

R E P O R T

PRELIMINARY SITE ASSESSMENT MABEL L. CHILTON PROPERTY GUILFORD COUNTY, NORTH CAROLINA

STATE PROJECT: 6.498003T
(TIP: U-2525B)

Prepared for
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1.1 PROJECT INTRODUCTION AND ORGANIZATION

This report documents a Preliminary Site Assessment (PSA) for the NCDOT Parcel 948 performed by URS Corporation – Maryland (URS) on behalf of the North Carolina Department of Transportation (NCDOT). The subject site of this PSA report is 5009 Summit Avenue, the west side of SR 2525 Guilford County, North Carolina. The NCDOT Parcel is currently the property of Mabel L. Chilton (see Figure 1). The PSA was performed in general accordance with: NCDOT's January 25, 2001 *Request for Technical and Cost Proposal for Preliminary Site Assessment, Parcel 948 – Mabel L. Chilton Property (Former L.R. Chilton Grocery)*; and URS's February 2, 2001 *Technical and Cost Proposal for Preliminary Site Assessment, Greensboro Eastern Loop, from US 70 Relocation to US 29 North of Greensboro; Parcel 948 – Mabel L. Chilton Property (Former L.R. Chilton Grocery)* (the Proposal). URS received a letter dated February 5, 2001 from NCDOT providing Notice To Proceed and establishing a due date no later than April 5, 2001 for the final PSA report.

The project included determination of UST content constituents, soil sampling using a Geoprobe rig, groundwater sampling for suspected contamination, and laboratory analyses of selected soil samples. The five UST's were located by the NCDOT. Soil borings were conducted on February 8th and 9th, 2001 under the supervision of URS personnel by URS's subcontractor, Probe Technology, Inc. of Concord, North Carolina. Analysis of soil samples were performed by Prism Laboratories, Inc. (Prism) of Charlotte, North Carolina under direct contract with NCDOT. URS's project manager, Lee Rhea, communicated any unforeseen conditions and project milestones to NCDOT via telephone and email during execution of the work scope.

1.2 PROJECT BACKGROUND

The location of the property is shown in Figure 1. The structure located on the subject property on the west side of State Route 2525, with the address 5009 Summit Avenue, is an abandoned gas station and grocery store. The business opened in the 1930's and the gas station operated until the early 1960's. There are five suspected UST's at the site, none of which are registered with the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Water Quality (DWQ). The structure seems to be in good condition, but according to the property owner has not been used in 15 years. Based on discussions with a neighbor, it was discovered that there is a water well on the property located north of the building, although URS was unable to locate it. The pump island is approximately 24 feet, or 7.32 meters (m), from the centerline of SR 2525.

The property is 0.15 miles (241 m) north of the Greensboro City Limits. There are several neighborhoods surrounding the property. Most of the surrounding houses use drinking water wells and are not supplied by city water, according to the neighbors. The area directly west of the property is a wooded area with no houses. The lot across to the east, across Summit Avenue, is also a wooded lot. There is a Texaco Gas Station 0.3 miles (483 m) north of the property on Summit Avenue.

2.1 TANK SAMPLING

NCDOT performed a Ground Penetrating Radar (GPR) survey to determine the approximate sizes of the five suspected UST's. Based on the GPR survey results, tanks #4 and #5 each have an approximate diameter of three feet and Tanks #2 and #3 each have an approximate diameter of four feet. The size of Tank #1 could not be determined.

URS made an attempt to collect samples from each of the UST's. However, URS located only three vents, and only those for Tanks #2 and #3 were reasonably accessible (see Figure 3). These tanks were sampled using disposable bailers. It was discovered that Tank #3 was completely empty, and Tank #2 contained approximately two inches of water with a trace of product.

2.2 SOIL SAMPLING RATIONALE AND PROCEDURES

URS conducted environmental screening sampling in targeted areas within the property to identify whether the subsurface had been impacted by potential contaminants. Initial sampling locations were selected based on existing information provided by the NCDOT and the locations of the UST's. Additional borings were conducted to delineate the extent of impact where evidence of significant petroleum impacts was encountered.

Soil samples were collected and logged continuously at each boring. Soil sample aliquots were divided into approximately 2-foot (0.610 m) increments for field screening with a photo-ionization detection (PID) and flame ionization detection (FID) instrument. However, due to difficulties with the FID as described below, it was not used for screening all borings. Groundwater was encountered in two of the borings, but the subsurface material was too impermeable to collect a representative groundwater sample. Completed borings were back-filled with bentonite pellets.

The soil field-screening instrument selected for this project was a Foxboro TVA with both flame-ionization detection (FID) and photo-ionization detection (PID) capabilities. However, the FID portion of the unit malfunctioned, and was completely unusable for three out of the fourteen borings completed. Therefore, borings GP-7, GP-13, and GP-14 were screened using only the PID.

Samples were collected for laboratory analysis in borings where headspace field screening analysis indicated possible impact. If impact was indicated at more than one depth, vertical delineation samples were collected from the zone with the highest headspace detection, the lowest headspace detection, and in most cases from the bottom of the boring. Each sample was analyzed for TPH Diesel Range Organics (DRO) (EPA Method 8015 mod./3550), TPH Gasoline Range Organics (GRO) (EPA Method 8015 mod./5030), and oil and grease (EPA Method 9071).

2.2.1 Quality Control/Quality Assurance Procedures

2.2.1.1 Sample Documentation and Labeling

The purpose of sample management is to create a “cradle to grave”, legally defensible, traceable and documented chain-of-custody (COC) for samples from the time of collection in the field through shipment, receipt by the laboratory, and final receipt of analytical data by URS. A copy of the COC forms for samples submitted for off-site commercial laboratory analyses has been maintained by the laboratory as part of the data package, and by URS in the project files.

In the field, data was collected on standard boring logs as well as in a logbook maintained by the URS field representative. All pertinent field data collection activities and observations were recorded on either of these two media. In addition, field sketches have been made in the field logbooks when appropriate, with reference points tied to existing structures in the area (i.e. buildings). The field logbook and supporting boring log forms are identified by a project-specific number, client, and location, and are stored in the field project files when not in use.

2.2.1.2 Sample Identification and Labeling

Each sample collected was assigned a unique sample identification number and placed in the appropriate sample container. The sample numbering system provides a tracking number to allow retrieval and cross-referencing of sample information. Each sample container had a pre-printed sample label affixed to the outside with the site name, type of sample the sample identification number, and chemical preservatives added, if any. All documentation was completed in waterproof ink.

2.2.1.3 Sample Containers

URS collected samples for off-site commercial laboratory analyses in containers appropriate for the matrix being sampled and the parameters being analyzed. URS acquired commercially cleaned (to United States Environmental Protection Agency standards) sample containers from the analytical laboratory.

2.2.1.4 Sample Preservation and Holding Times

Sample preservation efforts commenced at the time of sample collection and continued until analyses were performed. Samples collected for laboratory analyses were stored on ice in insulated coolers immediately following collection. Where appropriate, sample preservatives were included in sample containers supplied by the laboratory.

2.2.1.5 Chain of Custody Protocol

URS has established a program of sample COC that was followed during sample handling activities in both field and laboratory operations. The primary purpose of COC procedures is to document the possession of the samples from collection through shipping, storage, analysis, data reporting, and disposal. The Project Manager or his/her designee has been responsible for monitoring compliance with COC procedures.

During field sampling activities, traceability of the sample was maintained from the time the samples were collected until laboratory data were issued. Initial information concerning collection of the samples was recorded in the field logbook. Information on the custody, transfer, handling, and shipping of all samples was recorded on a COC form.

The sampler was responsible for filling out the COC form initiated by the laboratory. The field team members were responsible for the care and custody of the samples collected until the samples were received at the laboratory. When transferring custody of the samples, the individual who relinquished custody of the samples had verified sample numbers and condition and would document the sample acquisition and transfer by signing, with date and time, the COC. Each cooler was hand delivered to the laboratory accompanied by a COC form.

