PRELIMINARY SITE ASSESSMENT
LAMB'S OF CAMDEN, INC.
152 US HIGHWAY 158 W
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 Zawacki, P.E.
Environmental Engineer

Gary M. Birk, P.E.
Senior Engineer
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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. This report summarizes the results of file review and field activities conducted for one of the parcels, Lamb's of Camden, located at 152 West U.S. Highway 158, Camden County, Camden, NC.

2.0 BACKGROUND

Lamb's of Camden is located at 152 West U.S. Highway 158 in Camden, NC (Figure 1). Previous investigation activities have been conducted at the site, as summarized below. Due to the extent of the previous investigations, Solutions-IES' assessment was limited in extent and focused on only the portions of the property that NCDOT intends to acquire.

As shown on Figure 2, the site is located on the west side of U.S. Highway 158. The site is owned by Horace Lamb and is currently a gasoline station, convenience store, and small seafood store. Three underground storage tanks (USTs) are located at the site. Two 8,000-gallon USTs were installed in 1998 and contain gasoline. A 6,000-gallon UST was installed in 1979 and also contains gasoline (EI, 1994). The UST Facility ID for the site is 0-004885, and the UST permit number is 1996081490. The UST permit was not posted at the site on the day of the site visit. Ms. Georgia Lamb indicated that they had recently remodeled and had misplaced the permit, but she stated that the permit is renewed every year. Ms. Lamb also indicated that they conduct tightness testing every year for their underground product lines and have a leak detection system for the USTs.

3.0 PREVIOUS INVESTIGATIONS

Solutions-IES obtained copies of previous investigation reports for the Lamb's of Camden property from NCDOT and the Washington Regional Office (WaRO) 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, an initial PSA was conducted at the site by

Environmental Investigations, P.A. (EI), in February 1994 for the NCDOT. Eight soil samples were collected as part of the PSA, and the analytical results indicated that there had been a release of petroleum hydrocarbons from the USTs and fuel dispensers located on the Lamb's of Camden property (EI, 1994).

A subsequent Initial Site Characterization Report was prepared for the site in October 1994 by PetroChem Recovery Services (PetroChem). This report provides a site description, identifies potential receptors, and presents the results of a free--product investigation. Based on the information provided in the report, free product was not discovered at the site (PetroChem, 1994). Neither soil nor groundwater samples were collected and analyzed as part of PetroChem's site characterization.

A Notice of Violation (NOV) was issued to Mr. and Mrs. Larry and Georgia Lamb on January 29, 2001 pertaining to the petroleum release at the Lamb's of Camden property by the NCDENR. The NOV indicated that a confirmed petroleum release had been identified at the site and the Lamb's had failed to submit a Limited Site Assessment Report in accordance with 15A NCAC 2L .0115(c)(4) (NCDENR, 2001).

4.0 FIELD ACTIVITIES

Due to the limited extent of previous investigation activities conducted at the site, field activities consisted of collecting and analyzing soil and groundwater samples from areas within the proposed highway expansion area at the site that had not been previously investigated. The field activities were conducted by Solutions-IES on October 11, 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, Mrs. Georgia Lamb, to notify her of the proposed sampling activities. Solutions-IES also contacted Carolina No-Cuts to identify utilities on the subject property and contracted Taylor Wiseman & Taylor of Raleigh, North Carolina, to further evaluate the area of the site within the proposed right-of-way for other USTs, subsurface piping and utilities.

After clearing the utilities on the property, Solutions-IES collected subsurface samples from the proposed right-of-way area. Samples were collected at six Geoprobe® boring locations, identified as GP-1E through GP-6E. 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), which was below the groundwater table. 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 collected soil samples for laboratory analysis. In general, the split sample stored on ice in the cooler with the apparent corresponding highest OVA reading at each boring location was selected for submittal to Prism Laboratories, Inc. in Charlotte, North Carolina. The samples submitted to the laboratory were 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.

Solutions-IES also attempted to collect a groundwater sample from boring GP-1E. In preparation for groundwater sampling, Solutions-IES purged approximately 4 gallons from the borehole. The majority of the fluid recovered from the borehole was free product. A sample was collected, as shown in Photo #7 in Appendix B. However, due to the presence of free product, the sample was not submitted for laboratory analysis.

Following completion of the soil sampling activities, the Geoprobe borings were abandoned by completely filling each boring with soil and sand. Borings emplaced in paved areas were finished at the surface to match pre-existing conditions.

5.0 LABORATORY RESULTS

The TPH analytical laboratory results for the soil samples are summarized in Table 2. TPH-GRO and TPH-DRO compounds were detected in soil sample GP-3E (1.2 to 1.8 m bgs) at concentrations of 2400 mg/kg and 940 mg/kg, respectively. TPH-GRO was also detected at a concentration of 1.5 mg/kg in boring GP-2E at a depth of 0.6 to 1.2 m bgs. TPH-GRO and TPH-DRO compounds were not detected at concentrations above the laboratory method detection limits in any of the other soil samples submitted for laboratory analysis. Copies of the laboratory reports are provided in Appendix D.

6.0 DISCUSSION

Previous soil sampling activities conducted in 1994 indicated that there had been a release of petroleum hydrocarbons from the USTs and fuel dispensers located on the Lamb's of Camden property. A free product study also conducted in 1994 did not discover free product at the site.

