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November 30, 2006

Mr. Don Moore
North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Reference: Limited Preliminary Site Assessment
HP Triad Properties, LLC
307 South Swing Road
Greensboro, Guilford County, North Carolina
NCDOT Project U-4006
WBS Element 35007.1.1
Earth Tech Project No. 96737

Dear Mr. Moore:

Earth Tech of North Carolina, Inc., (Earth Tech) has completed a limited Preliminary Site Assessment at the above-referenced property. The proposed work was outlined in the Technical and Cost proposal dated October 56, 2006, and the North Carolina Department of Transportation's (NCDOT's) Notice to Proceed dated October 6, 2006. Subsequent to the Notice to Proceed, the work was limited to a file and record review, and a geophysical investigation because access to the property for soil sampling and analysis was not granted. The purpose of this report is to summarize the information in the regulatory files and to document the geophysical survey.

Location and Description

The HP Triad Properties, LLC, (Triad) facility is located at 307 South Swing Road in Greensboro, North Carolina (Figures 1 and 2). The property is situated on the east side of Swing Road approximately ½ mile north of the intersection of Swing Road and Guildford College Road. Based on the information provided and a site visit, Earth Tech understands that the NCDOT will acquire the eastern portion of the Triad property for construction of the Bridford Parkway (SR 4126). The structures on the site were built in 1965 to house a construction company. Five buildings were constructed on the property, three of which are affected by the proposed NCDOT right-of-way. The three buildings affected include a Quonset hut and two metal buildings on the rear portion of the property that were used as part of a maintenance yard and storage. The office building at Swing Road and the automotive maintenance/repair shop behind the office building will not be affected. Topographically, the property is at it highest elevation at Swing Road and slopes significantly downward toward the unnamed tributary to South Buffalo Creek at the rear of the property. Because of the steep topography, the property was graded and terraced to three levels. The office building and maintenance/repair shop are located near the topographic high on the upper terrace.

Approximately 100 feet behind the maintenance/repair shop is a retaining wall that drops 10 to 15 feet to the next terrace. This area is about 30 feet wide that ends at a second retaining wall that drops approximately 5 feet to the lower terrace. The total topographic relief from Swing Road to the stream is about 50 feet.

From 1965 to 2002, the property changed ownership three times. During this time, five underground storage tanks (USTs) reportedly were removed from the site as well as contaminated soil associated with the USTs. In addition to the USTs, contamination from drum storage areas has been documented. The NCDOT will be acquiring the easternmost portion of the property and, as such, requested a Preliminary Site Assessment. However, the landowner allowed the geophysical investigation, but refused access for soil sampling on the property. The restricted access to the property resulted in a file review and the geophysical investigation as the only avenues of assessment.

File Review

In order to obtain a site history with regard to environmental issues, Earth Tech reviewed regulatory files available through public-access databases and at the regulatory agency offices. The site is located in Guilford County and, as such, the North Carolina Department of Environment and Natural Resources (NCDENR) has delegated the regulatory oversight for any environmental issues to the Guilford County Department of Public Health (GCDPH).

Earth Tech reviewed the UST registration database to obtain UST ownership information. According to the database, the USTs on the property were operated under Facility Number 0-009943. The operator and owner of the tank were listed as follows:

Owner	Operator
Associated Mechanical Contractors	Associated Mechanical Contractors
307 Swing Road	307 Swing Road
Greensboro, North Carolina 27419	Greensboro, North Carolina 27419

Associated Mechanical Contractors is the responsible party for the site contamination, but the landowner, as of the date of this report, is:

HP Triad Properties
220 Commerce Place
Greensboro, North Carolina 27401-2427

Earth Tech also reviewed the NCDENR Incident Management database and incident numbers 7859 and 87159 were assigned to the site. According to the database, Incident No. 7859 was assigned in 1992 when the USTs were removed and contamination confirmed. Incident No. 87159 was assigned in May 2006, but no release information was available. In a discussion with Mr. Gene Mao with the

GCDPH, Incident No. 87159 has been closed and Incident No. 7859 is the current number under which regulatory oversight is administered.

Earth Tech reviewed the file copies of reports submitted to the GCDPH. Reports from which information was obtained included the following.

- "Comprehensive Site Assessment, Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," dated June 1994 and prepared by O'Brien & Gere.
- "Corrective Action Plan, Former Associated Mechanical Contractors, Fishbach Properties, Incident No. 7859, Greensboro, North Carolina," dated July 1997 and prepared by O'Brien & Gere.
- "Soil Cleanup Report With Site Closure Request, AIG Consultants, Inc.," dated April 1999 and prepared by O'Brien & Gere.
- "UST Release Summary Report, Former Associated Mechanical Contractors Site, 307 Swing Road, Greensboro, North Carolina," dated July 2002 and prepared by Parsons.
- "Groundwater Monitoring Report, September 2005, Former Associated Mechanical Contractors Facility, Greensboro, North Carolina," dated November 2005 and prepared by Parsons.

The information in these reports indicates the presence of soil and groundwater contamination at the site. Several sources are sited as contributing to the contamination. These sources include:

- former 8,000-gallon leaded gasoline UST,
- former 8,000-gallon unleaded gasoline UST,
- former 2,000-gallon diesel fuel UST,
- former 6,000-gallon No. 2 fuel oil UST,
- former 550-gal waste oil UST,
- former drum storage area #1,
- former drum storage area #2, and
- former stressed vegetation area.

The documented source areas are shown on a Parsons site map in Attachment A. Portions of the reports cited above are presented in Attachment B. Of the contamination areas indicated in the reports, only the former drum storage area #1 appears to be encompassed by the proposed NCDOT right-of-way. However, the former 8,000-leaded gasoline UST, the former drum storage area #2, and the former stressed vegetation area are in close proximity to the proposed right-of-way as shown on Figure 2.

Former Drum Storage Area #1

In 1992, a Phase I and Phase II Environmental Site Assessment (ESA) was conducted at the property as part of a due diligence study for the property sale. Several areas of concern were identified including the drum storage areas and a stressed vegetation area. Drum storage area #1 was located

on the middle terrace near the northwest corner of the Quonset hut and appears to be encompassed by the proposed right-of-way. The area was identified as an 18-ft by 18-ft square, but the number of drums or the drum contents was not noted, except that the drums may have contained solvents. An initial investigation consisted of collecting soil samples from four hand auger borings advanced at each corner of the area and from depths ranging from 3 to 7 feet below ground surface. Soil samples were collected based on field screening and one soil sample from each boring was submitted for analysis of semivolatile organic compounds (EPA Method 8270), pesticides and PCBs (EPA Method 8080), volatile organic compounds (EPA Method 8240), oil and grease (EPA Method 9071), and TCLP metals. The analytical results indicated the presence of methylene chloride, ranging in concentrations from 6.6 micrograms per kilogram (µg/kg) to 7.7 µg/kg, in all the soil samples and 1,1,1-trichloroethane, at a concentration of 5.8 µg/kg, in one of the soil samples. Also detected in the soil samples were TCLP metal concentrations of barium, selenium and chromium. At the time these analyses were performed, no state standards were established to determine if contamination was present. However, the US Environmental Protection Agency (EPA) had established the TCLP limits for determining hazardous materials. None of the metals concentrations were above the TCLP limits for hazardous materials. Any detection of organic compounds was considered contamination under state guidelines.

On the basis of the laboratory reports, drum storage area #1 was excavated to remove the potential contamination. The excavation measured about 50 feet long, 20 feet wide, and 10 feet deep. Approximately 370 cubic yards of soil were excavated and disposed off-site. Eight soil samples were collected from the sidewalls and excavation bottom and these samples were analyzed for volatile organic compounds. Only the soil sample from the north sidewall at a depth of 4 feet contained a detectable compound; chloroform at a concentration of 120 µg/kg. According to the current NCDENR guidelines ("Groundwater Section Guidelines for the Investigation of Soil and Groundwater Contamination: Chlorinated Solvents and Other Dense Non-Aqueous Phase Liquids" dated July 2003), the action level for chloroform in soil is 1 µg/kg.

Former Drum Storage Area #2

The investigation and cleanup of former drum storage area #2 was conducted concurrently with the investigation and cleanup of former drum storage area #1. Drum storage area #2 was located in front of the lowermost automotive repair shop (Figure 2) on the lower terrace of the property. The proposed right-of-way does not appear to encompass the former drum storage area #2, but access to that portion of the property may be limited after the NCDOT acquisition and also may be acquired. Previous reports identified the area as an 18-ft by 18-ft square, but the number of drums or the drum contents was not noted, except that the drums may have contained solvents. An initial investigation consisted of collecting soil samples from four hand auger borings advanced at each corner of the area and from depths ranging from 3 to 4 feet below ground surface. Soil samples were collected based on field screening and one soil sample from each boring was submitted for analysis as described for former drum storage area #1. The analytical results indicated the presence of oil and grease at a concentration of 990 milligrams per kilogram (mg/kg) in one soil sample; methylene chloride, ranging in concentration from 6.0 to 36.3 µg/kg, in all the soil samples; xylenes ranging from 10.1 to

1,418 mg/kg in two soil samples; and benzidine at 58,800 µg/kg, in one of the soil samples. Also detected in the soil samples were TCLP metal concentrations of barium, selenium, mercury, and chromium. None of the metals concentrations were above the TCLP limits for hazardous materials. Any detection of organic compounds was considered contamination under state guidelines.

On the basis of the laboratory reports, drum storage area #2 was excavated to remove the potential contamination. The excavation measured about 20 feet long, 20 feet wide, and 5 feet deep. Approximately 75 cubic yards of soil were excavated and disposed off-site. Eight soil samples were collected from the sidewalls and excavation bottom and these samples were analyzed for volatile organic compounds. None of the soil samples contained detectable compounds.

Former Stressed Vegetation Area

The investigation and cleanup of the former stressed vegetation area was conducted concurrently with the investigation and cleanup of former drum storage areas #1 and #2. The former stressed vegetation area was located near the southwest corner of the Quonset hut about 50 feet west of the proposed right-of-way (Figure 2) on the lower terrace of the property. Previous reports identified the area as an arc about 30 feet long and 10 feet wide. The source of the stressed vegetation was not identified. An initial investigation consisted of collecting soil samples from four hand auger borings advanced along the axis of the stressed vegetation at depths ranging from 3 to 5 feet below ground surface. Soil samples were collected based on field screening and one soil sample from each boring was submitted for analysis as described for former drum storage area #1. The analytical results indicated the presence of methylene chloride at a concentration of 15.8 µg/kg in one soil sample. Also detected in the soil samples were TCLP metal concentrations of barium, selenium, and chromium. None of the metals concentrations were above the TCLP limits for hazardous materials. Any detection of organic compounds was considered contamination under state guidelines.

On the basis of the laboratory reports, the stressed vegetation area was excavated to remove the potential contamination. The excavation measured about 35 feet long, 12 feet wide, and 3 to 5 feet deep (the deeper end was located on the east side). Approximately 65 cubic yards of soil were excavated and disposed off-site. Five soil samples were collected from the sidewalls and excavation bottom and these samples were analyzed for volatile organic compounds. Three of the soil samples from the sidewalls at a depth of 3.5 to 5.5 feet contained detectable concentrations of chloroform ranging from 89 to 760 µg/kg. One soil sample, from the west sidewall at a depth of 2.5 feet, contained a trichloroethene concentration of 61 µg/kg. According to the current NCDENR guidelines, the action level for chloroform in soil is 1 µg/kg and for trichloroethene the action level is 18.5 µg/kg.

Former 8,000-Gallon Leaded Gasoline UST

The former 8,000-gallon leaded gasoline UST was located adjacent to the dispenser shed approximately 100 feet east of the upper terrace maintenance/repair shop (Figure 2). While not within the proposed right-of-way, the former UST area is about 30 feet from the right-of-way line. According to the NCDENR database, the UST was installed in 1980 and taken out of service in 1989. In December 1991, the UST was removed as part of UST closures throughout the property. Following the UST removal, four closure soil samples were collected for analysis of total petroleum hydrocarbons (TPH). The action level for TPH concentrations at the time the soil samples were collected was 10 mg/kg for gasoline range hydrocarbons and 40 mg/kg for diesel fuel range hydrocarbons. One soil sample at the pit bottom contained TPH concentrations above the action levels. As a result, additional excavation was conducted. At the conclusion of the excavation activities, the former UST pit measured 30 feet long, 15 feet wide, and 26 feet deep. Approximately 430 cubic yards of soil were excavated and disposed off-site. Two additional soil samples were collected from the excavation bottom and these samples were analyzed for TPH concentrations. One of the soil samples from near the pit bottom at a depth of 24 feet contained TPH identified as gasoline at a concentration of 190 mg/kg and TPH identified as diesel fuel at a concentration of 490 mg/kg. No further excavation was conducted to remove the remaining contamination.

Groundwater Contamination

As part of the initial investigation and cleanup resulting from the UST releases, three groundwater monitoring wells were installed at the Swing Road property. Following the initial investigation and confirmation of releases from the drum storage areas, at least 10 additional monitoring wells or recovery wells were installed at the site. Groundwater samples collected and analyzed from the wells suggested two chemical plumes; a BTEX plume associated with the former USTs and a solvent plume associated with the drum storage area #1. Periodic sampling was initiated in March 1992 and the most recent Groundwater Monitoring Report was for the September 2005 sampling event.

According to the monitoring report, depth to groundwater measurements indicate a groundwater flow direction to the southeast toward the stream, which is consistent with other historical data. Six wells are generally sampled for each sampling event and these wells are located within the proposed NCDOT right-of-way as shown on Figure 2. Initially the analytical results indicated the presence of chloroform, 1,1-dichloroethene, and tetrachloroethene in many of these wells. The analytical results from March, June and September 2005 indicate the presence of 1,1-dichloroethane in samples from wells MW-6 (1.1 µg/l) and MW-11 (3.5 µg/l); 1,1-dichloroethene in samples from wells MW-5 (16 µg/l) and MW-12 (6.3 µg/l); tetrachloroethene in samples from well RW-1 (13 µg/l); 1,1,1-trichloroethane in samples from well MW-5 (16 µg/l); and trichloroethene in samples from wells MW-5 (7.5 µg/l) and MW-12 (1.6 µg/l). Based on the regulations in 15A NCAC 2L, only the tetrachloroethene in well RW-1 and trichloroethene in well MW-5 are above their respective groundwater quality standards 0.7 µg/l and 2.8 µg/l. A review of the historical analytical results suggests that the concentrations of contaminants are decreasing with time.

Geophysical Survey

Pyramid Environmental conducted a geophysical survey as part of this project to evaluate if USTs were present on the property. The geophysical survey consisted of an electromagnetic survey using a Geonics EM61 time-domain electromagnetic induction meter to locate buried metallic objects, specifically USTs. A survey grid was laid out at the property with the X-axis oriented approximately perpendicular to Swing Road and the Y-axis oriented approximately parallel to Swing Road. The grid was located to cover the accessible portions of the proposed right-of-way. The survey lines were spaced 5 feet apart. Magnetic data was collected continuously along each survey line with a data logger. After collection, the data was reviewed in the field with graphical computer software. Following the electromagnetic survey, a ground penetrating radar (GPR) survey was conducted to further evaluate any significant metallic anomalies if such a survey was considered necessary.

Several anomalies were detected in the geophysical survey. These anomalies were generally attributed to buried utility lines, conduits, or surface metal. The survey concluded that no metallic USTs were present on the surveyed areas of the property. A detailed report of findings and interpretations is presented in Attachment C.

Conclusions and Recommendations

A Preliminary Site Assessment was requested for the HP Triad Properties LLC located at 307 South Swing Road in Greensboro, Guilford County, North Carolina. However, access for soil sampling was not granted and only the geophysical survey and file review were conducted. The geophysical survey indicated that no metallic USTs were detected in the proposed NCDOT right-of-way.

The file review suggested that soil and groundwater contamination have occurred at the property and two incident numbers have been assigned; however, one of the incident numbers has been closed. Four areas of concern have been identified: drum storage area #1 is within the right-of-way, drum storage area #2 is outside the right-of-way, but on a portion of the property that may be acquired, and two areas are outside, but in close proximity to, the right-of-way. From the file review Earth Tech concluded the following regarding the soil conditions.

- Drum storage area #1 has been excavated and confirmation sampling indicated that chloroform was present in one sample at a depth of about 4 feet at a concentration above the action level in the current NCDENR guidelines. The sample location as reported in the regulatory files is in a cut area, as shown on Figure 2, but the depth of the NCDOT cut is unknown.
- Drum storage area #2 has been excavated and confirmation soil samples indicate that no volatile target compounds were detected.
- The stressed vegetation area has been excavated and confirmation sampling indicated that chloroform was present in three soil samples at a depth of about 3.5 to 5.5 feet at concentrations above the action level in the current NCDENR guidelines. One soil sample, from a depth of 2.5 feet, contained a trichloroethene concentration above the action level in

the current NCDENR guidelines. The NCDOT drawing suggests that the stressed vegetation area is outside a fill area.

- An over-excavation of the 8,000-gallon leaded UST area was completed and a confirmation soil sample from a depth of 24 feet indicated the presence of TPH concentrations identified as both gasoline and diesel fuel. These concentrations were above the action levels in place at the time the work was conducted. As of the date of this report, TPH concentrations are no longer used to confirm contamination. However, no risk-based parameters were analyzed at the UST area to evaluate if contamination in the area requires additional remediation. According to the NCDOT drawing (Figure 2), the UST area is outside the right-of-way, but in proximity to a cut section. If the cut section in this area is greater than 20 feet, remaining contamination in the area may be encountered.

The documents in the regulatory files also confirm the presence of groundwater contamination at the property. Analytical results indicate that trichloroethene and tetrachloroethene are present at concentrations above the groundwater quality standards. The chlorinated solvent contaminant plume in groundwater appears to be located within the proposed right-of-way. The historical results suggest that the concentrations of these two compounds, as well as other compounds present but not above the groundwater quality standards, are decreasing with time.

The purpose of the Preliminary Site Assessment was to evaluate the property with respect to unknown USTs and the presence of contamination. Earth Tech was able to conduct the geophysical survey, which indicated that no metallic USTs were located within the proposed right-of-way. Earth Tech was unable to conduct soil and groundwater sampling to verify historical data. As a result, Earth Tech concludes that contamination likely exists at the HP Triad Properties at 307 Swing Road. Based on this conclusion, Earth Tech offers the following recommendations.

- Soil contamination at the former drum storage area #1 and the former 8,000-gallon leaded gasoline UST may be affected by road construction activities. As such, any material excavated from this area should be handled as contaminated and properly contained, stored, and disposed under applicable EPA and State rules.
- Groundwater contamination has been identified within the proposed right-of-way and in the area of the proposed drainage structure. Earth Tech recommends that any upgrades/replacement to the drainage structure consist of a closed-loop system to avoid becoming a conduit for migrating groundwater.

Earth Tech appreciates the opportunity to work with the NCDOT on this project. Because this report is a compilation of several previous reports already on file at the NCDENR and GCDPH, there is no requirement for a copy to be submitted to those agencies. If you have any questions, please contact me at (919)854-6238.

Sincerely,

Michael W. Branson, P.G.
Project Manager

Attachments

c: Project File

FIGURES

SCALE 1:24,000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

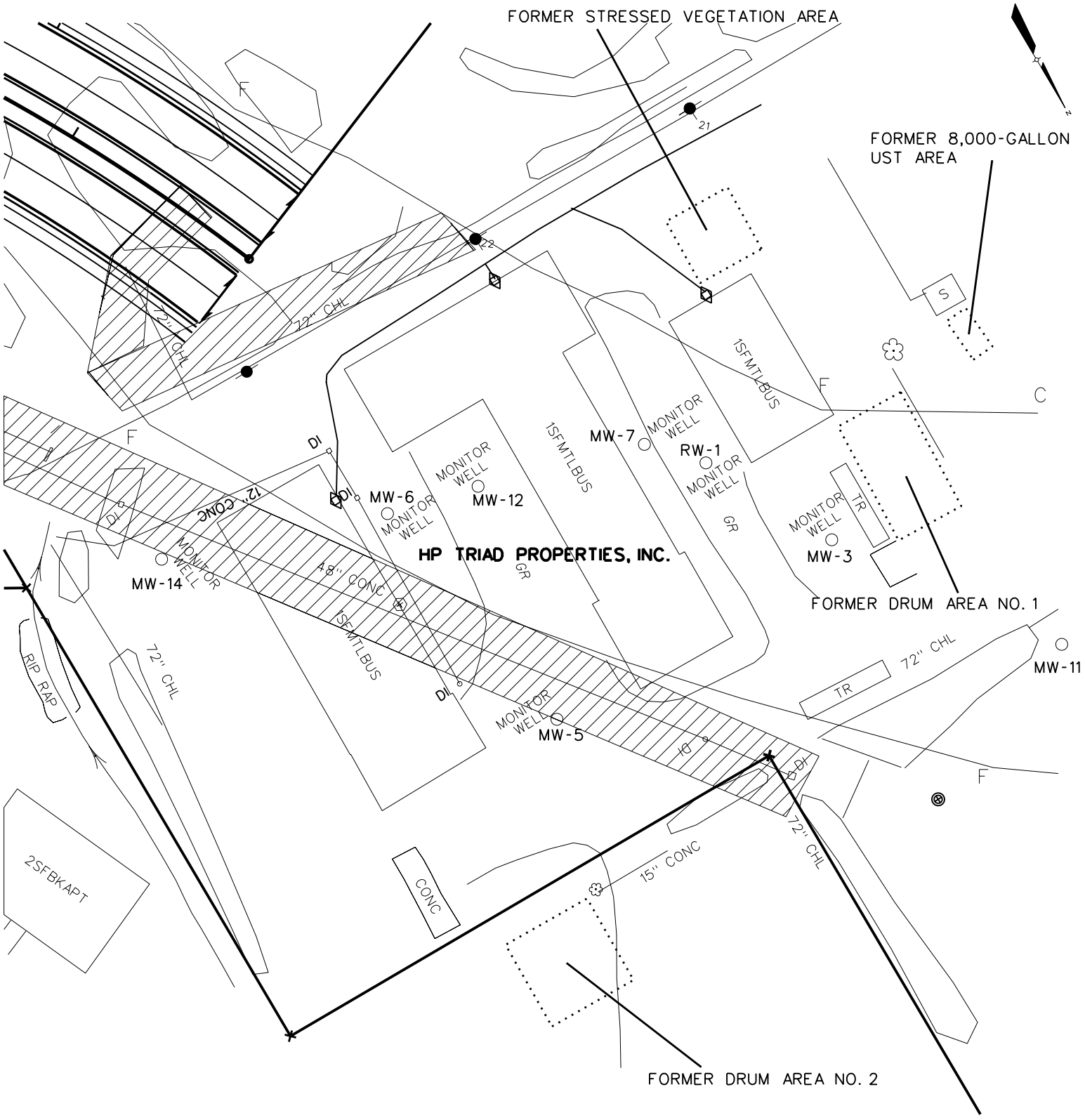
SOURCE: U.S. GEOLOGICAL SURVEY 7.5 MIN QUADRANGLE: GUILFORD, NC (REV 1994)

EARTH TECH

FIGURE 1
LOCATION MAP
HP TRIAD PROPERTIES
GREENSBORO, NORTH CAROLINA

NOVEMBER 2006

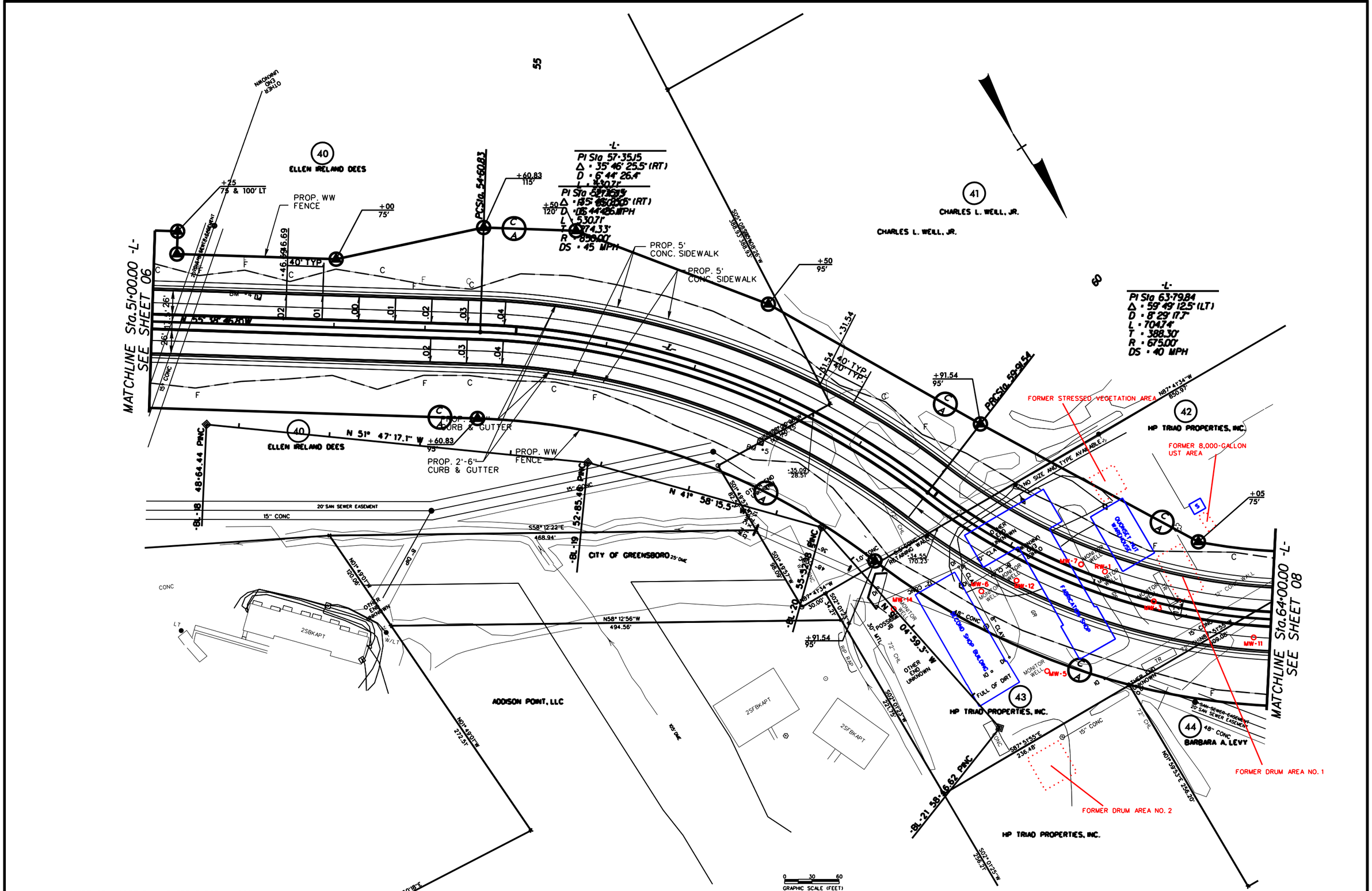
96737



EARTH TECH

FIGURE 2
SITE MAP
HP TRIAD PROPERTIES
GREENSBORO, NORTH CAROLINA

NOVEMBER 2003 96737



EARTH TECH

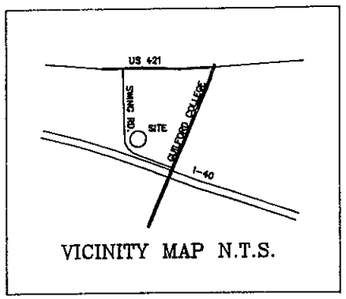
FIGURE 2
SITE MAP
HP TRIAD PROPERTIES
GREENSBORO, NORTH CAROLINA
NOVEMBER 2003 96737

ATTACHMENT A

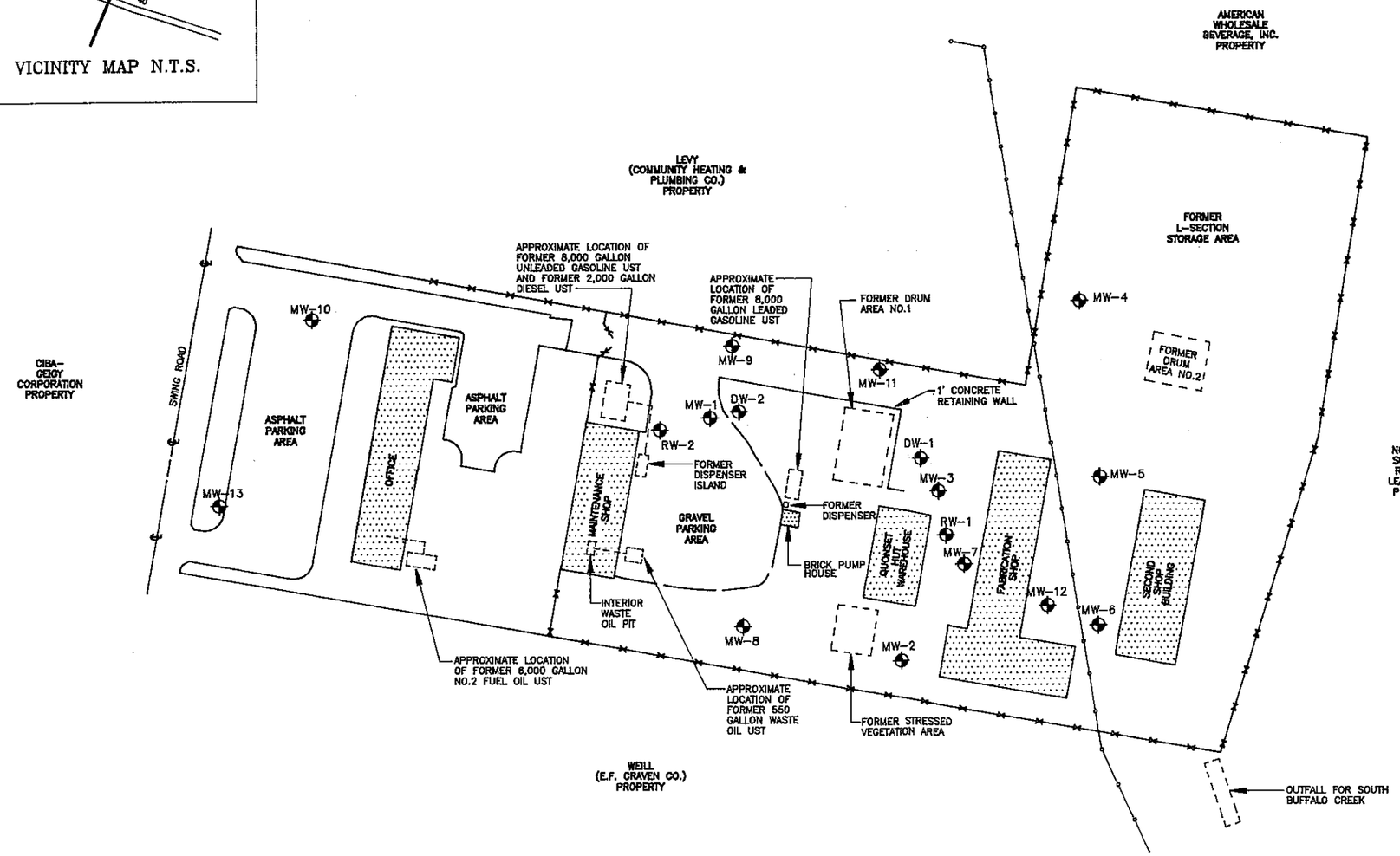
FIGURE 3

NOTES:

1. THE ONLY KNOWN SUBSURFACE UTILITY AT THE SITE IS THE 15–INCH SANITARY SEWER LINE. DUE TO THE SHALLOW GROUND WATER DEPTH IN THAT AREA OF THE SITE, IT IS BELIEVED THAT THE SANITARY SEWER LINE INTERCEPTS THE GROUND WATER TABLE.
2. OTHER SUBSURFACE UTILITIES AND CONDUITS HAVE NOT BEEN LOCATED FOR THE FACILITY.
3. THERE ARE NO BASEMENTS OR OTHER UNDERGROUND STRUCTURES LOCATED AT THE SITE WHICH MAY POTENTIALLY BE AT RISK FROM FREE PRODUCT AND/OR VAPORS.



VICINITY MAP N.T.S.



LEGEND

- MONITORING WELL
- FENCE
- 15–INCH SANITARY SEWER LINE
- CENTER LINE OF ROAD

SITE BASE PLAN
&
UTILITIES PLAN

ASSOCIATED MECHANICAL CONTRACTORS, INC.
307 SWING ROAD
GREENSBORO, N.C.

100 0 100 200

1"=100'

FILE NO. 5836.001–03F

O'BRIEN & GERE ENGINEERS, INC.

ATTACHMENT B

REPORT

Comprehensive Site Assessment

Associated Mechanical Contractors
307 Swing Road
Greensboro, North Carolina

AIG Consultants, Inc.
Atlanta, Georgia

June 1994

O'BRIEN & GERE
ENGINEERS, INC.

EXECUTIVE SUMMARY

AIG Consultants, Inc. (AIG) retained O'Brien & Gere Engineers, Inc. in October 1993 to develop a Comprehensive Site Assessment (CSA) report describing the environmental work completed to-date at the Associated Mechanical Contractors (AMC) site located at 307 Swing Road in Greensboro, N.C. The purpose of this CSA report is to summarize the environmental programs implemented and the analytical results obtained from the AMC site during the time period between July 1991 through May 1994. The environmental programs were conducted at the AMC site by:

- AIG and its subcontractors (including Nobile Oil Services [Noble], Public Service, Inc. [PSI], and Environmental & Regulatory Consultants, Inc. [ERC]) from July 1991 through October 1993;
- O'Brien & Gere Engineers, who was retained by a third party interested in purchasing the AMC site, during the time period of October 1992 through July 1993; and
- AIG and O'Brien & Gere Engineers from October 1993 through the present.

The AMC property is a 6.4 acre, L-shaped site zoned as "heavy industrial" in an area of mixed heavy industrial, light industrial, and residential zoning on the western side of Greensboro, N.C. The site, which has been inactive since the early 1990s, was last utilized for the fabrication of heating, ventilating, and air conditioning (HVAC) systems and as a vehicle maintenance yard.

Since cessation of operations at the AMC property, various (and often overlapping) environmental investigations and corrective actions have been conducted at the site between July 1991 and May 1994 for several areas of environmental concern, including: five former USTs; two former drum storage areas; and an area of stressed vegetation. Investigations and corrective actions included:

- an initial Phase I ELA performed by AIG in July 1991;
- a Phase II ELA conducted by AIG and Noble from December 1991 through October 1992 (consisting of the excavation and removal of the site's five USTs) and documented in a report dated October 1992;
- a secondary Phase I and limited Phase II ELA performed by O'Brien & Gere Engineers in October and November 1992 for a third party interested in purchasing the AMC property;
- hand auger investigations and the subsequent excavation of three potential areas of environmental concern (the two drum storage areas and the area of stressed vegetation) from February through June 1993; and
- continued environmental investigations and quarterly ground water monitoring conducted between October 1992 and May 1994 in response to ground water and soil contamination identified during the excavation and removal of an 8,000-gal leaded gasoline UST in December 1991.

Source Information/Initial Abatement Measures

Based on the results of the various environmental investigations, seven source areas were identified at the AMC site. Fore each source area, the following table provides a summary of the information regarding the source product, the source container, the amount of release, and the initial abatement measures conducted (UST closures and soil removal).

Source	Source Product	Amount of Release	Initial Abatement Measures Conducted
2000-Gal Diesel Fuel UST, 8000-Gal Unleaded Gasoline UST, and Associated Dispenser Island	Diesel and Unleaded Gasoline	Unknown	- The two USTs, associated piping, and dispenser island were excavated and removed. The USTs were rendered useless and disposed of at Safeway Tank Company in Colfax, N.C. - Approximately 200 cu yd of soil was removed from the excavations and delivered to Cunningham Brick in Lexington, N.C. for thermal treatment. - No free product was encountered in the excavations.
8000-Gal Leaded Gasoline UST	Leaded Gasoline	Unknown	- The UST, associated piping, and dispenser were excavated and removed. The UST was rendered useless and disposed of at Safeway Tank Company in Colfax, N.C. - Approximately 150 cu yd of soil was removed from the excavation and delivered to Cunningham Brick in Lexington, N.C. for thermal treatment. - Although the excavation extended to the soil/shallow ground water interface, no free product was encountered in the excavation. (Monitoring wells were installed at the site due to the extent of contamination identified with this UST during excavation and removal activities.)
550-Gal Waste Oil UST	Waste Oil	Unknown	- The UST and associated piping were excavated and removed. The UST was rendered useless and transported off-site to the Noble facility in Sanford, N.C. for subsequent disposal. - Approximately 75 cu yd of soil was removed from the excavation and delivered to Cunningham Brick in Lexington, N.C. for thermal treatment. - No free product was encountered in the excavation.
6000-Gal No. 2 Fuel Oil UST	No. 2 Fuel Oil	Unknown	- The UST and associated piping were excavated and removed. The UST was rendered useless and disposed of at Safeway Tank Company in Colfax, N.C. - Approximately 100 cu yd of soil was removed from the excavation and delivered to Cunningham Brick in Lexington, N.C. for thermal treatment. - No free product was encountered in the excavation.
Drum Area No. 1	Solvent in Former 55-Gal Drums	Unknown	- Since the site is inactive, the drums have been removed from this area. - Approximately 250 cu yd of soil was removed from the excavation and disposed of off-site. - No free product was encountered in the excavation.
Drum Area No. 2	Solvent in Former 55-Gal Drums	Unknown	- Since the site is inactive, the drums have been removed from this area. - Approximately 300 cu yd of soil was removed from the excavation and disposed of off-site. - No free product was encountered in the excavation.

Source	Source Product	Amount of Release	Initial Abatement Measures Conducted
Area of Stressed Vegetation	Solvent in Former 55-Gal Drums	Unknown	- Since the site is inactive, the drums have been removed from this area. - Approximately 150 cu yd of soil was removed from the excavation and disposed of off-site. - No free product was encountered in the excavation.

Soil Results

Based on a review of soil boring logs, monitoring well logs, and field notes from the numerous excavations performed at the facility, it appears that the soil at the AMC site is composed primarily of sandy silts and silty clays. The calculated hydraulic gradient for the site is 0.0165 ft/ft and the estimated ground water flow velocity for the site is approximately 4 ft/yr. Soil contamination was primarily present at the site in source areas, including: the five USTs with their associated piping and dispenser islands; the two former drum storage areas; and an area of stressed vegetation. Soil from each of these areas was excavated and disposed of off-site.

In reviewing the soil analytical results, it appears that the majority of the soil concentrations were confined to the identified source areas. As such, the majority of the concentrations from the source areas was removed during the excavations. Based on the analytical results, there appear to be two groupings of the constituents of concern: TPH-gasoline (with concentrations ranging up to 38 ppm); and chlorinated organic compounds (with concentrations ranging up to 0.76 ppm).

The remaining concentrations of TPH-gasoline, which are representative of the product contained in the former USTs at the site, range from 19 ppm to 38 ppm. A site sensitivity evaluation (SSE) prepared for the AMC site identified the TPH-gasoline clean-up level to be 60 ppm. Since the residual TPH-gasoline concentrations are less than the SSE clean-up level, the residual TPH concentrations in the soil should not pose a threat to the environment.

In addition to the TPH-gasoline, small areas containing chloroform and trichloroethene were also identified. Based on the compounds present and a review of the historical aerial photographs, it is believed that these compounds are remnant constituents related to former facility operations and maintenance practices. As such, the concentrations of chloroform and trichloroethene in the soil seem

to be limited to areas of the site from which the majority of the contaminated soil was previously removed. Although the March 1993 Ground Water Section Guidelines for the Investigation and Remediation of Soils and Ground Water prescribe a reportable concentration equal to the method detection limit for volatile organic compounds, the remaining concentrations of chloroform (ranging up to 0.76 ppm) and trichloroethene (at 0.061 ppm) are relatively minor. Soil concentrations from Drum Area No. 2 were completely excavated. Further excavation in Drum Area No. 1 and the stressed vegetation area to remove these remaining constituents was not pursued due to structural site constraints, including: the concrete retaining wall at Drum Area No. 1; and buildings, retaining walls, and steep slopes located in the vicinity of the stressed vegetation area.

Ground Water Results

Based on the potentiometric/ground water elevation contour map for the AMC site (from the February 28 - March 7, 1994 quarterly ground water monitoring event), the predominant ground water flow direction across the site is from northwest to southeast. The hydraulic gradient was calculated to be 0.0165 ft/ft and the estimated ground water flow velocity for the site is 4 ft/yr based on an assumed porosity of 40% and hydraulic conductivity of 1×10^{-2} ft/day as referenced for silty clay. Based on the hydraulic gradient and the estimated flow velocity, it appears that the contaminants of concern in the ground water are relatively immobile. The immobility of the ground water contaminants can be further identified through a review of the analytical data over the course of the five quarterly monitoring events.

Based on the analytical results, there appear to be two constituent groupings of concern: total BTEX, with concentrations ranging up to 4,200 ppb at the maintenance garage level of the site; and total volatile organic compounds, with concentrations ranging up to 123 ppb in the quonset hut area of the site.

