AN ARCHAEOLOGICAL SURVEY OF THE FRONTLINE GEOSERVICES' MANNING 3-D SEISMIC SURVEY IN THE ANGELINA NATIONAL FOREST ANGELINA COUNTY, TEXAS

By

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AN ARCHAEOLOGICAL SURVEY OF THE FRONTLINE GEOSERVICES MANNING 3-D SEISMIC SURVEY IN THE ANGELINA NATIONAL FOREST ANGELINA COUNTY, TEXAS

BVRA Project Number 08-21

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ABSTRACT

An archaeological survey was performed in compartments 44 and 48 of the Angelina National Forest by archaeologists representing Brazos Valley Research Associates (BVRA) and Dixie Environmental Services Company, LP. (DESCO) in June of 2008 under an Archaeological Resource Protection Act (ARPA) permit. Two separate areas totaling 1,369.6 acres were examined. The areas were investigated through a visual inspection accompanied by shovel testing at source points and along access routes. One area containing trash that had been dumped along an abandoned logging road was observed. This area is referred to in this report as Locality 1. The trash scatter is not considered to be significant. Therefore, it is recommended that the seismic survey be allowed to proceed as planned. Copies of the final report are on file at the Texas Historical Commission (THC), the Texas Archeological Research Laboratory (TARL), the National Forests and Grasslands in Texas, DESCO, and BVRA. The project notes and other records have been placed in permanent curation at the Supervisors Office of the National Forests and Grasslands in Texas.

ACKNOWLEDGMENTS

I am grateful to those who made this project possible. At the National Forests and Grasslands of Texas, John E. Ippolito (Public Services Team Leader) and Barbara Williams (Heritage Program Manager) assisted the Principal Investigator in his application for an ARPA permit as well as providing logistical support. Additional support was provided by Phyllis Wolf, District Archaeologist at the Sabine National Forest. At Frontline GeoServices, we thank Paige Sanderson for providing project information. The staff at DESCO provided project area maps and financial support for the survey crew that consisted of Edward P. Baxter, Matt Carter, Lisa Shaddox, Robert Vercher, and Anna Warren. Jean Hughes checked the TARL files for previously recorded sites and surveys in the project area. Lili G. Lyddon and Edward P. Baxter prepared the figures in this report. Rita D. Fields prepared the records for curation.

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INTRODUCTION

Frontline GeoServices plans to conduct a 3-D seismic survey in the Angelina National Forest in Angelina County, Texas (Figure 1). The project area is depicted on two USGS 7.5' topographic quadrangles. They are Manning (3194-214) (Figure 2) and Zavalla (3194-123) (Figure 3). The purpose of the seismic survey is to provide a high-resolution image of the subsurface geological features that will allow the client to effectively evaluate the hydrocarbon reserves underlying the project area. This survey requires the deployment of motion sensing devices (receivers) that will be deployed at regular intervals (165 feet) with spacing between receiver lines of 1650 feet. An energy source (*Pentolite*) will be placed at regular intervals (233.35 feet) in a diagonal pattern. The charge depth and configuration proposed for the project area consists of single holes (80 to 100 feet deep) drilled at intervals of 1815 feet along each source line.

The seismic survey will be conducted by several crews marking the proposed sites for source holes and locations of geophones. They will use GPS, inertial, and/or conventional surveying methods, and hand-clearing of vegetation will be necessary along source and receiver lines within some portions of the project area. Clearing of vegetation may be necessary in some areas to obtain line-of-sight for conventional surveying and/or to allow for the safe passage of crews along seismic lines. Brush, small trees, and branches will be cut through the use of chainsaws and/or machetes.

Drilling will begin shortly after the survey has been completed. It will be accomplished using highland drilling rigs. During this phase of operations, drills will maneuver through the project area from source point to source point following the route of least resistance. No mechanized clearing will be conducted ahead of the drilling equipment. Some small trees and shrubs may be impacted by the path of the drills.

One hole will be drilled at each source point location, loaded with the appropriate charge, and plugged. The diameter of a drilled hole will be about four inches. Each hole will be loaded with a 5.5-pound charge of *Pentolite*, and the hole will be plugged with bentonite for the prevention of commingling of surface and ground water.

Drilling will be followed by recording operations, which are tentatively scheduled to begin in July of 2008. This task will be supported by helicopter to minimize impacts to the terrain. The helicopters will lower cache bags containing equipment along the receiver lines, and crews will deploy this equipment using All Terrain Vehicles, where permitted, or on foot. Equipment will consist of data recording boxes, geophones, and cables. Once enough equipment is laid out to complete a recording patch, the recording crew will begin detonating charges.

The charge in each source hole will be remotely detonated, one at a time, and the resulting energy wave recorded. Crewmembers will travel through the area, hook a shooting pack to each electronic detonating wire (cap), and detonate each charge.

Clean up will be conducted in conjunction with all phases of operations. After charges are detonated and recording is completed in each swath (area between two receiver lines), all equipment, trash, and flagging will be completely removed from the area and placed in cached bags for removal by helicopter. Equipment removed from lines in the west section of the recording patch will be deployed along lines east of the recording patch to allow recording operations to continue in that direction. Project impacts are expected to be minimal and temporary in nature.

