

GEOTECHNICAL NOV 14 2001


**PRELIMINARY SITE ASSESSMENT  
DUCK THRU FOOD STORE #16  
US HIGHWAY 158 AND NC 343  
CAMDEN COUNTY, NORTH CAROLINA  
STATE PROJECT NO. 8.T020401 (R-2414B)**

**Prepared for:  
NCDOT Geotechnical Unit  
PO Box 25201  
Raleigh, North Carolina 27611-5201**

**Prepared by:  
Solutions Industrial & Environmental Services, Inc.  
3722 Benson Drive  
Raleigh, North Carolina 27609**

**Solutions Project No. 0870.01A3.NDOT**

*Christie Zawlocki*  
Christie Zawlocki, P.E.  
Environmental Engineer

  
*Gary M. Birk*  
Gary M. Birk, P.E.  
Senior Engineer  
11-13-2001

November 13, 2001

## **TABLE OF CONTENTS**

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>1</b>
<b>2.0</b>	<b>BACKGROUND.....</b>	<b>1</b>
<b>3.0</b>	<b>PREVIOUS INVESTIGATIONS.....</b>	<b>1</b>
<b>4.0</b>	<b>FIELD ACTIVITIES .....</b>	<b>2</b>
<b>5.0</b>	<b>LABORATORY RESULTS .....</b>	<b>3</b>
<b>6.0</b>	<b>DISCUSSION.....</b>	<b>3</b>
<b>7.0</b>	<b>CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>4</b>
<b>8.0</b>	<b>REFERENCES .....</b>	<b>4</b>

### **TABLES**

**TABLE 1 – SUMMARY OF FIELD SCREENING RESULTS FOR SOIL**

**TABLE 2 – SUMMARY OF ANALYTICAL RESULTS FOR SOIL**

### **FIGURES**

**FIGURE 1 – SITE LOCATION MAP**

**FIGURE 2 – SAMPLE BORING LOCATIONS**

### **APPENDICES**

**APPENDIX A – PREVIOUS REPORTS**

**APPENDIX B – PHOTOGRAPHS**

**APPENDIX C – BORING LOGS**

**APPENDIX D – LABORATORY ANALYTICAL REPORTS**

## **1.0 INTRODUCTION**

The NCDOT is planning improvements to U.S. Highway 158 in Camden County which will require acquiring property for new highway construction. On September 26, 2001, Solutions Industrial & Environmental Services, Inc. (Solutions-IES) submitted proposal NC01892P to the NCDOT for conducting preliminary site assessments (PSAs) on seven parcels of land sited within the planned construction area along U.S. Highway 158 in Camden, North Carolina (Figure 1). This report summarizes the results of file review and field activities conducted for one of the parcels, Duck Thru Food Store #16 (Duck Thru), located at the intersection of U.S. Highway 158 and NC 343 in Camden County, Camden, NC.

## **2.0 BACKGROUND**

The Duck Thru site is located at the northeast corner of U.S. Highway 158 and NC 343 in Camden, NC (Figure 1). Previous assessment activities have been conducted at the site, as summarized below. Due to the extent of previous investigations, Solutions-IES' investigation was limited in extent and focused on only the portions of the property that NCDOT intends to acquire.

The site is currently a gasoline station and convenience store. Four USTs are presently located at the site. According to the facility's UST permit, three of the tanks are greater than 3500 gallons and one tank is less than 3500 gallons in size. The store manager did not know the exact size of the tanks. The UST Facility ID for the site is 0-035948, and the UST permit number is 2001037710. The UST permit was posted at the store on the day of the site visit and identified Jernigan Oil Co., Inc. as the UST owner.

## **3.0 PREVIOUS INVESTIGATIONS**

Solutions-IES obtained copies of previous investigation reports for the Duck Thru site from the Washington Regional Office of the North Carolina Department of Environment and Natural Resources (NCDENR). Copies of the reports reviewed by Solutions-IES are provided in Appendix A. Based on our review of available files, historically, the property was leased to the Hollowell Oil Company (Hollowell), who operated a self-service gasoline station from 1977 to 1989. The property also may have been used as a Texaco service station as early as 1920 (Omega, 1997). Three gasoline USTs used by Hollowell were

removed from the site in 1989. Two orphan USTs (4,000-gallon gasoline, 280-gallon kerosene) were discovered at the site in 1991 and were removed in 1996 (Omega, 1997).

Various assessment activities conducted at the site between 1991 and 1997 revealed that soil and groundwater in the vicinity of the former USTs and pump islands at the site are impacted with petroleum hydrocarbons at concentrations above the 15A NCAC 2L Groundwater Quality Standards (2L standards). The affected groundwater has migrated off-site to the northwest under U.S. Highway 158. In 1991, approximately 200 cubic yards of impacted soil in the vicinity of the former USTs were excavated. The Corrective Action Plan (CAP) for the site recommended dual phase extraction to treat the remaining affected soil and groundwater at the site (Omega, 1998).

#### **4.0 FIELD ACTIVITIES**

Due to the extent of previous investigation activities conducted at the site, field activities were limited to collecting and field-screening soil samples from areas within the proposed highway expansion area at the site. The field activities were conducted by Solutions-IES on October 10, 2001. Photographs were taken to document site conditions during the assessment activities. The site photographs are included in Appendix B.