The ground water BTEX contamination is centered around monitoring wells RW-2 and MW-1. These monitoring wells are located in the vicinity of the former leaded gasoline, unleaded gasoline, and diesel fuel USTs. Other monitoring wells were also found to contain aberrational low concentrations of benzene at one time or another during the course of the five quarterly monitoring events; however, based on a review of the analytical data from the five monitoring events, it is believed that the aberrational benzene concentrations were caused by poor sampling procedures, confusion over the

identification of wells and/or cross-contamination from other samples in the cooler. Since trip blanks and field blanks were not collected by previous investigators during the first four rounds of quarterly sampling, the effects of the potential cross-contamination can not fully be assessed. The following table provides a listing of the monitoring wells containing BTEX contamination during each of the sampling events:

Sampling Event	Monitoring Wells Containing Elevated Levels of BTEX	Monitoring Wells Which Contained Elevated Levels of BTEX Thought to be Caused by Cross-Contamination
3/4/92	MW-1	---
1/30/93	MW-1, RW-2	MW-8
4/16/93	MW-1, RW-2	MW-10
6/10-30/93	MW-1, RW-2	DW-1
10/7/93	MW-1, RW-2	MW-2, MW-3
2/28/94-3/7/94	MW-1, RW-2	---

It appears that the chlorinated organics concentrations are centered around monitoring wells MW-1 and RW-2 on the maintenance garage level of the site and monitoring wells MW-7, RW-1, and DW-1 on the quonset hut level. Other monitoring wells were also found to contain aberrational low concentrations of chlorinated compounds at one time or another during the five quarterly ground water monitoring events; however, based on a review of the analytical data from the five monitoring events, it is believed that the aberrational chlorinated organics concentrations were caused by poor sampling techniques or cross-contamination from other samples in the cooler. Trip blanks and field blanks were not collected during the October 7, 1993 monitoring event; therefore, the effects of the potential cross-contamination can not fully be assessed. The trip blank from the February 28 through March 7, 1994 monitoring event revealed a tetrachloroethene concentration of 6.0 ppb which indicates that the monitoring well MW-3 tetrachloroethene concentration may have been caused by cross-contamination in the cooler. The following table provides a listing of the monitoring wells containing chlorinated organic contamination during each of the sampling events:

Sampling Event	Monitoring Wells Containing Elevated Levels of Chlorinated Organics	Monitoring Wells Which Contained Elevated Levels of Chlorinated Organics Thought to be Caused by Cross-Contamination
3/4/92	---	---

Sampling Event	Monitoring Wells Containing Elevated Levels of Chlorinated Organics	Monitoring Wells Which Contained Elevated Levels of Chlorinated Organics Thought to be Caused by Cross-Contamination
1/30/93	MW-1, MW-7, RW-1, RW-2	---
4/16/93	MW-1, MW-7	---
6/10-30/93	MW-1, MW-7, RW-1, RW-2, DW-1	---
10/7/93	MW-1, MW-7, RW-1	MW-5, MW-11
2/28/94-3/7/94	MW-1, MW-7, RW-1, RW-2, DW-1	MW-3

Conclusions and Recommendations

In reviewing the results of the previous investigations, it is recommended that the AMC site remain within the NCDEM - Ground Water Section's investigation and remediation program guidelines for petroleum-contaminated sites. This assessment is based on: the USTs triggering the investigation at the site; and the concentrations of total BTEX identified in the ground water at the site as compared to the concentrations of the other volatile organic compounds.

In following the NCDEM - Ground Water Section guidelines, it is recommended that a Corrective Action Plan (CAP) be developed to evaluate natural degradation as a means for cleanup at the AMC site in accordance with the November 1993 No Further Action guidance document for the Title 15A NCAC 2L standards. Natural degradation has been proposed for this site for the following reasons:

1. All source areas (including USTs, soils in the two drum storage areas, and soils from the stressed vegetation area) have been excavated and removed from the site.
2. The remaining soil TPH contamination is below the SSE concentration of 60 ppm for TPH-gasoline for the site.
3. The remaining volatile organic soil contamination is relatively low (ranging up to 0.76 ppm) in areas which could not be further excavated due to physical site constraints.
4. The ground water contamination appears to be limited to two areas: MW-1/RW-2 on the maintenance garage level; and MW-7/RW-1/DW-1 on the quonset hut level.
5. No free product has been observed at the site nor indicated with an electronic interface probe.
6. The ground water contamination is relatively immobile. The hydraulic gradient at the site is 0.0165 ft/ft and the estimated ground water flow velocity is estimated to be 4 ft/yr. In addition, the ground water analytical results have not shown any fluctuation in the extent of the area of concern.
7. In reviewing the analytical data, it appears that the BTEX and total volatile organic concentrations are declining through natural degradation over time.
8. BTEX and volatile organic concentrations are not expected to increase because the site is inactive and the sources have been removed.

9. The closest surface water body is South Buffalo Creek to the east of the facility. According to the NCDEM - Water Quality Section, South Buffalo Creek is not used as a water supply source.
10. The closest receptor well is located 1,500 ft to the northeast of the AMC site. The receptor well is located in an abandoned residence. The City of Greensboro supplies potable water to this area of the City and is available for connection into, if warranted.
11. A system of monitoring wells is available at the site for monitoring the potential migration of contaminants.

To fulfill the 2L requirements for evaluating natural degradation as a feasible option for this site, the CAP will focus on identifying a 5-yr travel time for ground water contaminants at the site and the potential for the contaminants to flow off-site.

In addition to developing a CAP for the AMC site, there are several additional recommendations which should be considered:

1. The NCDEM - Ground Water Section should issue a No Further Action letter for the 550-gal waste oil UST and associated waste oil pit which were excavated and removed from the site in 1992. Based on the analytical results, soil contamination did not remain in the excavated areas. In addition, the quality of the ground water in monitoring well MW-8, which is located immediately downgradient of the former waste oil UST, has not been impacted by the operation of the waste oil UST system. In fact, the analytical results from MW-8 confirm that ground water contamination does not exist in this area.
2. For future ground water monitoring at the site, the semivolatile analysis and TCLP metals analysis should be removed from the list of required parameters. A review of the five rounds of ground water monitoring from the site reveals the absence of semivolatile compounds at the site. A review of the TCLP metals analytical results reveals the presence of metals concentrations along the northern property line of the facility as well as along the 15-inch sanitary sewer line at the lowest level of the facility. As such, it appears that the TCLP metals are being transported onto the site from an upgradient source. Further, the TCLP metals analytical results do not match with the former operational and maintenance trends at the AMC site (as obtained through a review of historical aerial photographs and background information).
3. There is currently a network of seventeen monitoring wells at the AMC site. Due to the steep topography of the site (and the associated erosion) and because the facility has been inactive, several of the wells should be repaired or abandoned. (Note that abandonment of several of the wells should not adversely affect monitoring at the site due to the number of monitoring wells currently present.) The following table provides a listing of the monitoring wells and the proposed actions:

Monitoring Well Designation	Proposed Action
MW-1	- Maintain well. - Repair concrete pad and well cover.
MW-2	- Maintain well. - Replace one well cover bolt.

Monitoring Well Designation	Proposed Action
MW-3	- Maintain well. - Repair concrete pad and well cover.
MW-4	- Abandon this well. This well has historically not contained contaminants. It is not located upgradient or downgradient of the areas of concern. The concrete pad is badly cracked and the riser is in bad shape.
MW-5	- Maintain well. - Repair concrete pad.
MW-6	- Maintain well. - Repair concrete pad.
MW-7	- Maintain well. - Repair concrete pad.
MW-8	- Maintain well.
MW-9	- Abandon this well. This well has historically not contained contaminants, other than TCLP metals. It is not located upgradient or downgradient of the areas of concern. The concrete pad is at ground level and allows surface infiltration from the facility access road.
MW-10	- Abandon this well. This well has historically not contained contaminants. It is located upgradient of the areas of concern. The concrete pad is broken up and the asphalt parking lot is also cracked, allowing surface infiltration into the well.
MW-11	- Maintain well. - Repair the concrete pad.
MW-12	- Maintain well. - Repair the concrete pad.
MW-13	- Abandon this well. This well has historically not contained contaminants. It is located upgradient of the areas of concern.
RW-1	- Maintain well. Repair casing. Although this well has historically contained contaminants of concern, the well is in bad shape. The concrete pad is broken up and the riser casing is kinked and cracked just below ground surface.
RW-2	- Maintain well.
DW-1	- Maintain well. - Repair the concrete pad.
DW-2	- Maintain well.

SECTION 1 - INTRODUCTION

1.01 Purpose

In October 1993, AIG Consultants, Inc. (AIG) retained O'Brien & Gere Engineers, Inc. to develop a Comprehensive Site Assessment (CSA) report describing the environmental work completed to-date at the Associated Mechanical Contractors (AMC) site located at 307 Swing Road in Greensboro, N.C. The purpose of this CSA report is to summarize the environmental programs implemented and the analytical results obtained from the AMC site during the time period between July 1991 through May 1994. The environmental programs were conducted at the AMC site by:

- AIG and its subcontractors (including Noble Oil Services [Noble], Public Service, Inc. [PSI], and Environmental & Regulatory Consultants, Inc. [ERC]) from July 1991 through October 1993;
- O'Brien & Gere Engineers, who was retained by a third party interested in purchasing the AMC site, during the time period of October 1992 through July 1993; and
- AIG and O'Brien & Gere Engineers from October 1993 through the present.

Based on the recommendations of this CSA report, the requirements for additional field investigations or a Corrective Action Plan (CAP) will be identified for the AMC site to maintain its compliance with applicable N.C. regulations.

1.02 Background

The property located at 307 Swing Road in Greensboro, N.C. was purchased from the H.L. Coble Construction Co. by AMC on July 18, 1975. The property, operated from 1975 through the late 1980s as AMC, was utilized for the fabrication of heating, ventilating, and air conditioning (HVAC) systems and as a vehicle maintenance yard. Since the cessation of operations at the facility, two environmental liability assessments (ELAs) have been performed at the site. As a result of the ELAs, several areas of potential environmental concern have been identified, including: five former USTs; two former drum storage areas; and an area of stressed vegetation. Subsequently, investigative and corrective actions have been conducted to mitigate the effects of the environmental concerns at the site.

Due to the number of investigative and corrective actions conducted at the property, the following listing has been prepared to provide a chronological summary of the environmental work conducted at the AMC site to-date:

Date(s)	Activities
July 19, 1991	- AIG conducted a Phase I ELA for the AMC property. The Phase I ELA recommended further Phase II ELA investigations, including the removal of four USTs. (A fifth UST was later identified and removed.)
December 11-13, 1991	- AIG retained Noble to remove three of the five USTs, including: an 8,000-gal leaded gasoline UST; an 8,000-gal unleaded gasoline UST; and a 2,000-gal diesel fuel UST. In addition, AIG and Noble also removed a dispenser island associated with the 8,000-gal unleaded gasoline UST and the 2,000-gal diesel fuel UST. According to the reports, soil sampling revealed contamination at the dispenser island and at the 8,000-gal leaded gasoline UST.
December 19-20, 1991	- AIG and Noble returned to the site to remove soil contamination in the dispenser island excavation and in the 8,000-gal leaded gasoline UST excavation. Samples were collected from these excavations on these dates to document contamination removal.
December 26-27, 1991	- Due to the elevated concentrations of contamination remaining in the excavations from December 19-20, 1991, AIG and Noble returned to the site to further remove soil contamination in the dispenser island excavation and in the 8,000-gal leaded gasoline UST excavation. Soil removal from the dispenser excavation was completed at 13 ft below grade; soil removal from the UST excavation was terminated when ground water was encountered in the excavation.
February 24-27, 1992	- AIG retained PSI to complete twelve soil borings at selected locations to define the extent of contamination associated with the 8,000-gal leaded gasoline UST excavation. Two soil samples were collected from each boring location. Three monitoring wells (one upgradient and two downgradient) were also installed at the site in accordance with the N.C. Division of Environmental Management (DEM) requirements.
March 4, 1992	- AIG retained PSI to collect ground water samples from the three monitoring wells which were installed in January 1992.
April 24, 1992	- The NCDEM - Ground Water Section issued a Notice of Violation (NOV) to AMC for a 3.3 parts per billion (ppb) concentration of benzene in one of the ground water samples collected from the site during the March 4, 1992 sampling event.
May 6-7, 1992	- AIG retained Noble to finish removing soil from the dispenser island excavation associated with the 8,000-gal unleaded gasoline UST and the 2,000-gal diesel fuel UST. The final round of sampling for the dispenser island's excavation was also completed at this time. During the continued excavation of the dispenser island, the fifth UST, a 550-gal waste oil UST, was discovered at the site and scheduled for removal.
June 15-16, 1992	- AIG retained Noble to remove one 550-gal waste oil UST from the southeastern corner of the maintenance shop at the site.
June 25, 1992	- AIG and Noble collected soil samples from a background, upgradient location from the 550-gal waste oil UST and from the stockpiled soil from the waste oil UST excavation.

Date(s)	Activities
July 28, 1992	- AIG retained ERC to prepare a Comprehensive Site Assessment (CSA) report to document the December 11-13, 1991 removal of the 8,000-gal leaded gasoline UST, the 8,000-gal unleaded gasoline UST, the 2,000-gal diesel fuel UST, the dispenser island, and associated piping. The CSA report was submitted to the NCDEM - Ground Water Section on July 28, 1992.
August 19-20, 1992	- AIG retained Noble to remove one 6,000-gal No. 2 fuel oil UST located on the southeastern corner of the office building at the site.
September 9, 1992	- AIG retained Noble to remove the waste oil pit and associated piping located inside of the maintenance shop.
September 11, 1992	- The NCDEM - Ground Water Section issued a response letter to the July 28, 1992 CSA prepared for the AMC site. Based on the response letter, further ground water investigations and corrective actions were required for the AMC site.
October 1992	- AIG completed a Phase II ELA report for the environmental programs completed from July 1991 through October 1992 (including soil and ground water sampling results associated with the removal of the five USTs).
October 16, 1992	- The NCDEM - Ground Water Section issued a letter of "No Further Action" for the 6,000-gal No. 2 fuel oil UST.
October 22, 1992	- As required by the NCDEM - Ground Water Section, AIG retained ERC to perform an aquifer pump test at the site to identify the characteristics of the ground water at the site.
October-November 1992	- O'Brien & Gere Engineers conducted a Phase I and a limited Phase II ELA for the AMC property for an interested buyer. In addition to the contamination revealed during the removal of the five USTs, O'Brien & Gere Engineers also identified several other areas of potential environmental concern through visual observations and a limited soil gas survey. The areas of potential environmental concern included: - Drum Area No. 1 (to further quantify potential soil contamination revealed through the soil gas sampling program); - Drum Area No. 2 (to further quantify potential soil contamination revealed through the soil gas sampling program); - potential soil contamination in the vicinity of stressed vegetation on the southeastern corner of the quonset hut storage warehouse; and - potential soil contamination along the property's eastern fenceline, which was reportedly utilized for the staging of contaminated soil during the removal of the USTs.
November 1992	- AIG retained ERC to install six additional monitoring wells at the site to further delineate the contaminant plume.
December 1-2, 1992	- AIG retained ERC to install three additional monitoring wells (MW-8 through MW-10) and a recovery well (RW-2) at the site to further delineate the contaminant plume.

Date(s)	Activities
December 31, 1992	- ERC prepared a report documenting the installation of monitoring wells on December 1-2, 1992.
January 30, 1993	- AIG retained ERC to perform one round of quarterly ground water sampling at the site.
February 3-5, 1993	- As requested by an interested buyer for the property, AIG retained ERC to conduct a preliminary hand-auger investigation of Drum Area No. 1, Drum Area No. 2, and the area of stressed vegetation, which were identified as areas of potential environmental concern in the O'Brien & Gere Engineers' Phase I and limited Phase II ELA report.
March 10, 1993	- ERC prepared a report documenting the results of the voluntary preliminary hand-auger investigation. The report indicated that contaminants of concern were detected in the three areas during February 3-5, 1993.
April 16, 1993	- AIG retained ERC to perform one round of quarterly ground water sampling at the site.
May 5, 1993	- ERC prepared a report documenting the quarterly ground water monitoring conducted in January 1993.
May 11, 1993	- ERC prepared a report documenting the quarterly ground water monitoring conducted in April 1993.
May 13, 1993	- O'Brien & Gere Engineers was retained by the third party interested in purchasing the property to perform soil sampling along the eastern fenceline at the site. This area had been identified as an area of potential concern in the O'Brien & Gere Engineers' Phase I and Limited Phase II ELA report.
June 8-9, 1993	- AIG retained ERC to install four additional monitoring wells at the site.
June 9-30, 1993	- AIG retained ERC to conduct one round of quarterly ground water sampling at the site.
June 23-24, 1993	- As requested by an interested buyer for the property, AIG retained ERC to voluntarily excavate soil from the two drum storage areas and the area of stressed vegetation, which were originally identified in the November 1992 O'Brien & Gere Engineers report and preliminarily investigated by AIG and ERC through a hand-auger program in February 1993. Soil samples were collected from the three excavations to document removal of the contamination.
July 1, 1993	- O'Brien & Gere Engineers prepared a letter report documenting the analytical results from the May 13, 1993 soil sampling event along the eastern property line of the AMC site. Based on the results, no further actions were required for this area.
September 29, 1993	- ERC prepared a report documenting the installation of the four additional monitoring wells on June 8-9, 1993.

Date(s)	Activities
October 6, 1993	- ERC prepared a report documenting the quarterly ground water monitoring conducted June 9-30, 1993.
October 7, 1993	- AIG retained ERC to conduct one round of quarterly ground water sampling at the site.
October 26, 1993	- ERC prepared a report documenting the quarterly ground water monitoring conducted October 7, 1993.
February 28 - March 7, 1994	- AIG retained O'Brien & Gere Engineers to conduct one round of quarterly ground water sampling at the site and to inspect each of the monitoring wells for construction and maintenance. The quarterly ground water analytical results are reported within this CSA report.

1.03 Report Format

In order to clearly present the environmental work completed at the AMC property to-date and to expedite regulatory agency review, this CSA report has been formatted in accordance with Section 15.2 "Comprehensive Site Assessment (CSA) Format" of the Ground Water Section Guidelines for the Investigation and Remediation of Soils and Ground Water, dated March 1993. As such, this report has been subdivided into the following sections:

- Section 1, which identifies the purpose of the CSA report and briefly outlines the background of the environmental programs conducted at the AMC site to-date;
- Section 2, which provides the history of property ownership and use, release incidents, environmental investigations, and corrective actions;
- Section 3, which identifies potential receptors and migration pathways;
- Section 4, which describes the soil and ground water investigations and provides the analytical results;
- Section 5, which presents recommendations for the project based on the information summarized in this CSA report; and
- Section 6, which provides the references utilized in preparing this CSA report.

SECTION 2 - SITE HISTORY AND SOURCE CHARACTERIZATION

2.01 General

This section provides a history of the property ownership for the AMC site and then focuses on the release incidents, environmental investigations, and corrective actions which have occurred at the site to-date. The history of the property ownership includes:

- a general site description and location;
- a history of the property ownership through a chain-of-ownership title search; and
- a historical aerial photograph review.

The description of release incidents, environmental investigations, and corrective actions includes:

- the initial Phase I and Phase II ELAs written by AIG;
- the secondary Phase I and limited Phase II ELA prepared by O'Brien & Gere Engineers for a prospective buyer;
- the excavation of all five of the USTs formerly located at the AMC property;
- environmental investigations, corrective actions, and quarterly ground water sampling conducted at the AMC site due to releases associated with the former USTs;
- a soil gas survey, a preliminary hand auger investigation, and subsequent excavation of soil from two former drum storage areas and an area of stressed vegetation; and
- the sampling of soil along the eastern fenceline of the property in an area reportedly used for the staging of soils during the removal of the USTs.

2.02 History of Property Ownership and Use

a. General Site Description/Location

The AMC property is a 6.4-acre, L-shaped site zoned as "heavy industrial" in an area of mixed heavy industrial, light industrial, and residential zoning on the western side of Greensboro, N.C. The site and surrounding area are shown on the site location map in Figure 1 and the county road map in Figure 2. As depicted on the site plan in Figure 3, the site is bounded to the north by the Community Heating and Plumbing Company (Community) and American Wholesale Beverage, Inc. and to the south by the E.F. Craven Company. The site is also bordered by a Norfolk-Southern railroad lead track and a wooded residential property to the east and by Swing Road and CIBA-GEIGY Corporation to the west. A listing of the adjacent property owners is provided in Table 2.

The site, which is currently inactive, was last utilized for the fabrication of HVAC systems and as a vehicle maintenance yard. As such, the site currently contains five main buildings, a metal storage

shed, a brick pump house, and a concrete structure apparently used to burn trash. The five main buildings, identified from the western property line to the east, include:

- the two-story office building, which parallels Swing Road and contains offices and storage rooms;
- the maintenance shop, which contains five service bays as well as a two-story section containing storage space on the upper floor and offices, locker rooms, and a boiler room on the lower floor;
- a one-story quonset hut, which was formerly used as a storage warehouse, with an associated concrete platform storage area adjacent to the western side of the hut;
- the fabrication shop, which contains a shop area in the southern portion of the building and welding bays in the middle and northern sections of the building; and
- a second shop building, which also formerly housed welding bays.

The metal storage shed is located northwest of the second shop building. The brick pump house, which once serviced an 8,000-gal leaded gasoline UST, is located immediately upgradient and west of the quonset hut storage building's platform storage area. The concrete burn structure, which is in poor condition and does not appear to have been used for some time, is located to the south of the brick pump house.

Those areas of the site not containing buildings are covered by pavement, gravel and dirt roadways, or vegetative growth. Paved areas of the site include the front driveway and parking lot area, located on the western side of the office building, as well as a driveway leading from the front parking lot area, along the north side of the office building, to the backyard area. Once the paved driveway reaches the fenced backyard area, at the northwest corner of the maintenance shop building, it turns to gravel and dirt. Gravel and dirt roadways cover the majority of the backyard area. In addition, the L-section of the property, located immediately east of the Community property, is a large square-shaped storage area with a dirt/gravel cover. A grass lawn is maintained around the office building and front parking lot and driveway areas. Other vegetative growth occurs in small patches around the other buildings on-site.

In addition to the buildings and surface coverings, the NCDEM - UST Section files contained the following registration information for the USTs formerly located at the AMC site:

UST Identification	UST Capacity (Gal)	Product Stored	Installation Date	Removal Date
1	2,000	Diesel Fuel	April 15, 1980	December 11, 1991
2	8,000	Unleaded Gasoline	April 15, 1980	December 11, 1991
3	8,000	Leaded Gasoline	April 15, 1980	December 11, 1991

UST Identification	UST Capacity (Gal)	Product Stored	Installation Date	Removal Date
4	550	Waste Oil	April 16, 1978	May 15, 1992
5	6,000	No. 2 Fuel Oil (Heating Oil)	April 17, 1974	August 19, 1992

In addition to the storage of fuel and heating oil in USTs, AMC had also stored automotive repair fluids (including cleaning and degreasing fluids, oils, and greases) in the maintenance shop area and cleaning materials (including chlorinated solvents) in two designated drum storage areas at the facility.

Prior to construction of the site in the mid-1960s, the eastern portion of the AMC property formed part of the creek bed for South Buffalo Creek. In order to build on the site, runoff through the area was re-channeled, a 15-inch City sanitary sewer line was installed adjacent to the former creek bed, and the elevation of the eastern portion of the site was elevated with fill material. Based on current utility maps for the area, the City sanitary sewer line transects the eastern portion of the site diagonally from northwest to southeast as shown on the site base map and utilities plan in Figure 3. Although the site was filled, the site still contains a significant drop in topography (of approximately 40 ft) from west to east toward South Buffalo Creek. In fact, the site can be subdivided into three levels with: the office building and parking lot area located on the top level; the maintenance shop, brick pump house, and concrete burn structure on the middle level; and the quonset hut, fabrication shop, second shop building, metal storage shed, and L-section storage area at the base. A dirt/gravel road and an associated retaining wall, located along the northern property line, provide the connection between the three levels.

Based on a review of area utility maps and contacts to local utility suppliers, the utilities which are currently supplied to the site include: electricity supplied by Duke Power; natural gas supplied by Piedmont Natural Gas Service; and potable water and sanitary service provided by the City of Greensboro. Telephone service to the subject area is provided by Southern Bell.

b. History of Property Ownership

A chain-of-ownership title search was conducted in October 1992 by Smith Helms Mulliss & Moore, Attorneys at Law, located in Greensboro, N.C. Based on the search, the AMC property was acquired in two sections. The chain-of-ownership for the main part of the property includes:

Date of Deed	Grantee
June 25, 1987	Fischbach Properties, Inc. (of which AMC is a wholly owned subsidiary)
July 18, 1975	Associated Mechanical Contractors, Inc. (AMC)
November 29, 1965	H.L. Coble Construction Co.
April 17, 1963	Ardith Gallimore
December 16, 1959	G. Talmadge Swing - Will
June 4, 1934	G. Talmadge Swing

The chain-of-ownership for the L-section storage area, located east of the Community property, includes:

Date of Deed	Grantee
June 25, 1987	Fischbach Properties, Inc. (of which AMC is a wholly owned subsidiary)
January 4, 1985	Associated Mechanical Contractors, Inc. (AMC)
August 3, 1983	Bertran Levy
July 25, 1967	Piedmont Burner Service Corp.
March 16, 1966	Bertran and Barbara Levy
April 17, 1963	Ardith Gallimore

The chain-of-ownership for the L-section storage area prior to April 17, 1963 corresponds with the ownership for the main part of the property, as provided above.

c. Historical Aerial Photograph Review

In addition to the title search, historical aerial photographs and land use maps for the years 1965, 1970, 1982, and 1990 were obtained from the Guilford County Mapping Department and the City of Greensboro Property Management Department to assist in the characterization of former site activities. Copies of the 1965, 1970, 1982, and 1990 aerial photographs are included as Figures 4 through 7.

The 1965 aerial photograph, in Figure 4, shows the office building on the AMC property. The remainder of the property was cleared for further construction. South Buffalo Creek is also identifiable along the eastern portion of the site.

In contrast, the majority of the AMC property had been constructed by the time of the 1970 aerial photograph as shown in Figure 5. The office building, maintenance shop, quonset hut, and fabrication shop can be identified in the photograph. In addition, outside storage of parts and equipment in the area

of the current second shop building and east of the maintenance shop building can also be discerned. The L-section storage area was cleared, but unused in the 1970 aerial photograph.

Figure 6, the 1982 aerial photograph, shows that the second shop building, the brick pump house, and the metal storage shed had been constructed and an addition had been built for the northern end of the fabrication shop in the time period between the 1970 and 1982 photographs. In addition, it appears that outside storage of parts and equipment had increased substantially. An increase in storage is noted: in the area between the maintenance shop and the quonset hut; in the areas surrounding the fabrication shop and the second shop building; and in the square-shaped storage area in the L-section of the property.

The 1990 aerial photograph in Figure 7 reveals an addition to the southern portion of the fabrication shop and also reveals that the majority of the outside equipment storage had been cleared away.

2.03 Release Incidents/Environmental Investigations/Corrective Actions

Potential areas of environmental concern at the AMC property identified through the Phase I and Phase II ELAs included:

- five former USTs located at the site;
- two former drum storage areas;
- an area of stressed vegetation; and
- an area along the eastern fenceline where contaminated soil from the UST removals was reportedly staged.

Release incidents at the AMC property were confirmed during:

- the excavation and removal of the 8,000-gal leaded gasoline UST and its associated piping; and
- a soil gas survey and preliminary hand auger investigation of the two former drum storage areas and the area of stressed vegetation.

The following areas were investigated, but did not contain significant releases:

- the excavation containing the former 8,000-gal unleaded gasoline UST and the former 2,000-gal diesel fuel UST and the excavation containing their associated dispenser island;
- the excavation containing the former 550-gal waste oil UST;
- the excavation containing the former 6,000-gal No. 2 fuel oil UST; and
- the eastern fenceline area where contaminated soil from the UST removals was reportedly staged.

Due to the number of different (and often overlapping) environmental investigations and corrective actions conducted at the site between July 1991 and October 1993, each of the different investigations and corrective actions have been separated into their own subsections, as follows:

- the results of the initial Phase I ELA;
- the excavation and removal of the 8,000-gal leaded gasoline UST and its associated piping leading to the brick pump house;
- the excavation and removal of the 8,000-gal unleaded gasoline UST, the 2,000-gal diesel fuel UST, their associated dispenser island, and their associated piping;
- the results of the environmental investigations conducted between December 1991 and September 1992 in response to contamination identified during the excavation and removal of the 8,000-gal leaded gasoline UST;
- the excavation and removal of the 550-gal waste oil UST and its associated piping leading into a waste oil pit in the maintenance shop;
- the excavation and removal of the 6,000-gal No. 2 fuel oil UST and its associated piping;
- the results of the initial Phase II ELA;
- the results of the secondary Phase I and limited Phase II ELA;
- the hand auger investigation and subsequent excavation of three potential areas of environmental concern (the two drum storage areas and the area of stressed vegetation) based on the secondary ELA performed for the site;
- the soil sampling conducted along the eastern fenceline to investigate the area where contaminated soil from the UST removals was reportedly staged; and
- the results of continued environmental investigations and quarterly ground water monitoring conducted between October 1992 and October 1993 in response to contamination identified during the excavation and removal of the 8,000-gal leaded gasoline UST.

a. Initial Phase I ELA

An initial Phase I ELA was prepared for the AMC site by AIG in July 1991. According to the Phase I ELA report, the following primary areas of concern were identified:

- friable asbestos in the boiler room of the office building;
- three USTs (one 8,000-gal leaded gasoline UST, one 8,000-gal unleaded gasoline UST, and one 2,000-gal diesel fuel UST) which had been out-of-service since 1989;
- one 6,000-gal No. 2 fuel oil UST which was still in use to store heating oil for the office building; and
- chemicals, hazardous constituents, gas cylinders, and other abandoned materials remaining throughout the facility.

The Phase I ELA recommended further investigation at the site through Phase II environmental programs. Specifically, the Phase II programs were to include:

- removal of friable asbestos from the office building's boiler room;
- exhuming the three USTs which were no longer in use;

- performing integrity testing on the 6,000-gal No. 2 fuel oil UST and associated piping; and
- removal of chemicals, hazardous constituents, and other abandoned materials which were remnants of the former HVAC fabricating operations (AIG, 1991).

It should be noted that a fifth UST, an out-of-service 550-gal waste oil UST, was also identified at the AMC site by AIG at a later date and was subsequently recommended for removal (AIG, 1992).

b. Excavation of the 8,000-Gal Leaded Gasoline UST/Associated Piping

Based on the recommendations of the Phase I ELA, AIG retained Noble in December 1991 to excavate and remove the 8,000-gal leaded gasoline UST and its associated piping leading to a dispenser at the brick pump house.

The 8,000-gal leaded gasoline UST had been out-of-service since 1989. On December 11-13, 1991, Noble drained and flushed all of the piping associated with the UST and then removed 35 gal of product and residuals from the UST. Following the removal of the product and residuals from the UST, Noble removed the UST's dispenser and gravel surface and excavated the soil from above and beside the UST. At this point, excavation was halted such that the UST could be cleaned, inspected, and purged of all flammable vapors. Following these precautionary measures, soil excavation and the removal of the UST were continued. Impacted soil, as evidenced by stained soil and odor, was removed from the excavation and was stockpiled on and covered with polyethylene sheeting at the site. Upon removal, the UST was also placed on polyethylene sheeting in a temporary staging area. While in the staging area, the UST was inspected for evidence of leakage. The UST and its associated piping appeared to be deteriorated in several locations; however, the quantity of release could not be identified (AIG, 1992).

Following the removal of the UST and piping, stained and odorous soil was observed in the excavation and the organic vapor analyzer (OVA) indicated that product remained. Prior to removing any further soil from the excavation, soil samples were collected from the following four locations on December 12-16, 1991: directly below the former dispenser (S-1); the bottom east side of the UST excavation at 12 ft below grade (S-7); the bottom west side of the UST excavation at 12 ft below grade (S-8); and the bottom center of the UST excavation at 12 ft below grade (S-13). The soil samples were collected using a stainless steel spatula, placed in glass containers with teflon-lined lids, placed on ice, and delivered to National Environmental Testing, Inc. (NET) in Bartlett, Ill. The spatula was

decontaminated with a non-phosphate detergent wash followed by a tap water rinse prior to use at each sampling location. At NET, the samples were analyzed for total petroleum hydrocarbons (TPH) by EPA Methods 3550 and 5030 (AIG, 1992).

Due to the soil contamination remaining in the UST excavation, AIG and Noble returned to the AMC site on December 19-20, 1991 to continue delineating the extent of contamination. At the conclusion of the two days on-site, the extent of the soil contamination had not been identified. AIG collected two samples from the base of the excavation (S-14 and S-15) on December 19, 1991. The soil samples were collected using a decontaminated spatula, placed in glass containers with teflon-lined lids, placed on ice, and delivered to ESE-Biosciences, Inc. (ESE) in Raleigh, N.C. At ESE, the samples were analyzed for TPH via EPA Methods 3550 and 5030 (AIG, 1992).

Since the extent of the contamination had not been delineated, AIG and Noble returned to the AMC site for a third time on December 26-27, 1991 to further excavate in the area of the former 8,000-gal leaded gasoline UST. During this excavation period, ground water was encountered in the excavation at a depth of approximately 26 ft below grade. (Free product was not encountered in the excavation at any time during the UST and soil removal programs.) As required when an excavation extends to the ground water table, work was terminated such that appropriate State and county officials could be notified and a permit for continued work could be obtained. AIG collected two final samples from the base of the excavation, S-20 at 24 ft below grade and S-21 at 18 ft below grade. The soil samples were collected using a decontaminated spatula, placed in glass containers with teflon-lined lids, placed on ice, and delivered to ESE. At ESE, the samples were analyzed for TPH via EPA Methods 3550 and 5030. The soil analytical results for the three rounds of sampling conducted at this excavation are provided in Section 4.02.b (AIG, 1992).

On December 30, 1991, the 8,000-gal UST was rendered useless and disposed of at Safeway Tank Company in Colfax, N.C. On February 4-5, 1992, Noble removed the petroleum contaminated soil from the site. The contaminated soil was delivered to Cunningham Brick in Lexington, N.C. for thermal treatment. The stockpiled soil (represented as sample S-24) had been sampled for characterization for disposal on February 3, 1992 and had been analyzed at ESE for: TCLP metals; volatile organic compounds (VOCs) by EPA Method 8240; semivolatile organic compounds (SVOCs) via EPA Method 8270; and PCBs and pesticides by EPA Method 8080 (AIG, 1992).

The subsequent environmental investigations and corrective actions associated with the former 8,000-gal leaded gasoline are discussed in Section 2.03.d. below (AIG, 1992).

c. Excavation of the 8,000-Gal Unleaded Gasoline UST/2,000-Gal Diesel Fuel UST/Dispenser Island/Associated Piping

Based on the recommendations of the Phase I ELA, AIG retained Noble in December 1991 to excavate and remove the 8,000-gal unleaded gasoline UST, the 2,000-gal diesel fuel UST, and their associated dispenser island and piping. The two USTs were located in one excavation area; the dispenser island was located in a second excavation area (AIG, 1992).

The 8,000-gal unleaded gasoline UST and 2,000-gal diesel fuel UST had been out-of-service since 1989. On December 11-13, 1991, Noble drained and flushed all of the piping associated with the USTs and then removed 50 gal of product residuals from the 2,000-gal UST and 60 gal of product residuals from the 8,000-gal UST. Following the removal of the residuals from the USTs, Noble removed the USTs' dispenser island and concrete surface prior to excavating the soil from above and beside the USTs. At this point, excavation was halted such that the USTs could be cleaned, inspected, and purged of all flammable vapors. Following these precautionary measures, soil excavation and removal of the USTs was continued. Soil removed from the excavations was stockpiled on and covered with polyethylene sheeting at the site. Upon removal, the USTs were also placed on polyethylene sheeting in a temporary staging area. While in the staging area, the USTs were inspected for evidence of leakage. The USTs and their associated piping appeared to be in good condition and staining was not observed in the USTs' excavation. However, upon removal of the dispenser island, staining and odor were observed and the OVA indicated that product remained in the excavation (AIG, 1992).

To document clean closure of the USTs' excavation, soil samples were collected from the following five locations on December 12, 1991: the bottom south side of the USTs' excavation at 12 ft below grade under the 8,000-gal UST (S-2); the bottom center of the USTs' excavation at 12 ft below grade under the 8,000-gal UST (S-3); the bottom south side of the USTs' excavation at 8 ft below grade under the 2,000-gal UST (S-4); the bottom center of the USTs' excavation at 8 ft below grade under the 2,000-gal UST (S-5); and the bottom north side of the USTs' excavation at 8 ft below grade under the 2,000-gal UST (S-6). Prior to removing further soil from the dispenser island excavation, four samples were collected December 13-16, 1991 from the following locations: under the diesel dispenser (S-9);

under the gasoline dispenser (S-10); in the general vicinity of the dispenser island (S-11); and under the bottom piping (S-12). The soil samples were collected using a stainless steel spatula, placed in glass containers with teflon-lined lids, placed on ice, and delivered to NET in Bartlett, Ill. The spatula was decontaminated with a non-phosphate detergent wash followed by a tap water rinse prior to use at each sampling location. At NET, the samples were analyzed for TPH by EPA Methods 3550 and 5030 (AIG, 1992).

Due to the soil contamination remaining in the dispenser island's excavation, AIG and Noble returned to the AMC site on December 19-20, 1991 to continue delineating the extent of contamination. At the conclusion of the two days on-site, the extent of the contaminant plume had not been identified. AIG collected four samples from the base of the excavation at depths of 2 ft below grade (S-16), 4 ft below grade (S-17), 6 ft below grade (S-18), and 10 ft below grade (S-19). The soil samples were collected using a decontaminated spatula, placed in glass containers with teflon-lined lids, placed on ice, and delivered to ESE in Raleigh, N.C. The samples were analyzed for TPH by EPA Methods 3550 and 5030 (AIG, 1992).

Since the extent of the contamination had not been delineated, AIG and Noble returned to the AMC site for a third time on December 26-27, 1991 to further excavate in the area of the former dispenser island. Although the extent of contamination was not identified, the excavation was completed at 13 ft below grade. AIG did not collect final samples from the base of the dispenser island's excavation on December 26-27, 1991 (AIG, 1992).

AIG and Noble returned to the AMC site on May 5-6, 1992 to finish excavating soil from the dispenser island excavation. Based on OVA readings as well as visual and olfactory observations, the dispenser island's excavation was completed to a depth of 18 ft on May 6, 1992. Four samples were then collected at the following four locations on May 6, 1992: 10 ft below grade along the south wall of the excavation (PI-1); 18 ft below grade in the center of the excavation floor (PI-2); 15 ft below grade in the southwest corner of the excavation (PI-3); and 10 ft below grade in the southeast corner of the excavation (PI-4). The soil samples were collected using a decontaminated stainless steel spatula, placed in glass containers with teflon-lined lids, placed on ice, and delivered to ESE. At ESE, the samples were analyzed for TPH via EPA Methods 3550 and 5030. The soil analytical results for each

of the rounds of sampling conducted at the USTs' excavation and the dispenser island's excavation are provided in Section 4.02.c (AIG, 1992).

Between December 30, 1991 and January 9, 1992, the two USTs were rendered useless and disposed of at Safeway Tank Company in Colfax, N.C. On February 4-5, 1992, Noble removed the petroleum contaminated soil from the site. The contaminated soil was delivered to Cunningham Brick in Lexington, N.C. for thermal treatment. The stockpiled soil had been sampled for characterization for disposal on February 3, 1992 (sample designation S-24) and had been analyzed at ESE for: TCLP metals; VOCs by EPA Method 8240; SVOCs via EPA Method 8270; and PCBs and pesticides by EPA Method 8080 (AIG, 1992).

d. Subsequent Delineation for the 8,000-Gal Leaded Gasoline UST (December 1991 through September 1992)

Due to the extensive contamination caused by the removed 8,000-gal leaded gasoline UST, AIG and PSI completed thirteen soil borings and installed three monitoring wells at the AMC site on February 24-27, 1992. The soil borings, which were located in the vicinity of the former UST and extended to depths ranging from 25 to 30 ft, were completed utilizing a truck-mounted drill rig equipped with an 8-inch diameter hollow stem auger. Soil samples were collected from each of the soil borings using split-spoon sampling devices. Split-spoons were decontaminated between sampling intervals using a non-phosphate detergent wash followed by a water rinse (AIG, 1992).

Drill cuttings were logged and split-spoon samples were collected at target intervals to the base of each soil boring. A portion of each core sample was placed into an appropriate laboratory container and allowed to volatilize. The sample was then screened with an OVA such that the sample with the highest reading could be selected for laboratory analysis. Based on this system, two soil samples were analyzed from each of ten of the thirteen soil boring locations (from an 8-10 ft shallow depth interval and a 22-30 ft deep depth interval). The samples were designated B-1 through B-20. Because the other three soil boring locations were to be converted into monitoring wells, one soil sample was collected from the base of each of the three monitoring well locations (MW-1 through MW-3) for laboratory analysis. Soil samples were collected from each of the soil borings on February 24-26, 1992. The samples were collected using a split-spoon sampling device, placed in glass containers with teflon-lined lids, placed on ice, and delivered to ESE in Raleigh, N.C. At ESE, the samples were analyzed for TPH

via EPA Methods 3550 and 5030. Soil analytical results are provided in Section 4.02.d. Soil and debris from the soil borings were reportedly spread on-site (AIG, 1992).

After completion of the thirteen soil borings, AIG and PSI installed three ground water monitoring wells (MW-1 through MW-3) in three of the soil boring locations. The monitoring wells were constructed with 2-inch inside diameter, schedule 40, flush joint PVC pipe with 10 ft of 0.01-inch slotted PVC screen. Well casings were packed with 20-30 industrial sand from the bottom of the borings to 2 ft above the 10-ft screen. The sand packs were sealed with 2 ft of bentonite clay and were grouted with a cement mixture the remaining length to near-grade. Concrete pads were poured at and near the ground surface and steel protective covers were installed to seal and secure the casings. Well casings were equipped with watertight locking well caps. All of the monitoring wells were finished at grade level (AIG, 1992).

After installation, the monitoring wells were developed by bailing. Well development, which lasted approximately 0.5 hr, was reportedly identified to be complete when the water appeared to be free of fine sediment. Water levels were allowed to stabilize in the monitoring wells prior to measurement with an electronic water level detector. Following stabilization, the water levels were measured to the nearest 0.01 ft to the top of the PVC well. The monitoring wells were also surveyed to identify the elevations of the casing tops. All elevations were relative to a working benchmark elevation of 100 ft located along the northern property line of the AMC site. Relative water level depths were then calculated using water level measurement data. Free product was not noted in any of the monitoring wells (AIG, 1992).

The monitoring wells were purged prior to sampling in order to obtain representative ground water samples. Purging was conducted using PVC plastic disposable bailers with associated nylon rope. A quantity of three well volumes of water was calculated and removed from each well. Ground water samples were obtained from monitoring wells MW-1 through MW-3 on March 4, 1992 using disposable bailers. The ground water was poured into laboratory-supplied vials, placed on ice, and delivered to ESE. At ESE, the samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 602. Monitoring well construction details are discussed in Section 4.03.a. Ground water analytical results are provided in Section 4.03.b (AIG, 1992).