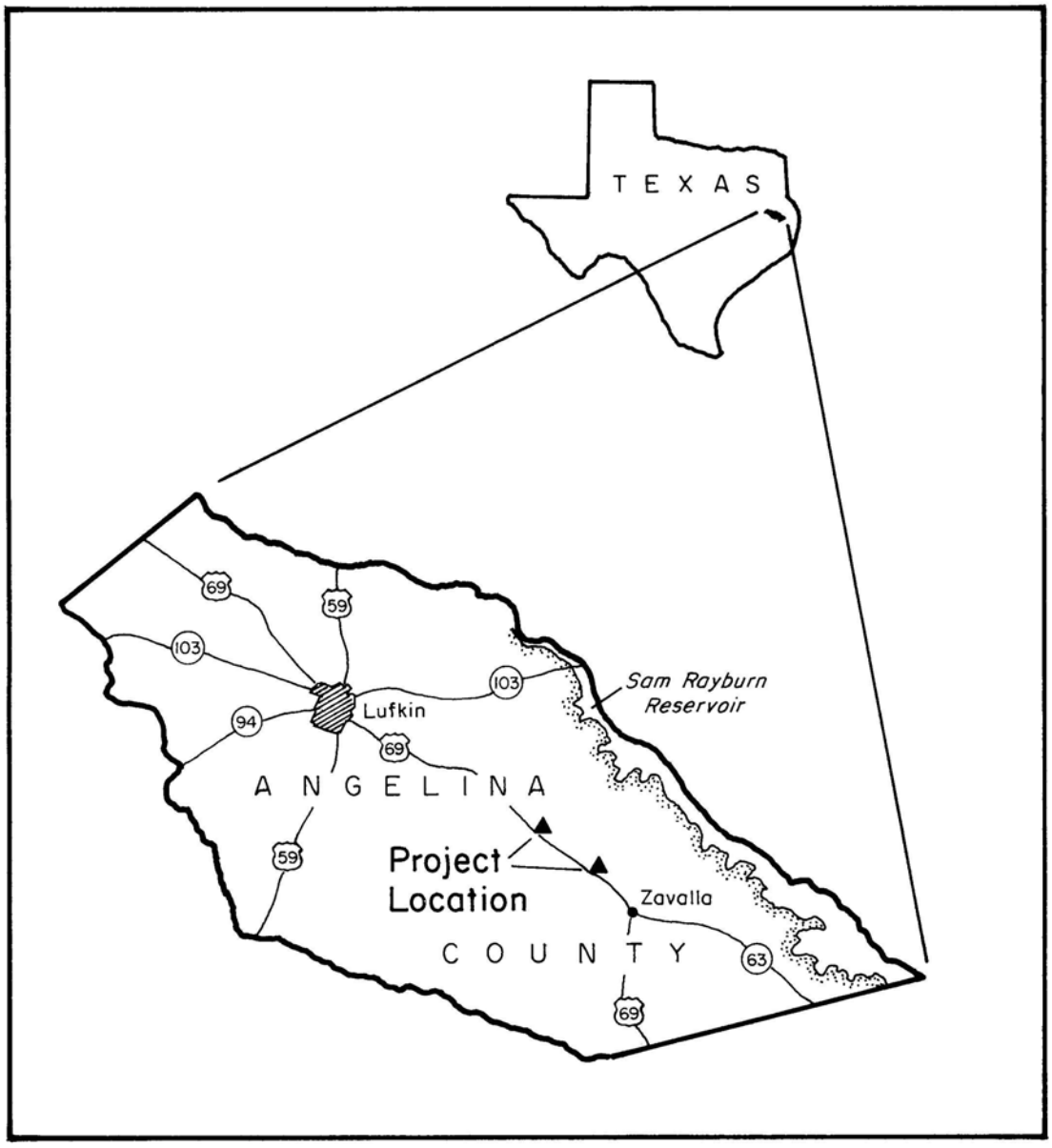

Figure 1. General Location

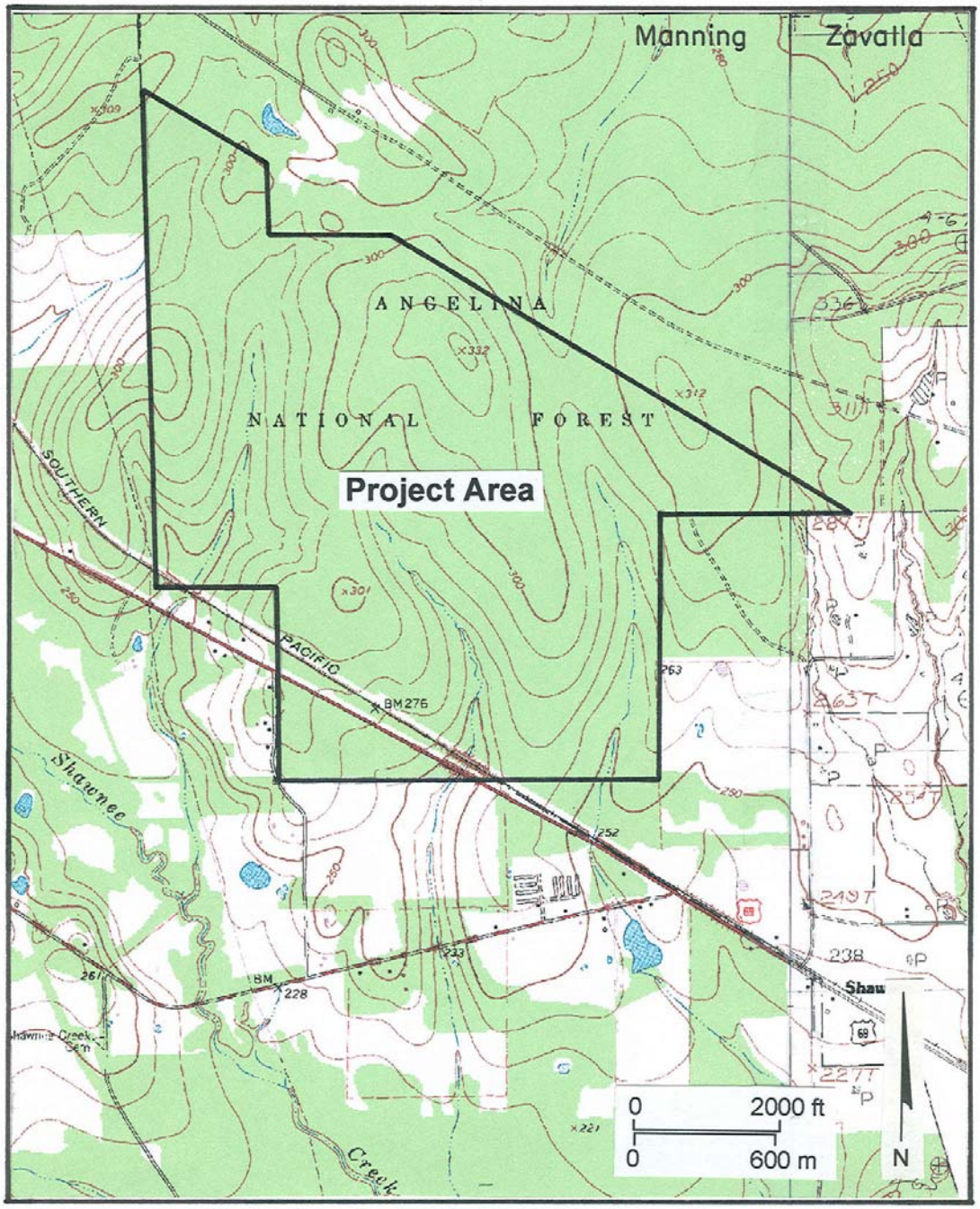

Figure 2. Project Area A on Manning Topographic Quadrangle

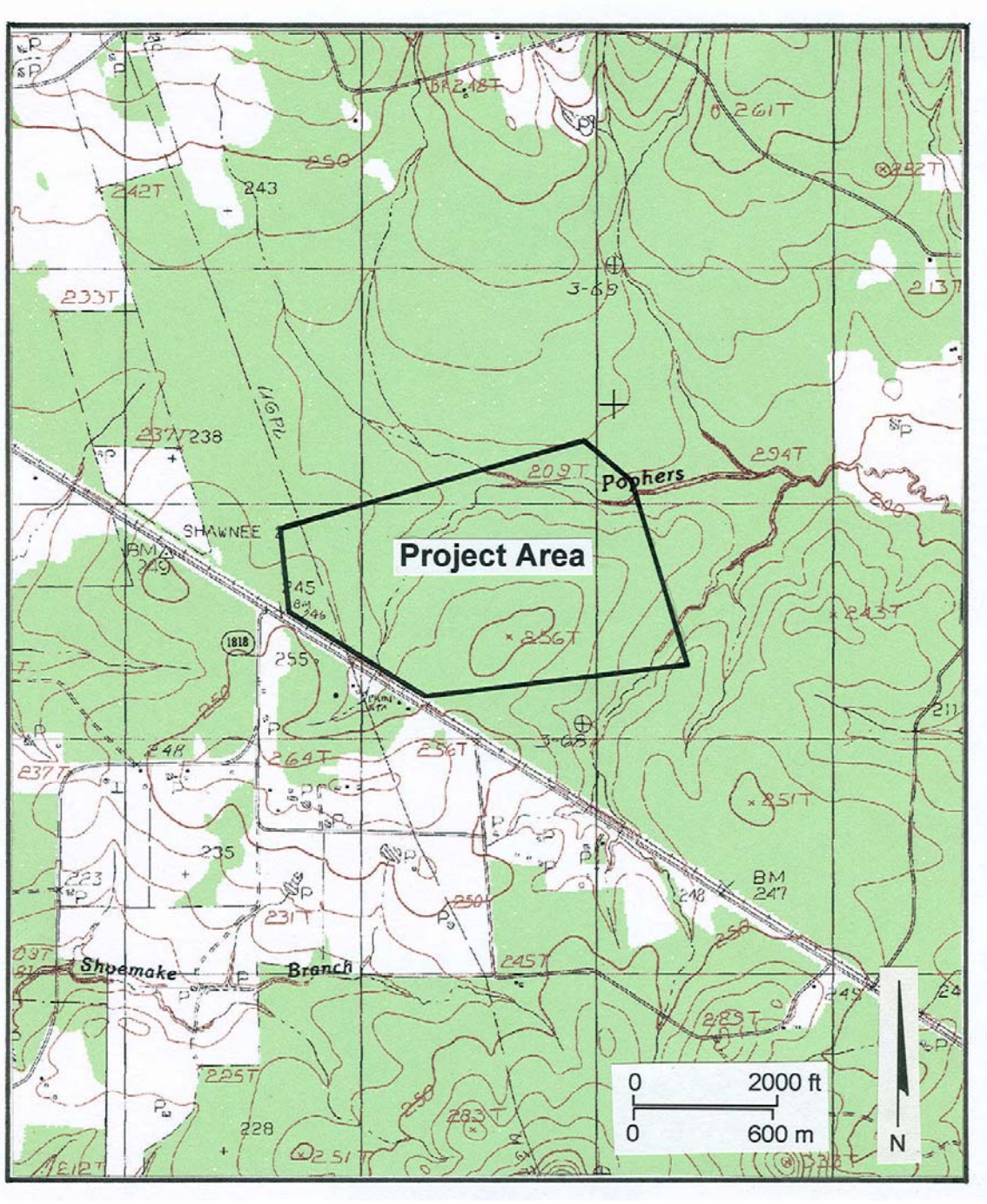

Figure 3. Project Area B on Zavalla Topographic Quadrangle

ENVIRONMENTAL SETTING

The following general discussion was taken from the Soil Survey of Angelina County (Dolezel 1988:1-4). Angelina County is located in the central part of East Texas. The northern and southern parts of the county have a dendritic drainage system with many large streams. Two rivers, Neches and Angelina, drain the county. In Area A, there are two unnamed tributaries that connect with Shawnee Creek to the south. In the county, elevation ranges from about 100 feet in the south near the Neches River to about 460 feet in the northern part of the county. Angelina County is in the East Texas Timberlands Land Resource Area, and forest products are a major part of the local economy. Soils in this area formed mainly under forest vegetation in a humid environment, and most are light in color and low in natural fertility. Nearly level areas are often wet, and moderately steep-to-steep areas tend to erode easily. The county has long, hot summers because of moist tropical air from the Gulf of Mexico persistently covers the area. Winters are cool and fairly short. Rainfall is fairly heavy throughout the year, and prolonged droughts are rare. The