2.2.2 Management of Investigation Derived Waste

Minimal investigative waste is generated when the Geoprobe direct push methodology is used. Soil from the Geoprobe borings that was not used as sample material was spread on the ground surface after field screening results in accordance with the Proposal. No containerized waste was generated during this investigation.

3.1 REGIONAL CONDITIONS

According to the United States Department of Agriculture Soil Conservation Service's December 1977 *Soil Survey of Guilford County, North Carolina*, overburden soils in the Site vicinity are classified as within the Enon-Mecklenburg (EoB2) and Cecil-Madison (CeB2) associations. Both of these soil associations are described as gently sloping and sloping, well-drained surficial soils with a loamy or clayey subsoil.

The Enon soils have a three inch thick surface layer of dark grayish brown fine sandy loam. The subsurface soil is about five inches thick and consists of yellowish brown fine sandy loam. The underlying subsoil is 25 inches thick, with the upper part consisting of a light olive brown sandy clay loam, and the lower part a yellowish brown clay. The underlying material, to a depth of 75 inches, is mottled brownish yellow, black, and dark greenish gray loam. Enon soils are described as being well drained.

The Mecklenburg soils are described as having a surface layer three inches thick that is a dark, grayish brown fine sandy loam. The subsoil is 31 inches thick and is composed of an upper mottled yellowish red and red clay and a lower yellowish red clay loam. The underlying material, to a depth of 70 inches, is mottled red and brownish yellow silty clay loam. Mecklenburg soils are also well drained.

The Cecil soils have a six inch thick brown sandy loam surface layer. The subsoil is 46 inches thick, with the upper part consisting of a yellowish red sandy clay loam, the middle part a red clay, and the lower part a mottled red clay loam. The underlying material to a depth of 85 inches is mottled red and yellow loam. Cecil soils are well drained.

The Madison soils are composed of a surface layer that is reddish brown sandy loam about five inches thick. The subsoil is 29 inches thick, with the upper part consisting of red clay and the lower part of mottled red clay loam. The underlying material, to a depth of 80 inches, is mottled reddish yellow sandy clay loam in the upper part and mottled reddish yellow sandy loam in the lower part. Madison soils are also well drained.

According to the North Carolina Geological Survey's 1985 *Geologic Map of North Carolina*, the site region is located within the Carolina Slate Belt. Bedrock in this region consists predominantly of well foliated, megacrystic, metamorphosed granite rock that locally contains hornblende (late Proterozoic to late Cambrian).

3.2 SITE CONDITIONS

Boring logs for the PSA Geoprobe explorations are provided in Appendix B. Borings GP-1 through GP-14 were performed at the NCDOT Parcel 948, 5009 Summit Avenue. Geoprobe borings were conducted at locations surrounding the UST's and at or near the property boundaries. The number of sampling locations was based on NCDOT's request to screen this area and does not necessarily reflect NCDEHR guidelines for UST investigations. Figure 3 shows the boring locations at this property. Boring depths ranged from 16 to 39 feet (4.88 to

SECTION THREE

Geological/Hydrogeological Conditions

11.9 m). Groundwater was detected in GP-1 and GP-3 at approximately 31.5 feet (9.61 m), but URS determined there was not enough water present to collect a groundwater sample.

The primary soil in the area was a clayey silt to silt with clayey saprolite. Resistance increased with depth in the saprolite, reaching effective refusal at depths from 23.5 to 39 feet (7.17 to 11.9 m) below the ground surface.

Geoprobe borings were first conducted south of the pump island, in the area of Tanks #2, #4, and #5. Initially, six borings designated GP-6 through GP-11 were selected to delineate the impacted area. Native soil (saprolite) was encountered in each boring. There was little resistance in the first 4-foot increment of GP-6, where an apparent void was encountered. The Geoprobe then encountered increasing resistance with depth and finally encountered refusal at 39 feet (11.9 m) below the ground surface (BGS). Borings GP-7 through GP-11 all hit refusal between 29.5 to 35 feet (9.00 to 10.68 m) BGS. Elevated headspace readings occurred during the field screening and strong petroleum odors were noted for each boring. Three soil samples were collected from GP-6, one from GP-7, two from GP-8, two from GP-9, three from GP-10, and one from GP-11.

GP-12 was placed approximately 30 feet (9.15 m) south of GP-10. Based on field screening results, the soil at this location also appeared to be impacted. Three soil samples were collected from GP-12. GP-14 was placed approximately 10 feet (3.05 m) west and 8 feet (2.44 m) south of the porch attached to the south end of the structure. GP-14 was advanced to 28 feet (8.54 m) BGS, but no samples were taken because no odors or elevated headspace results were detected.

Five borings were placed around Tanks #1 and #3. No obvious location for a former excavation was evident. In this area, groundwater was detected at GP-1 and GP-3 at approximately 31.5 feet (9.61 m) BGS. The Geoprobe encountered refusal at 31.5 feet (9.61 m) BGS at GP-4 and at 29 feet (8.85 m) BGS at GP-5, with no indications of the groundwater table. GP-1 was placed approximately 2 feet (0.610 m) north of Tank #1 and 6.25 feet (1.91 m) east of the building. GP-3 was located north of Tank #3 and east of Tank #1. GP-4 was placed approximately 8 feet (2.44 m) east of the former pump island. GP-5 was located adjacent to the former pump island. Petroleum odors were noted and elevated headspace reading occurred in all four boring locations. Two samples were collected from GP-1, two from GP-3, one from GP-4, and three from GP-5. GP-2 was placed approximately 2 feet (0.610 m) east of the building, south of Tank #1. GP-2 was advanced to 16 feet (4.88 m) BGS and no odors or signs of impacted soil were detected; therefore the boring was stopped. Upon further screening, the PID/FID detected elevated headspace readings, and two samples were taken from GP-2.

GP-13 was placed 36 feet (11.0 m) north of the former pump island, near the north edge of the property boundary. GP-13 was advanced to 30 feet (9.15 m) BGS into the saprolite. Because GP-13 yielded significantly lower field screening results in comparison to other borings, only one sample was collected.

All samples collected from the facility were sent to the contract laboratory and the analytical results are documented in Table 1 of this report. The complete laboratory report is included in Appendix C.

Fourteen borings were completed and 27 samples were collected at the Mabel L. Chilton Property. Out of the 27 samples collected, 23 exceeded the NCDENR Groundwater Section “Action Level” or TPH clean-up standard¹. Borings GP-5, GP-7 and GP-9 were among the highest reported results from the soil samples, indicating they were nearest to the source area. At the northern portion of the property, GP-13 did detect minor amounts of TPH, but not above the reportable quantity. This appears to be the extent of the impacted soil on the north side of the property. GP-12 had two sample depths, at 8 and 23.5 feet (2.44 and 7.16 m), that reported below the reportable quantities for TPH, and a third from a depth of 14 feet (4.27 m) reported above the Action Level for Oil and Grease. This indicates the impacted soil is nearing the edge of extent. See Figure 3 for the suspected dimensions of the plume.

4.1 CALCULATION OF IMPACTED SOIL

Borings GP-12, GP-13, and GP-14 were placed at the south, north, and southwest edges of the property boundary. GP-12, at the south edge, and GP-13, at the north edge, were both slightly impacted. This is most likely an indication of the north and south horizontal extent of impact. GP-14, at the southwest corner, does not appear to have any impact from the contaminated source area. No borings were placed inside the footprint of the structure or in the empty wooded lot across Summit Avenue, therefore the east and west horizontal delineation has not been determined. Based upon the available field screening and laboratory analysis, however, URS estimates there are approximately 3,212 tons of impacted beneath the Mabel L. Chilton Property (see Appendix D). Actual tonnage may vary due to uncertainty of the extent of impact to soil beneath the structure and Summit Avenue.

