Boring:* 12 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm) 250 500 750 / FID Field Screen (ppm) 250 500 750	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Asphalt*						
1	SP	SP Dry, tan, fine sand		MC	100	0		
2	SP	SP Dry, tan and brown, fine sand, petroleum odor		MC	100	0		
3 / 1								
4	SC	SC Dry, tan, clayey fine sand, petroleum odor		MC	100	2		
6	CL	CL Dry, tan, fine sandy clay, petroleum odor		MC	100	0		
7 / 2								
8	CL	CL Dry, tan, fine sandy clay, petroleum odor		MC	100	7		
9								
10 / 3	CL	CL Dry, tan, white, and orange, fine sandy clay, petroleum odor		MC	100	23		
11								
12		Boring terminated at 12 feet.						
13 / 4								
14								
15								

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Log of Soil Boring 17-14

Project: Rockingham Sites (Parcel 017) *Solutions-IES Project No.:* 2730.05A2.NDOT *Boring Number:* 17-14

Client: NCDOT

WBS # 34950.1.1 *City:* Rockingham *Initial Water Level:* N/A

State Project # U-3456 *County:* Richmond *Stabilized Water Level:* N/A

Drilling Method: Direct push *Boring Date:* 12/1/05 *Cave In Depth:* N/A

Sampler Type: Macro Core

Logged By: Dan Hirth *Checked By:* DH/CSH *Total Depth of Boring:* 8 feet

Depth (ft / m)	USCS Symbol	Description	Sample Interval	Type	% Recovery	PID Field Screen (ppm 250 500 750) / FID Field Screen (ppm 250 500 750)	Lab Sample Depth	Well Data
0 / 0		Ground Surface						
0		*Asphalt*						
1	*SP*	Dry, tan, fine sand with some orange fill		MC	100	0		
2	*SP*	Dry, tan, fine sand		MC	100	0		
3 / 1								
4	*SC*	Dry, tan, clayey fine sand		MC	100	0		
6	*SC*	Dry, tan, clayey fine sand		MC	100	6		
7 / 2								
8		Boring terminated at 8 feet.						
9								
10 / 3								
11								
12								
13 / 4								
14								
15								

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APPENDIX D

LABORATORY ANALYTICAL REPORT

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

Pace Analytical Services, Inc.
2225 Riverside Drive
Asheville, NC 28804
Phone: 828.254.7176
Fax: 828.252.4618

December 19, 2005

Ms. Sheri Knox
Solutions-IES
1101 Nowell Road
Raleigh, NC 27607

RE: Lab Project Number: 92108866
Client Project ID: NCDOT 34950.1.1 Parcel 17

Dear Ms. Knox:

Enclosed are the analytical results for sample(s) received by the laboratory on December 6, 2005. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Inorganic Wet Chemistry and Metals Analyses were performed at our Pace Asheville laboratory and Organic testing was performed at our Pace Charlotte laboratory unless otherwise footnoted.

If you have any questions concerning this report please feel free to contact me.

Sincerely,

Bonnie McKee

Bonnie McKee
Bonnie.McKee@pacelabs.com
Project Manager

Enclosures

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2225 Riverside Drive
Asheville, NC 28804
Phone: 828.254.7176
Fax: 828.252.4618

Lab Project Number: 92108866
Client Project ID: NCDOT 34950.1.1 Parcel 17

Solid results are reported on a dry weight basis

Lab Sample No: 926413790 Project Sample Number: 92108866-001 Date Collected: 12/01/05 17:10
Client Sample ID: 17-5 (6-8) Matrix: Soil Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	12.0	%		12/07/05 09:44	KBM			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	300	mg/kg	5.7	12/13/05 14:02	KBS	68334-30-5		
n-Pentacosane (S)	106	%		12/13/05 14:02	KBS	629-99-2		
Date Extracted	12/07/05			12/07/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	480	mg/kg	41.	12/09/05 19:07	DHW			
4-Bromofluorobenzene (S)	115	%		12/09/05 19:07	DHW	460-00-4		

Date: 12/19/05

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Lab Project Number: 92108866
Client Project ID: NCDOT 34950.1.1 Parcel 17

Lab Sample No: 926413808
Client Sample ID: 17-6 (4-6)

Project Sample Number: 92108866-002
Matrix: Soil

Date Collected: 12/01/05 17:15
Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	15.3	%		12/07/05 09:44	KBM			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	61.	mg/kg	5.9	12/13/05 13:28	KBS	68334-30-5		
n-Pentacosane (S)	110	%		12/13/05 13:28	KBS	629-99-2		
Date Extracted	12/07/05			12/07/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	590	mg/kg	40.	12/09/05 19:36	DHW			
4-Bromofluorobenzene (S)	112	%		12/09/05 19:36	DHW	460-00-4		

Date: 12/19/05

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Lab Project Number: 92108866
Client Project ID: NCDOT 34950.1.1 Parcel 17