total annual precipitation is 41 inches. Of this, 21 inches (50%) usually falls in April through September. In winter, the average temperature is 50 degrees Fahrenheit, and the average daily minimum temperature is 39 degrees. In summer, the average temperature is 82 degrees, and the average daily maximum temperature is 93 degrees.

According to the soil survey for Angelina County (Dolezel 1988:Sheets 24 and 30), Area A contains six soil types. These are Alazan very fine sandy loam, 0 to 4 percent slopes (AaB); Bernaldo fine sandy loam, 0 to 3 percent slopes (BaB); Fuller fine sandy loam, 1 to 4 percent slopes (FfB); Herty very fine sandy loam, 1 to 5 percent slopes (HeB); Keltys fine sandy loam, 1 to 5 percent slopes (KcB); and Moswell loam, 1 to 5 percent slopes (MsB). The majority of the project area contains AaB and BaB soils, and these are discussed below. Figure 4 depicts the soils in Area A.

AaB soils are found on terraces and low uplands. This soil is described by Dolezel (1988:23-24) as a soil formed in sediment partly reworked by wind. This soil has a very fine sandy loam surface layer about 16 inches thick. The subsoil, to a depth of 72 inches, is a sandy clay loam. AaB soils have a high available water capacity, are moderately permeable, are somewhat poorly drained, and runoff is slow to medium. This soil is saturated in late winter and early spring. The water table is found at a depth of 18 to 30 inches.