On April 24, 1992, the NCDEM - Ground Water Section issued a Notice of Violation (NOV) to AMC for a benzene concentration of 3.3 ppb in a ground water sample collected from monitoring well MW-3 on March 4, 1992 (AIG, 1992).

In compliance with the NOV, AIG retained ERC to prepare a Comprehensive Site Assessment (CSA) report. The CSA report, which was submitted to the NCDEM - Ground Water Section on July 28, 1992, documented the excavation and removal of: the 8,000-gal leaded gasoline UST and associated piping leading to the dispenser at the brick pump house; and the 8,000-gal unleaded gasoline UST and 2,000-gal diesel fuel UST, the USTs' dispenser island, and all of the associated piping connecting the USTs to the dispenser island. The CSA recommended that the NCDEM close the incident file and allow the proper abandonment of monitoring wells MW-1 through MW-3 (ERC, 1992a).

On September 11, 1992, the NCDEM - Ground Water Section issued a response to the July 28, 1992 CSA requiring additional subsurface investigation and cleanup at the AMC site. The additional investigations were to be performed to further delineate the contaminant plume and identify its potential impacts on the surrounding area. According to the AIG Phase II ELA report, the NCDEM - Ground Water Section required the installation of at least four additional 2-inch monitoring wells, a deep monitoring well, and a 4-inch recovery well. Quarterly ground water sampling results from the new and existing monitoring wells were also required to be reported to the NCDEM. In addition, AIG was to perform an aquifer pump test and design and install a ground water recovery system to treat the contaminated ground water at the site (AIG, 1992).

Further environmental investigations for ground water contaminant delineation have been conducted since September 1992 in response to the requirements of the NCDEM. These further activities, including an aquifer pump test, the installation of additional monitoring wells, and quarterly ground water monitoring, are discussed in Section 2.03 below.

e. Excavation of the 550-Gal Waste Oil UST

In May 1992, during the continued excavation at the former dispenser island area, AIG and Noble discovered a 550-gal waste oil UST. Based on the general recommendations of the Phase I ELA, AIG retained Noble in June 1992 to excavate and remove the 550-gal waste oil UST and its associated piping leading from a waste oil pit in the maintenance shop building (AIG, 1992).

The 550-gal waste oil UST had been out-of-service since 1989. On June 15-16, 1992, Noble drained and flushed all of the piping associated with the UST and then removed product and residuals from the UST. Following the removal of the residuals from the UST, Noble removed the concrete and gravel surface above the UST and excavated the soil from above and beside the UST. At this point, excavation was halted such that the UST could be cleaned, inspected, and purged of all flammable vapors. Following these precautionary measures, soil excavation and removal of the UST were continued. Impacted soil, as evidenced by stained soil and odor, was removed from the excavation and stockpiled on polyethylene sheeting at the site. Upon removal, the UST was also placed on polyethylene sheeting in a temporary staging area. While in the staging area, the UST was inspected for evidence of leakage. The UST and its associated piping appeared to be in good condition upon removal. At that time, it was suspected that the observed impact in the excavation was a result of overfill/spill incidents; however, the quantity of release could not be identified (AIG, 1992).

Following the removal of the UST and piping, stained and odorous soil was observed in the excavation. This stained and odorous soil was removed from the excavation prior to the collection of samples. Soil samples were collected from the following locations on June 15-17, 1992: surficial soil removed from the fill port area of the UST (WT-1); the bottom south side of the UST excavation at 7 ft below grade (WT-2); and the bottom north side of the UST excavation at 7 ft below grade (WT-3). The soil samples were collected using a stainless steel spatula, placed in glass containers with teflon-lined lids, placed on ice, and delivered to ESE in Raleigh, N.C. The spatula was decontaminated with a non-phosphate detergent wash followed by a tap water rinse prior to use at each sampling location. At ESE, the samples were analyzed for oil and grease by EPA Method 9071 (AIG, 1992).

On June 25, 1992, AIG and Noble returned to the AMC site to collect sample WT-4 from an upgradient, background area and sample WT-5 from the stockpiled soil. The upgradient, background sample (WT-4) was collected from a location approximately 10 ft upgradient of the excavation and from a depth of approximately 5 ft below grade. Because the UST was in good condition upon removal, the purpose of sample WT-4 was to provide a representative sample of the naturally-occurring background concentration with which to compare the oil and grease concentrations reported for the UST excavation. The soil samples were collected using a stainless steel hand auger and a stainless steel spatula, placed in glass containers with teflon-lined lids, placed on ice, and delivered to ESE. The hand auger and spatula were decontaminated with a non-phosphate detergent wash followed by a tap water rinse prior

to use at each sampling location. At ESE, the samples were analyzed for oil and grease via EPA Method 9071 (AIG, 1992).

On June 16, 1992, the 550-gal waste oil UST was rendered useless and transported offsite to the Noble facility in Sanford, N.C. for subsequent disposal. The UST was subsequently disposed of at Safeway Tank Company in Colfax, N.C. In addition, Noble also removed the contaminated soil from the site. The contaminated soil was delivered to Cunningham Brick in Lexington, N.C. for thermal treatment. The stockpiled soil had been sampled for characterization for disposal on August 5, 1992 (as sample WT-6) and had been analyzed at ESE for: TCLP metals; VOCs by EPA Method 8240; SVOCs via Method 8270; and PCBs and pesticides by EPA Method 8080 (AIG, 1992).

In September 1992, AIG and Noble returned to the AMC site to excavate and remove the waste oil pit in the maintenance shop and the remainder of the associated piping which had connected the pit to the waste oil UST. Prior to removing the waste oil pit and piping, the 6-gal of liquid remaining within the waste oil pit was transferred to an EPA-approved 55-gal drum. (The waste oil was subsequently disposed of by Laidlaw.) The waste oil pit, a square-shaped concrete trench approximately 2 ft by 2 ft by 3 ft in depth and its associated piping were then removed. Three soil samples were collected from the excavation for the waste oil pit and the piping on September 9, 1992 at the following locations: a crush and run area 10 ft west of the center of the excavation (CR-1); a crush and run area 10 ft east of the center of the excavation (CR-2); and a crush and run area at the center of the excavation (CR-3). The soil samples were collected using a decontaminated stainless steel spatula, placed on glass containers with teflon-lined lids, placed on ice, and delivered to ESE. At ESE, the samples were analyzed for: TPH via EPA Method 3550; BTEX, chlorobenzene, and dichlorobenzene by EPA Method 8020; and VOCs via EPA Method 8010. The soil analytical results for all phases of the waste oil UST and waste oil pit excavations and removals are provided in Section 4.02.e. The waste oil characterization results are also provided in Section 4.02.e (AIG, 1992).

f. Excavation of the 6,000-Gal No. 2 Fuel Oil UST

Based on the recommendations of the Phase I ELA, AIG retained Noble on August 19-20, 1992 to excavate and remove the 6,000-gal No. 2 fuel oil UST and its associated piping leading to the boiler room of the office building.

The 6,000-gal No. 2 fuel oil UST had been placed out-of-service earlier in 1992. On August 19-20, 1992, Noble drained and flushed all of the piping associated with the UST and then removed 62 gal of product and residuals from the UST. Following the removal of the residuals from the UST, Noble removed the UST's dispenser and gravel surface and excavated the soil from above and beside the UST. At this point, excavation was halted such that the UST could be cleaned, inspected, and purged of all flammable vapors. Following these precautionary measures, the excavation and removal of the UST was continued. Soil removed from the excavation was stockpiled on and covered with polyethylene sheeting at the site. Upon removal, the UST was also placed on polyethylene sheeting in a temporary staging area. While in the staging area, the UST was inspected for evidence of leakage. The UST and its associated piping appeared to be in good condition except for some deterioration noted in several locations along the piping; however, the quantity of release could not be identified (AIG, 1992).

Following the removal of the UST and piping, stained and odorous soil was observed in the piping excavation and the OVA indicated that product remained. After removing stained and odorous soil from the excavation, soil samples were collected from the following seven locations on August 19-20, 1992: the bottom east end of the excavation at a depth of 12 ft below grade (S-1); the bottom west side of the excavation at a depth of 12 ft below grade (S-2); a surficial sample (1 ft below grade) at the former fill port area (S-3); a piping run sample from 2 ft below grade at approximately 20 ft from the fill port (S-4); a piping run sample from 2 ft below grade at approximately 40 ft from the fill port (S-5); a piping run sample from 2 ft below grade at approximately 60 ft from the fill port (S-6); and a composite sample of the stockpiled soil from the excavation (S-7). The soil samples were collected using a stainless steel spatula, placed in glass containers with teflon-lined lids, placed on ice, and delivered to ESE in Raleigh, N.C. The spatula was decontaminated with a non-phosphate detergent wash followed by a tap water rinse prior to use at each sampling location. At ESE, the samples were analyzed for TPH by EPA Methods 3550 and 5030 (AIG, 1992).

Based on the analytical results, AIG and Noble returned to the AMC site on August 26, 1992 to further excavate in the area of the former 6,000-gal No. 2 fuel oil UST. Upon further excavation, AIG collected three additional samples from the excavation: S-3.1 at 5 ft below grade at the fill port location; S-5.1 from 55 inches below grade at the sample S-5 location; and S-6.1 from 10 ft below grade at the sample S-6 location. The soil samples were collected using a decontaminated spatula, placed in glass containers with teflon-lined lids, placed on ice, and delivered to ESE. At ESE, the

samples were analyzed for TPH via EPA Methods 3550 and 5030. The soil analytical results for the two rounds of sampling conducted at this excavation are provided in Section 4.02.f (AIG, 1992).

On August 24, 1992, the 6,000-gal UST was rendered useless and disposed of at Safeway Tank Company in Colfax, N.C. On October 2, 1992, Noble removed the petroleum contaminated soil from the site. The contaminated soil was delivered to Cunningham Brick in Lexington, N.C. for thermal treatment (AIG, 1992).

An October 16, 1992 letter from the NCDEM - Ground Water Section acknowledged receipt of the analytical results from the 6,000-gal No. 2 fuel oil UST's excavation. Based on the letter, the NCDEM had reviewed the report and recommended no further action for the former UST location (AIG, 1992).

g. Initial Phase II ELA

In October 1992, AIG compiled a Phase II ELA report for the AMC site. The Phase II report described the excavation and removal of the five UST systems from the site. In addition, the Phase II report provided information regarding the subsequent environmental investigations required at the AMC site to delineate the soil and ground water contamination associated with the 8,000-gal leaded gasoline UST location. In addition, the Phase II report discussed the removal of chemicals, hazardous constituents, paints, gas cylinders, and other abandoned materials from the site (AIG, 1992).

According to the Phase II report, only one Phase I recommendation remained to be addressed: the removal of the friable asbestos located in the boiler room of the office building (AIG, 1992).

h. Secondary Phase I and Limited Phase II ELA

In October and November 1992, O'Brien & Gere Engineers conducted a Phase I and limited Phase II ELA for the AMC property for a third party interested in buying the property. The Phase I ELA report included: a site history, including a chain-of-ownership title search and an aerial photograph review; site reconnaissance observations and findings; and Federal, State, local, and supplemental file reviews. The limited Phase II ELA program consisted of: asbestos sampling of boiler jacket and pipe insulation in the office building and in the maintenance shop; and soil gas sampling at ten selected locations in four distinct areas (the brick pump house area, Drum Area No. 1, Drum Area No. 2, and the metal

storage shed area). A discussion of the soil gas sampling results is provided in Section 4.02.g (OBG, 1992).

The conclusions and recommendations for the AMC site based on the Phase I and limited Phase II investigations included:

- tracking the investigations and corrective actions associated with the excavation and removal of the five USTs;
- soil sampling in Drum Area No. 1 to further quantify potential soil contamination revealed through the soil gas sampling program;
- soil sampling in Drum Area No. 2 to further quantify potential soil contamination revealed through the soil gas sampling program;
- soil sampling at the southeastern corner of the quonset hut storage warehouse due to the existence of stressed vegetation in the area; and
- soil sampling at the eastern fenceline in the area where the contaminated soil from the UST excavations had reportedly been stored (OBG, 1992).

i. Hand Auger Investigation/Soil Excavation at Drum Areas No. 1 & 2/Stressed Vegetation Area

Based on the recommendations and conclusions of the secondary Phase I and limited Phase II ELA programs, AIG retained ERC to perform a voluntary preliminary hand auger investigation of Drum Area No. 1, Drum Area No. 2, and the southwestern corner of the quonset hut storage warehouse on February 3-5, 1993 for an interested buyer for the property. Hand auger borings HA1-1 through HA1-4 were completed to depths ranging from 3-7 ft below grade at each of the corners of the 18 ft by 18 ft square-shaped area designated to be Drum Area No. 1. Hand auger borings HA2-1 through HA2-5 were completed to depths ranging from 3-4 ft below grade in the middle and at each corner of the 18 ft by 18 ft diamond designated to be Drum Area No. 2. The area of stressed vegetation contained hand auger borings HA3-1 through HA3-4, which were located approximately 9 ft apart along an arc around the southwest corner of the building. The hand auger borings in the area of stressed vegetation ranged from 3-5 ft in depth. The hand augers were performed using a 3.25-inch diameter stainless steel hand auger. An ERC representative logged and sampled the soils encountered in each boring at 1-ft intervals to the base of each boring. To reduce the potential for cross-contamination between sample locations, the hand auger was decontaminated with a non-phosphate detergent wash solution followed by a distilled water rinse between each sampling event (ERC, 1993a).

Soil samples were collected from the hand auger at 1-ft intervals from grade to the base of each boring. The samples from each interval were collected in laboratory-supplied glass jars as well as in plastic

bags. The soil samples in the plastic bags were then screened in the field with a photoionization detector (PID) to identify which of the samples collected from each boring should be selected for laboratory analysis. (If no volatile vapor content was detected, the sample from the deepest interval of the hand auger boring was submitted for laboratory analysis.) Based on the PID screenings, the sample from each boring displaying the highest concentration of volatiles was placed on ice and delivered to Webb Technical Group, Inc. (Webb) in Raleigh, N.C. At Webb, the samples were analyzed for: SVOCs by EPA Method 8270; pesticides and PCBs by EPA Method 8080; VOCs by EPA Method 8240; oil and grease by EPA Method 9071; and TCLP metals. The soil analytical results are provided in Section 4.02.h (ERC, 1993a).

Based on the analytical results obtained through the preliminary hand auger investigations at the two drum storage areas and at the area of stressed vegetation, the third party interested in purchasing the property requested the excavation of contaminated soil from each of the three areas. In response, AIG retained ERC to return to the AMC site on June 23-24, 1992 to excavate contaminated soil from the three areas and to collect post-excavation samples (AIG field notes, 1993).

The area of stressed vegetation on the southwestern corner of the quonset hut storage warehouse was excavated first. The excavation, which was crescent-shaped, extended horizontally in width to approximately 12 ft and in length to approximately 35 ft. The excavation was extended to 3-6 ft below grade, with a slope downward from west to east. Upon completion of the excavation, soil samples were collected from the excavation on June 23, 1992 from the following seven locations: west sidewall at 2.5 ft below grade (3.1); north sidewall at 3.5 ft below grade (3.2); east sidewall from 5.5 ft below grade (3.3); south sidewall from 3.5 ft below grade (3.4); excavation floor on the west side (3.5); the center of the excavation floor (3.6); and the excavation floor on the east side (3.7). The soil samples were collected using a stainless steel spatula, placed in glass containers with teflon-lined lids, placed on ice, and delivered to ESE of Raleigh, N.C. The spatula was decontaminated with a non-phosphate detergent wash followed by a distilled water rinse prior to use at each sampling location. At ESE, five of the seven samples (3.1, 3.2, 3.3, 3.5, and 3.7) were analyzed for VOCs via EPA Method 8010 (AIG field notes, 1993).

Drum Area No. 1 was excavated next. The excavation, which was rectangular in shape, extended horizontally to a length and width of approximately 50 ft by 20 ft. The excavation was also extended

to approximately 10 ft below grade. Upon completion of the excavation, soil samples were collected from the excavation on June 24, 1992 from the following eight locations: north sidewall at 4-5 ft below grade (1.1); west sidewall at 6 ft below grade (1.2); east sidewall from 6.5 ft below grade (1.3); south sidewall from 5 ft below grade (3.1); excavation floor on the south side (1.5); the center of the excavation floor (1.6); the excavation floor on the north side (1.7); and a composite of the stockpiled soil (1.8). The soil samples were collected using a decontaminated stainless steel spatula, placed in glass containers with teflon-lined lids, placed on ice, and delivered to ESE. At ESE, five of the eight samples (1.1, 1.2, 1.3, 1.4, and 1.6) were analyzed for VOCs via EPA Method 8010 (AIG field notes, 1993).

Drum Area No. 2 was excavated last. The excavation, which was square in shape, extended horizontally to a length and width of approximately 20 ft by 20 ft. The excavation was also extended to approximately 5 ft below grade. Upon completion of the excavation, soil samples were collected from the excavation on June 24, 1992 from the following eight locations: north sidewall at 4 ft below grade (2.1); west sidewall at 4 ft below grade (2.2); east sidewall from 4 ft below grade (2.3); south sidewall from 4 ft below grade (2.4); excavation floor on the north side (2.5); the center of the excavation floor (2.6); the excavation floor on the south side (2.7); and a composite of the stockpiled soil (2.8). The soil samples were collected using a decontaminated stainless steel spatula, placed in glass containers with teflon-lined lids, placed on ice, and delivered to ESE. At ESE, five of the eight samples (2.1, 2.2, 2.3, 2.4, and 2.6) were analyzed for VOCs via EPA Method 8010. The soil analytical results from the excavations of the drum storage areas and the area of stressed vegetation are provided in Section 4.02.i (AIG field notes, 1993).

j. Soil Sampling in the Former UST Staging Area

At the request of the third party interested in purchasing the AMC property, O'Brien & Gere Engineers was retained to collect soil samples along the eastern fenceline of the property in the area where contaminated soil was reportedly staged during the removal of the five former USTs. Based on the request, the soil sampling was conducted using a hand auger at five pre-selected sampling locations (F-1 through F-5). At each location, samples were collected from the 0-6 inch interval below grade (designated the "A" interval) and from the 18-24 inch interval below grade (designated the "B" interval). The soil samples were collected using a stainless steel hand auger, placed in glass containers with teflon-lined lids, placed on ice, and delivered to Versar Laboratories, Inc. (Versar) in Springfield, Va.

The hand auger was decontaminated prior to use at each sampling location. At Versar, the samples were analyzed for TPH utilizing a gas chromatograph (GC) - flame ionization detector (FID) by modified EPA Method 8015. The soil analytical results for this program are provided in Section 4.02.j (OBG, 1993).

k. Further Delineation for the 8,000-Gal Leaded Gasoline UST (October 1992 through October 1993)

In compliance with the September 16, 1992 NCDEM - Ground Water Section response letter and subsequent conversations with the NCDEM, AIG retained ERC to conduct further investigatory activities to delineate the contaminant plume associated with the former 8,000-gal leaded gasoline UST. These additional activities included:

- the performance of an aquifer pump test on October 22, 1992;
- the installation of six monitoring wells in November and December 1992;
- the completion of one round of quarterly ground water sampling in January 1993;
- the performance of one round of quarterly ground water sampling in April 1993;
- the installation of four additional monitoring wells on June 8-9, 1993;
- the completion of a round of ground water sampling in June 1993; and
- the completion of a round of ground water sampling in October 1993.

In addition, AIG retained O'Brien & Gere Engineers to conduct one round of quarterly ground water sampling in February 1994 and to inspect the condition of the monitoring wells.

The aquifer pump test was performed on October 22, 1992; however, a report including an interpretation of the results and the conclusions of the test was not prepared. As such, the aquifer pump test data has not been utilized in characterizing the AMC site (AIG, 1992).

In November and December 1992, AIG retained ERC to install seven shallow monitoring wells (MW-4 through MW-10), a deep well (DW-1), and a recovery well (RW-1). The monitoring wells were advanced with 8-inch outer diameter hollow stem augers to depths of 32-42 ft below grade. Soil samples representative of the subsurface were collected on 5-ft centers to the base of each boring using split spoon sampling devices. Prior to drilling each bore hole, augers and drill rods were steam cleaned to prevent cross-contamination between boring locations; likewise, split-spoons were decontaminated using a non-phosphate detergent wash followed by a deionized water rinse prior to each sampling event (ERC, 1992b).

During drilling, an ERC representative logged the soils encountered in each boring. The samples from each interval were collected in laboratory-supplied glass jars as well as in air-tight containers. The soil samples in the air-tight containers were then field screened with a PID to identify which of the samples from each boring should be selected for laboratory analysis. (If no volatile vapor content was detected, the sample from the deepest interval of the soil boring was submitted for laboratory analysis.) Based on the PID screenings, the sample from each boring displaying the highest concentration of volatiles was placed on ice and delivered to Webb in Raleigh, N.C. At Webb, the samples were analyzed for TPH via EPA Methods 3550 and 5030. The soil analytical results are provided in Section 4.02.k (ERC, 1992b).

After completion of the soil borings, ERC installed the shallow monitoring wells, the deep well, and the recovery well. The shallow monitoring wells were constructed with 0.01-inch continuous slot screen casing extending a minimum of 3 ft above the static water table level to facilitate the entry of free-floating hydrocarbons, if present, and to allow for seasonal fluctuations in the water table. The deep well, DW-1, was constructed with 0.01-inch continuous slot screen comprising the lower 5 ft of the boring. The 4-inch recovery well, RW-1, was constructed with 0.02-inch continuous slot screen casing extending a minimum of 3 ft above the static water table level to facilitate the entry of free-floating hydrocarbons, if present, and to allow for seasonal fluctuations in the water table. The remainder of each bore hole depth was completed with PVC riser to grade. The annular space between the well and the bore hole was backfilled with washed sand and sealed with a hydrated bentonite pack. The monitoring well installation was completed at the ground surface with either flush-mounted road covers, 2-ft by 2-ft roadboxes, or stick-up well boxes (ERC, 1992b).

After installation, the monitoring wells were developed by hand bailing. Well development was completed when the water appeared to be free of fine sediment materials capable of clogging the water-bearing formation. Water levels were allowed to stabilize in the monitoring wells prior to measurement with an electronic interface probe. Following stabilization, the water levels were measured to the nearest 0.01-ft to the top of the PVC riser, which had previously been surveyed relative to a working benchmark elevation of 100 ft set at the AMC site. Free product was not reported in any of the monitoring wells (ERC, 1992b).

One round of quarterly ground water sampling was conducted in January 1993. The sampling procedures and analytical results for this program are documented in an ERC report dated May 5, 1993. According to this report, the investigative activities included: measurement of ground water levels in the monitoring wells prior to purging; purging of no less than three well volumes of water from each well targeted for sampling; and the laboratory analysis of ground water samples collected from monitoring wells MW-1 through MW-10, RW-1, RW-2, and DW-1 following purging (ERC, 1993b).

According to the ERC report, each of the monitoring wells was gauged on January 30 and February 3, 1993 using an electronic interface probe to identify ground water levels and to investigate for the presence of free product. The wells were gauged by measuring the water table elevation to the nearest 0.01-ft relative to the top of the PVC riser, which had previously been surveyed relative to a working benchmark elevation of 100 ft set at the AMC site. Free product was not reported in any of the monitoring wells (ERC, 1993b).

Based on the ERC report, the monitoring wells were sampled on January 30 and February 3, 1993. The monitoring wells were purged prior to sampling in order to obtain representative ground water samples. Purging was conducted using PVC plastic disposable bailers with associated nylon rope. A quantity of three well volumes of water was calculated and removed from each well. Ground water samples were obtained from the monitoring wells on January 30 and February 3, 1993 using disposable bailers. The ground water was poured into laboratory-supplied vials, placed on ice, and delivered to Webb. At Webb, the January and February 1993 samples were analyzed for: VOCs by EPA Methods 601 and 602; SVOCs via EPA Method 625; and TCLP metals. Monitoring well construction details are discussed in Section 4.03.a and b. Ground water analytical results are provided in Section 4.03.c (ERC, 1993b).

The second round of quarterly ground water sampling was conducted in April 1993. The sampling procedures and analytical results for this program are documented in an ERC report dated May 11, 1993. According to this report, the investigative activities included: measurement of ground water levels in the monitoring wells prior to purging; purging of no less than three well volumes of water from each well targeted for sampling; and the laboratory analysis of ground water samples collected from monitoring wells MW-1 through MW-10, RW-1, RW-2, and DW-1 following purging (ERC, 1993c).

According to the ERC report, each of the monitoring wells was gauged on April 16, 1993 using an electronic interface probe to identify ground water levels and to investigate for the presence of free product. The wells were gauged by measuring the water table elevation to the nearest 0.01-ft relative to the top of the PVC riser, which had previously been surveyed relative to a working benchmark elevation of 100 ft set at the AMC site. Free product was not reported in any of the monitoring wells (ERC, 1993c).

Based on the ERC report, the monitoring wells were purged on April 16, 1993 prior to sampling in order to obtain representative ground water samples. Purging was conducted using PVC plastic disposable bailers with associated nylon rope. A quantity of three well volumes of water was calculated and removed from each well. Ground water samples were obtained from the monitoring wells on April 16, 1993 using disposable bailers. The ground water was poured into laboratory-supplied vials, placed on ice, and delivered to GeoChem, Inc. (GeoChem) in Morrisville, N.C. At GeoChem, the samples were analyzed for: VOCs by EPA Methods 601 and 602; and SVOCs via EPA Method 625. Monitoring well construction details are discussed in Section 4.03.a and b. Ground water analytical results are provided in Section 4.03.c (ERC, 1993c).

AIG and ERC returned to the AMC site on June 8-9, 1993 to complete four soil borings and install four monitoring wells (MW-11, MW-12, MW-13, and DW-2). The monitoring wells were advanced with 8-inch outer diameter hollow stem augers to depths of 25 ft, 25 ft, 45 ft, and 43 ft below grade for monitoring wells MW-11, MW-12, MW-13, and DW-2, respectively. Soil samples representative of the subsurface were collected on 5-ft centers to the base of each boring using split-spoon sampling devices. Prior to drilling each bore hole, augers and drill rods were steam cleaned to prevent cross-contamination between boring locations; likewise, split-spoons were decontaminated using a non-phosphate detergent wash followed by a deionized water rinse prior to each sampling event (ERC, 1993d).

During drilling, an ERC representative logged the soils encountered in each boring. The samples from each interval were collected in laboratory-supplied glass jars as well as in plastic bags. The soil samples in the plastic bags were then screened in the field with a PID to identify which of the samples collected from each boring should be selected for laboratory analysis. (If no volatile vapor content was detected, the sample from the deepest interval of the soil boring was submitted for laboratory analysis.)

Based on the PID screenings, the sample from each boring displaying the highest concentration of volatiles was placed on ice and delivered to ESE. At ESE, the soil samples were analyzed for TPH via EPA Methods 3550 and 5030. The soil analytical results are provided in Section 4.02.k (ERC, 1993d).

After completion of the soil borings, ERC installed the four monitoring wells. Monitoring wells MW-11 through MW-13 were constructed with 0.01-inch continuous slot screen casing extending a minimum of 3 ft above the static water table level to facilitate the entry of free-floating hydrocarbons, if present, and to allow for seasonal fluctuations in the water table. The deep well, DW-2, was constructed with 0.01-inch continuous slot screen casing comprising the lower 5 ft of the boring. The remainder of each bore hole depth was completed with PVC riser to grade. The annular space between the well and the bore hole was backfilled with washed sand and sealed with a hydrated bentonite pack. The monitoring well installation was completed at the ground surface with a 12-inch flush-mounted manhole cover to accommodate vehicular traffic and a locking well cap (ERC, 1993d).

After installation, the monitoring wells were developed by hand bailing. Well development was completed when the water appeared to be free of fine sediment materials capable of clogging the water-bearing formation. Water levels were allowed to stabilize in the monitoring wells prior to measurement with an electronic interface probe. Following stabilization, the water levels were measured to the nearest 0.01-ft to the top of the PVC riser, which had previously been surveyed relative to a working benchmark elevation of 100 ft set at the AMC site. Free product was not reported in any of the monitoring wells (ERC, 1993d). (The new monitoring wells were surveyed on July 27, 1993 and the elevation of each well was measured relative to the temporary benchmark established at the site.)

The monitoring wells were purged prior to sampling in order to obtain representative ground water samples. A quantity of three well volumes of water was calculated and removed from each well. Ground water samples were obtained from monitoring wells MW-11 through MW-13 and DW-2 on June 8-9, 1993 using disposable bailers. The ground water was poured into laboratory-supplied vials, placed on ice, and delivered to ESE. At ESE, the samples were analyzed for: VOCs via EPA Methods 601 and 602; and SVOCs by EPA Method 625. Ground water analytical results are provided in Section 4.03.c (ERC, 1993d).

The third round of quarterly ground water sampling was conducted in June 1993. The sampling procedures and analytical results for this program are documented in an ERC report dated October 6, 1993. According to this report, the investigative activities included: measurement of ground water levels in the monitoring wells prior to purging; purging of no less than three well volumes of water from each well targeted for sampling; and the laboratory analysis of ground water samples collected from monitoring wells MW-1 through MW-13, RW-1, RW-2, DW-1, and DW-2 following purging (ERC, 1993e).

According to the ERC report, each of the monitoring wells was gauged on June 30, 1993 using an electronic interface probe to identify ground water levels and to investigate for the presence of free product. The wells were gauged by measuring the water table elevation to the nearest 0.01-ft relative to the top of the PVC riser, which had previously been surveyed relative to a working benchmark elevation of 100 ft set at the AMC site. No free product was reported in the wells (ERC, 1993e).

Based on the ERC report, all of the monitoring wells (with the exception of MW-11 through MW-13 and DW-2 which were sampled on June 8-9, 1993) were purged on June 30, 1993 prior to sampling in order to obtain representative ground water samples. Purging was conducted using PVC plastic disposable bailers with associated nylon rope. A quantity of three well volumes of water was calculated and removed from each well. Ground water samples were obtained from the monitoring wells on June 30, 1993 using disposable bailers. The ground water was poured into laboratory-supplied vials, placed on ice, and delivered to ESE. At ESE, the samples were analyzed for: VOCs by EPA Methods 601 and 602; SVOCs via EPA Method 625; and TCLP metals. Ground water analytical results are provided in Section 4.03.c (ERC, 1993e).

A round of quarterly ground water sampling was also conducted in October 1993. The sampling procedures and analytical results for this program are documented in an ERC report dated October 26, 1993. According to this report, the investigative activities included: measurement of ground water levels in the monitoring wells prior to purging; purging of no less than three well volumes of water from each well targeted for sampling; and the laboratory analysis of ground water samples collected from monitoring wells MW-1 through MW-13, RW-1 and RW-2, and DW-1 and DW-2 following purging (ERC, 1993f).

According to the ERC report, each well was gauged on October 7, 1993 using an electronic interface probe to identify ground water levels and to investigate for the presence of free product. The wells were gauged by measuring the water table elevation to the nearest 0.01-ft relative to the top of the PVC riser, which had previously been surveyed relative to a working benchmark elevation of 100 ft set at the AMC site. Free product was not reported in any of the monitoring wells (ERC, 1993f).

Based on the ERC report, each of the monitoring wells was sampled on October 7, 1993. The monitoring wells were purged prior to sampling in order to obtain representative ground water samples. Purging was conducted using PVC plastic disposable bailers with associated nylon rope. A quantity of 3 well volumes of water was calculated and removed from each well. Ground water samples were obtained from the monitoring wells on October 7, 1993 using disposable bailers. The ground water was poured into laboratory-supplied vials, placed on ice, and delivered to GeoChem. At GeoChem, the samples were analyzed for: VOCs by EPA Methods 601 and 602; SVOCs via EPA Method 625; and TCLP metals. Ground water analytical results are provided in Section 4.03.c (ERC, 1993f).

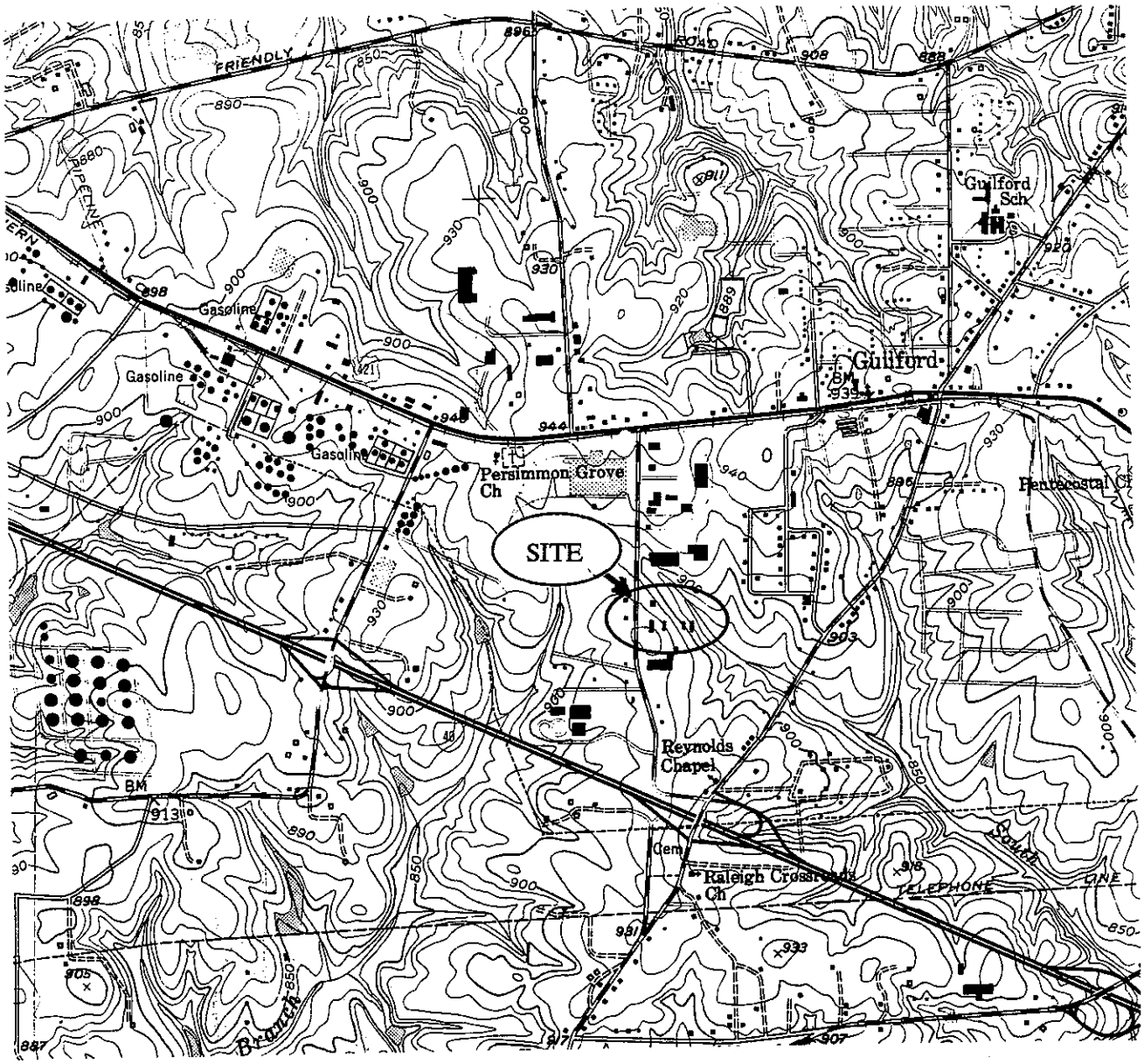
The final round of quarterly ground water sampling was conducted in February and March 1994 by O'Brien & Gere Engineers. The investigative activities included: measurement of ground water levels in the monitoring wells prior to purging; purging of at least three well volumes of water from each well prior to sampling; and the collection of ground water samples from monitoring wells MW-1 through MW-13, RW-1 and RW-2, and DW-1 and DW-2 for laboratory analysis. In addition, O'Brien & Gere Engineers was retained to inspect and document the physical condition of each of the monitoring wells.

On February 28, 1994, each monitoring well was gauged using an electronic interface probe to identify ground water levels and to investigate for the presence of free product. The wells were gauged by measuring the water table elevation to the nearest 0.01-ft relative to the top of the PVC riser. (O'Brien & Gere Engineers had contracted with a local firm to perform a survey of the site, including the location of each monitoring well and its top of casing elevation.) Free product was not reported in any of the monitoring wells; however, a strong chemical odor was noted for monitoring well MW-1.

Each of the monitoring wells was then purged and sampled on February 28, 1994 and March 1, 1994. The monitoring wells were purged prior to sampling in order to obtain representative ground water samples. Purging was conducted using PVC plastic disposable bailers with associated nylon rope. For

purging, a quantity of three well volumes of water was calculated and removed from each well. Ground water samples were then obtained from the monitoring wells using disposable bailers. The ground water was poured into laboratory-supplied vials, placed on ice, and delivered to ESE via overnight delivery. At ESE, the samples were analyzed for: VOCs by EPA Methods 601 and 602; SVOCs via EPA Method 625; and TCLP metals. Due to breakage of sample jars during transit, additional samples were collected for monitoring wells MW-1, MW-6, and MW-9 to replace lost samples. Ground water analytical results are provided in Section 4.03.c.

In addition to the quarterly ground water sampling, O'Brien & Gere Engineers also inspected the condition of each of the monitoring wells at the AIG site. The inspection consisted of: verifying the construction details of each of the wells (length of screen, total depth of well, etc.) through well plates and drilling notes; a visual inspection of the condition of the well (including the well boxes, well covers, locks, well caps, and the concrete pad); and a camera-view inspection of the inside of the well to identify potential problems in the well construction or maintenance. Details of the inspections are provided in Section 4.03.b.



SITE LOCATION MAP

ASSOCIATED MECHANICAL CONTRACTORS, INC.
307 SWING ROAD,
GREENSBORO, NORTH CAROLINA

QUADRANGLE LOCATION

THIS MAP TAKEN FROM THE
GUILFORD, NORTH CAROLINA
USGS QUADRANGLE

SCALE 1:24000

1 0 1/2 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

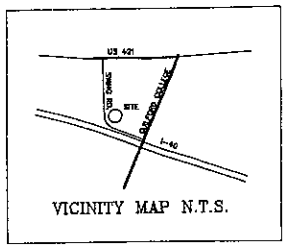
1 .5 0 1 KILOMETER

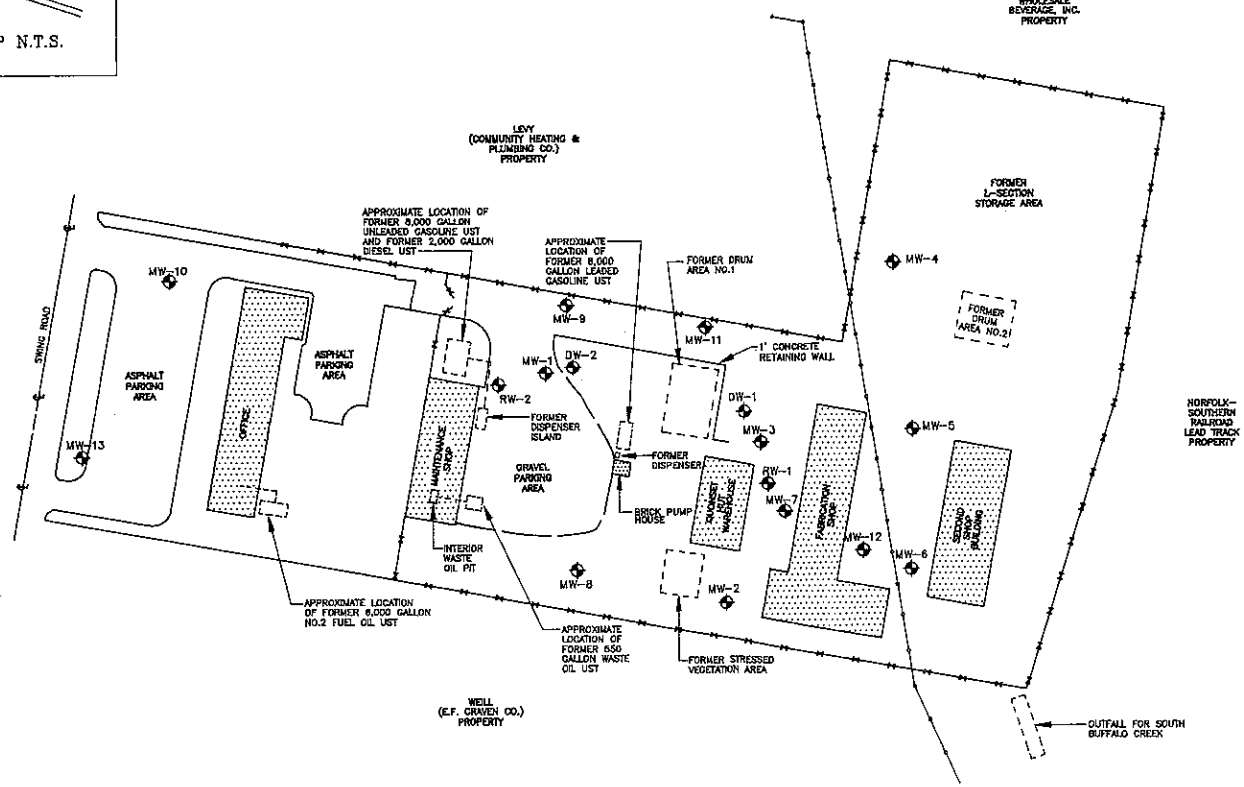
O'BRIEN & GERE
ENGINEERS INC.

FIGURE 3

NOTES:

1. THE ONLY KNOWN SUBSURFACE UTILITY AT THE SITE IS THE 15-INCH SANITARY SEWER LINE. DUE TO THE SHALLOW GROUND WATER DEPTH IN THAT AREA OF THE SITE, IT IS BELIEVED THAT THE SANITARY SEWER LINE INTERCEPTS THE GROUND WATER TABLE.
2. OTHER SUBSURFACE UTILITIES AND CONDUITS HAVE NOT BEEN LOCATED FOR THE FACILITY.
3. THERE ARE NO BASEMENTS OR OTHER UNDERGROUND STRUCTURES LOCATED AT THE SITE WHICH MAY POTENTIALLY BE AT RISK FROM FREE PRODUCT AND/OR VAPORS.