4.2 WELL SURVEY

Due to the likelihood of soil contamination on-site, URS conducted a well survey within a 1,500-foot (457 m) radius of the site (see Figure 4). The Mabel L. Chilton Property is approximately 0.15 mile (241 m) north the Greensboro City Limit. The property is bordered by wooded areas to the west, northwest and southwest. The property is mainly surrounded by residential neighborhoods. There are rows of houses north and south of the property. Across Summit Avenue to the northeast, Pindals Road has about a dozen houses on the south side of the dead end street and is wooded on the north side of the street. From discussions with the neighbors, most of the surrounding houses have drinking water wells. It was not determined if the neighborhoods south of the Greensboro City Limit are connected to city water or have drinking water wells. There is a Texaco Gas Station near the intersection of Hicone Road and Summit Avenue and a BBQ Restaurant on the corner of Pineneedle Drive and Summit Avenue.

¹ NCDENR Division of Water Quality, Groundwater Section. October 4, 1999 Memorandum to Environmental Service Companies, Consultants, and other interested parties, entitled: Revised Policy for Soil Analytical Methods.

PSA field observations and laboratory analytical results of soil samples indicate significant petroleum hydrocarbon contamination exists in on-site soils. Based on the available data for soils and the inferred groundwater flow direction in the area, it is possible that petroleum hydrocarbon contamination could exist in groundwater, and could have migrated south and east of the property.

Petroleum hydrocarbons in the soil have apparently migrated down to the water table and have likely contaminated groundwater. URS estimates the volume of impacted soils on-site to be approximately 3,212 tons (Appendix D). This estimation does not include any possible off-site contamination.

Tables

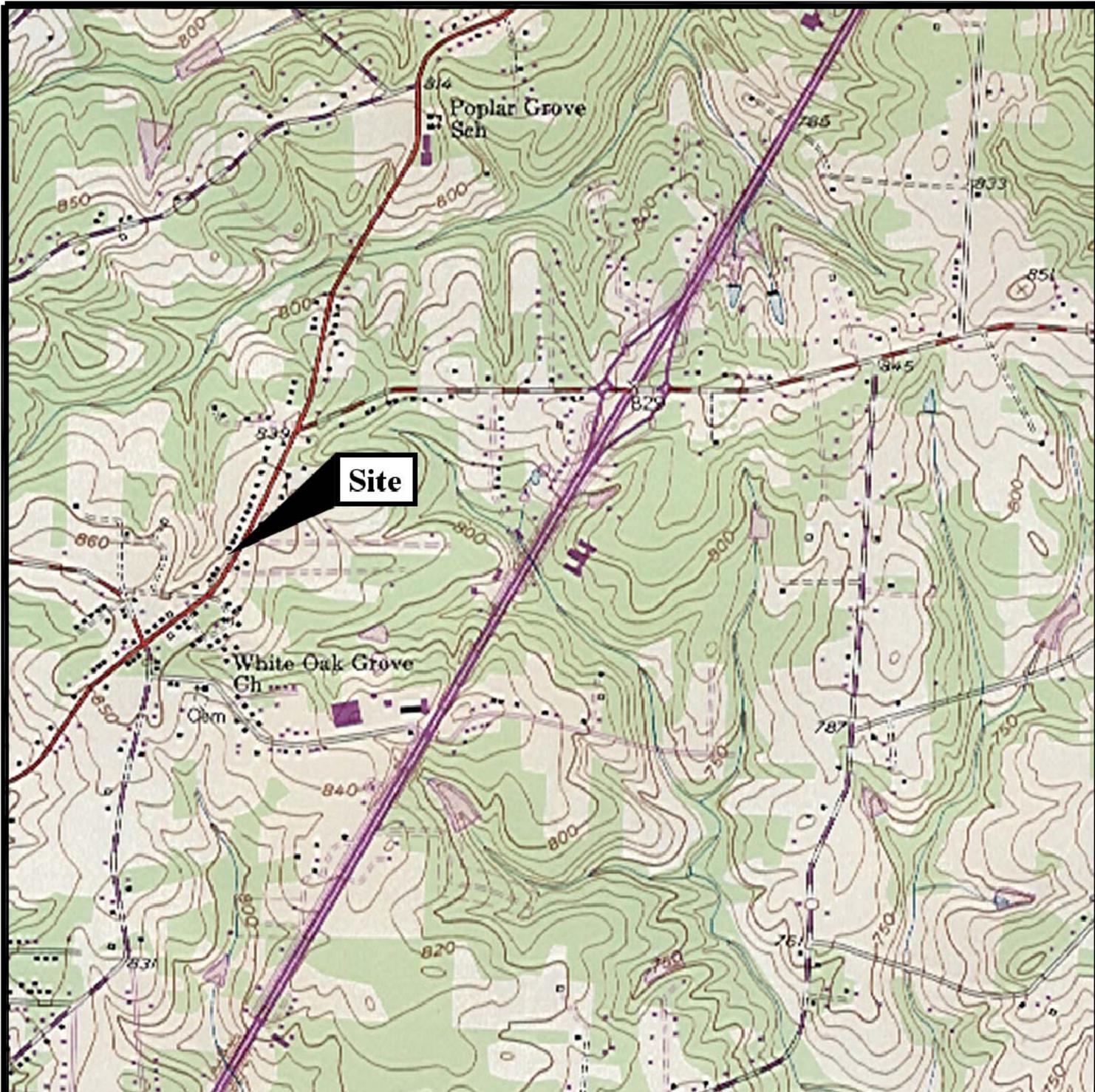
TABLE 1
SOIL LABORATORY ANALYTICAL RESULTS
NCDOT PARCEL 948 - MABEL L. CHILTON PROPERTY
GUILFORD COUNTY, NORTH CAROLINA
NCDOT PROJECT 8.1690303
(TIP: R-2616 AA)

Analysis	UNITS	Petroleum Hydrocarbons		
		GRO	DRO	Oil and Grease
STANDARDS				
Reportable Quantity	mg/kg	10	10	250
TPH Action Level	mg/kg	10	40	250
Soil-To-Groundwater	mg/kg	NE	NE	NE
Remediation Goal	mg/kg	NE	NE	NE
ANALYTICAL RESULTS				
GP-1-4	mg/kg	<1.0	<10	320
GP-1-16	mg/kg	<1.0	<10	260
GP-1-31	mg/kg	14	<10	320
GP-2-4	mg/kg	<1.0	<10	380
GP-2-14	mg/kg	<1.0	<10	450
GP-3-4	mg/kg	90	120	280
GP-3-28	mg/kg	210	<10	210
GP-4-30	mg/kg	420	<10	330
GP-5-8	mg/kg	61	<10	450
GP-5-16	mg/kg	6000	64	520
GP-5-29	mg/kg	2500	35	360
GP-6-4	mg/kg	<1.0	<10	320
GP-6-20	mg/kg	4.4	<10	220
GP-6-39	mg/kg	1200	<10	260
GP-7-20	mg/kg	20000	220	330
GP-8-2	mg/kg	<1.0	<10	170
GP-8-31.5	mg/kg	42	34	330
GP-9-4	mg/kg	<1.0	<10	260
GP-9-28	mg/kg	2500	81	280
GP-10-8	mg/kg	17	27	410
GP-10-18	mg/kg	22	350	1300
GP-10-32	mg/kg	230	15	350
GP-11-28	mg/kg	780	<10	440
GP-12-8	mg/kg	<1.0	<10	120
GP-12-14	mg/kg	1.2	<10	730
GP-12-23.5	mg/kg	2.5	<10	130
GP-13-20	mg/kg	7.2	<10	150

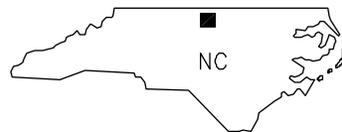
NOTES:

1. Soil samples were collected by Probe Technology of Concord, NC under the supervision of URS on 2-9-01 and submitted by URS under chain-of-custody protocols to Prism Laboratories, Inc. of Charlotte, NC for analyses.
2. Results for selected analytes are shown; see Appendix B for a full listing of results.
3. "<" denotes a non-detection (the detection limit follows).
4. "()" denotes an aqueous concentration.
5. STANDARDS are taken from guidance provided by the North Carolina Department of Environment and Natural Resources (NCDENR), including the Oct. 4, 1999 Division of Water Quality, Groundwater Section memorandum to environmental service companies, consultants and other interested parties entitled: Revised Policy for Soil Analytical Methods the Jan. 2, 1998 Guidelines for the Investigation and Remediation of Soil and Groundwater, Volume II; and the NCDENR Division of Waste Management, Superfund Section, Inactive Hazardous Sites Branch Aug. 1996 Guidelines for Assessment and Cleanup
6. "NE" - Not established

Figures



References:
 BROWNS SUMMIT, NC
 N3607.5-W7937.5/7.5
 1951
 PHOTOREVISED 1968
 AMS 5056 II NW-SERIES V842



QUADRANGLE LOCATION



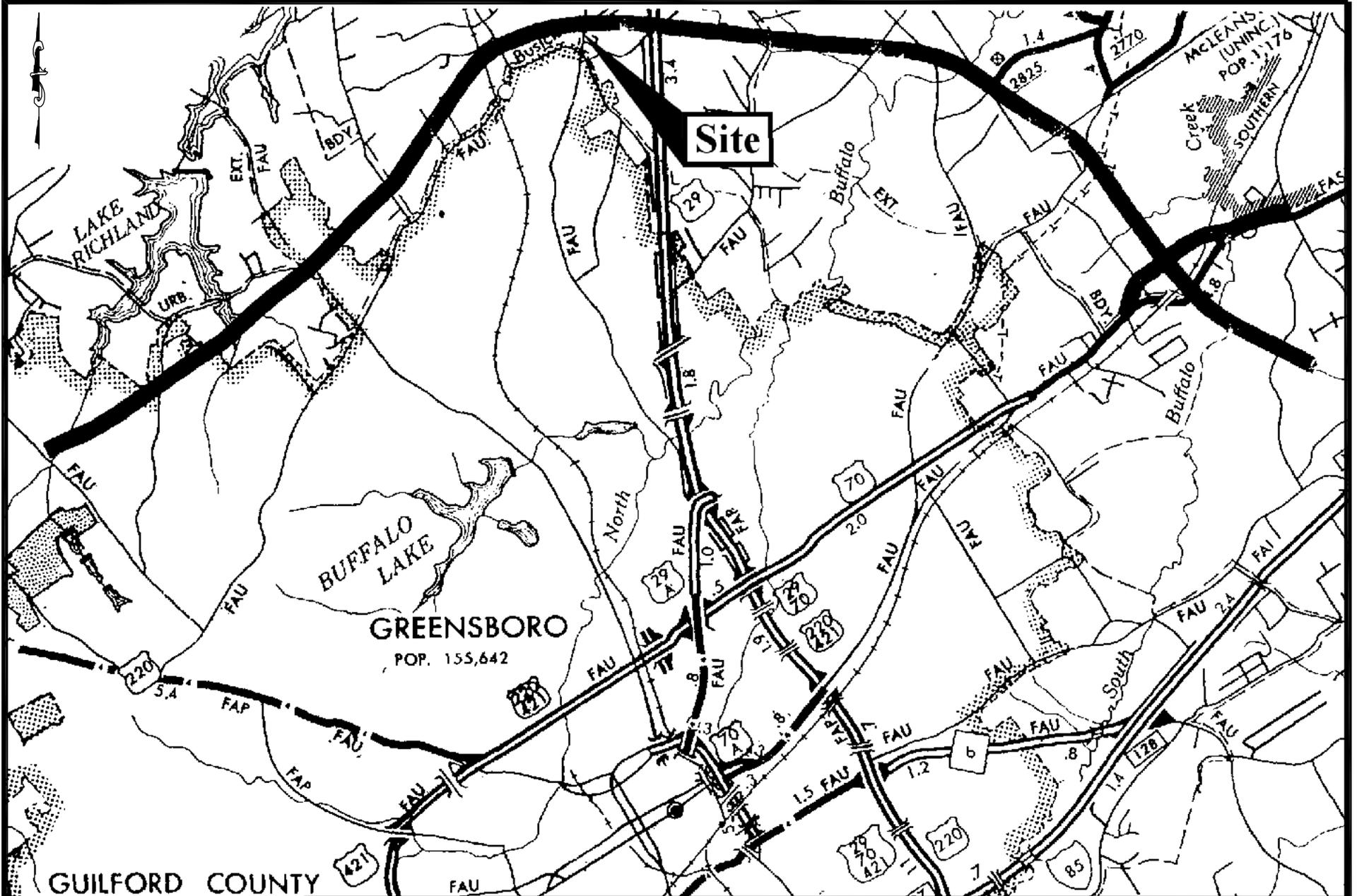
URS
 URS Corporation

CLIENT: NCDOT
 LOCATION: Guilford County, NC

PROJECT No. DATE: MARCH 29, 2001
 D6-00055146.05 CHK'D. LKR
 SCALE: 1" = 1000'

SITE LOCATION MAP

FIGURE: 1



GUILFORD COUNTY

GREENSBORO
POP. 155,642

Site

URS

URS Corporation

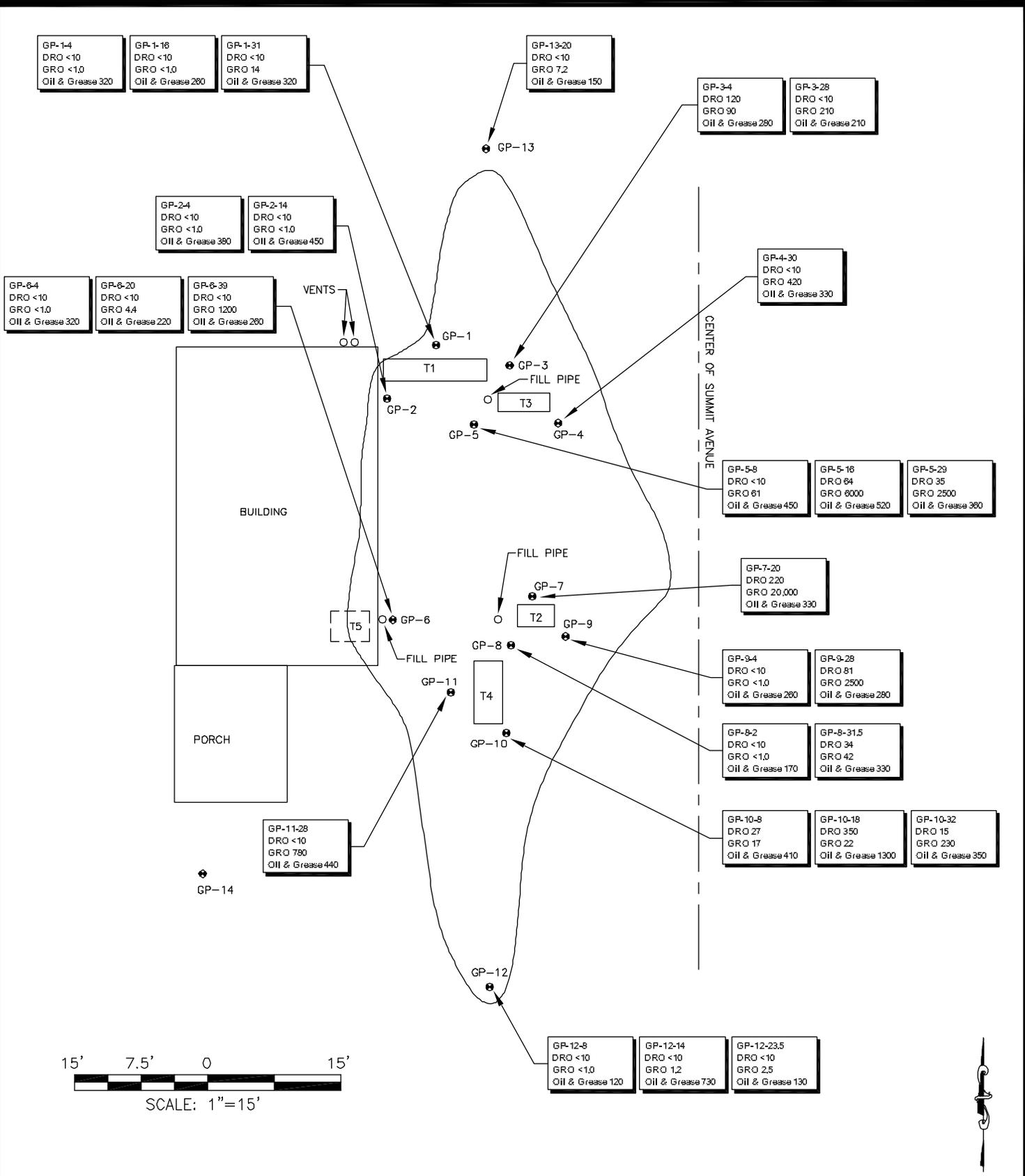
PROJECT No. D6-00055146.05	DATE: MARCH 29, 2001 CHK'D. LKR
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SCALE: N.T.S.