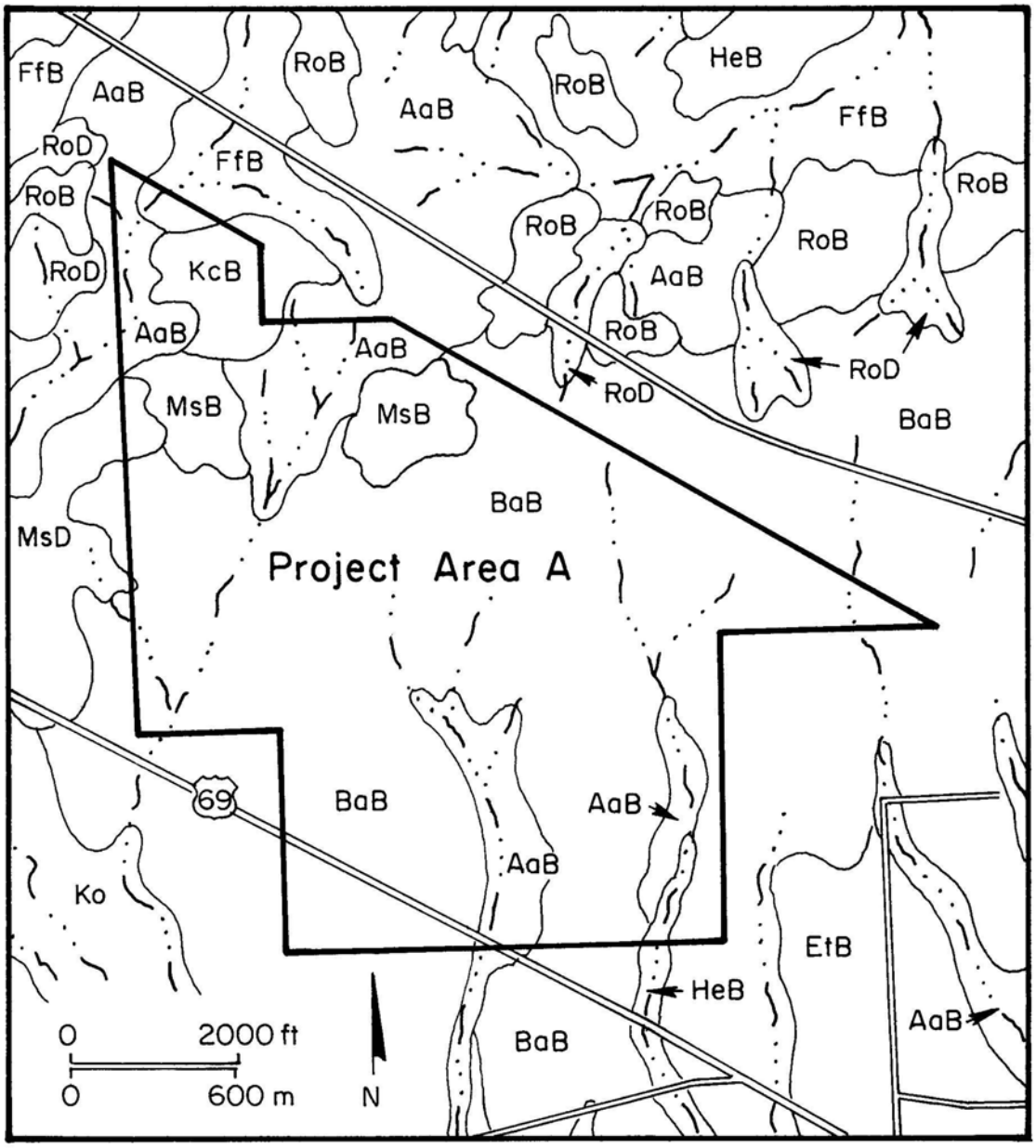

Figure 4. Area A Soils

BaB soils are found on broad, nearly level, and gently sloping terraces near all major streams. This soil is described by Dolezel (1988:26) as a soil that formed in old wind-modified sediment. Some areas have low mounds, especially those in virgin areas. This soil has a very fine sandy loam surface layer about 17 inches thick. The subsoil, to a depth of 65 inches, is a sandy clay loam. BaB soils have a high available water capacity, are moderately permeable, are well drained, and runoff is slow. This soil is saturated in at a depth of four to six feet in late winter and early spring.

According to the soil survey for Angelina County (Dolezel 1988:Sheet 30), Area B contains three soil types. These are Alazan very fine sandy loam, 0 to 4 percent slopes (AaB); Herty very fine sandy loam, 1 to 5 percent slopes (HeB); and Moswell loam, 1 to 5 percent slopes (MsB). The majority of the project area contains AaB and MsB soils, and these are discussed below. Figure 5 depicts the soils in Area B.

AaB soils are found on terraces and low uplands. This soil is described by Dolezel (1988:23-24) as a soil formed in sediment partly reworked by wind. This soil has a very fine sandy loam surface layer about 16 inches thick. The subsoil, to a depth of 72 inches, is a sandy clay loam. AaB soils have a high available water capacity, are moderately permeable, are somewhat poorly drained, and runoff is slow to medium. This soil is saturated in late winter and early spring. The water table is found at a depth of 18 to 30 inches.

MsB soils are found on gently sloping, broad interstream divides. This soils developed in marine shales and clays. This soil is described by Dolezel (1988:51-52) as containing a loam surface layer about five inches thick. The subsoil is sticky and plastic clay to a depth of 37 inches and platy clay to a depth of 45 inches. The underlying material, to a depth of about 70 inches, is shale. Gypsum and other salts are found in this soil below a depth of 23 inches. MsB soils have a medium available water capacity, are very slowly permeable, moderately well drained, and water erosion is a major hazard.

At the time of this survey the project area consisted of woods and a few cleared areas. Much of the area had been disturbed by past lumbering activities. Figure 6 depicts the field conditions in Area A.

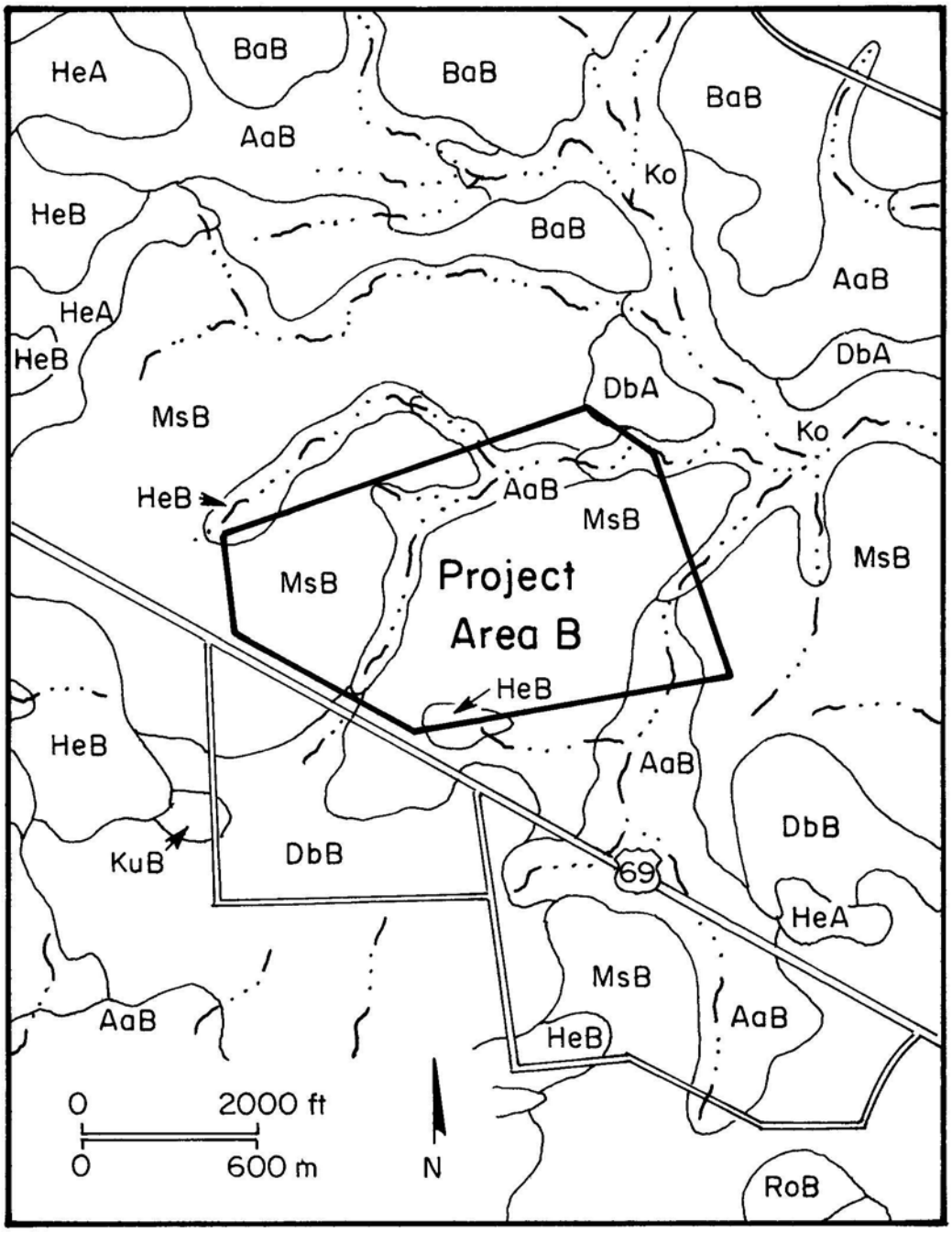

Figure 5. Area B Soils

Figure 6. View of Project Area (Area A)

ARCHAEOLOGICAL BACKGROUND

According to a recently published planning document for the Eastern Planning Region of Texas (Kenmotsu and Perttula 1993:Figure 1.1.2), Angelina County is situated within the Northeast Texas archeological study region. In 1985, according to a statistical overview prepared by the Texas Historical Commission (Biesaart et al. 1985:107), Angelina County contained 52 recorded sites. The site files at TARL revealed 172 recorded sites at the time of this survey. In 1985, 1 site in the county had been excavated, 21 had been tested by hand, 1 had been tested by machine, 30 sites had been dug by collectors, and 46 had been surface collected. Nine recorded prehistoric sites in the county were listed as Archaic, and 41 sites were listed as Late Prehistoric (Biesaart et al. 1985:108). Five sites contained burials.