LEGEND

- MONITORING WELL
- FENCE
- 15-INCH SANITARY SEWER LINE
- ℄ CENTER LINE OF ROAD

SITE BASE PLAN
&
UTILITIES PLAN

ASSOCIATED MECHANICAL CONTRACTORS, INC.
307 SWING ROAD
GREENSBORO, N.C.

100 0 100 200

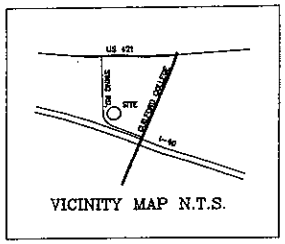
1"=100'

FILE NO. 5836.001-03F

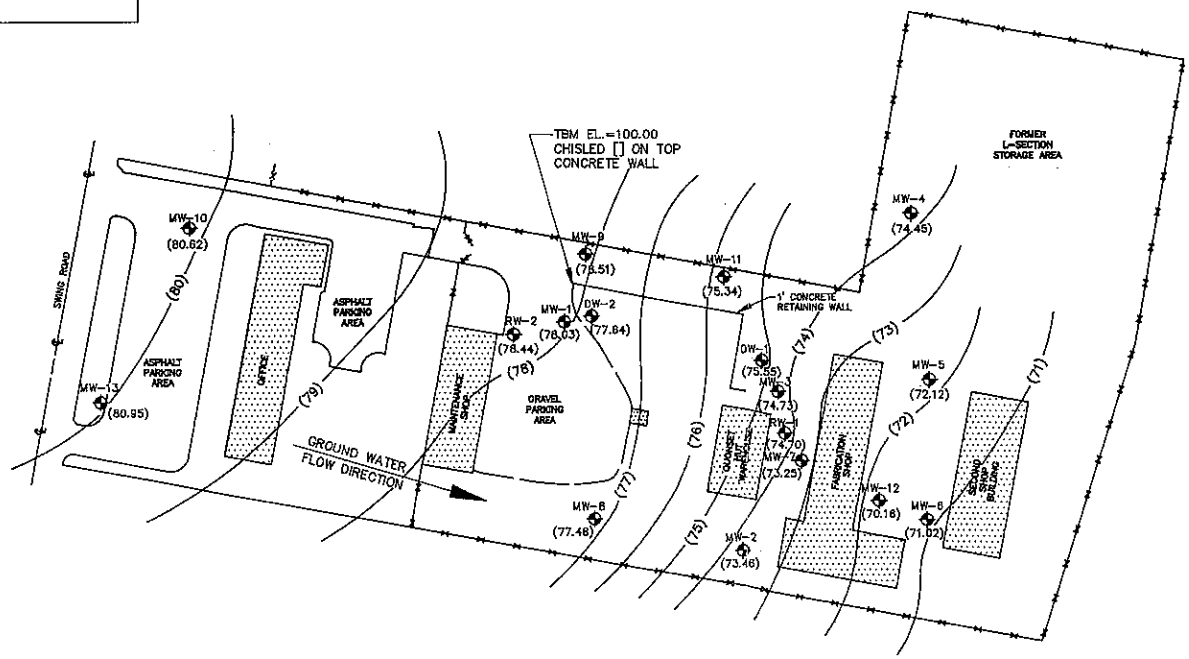
CRAVEN & DIEHL ENGINEERS, INC.

FIGURE 9

WELL	NORTH	EAST	GROUND ELEVATION	TOP CASING ELEVATION	FEBRUARY 28, 1994 GROUND WATER ELEVATION
MW-1	5073.6162	5376.0980	99.43	98.90	78.03
MW-2	4866.2930	5526.3788	81.62	81.38	73.46
MW-3	5018.2355	5555.8000	82.69	82.19	74.73
MW-4	5163.9896	5666.1684	78.53	81.98	74.45
MW-5	5027.1017	5680.3200	80.31	84.05	72.12
MW-6	4912.9114	5678.6132	79.04	82.07	71.02
MW-7	4962.0221	5576.4209	81.56	84.59	73.25
MW-8	4913.0893	5401.0425	100.60	100.56	77.48
MW-9	5131.7598	5392.0188	97.78	97.86	78.51
MW-10	5152.1720	5066.0018	114.37	114.15	80.62
MW-11	5110.8422	5508.7376	86.35	86.30	75.34
MW-12	4929.5092	5642.2017	80.45	80.48	70.16
MW-13	5008.9010	4995.4837	119.96	119.71	80.95
DW-1	5044.8055	5541.2944	83.28	85.84	75.55
DW-2	5076.7949	5402.0850	99.33	99.20	77.64
RW-1	4983.9361	5582.0148	82.43	85.73	74.70
RW-2	5063.6227	5333.4491	99.72	99.39	78.44



VICINITY MAP N.T.S.



1. THIS SURVEY DOES NOT REPRESENT A BOUNDARY SURVEY.
2. LOCATION OF WELLS ARE SHOWN RELATIVE TO EXISTING SITE FEATURES.
3. HORIZONTAL AND VERTICAL DATUM IS ASSUMED.

SURVEY CONDUCTED BY: MARLOWE, DREITZLER & ASS.
DATE: 3-7-94

LEGEND

- MONITORING WELL
- FENCE
- (80) GROUND WATER CONTOUR
- ℄ CENTER LINE OF ROAD

POTENTIOMETRIC/GROUND WATER ELEVATION CONTOUR MAP (FEBRUARY 28, 1994)

ASSOCIATED MECHANICAL CONTRACTORS, INC.
307 SWING ROAD
GREENSBORO, N.C.

100 0 100 200
1"=100'

FILE NO. 5836.001-09F

CRAVEN & BERG ENGINEERS, INC.

5836.002

Report

Corrective Action Plan
Former Associated Mechanical Contractors
Fischbach Properties
Incident No. 7859
Greensboro, North Carolina

AIG Consultants, Inc.
Atlanta, Georgia

Donald E. Stone, Jr., P.E.
Vice President

July 1997

O'BRIEN & GERE ENGINEERS, INC.

1015 Aviation Parkway, Suite 700
Morrisville, North Carolina 27560

DIVISION OF ENVIRONMENTAL MANAGEMENT
CERTIFICATION FOR THE SUBMITTAL OF A CORRECTIVE ACTION PLAN UNDER 15A NCAC 2L.0106(1)

Responsible Party:	Fischbach Corporation				
Address:	2775 S. Vallejo Street				
City:	Englewood	State:	CO	Zip Code:	80110
Site Name:	Former Associated Mechanical Contractors				
Address:	307 Swing Road				
City:	Greensboro	State:	NC	Zip Code:	27409

I, Donald E. Stone, Jr., a Professional Engineer/Licensed Geologist (circle one) for O'Brien & Gere Engineers, Inc. do hereby certify that the information indicated below is enclosed as part of the requested Corrective Action Plan (CAP) and that to the best of my knowledge the data, site assessments, engineering plans and other associated materials are correct and accurate.

(Each item must be initialed by the certifying licensed professional)

Yes — A listing of the names and addresses of those individuals meeting the notification requirements of 15A NCAC 2L are enclosed (if applicable).
All Some None (circle one) of the notification requirements contained in 15A NCAC 2L have been met. A list of any notification requirements not met is enclosed.

Yes — A Professional Engineer of Licensed Geologist has prepared, reviewed, or certified all applicable parts of the CAP in accordance with 15A NCAC 2L .0103(e).

Yes — A site assessment is attached which provides the information required by 15A NCAC 2L.0106(g).

Yes — A description of the proposed corrective action and supporting justification is enclosed.

Yes — Specific plans and engineering details for the restoration of ground water quality are enclosed and propose the use of the best available technology for the restoration of ground water quality to the levels of the ground water standards prescribed in 15A NCAC 2L.0202.

Yes — A schedule for the implementation and operation of the CAP is enclosed.

Yes — A monitoring plan is enclosed which has the capacity to evaluate the effectiveness of the remedial activity and the movement of the contaminant plume, and which meets the requirements of 15A NCAC 2L.0110.

Yes — The activity which resulted in the contamination incident is not permitted by the State as defined in 15A NCAC 2L.0106(e).

(OVER)

In addition, the undersigned also certifies that in accordance with the requirements of 15A NCAC 2L.0106(l), the following determinations have been made are included in the CAP:

Yes — all sources of contamination and free product have been removed or controlled in accordance with 15A NCAC 2L.0106(f).

Yes — the contaminant has the capacity to degrade and attenuate under the site-specific conditions.

Yes — the time and direction of contaminant travel can be predicted with reasonable certainty.

Yes — the migration of the contaminant will not result in any violation of the standards specified in 15A NCAC 2L.0202 at any existing or foreseeable receptor.

Yes — the contaminants have not and will not migrate onto adjacent properties, adjacent properties are served by public water supplies which cannot be influenced by contaminants migrating off-site, or adjacent landowners have consented in writing to a request allowing the contaminant upon their property.

Yes — the standards specified in 15A NCAC 2L.0202 will be met within one year time of travel upgradient from any receptor and no greater than the distance the contaminant can travel in five years. A ground water monitoring system has been installed which is sufficient to track the degradation and attenuation of contaminants and to ensure the limitations above are met.

Yes — all necessary access agreements needed to monitor ground water quality have been or can be obtained.

Yes — the proposed CAP is consistent with all other environmental laws.

NORTH CAROLINA PROFESSIONAL SEAL 18936 ENGINEER DONALD E. STONE JR.

(Please Affix Seal and Signature)

Notification Requirements

As required by the North Carolina Administrative Code (NCAC) Title 15A, Subchapter 2L, Section .0114, notification of the submission of the Corrective Action Plan (CAP) to the Guilford County Department of Health and a copy of the CAP has been issued to:

Mr. Roger Cotten
Guilford County manager

Dr. Harold D. Gabel, Director
Guilford County Department of Public Health

The following adjacent landowners have also been notified:

Mr. Lowell Easter
Easter and Eisenman

Mr. Jerry W. Harrison, Manager
Environmental Services
Novartis Crop Protection Inc.

Mr. Paul Levy
Community Heating & Plumbing Co.

Mr. Timothy Brooas
American Wholesale Beverage, Inc.

Mr. Spencer Coble
EF Craven Company

1. Introduction

1.1. General

AIG Consultants, Inc. (AIG) retained O'Brien & Gere Engineers, Inc. (O'Brien & Gere) to develop a Corrective Action Plan (CAP) report describing the proposed remedial actions to be implemented at the Former Associated Mechanical Contractors (AMC) site owned by Fischbach Corp. located at 307 Swing Road in Greensboro, NC. At present, the AMC site is a 6.4-acre, L-shaped property zoned as "heavy industrial" in an area of mixed heavy industrial, light industrial and residential zoning on the western side of Greensboro. Site location maps are provided as Figure 1 and Figure 2.

The property was undeveloped prior to 1965 when the first structures were erected to house the H.L. Coble Construction Company (Coble Construction). In July 1975, the property was purchased by AMC. The property, operated from 1975 through the late 1980s as AMC, was utilized for the fabrication of heating, ventilating, and air conditioning (HVAC) systems and as a vehicle maintenance yard. In June 1987, AMC was purchased by Fischbach Properties, a wholly-owned subsidiary of American Insurance Group. Fischbach remains the property owner. Operations at the facility were slowly scaled back beginning in the early 1990s until cessation of site activities in 1993. The site is currently abandoned. The site contains five main buildings, a metal storage shed, a brick pump house, and a concrete structure apparently used to burn trash. A site base map is provided as Figure 3. The five main buildings, identified from the western property line to the east, included:

- A two-story office building, which parallels Swing Road and contains offices and storage rooms

- A maintenance shop, which contains five service bays as well as a two-story section containing storage space on the upper floor and offices, locker rooms and a boiler room on the lower floor

- A one-story quonset hut, which was formerly used as a storage warehouse, with an associated concrete platform storage adjacent to the western side of the hut

- A fabrication shop, which contains a shop area in the southern portion of the building and welding bays in the middle and northern sections of the building

- A second shop building, which also formerly housed welding bays.

The metal storage shed is located northwest of the second shop building. The brick pump house, which once serviced an 8000-gal leaded gasoline underground storage tank (UST), is located immediately upgradient and west of the quonset hut storage building's platform storage area. The concrete burn structure, which is in poor condition and does not appear to have been used for some time, is located to the south of the brick pump house.

Those areas of the site not containing buildings are covered by pavement, gravel and dirt roadways or vegetative growth. Paved areas of the site include the front driveway and parking lot area, located on the western side of the office building, as well as a driveway leading from the front parking lot area, along the north side of the office building, to the backyard area. Once the paved driveway reaches the fenced backyard area, at the northwest corner of the maintenance shop building, it turns to gravel and dirt. Gravel and dirt roadways cover the majority of the backyard area. A grass lawn area is maintained around the office building and front parking lot and driveway areas.

Requirements for this CAP were based on:

- The results of previous environmental investigations conducted at the site between July 1991 and April 1997

- The conclusions and recommendations of a Comprehensive Site Assessment (CSA) report prepared for the site in June 1994, amended in June 1996 and accepted by the NCDEHNR in July 1997

- The recommendations from meetings conducted with the NCDEHNR Winston-Salem Regional Office (WSRO) in 1994, 1995, and 1996.

The environmental investigations were conducted at the AMC site by:

- AIG and its subcontractors (including Noble Oil Services [Noble], Professional Service, Inc.[PSI], and Environmental & Regulatory Consultants, Inc.[ERC]) from July 1991 through October 1993
- O'Brien & Gere (who was retained by a third party interested in purchasing the property) during the time period October 1992 through July 1993
- AIG and O'Brien & Gere from October 1993 through April 1997.

1.2. Purpose

The purpose of this CAP report is to provide remedial response for ground water contamination at the AMC site. The investigation originated from the receipt of a Notice of Violation on April 24, 1992. This CAP addresses:

- Sources of contamination and affected media
- Substances exceeding the ground water standards, and specific regulations violated
- Classification of the affected ground water and an analysis of the local unconfined aquifer
- Objectives of the CAP, including targeted cleanup concentrations
- Evaluation of remedial alternatives for clean-up of the site
- Details of the proposed corrective action plan.

1.3. Background

From 1991 through April 1997, numerous investigative and corrective actions were conducted at the AMC site. The following subsections provide a brief summary of each of the initial remedial actions. A more

detailed account of the initial remedial activities is provided within the CSA report for this site.

1.3.1. Excavation of the 8000-gal leaded gasoline UST

AIG retained Noble to excavate and remove an 8000-gal leaded gasoline UST, associated piping, and dispenser on December 11-13, 1993. (The UST had been in service from 1980 to 1989.) Prior to removal, approximately 35 gal of product and residuals were removed from the UST. Upon removal, the UST and associated piping reportedly appeared to have deteriorated in several locations indicating that release of product may have occurred; however, the quantity of release could not be identified.

Following the removal of the UST and piping, stained and odorous soil was observed in the excavation and an photoionization detector (PID) indicated that impacted soil was present. Soil excavation was continued at the former 8,000-gal leaded gasoline UST location on December 19-20, 1991 and on December 26-27, 1991. Excavation was terminated at a depth of approximately 26 ft when ground water was encountered. The final dimensions of the excavation measured approximately 15 ft by 30 ft by 26 ft in depth. Although ground water was encountered, reportedly free product was not present in the excavation at any time during the excavation activities.

On December 30, 1991, the 8000-gal UST was rendered useless and disposed of at Safeway Tank Company in Colfax, NC On February 4-5, 1992, Noble delivered the petroleum-contaminated soil to Cunningham Brick in Lexington, NC for thermal treatment.

Subsequent environmental investigations and corrective actions associated with the former 8000-gal leaded gasoline are discussed in Section 1.3.3 below.

1.3.2. Excavation of the 8000-gal unleaded gasoline UST/2000-gal diesel fuel UST/dispenser island/associated piping

AIG retained Noble to excavate and remove the 8000-gal unleaded gasoline UST, the 2000-gal diesel fuel UST, and their associated dispenser island and piping on December 11-13, 1991. The two USTs were located in one excavation area; the dispenser island was located in a second

excavation area. (The 8000-gal unleaded gasoline UST and the 2000-gal diesel fuel UST had been in service from 1980 to 1989.)

Prior to removal, approximately 50 gal of diesel fuel residual material was removed from the 2000-gal UST and approximately 60 gal of unleaded gasoline residual material was removed from the 8000-gal UST. Upon removal, the USTs and their associated piping appeared to be in good condition and staining was not observed in the UST excavation. However, upon removal of the dispenser island, staining and odor were observed in the excavation and the PID indicated that product remained in the excavation.

Excavation resumed at the former dispenser island area on December 19-20, 1991, December 26-27, 1991, and May 5-6, 1992. Based on PID readings and visual and olfactory observations, the dispenser island's excavation was completed to a depth of 18 ft on May 6, 1992. The final dimensions of the UST excavation were approximately 20 ft by 30 ft by 12 ft below grade; the final dimensions of the dispenser island excavation were 8 ft by 12 ft by 18 ft below grade.

Between December 30, 1991 and January 9, 1992, the two USTs were rendered useless and disposed of at Safeway Tank Company in Colfax, NC. On February 4-5, 1992, Noble delivered the petroleum contaminated soil to Cunningham Brick in Lexington, NC for thermal treatment.

1.3.3. Subsequent delineation for the 8000-gal leaded gasoline UST

Due to the extensive contamination caused by the removed 8000-gal leaded gasoline UST, AIG retained PSI to complete thirteen soil borings and install three monitoring wells at the AMC site on February 24-27, 1992. The soil borings, which were located in the vicinity of the former UST and extended to depths ranging from 25 to 30 ft. Two soil samples were collected from each of the soil borings (from an 8 to 10 ft shallow depth interval and a 22 to 30 ft deep depth interval) for laboratory analysis. The three monitoring wells (MW-1 through MW-3) were then installed in three of the soil boring locations. Ground water samples were obtained from monitoring wells MW-1 through MW-3 on March 4, 1992. Free product was not noted in any of the monitoring wells.

On April 24, 1992, the NCDEM - Ground Water Section issued a Notice of Violation (NOV) to AMC for a benzene concentration of 3.3 ppb in a ground water sample collected from monitoring well MW-3 on March 4, 1992. In compliance with the NOV, AIG retained ERC to prepare a Comprehensive Site Assessment (CSA) report. The CSA report was

submitted to the NCDEM - Ground Water Section on July 28, 1992. On September 11, 1992, the NCDEM - Ground Water Section issued a response to the July 28, 1992 CSA requiring additional subsurface investigation and cleanup at the AMC site. According to the NCDEM - Ground Water Section, additional required activities included: the installation of at least four additional 2-inch monitoring wells, a deep monitoring well, and a 4-inch recovery well; quarterly ground water sampling; the performance of an aquifer performance test; and the design and installation of a ground water recovery system to treat the contaminated ground water at the site.

1.3.4. Excavation of the 550-gal waste oil UST

AIG retained Noble to excavate and remove a 550-gal waste oil UST, its associated piping, and a waste oil pit in the maintenance shop building on June 15-16, 1992. (The 550-gal waste oil UST had been in service from 1978 to 1989.) The UST and its associated piping appeared to be in good condition upon removal. Based on the condition of the UST and piping, it was suspected that the contaminated soil observed in the excavation was a result of overfill/spill incidents. The quantity of the release could not be identified at the time of the excavation. Following the removal of the UST, additional soil excavation was not conducted based on the condition of the UST and piping and field observations of the remaining soil in the excavation (PID readings and visual and olfactory observations).

On June 16, 1992, the 550-gal waste oil UST was rendered useless and disposed of at Safeway Tank Company in Colfax, NC. The contaminated soil was also removed from the site and delivered to Cunningham Brick in Lexington, NC for thermal treatment.

In September 1992, AIG and Noble returned to the AMC site to excavate and remove the waste oil pit (a square-shaped concrete trench approximately 2 ft by 2 ft by 3 ft in depth) in the maintenance shop and the remainder of the associated piping. Approximately 6 gal of residual waste oil product was removed from the pit and subsequently disposed of by Laidlaw.

1.3.5. Excavation of the 6000-gal no. 2 fuel oil UST

AIG retained Noble to excavate and remove the 6000-gal No. 2 fuel oil UST and its associated piping leading to the boiler room of the office

building on August 19-20, 1992. (The 6000-gal No. 2 fuel oil UST had been in service from 1974 to 1992.) Approximately 62 gal of product residuals were removed from the UST. Upon removal, the UST and its associated piping appeared to be in good condition except for some deterioration noted in several locations along the piping. Reportedly, the quantity of release could not be identified.

Following the removal of the UST and piping, stained and odorous soil was observed in the piping excavation and the PID indicated that product remained. Stained and odorous soil was further excavated from the excavation on August 20, 1992 and again on August 26, 1992.

On August 24, 1992, the 6000-gal UST was rendered useless and disposed of at Safeway Tank Company in Colfax, NC. On October 2, 1992, Noble removed the petroleum contaminated soil from the site. The contaminated soil was delivered to Cunningham Brick in Lexington, NC for thermal treatment.

An October 16, 1992 letter from the NCDEM - Ground Water Section acknowledged receipt of the analytical results from the 6000-gal No. 2 fuel oil UST excavation. Based on the letter, the NCDEM had reviewed the report and recommended no further action for the former UST location.

1.3.6.. Hand auger investigation and soil excavation at drum area no. 1

Based on the recommendations of an environmental liability assessment (ELA) program, AIG retained ERC to perform a voluntary preliminary hand auger investigation of Drum Area No. 1 on February 3-5, 1993. Hand auger borings HA1-1 through HA1-4 were completed to depths ranging from 3 to 7 ft below grade at each of the corners of the 18 ft by 18 ft square-shaped area designated to be Drum Area No. 1. The hand augering was performed using a 3.25-inch diameter stainless steel hand auger and an ERC representative logged and PID-screened the soils encountered in each boring at 1-ft intervals to the base of each boring.

Based on the PID screening and analytical results obtained through the preliminary hand auger investigation, the contaminated soil was excavated on June 23-24, 1992. The rectangular-shaped excavation extended horizontally to a length and width of approximately 45 ft by 20 ft by 6 ft in depth.

1.3.7. Hand auger investigation and soil excavation at drum area no. 2

Based on the recommendations and conclusions of the ELA, AIG retained ERC to perform a voluntary preliminary hand auger investigation of Drum Area No. 2 on February 3-5, 1993. Hand auger borings HA2-1 through HA2-5 were completed to depths ranging from 3 to 4 ft below grade in the middle and at each corner of the 18 ft by 18 ft diamond designated to be Drum Area No. 2. The hand augering was performed using a 3.25-inch diameter stainless steel hand auger. An ERC representative logged and PID-screened the soils encountered in each boring at 1-ft intervals to the base of each boring.

Based on the analytical results obtained through the preliminary hand auger investigation, contaminated soil from Drum Area No. 1 was excavated on June 23-24, 1992. The square-shaped Drum Area No. 2 excavation extended horizontally to a length and width of approximately 20 ft by 20 ft. The excavation was also extended to approximately 5 ft below grade.

1.3.8. Hand auger investigation/soil excavation of the stressed vegetation area

Based on the recommendations of the ELA program, AIG retained ERC to perform a voluntary preliminary hand auger investigation of the southwestern corner of the quonset hut storage warehouse (the stressed vegetation area) on February 3-5, 1993. The area of stressed vegetation contained hand auger borings HA3-1 through HA3-4, which were located approximately 9 ft apart along an arc around the southwest corner of the building. The hand auger borings in the area of stressed vegetation ranged from 3 to 5 ft in depth. The hand augering was performed using a 3.25-inch diameter stainless steel hand auger. An ERC representative logged and PID-screened the soils encountered in each boring at 1-ft intervals to the base of each boring.

Based on the PID screening and analytical results obtained through the preliminary hand auger investigations at the area of stressed vegetation, AIG retained ERC to excavate contaminated soil from the stressed vegetation area on June 23-24, 1992. The crescent-shaped excavation extended horizontally in width to approximately 12 ft and in length to

approximately 35 ft. The excavation was extended to 3 to 6 ft below grade, with a slope downward from west to east.

1.3.9. Further delineation for the 8000-gal leaded gasoline UST (October 1992 through December 1995)

In compliance with the September 16, 1992 NCDEM - Ground Water Section CSA response letter and subsequent conversations with the NCDEM, AIG retained ERC and then O'Brien & Gere Engineers to conduct further investigatory activities to delineate the contaminant plume associated with the former 8000-gal leaded gasoline UST. These additional activities included:

- Performance of an aquifer performance test at monitoring well RW-1 on October 22, 1992
- Installation of six monitoring wells in November and December 1992
- Completion of one round of quarterly ground water sampling in January 1993
- Performance of one round of quarterly ground water sampling in April 1993
- Installation of four additional monitoring wells on June 8-9, 1993
- Completion of a round of ground water sampling in June 1993
- Completion of a round of ground water sampling in October 1993
- Completion of a round of ground water sampling in July 1994
- Performance of an aquifer pump test at monitoring well RW-2 on July 26-27, 1994
- Quarterly ground water sampling from March 1994 to present.

1.4. Previously-reported programs and undocumented at-peril activities

1.4.1. Previously-reported programs

Based on the NCDEM - Ground Water Section requirements, reports for the AMC site included: notices of intent to close the USTs; site investigation reports for the permanent closure of USTs; a CSA report

completed by AIG and ERC; monitoring well installation reports; quarterly monitoring results as required by the NCDEM; and a CSA completed by AIG and O'Brien & Gere Engineers. A listing of the reports completed for the AMC site and submitted to the NCDEM - Ground Water Section include:

- Form GW/UST-2, "Site Investigation Report for Permanent Closure or Change-in-Service of UST," for the 8000-gal leaded gasoline UST, the 8000-gal unleaded gasoline UST, and the 2000-gal diesel fuel UST, filed on March 2, 1992

- Form GW/UST-2, "Site Investigation Report for Permanent Closure or Change-in-Service of UST," for the 550-gal waste oil UST, filed on July 23, 1992

- Form GW/UST-2, "Site Investigation Report for Permanent Closure or Change-in-Service of UST," for the 6000-gal No. 2 fuel oil UST, filed on September 27, 1992

- "Comprehensive Site Assessment: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by Environmental & Regulatory Consultants, Inc., July 28, 1992

- Monitoring Well Installation: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina, prepared by Environmental & Regulatory Consultants Inc., December 31, 1992

- "Report for Quarterly Groundwater Sampling: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by Environmental & Regulatory Consultants, Inc., May 5, 1993

- "Report for Quarterly Groundwater Sampling: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by Environmental & Regulatory Consultants, Inc., May 11, 1993

- "Report for Monitoring Well Installations: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by Environmental & Regulatory Consultants, Inc., September 29, 1993

- "Report for Quarterly Groundwater Sampling: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by Environmental & Regulatory Consultants, Inc., October 6, 1993

- "Report for Quarterly Groundwater Sampling: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by Environmental & Regulatory Consultants, Inc., October 26, 1993

- "Comprehensive Site Assessment Report": Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by O'Brien & Gere Engineers, Inc.; June 1994. This report also incorporates ground water sampling results from March 1994

- "Quarterly Ground Water Monitoring Results: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by O'Brien & Gere Engineers, Inc., September 1994

- "Quarterly Ground Water Monitoring Results: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by O'Brien & Gere Engineers, Inc., December 1994

- "Quarterly Ground Water Monitoring Results: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by O'Brien & Gere Engineers, Inc., February 1995

- "Quarterly Ground Water Monitoring Results: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by O'Brien & Gere Engineers, Inc., April 1995

- "Quarterly Ground Water Monitoring Results: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by O'Brien & Gere Engineers, Inc., August 1995

- "Quarterly Ground Water Monitoring Results: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by O'Brien & Gere Engineers, Inc., November 1995

- "Quarterly Ground Water Monitoring Results: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by O'Brien & Gere Engineers, Inc., February 1996

- "Quarterly Ground Water Monitoring Results: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by O'Brien & Gere Engineers, Inc., May 1996

- "Supplemental Site Work: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by O'Brien & Gere Engineers, Inc., September 1996. This report details the results of an additional field investigation performed in June 1996

- "Quarterly Ground Water Monitoring Results: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by O'Brien & Gere Engineers, Inc., January 1997.

- "Quarterly Ground Water Monitoring Results: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina," prepared by O'Brien & Gere Engineers, Inc., July 1997.

1.4.2. Previously documented non-NCDEM activities

In addition to the reporting required by the NCDEM - Ground Water Section, two ELAs have been prepared for the site and the following reports:

- "Environmental Real Estate Assessment Phase I: Fischbach Properties, Inc. - Associated Mechanical Contractors, Greensboro, North Carolina," prepared by AIG Consultants, Inc., July 19, 1991

- "Environmental Real Estate Assessment Phase II: Fischbach Properties, Inc. - Associated Mechanical Contractors Division, Greensboro, North Carolina," prepared by AIG Consultants, Inc., October 1992

- "Phase I and Limited Phase II Environmental Assessment: Fischbach Properties, Inc. (Associated Mechanical Contractors, Inc.), 307 Swing Road, Greensboro, North Carolina," prepared by O'Brien & Gere Engineers, Inc., December 1992

- "Report for Hand-Auger Investigation: Associated Mechanical Contractors, Inc., 307 Swing Road, Greensboro, Guilford County, North Carolina," prepared by Environmental & Regulatory Consultants, Inc., March 10, 1993

- Field notes documenting the excavation of Drum Area No. 1, Drum Area No. 2, and the stressed vegetation area, prepared by Environmental & Regulatory Consultants, Inc., June 23-24, 1993

- Supplemental soil sampling at Drum Storage Area No. 2. Results of benzidine sampling included within "Quarterly Ground Water Monitoring Program and Additional Soil Sampling for the Former AMC Facility in Greensboro, North Carolina," prepared by O'Brien & Gere Engineers, Inc. in February 1995

- Supplemental ground water sampling at MW-11 to attempt to determine cause of chromium detections. Results summarized in April 19, 1995 report to NCDEM, prepared by O'Brien & Gere Engineers, Inc.

1.4.3. Previous permits/certificates

Temporary permits were obtained from the City of Greensboro to discharge ground water generated during the aquifer performance tests to the municipal wastewater system.

1.5. Report format

In order to present the CAP development process completed for the AMC property and to expedite regulatory agency review, this CAP report has been formatted in accordance with Section 15.4 "Corrective Action Plan (CAP) Report Format" of the Groundwater Section Guidelines for the Investigation and Remediation of Soils and Ground Water, dated March 1997. As such, this report has been subdivided into the following sections:

- Section 1 - Introduction. This section provides: the purpose of the CAP report; the background of the site, including a brief summary of the initial remedial activities conducted to-date; and a listing of the previous reports (both those previously provided to the NCDEM and not submitted) and permits/certificates for the site.

- Section 2 - Objectives of CAP. This section presents: a statement of goals and expected accomplishments; target clean-up concentrations for soil and ground water; and the targeted start-up and completion

dates for each of the components of the CAP. Targeted CAP dates include: submittal of pilot test data; submittal of necessary permit applications; commencement of remedial actions; system installation; system activation; system shut-down; estimated timeframe to achieve clean-up goals; and a project completion date.

- Section 3 - Exposure assessment. This section discusses: historical analytical data, including violations of ground water standards and soil clean-up levels; physical and chemical characteristics of the contaminants (including toxicity and persistence); significant pathways for human exposure; potential effects of residual, post-remedial contamination on surface water and ground water, and potential receptors at greatest risk assuming no further corrective action.

- Section 4 - Evaluation of remedial alternatives. This section provides a discussion of remedial options and a statement of recommendation and the rationale for the selected remedial alternatives. Included within this section is a discussion of the site hydrogeology.

- Section 5 - Proposed corrective action plan. This section provides: a general description of the proposed remedial alternative; a basis for selection of the recommended remedial alternative; proposed monitoring requirements, system evaluation; and reporting requirements.

2. Objective of CAP

The purpose of this section is to present: a statement of goals and expected accomplishments; target clean-up concentrations for ground water; and the targeted start-up and completion dates for each of the components of the CAP.

Targeted CAP dates include: submittal of necessary permitting, if any; commencement of remedial actions; estimated time to achieve clean up goals; projected date for determination of remedial success; and a project completion date.

2.1. Goals and expected accomplishments

The goal of this CAP is to provide for an appropriate and cost-effective ground water remedial measure which will allow the ground water quality to return to acceptable standards, without adversely affecting downgradient receptors.

2.2. Target cleanup concentrations

2.2.1. Soil target cleanup concentrations

The contaminated soil has been removed from the seven areas of concern listed in Section 1.3.2 and include: former UST areas; the former drum storage areas; and the former stressed vegetation area. Since the CAP will not address soil remediation, soil target cleanup concentrations will not be provided.

2.2.2. Ground water target cleanup concentrations

The expected target ground water cleanup concentrations are the levels deemed acceptable by the NCDEHNR.

2.3. Targeted CAP start-up, reporting, and completion dates

Ground water monitoring at the site has been performed quarterly from March 1994 to April 1996, and semi-annually from October 1996 to April 1997. In accordance with this CAP, the sampling schedule and program changes as listed herein will be implemented.

This CAP specifies an additional three years of semi-annual ground water monitoring at the site following approval of the CSA. Semi-annual monitoring reports documenting the activities and results will be provided following the respective sampling event.

At the end of this three-year period, a report will be provided which will document the program results, and either a request for no further action, or proposals for additional corrective action, if necessary.

Report

Soil Cleanup Report with Site Closure Request

AIG Consultants, Inc.
Atlanta, Georgia

April 1999

O'BRIEN & GERE
ENGINEERS, INC.

SITE DATA

Site Name:	**Former Associated Mechanical Contractors Site** **307 Swing Road** **Greensboro, North Carolina** **Refer to Site Vicinity Map - Figure 1**
Ground Water Incident No.:	**7859**
Risk Classification:	**Low**
Land Use Category:	**Industrial/Commercial**
Current UST Owner:	**The subject USTs were removed in 1992. Fischbach Properties, Inc. was the owner of record at the time of UST removal.**
Current Property Owner:	**Fischbach Properties, Inc.** **2775 S. Vallejo Street** **Englewood, Colorado 80110**
Adjacent Property Owners:	**Refer to Figure 2 - Adjacent Property Owner Map** **Refer to Appendix A - Adjacent Owner Listing**
Primary Environmental Consultant:	**AIG Consultants, Inc.** **Five Concourse Parkway** **Atlanta, Georgia 30328-2594** **O'Brien & Gere Engineers, Inc.** **1015 Aviation Parkway, Suite 700** **Morrisville, North Carolina 27560**

Release Information:

Potential areas of environmental concern at the AMC property identified through the Phase I and Phase II ESAs included:

- **five former USTs located at the site;**
- **two former drum storage areas;**
- **an area of stressed vegetation; and**
- **an area along the eastern fenceline where contaminated soil from the UST removals was reportedly staged.**

Release incidents at the AMC property were confirmed during:

- **the excavation and removal of a 8000-gal leaded gasoline UST and its associated piping; and**
- **a soil gas survey and preliminary hand auger investigation of the two former drum storage areas and the area of stressed vegetation.**

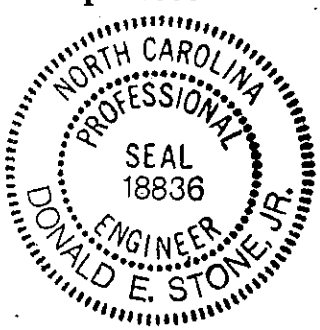
Initial site release confirmation occurred during removal events/soil sampling for each of the USTs (and systems) listed below:

UST ID	Tank	Release Type*	Volume	NC Coordinates	
				Longitude	Latitude
1	8000-gal Unleaded Gas	supply lines	ND	5302.92	5087.56
2	Former 2000-gal Diesel	supply lines	ND	5302.92	5087.56
3	Former GM #2 fuel oil	tank and lines	ND	5151.31	4963.62
4	Former 550-gal waste oil	over fills/spillage	ND	5316.71	4967.69
5	Former 8000-gal Leaded Gas	supply line	ND	5441.78	5022.50

Certification:

Donald E. Stone, Jr., P.E.
Senior Vice President

April 1999



Executive summary

Soil at the Former Associated Mechanical Contractors (AMC) site was impacted by halogenated and non-halogenated (petroleum) compounds. The source of the releases were underground storage tanks and above ground storage. The source of the releases as well as impacted soil have been removed.

The North Carolina Department of Environment and Natural Resources (NCDENR) has assigned a "low" risk site rank to the AMC site. Under this rank, the site is eligible for Site Closure Request pursuant to 15A NCAC 2L.0115(n). The purpose of this document is to present the Soil Cleanup Report and Request for Site Closure.

Numerous soil assessment phases followed by soils removal phases occurred between December 1991 and June 1993. During this period, approximately 1225 cubic yards (yd^3) of contaminated soil were removed. All soils exceeding NCDENR clean-up standards were removed with only minor exceptions. Two isolated remnant areas of total petroleum hydrocarbons (TPH) soil contamination were identified in sampling conducted in February 1992. The maximum concentration observed was 38 ppm by EPA Method 5030. O'Brien & Gere is of the opinion that the concentrations were slight and given that seven years has passed, the present concentrations should be reduced through natural processes.

Source information

Source areas and types of material are noted below:

Tank	Release Type	Volume
8000-gal Unleaded Gas	Supply lines	ND
Former 2000-gal Diesel	Supply lines	ND
Former GM #2 fuel oil	Tank and lines	ND
Former 550-gal waste oil	Over fills/spillage	ND
Former 8000-gal Leaded Gas	Supply line	ND
Drum Areas #1 and #2 Storage - Halogenated Compound	Spillage	ND
Stressed Vegetation Area - Halogenated Compounds	Unknown	ND

ND - Not Determined

Nature and extent of release

The following maximum contaminant concentrations were noted:

- The maximum gas and diesel range TPH was noted at the dispenser area for the former 2000-gal diesel UST and 8000-gal unleaded gasoline UST. The concentrations are reported from EPA Method 3550 (4800 ppm) and EPA Method 5030 (8300 ppm).

- The maximum oil and grease range TPH was noted in the area of the Waste Oil Tank near the fill port. The concentration reported by EPA Method 9071 was 51,000 ppm. Elevated concentrations of halogenated compounds by EPA Method 8240 included: dichloromethane (1580 ppb), 1,1,1-trichloroethane (24.9 ppb), and trichloromethane (13.4 ppb). (Post excavation sampling/analysis indicated all soils contaminated above method detection limits were removed.)

- The maximum concentration of halogenated compounds in surficial areas included methylene chloride occurring at 36.3 ppb by EPA Method 8240 in Drum Area #2. Benzidine was also present occurring at 55,800 ppb by EPA Method 8270 in Drum Area #2. (Post excavation sampling/ analysis indicated that soils contaminated with these compounds above method detection limits were removed.

The soils at the AMC site are composed primarily of tight clays and silt. Because of this, the soil contamination was confined primarily to the source areas. Contaminated soil from each of the identified source areas was excavated and disposed of off-site.

Cleanup levels for soil remediation were established using the following resources:

soil →

- NCDENR "Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater," March 1993

  The target cleanup level for TPH in soil for the following EPA Methods included:

Method 5030 (low boiling point)	10 ppm
Method 3550 (medium to high boiling point)	40 ppm
Method 9071 (oil & grease)	250 ppm

- USEPA Region III "Risk Based Concentration Tables," December 1995

  This reference was used to identify non-petroleum soil contaminant concentrations that exceeded threshold residential risk levels. All soils exceeding these risk levels or method detection limits were removed.

Remediation activities

During the period December 1991 through June 1993 numerous cycles of assessment/sampling/excavation occurred in each of the source areas identified in this report.

Soil excavation and off-site treatment/disposal was the only remedial action utilized. Approximately 1225 yd^3 was removed to Cunningham Brick, Lexington, NC and Laidlaw, Pineville, SC.

Post excavation sampling confirmed that all soils exceeding target cleanup level concentrations and, in many cases, analytical method detection limits have been removed with the exception of two isolated remnant areas discussed below.

In addition to remediation activities, the AMC site has undergone assessment activities associated with preparation of: comprehensive site assessments; corrective action plan; monitoring events and reports; and supplemental reports. A complete listing of the reports and documents prepared for this site are included in Appendix D.

Conclusions and petition for site closure

The subject site has been classified as a "Low" risk by the NCDENR. Site soils were impacted by halogenated and non-halogenated (petroleum) hydrocarbons in the following areas:

- Former 8000-gal leaded gasoline UST
- Former 8000-gal unleaded gasoline UST
- Former 2000-gal diesel UST
- Former 550-gal waste oil tank and associated sump and drains
- Former 6000-gal No. 2 fuel oil UST
- Drum areas #1 and #2 and the stressed vegetation area.

The soils in these areas were excavated and transported off-site for treatment.

Conclusions

In reviewing the soil analytical results provided within Section 3.2, it appears that the soil contamination was confined to the identified source areas. As such, all contaminated soil exceeding target cleanup levels or method detection limits were removed during the excavations with minor exceptions. The following list provides the locations at the site from which concentrations were not completely removed to the NCDEM-established standards obtained from the "Ground Water Section Guidelines for the Investigation and Remediation of Soils and Ground Water", dated March 1993.

Soil samples exhibit concentrations which exceeded 10 ppm of total petroleum hydrocarbons (TPH) as analyzed by EPA Method 5030, typical of low boiling point fuels such as gasoline, were noted in four samples collected from three soil borings completed at the site in February 1992.

- Soil sample B-1, collected from 10 ft below grade at soil boring #1 in the area of the former fuel dispenser from the 8000-gal unleaded gasoline UST and 8000-gal leaded gasoline UST exhibited a detectable TPH concentration of 23 ppm.

- Soil sample B-2, collected from 30 ft below grade at soil boring #1 in the area of the former fuel dispenser from the 8000-gal unleaded gasoline UST and 8000-gal leaded gasoline UST displayed a detectable TPH concentration of 19 ppm.