CLIENT: NCDOT
LOCATION: Guilford County, NC

GREENSBORO EASTERN LOOP

FIGURE: 2



S:\2000\55146\55146.05 - Guilford (Mabel L. Chilton)\fig.3.dwg



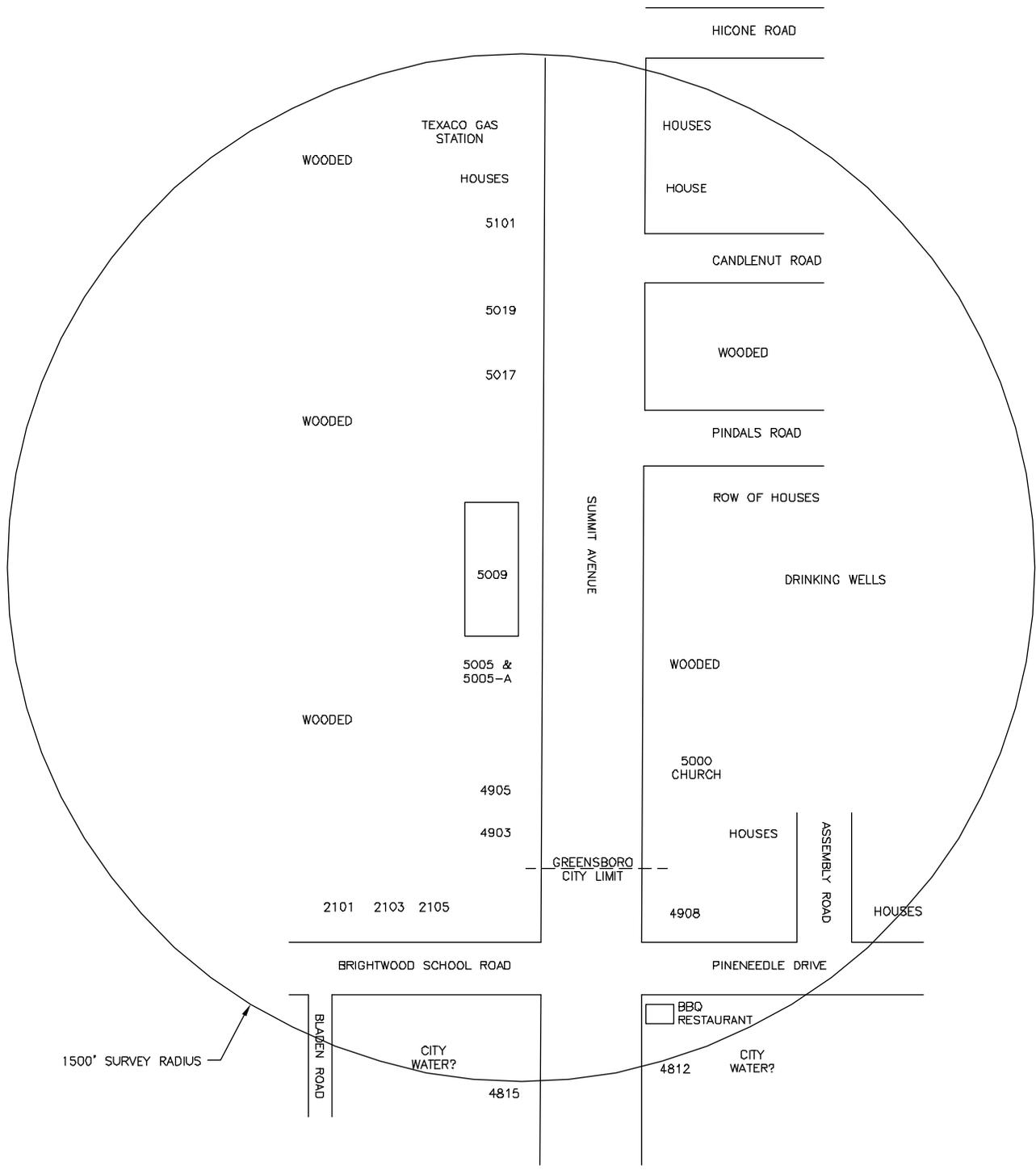
CLIENT: NCDOT
LOCATION: Guilford County, NC

PROJECT No. D6-00055146.05
DATE: MARCH 29, 2001
CHK'D. LKR
SCALE: AS SHOWN

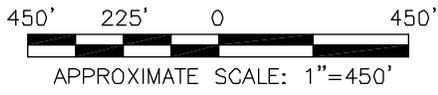
EXTENT OF INVESTIGATION
SOIL BORING LOCATIONS

FIGURE: 3

S:\2000\551146\551146.05 - Guilford (Mabel L. Chilton)\fig4.dwg



1500' SURVEY RADIUS



		CLIENT: NCDOT LOCATION: Guilford County, NC	
		1,500' RADIUS WELL SURVEY	
PROJECT No. D6-00055146.05	DATE: MARCH 29, 2001 CHK'D. LKR	FIGURE: 4	
SCALE: N.T.S.			

Appendix A
Photo Documentation

Appendix B
Boring Logs

Locations	Distance
GP-1	2 ft north of T1, 6.25 ft east of building
GP-2	2 ft south of T1, 1.5 ft east of building
GP-3	3 ft north of T3, 14.5 ft east of building
GP-4	2 ft south of T3, 19.5 ft east of building
GP-5	5 ft south of T1, 12 ft east of building
GP-6	2 ft east of T5 fillport
GP-7	2 ft north of T2, 18 ft east of building
GP-8	3.5 ft south of T2, 16.5 ft east of building
GP-9	2 ft east-southeast of T2, 22 ft east of building
GP-10	17 ft south of pump island, 2 ft southeast of T4
GP-11	11.5 ft south of pump island, 10.5 ft east of building
GP-12	30 ft south of T4
GP-13	36 ft north of pump island
GP-14	From porch on southend of building, 8 ft south, 10 ft west

**APPENDIX C
BORING LOCATION DATA
GUILFORD COUNTY, NORTH CAROLINA
NCDOT PROJECT
(TIP: U-2525B)**

DEPTH	PEN.	REC.	DESCRIPTION	PID Max	FID Max	Sample ID
BORING GP-1						
0 to 1	3.8	2.8	6" of gravel and topsoil.			
1 to 2						
2 to 3			Dry, red clayey SILT, with some saprolite.			
3 to 4				76	440	GP-1-4
4 to 5	3.8	3.6	Same			
5 to 6				47	135	
6 to 7						
7 to 8				61	228	No Odor
8 to 9	3.8	3.1	Same			
9 to 10				120	680	
10 to 11						
11 to 12				80	400	No Odor
12 to 13	3.8	3.6	Same			
13 to 14				133	760	
14 to 15			Slightly moist, red clayey SILT, with saprolite.			Trace Odors
15 to 16				68	82	GP-1-16
16 to 17	3.8	3.6	Same			
17 to 18				90	400	
18 to 19			Same			
19 to 20				160	720	Odor
20 to 21	3.8	3.2	Dry, tan and white saprolite.			
21 to 22				123	724	
22 to 23			Same			
23 to 24				98	530	Odor
24 to 25	3.8	3.3	Dry, tan, brown and white saprolite.			
25 to 26				95	280	
26 to 27			Same, becoming slightly moist.			
27 to 28				108	622	Odor
28 to 29	3.3	3.3	Same			
29 to 30				120	740	Odor
30 to 31						
31 to 32			Groundwater @ 31.5' End of Boring	350	2400	Odor