In 1991, an evaluation was made of significant sites in the Northeast Texas Archeological Region (Kenmotsu and Perttula 1993:Table 2.1.1). At this time, Angelina County contained 121 recorded prehistoric sites. Of this number, 19 were listed as not significant, 67 as unknown significance, 35 as probably significant, and 22 as significant. Today, the number of sites in the county exceeds 190.

The archaeological significance of Angelina County is partially reflected in the following statistics. In 1993, the county contained the second highest number of important known hunter-gatherer sites in Northeast Texas (n=3) (Kenmotsu and Perttula 1993:Figure 2.3.3) and also contained at least 13 important Late Caddoan sites (n=13) (Kenmotsu and Perttula 1993:Figure 2.5.2). Unfortunately, there are major forces that continue to threaten the integrity of archaeological sites in Angelina County. These include population growth (City of Lufkin and surrounding area), highway construction, surface lignite mining, Sam Rayburn Reservoir (formerly McGee Bend), and the lumbering industry.

Although private contract archaeology firms have played a part, most of the archaeological sites known to exist in Angelina County have been identified by surveys associated with reservoir construction and in-house projects by National Forest personnel. The earliest archaeological research in the area was performed in the late 1930s and early 1940s by researchers from The University of Texas at Austin. At that time, prehistoric cemeteries and mound sites were considered to be of primary importance. From the late 1940s until the mid 1970s, most of the archaeological research in East Texas was carried out in connection with reservoir construction. In 1948, Robert L. Stephenson published the results of his work at the proposed McGee Bend Reservoir in Angelina, Jasper, Nacogdoches, Sabine, and San Augustine counties (Stephenson 1948a, 1948b). At the time, this was the only professional archaeological investigation in the county.

In the 1970s, Ross Fields (1979) presented an overview of the cultural resources of the Davy Crockett, Sam Houston, Angelina, and Sabine national forests of Texas. This document provides a brief discussion of all sites in each forest, and 23 sites in Angelina County are mentioned. Another important document for this area is a cultural resource overview of the national forests in Texas by John Ippolito (1983). Of particular relevance to this project is Ippolito's Figure 21 entitled "Drainage Systems & Probability Zones, Angelina National Forest, Texas."

Although no part of the project area is within the Angelina National Forest, Ippolito's figure covers areas within 10 miles of the City of Lufkin. He considers the Neches and Angelina rivers to be high probability areas with several streams in the county listed as medium probability areas. According to Ippolito (personal communication), there are several drainages in the county such as Hurricane Creek and Biloxi Creek that should be considered to be medium to high probability areas. Ephemeral streams, such as those in the current project area, are viewed by Ippolito as low probability areas.

A check of the Archeological Sites Atlas revealed one previous survey in the vicinity of the current project area. This small area survey was performed for the United States Department of Agriculture, Rural Development. There is no information on the Atlas that documents the size of the project area, name of investigating firm, or date of survey. This area is approximately 452 meters southwest of the current project area.

It is beyond the scope of this report to discuss in detail the archaeological background of Angelina County, especially when numerous contract reports are available. The interested reader is referred to the statistical overview (Biesaart et al. 1985), the planning document published by the THC (Kenmotsu and Perttula 1993), and other reports cited above for more detailed information regarding the archaeology of Angelina County. According to Barbara Williams, there has been no activity in the project area. She also stated that no major surveys have been conducted in the vicinity.

METHODS

This archaeological survey was carried out in June of 2008. The fieldwork began on June 2, 2008 and was terminated on June 9, 2008. Shovel tests were excavated at each proposed source point and at intervals of 37 meters along access, except for those areas along old roads, trails, or disturbed fire lanes. All excavated earth was screened using ¼ inch hardware cloth and recorded on a "Log of Areas Investigated" that appears as Appendix I to this report. The survey crew recorded shovel test data on a log that was turned in at the end of the day. Each surveyor began the day with a new set of shovel test numbers. As a result, every field shovel test log begins with shovel test number 1. The tests (or areas investigated) were numbered consecutively in the left margin of each log. These numbers correspond with those in the first column in the Log of Areas Investigated (Area). If a source point was not tested, the phrase "no test" appears in the sixth column (Shovel Test Depth). On the original shovel test logs there is more information regarding soil types than is present in the Log of Areas Investigated.

The project area consists of two separate tracts, which are described in this report as Area A and Area B. Area A is a 1043.2-acre tract located in Compartment 44 of the Angelina National Forest, and Area B is a 326.4-acre tract located in Compartment 48 of the Angelina National Forest. The field methods for each area were identical. Due to the thick ground cover, the surface visibility was poor in most cases, and shovel testing was the only way to ensure that no sites were missed. In all, 119 source points and their access routes were investigated, and 363 shovel tests were excavated. Shovel tests varied in depth from less than 10 cm to 100 cm. The locations of the 363 shovel tests are depicted on two maps that appear in this report as Appendix II. The project was also documented by field notes, logs, and digital photography.

Historic trash was observed in Area A, and it was given the field number LS-01. The area was inspected through a surface inspection and nine shovel tests. The crew looked for signs of a house such as domestic plants and features. A map was made in the field, and the locality plotted on the topographic map. Following a discussion with Barbara Williams, it was decided to refer to this trash dump or scatter as Locality 1. Therefore, no site trinomial was assigned. This trash scatter contains some artifacts that date to modern times and some that may be older than 50 years. Since this locality is not considered to be significant, no artifacts were collected for analysis. They were described in the field. Figure 7 is a map that depicts the locality and the nine shovel tests, and Figure 8 illustrates a portion of the dump. The shovel test log for this locality appears in this report as Appendix III. These tests do not appear on the Log of Areas Investigated.