Lab Sample No: 926413873 Project Sample Number: 92108866-003 Date Collected: 12/01/05 17:15
Client Sample ID: 17-7 (8-10) Matrix: Soil Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	12.2	%		12/07/05 09:45	KBM			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	47.	mg/kg	5.7	12/12/05 17:51	KBS	68334-30-5		
n-Pentacosane (S)	85	%		12/12/05 17:51	KBS	629-99-2		
Date Extracted	12/07/05			12/07/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	50.	mg/kg	4.0	12/09/05 20:35	DHW			
4-Bromofluorobenzene (S)	118	%		12/09/05 20:35	DHW	460-00-4		

Date: 12/19/05

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Lab Project Number: 92108866
Client Project ID: NCDOT 34950.1.1 Parcel 17

Lab Sample No: 926413881 Project Sample Number: 92108866-004 Date Collected: 12/01/05 17:20
Client Sample ID: 17-8 (6-8) Matrix: Soil Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	12.2	%		12/07/05 19:39	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	5.7	12/12/05 21:20	KBS	68334-30-5		
n-Pentacosane (S)	105	%		12/12/05 21:20	KBS	629-99-2		
Date Extracted	12/07/05			12/07/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	ND	mg/kg	3.9	12/09/05 21:03	DHW			
4-Bromofluorobenzene (S)	112	%		12/09/05 21:03	DHW	460-00-4		

Date: 12/19/05

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Lab Project Number: 92108866
Client Project ID: NCDOT 34950.1.1 Parcel 17

Lab Sample No: 926413899
Client Sample ID: 17-11(8-10)

Project Sample Number: 92108866-005
Matrix: Soil

Date Collected: 12/01/05 17:20
Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	14.8	%		12/07/05 19:40	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	25.	mg/kg	5.9	12/12/05 18:25	KBS	68334-30-5		
n-Pentacosane (S)	69	%		12/12/05 18:25	KBS	629-99-2		
Date Extracted	12/07/05			12/07/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	250	mg/kg	4.2	12/09/05 21:33	DHW			
4-Bromofluorobenzene (S)	264	%		12/09/05 21:33	DHW	460-00-4	1	

Date: 12/19/05

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Lab Project Number: 92108866
Client Project ID: NCDOT 34950.1.1 Parcel 17

Lab Sample No: 926413907
Client Sample ID: 17-12(8-10)

Project Sample Number: 92108866-006
Matrix: Soil

Date Collected: 12/01/05 17:25
Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	11.6	%		12/07/05 19:40	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	12.	mg/kg	5.7	12/13/05 13:28	KBS	68334-30-5		
n-Pentacosane (S)	113	%		12/13/05 13:28	KBS	629-99-2		
Date Extracted	12/07/05			12/07/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	120	mg/kg	4.0	12/09/05 22:02	DHW			
4-Bromofluorobenzene (S)	293	%		12/09/05 22:02	DHW	460-00-4	1	

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Lab Project Number: 92108866
Client Project ID: NCDOT 34950.1.1 Parcel 17

Lab Sample No: 926413915 Project Sample Number: 92108866-007 Date Collected: 12/01/05 17:25
Client Sample ID: 17-13(10-12) Matrix: Soil Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	12.1	%		12/07/05 19:40	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	ND	mg/kg	5.7	12/12/05 21:55	KBS	68334-30-5		
n-Pentacosane (S)	107	%		12/12/05 21:55	KBS	629-99-2		
Date Extracted	12/07/05			12/07/05				
GC Volatiles								
GAS, Soil, North Carolina	Method: EPA 8015							
Gasoline	11.	mg/kg	4.2	12/12/05 15:09	DHW			
4-Bromofluorobenzene (S)	125	%		12/12/05 15:09	DHW	460-00-4		

Date: 12/19/05

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Lab Project Number: 92108866
Client Project ID: NCDOT 34950.1.1 Parcel 17

Lab Sample No: 926413923
Client Sample ID: 17-14(6-8)

Project Sample Number: 92108866-008
Matrix: Soil

Date Collected: 12/01/05 17:30
Date Received: 12/06/05 17:00

Parameters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Wet Chemistry								
Percent Moisture	Method: % Moisture							
Percent Moisture	13.6	%		12/07/05 19:40	KDF			
GC Semivolatiles								
TPH in Soil by 3545/8015	Prep/Method: EPA 3545 / EPA 8015							
Diesel Fuel	13.	mg/kg	5.8	12/13/05 12:53	KBS	68334-30-5		
n-Pentacosane (S)	103	%		12/13/05 12:53	KBS	629-99-2		
Date Extracted	12/07/05			12/07/05				
GC Volatiles								
GRO, Soil, North Carolina	Method: EPA 8015							
Gasoline	6.5	mg/kg	4.4	12/12/05 14:40	DHW			
4-Bromofluorobenzene (S)	133	%		12/12/05 14:40	DHW	460-00-4		

Date: 12/19/05

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Lab Project Number: 92108866
Client Project ID: NCDOT 34950.1.1 Parcel 17

PARAMETER FOOTNOTES

Method 9071B modified to use ASE.

All pH, Free Chlorine, Total Chlorine and Ferrous Iron analyses conducted outside of EPA recommended immediate hold time.

Depending on the moisture content the PRLs can be elevated for all soil samples reported on a dry weight basis.