Solutions-IES advanced six soil borings to further assess subsurface conditions in the proposed highway expansion area at Lamb's of Camden. During the sampling activities, Solutions-IES personnel encountered heavy staining and strong odors in four of the soil samples collected from the Geoprobe® borings, which was consistent with the high OVA readings (greater than 1000 ppm). The heaviest staining was encountered in the immediate vicinity of the fueling island at Geoprobe® borings GP-1E and GP-2E. However, the laboratory analytical results for soil samples collected from a depth of 0.6 to 1.2 m bgs at these two boring locations did not indicate high concentrations of petroleum compounds. The analytical results for the boring completed south/southwest of the fueling island (GP-3E) indicated elevated concentrations of both TPH-GRO and TPH-DRO at a depth of 1.2 to 1.8 m bgs. The TPH-DRO and TPH-GRO concentrations in GP-3E exceed the action levels for soil as identified in the NCDENR, Groundwater Section *Guidelines for the Investigation and Remediation of Soil and Groundwater* (NCDENR, July 2000) and exceed the UST closure levels of 10 mg/kg for TPH-DRO and TPH-GRO.[1]

The current assessment was limited to evaluating the presence or absence of petroleum contamination in the areas of the site within the proposed highway expansion area that were not previously investigated. Based on the previous and current data, Solutions-IES attempted to estimate the volume of soil that may be impacted at the site. Solutions-IES established a TPH threshold value of 10 mg/kg as a conservative

[1] NCDENR, Division of Waste Management, UST Section *Guidelines for Tank Closure*, December 2000.

indicator concentration of soil contamination that would likely have to be remediated with the understanding that:

- any detectable TPH concentrations are reportable;
- additional assessment activities may be required to define the nature and extent of the releases; and
- additional testing using Massachusetts Department of Environmental Protection (MADEP) Methods for the determination of Volatile and Extractable Petroleum Hydrocarbons (VPH and EPH) would be required to establish the Maximum Soil Contaminant Concentrations (MSCCs) for each of the hydrocarbon fractions[2]

Figure 3 shows our estimate of the lateral extent of soil impact within the proposed highway expansion area defined by previous and current TPH analyses. The proposed highway expansion area does not extend in to the immediate area surrounding the USTs where previous petroleum contamination was identified; therefore, impacts in this area are not shown on Figure 3. In general, the lateral extent was estimated as the midpoint between impacted and non-impacted boring locations. As shown on Figure 3, soils in the vicinity of the fueling island at the site appears to be impacted with petroleum hydrocarbons. Solutions-IES attempted to estimate the volume of affected soil in this area. Based on field observations and the limited available laboratory data, the average area of impacted soil appears to be approximately 50 m by 7 m. On average, the affected soil in the unsaturated zone appears to extend from approximately 0.6 m to the top of the water table at 1.5 m. Therefore, the approximate volume of impacted soil is estimated to be approximately 315 cubic meters (412 cubic yards). Additional sampling would be required to better estimate the vertical and horizontal extent of petroleum impact at the site.

Free product was observed in the one boring, GP-1E, where an attempt to collect a groundwater sample was made. Due to the presence of free product, a groundwater sample was not collected. At the request of the NCDOT, Solutions-IES notified Mr. Richard Powers with the WaRO on October 16, 2001of the free product discovery at the Lamb's of Camden property.

The current assessment was limited to evaluating the presence or absence of petroleum contamination in the NCDOT area of construction. Based on field observations, Solutions-IES attempted to delineate the lateral extent of affected soil around the fueling island in a north-south direction along U.S. Highway 158. However, complete delineation of the lateral or vertical extent of contamination in the soil or groundwater was not proposed or conducted. Without additional monitoring points, the direction of groundwater flow

[2] *Guidelines for Corrective Action, North Carolina Underground Storage Tank Section, Effective July 1, 2001*, State of North Carolina, Department of Environment and Natural Resources, DWM, UST Section, April 2001.

could not be determined. However, based on the topographic features and previous reports on file, it is inferred that groundwater is flowing to the west.

7.0 CONCLUSIONS AND RECOMMENDATIONS

This PSA was performed on behalf of the NCDOT for Lamb's of Camden located at 152 West U.S. Highway 158, Camden County, North Carolina. Based upon our file review, field observations at the time of the site visit, and laboratory results, we offer the following conclusions:

- Historical and current data indicate that soils near the USTs and fuel dispensers at the site have been impacted by petroleum hydrocarbons. During the recent field activities, the heaviest staining and odors were observed near the fuel dispensers within the proposed highway expansion area. Based on the limited data collected, the volume of contaminated soil near the fuel dispensers was estimated to be approximately 315 cubic meters (412 cubic yards). However, the laboratory results suggest that additional assessment or remedial action may be necessary.

- Phase-separated hydrocarbons were observed on the groundwater surface in the immediate vicinity of the fueling island at a depth of approximately 1.5 m (5 feet) bgs beneath NCDOT's proposed work area. The horizontal and vertical extent of contamination was not defined by the scope of this assessment. However, it is inferred that shallow groundwater further west beyond the areas of this assessment may also be impacted; areas west of the fueling island may not be in the area proposed for highway expansion. Remediation of the groundwater contamination may be required in the future.

8.0 REFERENCES

Environmental Investigations, P.A. (1994) Preliminary Site Assessment Report, Site 2: Lamb's of Camden; Widening of US 158 from Elizabeth City to Belcross.

PetroChem Recovery Services (1994). Initial Site Characterization Report, Lamb's of Camden, October 18, 1994.

NCDENR Division of Waste Management, Underground Storage Tank Section, Notice of Violation of 15A NCAC 2L.0115, Risk-Based Assessment and Corrective Action for Petroleum Underground Storage Tanks Regulations, Lamb's of Camden, January 29, 2001.