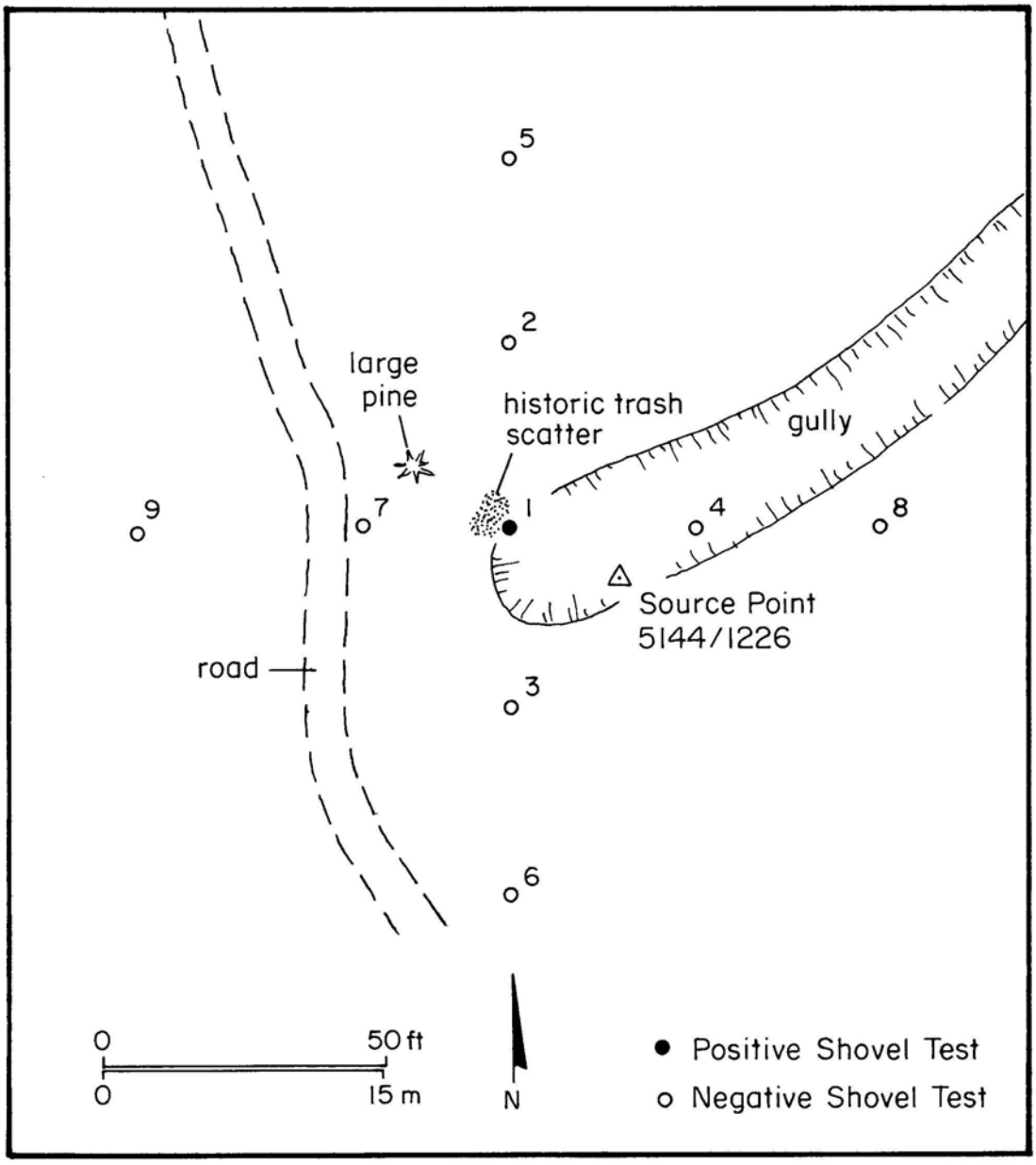

Figure 7. Locality 1 (Map)

Figure 8. Locality 1 (View of Glass Bottles)

RESULTS AND CONCLUSIONS

The records check at TARL revealed that no previously recorded sites are present within any portion of the project area as currently defined. A review of the literature revealed that significant prehistoric and historic sites are present in nearby areas of Angelina County. One small concentrated trash scatter or dump was recorded in Area A at source point 5144/1226. The trash was found adjacent to an abandoned logging road, and it represents an unauthorized dumping event on Forest Service property. This area is referred to in this report as Locality 1, and it contains the remains of glass bottles and jars, a metal pail, paint can, small aluminum coffee pot, stove burner parts, brown glass and clear glass. These artifacts date to the 20th century. A visual search of the area did not encounter any features or domestic plants that are typically found at a house site. The nine shovel tests excavated in the area were dug through sand, sandy loam, and sandy clay to a maximum depth of 40 cm. Only one test was positive. A wire nail was recovered at 10 cm below the surface in Shovel Test 1. Trash dumps are a common occurrence, and Locality 1 is not viewed as significant.

RECOMMENDATIONS

Only one area containing artifacts was found in the project area. The trash scatter referred to as Locality 1 is not significant. Therefore, it is recommended that construction be allowed to proceed as planned. It is always possible that archaeological sites are missed during any archaeological survey. Should evidence of a prehistoric or historic site in the project area be discovered during construction, all work in this area should cease immediately until the Texas Historical Commission can evaluate the situation. This project was performed according to the Minimum Survey Standards as defined by the THC.

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Appendix I - Log of Areas Investigated

Area	Source Point Receiver Point	Source Point	Access	Offset: Distance / Direction	Shovel Test Depth*	Date	Recorders	Comments
1	5155/1201	x		none	30 cm	06/02/08	Entire Crew	clay at 30 cm
2	5155/1201		x	37m NE	30 cm	06/02/08	Entire Crew	clay at 30 cm
3	5155/1202	x		none	30 cm	06/02/08	Entire Crew	clay at 30 cm
4	1201/5355		x	none	30 cm	06/02/08	Entire Crew	clay at 30 cm
5	5155/1200	x		none	30 cm	06/02/08	Entire Crew	clay at 30 cm
6	1201/5355		x	74m SSE	30 cm	06/02/08	Entire Crew	clay at 30 cm
7	1201/5355		x	37m SSE	30 cm	06/02/08	Entire Crew	clay at 30 cm
8	5144/1205		x	37m NE	30 cm	06/03/08	Ed Baxter	clay at 30 cm
9	5144/1207	x		none	30 cm	06/03/08	Ed Baxter	clay at 30 cm
10	5144/1208		x	37m NE	40 cm	06/03/08	Ed Baxter	clay at 40 cm
11	5133/1221	x		none	30 cm	06/03/08	Ed Baxter	clay at 30 cm
12	5133/1221		x	37m NE	40 cm	06/03/08	Ed Baxter	clay at 40 cm
13	5133/1222	x		none	10 cm	06/03/08	Ed Baxter	clay at 10 cm
14	5133/1222		x	37m NE	<10 cm	06/03/08	Ed Baxter	clay at surface
15	5133/1223	x		none	<10 cm	06/03/08	Ed Baxter	clay at surface
16	5133/1223		x	37m NE	40 cm	06/03/08	Ed Baxter	clay at 40 cm
17	5133/1224	x		none	40 cm	06/03/08	Ed Baxter	clay at 40 cm
18	5155/1202		x	37m NE	55 cm	06/03/08	Matt Carter	clay at 55 cm
19	5155/1203		x	37m NE	30 cm	06/03/08	Matt Carter	clay at 30 cm
20	5155/1204		x	37m NE	30 cm	06/03/08	Matt Carter	clay at 30 cm
21	5155/1205		x	37m NE	50 cm	06/03/08	Matt Carter	clay at 50 cm
22	5155/1206		x	37m NE	35 cm	06/03/08	Matt Carter	clay at 35 cm
23	5144/1218		x	37m NE	25 cm	06/03/08	Matt Carter	clay at 25 cm
24	5144/1220	x		none	55 cm	06/03/08	Matt Carter	clay loam at 45 cm
25	5144/1221		x	37m NE	40 cm	06/03/08	Matt Carter	clay at 40 cm
26	5144/1223	x		none	60 cm	06/03/08	Matt Carter	clay loam at 55 cm
27	5133/1227	x		1516 ft N	35 cm	06/03/08	Matt Carter	sandy clay at 35 cm
28	5133/1227		x	35m E	70 cm	06/03/08	Matt Carter	sandy clay at 65 cm
29	5133/1228	x		1350 ft N	20 cm	06/03/08	Matt Carter	clay at 20 cm
30	5133/1228		x	35m SE	40 cm	06/03/08	Matt Carter	clay at 40 cm
31	5133/1229	x		1155 ft N	30 cm	06/03/08	Matt Carter	clay at 30 cm
32	5144/1205	x		none	25 cm	06/03/08	Robert Vercher	clay at 25 cm
33	5144/1206	x		none	25 cm	06/03/08	Robert Vercher	clay at 25 cm
34	5144/1207		x	37m NE	35 cm	06/03/08	Robert Vercher	clay at 35 cm
35	5144/1209	x		18 ft S	45 cm	06/03/08	Robert Vercher	clay at 45 cm
36	1211/5354		x	none	30 cm	06/03/08	Robert Vercher	clay at 30 cm
37	5144/1211	x		none	30 cm	06/03/08	Robert Vercher	clay at 30 cm
38	5144/1211		x	37m NE	30 cm	06/03/08	Robert Vercher	clay at 30 cm
39	5144/1212	x		none	35 cm	06/03/08	Robert Vercher	clay at 35 cm
40	5144/1213		x	37m NE	35 cm	06/03/08	Robert Vercher	clay at 35 cm
41	5144/1214		x	37m NE	45 cm	06/03/08	Robert Vercher	clay at 45 cm
42	5144/1215		x	37m NE	35 cm	06/03/08	Robert Vercher	clay at 35 cm
43	5144/1216		x	37m NE	50 cm	06/03/08	Robert Vercher	clay at 50 cm
44	5144/1217		x	37m NE	30 cm	06/03/08	Robert Vercher	clay at 30 cm
45	5144/1219		x	37m NE	35 cm	06/03/08	Robert Vercher	clay at 35 cm
46	1221/5364		x	none	60 cm	06/03/08	Robert Vercher	roots at 60 cm
47	5144/1222		x	37 m NE	45 cm	06/03/08	Robert Vercher	clay at 45 cm
48	5144/1223		x	37m NE	60 cm	06/03/08	Robert Vercher	clay at 60 cm