- Soil sample B-6, collected from 30 ft below grade at soil boring #3 in the area between the former 8000-gal leaded gasoline UST and 8000-gal unleaded gasoline UST displayed a detectable TPH concentration of 22 ppm.

- Soil sample B-7, collected from 10 ft below grade at soil boring #4 in the area of the former 8000-gal leaded gasoline UST displayed a detectable TPH concentration of 38 ppm.

The TPH contaminant levels, although exceeding target cleanup levels, are considered slight. Additionally, the soil analytical data is now more than seven years old. It is reasonable to assume that naturally occurring processes such as biodegradation and soil venting has resulted in a reduction in remaining contaminant levels.

All soils in the Drum Areas and the stressed vegetation area were removed to acceptable risk levels.

Petition for site closure

Extensive soil sampling at the site has indicated that during the on-site UST closure and subsequent multiple soil remediation (excavation and removal) phases in the UST areas, drum areas, and stressed vegetation areas that all soils impacted by halogenated and non-halogenated (petroleum hydrocarbons) have been removed with the exception of isolated remnant areas of TPH contamination. Slight exceedances of the low boiling point, gasoline range TPH by EPA Method 5030 (minimum cleanup level is 10 ppm) were noted in two areas. Because the TPH concentrations are considered slight (19 - 38 ppm) and the potential for natural processes of soil venting and biodegradation to lower TPH concentrations in soil over the past seven years, O'Brien & Gere recommends that no further action is necessary to assess or remediate remnant soil contamination.

Additionally, remnant soil contamination has been reviewed and evaluated by the North Carolina Department of Environment and Natural Resources - Environmental Epidemiology Section (NCDENR - EES) to not pose a significant health risk. Refer to correspondence from the NCDEM EES to the NCDEM Winston-Salem Regional Office contained in Appendix B.

Based on the presentation of soil removal activities, post excavation soil sample analysis, and the "low" risk site rank assigned by the NCDENR, O'Brien & Gere recommends that the NCDENR issue a letter indicating no further action is required at this site.

Introduction

Soil at the former Associated Mechanical Contractors (AMC) site was impacted by halogenated and non-halogenated (petroleum hydrocarbons). The source of the releases were underground storage tanks and above ground storage in drums. The source areas have been removed as well as contaminated soils exceeding target cleanup levels or analytical method detection limits. The subject site has undergone numerous assessment activities including a comprehensive site assessment (CSA), a corrective action plan (CAP), monitoring events, and numerous cycles of soil excavation followed by sampling until clean closure was determined.

The site was recently ranked by the NCDENR as a "low" risk site. Under this site ranking, the site is eligible for site closure request pursuant to 15A NCAC 2L.0115(h).

This "Soil Cleanup Report and Site Closure Request" has been prepared and compiled from the investigative, assessment, and soil excavation activities that have been previously performed and documented in the reports referenced in Appendix D.

1.0 Evaluation of remedial alternative

Soil remediation occurred between December 1991 and June 1993. Remediation of contaminated soils was performed by excavation and disposal at facilities approved by the State of North Carolina. No other remedial alternatives were utilized (refer to Section 2.0).

2.0 Site remediation

Soil remediation was completed through excavation and off-site treatment. The following subsections detail the soil excavation activities and summarizes the post-excavation analytical results in each of the areas of concern at the AMC site in Greensboro, NC.

A detailed discussion of post excavation and progress sampling/analytical assessment data is provided in Section 3.0.

2.1 Target TPH soil cleanup levels

The field sampling/analysis and report preparation including the Comprehensive Site Assessment (CSA) and subsequent reports were completed under the "Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater" March 1993. Target cleanup levels and remediation goals are based on this guidance document and revisions.

The target soil cleanup levels include:

- Low boiling point hydrocarbons, 10 ppm by EPA Method 5030
- Medium to high boiling point hydrocarbons, 40 ppm by EPA Method 3550
- Oil and grease, 250 ppm by EPA Method 9071.

2.2 Excavation and delineation of contaminated soil for various USTs

2.2.1 Excavation of the 8000-gal leaded gasoline UST and associated piping

Based on the recommendations of the Phase I Environmental Site Assessment (ESA), AIG retained Nobile Oil Services, Inc. (Noble) in December 1991 to excavate and remove the 8000-gal leaded gasoline UST and its associated piping leading to a dispenser at the brick pump house. This area is depicted on Figure 3.

The 8000-gal leaded gasoline UST had been out-of-service since 1989. On December 11-13, 1991, Noble drained and flushed all of the piping associated with the UST and then removed 35 gal of product and residuals from the UST. Following the removal of the product and residuals from the UST, Noble removed the UST's dispenser and gravel surface and excavated the soil from above and beside the UST. At this point, excavation was halted such that the UST could be cleaned, inspected, and purged of all flammable vapors. Following these precautionary measures, soil excavation and the removal of the UST were continued. Impacted soil, as evidenced by stained soil and odor, was removed from the excavation and was stockpiled on and covered with polyethylene sheeting at the site. Upon removal, the UST was also placed on polyethylene sheeting in a temporary staging area. While in the staging area, the UST was inspected for evidence of leakage. The UST and its associated piping appeared to be deteriorated in several locations; however, the quantity of release could not be identified (AIG, 1992).

Following the removal of the UST and piping, stained and odorous soil was observed in the excavation and the organic vapor analyzer (OVA) indicated that product remained. Prior to removing any further soil from the excavation, soil samples were collected from the following four locations on December 12-16, 1991: directly below the former dispenser (S-1); the bottom east side of the UST excavation at 12 ft below grade (S-7); the bottom west side of the UST excavation at 12 ft below grade (S-8); and the bottom center of the UST excavation at 12 ft below grade (S-13). The samples were analyzed for TPH by EPA Methods 3550 and 5030 (AIG, 1992) and indicated soil contamination was present above the target cleanup levels.

Due to the soil contamination remaining in the UST excavation, AIG and Noble returned to the AMC site on December 19-20, 1991 to continue delineating the extent of contamination. At the conclusion of the two days on-site, the extent of the soil contamination had not been identified. AIG collected two samples from the base of the excavation (S-14 and S-15) on December 19, 1991. The samples were analyzed for TPH via EPA Methods 3550 and 5030 (AIG, 1992) and indicated soil contamination was present above the target cleanup level.

Since the extent of the contamination had not been delineated, AIG and Noble returned to the AMC site for a third time on December 26-27, 1991 to further excavate in the area of the former 8000-gal leaded gasoline UST. AIG collected two samples from the excavation, S-20 at 24 ft below grade and S-21 at 18 ft below grade (refer to Figure 4, Detail B). The samples were

analyzed for TPH via EPA Methods 3550 and 5030 and indicated an exceedance of target cleanup levels at sample S-21. Sample S-20 indicated soil contamination less than target cleanup levels. Excavation was terminated at a depth of 26 ft. The final excavation dimensions measured approximately 15 ft by 30 ft by 26 ft in depth. (Free product was not encountered in the excavation at any time during the UST and soil removal process.)

On December 30, 1991, the 8000-gal UST was rendered useless and disposed of at Safeway Tank Company in Colfax, NC. On February 4-5, 1992, Noble removed the petroleum contaminated soil from the site. The contaminated soil was delivered to Cunningham Brick in Lexington, NC for thermal treatment. The stockpiled soil (represented as sample S-24) had been sampled for characterization for disposal on February 3, 1992, and the results of the analysis indicated the soils were non-hazardous and disposed of as TPH-contaminated soils. Post closure sampling confirmed that TPH soils have been removed to levels below NCDENR target clean-up standards. Refer to Section 3.2.2 for discussion and results of closure sampling.

2.2.2 Excavation of the 8000-gal unleaded gasoline UST/2000-gal diesel fuel UST/dispenser island and associated piping

Based on the recommendations of the Phase I ESA, AIG retained Noble in December 1991 to excavate and remove the 8000-gal unleaded gasoline UST, the 2000-gal diesel fuel UST, and their associated dispenser island and piping. The two USTs were located in one excavation area; the dispenser island was located in a second excavation area (AIG, 1992). The tank location(s) and sample points are depicted on Figure 3.

The 8000-gal unleaded gasoline UST and 2000-gal diesel fuel UST had been out-of-service since 1989. On December 11-13, 1991, Noble drained and flushed all of the piping associated with the USTs and then removed 50 gal of product residuals from the 2000-gal UST and 60 gal of product residuals from the 8000-gal UST. Following the removal of the residuals from the USTs, Noble removed the USTs' dispenser island and concrete surface prior to excavating the soil from above and beside the USTs. At this point, excavation was halted such that the USTs could be cleaned, inspected, and purged of all flammable vapors. Following these precautionary measures, soil excavation and removal of the USTs was continued. Soil removed from the excavations was stockpiled on and covered with polyethylene sheeting at the site. Upon removal, the USTs were also placed on polyethylene sheeting in a temporary staging area. While in the staging area, the USTs were inspected for evidence of leakage. The USTs and their associated piping appeared to be in good condition and staining was not observed in the USTs' excavation. However, upon removal of the dispenser island, staining

and odor were observed and the OVA indicated that product remained in the excavation (AIG, 1992).

To document clean closure of the USTs' excavation, soil samples were collected from the following five locations on December 12, 1991: S-2, 12 ft below grade and under the bottom south side of the former 8000-gal UST; S-3, 12 ft below grade and under the bottom center of the former 8000-gal UST; S-4, 8 ft below grade and under the bottom south side of the former 2000-gal UST; S5, 8 ft below grade and under the bottom center of the former 2000-gal UST; and S6, 8 ft below grade under the bottom north side of the 2000-gal UST (refer to Figure 4, Detail A).

Prior to removing further soil from the dispenser island excavation, four samples were collected December 13-16, 1991 from the following locations: under the diesel dispenser (S-9); under the gasoline dispenser (S-10); in the general vicinity of the dispenser island (S-11); and under the bottom piping (S-12). The samples were analyzed for TPH by EPA Methods 3550 and 5030 (AIG, 1992) and indicated soil contamination exceeding the target cleanup levels.

Due to the soil contamination remaining in the dispenser island's excavation, AIG and Noble returned to the AMC site on December 19-20, 1991 to continue delineating the extent of contamination. At the conclusion of the two days on-site, the extent of the contaminant plume had not been identified. AIG collected four samples from the base of the excavation at depths of 2 ft below grade (S-16), 4 ft below grade (S-17), 6 ft below grade (S-18), and 10 ft below grade (S-19). The samples were analyzed for TPH by EPA Methods 3550 and 5030 (AIG, 1992) and indicated soil contamination exceeding the target cleanup levels.

Since the extent of the contamination had not been delineated, AIG and Noble returned to the AMC site for a third time on December 26-27, 1991 to further excavate in the area of the former dispenser island. Although the extent of contamination was not determined, the excavation was temporarily stopped at 13 ft below grade. AIG did not collect samples from the base of the dispenser island's excavation (AIG, 1992).

AIG and Noble returned to the AMC site on May 5-6, 1992 to finish excavating soil from the dispenser island excavation. Based on OVA readings as well as visual and olfactory observations, the dispenser island's excavation was completed to a depth of 18 ft on May 6, 1992. Four samples were then collected at the following four locations on May 6, 1992: 10 ft below grade along the south wall of the excavation (PI-1); 18 ft below grade

in the center of the excavation floor (PI-2); 15 ft below grade in the southwest corner of the excavation (PI-3); and 10 ft below grade in the southeast corner of the excavation (PI-4) (refer to Figure 4, Detail A). The samples were analyzed for TPH via EPA Methods 3550 and 5030 and indicated soil contaminant levels were less than the target cleanup levels. The excavation was terminated at approximately 18 ft.

Between December 30, 1991 and January 9, 1992, the two USTs were rendered useless and disposed of at Safeway Tank Company in Colfax, NC. On February 4-5, 1992, Noble removed the petroleum contaminated soil from the site. The contaminated soil was delivered to Cunningham Brick in Lexington, NC for thermal treatment. The stockpiled soil had been sampled for characterization for disposal on February 3, 1992 (sample designation S-24) and determined to be non-hazardous and suitable for disposal as petroleum-contaminated soil. Refer to section 3.2.3 for a discussion of sampling activities and analytical results.

2.2.3 Subsequent delineation for the 8000-gal leaded gasoline UST (December 1991 through September 1992)

Due to the extensive contamination caused by the removed 8000-gal leaded gasoline UST and the presence of ground water in the excavation, the NCDENR - Groundwater Section required additional investigation. AIG and Professional Services Industries (PSI) completed thirteen soil borings. Three borings were complated as monitoring wells (Borings 1 through 10 and MW-1, 2, and 3) at the AMC site on February 24-27, 1992. The boring and monitoring well locations are depicted on Figure 3.

The results of the investigation activities and post excavation closure sampling indicate that gas range and diesel range TPH contaminated soil has been removed from the former tank location. However, the analysis indicated that two isolated areas of gas range TPH were present exceeding 10 mg/kg. The highest concentration was 38 mg/kg. These concentrations were reported in samples collected in February 1992. It is reasonable to assume that these concentrations are no long present due to natural soil vapor exchange and biodegradation processes. These exceedances are not considered a site concern. Refer to Section 3.2.4. for a discussion of sampling activities and analytical results.

2.2.4 Excavation of the 550-gal waste oil UST

In May 1992, during the continued excavation at the former dispenser island area, AIG and Noble discovered a 550-gal waste oil UST. Based on the general recommendations of the Phase I ESA, AIG retained Noble in June 1992 to excavate and remove the 550-gal waste oil UST and its associated

piping leading from a waste oil pit in the maintenance shop building (AIG, 1992).

The 550-gal waste oil UST had been out-of-service since 1989. On June 15-16, 1992, Noble drained and flushed all of the piping associated with the UST and then removed product and residuals from the UST. Following the removal of the residuals from the UST, Noble removed the concrete and gravel surface above the UST and excavated the soil from above and beside the UST. At this point, excavation was halted such that the UST could be cleaned, inspected, and purged of all flammable vapors. Following these precautionary measures, soil excavation and removal of the UST were continued. Impacted soil, as evidenced by stained soil and odor, was removed from the excavation and stockpiled on polyethylene sheeting at the site. Upon removal, the UST was also placed on polyethylene sheeting in a temporary staging area. While in the staging area, the UST was inspected for evidence of leakage. The UST and its associated piping appeared to be in good condition upon removal. At that time, it was suspected that the observed impact in the excavation was a result of overfill/spill incidents; however, the quantity of release could not be identified (AIG, 1992).

Following the removal of the UST and piping, stained and odorous soil was observed in the excavation. This stained and odorous soil was removed from the excavation prior to the collection of samples. Soil samples were collected from the following locations on June 15-17, 1992: surficial soil removed from the fill port area of the UST (WT-1); the bottom south side of the UST excavation at 7 ft below grade (WT-2); and the bottom north side of the UST excavation at 7 ft below grade (WT-3) (refer to Figure 5, Detail C). The soil samples were analyzed for oil and grease by EPA Method 9071 (AIG, 1992). The analysis indicated that samples WT-2 and WT-3 obtained at the base of the excavation were less than the target cleanup levels. The excavation was terminated at 7 ft.

On June 16, 1992, the 550-gal waste oil UST was rendered useless and transported offsite to the Noble facility in Sanford, NC. for subsequent disposal. The UST was subsequently disposed of at Safeway Tank Company in Colfax, NC. In addition, Noble also removed the contaminated soil from the site. The contaminated soil was delivered to Cunningham Brick in Lexington, NC. for thermal treatment. The stockpiled soil had been sampled for characterization for disposal on August 5, 1992 (as sample WT-6) and determined to be non-hazardous and suitable for disposal as petroleum-contaminated soil (AIG, 1992).

In September 1992, AIG and Noble returned to the AMC site to excavate and remove the waste oil pit in the maintenance shop and the remainder of the associated piping which had connected the pit to the waste oil UST. Prior to removing the waste oil pit and piping, the 6-gal of liquid remaining within the waste oil pit was transferred to an EPA-approved 55-gal drum. (The waste oil was subsequently disposed of by Laidlaw.) The waste oil pit, a square-shaped concrete trench approximately 2 ft by 2 ft by 3 ft in depth and its associated piping were then removed. Three soil samples were collected from the excavation for the waste oil pit and the piping on September 9, 1992 at the following locations: a crush and run area 10 ft west of the center of the excavation (CR-1); a crush and run area 10 ft east of the center of the excavation (CR-2); and a crush and run area at the center of the excavation (CR-3) (refer to Figure 5, Detail C). The samples were analyzed for the following parameters: TPH by EPA Method 3550; BTEX, chlorobenzene, and dichlorobenzene by EPA Method 8020; and VOCs by EPA Method 8010.

The analytical results of the closure sampling indicated that there were no exceedances of target cleanup levels or risk-base concentrations presented in the USEPA Region III, Risk-Based Concentration Table, December 1995. No further excavation activities were necessary. Refer to Section 3.2.5 for a discussion of the sampling and analytical activities and results.

2.2.5 Excavation of the 6000-gal no. 2 fuel oil UST

Based on the recommendations of the Phase I ESA (AIG, 1991), AIG retained Noble on August 19-20, 1992 to excavate and remove the 6000-gal No. 2 fuel oil UST and its associated piping leading to the boiler room of the office building.

The 6-gal No. 2 fuel oil UST had been placed out-of-service earlier in 1992. On August 19-20, 1992, Noble drained and flushed all of the piping associated with the UST and then removed 62 gal of product and residuals from the UST. Following the removal of the residuals from the UST, Noble removed the UST's dispenser and gravel surface and excavated the soil from above and beside the UST. At this point, excavation was halted such that the UST could be cleaned, inspected, and purged of all flammable vapors. Following these precautionary measures, the excavation and removal of the UST was continued. Soil removed from the excavation was stockpiled on and covered with polyethylene sheeting at the site. Upon removal, the UST was also placed on polyethylene sheeting in a temporary staging area. While in the staging area, the UST was inspected for evidence of leakage. The UST and its associated piping appeared to be in good condition except for some deterioration noted in several locations along the piping; however, the quantity of release could not be identified (AIG, 1992).

Following the removal of the UST and piping, stained and odorous soil was observed in the piping excavation and the OVA indicated that product remained. After removing stained and odorous soil from the excavation, soil samples were collected from the following seven locations on August 19-20, 1992: the bottom east end of the excavation at a depth of 12 ft below grade (S-1); the bottom west side of the excavation at a depth of 12 ft below grade (S-2); a surficial sample (1 ft below grade) at the former fill port area (S-3); a piping run sample from 2 ft below grade at approximately 20 ft from the fill port (S-4); a piping run sample from 2 ft below grade at approximately 40 ft from the fill port (S-5); a piping run sample from 2 ft below grade at approximately 60 ft from the fill port (S-6); and a composite sample of the stockpiled soil from the excavation (S-7) (refer to Figure 7, Detail D). The soil samples were analyzed for TPH by EPA Methods 3550 and 5030 (AIG, 1992) and indicated that soil contamination was present exceeding the target cleanup levels.

Based on the analytical results, AIG and Noble returned to the AMC site on August 26, 1992 to further excavate in the area of the former 6000-gal No. 2 fuel oil UST. Upon further excavation, AIG collected three additional samples from the excavation: S-3.1 at 5 ft below grade at the fill port location; S-5.1 from 55 inches below grade at the sample S-5 location; and S-6.1 from 10 ft below grade at the sample S-6 location. The samples were analyzed by EPA Methods 3550 and 5030 (AIG, 1992). The soil analytical results indicated that soil contamination had been removed to levels less than the target cleanup levels.

On August 24, 1992, the 6000-gal UST was rendered useless and disposed of at Safeway Tank Company in Colfax, NC. On October 2, 1992, Noble removed the petroleum contaminated soil from the site. The contaminated soil was delivered to Cunningham Brick in Lexington, N.C. for thermal treatment (AIG, 1992).

The results of the investigation activities and post excavation closure samples indicate that all gasoline range and diesel range TPH contaminated soil exceeding the NCDENR standard has been removed from this area. Refer to Section 3.2.6. for a discussion of the sampling and analytical activities and results.

An October 16, 1992 letter from the NCDEM - Ground Water Section acknowledged receipt of the analytical results from the 6000-gal No. 2 fuel oil UST's excavation. Based on the letter, the NCDEM had reviewed the report and recommended no further action for the former 6000-gal UST location (AIG, 1992).

2.3. Investigation of non-UST areas of concern

2.3.1 Secondary Phase I and Limited Phase II ESA

In October and November 1992, O'Brien & Gere Engineers, Inc. (O'Brien & Gere) conducted a Phase I and limited Phase II ESA (OBG, 1992) for the AMC property for a third party interested in buying the property. The Phase I ESA report included: a site history, including a chain-of-ownership title search and an aerial photograph review; site reconnaissance observations and findings; and Federal, State, local, and supplemental file reviews. The limited Phase II ESA program consisted of soil gas sampling at ten selected locations in four distinct areas (the brick pump house area, Drum Area No. 1, Drum Area No. 2, and the metal storage shed area). These areas are depicted on Figure 3.

Based on the Phase I and limited Phase II investigations, O'Brien & Gere recommended:

- Tracking the investigations and corrective actions associated with the excavation and removal of the five USTs
- Soil sampling in Drum Area No. 1 to further quantify potential soil contamination revealed through the soil gas sampling program
- Soil sampling in Drum Area No. 2 to further quantify potential soil contamination revealed through the soil gas sampling program
- Soil sampling at the southeastern corner of the quonset hut storage warehouse due to the existence of stressed vegetation in the area
- Soil sampling at the eastern fenceline in the area where the contaminated soil from the UST excavations had reportedly been stored (OBG, 1992).

2.4 Hand auger investigation and soil excavation

2.4.1. Drum areas no. 1 & 2, stressed vegetation area

Based on the recommendations and conclusions of the secondary Phase I and limited Phase II ESA programs, AIG retained Environment and Regulatory Consultants (ERC) to perform a preliminary hand auger investigation of Drum Area No. 1, Drum Area No. 2, and the southwestern corner of the quonset hut storage warehouse on February 3-5, 1993 for an interested buyer for the property. Hand auger borings HA1-1 through HA1-4 were completed to depths ranging from 3-7 ft below grade at each of the corners of the 18 ft by 18 ft square-shaped area designated to be Drum Area No. 1 and depicted on Figure 8, Detail E. Hand auger borings HA2-1 through HA2-5 were completed to depths ranging from 3-4 ft below grade in the middle and at each corner of the 18 ft by 18 ft diamond designated to be Drum Area No. 2 and depicted on Figure 5, Detail F. The area of stressed vegetation

contained hand auger borings HA3-1 through HA3-4, which were located approximately 9 ft apart along an arc around the southwest corner of the building and depicted on Figure 6, Detail G. The hand auger borings in the area of stressed vegetation ranged from 3-5 ft in depth (ERC, 1993a).

Soil samples were collected from the hand auger at 1-ft intervals from grade. The samples from each interval were collected in laboratory-supplied glass jars as well as in plastic bags. The soil samples in the plastic bags were then screened in the field with a photoionization detector (PID) to identify which of the samples collected from each boring should be selected for laboratory analysis. (If no volatile vapor content was detected, the sample from the deepest interval of the hand auger boring was submitted for laboratory analysis.) Based on the PID screenings, the sample from each boring displaying the highest concentration of volatiles were analyzed for: SVOCs by EPA Method 8270; pesticides and PCBs by EPA Method 8080; VOCs by EPA Method 8240; oil and grease by EPA Method 9071; and TCLP metals. The soil analytical results indicated elevated concentrations of volatile and semivolatile compounds. The soil sampling and analytical data are provided in Section 3.2.8.

Based on the analytical results obtained through the preliminary hand auger investigations at the two drum storage areas and at the area of stressed vegetation, the third party interested in purchasing the property requested the excavation of contaminated soil from each of the three areas. In response, AIG retained ERC to return to the AMC site on June 23-24, 1992 to excavate contaminated soil from the three areas and to collect post-excavation samples (AIG field notes, 1993).

Stressed vegetation area

The area of stressed vegetation on the southwestern corner of the quonset hut storage warehouse was excavated first. The excavation, which was crescent-shaped, extended horizontally in width to approximately 12 ft and in length to approximately 35 ft. The excavation was extended to 3-6 ft below grade, with a slope downward from west to east. Upon completion of the excavation, soil samples were collected from the excavation on June 23, 1992 from the following seven locations: west sidewall at 2.5 ft below grade (3.1); north sidewall at 3.5 ft below grade (3.2); east sidewall from 5.5 ft below grade (3.3); south sidewall from 3.5 ft below grade (3.4); excavation floor on the west side (3.5); the center of the excavation floor (3.6); and the excavation floor on the east side (3.7). Five of the seven samples (3.1, 3.2, 3.3, 3.5, and 3.7) were analyzed for VOCs via EPA Method 8010 (AIG field notes, 1993).

The analysis indicated that contaminated soil exceeding the USEPA Region III Risk Based Concentration Table for a residential soils had been removed.

Drum Area No. 1

Drum Area No. 1 was excavated next. The excavation, which was rectangular in shape, extended horizontally to a length and width of approximately 50 ft by 20 ft. The excavation was also extended to approximately 10 ft below grade. Upon completion of the excavation, soil samples were collected from the excavation on June 24, 1992 from the following eight locations: north sidewall at 4-5 ft below grade (1.1); west sidewall at 6 ft below grade (1.2); east sidewall from 6.5 ft below grade (1.3); south sidewall from 5 ft below grade (3.1); excavation floor on the south side (1.5); the center of the excavation floor (1.6); the excavation floor on the north side (1.7); and a composite of the stockpiled soil (1.8). Five of the eight samples (1.1, 1.2, 1.3, 1.4, and 1.6) were analyzed for VOCs via EPA Method 8010 (AIG field notes, 1993).

The results indicated that contaminated soils exceeding the USEPA Region III Risk Based Concentration Tables for residential soils had been removed.

Drum Area No. 2

Drum Area No. 2 was excavated last. The excavation, which was square in shape, extended horizontally to a length and width of approximately 20 ft by 20 ft. The excavation was also extended to approximately 5 ft below grade. Upon completion of the excavation, soil samples were collected from the excavation on June 24, 1992 from the following eight locations: north sidewall at 4 ft below grade (2.1); west sidewall at 4 ft below grade (2.2); east sidewall from 4 ft below grade (2.3); south sidewall from 4 ft below grade (2.4); excavation floor on the north side (2.5); the center of the excavation floor (2.6); the excavation floor on the south side (2.7); and a composite of the stockpiled soil (2.8). Five of the eight samples (2.1, 2.2, 2.3, 2.4, and 2.6) were analyzed for VOCs via EPA Method 8010.

The results indicated that contaminated soils exceeding the USEPA Region III Risk Based Concentration Tables for residential soils had been removed.

The post-excavation soil sampling activities and analytical results for the drum storage areas and the area of stressed vegetation are provided in Section 3.2.9.

2.4.2 Soil sampling in the former petroleum-contaminated soil staging area

At the request of the third party interested in purchasing the AMC property, O'Brien & Gere Engineers was retained to collect soil samples along the eastern fenceline of the property in the area where contaminated soil was reportedly staged during the removal of the five former USTs. Based on the request, the soil sampling was conducted using a hand auger at five pre-selected sampling locations **(F-1 through F-5)**. At each location, samples were collected from the 0-6 inch interval below grade (designated the "A" interval) and from the 18-24 inch interval below grade (designated the "B" interval). The samples were analyzed for TPH utilizing a gas chromatograph (GC) - flame ionization detector (FID) by modified EPA Method 8015. The soil analytical results indicated that no impact to soils occurred. The sampling activities and analytical results are presented in section 3.2.10.

2.5. Off-site treatment

All soils determined to be environmentally impacted were excavated and transported off-site for treatment and disposal. The soil excavation was completed in numerous events that occurred between December 1991 and June 1993.

Volume soil treated/disposed

Based on calculated volumes of areas excavated, approximately 1225 yd^3 of contaminated soil was removed from the areas associated with petroleum underground storage tanks, Drum Areas No. 1 and 2 and the stressed vegetation area.

Treatment/disposal method

Soils associated with petroleum USTs were transported and disposed at Cunningham Brick and Noble Oil Services. Soils manifests and certificate of disposal are included in Appendix 4.

Soils associated with the drum areas and the stressed vegetation area were transported and disposed of at Laidlaw's facility in Pineville, South Carolina.

Name and address of excavation contractors

Noble Oil Services
5617 Clyde Rhyme Drive
Sanford, NC 27330

Environmental and Regulatory Consultants, Inc.
1100 Logger Court, Suite F-103
Raleigh, NC 27609

Name and address of transporter

Long Brothers of Summerfield, Inc.
1024 E. Mountain Street
Kernersville, NC

Name and address of treatment facilities

Laidlaw
Pineville, SC

Noble Oil Services
5617 Clyde Rhyme Drive
Sanford, NC

Analytical results for soil samples collected prior to off-site treatment

Analytical results for soils transported off-site are included in the Comprehensive Site Assessment, Associated Mechanical Contractors, Greensboro, NC, O'Brien & Gere Engineers, Inc., June 1994 (OBG, 1994).

Permits

No permits for off-site treatment are required.

Actual costs

Documentation of the actual cost of disposal was not available.

Soil disposal manifests

Refer to Appendix C

3.0 Post (and progress) remediation sampling

3.1. General

The purpose of this section is to present the analytical results of the soil investigation and closure sampling conducted at the AMC site from July 1991 through May 1994.

The soil investigation results include: a geology and soil characterization for the site; the analytical constituents currently remaining in the soil at the AMC site; and a description of the migration of the remaining analytical constituents in the soil at the site. In identifying the analytical constituents in the soil at the site, the guidelines established in the NCDEM's Ground Water Section Guidelines for the Investigation and Remediation of Soils and Ground Water, dated March 1993, were followed. As such, reportable concentrations for soil included analytical concentrations of greater than: 10 ppm for TPH-gasoline (EPA Method 5030); 40 ppm for TPH-diesel (EPA Method 3550); 250 ppm for oil and grease (EPA Method 9071); and the method detection level (MDL) for all other analyses (including VOCs by EPA Method 8240, SVOCs by EPA Method 8270, PCBs and pesticides by EPA Method 8080, and TCLP metals).

3.2 Soil investigation results

3.2.1. Geology and soil characterization

Guilford County lies within the Piedmont physiographic province of N.C. and displays the characteristic of an uplifted, partially-dissected peneplain. The topography is gently rolling near the larger streams and relatively flat across the broad, inter-stream areas. The geology of Guilford County appears relatively complex. Several regional geologic units outcrop in Guilford County with irregular areal distribution, including: gneiss; greenstone schist; slate; sheared granite; diorite; and porpyritic granite. Regional geologic units which do not crop out in Guilford County include the Triassic Newark Group and a quartzite and schist unit (ERC, 1992a).

Based on the geologic maps of the area, the project site appears to be underlain by a sheared granite unit. The sheared granite is characterized as

a light pink to grey, mostly coarse schistose or gneissic rock. The unit is cut by numerous green mafic schistose or slaty dikes which resemble the greenstone schist (ERC, 1992a).

The stratigraphy within the borings, as identified through soil boring logs and well construction records, is characterized as predominantly silt and clay with varying amounts of micaceous material. Based on the AIG and ERC reports prepared from 1992 through 1994, soil types at the site are generalized as:

Soil Classification	
Depth (ft)	**Description**
0.0 - 10.0	Reddish brown sandy SILT grading to orange sandy CLAY
10.0 - 25.0	Moist, red to orange, fine to medium grained sandy CLAY to fine sandy CLAY
25.0 - 28.5	Wet, tan, brown, and orange, fine sandy SILT with mica
28.5 - 35.0	Wet, tan and orange, fine clayey SILT

Ground water depths range from 30 to 35 ft below grade along the westerly portion of the site to 4 to 8 ft below grade along the easterly portion of the site.

3.2.2 8000-gal leaded gasoline UST post-excavation results

The following table provides a summary of soil samples collected upon excavation and removal of the 8000-gal leaded gasoline UST in December 1991. Included within the table are the soil sample designations for each of the samples collected from this area, a description of the sample, the date the soil sample was collected, the parameters for which the sample was analyzed, and additional notes regarding whether the sample is representative of the soil remaining in the subsurface of the AMC site. Refer to Figure 4 for sample locations.

Sample Designation	Sample Description	Date Sampled	Analytical Parameters	Additional Notes
S-1	Below Former Dispenser	12/12/91	TPH, 3550 TPH, 5030	- No further excavation or sampling was conducted under the dispenser. This sample is representative of the soil remaining at the site.
S-7	Bottom East Side of UST Excavation, 12 ft below grade	12/13/91	TPH, 3550 TPH, 5030	- Further excavation and sampling conducted after collection of this sample. See sample S-20 for bottom interval.
S-8	Bottom West Side of UST Excavation, 12 ft below grade	12/13/91	TPH, 3550 TPH, 5030	- Further excavation and sampling conducted after collection of this sample. See sample S-20 for bottom interval.
S-13	Bottom Center of UST Excavation, 12 ft below grade	12/16/91	TPH, 3550 TPH, 5030	- Further excavation and sampling conducted after collection of this sample. See sample S-20 for bottom interval.
S-14	Bottom of UST Excavation, @ 16 ft below grade	12/19/91	TPH, 3550 TPH, 5030	- Further excavation and sampling conducted after collection of this sample. See sample S-20 for bottom interval.
S-15	Bottom of UST Excavation, @ 16 ft below grade	12/19/91	TPH, 3550 TPH, 5030	- Further excavation and sampling conducted after collection of this sample. See sample S-20 for bottom interval.
S-20	Bottom of UST Excavation, 24 ft below grade	12/26/91	TPH, 3550 TPH, 5030	- No further sampling conducted after this sample. This sample is representative of the soil remaining at the site. - Ground water encountered in excavation.
S-21	Bottom of UST Excavation, 18 ft below grade	12/26/91	TPH, 3550 TPH, 5030	- Further excavation and sampling conducted after collection of this sample. See sample S-20 for bottom interval.
S-24	Composite Sample of Stockpiled Soil from the Excavation	2/3/92	TCLP Metals VOCs, 8240 SVOCs, 8270 PCBs, 8080	- This sample is representative of the soil removed from the UST excavation. However, this sample does not necessarily constitute the contamination level remaining at the site.

Because AIG and Noble returned to the site on numerous occasions to remove additional soil from the excavation, only two of the above-referenced samples, S-1 and S-20, should be considered representative of the soil contamination that currently remains in the former 8,000-gal leaded gasoline UST area at the AMC site. (The soil represented by samples S-1, S-7, S-8, S-13, S-14, S-15, and S-21 was removed from the site through subsequent excavations conducted on December 19-20, 1991 and December 26-27, 1991.) In addition, the composited stockpile sample (S-24) represented soil removed from the excavation during the different programs; therefore, this sample is not representative of the remaining soil contamination (AIG, 1992).

The following table summarizes the analytical results obtained from the sampling programs conducted at the 8,000-gal leaded gasoline UST excavation:

Analytical Parameter	TPH-Diesel (Method 3550)	TPH-Gasoline (Method 5030)
Sample S-1 *	---	< 6.0 ppm
Sample S-7	---	< 6.0 ppm
Sample S-8	---	< 6.0 ppm
Sample S-13	---	< 6.0 ppm
Sample S-14	190 ppm	490 ppm
Sample S-15	1.4 ppm	1.0 ppm
Sample S-20 *	---	< 6.0 ppm
Sample S-21	190 ppm	490 ppm
Sample S-24	---	---
NCDEM-Established Soil Standard	40 ppm	10 ppm

* - Signifies those samples most closely representing the remaining soil conditions in this area.
--- - Signifies that the sample was not analyzed for that analytical parameter.
- The NCDEM-established soil standards for TPH-Diesel and TPH-Gasoline were obtained from the Ground Water Section Guidelines for the Investigation and Remediation of Soils and Ground Water, dated March 1993.

Sample S-24 was collected from the soil stockpile and analyzed for waste characterization by EPA Methods 8260, 8270, 8080, and TCLP metals. The analytical parameters detected, and their corresponding concentrations, included: TCLP-barium (1.0 ppm); 2-butanone (40 ppb); sec-butylbenzene (22 ppb); dichloromethane (117 ppb); 2-hexanone (69 ppb); iodomethane (12 ppb); isopropylbenzene (27 ppb); 1,2,4-trimethylbenzene (22 ppb); xylenes (28 ppb); bis(2-ethylhexyl) phthalate (848.9 ppb); butylbenzyl phthalate (1369.3 ppb); and di-n-butyl phthalate (3160.5 ppb). Sample analysis indicated that the soil was non-hazardous. The analytical results are presented in the CSA, O'Brien & Gere Engineers, Inc., June 1994 (OBG, 1994).

Based on the analytical results for samples S-1 and S-20, elevated concentrations of TPH-diesel and TPH-gasoline do not remain in the soil at the former location of the 8,000-gal leaded gasoline UST (AIG, 1992).

3.2.3 8000-gal unleaded gasoline UST/2000-gal diesel fuel UST/ dispenser island post-excavation results

The following table provides a summary of the soil samples collected during excavation and removal of the 8000-gal unleaded gasoline UST, the 2000-gal diesel UST, and their associated dispenser island and piping. Included

within the table are the sample designations for each of the soil samples collected from this area, a description of the sample, the date the sample was collected, the parameters for which the sample was analyzed, and additional notes regarding whether the sample is representative of the soil remaining in the subsurface of the AMC site. Refer to Figure 4 for sample locations.

Sample Designation	Sample Description	Date Sampled	Analytical Parameters	Additional Notes
S-2	Bottom South Side of the USTs' Excavation, 12 ft below grade under 8,000-Gal UST	12/12/91	TPH, 3550 TPH, 5030	- No further excavation or sampling was conducted in the USTs excavation after collection of samples S-2 through S-6. Therefore, this sample is representative of the soil remaining at the site.
S-3	Bottom Center of USTs' Excavation, 12 ft below grade under 8,000-Gal UST	12/12/91	TPH, 3550 TPH, 5030	- No further excavation or sampling was conducted in the USTs excavation after collection of samples S-2 through S-6. Therefore, this sample is representative of the soil remaining at the site.
S-4	Bottom South Side of the USTs' Excavation, 8 ft below grade under 2,000-Gal UST	12/12/91	TPH, 3550 TPH, 5030	- No further excavation or sampling was conducted in the USTs excavation after collection of samples S-2 through S-6. Therefore, this sample is representative of the soil remaining at the site.
S-5	Bottom Center of the USTs' Excavation, 8 ft below grade under 2,000-Gal UST	12/12/91	TPH, 3550 TPH, 5030	- No further excavation or sampling was conducted in the USTs excavation after collection of samples S-2 through S-6. Therefore, this sample is representative of the soil remaining at the site.
S-6	Bottom North Side of the USTs' Excavation, 8 ft below grade under 2,000-Gal UST	12/12/91	TPH, 3550 TPH, 5030	- No further excavation or sampling was conducted in the USTs excavation after collection of samples S-2 through S-6. Therefore, this sample is representative of the soil remaining at the site.
S-9	Under Diesel Dispenser (close to surface)	12/13/91	TPH, 3550 TPH, 5030	- Further excavation and sampling conducted after collection of this sample. See samples PI-1 through PI-4 for bottom interval.
S-10	Under Unleaded Gasoline Dispenser (close to surface)	12/13/91	TPH, 3550 TPH, 5030	- Further excavation and sampling conducted after collection of this sample. See samples PI-1 through PI-4 for bottom interval.
S-11	General Vicinity of Dispenser Island	12/16/91	TPH, 3550 TPH, 5030	- Further excavation and sampling conducted after collection of this sample. See samples PI-1 through PI-4 for bottom interval.
S-12	Dispenser Island Excavation - Under Bottom Piping	12/16/91	TPH, 3550 TPH, 5030	- Further excavation and sampling conducted after collection of this sample. See samples PI-1 through PI-4 for bottom interval.
S-16	Dispenser Island Excavation, 2 ft below grade	12/19/91	TPH, 3550 TPH, 5030	- Further excavation and sampling conducted after collection of this sample. See samples PI-1 through PI-4 for bottom interval.

Sample Designation	Sample Description	Date Sampled	Analytical Parameters	Additional Notes
S-17	Dispenser Island Excavation, 4 ft below grade	12/19/91	TPH, 3550 TPH, 5030	- Further excavation and sampling conducted after collection of this sample. See samples PI-1 through PI-4 for bottom interval.
S-18	Dispenser Island Excavation, 6 ft below grade	12/19/91	TPH, 3550 TPH, 5030	- Further excavation and sampling conducted after collection of this sample. See samples PI-1 through PI-4 for bottom interval.
S-19	Dispenser Island Excavation, 10 ft below grade	12/19/91	TPH, 3550 TPH, 5030	- Further excavation and sampling conducted after collection of this sample. See samples PI-1 through PI-4 for bottom interval.
PI-1	South Wall of Dispenser Island Excavation, 10 ft below grade	5/6/92	TPH, 3550 TPH, 5030	- No further excavation or sampling was conducted in the dispenser area after samples PI-1 through PI-4. Therefore, this sample is representative of the soil remaining at the site.
PI-2	Center Floor of Dispenser Island Excavation, 18 ft below grade	5/6/92	TPH, 3550 TPH, 5030	- No further excavation or sampling was conducted in the dispenser area after samples PI-1 through PI-4. Therefore, this sample is representative of the soil remaining at the site.
PI-3	Southwest Corner of Dispenser Island Excavation, 15 ft below grade	5/6/92	TPH, 3550 TPH, 5030	- No further excavation or sampling was conducted in the dispenser area after samples PI-1 through PI-4. Therefore, this sample is representative of the soil remaining at the site.
PI-4	Southeast Corner of Dispenser Island Excavation, 10 ft below grade	5/6/92	TPH, 3550 TPH, 5030	- No further excavation or sampling was conducted in the dispenser area after samples PI-1 through PI-4. Therefore, this sample is representative of the soil remaining at the site.
S-24	Composite Sample of Stockpiled Soil from the Excavation	2/3/92	TCLP Metals VOCs, 8240 SVOCs, 8270 PCBs, 8080	- This sample is representative of the soil removed from the UST excavation. However, this sample does not necessarily constitute the contamination level remaining at the site.