Prior to beginning subsurface sampling, Solutions-IES personnel contacted the store manager to notify her of the proposed sampling activities. Solutions-IES also contacted Carolina No-Cuts to identify utilities on the subject property.

After clearing the utilities on the property, Solutions-IES collected subsurface samples from the proposed highway expansion area. Samples were collected at four Geoprobe® boring locations, identified as GP-1B through GP-4B. The locations of the Geoprobe® borings are indicated on Figure 2.

The Geoprobe® borings were advanced to a total depth of 2.4 m (8 feet) below ground surface (bgs). Continuous soil cores were collected from each boring using a Macro® Sampler. Upon removal from the ground, the cores were cut into 2-foot lengths. Soil from each 2-foot interval was further split into two identical portions. Each portion was placed in a separate resealable plastic bag. One bag was placed on ice for possible laboratory analysis, while the other bag was sealed and placed at ambient temperature for field screening with an organic vapor analyzer (OVA).

The soil samples were examined for soil type and the presence or absence of petroleum staining or odor. After a period of approximately 20 minutes, which allowed for the accumulation of volatile organic compounds (VOCs) in the headspace of the bags, each sealed bag left at ambient temperature was scanned with the OVA. A background reading was taken with the OVA prior to measuring VOC concentrations in the bags. The readings of the VOC concentrations in the headspace were then entered on the boring log along with a soil description and any indications of petroleum staining or odor (Appendix C). The results of the OVA field screenings are summarized on Table 1.

Based on field observations and OVA readings, Solutions-IES only collected one soil sample for laboratory analysis. The split sample stored on ice in the cooler with the apparent corresponding highest OVA reading at this boring location (GP-2B) was selected for submittal to Prism Laboratories, Inc. in Charlotte, NC. The sample submitted to the laboratory was analyzed for total petroleum hydrocarbons (TPH) as both gasoline-range organics (GRO) and diesel-range organics (DRO) using EPA SW-846 methods 5030 and 3550, respectively.

Following completion of the soil sampling activities, the Geoprobe borings were abandoned by completely filling each boring with soil and sand.

## **5.0 LABORATORY RESULTS**

The analytical laboratory results for the soil sample submitted for analysis are summarized in Table 2. TPH-GRO and TPH-DRO compounds were detected in the soil sample at concentrations of 160 mg/kg and 78 mg/kg, respectively. Copies of the laboratory reports are provided in Appendix D.

## **6.0 DISCUSSION**

Review of available files for the Duck Thru site indicates that a historical release from former USTs and fuel dispensers impacted soil and groundwater at the site. The groundwater plume migrated off-site under U.S. Highway 158. The CAP for the site recommended dual phase extraction to address the soil and groundwater contamination. At the time of the site visit, there appeared to be a remediation system in place; however, recent data were not available at the Washington Regional Office.

Solutions-IES advanced four soil borings to assess subsurface conditions in the proposed highway expansion area at the Duck Thru site. Due to low OVA readings and review of previous investigation

activities conducted at the site, soil samples were not collected for laboratory analysis at three of the four boring locations. However, Solutions-IES personnel encountered staining and strong odors at one Geoprobe boring location (GP-2B), which was consistent with high OVA readings at this location (greater than 1000 ppm). A soil sample at this location from a depth of 0.6 to 1.2 m bgs was collected for laboratory analysis, and the analytical results indicated the presence of both TPH-GRO and TPH-DRO at concentrations of 160 mg/kg and 78 mg/kg, respectively. This sample location is near the former fueling island at the site and appears to be within the area of the groundwater plume. The extent of soil and groundwater contamination in this area of the site was previously reported in the CSA and CAP.

## **7.0 CONCLUSIONS AND RECOMMENDATIONS**

This PSA was performed on behalf of the NCDOT for the Duck Thru site located at the intersection of U.S. Highway 158 and NC 343 in Camden County, North Carolina. Based upon our file review, field observations and laboratory results, we offer the following conclusions:

- Historical groundwater data indicate that affected groundwater extends from the site northeast under U.S. Highway 158. Recent data were not available at the Washington Regional Office; therefore, the current extent of affected groundwater could not be assessed.
- The CAP for the site proposed dual-phase extraction to address impacted soil and groundwater at the site. At the time of the site visit, there appeared to be a remediation system in place.
- Soil (>0.6 m bgs) and groundwater (~1.8 m bgs) appear to be impacted with petroleum hydrocarbons along U.S. Highway 158 near Geoprobe boring GP-2B. This location is within the area of proposed highway expansion activities. Since remediation is ongoing at the site, it was not possible to estimate the volume of impacted soil using historical and current data.

## **8.0 REFERENCES**

Omega Environmental Services (1997) Comprehensive Site Assessment Addendum II, Hollowell Site, Hwy 158 and NC 343, Camden, North Carolina. Groundwater Incident # 6309. Incident Rank 185-B. December 1997.

Omega Environmental Services (1997) Corrective Action Plan, Hollowell Site, Hwy 158 and NC 343, Camden, North Carolina. Groundwater Incident # 6309. Incident Rank 185-B. May 1998.