Area	Source Point Receiver Point	Source Point	Access	Offset: Distance / Direction	Shovel Test Depth*	Date	Recorders	Comments
49	5144/1225		x	37m NE	35 cm	06/03/08	Robert Vercher	clay at 35 cm
50	5144/1226		x	37m NE	30 cm	06/03/08	Robert Vercher	clay at 30 cm
51	5144/1227		x	37m NE	35 cm	06/03/08	Robert Vercher	clay at 35 cm
52	5144/1204	x		329 ft N	20 cm	06/03/08	Lisa Shaddox	clay at 20 cm
53	5144/1206		x	37m NE	20 cm	06/03/08	Lisa Shaddox	clay at 20 cm
54	5144/1208	x		none	30 cm	06/03/08	Lisa Shaddox	clay at 30 cm
55	5144/1210	x		none	35 cm	06/03/08	Lisa Shaddox	clay at 25 cm
56	5144/1212		x	37m NE	20 cm	06/03/08	Lisa Shaddox	clay at 20 cm
57	5144/1213	x		none	20 cm	06/03/08	Lisa Shaddox	clay at 20 cm
58	5144/1214	x		none	55 cm	06/03/08	Lisa Shaddox	clay at 55 cm
59	5144/1215	x		none	40 cm	06/03/08	Lisa Shaddox	clay at 40 cm
60	5144/1216	x		none	60 cm	06/03/08	Lisa Shaddox	clay at 60 cm
61	5144/1217	x		none	30 cm	06/03/08	Lisa Shaddox	clay at 30 cm
62	5144/1218	x		none	20 cm	06/03/08	Lisa Shaddox	clay at 20 cm
63	5144/1219	x		none	20 cm	06/03/08	Lisa Shaddox	clay at 20 cm
64	5144/1221	x		none	30 cm	06/03/08	Lisa Shaddox	clay at 30 cm
65	5144/1222	x		none	55 cm	06/03/08	Lisa Shaddox	clay at 55 cm
66	5144/1224	x		164 ft S	30 cm	06/03/08	Lisa Shaddox	clay at 30 cm
67	5144/1224		x	37m NE	30 cm	6/3/2008	Lisa Shaddox	clay at 30 cm
68	5144/1225	x		none	35 cm	06/03/08	Lisa Shaddox	clay at 35 cm
69	5144/1226	x		none	20 cm	06/03/08	Lisa Shaddox	clay at 20 cm
70	5144/1227	x		none	40 cm	06/03/08	Lisa Shaddox	clay at 40 cm
71	5144/1228	x		none	40 cm	06/03/08	Lisa Shaddox	clay at 40 cm
72	5155/1203	x		none	35 cm	06/03/08	Anna Warren	clay at 30 cm
73	5155/1204	x		none	25 cm	06/03/08	Anna Warren	clay at 20 cm
74	5155/1205	x		none	40 cm	06/03/08	Anna Warren	clay at 35 cm
75	5155/1206	x		none	30 cm	06/03/08	Anna Warren	clay at 30 cm
76	5155/1209	x		none	25 cm	06/04/08	Lisa Shaddox	clay at 25 cm
77	5155/1210	x		none	20 cm	06/04/08	Lisa Shaddox	clay at 20 cm
78	5155/1211	x		none	20 cm	06/04/08	Lisa Shaddox	clay at 20 cm
79	5155/1212	x		none	30 cm	06/04/08	Lisa Shaddox	clay at 30 cm
80	5155/1213	x		none	30 cm	06/04/08	Lisa Shaddox	clay at 30 cm
81	5155/1214	x		none	45 cm	06/04/08	Lisa Shaddox	sandy clay at 45 cm
82	5155/1215	x		none	25 cm	06/04/08	Lisa Shaddox	sandy clay at 25 cm
83	5155/1216	x		none	25 cm	06/04/08	Lisa Shaddox	sandy clay at 25 cm
84	5155/1217	x		none	30 cm	06/04/08	Lisa Shaddox	sandy clay at 30
85	5155/1218	x		none	20 cm	06/04/08	Lisa Shaddox	sandy clay at 20 cm
86	5155/1219	x		none	30 cm	06/04/08	Lisa Shaddox	sandy clay at 30 cm
87	5155/1220	x		none	25 cm	06/04/08	Lisa Shaddox	sandy clay at 25 cm
88	5155/1221	x		none	20 cm	06/04/08	Lisa Shaddox	sandy clay at 20 cm
89	5166/1214	x		158 ft S	no test	06/04/08	Lisa Shaddox	in disturbed road
90	5166/1213	x		none	no test	06/04/08	Lisa Shaddox	in disturbed road
91	5166/1212	x		194 ft N	no test	06/04/08	Lisa Shaddox	in disturbed road
92	5166/1210	x		630 ft N	no test	06/04/08	Lisa Shaddox	in ditch
93	5177/1207	x		640 ft S	no test	06/04/08	Lisa Shaddox	in disturbed road
94	5177/1206	x		461 ft S	no test	06/04/08	Lisa Shaddox	in ditch
95	5177/1201	x		none	30 cm	06/04/08	Lisa Shaddox	sandy clay at 30 cm
96	5155/1208		x	37 m NE	35 cm	06/04/08	Matt Carter	clay at 35 cm
97	5155/1209		x	37m NE	30 cm	06/04/08	Matt Carter	clay at 30 cm
98	1211/5365			none	40 cm	06/04/08	Matt Carter	clay at 40 cm
99	5155/1211		x	43m NE	45 cm	06/04/08	Matt Carter	clay at 45 cm
100	5155/1212		x	37m NE	25 cm	06/04/08	Matt Carter	sandy clay at 25 cm