Because AIG and Noble returned to the site on numerous occasions to remove additional soil from the excavations, the samples which should be considered representative of the soil contamination that currently remains in this area at the AMC site include: samples S-2 through S-6 for the USTs' excavation; and samples PI-1 through PI-4 for the dispenser island's excavation. (The soil represented by the other soil samples was removed from the site through subsequent excavations conducted on December 19-20, 1991, December 26-27, 1991, and May 5-6, 1992.) In addition, the

composited stockpile sample (S-24) represented soil removed from the excavations during the different programs; therefore, this sample is not representative of remaining soil contamination (AIG, 1992).

The following table summarizes the analytical results obtained from the sampling programs conducted at the 8,000-gal unleaded gasoline UST and 2000-gal diesel UST excavation and the dispenser island excavation:

Analytical Parameter	TPH-Diesel (Method 3550)	TPH-Gasoline (Method 5030)
Sample S-2 *	< 7.0 ppm	< 7.0 ppm
Sample S-3 *	< 7.0 ppm	< 7.0 ppm
Sample S-4 *	< 7.0 ppm	< 7.0 ppm
Sample S-5 *	< 6.0 ppm	< 6.0 ppm
Sample S-6 *	< 7.0 ppm	< 7.0 ppm
Sample S-9	< 7.0 ppm	< 7.0 ppm
Sample S-10	< 7.0 ppm	< 7.0 ppm
Sample S-11	102 ppm	< 6.0 ppm
Sample S-12	< 70 ppm	2,900 ppm
Sample S-16	9.2 ppm	260 ppm
Sample S-17	4,800 ppm	8,300 ppm
Sample S-18	1.7 ppm	8.3 ppm
Sample S-19	1.5 ppm	320 ppm
Sample S-21	190 ppm	490 ppm
Sample S-24	---	---
Sample PI-1 *	< 0.9 ppm	3.7 ppm
Sample PI-2 *	< 0.9 ppm	3.3 ppm
Sample PI-3 *	< 0.9 ppm	1.0 ppm
Sample PI-4 *	< 0.9 ppm	5.3 ppm
NCDEM-Established Soil Standard	40 ppm	10 ppm

* - Signifies those samples most closely representing the remaining soil conditions in this area.
--- - Signifies that the sample was not analyzed for that analytical parameter.
- The NCDEM-established soil standards for TPH-Diesel and TPH-Gasoline were obtained from the Ground Water Section Guidelines for the Investigation and Remediation of Soils and Ground Water, dated March 1993.

Soil sample S-24 was analyzed for soil disposal characterization. Sample analysis indicated the soil was non-hazardous and suitable for disposal as petroleum-contaminated soil. Refer to Section 3.2.2. for analytical results. Based on the analytical results for samples S-2 through S-6 and samples PI-1 through PI-4, elevated concentrations of TPH-diesel and TPH-gasoline do not remain in the soil at the former location of the 8,000-gal unleaded gasoline UST, the 2,000-gal diesel UST, or the associated dispenser island and piping (AIG, 1992). The analytical results are presented in the CSA, O'Brien & Gere Engineers, Inc., June 1994 (OBG, 1994).

3.2.4. Subsequent soil boring delineation results

The following table provides a summary of the soil sampling conducted during the February 1992 delineation program. The sampling was completed in the area of the former 8000-gal leaded gasoline USTs. The delineation program was required by the NCDEM-Ground Water Section because ground water was encountered in the excavation for the 8,000-gal unleaded gasoline UST. Ten soil borings were completed and three monitoring wells were installed during this program and are depicted on Figure 3.

The soil borings, which were located in the vicinity of the former UST and extended to depths ranging from 25 to 30 ft, were completed utilizing a truck-mounted drill rig equipped with an 8-inch diameter hollow stem auger. Soil samples were collected from each of the soil borings using split-spoon sampling devices. Split-spoons were decontaminated between sampling intervals using a non-phosphate detergent wash followed by a water rinse (AIG, 1992).

Drill cuttings were logged and split-spoon samples were collected at target intervals to the base of each soil boring. A portion of each core sample was placed into an appropriate laboratory container and allowed to volatilize. The sample was then screened with an OVA such that the sample with the highest reading could be selected for laboratory analysis. Based on this system, two soil samples were analyzed from each of ten of the thirteen soil boring locations (from an 8-10 ft shallow depth interval and a 22-30 ft deep depth interval). The samples were designated B-1 through B-20. Because the other three soil boring locations were to be converted into monitoring wells, one soil sample was collected from the base of each of the three monitoring well locations (MW-1 through MW-3) for laboratory analysis. Soil samples were collected from each of the soil borings on February 24-26, 1992. The samples were collected using a split-spoon sampling device, placed in glass containers with teflon-lined lids, placed on ice, and delivered to ESE in Raleigh, N.C. At ESE, the samples were analyzed for TPH via EPA Methods 3550 and 5030 (AIG, 1992).

Included in the following table are the sample designations for each of the soil samples collected from this area, a description of the sample, the date the sample was collected, the analytical parameters and results. Since excavation activities were not conducted in any of these areas after the completion of the delineation program, all of the samples are representative of the subsurface conditions at the AMC site (AIG, 1992).

Sample Location	Sample Designation	Date Sampled	TPH-Diesel (Method 3550)	TPH - Gasoline (Method 5030)
Boring 1, 10 ft below grade	B-1*	2/24/92	0.83 ppm	22 ppm
Boring 1, 30 ft below grade	B-2*	2/24/92	0.91 ppm	19 ppm
Boring 2, 10 ft below grade	B-3*	2/24/92	1.0 ppm	6.4 ppm
Boring 2, 30 ft below grade	B-4*	2/24/92	1.1 ppm	8.7 ppm
Boring 3, 10 ft below grade	B-5*	2/24/92	1.0 ppm	0.6 ppm
Boring 3, 30 ft below grade	B-6*	2/24/92	1.3 ppm	22 ppm
Boring 4, 10 ft below grade	B-7*	2/24/92	1.4 ppm	38 ppm
Boring 4, 30 ft below grade	B-8*	2/24/92	0.95 ppm	3.8 ppm
Boring 5, 10 ft below grade	B-9*	2/26/92	1.2 ppm	< 0.25 ppm
Boring 5, 30 ft below grade	B-10*	2/26/92	1.0 ppm	< 0.25 ppm
Boring 6, 8 ft below grade	B-11*	2/26/92	1.0 ppm	< 0.25 ppm
Boring 6, 22 ft below grade	B-12*	2/26/92	0.9 ppm	1.7 ppm
Boring 7, 10 ft below grade	B-13*	2/26/92	< 4.0 ppm	0.54 ppm
Boring 7, 24 ft below grade	B-14*	2/26/92	1.1 ppm	< 0.25 ppm
Boring 8, 10 ft below grade	B-15*	2/26/92	4.6 ppm	< 0.25 ppm
Boring 8, 24 ft below grade	B-16*	2/26/92	< 4.0 ppm	< 0.25 ppm
Boring 9, 10 ft below grade	B-17*	2/26/92	4.1 ppm	< 0.25 ppm
Boring 9, 25 ft below grade	B-18*	2/26/92	1.0 ppm	< 0.25 ppm
Boring 10, 10 ft below grade	B-19*	2/26/92	1.3 ppm	1.6 ppm
Boring 10, 25 ft below grade	B-20*	2/26/92	1.5 ppm	0.42 ppm
Monitoring Well 1	MW-1*	2/24/92	---	< 0.01 ppm
Monitoring Well 2	MW-2*	2/24/92	---	0.01 ppm
Monitoring Well 3	MW-3*	2/24/92	---	0.86 ppm

* - Signifies those samples most closely representing the remaining soil conditions at the site.
--- - Signifies that the sample was not analyzed for that analytical parameter.
- The NCDEM-established soil standards for TPH-Diesel and TPH-Gasoline were obtained from the Ground Water Section Guidelines for the Investigation and Remediation of Soils and Ground Water, dated March 1993.

Based on the analytical results for samples B-1 through B-20 and samples MW-1 through MW-3, slightly elevated concentrations of TPH-gasoline (ranging from 19 ppm to 38 ppm) remain in two areas in the vicinity of the former dispenser island and the former 8,000-gal leaded gasoline UST (AIG, 1992). These areas of isolated remnant soil contamination are depicted on Figure 3 and isoconcentration cross-section A'-A, Figure 9. The analytical results are presented in the CSA, O'Brien & Gere Engineers, Inc., June 1994 (OBG, 1994).

3.2.5 550-gal waste oil UST and waste oil pit post-excavation results

The following table provides a summary of the soil sampling conducted upon excavation and removal of the 550-gal waste oil UST in May 1992 and the waste oil pit in September 1992. Included within the table are the sample designations for each of the samples collected from this area, a description of the sample, the date the sample was collected, the parameters for which the sample was analyzed, and additional notes regarding whether the sample is representative of the soil remaining in the subsurface of the AMC site. Refer to Figure 3 for sample locations.

Sample Designation	Sample Description	Date Sampled	Analytical Parameters	Additional Notes
WT-1	Surficial Sample at Fill Port	6/15/92	Oil & Grease, 9071	- Further excavation and sampling conducted after collection of this sample.
WT-2	Eastern Floor of UST Excavation, 8 ft below grade	6/17/92	Oil & Grease, 9071	- No further excavation or sampling was conducted after collection of this sample. Therefore, this sample is representative of the soil remaining at the site.
WT-3	Western Floor of UST Excavation, 8 ft below grade	6/17/92	Oil & Grease, 9071	- No further excavation or sampling was conducted after collection of this sample. Therefore, this sample is representative of the soil remaining at the site.
WT-4	Background, Upgradient Sample, 5 ft below grade	6/25/92	Oil & Grease, 9071	- As a background, upgradient sample, no further excavation or sampling was conducted after collection of this sample. This sample was collected to identify naturally-occurring oil & grease concentrations in the soil at the property. Therefore, this sample is representative of the soil remaining at the site.

Sample Designation	Sample Description	Date Sampled	Analytical Parameters	Additional Notes
WT-5	Composite Sample of Stockpiled Soil from Excavation	6/25/92	Oil & Grease, 9071	- This sample is representative of the soil removed from the UST excavation. However, this sample does not necessarily constitute the contamination level remaining at the site.
WT-6	Composite Sample of Stockpiled Soil from Excavation	8/5/92	TCLP Metals VOCs, 8240 SVOCs, 8270 PCBs, 8080	- This sample is representative of the soil removed from the UST excavation. However, this sample does not necessarily constitute the contamination level remaining at the site.
CR-1	Crush and Run, 10 Ft West of Center, 2 ft below grade	9/9/92	TPH, 3550 VOCs, 8010/8020	- No further excavation or sampling was conducted after collection of this sample. Therefore, this sample is representative of the soil remaining at the site.
CR-2	Crush and Run, 10 Ft East of Center, 2 ft below grade	9/9/92	TPH, 3550 VOCs, 8010/8020	- No further excavation or sampling was conducted after collection of this sample. Therefore, this sample is representative of the soil remaining at the site.
CR-3	Crush and Run, Center of Excavation, 2 ft below grade	9/9/92	TPH, 3550 VOCs, 8010/8020	- No further excavation or sampling was conducted after collection of this sample. Therefore, this sample is representative of the soil remaining at the site.

Six of the above-referenced samples, WT-2 through WT-4 and CR-1 through CR-3, should be considered representative of the soil contamination that currently remains in the area of the former waste oil UST and the former waste oil pit at the AMC site. The soil represented by sample WT-1 has been removed from the site through subsequent excavation. In addition, the composited samples from the stockpile (WT-5 and WT-6) represented soil removed from the excavation during the programs; therefore, these samples are not be representative of the remaining soil contamination (AIG, 1992).

The following table summarizes the analytical results obtained from the sampling programs conducted at the 550-gal waste oil UST and the waste oil pit excavations:

Analytical Parameter	TPH-Diesel (Method 3550)	Oil & Grease (Method 9071)
Sample WT-1	---	51,000 ppm
Sample WT-2 *	---	150 ppm
Sample WT-3 *	---	62 ppm
Sample WT-4 *	---	120 ppm
Sample WT-5	---	1,900 ppm
Sample WT-6	---	---
Sample CR-1 *	9.0 ppm	---
Sample CR-2 *	3.2 ppm	---
Sample CR-3 *	2.1 ppm	---
NCDEM-Established Soil Standard	40 ppm	250 ppm

* - Signifies those samples most closely representing the remaining soil conditions in this area.
--- - Signifies that the sample was not analyzed for that analytical parameter.
- The NCDEM-established soil standards for TPH-Diesel and Oil & Grease were obtained from the Ground Water Section Guidelines for the Investigation and Remediation of Soils and Ground Water, dated March 1993.

Samples CR-1 through CR-3 were also analyzed for VOCs via EPA Methods 8010 and 8020. Based on the analytical data, none of the samples contained elevated concentrations of VOCs. The analytical parameters detected in composited stockpile sample WT-6 (and their corresponding concentrations) included: TCLP-barium (0.76 ppm); TCLP-lead (0.19 ppm); dichloromethane (1,580 ppb); 1,1,1-trichloroethane (24.9 ppb); and trichloromethane (13.4 ppb).

Based on the analytical results for samples WT-2 through WT-4 and CR-1 through CR-3, elevated concentrations of TPH-diesel and oil and grease do not remain in the soil at the former locations of the 550-gal waste oil UST and waste oil pit. In addition, samples CR-1 through CR-3 did not contain elevated concentrations of VOCs (AIG, 1992). The analytical results are presented in the CSA, O'Brien & Gere Engineers, Inc., June 1994 (OBG, 1994).

3.2.6. 6000-gal no. 2 fuel oil UST post-excavation results

The following table provides a summary of the sampling conducted upon excavation and removal of the 6,000-gal No. 2 fuel oil UST in August 1992. Included within the table are the sample designations for each of the samples collected from this area, a description of the sample, the date the sample was collected, the parameters for which the sample was analyzed, the analytical results, and additional notes regarding whether the sample is representative of the soil remaining in the subsurface of the AMC site. Refer to Figure 3 and Figure 4, Detail D for sample locations.

Sample Designation	Sample Description	Date Sampled	TPH - Diesel (Method 3550)	TPH - Gasoline (Method 5030)	Additional Notes
S-1*	Eastern Floor of UST Excavation, @ 10 ft below grade	8/19/92	2.4 ppm	5.8 ppm	- No further excavation or sampling was conducted in the waste oil UST excavation. Therefore, this sample is representative of soil remaining at the site.
S-2*	Western Floor of UST Excavation, @ 10 ft below grade	8/19/92	2.3 ppm	1.1 ppm	- No further excavation or sampling was conducted in the waste oil UST excavation. Therefore, this sample is representative of soil remaining at the site.
S-3	UST Fill Port Area, 2 ft below grade	8/20/92	3.6 ppm	< 0.25 ppm	- Further excavation and sampling conducted after collection of this sample. See sample S-3.1 for bottom interval.
S-3.1*	Same as Sample S-3, 5 ft below grade	8/26/92	2.2 ppm	< 0.25 ppm	- No further excavation and sampling conducted after collection of this sample. Therefore, this sample is representative of soil remaining at the site.
S-4*	Piping @ 20 Ft from Fill Port, 2 ft below grade	8/20/92	< 2.0 ppm	< 0.25 ppm	- No further excavation and sampling conducted after collection of this sample. Therefore, this sample is representative of soil remaining at the site.
S-5	Piping @ 40 Ft from Fill Port, 2 ft below grade	8/20/92	3.4 ppm	< 0.25 ppm	- Further excavation and sampling conducted after collection of this sample. See sample S-5.1 for bottom interval.
S-5.1*	Same as Sample S-5, 4.5 ft below grade	8/26/92	2.0 ppm	< 0.25 ppm	- No further excavation and sampling conducted after collection of this sample. Therefore, this sample is representative of soil remaining at the site.
S-6	Piping @ 60 Ft from Fill Port, 2 ft below grade	8/20/92	1,300 ppm	7.0 ppm	- Further excavation and sampling conducted after collection of this sample. See sample S-6.1 for bottom interval.

Sample Designation	Sample Description	Date Sampled	TPH - Diesel (Method 3550)	TPH - Gasoline (Method 5030)	Additional Notes
S-6.1*	Same as Sample S-6, 5 ft below grade	8/26/92	2.3 ppm	< 0.25 ppm	- No further sampling conducted after collection of this sample. Therefore, this sample is representative of soil remaining at the site.
S-7	Composite Sample from Stockpile	8/20/92	11 ppm	< 0.25 ppm	- This sample is representative of the soil removed from the UST excavation. However, this sample does not necessarily constitute the contamination level remaining at the site.

* - Signifies those samples most closely representing the remaining soil conditions in this area.
--- - Signifies that the sample was not analyzed for that analytical parameter.
- The NCDEM-established soil standards for TPH-Diesel and TPH-Gasoline were obtained from the Ground Water Section Guidelines for the Investigation and Remediation of Soils and Ground Water, dated March 1993.

Six of the above-referenced samples (S-1, S-2, S-3.1, S-4, S-5.1, and S-6.1) should be considered representative of the soil contamination that currently remains in this area at the AMC site. (The soil represented by samples S-3, S-5, and S-6 was removed from the excavation through subsequent excavations.) In addition, the composited stockpile sample (S-7) represented soil removed from the excavation; therefore, this sample is not representative of the remaining soil contamination (AIG, 1992).

Based on the analytical results for samples S-1, S-2, S-3.1, S-4, S-5.1, and S-6.1, elevated concentrations of TPH-diesel and TPH-gasoline do not remain in the soil at the former location of the 6,000-gal No. 2 fuel oil UST. On October 16, 1992, the NCDEM-Ground Water Section issued a letter indicating that the above data had been reviewed and that no further action was required for the 6,000-gal No. 2 fuel oil UST area (AIG, 1992). The analytical results are presented in the CSA, O'Brien & Gere Engineers, Inc., June 1994 (OBG, 1994).

3.2.7. Limited Phase II ESA soil gas survey results

As per the request of a third party interested in purchasing the AMC site, O'Brien & Gere Engineers conducted a soil gas survey in four areas of potential environmental concern at the AMC site, including: the brick pump house (the dispenser area for the former 8,000-gal leaded gasoline UST); Drum Area No. 1; Drum Area No. 2 including the metal storage shed (OBG, 1992). Refer to Figure 4 for sample locations.

The following summary table provides a listing of the soil gas points, their locations, and the detected constituents of concern:

Soil Gas Point Designation	Soil Gas Point Location	Detected Constituents of Concern
A 2/1 *	Brick Pump House	FID Response Benzene = 49.6 ppb Toluene = 1,761 ppb Ethylbenzene = 8.1 ppb o-Xylene = 1.7 ppb Total Non-Target as Toluene = 13,368 ppb
A 2/2 *	Brick Pump House	FID Response Benzene = 3.3 ppb Toluene = 2.7 ppb Total Non-Target as Toluene = 18 ppb
A 2/3	Drum Area No. 1	FID Response Benzene = 2.8-3.1 ppb Toluene = 80-89 ppb Perchloroethylene = 57-64 ppb o-Xylene = 0.08-0.12 ppb Total Non-Target as Toluene = 4,498-4,724 ppb ECD Response Trichloroethylene (TCE) = 4.0-4.3 ppb Perchloroethylene = 47-52 ppb Total Non-Target as TCE = 323-346 ppb
A 2/4	Drum Area No. 1	FID Response Benzene = 2.0 ppb Toluene = 59 ppb Perchloroethylene = 15 ppb Total Non-Target as Toluene = 997 ppb ECD Response Perchloroethylene = 13 ppb Total Non-Target as TCE = 191 ppb
A 2/5	Drum Area No. 1	FID Response Toluene = 0.5 ppb o-Xylene = 1.5 ppb Total Non-Target as Toluene = 215 ppb ECD Response Perchloroethylene = 0.05 ppb Total Non-Target as TCE = 144 ppb
A 2/6	Drum Area No. 2	FID Response Total Non-Target as Toluene = 3.8 ppb
A 2/7	Drum Area No. 2	FID Response Total Non-Target as Toluene = 28 ppb
A 2/8	Drum Area No. 2	FID Response Total Non-Target as Toluene = 1.6 ppb

Soil Gas Point Designation	Soil Gas Point Location	Detected Constituents of Concern
A 2/9	Metal Storage Shed	FID Response Total Non-Target as Toluene = 14 ppb ECD Response Total Non-Target as TCE = 1.1 ppb
A 2/10	Metal Storage Shed	FID Response Toluene = 0.9 ppb Total Non-Target as Toluene = 655 ppb ECD Response Total Non-Target as TCE = 4.7 ppb

* - Signifies those samples most closely representing the remaining soil contamination in this area.
--- - Signifies that the sample was not analyzed for that analytical parameter.
- The NCDEM has not established soil gas standards; therefore, any analytical parameters which exhibited concentrations in excess of their method detection levels have been reported.

These results served as a preliminary screening for the site. Based on these results, further soil sampling and excavation were conducted in Drum Area No. 1, Drum Area No. 2 including the metal storage shed area (refer to Section 3.2.8). Since the soil gas points in Drum Area No. 1, Drum Area No. 2, and the metal storage shed area were subsequently excavated, only soil gas points A2/1 and A2/2 in the brick pump house area currently remain intact at the AMC site and are considered representative of the constituents currently present in that area of the site (OBG, 1992). The analytical results are presented in the CSA, O'Brien & Gere Engineers, Inc., June 1994 (OBG, 1994).

3.2.8. Drum Areas No. 1 & 2/stressed vegetation area hand auger investigation results

The following table provides a summary of the preliminary hand auger investigation conducted in February 1993 by ERC (ERC, 1993a) in Drum Area No. 1, Drum Area No. 2 (including the metal storage shed area), and the area of stressed vegetation (refer to Figure 4). (The preliminary hand auger investigation was performed in response to the soil gas survey discussed in Section 3.2.7 above.) Included within the table are the sample designations for each of the samples collected from this area, a description of the sample, the date the sample was collected, the parameters for which the sample was analyzed, and additional notes regarding whether the sample is representative of the soil remaining in the subsurface of the AMC site.

Sample Designation	Sample Description	Date Sampled	Analytical Parameters	Detected Constituents of Concern	Additional Notes
HA 1-1	Drum Area No. 1, 7 ft below grade	2/3-5/93	TCLP Metals Oil & Grease, 9071 VOCs, 8240 SVOCs, 8270 PCBs, 8080	TCLP Barium = 0.781 ppm 100 TCLP Selenium = 0.105 ppm 1.0 Methylene Chloride = 7.7 ppb 1,1,1-Trichloroethane = 5.8 ppb	- In June 1993, Drum Area No. 1 was excavated. As such, this sample does not represent the current site conditions.
HA 1-2	Drum Area No. 1, 3 ft below grade	2/3-5/93	TCLP Metals Oil & Grease, 9071 VOCs, 8240 SVOCs, 8270 PCBs, 8080	TCLP Barium = 0.497 ppm Methylene Chloride = 7.6 ppb	- In June 1993, Drum Area No. 1 was excavated. As such, this sample does not represent the current site conditions.
HA 1-3	Drum Area No. 1, 3 ft below grade	2/3-5/93	TCLP Metals Oil & Grease, 9071 VOCs, 8240 SVOCs, 8270 PCBs, 8080	TCLP Barium = 0.635 ppm Methylene Chloride = 6.6 ppb	- In June 1993, Drum Area No. 1 was excavated. As such, this sample does not represent the current site conditions.
HA 1-4	Drum Area No. 1, 3 ft below grade	2/3-5/93	TCLP Metals Oil & Grease, 9071 VOCs, 8240 SVOCs, 8270 PCBs, 8080	TCLP Barium = 0.435 ppm TCLP Chromium = 0.031 ppm 5.0 Methylene Chloride = 6.6 ppb	- In June 1993, Drum Area No. 1 was excavated. As such, this sample does not represent the current site conditions.
HA 2-1	Drum Area No. 2 (Including the Metal Storage Shed), 4 ft below grade	2/3-5/93	TCLP Metals Oil & Grease, 9071 VOCs, 8240 SVOCs, 8270 PCBs, 8080	TCLP Barium = 1.21 ppm TCLP Chromium = 0.018 ppm TCLP Mercury = 0.00026 ppm 0.2 Oil & Grease = 990 ppm ** (Greater than the NCDEM standard of 250 ppm.) Methylene Chloride = 36.3 ppb Ethylbenzene = 171 ppb m,p-Xylene = 1,012 ppb o-Xylene = 406 ppb Benzidine = 55,800 ppb	- In June 1993, Drum Area No. 2 was excavated. As such, this sample does not represent the current site conditions.
HA 2-2	Drum Area No. 2 (Including the Metal Storage Shed), 3 ft below grade	2/3-5/93	TCLP Metals Oil & Grease, 9071 VOCs, 8240 SVOCs, 8270 PCBs, 8080	TCLP Barium = 1.37 ppm TCLP Chromium = 0.222 ppm Methylene Chloride = 11.2 ppb	- In June 1993, Drum Area No. 2 was excavated. As such, this sample does not represent the current site conditions.
HA 2-3	Drum Area No. 2 (Including the Metal Storage Shed), 3 ft below grade	2/3-5/93	TCLP Metals Oil & Grease, 9071 VOCs, 8240 SVOCs, 8270 PCBs, 8080	TCLP Barium = 1.11 ppm TCLP Chromium = 0.031 ppm Methylene Chloride = 8.4 ppb m,p-Xylene = 10.1 ppb	- In June 1993, Drum Area No. 2 was excavated. As such, this sample does not represent the current site conditions.
HA 2-4	Drum Area No. 2 (Including the Metal Storage Shed), 3 ft below grade	2/3-5/93	TCLP Metals Oil & Grease, 9071 VOCs, 8240 SVOCs, 8270 PCBs, 8080	TCLP Barium = 0.921 ppm TCLP Selenium = 0.104 ppm Methylene Chloride = 6.8 ppb	- In June 1993, Drum Area No. 2 was excavated. As such, this sample does not represent the current site conditions.
HA 2-5	Drum Area No. 2 (Including the Metal Storage Shed), 3 ft below grade	2/3-5/93	TCLP Metals Oil & Grease, 9071 VOCs, 8240 SVOCs, 8270 PCBs, 8080	TCLP Barium = 1.40 ppm TCLP Mercury = 0.00026 ppm Methylene Chloride = 6.0 ppb	- In June 1993, Drum Area No. 2 was excavated. As such, this sample does not represent the current site conditions.

Sample Designation	Sample Description	Date Sampled	Analytical Parameters	Detected Constituents of Concern	Additional Notes
HA 3-1	Area of Stressed Vegetation, 5 ft below grade	2/3-5/93	TCLP Metals Oil & Grease, 9071 VOCs, 8240 SVOCs, 8270 PCBs, 8080	TCLP Barium = 0.439 ppm TCLP Chromium = 0.030 ppm Methylene Chloride = 15.8 ppb	- In June 1993, the area of stressed vegetation was excavated. As such, this sample does not represent the current site conditions.
HA 3-2	Area of Stressed Vegetation, 3 ft below grade	2/3-5/93	TCLP Metals Oil & Grease, 9071 VOCs, 8240 SVOCs, 8270 PCBs, 8080	TCLP Barium = 0.446 ppm TCLP Chromium = 0.013 ppm	- In June 1993, the area of stressed vegetation was excavated. As such, this sample does not represent the current site conditions.
HA 3-3	Area of Stressed Vegetation, 3 ft below grade	2/3-5/93	TCLP Metals Oil & Grease, 9071 VOCs, 8240 SVOCs, 8270 PCBs, 8080	TCLP Barium = 0.468 ppm TCLP Selenium = 0.130 ppm	- In June 1993, the area of stressed vegetation was excavated. As such, this sample does not represent the current site conditions.
HA 3-4	Area of Stressed Vegetation, 3 ft below grade	2/3-5/93	TCLP Metals Oil & Grease, 9071 VOCs, 8240 SVOCs, 8270 PCBs, 8080	TCLP Barium = 0.449 ppm	- In June 1993, the area of stressed vegetation was excavated. As such, this sample does not represent the current site conditions.

None of the above-referenced samples should be considered representative of the soil contamination that currently exists at the AMC site. Subsequent excavations were conducted in Drum Area No. 1, Drum Area No. 2, and the area of stressed vegetation during June 1993. These subsequent excavations, discussed in Section 3.2.9. below, removed all of the soils screened during the preliminary hand auger investigations (AIG, 1993a). The analytical results are presented in the CSA, O'Brien & Gere Engineers, Inc., June 1994 (OBG, 1994).

As a result of detected constituents of concern, Drum Area No. 1, Drum Area No. 2 (including the metal storage shed area), and the area of stressed vegetation were subsequently excavated in June 1993. Post excavation soil sample results are presented in the following sections.

3.2.9. Drum Areas No. 1 & 2/stressed vegetation area post-excavation results

The following table provides a summary of the sampling conducted and analytical results upon finished excavation and removal of contaminated soil from Drum Area No. 1, Drum Area No. 2 (including the metal storage shed area), and the area of stressed vegetation in June 1993. The loation of each area is depicted on Figure 3. The sample locations for each area are depicted

on: Figure 8, Detail E for Drum Area No. 1; Figure 5, Detail F for Drum Area No. 2; and Figure 6, Detail G for the stressed vegetation area. Included within the table are the sample designations for each of the samples collected from this area, a description of the sample, the date the sample was collected, the parameters for which the sample was analyzed, and detected constituents of concern.

Sample Designation	Sample Description	Date Sampled	Analytical Parameters	Detected Constituents of Concern
1.1*	Drum Area No. 1, North Sidewall, 4 ft below grade	6/24/93	VOCs, 8010	Chloroform = 120 ppb
1.2*	Drum Area No. 1, West Sidewall, 6 ft below grade	6/24/93	VOCs, 8010	None
1.3*	Drum Area No. 1, East Sidewall, 6.5 ft below grade	6/24/93	VOCs, 8010	None
1.4*	Drum Area No. 1, South Sidewall, 5 ft below grade	6/24/93	VOCs, 8010	None
1.6*	Drum Area No. 1, Center of Excavation Floor, 5 ft below grade	6/24/93	VOCs, 8010	None
2.1*	Drum Area No. 2 (Including Metal Storage Shed Area), North Sidewall, 4 ft below grade	6/24/93	VOCs, 8010	None
2.2*	Drum Area No. 2 (Including Metal Storage Shed Area), West Sidewall, 4 ft below grade	6/24/93	VOCs, 8010	None
2.3*	Drum Area No. 2 (Including Metal Storage Shed Area), East Sidewall, 4 ft below grade	6/24/93	VOCs, 8010	None
2.4*	Drum Area No. 2 (Including Metal Storage Shed Area), South Sidewall, 4 ft below grade	6/24/93	VOCs, 8010	None
2.6*	Drum Area No. 2 (Including Metal Storage Shed Area), Center of Excavation Floor, 5 ft below grade	6/24/93	VOCs, 8010	None

Sample Designation	Sample Description	Date Sampled	Analytical Parameters	Detected Constituents of Concern
3.1*	Area of Stressed Vegetation, West Sidewall, 2.5 ft below grade	6/23/93	VOCs, 8010	Chloroform = 760 ppb Trichloroethene = 61 ppb
3.2*	Area of Stressed Vegetation, North Sidewall, 3.5 ft below grade	6/23/93	VOCs, 8010	Chloroform = 89 ppb
3.3*	Area of Stressed Vegetation, East Sidewall, 5.5 ft below grade	6/23/93	VOCs, 8010	Chloroform = 120 ppb
3.5*	Area of Stressed Vegetation, West Side Excavation Floor, 3 ft below grade	6/23/93	VOCs, 8010	None
3.7*	Area of Stressed Vegetation, East Side Excavation Floor, 6 ft below grade	6/23/93	VOCs, 8010	None

* - Signifies those samples most closely representing the remaining soil contamination in this area.
--- - Signifies that the sample was not analyzed for that analytical parameter.
- The NCDEM has not established soil gas standards; therefore, any analytical parameters which exhibited concentrations in excess of their method detection levels have been reported

All of the above-referenced samples should be considered representative of the soil contamination that currently exists at the AMC site. Further excavations in Drum Area No. 1, Drum Area No. 2 (including the metal storage shed area), and the area of stressed vegetation were not conducted after June 23-24, 1993 (AIG field notes, 1993). The analytical results are presented in the CSA, O'Brien & Gere Engineers, Inc., June 1994 (OBG, 1994).

Based on the analytical results for samples, it appears that:

- One area along the northern sidewall of the Drum Area No. 1 excavation contained chloroform (Sample 1.1) Further excavation could not be performed due to the presence of a retaining wall.

- The Drum Area No. 2 excavation was extended such that no volatile organic constituents of concern remain in that area.

- Areas of the north, west, and east sidewalls of the excavation in the stressed vegetation area contain chloroform and trichloroethene.

Further excavation along the sidewalls in the stressed vegetation area was hindered due to the presence of retaining walls and steep slopes along the excavation area (AIG field notes, 1993).

The levels of chloroform and trichloroethylene were below the USEPA Region III risk based concentration for residential soil: chloroform 100,000 μg/kg and trichloroethylene 58,000 μg/kg.

The concentrations of chloroform and trichloroethylene remaining in soil were reviewed by the NCDENR Environmental Epidemiology Section (EES). The EES concluded that these compounds did not present a risk to receptors at the concentrations found. Refer to EES correspondence, November 28, 1994, Appendix B. No further action is recommended. *Note: the EES correspondence indicated that additional excavation and closure sampling were required in Drum Area #2. This work was performed; however, closure sampling was completed using EPA Method 8010. This method was not able to detect the compound benzidine, a contaminant of concern in this area. Additional sampling was completed in this area by O'Brien & Gere and analyzed by EPA Methods 8240 and 8270. This analysis indicated there were no concentration of benzidine exceeding method detection limits (OBG, May 1996).*

3.2.10 Former UST staging area soil sample results

The following table provides a summary of the sampling conducted on May 13, 1993 in the area along the eastern fenceline, where soil was reportedly staged during the excavation and removal of the USTs. Included within the table are the sample designations for each of the samples collected from this area, a description of the sample, the date the sample was collected, the parameters for which the sample was analyzed and analytical results.

Sample Designation	Sample Description	Date Sampled	Analytical Parameters	TPH Method 8015 (mg/kg)
F-1 A&B*	Location #1 (A = 0-6 inch below grade; B = 18-24 inch below grade)	5/13/93	TPH, 8015	< 10
F-2 A&B*	Location #2 (A = 0-6 inch below grade; B = 18-24 inch below grade)	5/13/93	TPH, 8015	< 10
F-3 A&B*	Location #3 (A = 0-6 inch below grade; B = 18-24 inch below grade)	5/13/93	TPH, 8015	< 10

Sample Designation	Sample Description	Date Sampled	Analytical Parameters	TPH Method 8015 (mg/kg)
F-4 A&B*	Location #4 (A = 0-6 inch below grade; B = 18-24 inch below grade)	5/13/93	TPH, 8015	< 10
F-5 A&B*	Location #5 (A = 0-6 inch below grade; B = 18-24 inch below grade)	5/13/93	TPH, 8015	< 10

* - Signifies those samples most closely representing the remaining soil conditions in this area.
--- - Signifies that the sample was not analyzed for that analytical parameter.
- The NCDEM-established soil standards for TPH-Diesel and TPH-Gasoline were obtained from the Ground Water Section Guidelines for the Investigation and Remediation of Soils and Ground Water, dated March 1993.

All of the above-referenced samples should be considered representative of the absence of soil contamination in this area. Based on the analytical results for samples F-1 A&B through F-5 A&B, the staged soil from the UST removals did not impact the soil at the eastern fenceline of the AMC site (OBG, 1993). The analytical results are presented in the CSA, O'Brien & Gere Engineers, Inc., June 1994 (OBG, 1994).

3.2.11. Migration of contaminants in soil

Based on a review of soil boring logs, monitoring well logs, and field notes, it appears that the soil at the AMC site is composed primarily of tight clays and silts. Soil contamination was confined primarily to the source areas. These source areas included: the five USTs with their associated piping and dispenser islands; the two former drum storage areas; and an area of stressed vegetation. Soil from each of these areas was excavated and disposed of off-site.

4.0 Conclusions and petition for site closure

The subject site has been classified as a "Low" risk by the NCDENR. Site soils were impacted by halogenated and non-halogenated (petroleum) hydrocarbons in the following areas:

- Former 8000-gal leaded gasoline UST
- Former 8000-gal unleaded gasoline UST
- Former 2000-gal diesel UST
- Former 550-gal waste oil tank and associated sump and drains
- Former 6000-gal No. 2 fuel oil UST
- Drum areas #1 and #2 and the stressed vegetation area.

The soils in these areas were excavated and transported off-site for treatment.

4.1. Conclusions

In reviewing the soil analytical results provided within Section 3.2, it appears that the soil contamination was confined to the identified source areas. As such, all contaminated soil exceeding target cleanup levels or method detection limits were removed during the excavations with minor exceptions. The following list provides the locations at the site from which concentrations were not completely removed to the NCDEM-established standards obtained from the "Ground Water Section Guidelines for the Investigation and Remediation of Soils and Ground Water", dated March 1993.

Soil samples exhibit concentrations which exceeded 10 ppm of total petroleum hydrocarbons (TPH) as analyzed by EPA Method 5030, typical of low boiling point fuels such as gasoline, were noted in four samples collected from three soil borings completed at the site in February 1992.

- Soil sample B-1, collected from 10 ft below grade at soil boring #1 in the area of the former fuel dispenser from the 8000-gal unleaded gasoline UST and 8000-gal leaded gasoline UST exhibited a detectable TPH concentration of 23 ppm.

- Soil sample B-2, collected from 30 ft below grade at soil boring #1 in the area of the former fuel dispenser from the 8000-gal unleaded gasoline UST and 8000-gal leaded gasoline UST displayed a detectable TPH concentration of 19 ppm.

- Soil sample B-6, collected from 30 ft below grade at soil boring #3 in the area between the former 8000-gal leaded gasoline UST and 8000-gal unleaded gasoline UST displayed a detectable TPH concentration of 22 ppm.

- Soil sample B-7, collected from 10 ft below grade at soil boring #4 in the area of the former 8000-gal leaded gasoline UST displayed a detectable TPH concentration of 38 ppm.

The TPH contaminant levels, although exceeding target cleanup levels, are considered slight. Additionally, the soil analytical data is now more than seven years old. It is reasonable to assume that naturally occurring processes such as biodegradation and soil venting has resulted in a reduction in remaining contaminant levels.

All soils in the Drum Areas and the stressed vegetation area were removed to acceptable risk levels.

4.2. Petition for site closure

Extensive soil sampling at the site has indicated that during the on-site UST closure and subsequent multiple soil remediation (excavation and removal) phases in the UST areas, drum areas, and stressed vegetation areas that all soils impacted by halogenated and non-halogenated (petroleum hydrocarbons) have been removed with the exception of isolated remnant areas of TPH contamination. Slight exceedances of the low boiling point, gasoline range TPH by EPA Method 5030 (minimum cleanup level is 10 ppm) were noted in two areas. Because the TPH concentrations are considered slight (19 - 38 ppm) and the potential for natural processes of soil venting and biodegradation to lower TPH concentrations in soil over the past seven years, O'Brien & Gere recommends that no further action is necessary to assess or remediate remnant soil contamination.

Additionally, remnant soil contamination has been reviewed and evaluated by the North Carolina Department of Environment and Natural Resources - Environmental Epidemiology Section (NCDENR - EES) to not pose a

significant health risk. Refer to correspondence from the NCDEM EES to the NCDEM Winston-Salem Regional Office contained in Appendix B.

Based on the presentation of soil removal activities, post excavation soil sample analysis, and the "low" risk site rank assigned by the NCDENR, O'Brien & Gere recommends that the NCDENR issue a letter indicating no further action is required at this site.

UST Release Summary Report
Former Associated Mechanical Contractors Site
307 Swing Road
Greensboro, North Carolina

Submitted to:

Guilford County, North Carolina
Department of Public Health
Division of Environmental Health
1100 East Wendover Avenue
Greensboro, North Carolina 27405
Attn: Ms. Sharon Cihak
336-641-3541

prepared for:

Fischbach LLC
333 West Hampden Avenue
Suite 520
Englewood, Colorado 80110

prepared by:

PARSONS
Newport News, Virginia

July 2002

EXECUTIVE SUMMARY

Parsons has reviewed the environmental status of the property located at 307 Swing Road in Greensboro, North Carolina. Review and summary was required due to the large amount of environmental investigation completed since 1992, the complexity of the data, and inability to achieve regulatory closure. All information provided in this report is based on findings related to work completed by others at the site. No additional sampling or analysis has been accomplished.

Two distinct types of contamination have been identified at the site. Each regulated under a separate North Carolina Department of Environment and Natural Resources (NCDENR) program. The petroleum-impact ("upper" plume) at the site is related to residual contamination from five former USTs and is regulated by the UST Section. The chlorinated-impact ("lower" plume) at this site is not related to the USTs and is regulated by the Groundwater Section. The chlorinated impact will be managed as a separate issue and is not included in this summary.

The status of each UST removed from the site is summarized in the following table.

Regulatory Closure Requirements Achieved	Contents	Standards Met/Date	Groundwater Encountered	Reference
Yes	Unleaded Gas	Yes/1992*	No	*Site Investigation Report for Permanent Closure or Change-in-Service* submitted in March 1992
Yes	Diesel	Yes/1992*	No	*Site Investigation Report for Permanent Closure or Change-in-Service* submitted in March 1992
Yes	#2 Fuel Oil	Yes/1992*	No	*Site Investigation Report for Permanent Closure or Change-in-Service* submitted in September 1992
Yes	Used Oil	Yes/1992*	No	*Site Investigation Report for Permanent Closure or Change-in-Service* submitted in July 1992
Yes	Leaded Gas	Yes/2001**	Yes	*Soil Cleanup Report with Closure Request Addendum* submitted in October 2001 and *Site Investigation Summary Report* Submitted in September 2001

NOTE: * **Soil** samples collected from each excavation extent were below requirements in 1991 and 1992.

** **Soil** samples collected from the excavation extent of the leaded UST were below requirements in 1991 and 1992. However, groundwater was encountered in this excavation. Soil samples collected in 1992 adjacent to the tank excavation were slightly above the 1992 standards. Resampling of these locations in 2001 have been analyzed for required EPH and VPH via MADEP methods and are below industrial/commercial, residential, and soil-to-water levels. To address the groundwater related to this UST, several monitoring wells were installed and have been monitored since 1992. Groundwater samples collected from these wells have been below gross contamination levels since October 1996 *(Site Investigation Summary Report,* Table 3*)*.