NOTES:

1. Geoprobe explorations were completed on 2/9/01 by Mike Tynan (Probe Technology, Inc. of Concord, NC) using a Geoprobe rig under the supervision of Corlista Urtz (URS). Sampling was performed using an acetate-lined four-foot long steel sampler.
2. Field Photo Ionization Detector (PID) and Flame Ionization Detector (FID) screening was performed using a Foxboro Total Vapor Analyzer (TVA).
3. All penetration, recovery, and depth measurements are expressed in units of feet; PID and FID measurements are expressed as parts per million relative to isobutylene and methane standards.
4. Groundwater was encountered at 31.5'. Boring backfilled with granular bentonite.
5. ND indicates No Detection.

**APPENDIX C
BORING LOCATION DATA
GUILFORD COUNTY, NORTH CAROLINA
NCDOT PROJECT
(TIP: U-2525B)**

DEPTH	PEN.	REC.	DESCRIPTION	PID Max	FID Max	Sample ID
BORING GP-2						
0 to 1	3.8	1.0	6" gravel and topsoil			
1 to 2						
2 to 3			Slightly moist, red clayey SILT.			No Odor
3 to 4						GP-2-4
4 to 5	3.8	3.8	Slightly moist, red clayey SILT, with saprolite.			
5 to 6				200	>900	
6 to 7						
7 to 8				24	35	No Odor
8 to 9	3.8	3.2	Same			
9 to 10				20	22	
10 to 11						
11 to 12				20	101	No Odor
12 to 13	3.8	3.8	Same			
13 to 14				53	210	GP-2-14
14 to 15						
15 to 16				69	283	No Odor
			End of Boring			

NOTES:

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2. Field Photo Ionization Detector (PID) and Flame Ionization Detector (FID) screening was performed using a Foxboro Total Vapor Analyzer (TVA).
3. All penetration, recovery, and depth measurements are expressed in units of feet; PID and FID measurements are expressed as parts per million relative to isobutylene and methane standards.
4. No groundwater was encountered. Boring backfilled with granular bentonite.
5. ND indicates No Detection.

**APPENDIX C
BORING LOCATION DATA
GUILFORD COUNTY, NORTH CAROLINA
NCDOT PROJECT
(TIP: U-2525B)**

DEPTH	PEN.	REC.	DESCRIPTION	PID Max	FID Max	Sample ID	
BORING GP-3							
0 to 1	3.8	3.2	6" gravel and topsoil				
1 to 2			Dry, red clayey SILT, with saprolite.				
2 to 3						Trace Odors	
3 to 4				32	8	GP-3-4	
4 to 5	3.8	3.5	Same				
5 to 6					52	203	
6 to 7							
7 to 8			Dry, tan and white clayey SILT, with saprolite.	145	1200	Odors	
8 to 9	3.8	3.8	Same				
9 to 10					175	806	
10 to 11							
11 to 12				180	844	Odors	
12 to 13	3.8	3.8	Same				
13 to 14					125	632	
14 to 15							
15 to 16				110	450	Odors	
16 to 17	3.8	3.7	Same				
17 to 18					102	366	
18 to 19							
19 to 20				32	135	Odors	
20 to 21	3.8	3.5	Same				
21 to 22					72	133	
22 to 23							
23 to 24				58	112	Odors	
24 to 25	3.8	3.5	Same				
25 to 26					42	98	
26 to 27							Odors
27 to 28				49	105	GP-3-28	
28 to 29	3.3	3.3	Same				
29 to 30							
30 to 31					Slightly moist, white saprolite.	54	110
31 to 32			Groundwater @ 31.5' End of Boring				

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4. Groundwater was encountered at 31.5'. Boring backfilled with granular bentonite.
5. ND indicates No Detection.

**APPENDIX C
BORING LOCATION DATA
GUILFORD COUNTY, NORTH CAROLINA
NCDOT PROJECT
(TIP: U-2525B)**

DEPTH	PEN.	REC.	DESCRIPTION	PID Max	FID Max	Sample ID
BORING GP-4						
0 to 1	3.8	3.8	6" gravel and topsoil			
1 to 2			Dry, red-tan clayey SILT.	40	210	
2 to 3						
3 to 4			Dry, red-brown, clayey SILT, with saprolite.	9	8	No Odor
4 to 5	3.8	3.8				
5 to 6			Dry, light red and white, clayey SILT, with saprolite.	17	28	
6 to 7						
7 to 8			Dry, tan, some sand, clayey SILT, with saprolite.	140	550	Trace Odors
8 to 9	3.8	3.8	Same			
9 to 10				30	55	
10 to 11						
11 to 12			Dry, red, tan and white, clayey SILT, with saprolite.	40	95	Odors
12 to 13	3.8	3.8				
13 to 14			Dry, dark red, clayey SILT, saprolite.	110	400	
14 to 15						
15 to 16			Same	55	140	Odors
16 to 17	3.8	3.8				
17 to 18			Same	110	120	
18 to 19						
19 to 20			Dry, dark red, some black soil, clayey SILT, with saprolite.	80	360	Trace Odors
20 to 21	3.8	3.5				
21 to 22			Same	120	1400	
22 to 23						
23 to 24			Slightly moist, red clayey SILT.	200	1400	Trace Odors
24 to 25	3.8	3.7				
25 to 26			Slightly moist, brown, some black soil, clayey SILT.	300	1400	
26 to 27						
27 to 28			Same	400	1400	Trace Odors
28 to 29	3.3	3.3				
29 to 30				440	1400	GP-4-30
30 to 31			Same	180	1400	Trace Odors
31 to 32			Refusal @ 31.5'			

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4. No groundwater was encountered. Boring backfilled with granular bentonite.
5. ND indicates No Detection.

**APPENDIX C
BORING LOCATION DATA
GUILFORD COUNTY, NORTH CAROLINA
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(TIP: U-2525B)**

DEPTH	PEN.	REC.	DESCRIPTION	PID Max	FID Max	Sample ID
BORING GP-5						
0 to 1	3.8	3.3	1' topsoil and gravel			
1 to 2			Dry, red clay, some SILT.	200	1400	
2 to 3						
3 to 4			Dry, red clay, some SILT, saprolite.	20	40	Trace Odors
4 to 5	3.8	3.8	Same			
5 to 6				80	330	
6 to 7						Odors
7 to 8			Red clay, and white-purple saprolite.	10	9	GP-5-8
8 to 9	3.8	3.8				
9 to 10			Dry, red clayey SILT, saprolite.	220	1400	
10 to 11						
11 to 12			Dry, red clayey SILT, some sand, saprolite.	110	1400	Odors
12 to 13	3.8	3.8				
13 to 14			Dry, tan and white, clayey SILT, saprolite.	150	240	
14 to 15						Odors
15 to 16				450	1400	GP-5-16
16 to 17	3.8	3.8				
17 to 18			Same, with some purple coloring.	40	110	
18 to 19						
19 to 20			Dry, tan and white, clayey SILT, saprolite.	100	450	Odors
20 to 21	3.8	3.8				
21 to 22				140	580	
22 to 23						
23 to 24				200	1400	Odors
24 to 25	3.8	3.7	Same			
25 to 26				240	1400	
26 to 27						
27 to 28				240	1400	Odors
28 to 29	1.5	1.5		180	1400	GP-5-29
29 to 30			Refusal @ 29'			