2-Chloroethyl vinyl ether has been shown to degrade in the presence of acid.

ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
(S)	Surrogate
[1]	The surrogate recovery was outside QC acceptance limits due to matrix interference.

Date: 12/19/05

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QUALITY CONTROL DATA

Lab Project Number: 92108866
Client Project ID: NCDOT 34950.1.1 Parcel 17

QC Batch: 144509
QC Batch Method: EPA 3545
Analysis Method: EPA 8015
Analysis Description: TPH in Soil by 3545/8015
Associated Lab Samples: 926413790 926413808 926413873 926413881 926413899 926413907 926413915 926413923

METHOD BLANK: 926420845
Associated Lab Samples: 926413790 926413808 926413873 926413881 926413899 926413907 926413915 926413923

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Diesel Fuel	mg/kg	ND	5.0	
n-Pentacosane (S)	%	110		

LABORATORY CONTROL SAMPLE: 926420852

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Diesel Fuel	mg/kg	166.70	155.0	93	
n-Pentacosane (S)				139	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 926420860 926420878

Parameter	Units	926413717 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
Diesel Fuel	mg/kg	22.46	189.70	184.6	178.1	86	82	4	
n-Pentacosane (S)						132	127		

Date: 12/19/05

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QUALITY CONTROL DATA

Lab Project Number: 92108866
Client Project ID: NCDOT 34950.1.1 Parcel 17

QC Batch: 144577
QC Batch Method: EPA 8015
Analysis Method: EPA 8015
Analysis Description: GAS, Soil, North Carolina
Associated Lab Samples: 926413790 926413808 926413873 926413881 926413899 926413907 926413915 926413923

METHOD BLANK: 926423732
Associated Lab Samples: 926413790 926413808 926413873 926413881 926413899 926413907 926413915 926413923

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Gasoline	mg/kg	ND	5.0	
4-Bromofluorobenzene (S)	%	82		

LABORATORY CONTROL SAMPLE: 926423740

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
Gasoline	mg/kg	25.00	26.21	105	
4-Bromofluorobenzene (S)				86	

MATRIX SPIKE: 926430505

Parameter	Units	926413683 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
Gasoline	mg/kg	1.036	20.12	21.88	104	
4-Bromofluorobenzene (S)					86	

SAMPLE DUPLICATE: 926423765

Parameter	Units	926413808 Result	DUP Result	RPD	Footnotes
Gasoline	mg/kg	590.0	600.0	0	
4-Bromofluorobenzene (S)	%	112	105		

Date: 12/19/05

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QUALITY CONTROL DATA

Lab Project Number: 92108866
Client Project ID: NCDOT 34950.1.1 Parcel 17

QC Batch: 144433
Analysis Method: % Moisture
QC Batch Method:
Analysis Description: Percent Moisture
Associated Lab Samples: 926413790 926413808 926413873

SAMPLE DUPLICATE: 926415035

Parameter	Units	926409780 Result	DUP Result	RPD	Footnotes
Percent Moisture	%	10.00	12.10	19	

Date: 12/19/05

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QUALITY CONTROL DATA

Lab Project Number: 92108866
Client Project ID: NCDOT 34950.1.1 Parcel 17

QC Batch: 144510
Analysis Method: % Moisture
QC Batch Method:
Analysis Description: Percent Moisture
Associated Lab Samples: 926413881 926413899 926413907 926413915 926413923

SAMPLE DUPLICATE: 926421223

Parameter	Units	926417403 Result	DUP Result	RPD	Footnotes
Percent Moisture	%	9.100	9.100	0	

Date: 12/19/05

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Lab Project Number: 92108866
Client Project ID: NCDOT 34950.1.1 Parcel 17

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

LCS(D)	Laboratory Control Sample (Duplicate)
MS(D)	Matrix Spike (Duplicate)
DUP	Sample Duplicate
ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
RPD	Relative Percent Difference
(S)	Surrogate

Date: 12/19/05

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Page: 1 of 1

897907

Section A
Required Client Information:

Company	
Address	
Email To:	
Phone	Fax
Requested Due Date/TAT:	

Section B
Required Project Information:

Report To:	
Copy To:	
Purchase Order No.:	
Project Name:	
Project Number:	

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☒ UST ☐ RCRA ☐ Other _____

SITE LOCATION ☐ GA ☐ IL ☐ IN ☐ MI ☐ MN ☐ NC ☐ OH ☐ SC ☐ WI ☐ OTHER _____

Section D
Required Client Information

SAMPLE ID

One Character per box.
(A-Z, 0-9 / ,-)
Samples IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	MATRIX CODE	SAMPLE TYPE G=GRAB C=COMP	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Filtered (Y/N)	Requested Analysis:	Residual Chlorine (Y/N)	Pace Project Number / Lab I.D
1																				
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

Additional Comments:

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME

SAMPLE CONDITION

Temp in °C	Received on Ice Y/N	Custody Sealed Cooler Y/N	Samples Intact Y/N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM / DD / YY)

SEE REVERSE SIDE FOR INSTRUCTIONS