This report provides a summary of work performed and intended to comply with NCDENR petroleum UST release investigation guidance. The USTs were removed in 1992 and the Comprehensive Site Assessment (CSA) was submitted prior to January 2,1998, which indicates the requirements flowchart provided as Figure 4 of the *Guidelines for Assessment and Corrective Action*, NCDENR UST Section, July 1, 2001, should be followed. However, verification of LOW risk cannot be determined in the existing documentation. The site risk level has historically been referred to as LOW.

To provide information required to confirm regulatory compliance and risk ranking, this report provides historical information and then follows the Limited Site Assessment Form found in Appendix B of the *Guidelines*.

In the event that the risk level is classified HIGH, Figure 4 of the *Guidelines* indicates the Corrective Action Plan (CAP) should be implemented until contaminates are at or below the 2L.0202 standards. The CAP recommended a natural attenuation and a three-year groundwater monitoring program that was initiated in January 1993. In accordance with the CAP, groundwater samples were collected and analyzed quarterly in 1993, 1994, and 1995. Samples were also collected and analyzed in 1996, 1997, 1998, and 2001. The samples collected and analyzed in 1998 and 2001 indicate petroleum compounds are below the standards established in 2L.0202.

As required by HIGH or LOW risk sites in Figure 4 of the *Guidelines*, Soil Cleanup report with Site Closure Request was submitted in April 1999. The report requested no further action with regard to both petroleum and chlorinated contamination. An addendum to the Request was submitted in October 2001 in response to NCDENR letter dated March 16, 2001. The addendum provided additional soil analyses (MADEP Method) results indicating samples collected adjacent to the former leaded gasoline UST were below maximum soil contaminant concentrations and requested no further action with regard to petroleum and chlorinated impact to the soils at the site.

Based upon summary information provided in this report, Fischbach Corporation requests the following actions regarding this site:

1) **A confirmation from Guilford County and the NCDENR of the site risk ranking,**

2) **Approval of regulatory closure of the five former petroleum USTs at the subject property, and**

3) **Confirmation of no further action required regarding the soil and groundwater petroleum impact at the subject site.**

As stated previously, the chlorinated impact will be addressed in a separate summary report.

PURPOSE

The purpose of this report is to provide an abbreviated history of actions addressing the release of petroleum compounds following the closure of five underground storage tanks (USTs) at the former Associated Mechanical Contractors (AMC) site located at 307 Swing Road in Greensboro, North Carolina. The state has identified a petroleum impact area ("upper" plume) related to residual contamination from these USTs. The information summarized in this report is organized to confirm the risk classification and define further action requirements (if any) at the site.

A second area known as the chlorinated impact ("lower" plume) at this site will be managed as a separate issue and is not included in this report.

Since the initiation of investigative actions in 1992, a significant amount of soil and groundwater data has been collected in the vicinity of the five USTs. This data has been submitted both to the Guilford County Department of Public Health (GCDPH) and the North Carolina Department of Environment and Natural Resources (NCDENR) in several documents. All analytical data provided in this summary report has been compiled from previous reports and investigations submitted to the County. No additional soil or groundwater analyses have been performed.

The petroleum release occurred and the Comprehensive Site Assessment (CSA) was submitted prior to January 2,1998, therefore, the requirements flowchart provided as Figure 4 in the *Guidelines for Assessment and Corrective Action*, NCDENR UST Section, July 1, 2001, should be followed. In order to provide the information required to confirm regulatory compliance, including the risk ranking, this summary report (beginning with Section IV) follows the Limited Site Assessment Form found in Appendix B of the *Guidelines*. The next section summarizes our findings regarding the regulatory status of each of the five removed tanks. The remaining sections that follow provide justification of these findings based on work completed by others at the site.

I. SITE INFORMATION

Incident Number:	7859
Facility Identification Number:	0-017419
Tank Identification Number:	01 Through 05
Date of Report:	June 2002
Risk Classification:	Low (075E on NC DENR Database 5/30/1998)
Land Use Classification:	Industrial/Commercial

Current Owner and Operator (Property and UST):

Triad Properties, Inc.
220 Commerce Place
Greensboro North Carolina 27401-2427
1-336-379-9416
Attn: Mr. Jerry Pell

Former Owner:

Fischbach LLC
333 West Hampden Avenue
Suite 520
Englewood, Colorado 80110
1-303-762-6681
Attn: Ms. Lorraine Arnold

Current Consultant:

Parsons
11818 Rock Landing Drive, Suite 204
Newport News, Virginia 23606
757-599-8000

II. UNDERGROUND STORAGE TANK INFORMATION

Five underground storage tanks (USTs), associated pipelines, and pumps were removed from the site in 1991 and 1992. No known USTs are currently located on site. The former USTs include one 8,000-gallon leaded gasoline UST, one 8,00-gallon unleaded gasoline UST, a 2,000-gallon diesel USTs, a 6,000-gallon #2 fuel oil UST, and a 500-gallon used oil UST. The unleaded gasoline and diesel USTs were located side-by-side, were removed in one excavation, and shared a dispenser island. The leaded gasoline UST was connected to a separate pump island. The #2 fuel oil UST was connected to the multi-story office building on the western portion of the property. The used oil UST was located outside the eastern wall of the maintenance shop.

Table 1 UST Descriptions

UST ID*	Volume (gal)	Contents	Latitude	Longitude
01	8,000	Unleaded Gasoline	5087.56	5302.92
02	2,000	Diesel	5087.56	5302.92
03	6,000	#2 Fuel Oil	4963.62	5151.31
04	550	Used Oil	4967.69	5316.71
05	8,000	Leaded Gasoline	5022.50	5441.78

* Note that UST identification numbers have varied from one report to another. The identifications listed are representative of the *Soil Cleanup Report with Site Closure Request* (O'Brien & Gere, April 1999).

III. DISCOVERY INFORMATION

In response to recommendations made in a Phase I Environmental Site Assessment (ESA) in 1991, the 8,000-gallon leaded gasoline, 8,000-gallon unleaded gasoline, and 2,000-gallon diesel USTs were removed in December 1991. The 550-gallon used oil UST was discovered during this removal process, and subsequently removed in June 1992. The 6,000-gallon #2 fuel oil tank was removed in August 1992, also in response to the Phase I report. The following table summarizes the initial actions regarding the UST removals:

Table 2 Initial UST Removal Actions

UST ID*	Volume (gal)	Contents	Removal Notes	Free Product
01	8,000	Unleaded Gas	Removal of tank, piping, and dispenser (12/11/91). Stained soil was not noted in excavation for tank, but was noted in excavation for dispenser.	No
02	2,000	Diesel	Removal of tank, piping, and dispenser (12/11/91). Stained soil was not noted in excavation for tank, but was noted in excavation for dispenser.	No
03	6,000	#2 Fuel Oil	Some stained soil was noted and removed with tank (8/19/92).	No
04	550	Used Oil	Some stained soil was noted and removed with tank (6/15/92).	No
05	8,000	Leaded Gas	Removal of tank, piping, and dispenser (12/11/91). Stained soil was noted in excavation	No

* Note that UST identification numbers have varied from one report to another. The identifications listed are representative of the *Soil Cleanup Report with Site Closure Request* (O'Brien & Gere, April 1999).

IV. INITIAL NOTIFICATION

The initial notification was made on December 18, 1991 following the removal of the two gasoline USTs and the diesel fuel UST.

V. INITIAL ABATEMENT ACTIVITIES (~20-DAY REPORT)

This section describes the activities that follow the Initial Abatement Report format (20 Day Report) found in Appendix B of the Guidelines.

A. SITE IDENTIFICATION

The site information is noted in the beginning of this summary.

B. INITIAL ABATEMENT ACTIVITIES

Removal of regulated substances. The following table summarizes the removal of regulated substances from the USTs prior to removal:

Table 3 Removal of Regulated Substances

UST ID*	Volume (gal)	Contents	Product Removal Notes
01	8,000	Unleaded Gas	Removal of tank, piping, and dispenser (12/11/91). Removed 60 gallons of product/residuals.
02	2,000	Diesel	Removal of tank, piping, and dispenser (12/11/91). Removed 50 gallons of product/residuals.
03	6,000	#2 Fuel Oil	Tank was removed on 8/19/92. Removed 65 gallons of product/residuals.
04	550	Used Oil	Tank was removed on 6/15/92. Residuals were removed prior to tank removal (no volume noted).

UST ID*	Volume (gal)	Contents	Product Removal Notes
05	8,000	Leaded Gas	Removal of tank, piping and dispenser (12/11/91). 35 gallons of product/residuals removed.

* Note that UST identification numbers have varied from one report to another. The identifications listed are representative of the *Soil Cleanup Report with Site Closure Request* (O'Brien & Gere, April 1999).

Source Control Actions. During the tank removal process, each tank was uncovered, emptied, cleaned, and vapor-freed prior to removal.

Contaminant Migration Control. All tanks were located underground. All contents were removed from the tanks prior to removal. Upon removal of tanks, no free product was noted in any of the excavations.

Fire/Safety Hazard Mitigation. Each tank was emptied of all contents and purged of vapors prior to tank removal.

Contaminated Soil Storage. The following table summarizes the soil excavation completed at the time of tank removals. A total of 1,225 cubic yards of soil were removed during this phase:

Table 4 Contaminated Soil Storage

UST ID*	Volume (gal)	Contents	Contaminated Soil Removal Notes
01	8,000	Unleaded Gas	Removal of tank, piping, and dispenser (12/11/91). Initial soil excavation on 12/11. Soil was placed on polyethylene sheeting. Additional soil was excavated on 12/19, 12/26, and 5/5/92. Final excavation was approximately 8' deep under the tanks and 18' deep under the dispenser area. Soil was delivered to Cunningham Brick in Lexington for thermal treatment.
02	2,000	Diesel	Removal of tank, piping, and dispenser (12/11/91). Initial soil excavation on 12/11. Soil was placed on polyethylene sheeting. Additional soil was excavated on 12/19, 12/26 and 5/5/92. Final excavation was approximately 8' deep under the tanks and 18' deep under the dispenser area. Soil was delivered to Cunningham Brick in Lexington for thermal treatment
03	6,000	#2 Fuel Oil	Tank was removed on 8/19/92. Initial soil excavation took place on this date also. Additional soil was excavated on 8/26/92. Final excavation was approximately 12' deep under the tank. Soil was delivered to Cunningham Brick in Lexington for thermal treatment
04	550	Used Oil	Tank was removed on 6/15/92. Initial soil excavation took place on this date also. Final excavation was approximately 7' deep under the tank. Soil was delivered to Cunningham Brick in Lexington for thermal treatment
05	8,000	Leaded Gas	Removal of tank, piping, and dispenser (12/11/91). Initial soil excavation on 12/11. Soil was placed on polyethylene sheeting. Additional soil was excavated on 12/19 and 12/26. Final excavation measured 15' by 30' by 26' deep. Soil was delivered to Cunningham Brick in Lexington for thermal treatment.

* Note that UST identification numbers have varied from one report to another. The identifications listed are representative of the *Soil Cleanup Report with Site Closure Request* (O'Brien & Gere, April 1999).

Free Product Status.

No free product was noted in any of the excavations following tank removal.

C. SITE HISTORY.

Former UST and ownership and operator histories are provided in the following tables:

Table 5 Historical UST Information

UST ID	Product	Volume (gal)	Installation Date	Removal Date	Release
01	Unleaded Gas	8,000	4/15/80	12/11/91	Yes
02	Diesel	2,000	4/15/80	12/11/91	Yes
03	#2 Fuel Oil	6,000	4/17/74	8/19/92	Yes
04	Used Oil	550	4/16/78	6/15/92	Yes
05	Leaded Gas	8,000	4/15/80	12/11/91	Yes

* Note that UST identification numbers have varied from one report to another. The identifications listed are representative of the *Soil Cleanup Report with Site Closure Request* (O'Brien & Gere, April 1999).

Table 6 Historical UST Ownership

UST	Name/Address of Owner	Dates of Ownership/Operation	Owner/Operator
None	Triad Properties, Inc. 220 Commerce Place Greensboro, North Carolina 27401	1998-Present	No
All	Fischbach LLC 333 West Hampden Avenue Suite 520 Englewood, Colorado 80110	1987-1998	Yes
All	Associated Mechanical Contractors 307 Swing Road Greensboro, North Carolina 27401	1975-1987	Yes
Fuel Oil and Used Oil	H.L. Coble Construction Company 307 Swing Road Greensboro, North Carolina 27401	1965-1975	Yes

D. SOURCE INFORMATION

Initial Sampling and Analysis. The following table summarizes the final results of the initial sampling completed at the time of UST removals. The data presents the final confirmation samples collected from the extents of the excavations and considered to closely represent the soil remaining in areas of the excavations. Refer to *Comprehensive Site Assessment Report* (O'Brien & Gere, May 1994) and *Soil Cleanup Report with Closure Request* (O'Brien & Gere, April 1999) for a complete summary of initial sampling and analyses.

Table 7 Initial Sampling Analyses

Former 8,000-gallon Unleaded Gasoline UST and Former 2,000-gallon Diesel Fuel UST USTs were side-by-side and considered one excavation. Refer to **Figure 4 Detail "A"** in the April 1999 *Soil Cleanup Report with Closure Request*							
				Value (ppm)		NCDEM Regulatory Standard (ppm)	
Date	**Parameter**	**Sample**	**Location**	**Method 3350**	**Method 5030**	**Method 3350**	**Method 5030**
12/12/91	TPH	S-2	12 ft bgs southwest extent of former 8,000-gallon unleaded gasoline UST	<7.0	<7.0	40	10
12/12/91	TPH	S-3	12 ft bgs floor centered under former 8,000-gallon unleaded gasoline UST	<7.0	<7.0	40	10
12/12/91	TPH	S-4	8 ft bgs southern extent former 2,000-gal diesel UST	<7.0	<7.0	40	10
12/12/91	TPH	S-5	8 ft bgs floor centered under former 2,000-gal diesel UST	<6.0	<6.0	40	10
12/12/91	TPH	S-6	8 ft bgs northern extent of excavation floor centered between both USTs	<7.0	<7.0	40	10
5/6/92	TPH	PI-1	10 ft bgs southern sidewall dispenser island for both USTs	<0.9	3.7	40	10
5/6/92	TPH	PI-2	18 ft bgs center of former dispenser island for both USTs	<0.9	3.3	40	10
5/6/92	TPH	PI-3	15 ft bgs southwestern corner of former dispenser island for both USTs	<0.9	1.0	40	10
5/6/92	TPH	PI-4	10 ft bgs southeastern corner of former dispenser island for both USTs	<0.9	5.3	40	10
6,000-gallon #2 Fuel Oil Refer to **Figure 7** in the April 1999 *Soil Cleanup Report with Closure Request*							
				Value (ppm)		NCDEM Regulatory Standard (ppm)	
Date	**Parameter**	**Sample**	**Location**	**Method 3350**	**Method 5030**	**Method 3350**	**Method 5030**
8/19/92	TPH	S-1	10 ft bgs eastern extent of former UST	2.4	5.8	40	10
8/19/92	TPH	S-2	10 ft bgs western extent of former UST	2.3	1.1	40	10
8/26/92	TPH	S-3.1	3.5 ft bgs at former fill port	2.2	<0.25	40	10
8/26/92	TPH	S-5.1	4.5 ft bgs at former piping	2.0	<0.25	40	10
8/26/92	TPH	S-6.1	5 ft bgs at former piping	2.3	<0.25	40	10

550-gallon Used Oil Refer to **Figure 5 Detail "C"** in the April 1999 *Soil Cleanup Report with Closure Request*							
				Value (ppm)		NCDEM Regulatory Standard (ppm)	
Date	**Parameter**	**Sample**	**Location**	**Method 3350**	**Method 9071**	**Method 3350**	**Method 9071**
6/15/92	Oil & Grease	WT-2	7 ft bgs western extent of former UST	-	150	40	250
6/15/92	Oil & Grease	WT-3	7 ft bgs eastern extent of former UST	-	62	40	250
8,000-gallon Leaded Gasoline Refer to **Figure 4 Detail "B"** in the April 1999 *Soil Cleanup Report with Closure Request*							
				Value (ppm)		NCDEM Regulatory Standard (ppm)	
Date	**Parameter**	**Sample**	**Location**	**Method 3350**	**Method 5030**	**Method 3350**	**Method 5030**
12/12/91	TPH	S-1	Below dispenser (southwest corner of former UST)	-	<6.0	40	10
12/26/91	TPH	S-20	24ft bgs northern end of excavation	-	<6.0	40	10
2/24/92	TPH	B-1*	Boring #1 adjacent to UST, 10 feet below grade	0.83	**23**	40	10
2/24/92	TPH	B-2*	Boring #1 adjacent of UST, 30 feet below grade	0.91	**19**	40	10
2/24/92	TPH	B-6*	Boring #3 adjacent to the UST, 30 feet below grade	1.3	**22**	40	10
2/24/92	TPH	B-7*	Boring #4 adjacent to the UST, 10 feet below grade	1.4	**38**	40	10
2/24/92	TPH (Water)	MW-1	Monitoring Well 1	-	<0.01	40	10
2/24/92	TPH (Water)	MW-2	Monitoring Well 2	-	0.01	40	10
2/24/92	TPH (Water)	MW-3	Monitoring Well 3 (Benzene was detected in this well at 3.3 ppb on 3/4/92 and prompted installation of additional wells and investigation)	-	0.86	40	10

*These soil borings were taken following the removal of the tanks. The borings were requested by the NCDEM Groundwater Section due to groundwater encountered in the excavation of the 8,000-gallon leaded gasoline UST.

E. FIGURES.

The required figures have been submitted with other reports and are not reproduced here. The following table summarizes the required figures and report locations.

Table 8 Figure References

Figure	Location
7½ Minute USGS Topographic Quadrangle Map	*Soil Cleanup Report with Site Closure Request*, O'Brien & Gere, April 1999, Figure 1
Site Map with UST Locations	*Soil Cleanup Report with Site Closure Request*, O'Brien & Gere, April 1999, Figure 3
Detailed Site Map Indicating Locations of Soil Samples and Results	*Soil Cleanup Report with Site Closure Request*, O'Brien & Gere, April 1999, Figure 3 through Figure 7
Site Map Indicating Location of Groundwater Sampling Points and Results	*Soil Cleanup Report with Site Closure Request*, O'Brien & Gere, April 1999, Figure 3

E. APPENDICES.

The required appendices have been submitted with other reports and are not reproduced here. The following table summarizes the required appendices and report locations.

Table 9 Summary of Appendices

Appendix	Location
Boring Logs and Lithologic Descriptions	EXPECTED REFERENCE: *Report for Hand-Auger Investigation: Associated Mechanical Contractors, Inc., 307 Swing Road, Greensboro, Guilford County, North Carolina*, prepared by Environmental & Regulatory Consultants, Inc., March 10, 1993 (ERC, 1993a).
Well Construction Records	EXPECTED REFERENCE: *Monitoring Well Installation: Associated Mechanical Contractors, 307 Swing Road, Greensboro, North Carolina*, prepared by Environmental & Regulatory Consultants Inc., December 31, 1992 (ERC, 1992b). Inspection results listed in *Comprehensive Site Assessment Report*, O'Brien & Gere, May 1994.
Field Measurements Taken at Sample Locations	Not referenced.
Standard Procedures	*Comprehensive Site Assessment Report*, O'Brien & Gere, May 1994, embedded in report text
Disposal Manifests	*Soil Cleanup Report with Site Closure Request*, O'Brien & Gere, April 1999, Appendix C
Laboratory Reports	*Comprehensive Site Assessment Report*, AIG Consultants, May 1994, Appendix A - D
Health and Safety Plan	Not referenced.

VI. SITE SUMMARY FOLLOWING INITIAL ABATEMENT ACTIVITIES

Corrective Action Plan (O'Brien & Gere, July 1997), Section 1.4, provides a list of reports submitted. The following table summarizes the status of the five former USTs:

Table 10 UST Status

Volume (gal)	Contents	Soil Below Standards	Free Product	Status
8,000	Unleaded Gas (same excavation as diesel)	Yes	No	*Site Investigation Report for Permanent Closure or Change-in-Service* submitted in March 1992
2,000	Diesel (same excavation as unleaded gasoline)	Yes	No	*Site Investigation Report for Permanent Closure or Change-in-Service* submitted in March 1992
6,000	#2 Fuel Oil	Yes	No	*Site Investigation Report for Permanent Closure or Change-in-Service* submitted in September 1992
550	Used Oil	Yes	No	*Site Investigation Report for Permanent Closure or Change-in-Service* submitted in July 1992
8,000	Leaded Gas	No*	No	*Site Investigation Report for Permanent Closure or Change-in-Service* submitted in March 1992

* Soil sample results that exceeded 10 ppm of total petroleum hydrocarbons (TPH) as analyzed by EPA Method 5030 (typical of low boiling point fuels such as gasoline) were noted in four samples collected from three soil borings completed at the site in February 1992. All four samples were related to the 8,000-gallon leaded fuel tank location.

According to the 1994 *Comprehensive Site Assessment Report* groundwater was encountered during the excavation of the leaded gasoline UST, but not during excavation of the unleaded gasoline UST. References to the groundwater encountered during excavation of the 8,000-gallon unleaded gasoline UST are believed to be typos. No reference to groundwater in the unleaded UST excavation has been discovered.

With exception of the leaded gasoline UST excavation, all final confirmation samples collected at the extents of the excavations were below regulatory requirements. The leaded gasoline UST final confirmation samples indicated the following:

- Soil sample B-1, collected from 10 feet below grade at soil boring 1 in the area of the former fuel dispenser from the 8000-gallon leaded gasoline UST and 8000-gallon leaded gasoline UST exhibited a detectable TPH concentration of 23 ppm.
- Soil sample B-2, collected from 30 feet below grade at soil boring 1 in the area of the former fuel dispenser from the 8000-gallon leaded gasoline UST and 8000-gallon leaded gasoline UST displayed a detectable TPH concentration of 19 ppm.
- Soil sample B-6, collected from 30 feet below grade at soil boring 3 in the area near the former 8000-gallon leaded gasoline UST displayed a detectable TPH concentration of 22 ppm.

- Soil sample B-7, collected from 10 feet below grade at soil boring 4 in the area of the former 8000-gallon leaded gasoline UST displayed a detectable TPH concentration of 38 ppm.

VI. LIMITED SITE ASSESSMENT

In accordance with the requirements of 2L.0115(c)(4), a report is required to be submitted to the NCDENR containing sufficient information to classify the level of risk to human health and the environment posed by the contamination remaining on the site. This report is referred to as a Limited Site Assessment Report. (Note: An alternate to this requirement is the Soil Contamination report that addresses minor contamination levels remaining in unsaturated soils following tank removals 2L.0115(c)(3). This option was not available for this site due to groundwater encountered in the excavation of the leaded gasoline UST.)

A. SITE IDENTIFICATION

Provided in Section I.

B. RISK CHARACTERIZATION

Limited Site Assessment Risk Classification and Land Use Form. Black text below represents form requests. Blue text below represents answers to the form requests.

Part I – Groundwater/Surface Water/Vapor Impacts

High Risk

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

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

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

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

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

If yes, describe. Not Applicable

6. Are there any other factors that would cause the release to pose an imminent danger to public health, public safety, or the environment? ~~YES~~/NO

If yes, describe. Not Applicable

Intermediate Risk

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

If YES, does the maximum groundwater contaminant concentration exceed the surface water quality standards and criteria found in 15A NCAC 2B .0200 by a factor of 10? * **YES/~~NO~~**

*Benzene was detected in MW-1 at 2,200 ppb in April 1997. The NC standard for Benzene in surface waters from 15 A NCAC 2B .0208(a)(2)(B) is 71.4 ppb. Current sample results show no detectable Benzene.

8. Is the source area of the release located within an approved or planned wellhead protection area as defined in 42 usc 300h-7(e)? **~~YES~~/NO**

If yes, describe. Not Applicable

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

If YES, is the source area of the release located in an area in which there is recharge to an unconfined or semi-confined deeper aquifer that is being used or may be used as a source of drinking water? Not Applicable

If YES, describe. Not Applicable

10. Do the levels of groundwater contamination for any contaminant exceed the gross contamination levels (see Table 9) established by the Department? **~~YES~~/NO**

Groundwater samples have been collected on site since 1992. One sample in 1996 exceeded the Benzene level of 5 mg/L. No other sample analyzed since Mar 92 has exceeded the gross contamination level for any petroleum compound. Refer to *Site Investigation Summary Report*, September 2001, Table 3 for Historical Groundwater Analytical Results for Petroleum Compounds.

Part II - Land Use

Property Containing Source Area of Release

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

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

3. Does the property contain a commercial (e.g., retail, warehouse, office/business space, etc.) or industrial (e.g., manufacturing, utilities, industrial research and development,

chemical/petroleum bulk storage, etc.) enterprise, an inactive commercial or industrial enterprise, or is the land undeveloped? **YES/~~NO~~**

Describe: Active commercial enterprises. Refer to the site description provided in the *Site Investigation Summary Report* (September 2001, O'Brien & Gere) for further detail.

4. Do children visit the property? **~~YES~~/NO**

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

Explain. The property is fenced with and secured with padlocked gate.

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

If yes, what mechanisms are in place or can be put into place to ensure that the contaminated soil will remain capped in the foreseeable future? Not Applicable

6. What is the zoning status of the property? Heavy Industrial

7. Is the use of the property likely to change in the next 20 years? **~~YES~~/NO**

Explain. *Correction Action Plan* (O'Brien & Gere, 1997) states that the future anticipated use of the site is industrial; the property is zoned as industrial, and is surrounded on three sides by industrial activities. Based on the age and condition of the buildings present on the property, a future user of the site may demolish the existing buildings, and construct facilities suitable to their needs. This would likely entail subsurface disturbance for construction activities, such as establishing building footings and installation of utilities.

Property Surrounding Source Area of Release

1. What is the distance from the source area of the release to the nearest primary or secondary residence (permanent or temporary)? 1,000 feet west.

2. What is the distance from the source area of the release to the nearest school, daycare center, hospital, playground, park, recreation area, church, nursing home or other place of public assembly? None known within 1,500 feet.

3. What is the zoning status of properties in the surrounding area? Mixed heavy industrial, light industrial, and residential.

4. Briefly characterize the use and activities of the land in the surrounding area. Residential west and commercial and industrial north, south, and east.

C. RECEPTOR INFORMATION

1. Water Supply Wells. The nearest known water supply well is a hand-dug well located across Buffalo Creek in an abandoned dwelling along Sims Road, approximately 1,500 feet northeast of the AMC site (*Comprehensive Site Assessment Report*, May 1994, O'Brien & Gere).

2. Public Water Supplies. Are public water supplies available within 1,500 feet of the source area of the release? ~~YES~~/NO

If yes, where is the location of the nearest public water lines and the source(s) of the public water supply (indicate on map). Not Applicable.

3. Surface Water. Identify all surface water bodies (e.g., ditch, pond, stream, lake, river) within 1,500 feet of the source area of the release. This information must be shown on the USGS topographic map.

South Buffalo Creek is located approximately 200 feet southeast of the source area. Most recent USGS map submitted is included in the *Soil Cleanup Report*, April 1999, O'Brien & Gere.

4. Wellhead Protection Areas. Identify all planned or approved wellhead protection areas (e.g., ditch, pond, stream, lake, river) within 1,500 feet of the source area of the release. This information must be shown on the USGS topographic map. Wellhead protection areas are defined in 42 USC 300h-7(e).

The City of Greensboro is served by surface water supplies. Information provided by Mr. Lee Spencer, NCDEM, Winston Salem Regional office, (336) 771-4600, indicated that Guilford County does not contain any wellhead protection areas.

5. Describe Deep Aquifers in the Coastal Plain Physiographic Region: The subject site is not in the Coastal Plain Physiographic Region as designated on a map entitled "Geology of North Carolina" published by the Department in 1985.

6. Describe Subsurface Structures. Large concentrations of explosive vapors are not expected as no free-phase product was noted on the groundwater in the excavation when the source USTs were removed. There are no known basements, septic tanks, or leachfields known to exist on the subject site or adjacent properties. One subsurface utility, a 15-inch sanitary sewer line, is present on the subject site.

7. Property Owners and Occupants. Attach Table B-6, listing the names and addresses of property owners and occupants within or contiguous to the area containing contamination and all property owners and occupants within or contiguous to the area where the contamination is expected to migrate. Discuss other relevant aspects of the site and nearby areas, including receptors. Provide data from available sources and/or site investigations concerning the following: Land use information, including the uses and activities (involving possible human exposure to contamination) that occur at the site and adjacent properties;

Petroleum contamination does not appear to have migrated off outside the subject site property boundary. According to *Site Investigation Summary Report* (O'Brien & Gere, 2001), the subject site property was undeveloped prior to 1965 when the first structures were erected to house the H.L. Coble Construction Company (Coble Construction). In July 1975, the property was purchased by AMC. The property, operated from 1975 through the late 1980s as AMC, was utilized for the fabrication of heating, ventilating, and air conditioning (HVAC) systems and as a vehicle maintenance yard. In June 1987, AMC was purchased by Fischbach Properties, Inc., a wholly-owned subsidiary of Fischbach, LLC. Fischbach remains the property owner. Operations at the facility were slowly scaled back beginning in the early 1990s until cessation of site activities in 1993. The site was abandoned until 1998, when the property was purchased by Triad Properties Incorporated. Triad Properties Incorporated has leased the former office building to USA Staffing since July 1998. The former maintenance shop has also been leased since July 1998. AJR Imports operates an auto repair shop in the former maintenance shop. The other buildings on the property remain vacant. Further detail regarding site history and chain of title information can be found in *Comprehensive Site Assessment Report* (O'Brien & Gere, 1994).

Corrective Action Plan (O'Brien & Gere, July 1997) discusses exposure assessment in Section 3 and correspondence from North Carolina DEHNR, Division of Epidemiology, November 1994, indicates remnant soil contamination does not pose a significant health risk.

The only relevant receptor aspect appears to be the close proximity (200 feet) of South Buffalo Creek to the source.

Indicate on the site map other possible routes of exposure to contamination such as sewers, utility lines, conduits, basements, septic tanks, drainfields, etc. Sanitary sewer line trending northwest-southeast is located on the eastern portion of the site.

Distance to nearest body of surface water (e.g., ditch, pond, stream, river, etc.). South Buffalo Creek is located approximately 200 feet southeast of the source area. The creek does not serve as a public water supply. According to the NC DENR Division of Water Quality, Basinwide Information Management System Reports online database, South Buffalo Creek is a Class C Stream with Nutrient Sensitive Waters. (The report was obtained at the following website: http://h2o.enr.state.nc.us/bims/Reports/reports.html.)

D. SITE GEOLOGY AND HYDROGEOLOGY

Describe the soil and geology encountered at the site. Discuss the effects of soil and geological characteristics on the migration and attenuation of contaminants. Include information obtained during assessment activities (e.g., lithologic descriptions made during drilling, probe surveys, tank closure, etc). If a Phase II investigation is required include a discussion of groundwater flow direction and hydraulic gradient (vertical and horizontal).

Comprehensive Site Assessment Report (O'Brien & Gere, May 1994) states that prior to construction on the site in the mid-1960s, the property formed part of South Buffalo Creek. In order to build on the site, runoff through the area was re-channeled, a 15-inch City sanitary sewer line was installed adjacent to the former creek bed, and the eastern portion of the property was filled in. Based on utility maps for the area, the City sanitary sewer line transects the eastern portion of the site diagonally from northwest to southeast. Since the sewer line transects the site downgradient of the contaminant areas, the flow of the groundwater and associated contamination may be influenced by the presence of the utility line. In addition, the presence of the fill material in the former creek bed may also affect the migration patterns of the groundwater and contaminants. Soil boring logs and well construction records characterize the site soil as predominantly silt and clay with varying amounts of micaceous material. The following table provides a generalized soil classification. Additional detail regarding site geology and hydrogeology is contained in the 1994 *Comprehensive Site Assessment Report.*

Table 11 Generalized Soil Classifications

Depth (ft)	Description
0.0 - 10.0	Reddish brown sandy SILT grading to orange sandy CLAY
10.0 - 25.0	Moist, red to orange, fine to medium grained sandy CLAY to fine sandy CLAY
25.0 - 28.5	Wet, tan, brown, and orange, fine sandy SILT with mica
28.5 - 35.0	Wet, tan and orange, fine clayey SILT

Site Investigation Summary Report (O'Brien & Gere, September 2001) states:

- Previous investigations have indicated that the site is underlain by more than 40 ft of silt and clay soil. This soil is a saprolite that has formed by the weathering of underlying bedrock. Bedrock has not been encountered in any of the boreholes at the Associated Mechanical Contractors site, but geologic maps of the area indicate that it is likely sheared granite.

- Groundwater is encountered at varying depths across the property, depending upon the surface topography. The groundwater flow direction is to the east and southeast toward South Buffalo Creek, which is a likely discharge point for the groundwater.

- Pump testing of wells RW-1 and RW-2 has indicated a hydraulic conductivity of 1.5 x 10-5 ft/min and 6.5 x 10-5 ft/min, respectively. Calculations from

previous reports indicate a hydraulic gradient of 0.018 and a groundwater velocity of between 0.8 and 2.5 ft/year.

E. SAMPLING RESULTS

Phase I Investigation

A Phase I investigation includes the installation of one monitoring well in the source area of a release. Soil samples are to be collected every five feet in the unsaturated zone and should be analyzed in accordance with the methods specified in Table 5 (Analytical Methods for Petroleum Contaminated Soil). If the water table is encountered at 25 feet or greater from the land surface, samples for laboratory analysis should be collected every 10 feet in the unsaturated zone.

1. Describe all soil sampling performed during the installation of the source well(s) (use maps and tables whenever possible) and include:

- Location of soil samples;
- Type of soil samples (from excavation, borehole, geoprobe, etc.);
- Complete and attach Table B-3.
- If multiple source areas have been identified, use individual tables for each source well installation.

Complete historical soil sample results are presented in the 1994 *Comprehensive Site Assessment Report*, 1997 *Corrective Action Plan*, and 1999 *Site Cleanup Report with Closure Request.* Laboratory analyses indicated the only soil samples collected above the 1991 and 1992 petroleum regulatory limits were those associated with the leaded gasoline UST (Method 5030 indicated TPH at 23 ppm, 19 ppm, and 22 ppm. The limit was 10 ppm). Final confirmation excavation samples are provided in Section D, Source Information, of this report. Data provided in the tables was collected from the site in 1991 and 1992, and it is anticipated that the TPH levels have naturally attenuated below current MSCC SCLs. In response to North Carolina DENR, Division of Waste Management, UST Section letter dated March 19, 2001 soil samples were collected from the approximate location of previous samples that detected TPH contamination slightly above regulatory limits. The samples were analyzed for MADEP VPH and EPH. Analyses indicate no analyte above the Residential MSCC or the Soil to Groundwater MSCC (O'Brien & Gere letter dated October 25, 2001).

2. Describe any groundwater sampling from the source area monitoring well(s). Use maps and tables whenever possible and include:

- Location of groundwater samples/monitoring wells/water supply wells;
- Complete and attach Table B-4.
- If multiple source areas have been identified, use individual tables for each source well.

3. Monitoring well construction information. Complete and attach Table B-7.

Phase II Investigation (If required)

NOTE: A Phase II investigation should only be conducted if the release is from a commercial UST and the levels of groundwater contamination detected in the source area monitoring well exceed the groundwater standards or interim standards by a factor of 10.

The Phase II investigation includes the installation of four additional monitoring wells to be installed as follows: one upgradient of the source of contamination, two downgradient of the source of contamination, and one vertical extent well immediately downgradient of the source but within the area of contamination. The upgradient and downgradient wells must be placed so that groundwater flow direction can be determined.

1. Monitoring well construction information. Complete and attach Table B-7.

2. Describe any groundwater sampling from the monitoring well(s). Use maps and tables whenever possible and include:

- Location of groundwater samples/monitoring wells/water supply wells;
- Complete and attach Table B-4.
- If multiple source areas have been identified, use individual tables for each area.

Refer to *Site Investigation Summary Report* (*O'Brien & Gere*, September 2001) for a previous investigations summary regarding monitoring well installation and sample collection. The following table is also provided in the *Summary Report* and is reproduced here to provide a summary. Laboratory analyses indicate all samples collected with the exception of MW-1 in 1996 are below NC Gross Contamination Levels for Groundwater. The 2001 round of sampling included all monitoring wells still surviving on the site. The 2001 samples were analyzed via EPA Method 8260B (Volatile Organic Compounds). Prior samples (1992-1998) were analyzed via EPA Method 601 (Purgeable Halocarbons) and EPA Method 602 (Purgeable Aromatics)

Table 12 Groundwater Analytical Results for Petroleum Compounds from 2001 *Site Investigation Summary Report*

Petroleum Related Constituent	Well	NC Gross Contam Level	Concentration (mg/L)																	
			Mar-92	Jan-93	Apr-93	Jun-93	Oct-93	Mar-94	Jul-94	Oct-94	Dec-94	Apr-95	Jul-95	Oct-95	Dec-95	Apr-96	Oct-96	Apr-97	Jan-98	Aug-01
Benzene	MW-1	5	ND	**0.002**	**1.2**	**1.7**	**1.2**	**1.6**	**3.4**	**3.4**	**3.7**	**4.7**	**4.8**	**3.8**	**4.4**	**20.58**	**4.8**	**2.4**	--	--
	MW-2		ND	ND	ND	ND	**0.0075**	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--
	MW-3		**0.0033**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--
	MW-8		--	**0.002**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--
	MW-10		--	ND	**0.0014**	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--
	RW-1		--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.011**	--	--	--	ND
	RW-2		--	**0.669**	**2.2**	**1.7**	**0.24**	**0.003**	**0.09**	**0.066**	**0.028**	ND	**0.021**	**0.014**	**0.015**	**0.022**	ND	**0.005**	<0.001	<0.001
	DW-1		--	ND	ND	**0.007**	ND	ND	**0.0016**	ND	**0.004**	ND	ND	ND	ND	**0.0032**	--	--	--	<0.001
	DW-2		--	--	--	ND	ND	ND	**0.0035**	**0.0046**	ND	**0.008**	**0.015**	**0.014**	**0.033**	**0.172**	--	--	--	--
Toluene	MW-1	257.5	ND	ND	**2.7**	**3.7**	**2**	**2.5**	**1.3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--
	RW-2		--	ND	**4.8**	**3.7**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<0.001	<0.001
Ethylbenzene	MW-1	29	ND	ND	**0.23**	**0.31**	**0.21**	**0.1**	**0.45**	**0.38**	**0.16**	**0.16**	**0.248**	ND	ND	ND	**0.11**	ND	--	--
	RW-2		--	**0.29**	**0.46**	**0.42**	**0.46**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<0.001	<0.001
Xylene	MW-1	87.5	ND	ND	**0.89**	**1.3**	**0.92**	ND	**26.1**	ND	ND	ND	ND	ND	ND	**12.22**	**3.5**	**1.8**	--	--
	RW-2		--	**0.948**	**1.5**	**1.3**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<0.001	<0.001
1,2-Dichloroethane	MW-1	0.38	ND	ND	ND	ND	ND	**0.0018**	**0.0034**	**0.0037**	ND	**0.0046**	**0.0054**	**0.0041**	ND	**0.0386**	**0.0061**	ND	--	--
	RW-2		--	ND	ND	**0.0019**	ND	ND	**0.0018**	**0.0019**	**0.002**	**0.00089**	**0.0013**	**0.0012**	ND	**0.0033**	ND	ND	<0.001	--
Methyl tertiary butyl ether	MW-1	200	ND	ND	**0.2**	**0.33**	**0.27**	ND	**0.13**	ND	ND	ND	ND	ND	ND	**0.93**	**2**	ND	--	--
	RW-2		--	ND	**0.57**	**0.43**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<0.001	**0.0013**
	DW-1		--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	**0.074**
Ethylene dibromide	MW-4	0.05	--	ND	ND	ND	ND	--	--	--	--	--	--	--	ND	**0.0035**	--	--	--	--

-- Well not sampled.
ND Constituent not detected.
Detections shown in bold.
Highlighted values exceed North Carolina Gross Contamination Level

F. CONCLUSIONS AND RECOMMENDATIONS

Discuss the risk criteria that apply to the release and identify any other site-specific factors related to the release that may pose a risk to human health and the environment. Also, discuss any site-specific conditions or possible actions that could result in lowering the level of risk posed by the release.

The risks associated with the release are discussed in the CAP.

G. FREE PRODUCT INVESTIGATION/RECOVERY: (if applicable)

Not Applicable

H. SITE HISTORY:

- Update site history information provided in the 20-Day Report as necessary.
- Using the format in Table B-1, list all UST systems currently or previously located at the site including UST system number, product, capacity, date installed, date removed or closed, and whether a release was discovered. UST system numbers should correspond to the site map information requested below.
- Using the format in Table B-2, list the names, addresses, telephone numbers, and dates of ownership/operation of all previous UST owners and operators of the UST system(s).

Information as provided previously.

I. FIGURES (Please attach the following figures)

- 71/2 minute USGS topographic quadrangle map copy showing an area within a 1,500-foot radius of the source area of the release and depicting the site location, all water supply wells, public water supplies, surface water intakes, surface water bodies, designated well head protection areas, and areas of recharge to deeper aquifers in the Coastal Plan that are or may be used as a source for drinking water.

- 71/2 minute USGS topographic quadrangle map copy showing an area within a 1,500-foot radius of the source area of the release and depicting the site location as well as all schools, daycare centers, hospitals, playgrounds, parks, recreation areas, churches, nursing homes, or other places of public assembly. Also identify the zoning status of the area within the 1,500-foot radius.

- Site map with UST systems location(s) including piping and pump islands, site boundaries, buildings, named roads, subsurface utilities, basements, adjacent properties, scale, and north arrow.

- Site map showing the results of all soil sampling conducted. Indicate sample identifications, sample locations, sampling depths, and analytical results.

- Site map showing the results of all groundwater sampling conducted. Indicate sample identifications, sample locations, monitoring well identifications, and analytical results.

- Site map showing the elevation of groundwater in the monitoring wells and the direction of groundwater flow. NOTE: This requirement applies to the Phase II investigation only.

