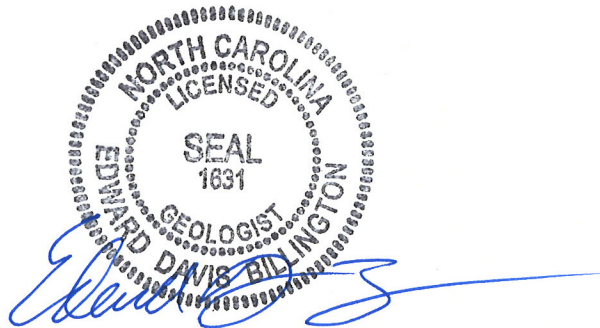


North Carolina Department of Transportation

**AIR EXCAVATION ACTIVITIES
ON PARCEL 132**

**State Project U-4020, WBS Element 35015.1.1
US 421 (King Street) from US 321 (Hardin Street)
to East of NC 194 (Jefferson Road) in Boone
Watauga County, North Carolina**



March 18, 2009
Project Number 08210020.07



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1.0 INTRODUCTION

Schnabel Engineering performed a geophysical survey on Parcel 132 in March, 2008, that included collection of EM61 metal detection data and ground-penetrating radar (GPR) data. The geophysical data indicated that a possible UST was located beneath a grassy island on the northwestern corner of the parcel. Geoprobe borings and laboratory analyses for petroleum products were also performed in the area of the potential UST. These studies were documented in Schnabel reports to the NCDOT dated May 2, 2008, and May 30, 2008.

The NCDOT requested that we confirm the presence of the UST and then proceed with UST closure.

2.0 FIELD METHODOLOGY AND DISCUSSION OF RESULTS

On March 4, 2009, Schnabel personnel relocated the center of the possible UST with DGPS and GPR. We observed Vaughn & Melton Consulting Engineers as they utilized their Vacmasters 1000 air excavation unit to remove soil from the possible UST location. The Vacmasters 1000 is a trailer-mounted unit that includes an air jetting wand to loosen the soil and a suction hose to pull the soil into a holding tank (Figure 1, top photo).

Vaughn & Melton removed the sod and began excavating the soil in an approximately 2-foot by 2-foot hole centered on the location of the center of the possible UST. At a depth of approximately 2 feet, we encountered a bent piece of metal that appeared to be an old section of guard rail (Figure 1, bottom photo). We removed the surrounding soil, but the piece of metal extended laterally into the undisturbed soil and was not able to be removed (Figure 2, top photo). We increased the size of the hole to approximately 4-foot by 2-foot and continued excavating downwards to determine if a UST was present beneath the scrap metal.

In addition to the scrap metal, a large boulder and several smaller boulders and cobbles were found in the hole and in the sides of the hole (Figure 2, bottom photo). At a depth of approximately 3.5 feet we encountered an asphalt layer. We attempted to chip through the asphalt and continue excavating downwards but the asphalt was underlain by hard weathered rock. At this point we contacted Cyrus Parker, from the NCDOT, with our findings. Mr. Parker agreed with our recommendation to backfill the hole and demobilize (Figure 3).

3.0 CONCLUSIONS

Our investigation at the location of the possible UST on Parcel 132 of Project U-4020 in Boone, NC indicates the following:

- The geophysical anomalies that had been recorded previously were likely caused by a piece of scrap metal and one or more boulders. The EM61 response was probably due to the piece of buried metal guard rail. The hyperbolic response seen on the GPR record was probably due to one or more of the boulders adjacent to the buried metal guard rail.
- Evidence of a UST was not found within the excavation limits at this location on Parcel 132.

4.0 LIMITATIONS

These services have been performed and this report prepared for the North Carolina Department of Transportation in accordance with generally accepted guidelines for conducting geophysical and geological surveys. It is generally recognized that the results of geophysical surveys are non-unique and may not represent actual subsurface conditions.



Start of air excavation with Vacmasters 1000 unit



Initial scrap metal encounter



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Watauga County, North Carolina

**PARCEL 132
PHOTOS OF
AIR EXCAVATION**

FIGURE 1



More of the scrap metal uncovered



Exposed boulder next to scrap metal



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**PARCEL 132
PHOTOS OF
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FIGURE 2



End of air excavation



Backfilled hole



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**PARCEL 132
PHOTOS OF
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FIGURE 3