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3. All penetration, recovery, and depth measurements are expressed in units of feet; PID and FID measurements are expressed as parts per million relative to isobutylene and methane standards.
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**APPENDIX C
BORING LOCATION DATA
GUILFORD COUNTY, NORTH CAROLINA
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(TIP: U-2525B)**

DEPTH	PEN.	REC.	DESCRIPTION	PID Max	FID Max	Sample ID
BORING GP-6						
0 to 1	3.8	1.3	6" of asphalt and gravel			
1 to 2						
2 to 3			~2' voidspace			No Odors
3 to 4			Moist, red-brown, clayey SILT.	90	100	GP-6-4
4 to 5	3.8	2.8				
5 to 6			Slightly moist, red clay, saprolite.	1600	2100	
6 to 7						
7 to 8			Slightly moist, red clayey SILT, with saprolite.	50	420	Odors
8 to 9	3.8	3.8				
9 to 10			Dry, red clayey SILT.	8000	936	
10 to 11						
11 to 12			Dry, red clayey SILT, with saprolite.	5000	820	Trace Odors
12 to 13	3.8	3.8				
13 to 14			Same	40	320	
14 to 15						
15 to 16				105	890	Odors
16 to 17	3.8	3.8				
17 to 18			Dry, red and white, some clayey SILT, mostly saprolite.	75	550	
18 to 19						Odors
19 to 20			Dry, brown clayey SILT.	25	60	GP-6-20
20 to 21	3.8	3.8				
21 to 22				73	380	
22 to 23						
23 to 24			Same, lighter in color.	50	380	Odors
24 to 25	3.8	3.8				
25 to 26			Dry, tan and white, some clayey SILT, mostly saprolite.	385	5000	
26 to 27						Petroleum and sulfur odors
27 to 28				580	450	
28 to 29	3.8	3.8				
29 to 30			Dry, white saprolite	250	500	
30 to 31						
31 to 32				150	930	Odors
32 to 33	3.8	3.6				
33 to 34			Same	950	3600	
34 to 35						
35 to 36			Dry, tan and white saprolite.	36	240	Odors
36 to 37	3.0	3.0				
37 to 38						Odors
38 to 39			Dry, brown and white saprolite.	111	286	GP-6-39
39 to 40			Refusal @ 39'			

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**APPENDIX C
BORING LOCATION DATA
GUILFORD COUNTY, NORTH CAROLINA
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(TIP: U-2525B)**

DEPTH	PEN.	REC.	DESCRIPTION	PID Max	FID Max	Sample ID
BORING GP-7						
0 to 1	3.8	3.8	6" asphalt and gravel			
1 to 2			Dry, red clayey SILT, with saprolite.	140	460	
2 to 3						
3 to 4				110	350	Odors
4 to 5	3.8	3.8	Same			
5 to 6				500		
6 to 7						
7 to 8				505		Odors
8 to 9	3.8	3.8	Same			
9 to 10				520		
10 to 11						
11 to 12			Dry, tan and white, clayey SILT, with saprolite.	530		Odors
12 to 13	3.8	3.8	Same			
13 to 14				675		
14 to 15						
15 to 16			Dry, red and white, clayey SILT, saprolite.	665		Odors
16 to 17	3.8	3.8				
17 to 18				540		
18 to 19						Odors
19 to 20			Slightly moist, red-brown, clayey SILT.	710		GP-7-20
20 to 21	3.8	3.6				
21 to 22			Dry, brown, clayey SILT, saprolite.	520		
22 to 23						
23 to 24				460		Odors
24 to 25	3.8	3.3	Same			
25 to 26				510		
26 to 27						
27 to 28			Dry, tan and white, clayey SILT, with saprolite.	330		Odors
28 to 29	3.8	3.8				
29 to 30			Dry, dark brown, clayey SILT.	350		
30 to 31						
31 to 32			Dry, tan and white, clayey SILT, with saprolite.	245		Odors

Refusal @ 32'

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**APPENDIX C
BORING LOCATION DATA
GUILFORD COUNTY, NORTH CAROLINA
NCDOT PROJECT
(TIP: U-2525B)**

DEPTH	PEN.	REC.	DESCRIPTION	PID Max	FID Max	Sample ID
BORING GP-8						
0 to 1	3.8	3.8	6" topsoil			
1 to 2			Dry, red clayey SILT.	90	430	GP-8-2
2 to 3						
3 to 4			Dry, red clayey SILT, with saprolite.	69	199	No Odor
4 to 5	3.8	3.8				
5 to 6			Same	230	1400	
6 to 7						
7 to 8			Dry, white and tan, clayey SILT, with saprolite.	245	1400	Trace Odors
8 to 9	3.8	3.8				
9 to 10			Same	420	1400	
10 to 11						
11 to 12			Same	111	586	Odors
12 to 13	3.8	3.8				
13 to 14			Dry, red clayey SILT.	210	1400	
14 to 15						
15 to 16				260	1400	Odors
16 to 17	3.8	3.8				
17 to 18			Same			
18 to 19						
19 to 20				200	1400	Odors
20 to 21	3.8	3.8				
21 to 22			Same	265	1400	
22 to 23						
23 to 24			Dry, white and tan, clayey SILT, with saprolite.	400	1400	Odors
24 to 25	3.8	3.8				
25 to 26			Same			
26 to 27						
27 to 28				186	740	Odors
28 to 29	3.3	3.3				
29 to 30			Same			
30 to 31			Dry, white saprolite.	340	1400	Odors GP-8-31.5
31 to 32			Refusal @ 31.5			

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5. ND indicates No Detection.

**APPENDIX C
BORING LOCATION DATA
GUILFORD COUNTY, NORTH CAROLINA
NCDOT PROJECT
(TIP: U-2525B)**

DEPTH	PEN.	REC.	DESCRIPTION	PID Max	FID Max	Sample ID
BORING GP-9						
0 to 1	3.8	3.2	6" gravel			
1 to 2			Dry, red and white, clayey SILT, with saprolite.			
2 to 3						No Odors
3 to 4				66	70	GP-9-4
4 to 5	3.8	3.7	Same			
5 to 6				72	625	
6 to 7						
7 to 8			Dry, tan and white, clayey SILT, saprolite.	80	810	Odors
8 to 9	3.8	3.8	Same			
9 to 10				135	1210	
10 to 11						
11 to 12				410	1400	Odors
12 to 13	3.8	3.5	Same			
13 to 14				565	1400	
14 to 15						
15 to 16			Dry, tan and white, clayey SILT, saprolite.	550	1400	Odors
16 to 17	3.8	3.7	Same			
17 to 18				700	1400	
18 to 19						
19 to 20				650	1400	Odors
20 to 21	3.8	3.8	Same			
21 to 22				625	1400	
22 to 23						
23 to 24				470	1400	Odors
24 to 25	3.8	3.8	Same			
25 to 26				390	1020	
26 to 27						Odors
27 to 28				210	920	GP-9-28
28 to 29	3.8	3.8	Same			
29 to 30			Slightly moist, brown saprolite.	125	810	
30 to 31						
31 to 32				80	410	
32 to 33	3.0	3.0	Same			
33 to 34						
34 to 35			Refusal @ 35'	60	120	Odors

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GUILFORD COUNTY, NORTH CAROLINA
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DEPTH	PEN.	REC.	DESCRIPTION	PID Max	FID Max	Sample ID
BORING GP-10						
0 to 1	3.8	2.9	1' asphalt and gravel			
1 to 2			Slightly moist, brown, clayey SILT, some sand.	72	352	
2 to 3						
3 to 4				26	78	No Odors
4 to 5	3.8	3.8				
5 to 6			Slightly moist, red, clayey SILT, with saprolite.	51	274	
6 to 7				25	80	Odors GP-10-8
7 to 8						
8 to 9	3.8	3.8	Same			
9 to 10			Dry, red and brown, some purple, clayey SILT, with saprolite.	44	351	
10 to 11						
11 to 12				90	270	Odors
12 to 13	3.8	3.8				
13 to 14			Dry, tan and white saprolite.	141	388	
14 to 15						
15 to 16				175	600	Odors
16 to 17	3.8	3.8				
17 to 18			Dry, white saprolite.	220	1400	GP-10-18
18 to 19						
19 to 20			Dry, tan and white saprolite.	60	410	Odors
20 to 21	3.8	3.8	Same			
21 to 22				72	550	
22 to 23						
23 to 24				100	410	Odors
24 to 25	3.8	3.8	Same			
25 to 26				68	310	
26 to 27						
27 to 28				60	210	Odors
28 to 29	3.8	3.2	Same			
29 to 30				150	1400	Heavy Odors in bedrock.
30 to 31						
31 to 32			Dry, white saprolite.	160	800	GP-10-32