NOTE: If possible, use a single base map to prepare site maps using a map scale of 1 inch = 40 feet (or a smaller scale for large sites, if necessary). Maps and figures should include conventional symbols, notations, labeling, legends, scales, and north arrows and should conform to generally accepted practices of map presentation such as those enumerated in the USGS Geological Survey pamphlet, "Topographic Maps.

Information as provided previously.

J. OTHER INFORMATION (Please attach the following information)

- Boring logs and lithologic descriptions;

- Well construction records (Table B-7);

- Field measurements (e.g., pH, dissolved oxygen, specific conductivity, temperature) made during groundwater sampling);

- Standard procedures used at site for sampling, field equipment decontamination, field screening, etc.;

- Disposal manifests; and

- All laboratory reports and chain-of-custody documents.

Information as provided previously.

CONCLUSION

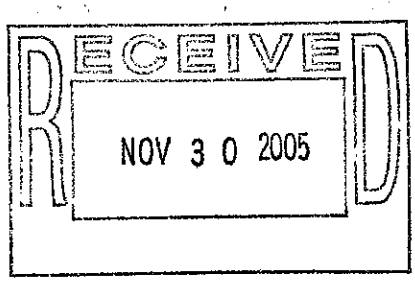
This report provides a summary of work performed and intended to comply with NCDENR petroleum UST release investigation guidance. The USTs were removed in 1992 and the Comprehensive Site Assessment (CSA) was submitted prior to January 2,1998, which indicates the requirements flowchart provided as Figure 4 of the *Guidelines for Assessment and Corrective Action*, NCDENR UST Section, July 1, 2001, should be followed. However, verification of LOW risk cannot be determined in the existing documentation. The site risk level has historically been referred to as LOW.

In the event that the risk level is classified HIGH, Figure 4 of the *Guidelines* indicates the Corrective Action Plan (CAP) should be implemented until contaminates are at or below the 2L.0202 standards. The CAP recommended a natural attenuation and a three-year groundwater monitoring program that was initiated in January 1993. In accordance with the CAP, groundwater samples were collected and analyzed quarterly in 1993, 1994, and 1995. Samples were also collected and analyzed in 1996, 1997, 1998, and 2001. The samples collected and analyzed in 1998 and 2001 indicate petroleum compounds are below the standards established in 2L.0202.

As required by HIGH or LOW risk sites in Figure 4 of the *Guidelines*, Soil Cleanup Report with Site Closure Request was submitted in April 1999. The report requested no further action with regard to both petroleum and chlorinated contamination. An addendum to the Request was submitted in October 2001 in response to NCDENR letter dated March 16, 2001. The addendum provided additional soil analyses (MADEP Method) results indicating samples collected adjacent to the former leaded gasoline UST were below maximum soil contaminant concentrations and requested no further action with regard to petroleum and chlorinated impact to the soils at the site.

GROUNDWATER MONITORING REPORT
SEPTEMBER 2005

Former Associated Mechanical Contractors Facility
Greensboro, North Carolina



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NOVEMBER 2005

PARSONS

1.0 Introduction

This Groundwater Monitoring Report describes sampling conducted in September 2005 at the former Associated Mechanical Contractors (AMC) facility located at 307 Swing Road in Greensboro, North Carolina (Incident File #7859). The September 2005 sampling event included the collection of groundwater samples from six wells for analysis of volatile organic compounds (VOCs). Active wells were checked for water depth, total depth, and the presence of nonaqueous phase liquids (NAPLs).

Figure 1 illustrates the site layout.

2.0 Groundwater Sampling

Groundwater samples were collected from six wells (MW-5a, MW-6, MW-11, MW-12, RW-1 and MW-14a) on September 20, 2005. Prior to sampling, the wells were purged of a minimum of three well volumes on September 19 using a peristaltic pump or bailers and allowed to recharge overnight. Temperature, specific conductivity, pH, dissolved oxygen, turbidity, and oxidation/reduction potential (redox) were measured in the field. Samples were collected using disposable bailers and placed directly into the appropriate pre-preserved bottleware provided by STL Laboratories for analysis of VOCs via Standard Method 6210D. Site-specific quality control samples included a field duplicate of RW-01, a field blank, and a trip blank.

3.0 Results

Table 1 summarizes the field data for the wells included in this sampling event. Free product was not detected in any of these wells. Depth to groundwater was consistent with historical observations and generally consistent with a south-easterly groundwater flow direction (i.e., from MW-11 towards MW-14a).

The laboratory analytical report for samples collected on September 20 is provided in Attachment 1. Table 2 lists the detections above the practical quantitation limit (PQL) for the September 2005 sampling event. Table 3 summarizes the historical detections for these wells.

As shown in Table 2, four different chlorinated compounds were detected in site wells above the PQL during the September 2005 sampling event. These compounds include 1,1-dichloroethane (1,1,-DCA); 1,1-dichloroethene (1,1-DCE); tetrachloroethene (PCE); and trichloroethene (TCE). One of the detections (PCE in RW-1) was above the North Carolina 2L ground water standards (2L standards). These results are discussed further below.

MW-5A: Two chlorinated compounds (1,1-DCE and TCE) were detected above the PQL but below the 2L standards in MW-5A. As shown in Table 3, this is the first quarter in which this well has not exceeded the 2L standards. In addition, 1,1,1-trichloroethane was not detected above the PQL in this well for the first time in the past nine sampling events.

MW-6: No chlorinated compounds were detected above the PQL in MW-6. Chlorinated compounds have not exceeded the 2L standards in this well and this is the third consecutive quarter in which no chlorinated compounds have been detected above the PQL. This well has

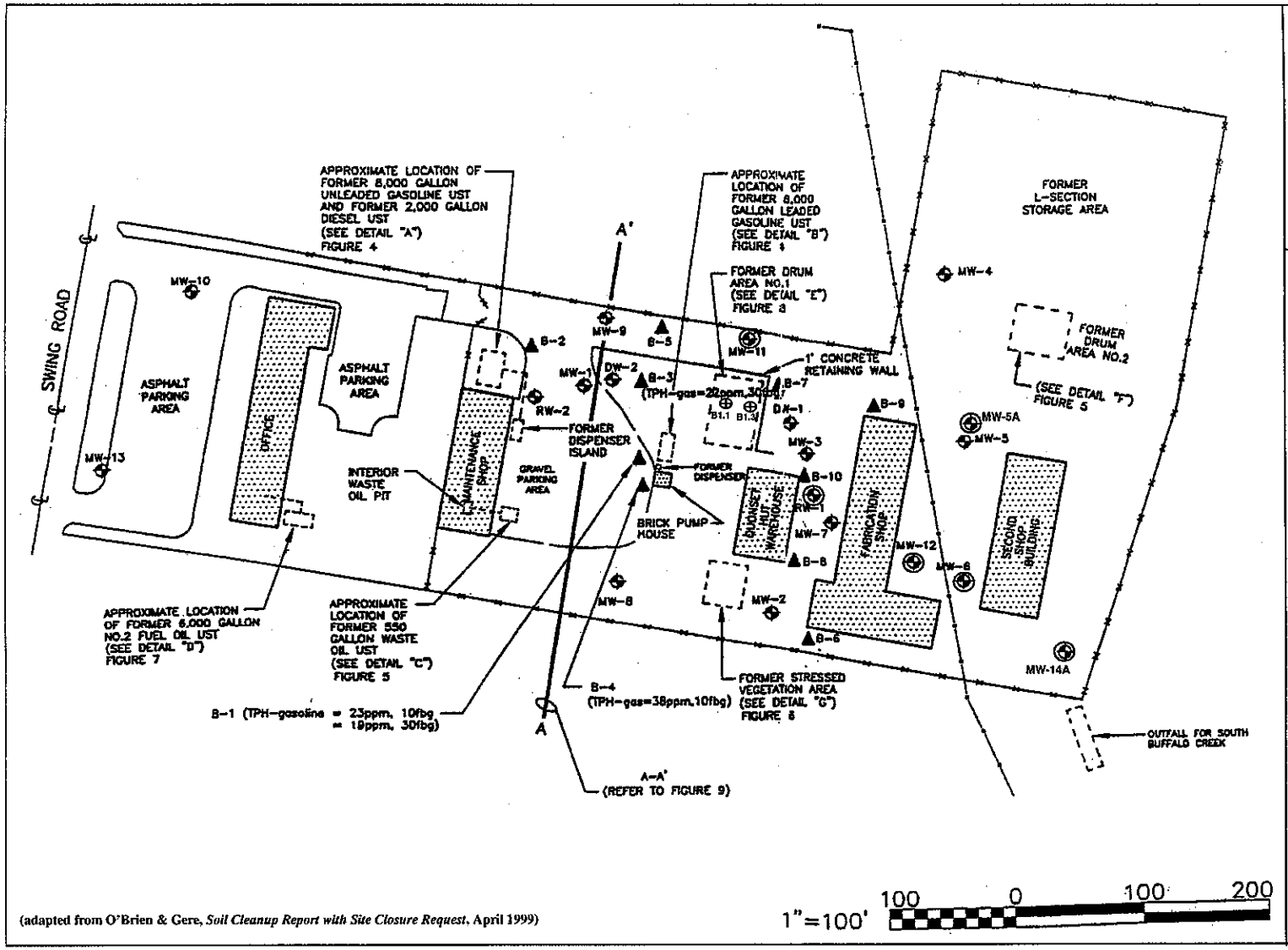
been kept in the quarterly monitoring program due to its downgradient location and its proximity to the sanitary sewer line running through the property.

MW-11: One chlorinated compound (1,1-DCA) was detected above the PQL but below the 2L standard in MW-11. This is the most upgradient well. This detection is consistent with historical results.

MW-12: Two chlorinated compounds (1,1-DCE and TCE) were detected above the PQL but below the 2L standards in MW-12. VOCs have not been detected in MW-12 above the 2L standards for five consecutive quarters. Therefore, this well could be considered for elimination from the sampling program.

RW-1: One chlorinated compound (PCE) was detected above the PQL in RW-1 at a concentration exceeding the 2L standard. This is consistent with historical data for this well.

MW-14a: VOCs were not reported above the PQL in downgradient well MW-14a.



(adapted from O'Brien & Gere, *Soil Cleanup Report with Site Closure Request*, April 1999)

LEGEND

- MONITORING WELL
- APPROXIMATE SOIL BORING LOCATION
- FENCE
- 15-INCH SANITARY LINE
- CENTER LINE OF ROAD
- GROUND WATER MONITORING WELLS SAMPLED FOR VOCs IN SEPT 2005

FIGURE 1
Site Plan

Former AMC Property
307 Swing Road
Greensboro, NC

Table 1
Groundwater Monitoring Field Data

Former AMC Site
307 Swing Road, Greensboro, NC

September 2005 Sampling Event

Well ID	Top of Casing Elevation (ft AMSL)	Depth to Water Prior to Purging (ft)	Total Well Depth (ft)	Depth to Free Product	Thickness of Free Product	Groundwater Elevation (ft AMSL)	Calculated Purge Volume (gal)	Purge Method	Actual Purge Volume (gal)	Depth to Water Prior to Sampling (ft)	Sample Time	pH	Temp (°C)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	ORP (mV)	Description
MW-5a	UNK	7.34	18	ND	ND	UNK	5.44	Bail	5.5	7.52	1025	6.33	22.48	0.107	999	4.28	52	Milky, dark, muddy
MW-6	888.39	12.08	18	ND	ND	876.31	3.02	Bail	3	12.49	1056	6.42	21.35	0.180	405	1.82	13	Milky, tan/brown
MW-11	892.50	10.85	25	ND	ND	881.65	7.22	Bail	7.2	11.21	925	5.08	17.48	0.039	999	3.53	124	Muddy, reddish-brown
MW-12	886.29	9.25	25	ND	ND	877.04	8.03	Bail	8	9.58	1040	6.27	21.18	0.091	884	4.81	58	Muddy, brown
MW-14a	UNK	7.1	14.4	ND	ND	UNK	3.72	Bail	3.8	7.18	1107	7.24	21.52	0.257	999	1.87	-104	Murky, greenish brown
RW-01	888.51	8.26	21.6	ND	ND	880.25	26.41	Pump	26.5	8.26	955	5.70	22.35	0.075	53	4.16	83	Clear, slight odor

Wells were purged on September 19 and sampled on September 20, 2005.
ND - Not Detected
ORP - Oxidation/Reduction Potential
UNK - Unknown (top of casing for these replacement wells has not been surveyed)
" --" - Well not sampled

Table 2
Constituents Detected above the PQL

Former AMC Site
307 Swing Road, Greensboro, NC

September 2005 Sampling Event

Constituent	Units	North Carolina 15A NCAC 2L.0202 Standard	MW-5A	MW-6	MW-11	MW-12	RW-1
1,1-Dichloroethane *(1,1-DCA)*	mg/l	0.7			0.0022		
1,1-Dichloroethene *(1,1-DCE)*	mg/l	0.007	0.0053			0.0063	
1,1,1-Trichloroethane *(1,1,1-TCA)*	mg/l	0.2					
Tetrachloroethene *(PCE)*	mg/l	0.0007					0.0095
Trichloroethene *(TCE)*	mg/l	0.0028	0.0019			0.0016	

PQL - Practical Quantitation Limit

- Highlighted results exceed the 2L Standard

Table 3
Historical Summary of Constituents Detected above the PQL [1]

Former AMC Site
307 Swing Road, Greensboro, NC

Constituent	Well	North Carolina 15A NCAC 2L.0202 Standard (ppm)	North Carolina Gross Contamination Level (Table 9) (ppm)	Concentration (mg/L)																												
				Mar-92	Jan-93	Apr-93	Jun-93	Oct-93	Mar-94	Jul-94	Oct-94	Dec-94	Apr-95	Jul-95	Oct-95	Dec-95	Apr-96	Oct-96	Apr-97	Jan-98	Sep-01	Nov-02	Apr-03	Nov-03	Feb-04	May-04 [2]	Aug-04	Sep-04	Nov-04	Mar-05	Jun-05	Sep-05
Carbon tetrachloride	MW-12	0.0003	N/A	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.0017**	ND	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001
Chlorobenzene	MW-6	0.05	N/A																													
Chloroform	MW-1	0.00019	0.19	ND	**0.069**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	0.001	<0.001	<0.001	<0.001
	MW-3			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.0056**	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-4			--	ND	ND	ND	ND	--	--	--	--	--	--	--	ND	**0.0025**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-5*			--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.0019**	ND	ND	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001
	MW-8			--	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.00039**	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-12			--	--	--	ND	ND	ND	ND	ND	ND	ND	**0.0011**	**0.0049**	**0.0052**	ND	ND	ND	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001
	RW-1			--	ND	ND	**0.0051**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001
	RW-2			--	ND	ND	ND	ND	ND	ND	ND	ND	**0.00039**	**0.00066**	**0.00045**	**0.00048**	ND	ND	ND	<0.001	<0.001	--	--	--	--	--	--	--	--	--	--	--	--
	DW-1			--	ND	ND	**0.0013**	ND	**0.0017**	ND	**0.0023**	**0.002**	**0.002**	**0.0021**	**0.0019**	**0.0021**	ND	--	--	--	<0.001	--	--	--	--	--	--	--	--	--	--	--	--
	DW-2			--	--	--	ND	ND	**0.0017**	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chloromethane	MW-11	0.0026	2600	--	--	--																										
1,1-Dichloroethane	MW-6	0.7																			0.0013	<0.001	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001
(1,1-DCA)	MW-11			--	--	--															<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		**0.0011**	<0.001	<0.001	<0.001
1,2-Dichloroethane	MW-12	0.00038	0.38	--	--	--															**0.0032**	**0.0058**	**0.0053**	**0.0051**	**0.0041**	**0.0021**	--	**0.0035**	**0.0023**	**0.002**	**0.0022**
(1,2-DCA)	MW-14																				<0.001	<0.001	<0.001	**0.0024**	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001
1,1-Dichloroethene	MW-5*	0.007	7																		<0.001		<0.001	**0.0013**	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001
(1,1-DCE)	MW-7			--	ND	ND	ND	ND	**0.11**	**0.13**	**0.093**	**0.1**	ND	ND	ND	ND	ND	**0.024**	ND	**0.027**	<0.001	**0.0066**	**0.0098**	**0.0091**	**0.02**	**0.015**	**0.0098**	--	**0.016**	**0.013**	**0.013**	**0.0053**
	MW-11			--	--	--	ND	ND	ND	ND	ND	**0.012**	**0.013**	**0.014**	**0.0021**	**0.017**	**0.298**	**0.018**	**0.01**	**0.0086**	**0.0013**	<0.001	<0.001	<0.001	<0.001	<0.001	--	--	--	--	--	--
	MW-12			--	--	--															<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001
	RW-1			--	ND	ND	ND	ND	**0.0096**	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	<0.001	**0.01**	**0.0045**	**0.0024**	**0.0042**	**0.0034**	<0.001	--	**0.0041**	**0.0033**	**0.0027**	**0.0063**
Tetrachloroethene	MW-3	0.0007	0.7	ND	ND	ND	ND	ND	**0.0045**	**0.0023**	**0.0049**	**0.0019**	**0.0015**	**0.0015**	**0.0015**	**0.0039**	**0.0052**	ND	ND	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001
(PCE)	MW-5*			--	ND	ND	ND	**0.0011**	ND	ND	ND	ND	ND	ND	**0.0018**	**0.0005**	ND	ND	ND	<0.001	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-7			--	**0.0146**	**0.0091**	**0.018**	**0.035**	**0.033**	**0.017**	**0.016**	**0.017**	**0.014**	**0.012**	**0.025**	**0.056**	**0.0314**	**0.0046**	**0.004**	**0.0089**	<0.001	**0.0011**	<0.001	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001
	MW-11			--	--	--	ND	ND	ND	ND	ND	ND	**0.0012**	**0.002**	**0.0017**	**0.0022**	**0.022**	ND	**0.001**	<0.001	**0.0012**	<0.001	<0.001	<0.001	<0.001	<0.001	--	--	--	--	--	--
	RW-1			--	**0.0026**	ND	ND	**0.0026**	**0.006**	**0.0085**	**0.0055**	**0.006**	**0.0072**	**0.001**	**0.0068**	**0.012**	**0.081**	--	--	--	**0.0087**	**0.0076**	**0.0049**	**0.0044**	**0.0052**	**0.010**	<0.001	--	**0.013**	**0.0086**	**0.011**	**0.0095**
	MW-14																ND	ND	ND	<0.001	<0.001	--		<0.001	<0.001	<0.001	**0.012**	<0.001	<0.001	<0.001	<0.001	<0.001
1,1,1-Trichloroethane	MW-5*																					<0.001	**0.0013**	**0.0011**	**0.0012**	**0.0016**	**0.0011**	--	**0.0014**	**0.0013**	**0.0014**	<0.001
(1,1,1-TCA)	MW-12	0.2		--	--	--															**0.0012**	**0.0013**	<0.001	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001
Trichloroethene	MW-5*	0.0028	2.8	--	ND	ND	ND	ND	ND	ND	ND	ND	**0.0034**	**0.0038**	ND	**0.0033**	ND	**0.0038**	**0.003**	**0.0056**	--	**0.0035**	**0.0057**	**0.0049 B**	**0.0057**	**0.0072**	**0.0047**	--	**0.0066**	**0.0066**	**0.0075**	**0.0019**
(TCE)	MW-12			--	--	--															**0.0033**	**0.0018**	<0.001	<0.001	**0.0015**	<0.001	--	**0.0011**	<0.001	**0.0011**	**0.0016**
m&p-Xylene	MW-7	0.53																				<0.001	**0.0038**	<0.001								
o-Xylene	MW-7	0.53																				<0.001	**0.0014**	<0.001	--	--	--	--	--	--	--	--

NOTES:

/1 Table shows results reported above the practical quantitation limit. Data for March 1992 through September 2001 was collected by others and taken from reports prepared by others as available. Data for November 2002 to present was collected by Parsons.
Detections above the practical quantitation limit are shown in bold.
Yellow highlighted values exceed 15A NCAC 2L.0202 groundwater standard.

/2 The laboratory reported 1,2,4 trichlorobenzene just above the PQL in the sample collected from MW-14a. The detection was qualified by the laboratory due to a detection in an associated laboratory method blank; during the data validation performed by Parsons this result was requalified as not detected because of the associated blank contamination. This compound has not previously been detected at the site.

/3 MW-14 was found damaged during the April 2003 sampling event (stickup apparently run over by a vehicle) and therefore was not sampled. MW-14 was abandoned and replaced with MW-14a in November 2003.

-- Well not sampled.

* MW-5 abandoned and replaced with MW5-A in Nov 02

B Data qualifier indicating that the compound was also detected in a laboratory method blank associated with the sample. The reported result should be considered estimated and may be biased high due to the blank contamination. The true concentration of the analyte in the sample may be lower than the reported result.

ND Constituent not detected above the practical quantitation limit.

PQL Practical Quantitation Limit

Yellow highlighted values exceed 15A NCAC 2L.0202 groundwater standard.

ATTACHMENT C

Pyramid Project # 2006292

GEOPHYSICAL INVESTIGATION REPORT

EM61 & GPR SURVEYS

Jerry Pell Property
307D Swing Road
Greensboro, North Carolina

November 29, 2006

Report prepared for: **Mike Branson**
Earth Tech, Inc.
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Raleigh, North Carolina 27607

Prepared by: _____
Douglas Canavello, PG

Reviewed by: _____
Michael G. Jones, PG

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Earth Tech of North Carolina, Inc.
GEOPHYSICAL INVESTIGATION REPORT
Jerry Pell Property
307D Swing Road
Greensboro, North Carolina

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FIGURES

1.0 INTRODUCTION

Pyramid Environmental and Engineering, PC conducted geophysical investigations for Earth Tech of North Carolina, Inc. across the accessible areas of the Jerry Pell Property located at 307D Swing Road in Greensboro, North Carolina. The site contains three auto repair garages that are surrounded by numerous vehicles and miscellaneous equipment. The open accessible portions of the site that were investigated, consist of grass or gravel-covered surfaces. The geophysical investigation was conducted during the period of November 8-10, 2006, to determine if unknown, metallic, underground storage tanks (USTs) were present beneath the property and to delineate metallic underground utility lines. The work was performed as part of the NCDOT road-widening project.

Earth Tech's representative Mr. Michael Branson, PG, provided maps that outlined the geophysical survey area of the site and visited the site with Pyramid representatives prior to the geophysical investigation.

2.0 FIELD METHODOLOGY

Prior to conducting the geophysical investigation, a 10-foot by 10-foot survey grid was established across the proposed survey area using pin flags and 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 investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. The metal detection survey was conducted using a Geonics EM61-MK1 metal detection instrument. According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. The EM61 data were digitally collected along parallel, northerly-southerly (X-axis) or easterly-westerly (Y-axis) trending survey lines spaced five feet apart. The data were downloaded to a computer and reviewed in the field and office using the Geonics DAT61W and Surfer for Windows Version 7.0 software programs.

GPR surveys were conducted across selected EM61 differential anomalies using a Geophysical Survey Systems SIR-2000 unit equipped with a 400 MHz antenna. GPR data were digitally collected in a continuous mode using a vertical scan of 512 samples, at a sampling rate of 48 scans per second. An 80 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 to a maximum investigating depth of approximately five feet based on an estimated two-way travel time of 8 nanoseconds per foot.

The GPR data were reviewed in the field and office using Radprint and Radan 5.0 software programs. Photographs showing the geophysical equipment used at this site are shown in **Figure 1**.

Contour plots of the EM61 bottom coil results and the EM61 differential results for the Jerry Pell property are presented in **Figures 2 and 3**, respectively. 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 USTs and ignore the smaller insignificant metal objects. The solid brownish-red lines in Figure 3 represent the GPR survey lines that were acquired at the Pell property.

Preliminary contour plots of the EM61 bottom coil and the differential results for the site were emailed to Mr. Branson during the week of November 13, 2006.

3.0 DISCUSSION OF RESULTS

The linear EM61 bottom coil anomalies, such as the ones intersecting grid coordinates X=120 Y=252, X=130 Y=265, X=160 Y=240, X=240 Y=183, and X=270 Y=265 are probably in response to underground utility lines. The probable utility lines are identified by dashed magenta-colored lines in Figures 2 and 3. The approximate locations of the detected underground utility lines were marked

in the field using marking paint. Most of the high amplitude bottom coil anomalies (contours shaded in red) such as the ones centered near grid coordinates X=64 Y=120, X=190 Y=35, X=320 Y=250, and X=355 Y=45, are probably in response to the metallic garages, vehicles, miscellaneous equipment, and/or steel reinforced concrete. The small, isolated, bottom coil anomalies such as the ones centered near grid coordinates X=235 Y=210, X=245 Y=148, X=335 Y=192, and X=368 Y=220, are probably in response to insignificant metallic debris or objects.

GPR surveys conducted across the differential anomalies centered near grid coordinates X=320 Y=250 and X=362 Y=265 suggest the anomalies are in response to the steel reinforced concrete slab and miscellaneous debris, respectively. GPR surveys conducted across the high amplitude differential anomaly centered near grid coordinates X=350 Y=40 suggest the anomaly is in response to steel reinforced concrete, buried utility line related objects, and/or known surface features. The remaining differential anomalies are probably in response to interference from the underground utility lines, buildings, vehicles and equipment, or other known surface objects.

The geophysical investigations did not detect the presence of possible or probable metallic USTs beneath the surveyed portion of the Jerry Pell property.

4.0 SUMMARY & CONCLUSIONS

Our evaluation of the EM61 and GPR data collected across the accessible portion of the Jerry Pell property located at 307D Swing Road in Greensboro, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of possible metallic USTs within the surveyed portions of the site.

- The linear EM61 bottom coil anomalies, such as the ones intersecting grid coordinates X=120 Y=252, X=130 Y=265, X=160 Y=240, X=240 Y=183, and X=270 Y=265 are probably in response to underground utility lines.

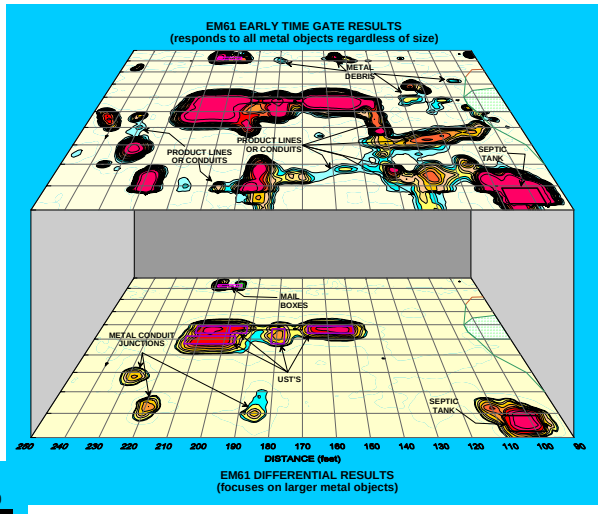
- Most of the high amplitude bottom coil anomalies (contours shaded in red) such as the ones centered near grid coordinates X=64 Y=120, X=190 Y=35, X=320 Y=250, and X=355 Y=45 are probably in response to the metallic garages, vehicles, miscellaneous equipment, and/or steel reinforced concrete.

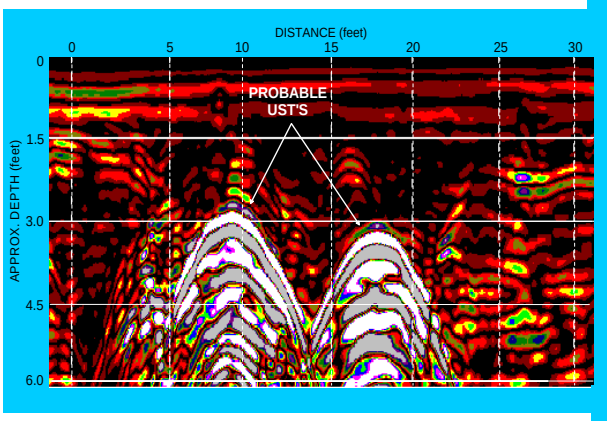
- GPR surveys conducted across the high amplitude differential anomaly centered near grid coordinates X=350 Y=4 suggest the anomaly is in response to steel reinforced concrete, buried utility line related objects, and/or known surface features.

- The geophysical investigations did not detect the presence of possible or probable metallic USTs beneath the surveyed portion of the Jerry Pell property.

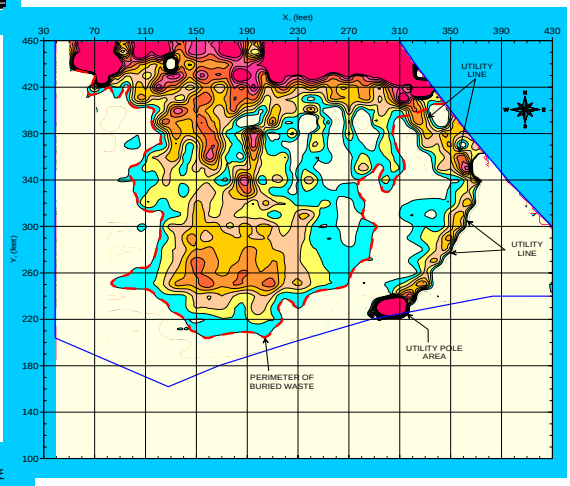
5.0 LIMITATIONS

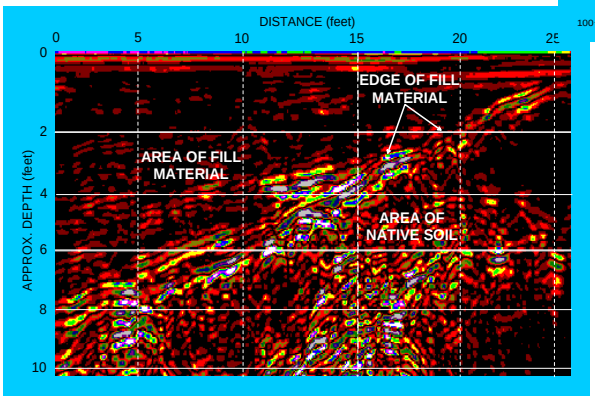
EM61 and GPR surveys have been performed and this report prepared for Earth Tech of North Carolina, Inc. in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project do not conclusively determine that the surveyed portion of the site does not contain USTs but that none were detected.


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
MAIL BOXES
METAL CONDUIT JUNCTIONS
UST'S
SEPTIC TANK
DISTANCE (feet)
EM61 DIFFERENTIAL RESULTS
(focuses on larger metal objects)


DISTANCE (feet)
PROBABLE UST'S
APPROX. DEPTH (feet)

FIGURES


X, (feet)
UTILITY LINE
UTILITY LINE
UTILITY POLE AREA
PERIMETER OF BURIED WASTE
Y, (feet)


DISTANCE (feet)
EDGE OF FILL MATERIAL
AREA OF FILL MATERIAL
AREA OF NATIVE SOIL
APPROX. DEPTH (feet)

The photograph shows the Geonics EM61 metal detector that was used to conduct the metal detection survey at the Jerry Pell property.

The photographs show the SIR-2000 GPR system equipped with a 400 MHz antenna that were used to conduct the ground penetrating radar investigation at the Jerry Pell property.

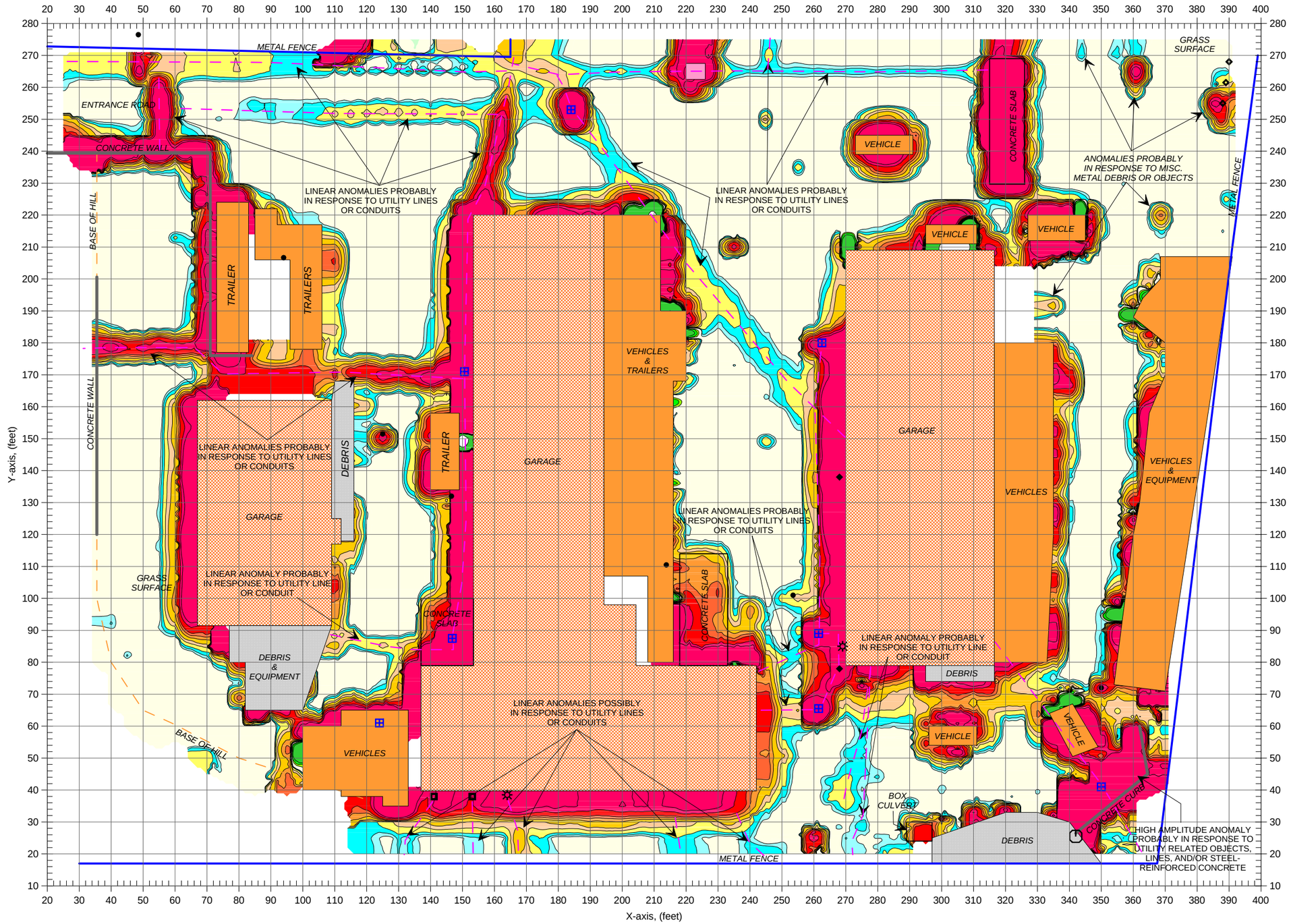
PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	EARTH TECH OF NORTH CAROLINA, INC.	DATE	11/29/06	DRWN	MJD
SITE	JERRY PELL PROPERTY (307D SWING ROAD)	LAY		CHKD	
CITY	GREENSBORO	STATE	NORTH CAROLINA	DWG	
TITLE	GEOPHYSICAL RESULTS	JNO	2006-292	FIGURE	

GRAPHIC SCALE IN METERS

PHOTOGRAPHS OF GEOPHYSICAL EQUIPMENT

FIGURE 1



N
W E
S

APPROXIMATE NORTH

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTHERLY-SOUTHERLY OR EASTERLY-WESTERLY TRENDING LINES SPACED 5 FEET APART
- CLEANOUT PIPE
- METAL PROTECTION PIPE
- MONITORING WELL
- GAS METER
- ELECTRICAL BOX
- STORM SEWER GRATE
- WATER VALVE
- GAS METER
- DUMPSTER
- POSSIBLE OR PROBABLE UTILITY LINE OR CONDUIT, AS SUGGESTED BY GEOPHYSICAL RESULTS

EM61 BOTTOM COIL RESPONSE (MILLIVOLTS)

-5000 -400 -200 -100 -90 -45 -80 -75 -100 -150 200 300 400 500 750 1000

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 Nov. 8-9, 2006 using a Geonics EM61 instrument.

Ground penetrating radar (GPR) data were acquired on Nov. 10, 2006 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

The geophysical results did not detect metallic USTs within the surveyed portions of this site.

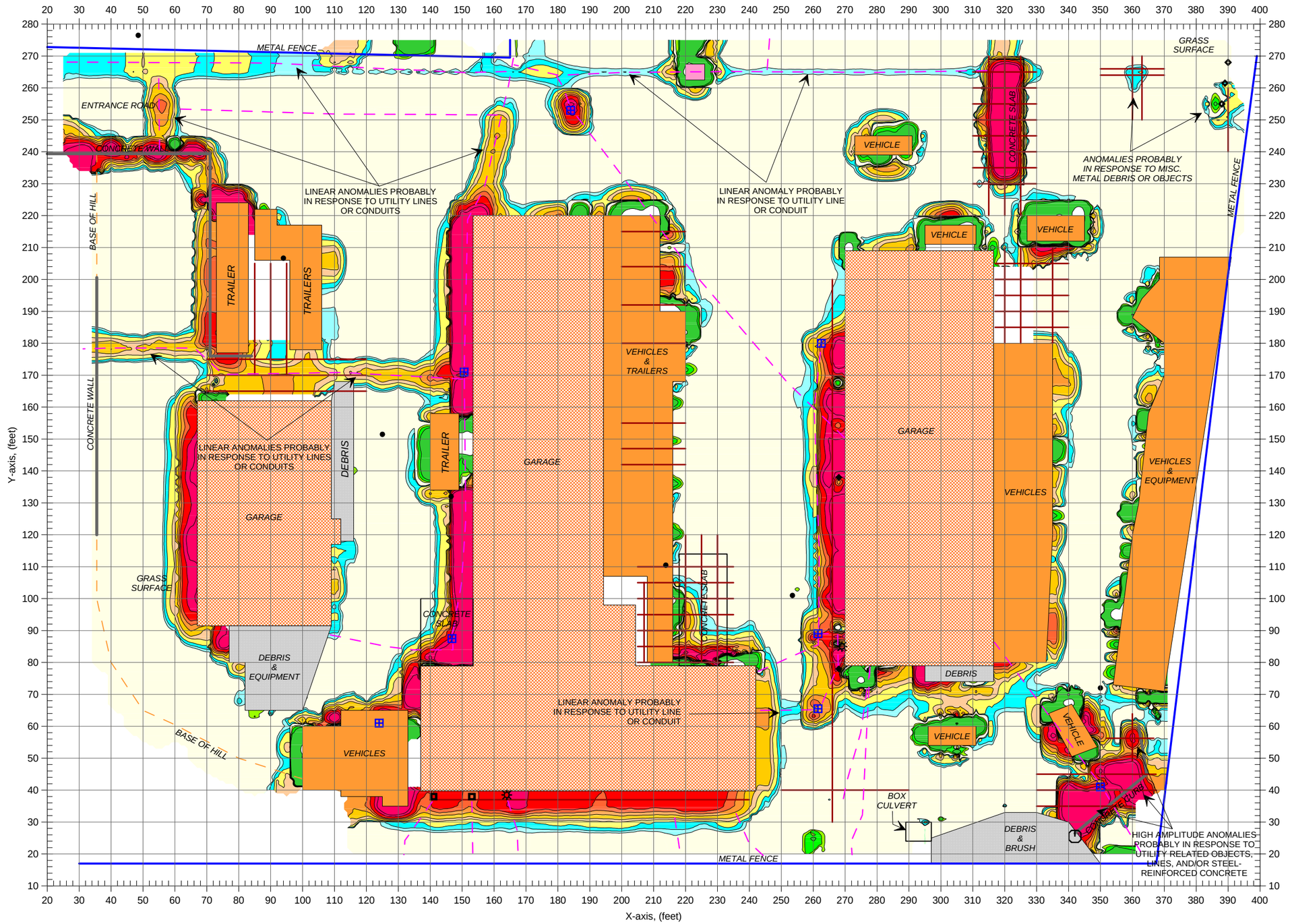
PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	EARTH TECH OF NORTH CAROLINA, INC.		DATE	11/29/06	DRWN MJD
SITE	JERRY PELL PROPERTY (307D SWING ROAD)		LAY		CHKD
CITY	GREENSBORO	STATE NORTH CAROLINA	DWG		
TITLE	GEOPHYSICAL RESULTS		J.NO.	2006-292	FIGURE

GRAPHIC SCALE IN METERS

EM61 BOTTOM COIL RESULTS

FIGURE 2



N
W E
S

APPROXIMATE NORTH

LEGEND

- EM61 SURVEY AREA: EM DATA ACQUIRED ALONG NORTHERLY-SOUTHERLY OR EASTERLY-WESTERLY TRENDING LINES SPACED 5 FEET APART
- CLEANOUT PIPE
- METAL PROTECTION PIPE
- MONITORING WELL
- GAS METER
- ELECTRICAL BOX
- STORM SEWER GRATE
- WATER VALVE
- GAS METER
- DUMPSTER
- POSSIBLE OR PROBABLE UTILITY LINE OR CONDUIT, AS SUGGESTED BY GEOPHYSICAL RESULTS
- GPR SURVEY LINE

EM61 DIFFERENTIAL RESPONSE (MILLIVOLTS)

-5000 -400 -200 -100 -90 -45 -80 -75 -100 -150 -200 -300 -400 -500 -750 -1000

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 USTs and ignores smaller miscellaneous, buried, metal debris. The EM metal detection data were collected on Nov. 8-9, 2006 using a Geonics EM61 instrument.

Ground penetrating radar (GPR) data were acquired on Nov. 10, 2006 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

The geophysical results did not detect metallic USTs within the surveyed portions of this site.

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT	EARTH TECH OF NORTH CAROLINA, INC.		DATE	11/28/06	DRWN MJD
SITE	JERRY PELL PROPERTY (307D SWING ROAD)		LAY		CHKD
CITY	GREENSBORO	STATE NORTH CAROLINA	DWG		
TITLE	GEOPHYSICAL RESULTS		JOB	2006-292	FIGURE

GRAPHIC SCALE IN METERS

EM61 DIFFERENTIAL RESULTS

FIGURE 3