Refusal @ 35'

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BORING LOCATION DATA
GUILFORD COUNTY, NORTH CAROLINA
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DEPTH	PEN.	REC.	DESCRIPTION	PID Max	FID Max	Sample ID
BORING GP-11						
0 to 1	3.8	3.1	6" asphalt and gravel			
1 to 2			Dry, red clayey SILT.	12	28	
2 to 3						
3 to 4				480	220	No Odors
4 to 5	3.8	3.8				
5 to 6			Slightly moist, red clayey SILT, with saprolite.	252	550	
6 to 7						
7 to 8				18	90	No Odors
8 to 9	3.8	3.6	Same			
9 to 10				2800	256	
10 to 11						
11 to 12				17	35	Trace Odors
12 to 13	3.8	3.8	Same			
13 to 14				1800	6000	
14 to 15						
15 to 16			Dry, tan SILT, with saprolite.	22	68	Odors
16 to 17	3.8	3.8				
17 to 18			Slightly moist, red clayey SILT, with saprolite.	1200	380	
18 to 19						
19 to 20			Dry, brown and white, clayey SILT, with saprolite.	43	160	Odors
20 to 21	3.8	3.4	Same			
21 to 22				140	710	
22 to 23						
23 to 24				80	165	Odors
24 to 25	3.8	3.4	Same			
25 to 26				1200	7500	
26 to 27						
27 to 28				5800	4022	Odors
28 to 29	1.5	1.5	Dry, white saprolite.			
29 to 30			Refusal @ 29.5	5800	3600	GP-11-29.5

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DEPTH	PEN.	REC.	DESCRIPTION	PID Max	FID Max	Sample ID		
BORING GP-12								
0 to 1	3.8	3.8	6" topsoil and gravel	4	1			
1 to 2			Dry, red and brown clay.					
2 to 3								
3 to 4	3.8	3.8	Dry, tan and white, clayey SILT, with saprolite.	4	1	No Odors		
4 to 5			Same					
5 to 6	3.8	3.8	Dry, brown, clayey SILT.	4	3			
6 to 7				3	1			
7 to 8								
8 to 9	3.8	3.8	Same	12	29			
9 to 10				60	300			
10 to 11								
11 to 12	3.8	3.8	Same	55	140	GP-12-14		
12 to 13								
13 to 14	3.8	3.5	Dry, tan and white, clayey SILT, with saprolite.	50	290	Trace Odors		
14 to 15				30	85			
15 to 16				110	320	Trace Odors		
16 to 17	3.3	3.3	Same	220	680			
17 to 18								
18 to 19	3.3	3.3	Saprolite.	500	1400	GP-12-23.5		
19 to 20								
20 to 21								
21 to 22			Refusal @ 23.5'					
22 to 23								
23 to 24								

NOTES:

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DEPTH	PEN.	REC.	DESCRIPTION	PID Max	FID Max	Sample ID
BORING GP-13						
0 to 1	3.8	3.5	6" topsoil and sand			
1 to 2			Dry, red and brown, clayey SILT, with saprolite.	19		
2 to 3						
3 to 4				17		No Odor
4 to 5	3.8	3.8				
5 to 6			Dry, tan and white, clayey SILT, with saprolite.	15		
6 to 7						
7 to 8			Dry, brown clayey SILT, with saprolite.	13		No Odor
8 to 9	3.8	3.7	Same			
9 to 10				12		
10 to 11						
11 to 12				18		No Odor
12 to 13	3.8	3.5				
13 to 14			Dry, red, clayey SILT, with saprolite.	13		
14 to 15						
15 to 16				14		No Odor
16 to 17	3.8	3.3	Same			
17 to 18				62		
18 to 19						
19 to 20				100		GP-13-20
20 to 21	3.8	3.8				
21 to 22			Dry, tan, clayey SILT, with saprolite.	47		
22 to 23						
23 to 24				38		No Odor
24 to 25	3.8	3.4	Same			
25 to 26				63		
26 to 27						
27 to 28			Dry, white saprolite.	72		No Odor
28 to 29	2.0	2.0				
29 to 30			Refusal @ 30'	16		

NOTES:

1. Geoprobe explorations were completed on 2/9/01 by Mike Tynan (Probe Technology, Inc. of Concord, NC) using a Geoprobe rig under the supervision of Corlista Urtz (URS). Sampling was performed using an acetate-lined four-foot long steel sampler.
2. Field Photo Ionization Detector (PID) and Flame Ionization Detector (FID) screening was performed using a Foxboro Total Vapor Analyzer (TVA).
3. All penetration, recovery, and depth measurements are expressed in units of feet; PID and FID measurements are expressed as parts per million relative to isobutylene and methane standards.
4. No groundwater was encountered. Boring backfilled with granular bentonite.
5. ND indicates No Detection.

**APPENDIX C
BORING LOCATION DATA
GUILFORD COUNTY, NORTH CAROLINA
NCDOT PROJECT
(TIP: U-2525B)**

DEPTH	PEN.	REC.	DESCRIPTION	PID Max	FID Max	Sample ID
BORING GP-14						
0 to 1	3.8	3.6	6" topsoil			No Odor
1 to 2			Dry, red and brown, clayey SILT.	2		No Samples
2 to 3						
3 to 4				2		
4 to 5	3.8	3.8	Same			
5 to 6				1		
6 to 7						
7 to 8			Dry, red and brown, clayey SILT, with saprolite.	3		No Odor
8 to 9	3.8	3.7	Same			
9 to 10				2		
10 to 11						
11 to 12				2		No Odor
12 to 13	3.8	3.8	Same			
13 to 14				2		
14 to 15						
15 to 16				2		No Odor
16 to 17	3.8	3.8	Same			
17 to 18				3		
18 to 19						
19 to 20			Dry, brown, clayey SILT, with saprolite.	2		No Odor
20 to 21	3.8	3.8	Same			
21 to 22				3		
22 to 23						
23 to 24				3		No Odor
24 to 25	3.8	3.8	Same			
25 to 26				3		
26 to 27						
27 to 28			End of Boring 28'	2		No Odor

NOTES:

1. Geoprobe explorations were completed on 2/9/01 by Mike Tynan (Probe Technology, Inc. of Concord, NC) using a Geoprobe rig under the supervision of Corlista Urtz (URS). Sampling was performed using an acetate-lined four-foot long steel sampler.
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3. All penetration, recovery, and depth measurements are expressed in units of feet; PID and FID measurements are expressed as parts per million relative to isobutylene and methane standards.
4. No groundwater was encountered. Boring backfilled with granular bentonite.
5. ND indicates No Detection.

Appendix C
Laboratory Results

Appendix D
Calculations of Impacted Soil

Mabel L. Chilton Property

Soil Volume Calculation:

Using planimeter on concentration contour, see Figure 3:

1,835.2 sq. ft

Assuming an average soil column to be removed of 31.5 feet:

1,835.2 Sq. feet x 31.5 feet = 57,809 cu. feet

Assuming a conversion of 1.5 tons per in place cubic yard

57,809 cu. feet x 1 cu. yard/ 27 cu. feet x 1.5 tons per cu. yard = 3,212 tons.

Calculated soil impact within the Mabel L. Chilton Property is 3,212 tons.