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101	5155/1213		x	37m NE	30 cm	06/04/08	Matt Carter	sandy clay at 30 cm
102	5155/1214		x	37m NE	30 cm	06/04/08	Matt Carter	sandy clay at 30 cm
103	5155/1215		x	37m NE	30 cm	06/04/08	Matt Carter	sandy clay at 25 cm
104	5155/1216		x	37m NE	30 cm	06/04/08	Matt Carter	clay loam at 30 cm
105	5155/1217		x	37m NE	30 cm	06/04/08	Matt Carter	silty clay at 30 cm
106	5155/1218		x	37m NE	40 cm	06/04/08	Matt Carter	wet clay loam at 40 cm
107	5155/1219		x	37m NE	30 cm	06/04/08	Matt Carter	clay loam at 30 cm
108	1221/5375			none	30 cm	06/04/08	Matt Carter	silty clay loam at 30 cm
109	5166/1211	x		332 ft N	30 cm	06/04/08	Matt Carter	sandy clay at 30 cm
110	5177/1205	x		293 ft S	30 cm	06/04/08	Matt Carter	sandy clay at 25 cm
111	5177/1204	x		141 fe S	no test	06/04/08	Matt Carter	in gravel road
112	5177/1203	x		26 ft S	no test	06/04/08	Matt Carter	in gravel road
113	5177/1202	x		30 ft N	no test	06/04/08	Matt Carter	in ditch
114	1201/5378		x	15m S	30 cm	06/04/08	Matt Carter	clay loam at 25 cm
115	1201/5377		x	none	30 cm	06/04/08	Matt Carter	sandy clay at 30 cm
116	5166/1204	x		none	30 cm	06/04/08	Robert Vercher	clay at 30 cm
117	5166/1204		x	37m NE	20 cm	06/04/08	Robert Vercher	clay at 20 cm
118	5166/1205	x		none	30 cm	06/04/08	Robert Vercher	clay at 30 cm
119	5166/1205		x	37m NE	35 cm	06/04/08	Robert Vercher	clay at 35 cm
120	5166/1206		x	37m NE	30 cm	06/04/08	Robert Vercher	clay at 30 cm
121	5166/1207		x	37m NE	35 cm	06/04/08	Robert Vercher	clay at 35 cm
122	5166/1208		x	37m NE	25 cm	06/04/08	Robert Vercher	roots at 25 cm
123	5177/1194	x		none	25 cm	06/04/08	Robert Vercher	clay at 25 cm
124	5177/1194		x	37m NE	15 cm	06/04/08	Robert Vercher	clay at 15 cm
125	5177/1195	x		none	25 cm	06/04/08	Robert Vercher	clay at 25 cm
126	5177/1195		x	37m NE	20 cm	06/04/08	Robert Vercher	clay at 20 cm
127	5177/1196	x		none	25 cm	06/04/08	Robert Vercher	clay at 25 cm
128	5177/1196		x	37m NE	15 cm	06/04/08	Robert Vercher	clay at 15 cm
129	5177/1197	x		none	30 cm	06/04/08	Robert Vercher	clay at 30 cm
130	5177/1197		x	37m NE	no test	06/04/08	Robert Vercher	in disturbed trail
131	5177/1198	x		none	25 cm	06/04/08	Robert Vercher	clay at 25 cm
132	5177/1198		x	37m NE	20 cm	06/04/08	Robert Vercher	clay at 20 cm
133	5177/1199		x	37m NE	30 cm	06/04/08	Robert Vercher	clay at 30 cm
134	5166/1201	x		none	30 cm	06/04/08	Ed Baxter	clay at 30 cm
135	5166/1201		x	37m NE	30 cm	06/04/08	Ed Baxter	clay at 30 cm
136	5166/1202	x		none	25 cm	06/04/08	Ed Baxter	clay at 25 cm
137	5166/1202		x	37m NE	30 cm	06/04/08	Ed Baxter	clay at 30 cm
138	5166/1203	x		none	25 cm	06/04/08	Ed Baxter	clay at 25 cm
139	5166/1203		x	37m NE	25 cm	06/04/08	Ed Baxter	clay at 25 cm
140	5166/1206	x		none	40 cm	06/04/08	Ed Baxter	clay at 40 cm
141	5166/1207	x		none	40 cm	06/04/08	Ed Baxter	clay at 40 cm
142	5166/1208	x		13 ft N	40 cm	06/04/08	Ed Baxter	clay at 40 cm
143	5166/1209	x		none	40 cm	06/04/08	Ed Baxter	clay at 40 cm
144	1191/5366		x	none	20 cm	06/04/08	Ed Baxter	clay at 20 cm
145	1191/5366		x	37m NE	10 cm	06/04/08	Ed Baxter	clay at surface
146	1191/5366		x	60m NE	10 cm	06/04/08	Ed Baxter	clay at 10 cm
147	5177/1191	x		none	10 cm	06/04/08	Ed Baxter	clay at 10 cm
148	5177/1191		x	37m NE	10 cm	06/04/08	Ed Baxter	clay at 10 cm
149	5177/1191		x	60m NE	10 cm	06/04/08	Ed Baxter	clay at 10 cm
150	5177/1192	x		none	40 cm	06/04/08	Ed Baxter	clay at 40 cm
151	5177/1192		x	37m NE	10 cm	06/04/08	Ed Baxter	claty at <10 cm
152	5177/1193	x		none	10 cm	06/04/08	Ed Baxter	clay at <10 cm

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153	5177/1193		x	37m NE	10 cm	06/04/08	Ed Baxter	clay at <10 cm
154	5177/1199	x		none	40 cm	06/04/08	Ed Baxter	clay at 40 cm
155	5177/1200	x		none	30 cm	06/04/08	Ed Baxter	clay at 30 cm
156	5188/1199		x	37m NE	60 cm	06/05/08	Matt Carter	sandy clay at 60 cm
157	5188/1198		x	37m NE	70 cm	06/05/08	Matt Carter	clay at 70 cm
158	5188/1197		x	37m NE	90 cm	06/05/08	Matt Carter	compact sand at 90 cm
159	5188/1196		x	37m NE	70 cm	06/05/08	Matt Carter	sandy clay at 70 cm
160	5188/1195		x	37m NE	30 cm	06/05/08	Matt Carter	sandy clay at 30 cm
161	5188/1194		x	37m NE	30 cm	06/05/08	Matt Carter	sandy clay at 30 cm
162	5188/1193		x	37m NE	45 cm	06/05/08	Matt Carter	sandy clay at 45 cm
163	5188/1193		x	37m N	60 cm	06/05/08	Matt Carter	sandy clay at 60 cm
164	5188/1192		x	30 m S	no test	06/05/08	Matt Carter	in disturbed floodplain
165	5188/1192		x	37m SW	95 cm	06/05/08	Matt Carter	sandy clay at 95 cm
166	1191/5378		x	none	25 cm	06/05/08	Matt Carter	clay at 25 cm
167	5188/1189		x	37m NE	50 cm	06/05/08	Matt Carter	clay at 50 cm
168	5188/1188		x	37m NE	25 cm	06/05/08	Matt Carter	clay at 15 cm
169	5188/1187		x	37m NE	20 cm	06/05/08	Matt Carter	clay at 10 cm
170	5188/1186		x	37m NE	10 cm	06/05/08	Matt Carter	clay at surface
171	5188/1185		x	37m NE	10 cm	06/05/08	Matt Carter	clay at 5 cm
172	5188/1184		x	37m NE	20 cm	06/05/08	Matt Carter	clay at 15 cm
173	5188/1183		x	37m NE	10 cm	06/05/08	Matt Carter	clay at surface
174	5188/1200	x		none	60 cm	06/05/08	Lisa Shaddox	sandy clay at 60 cm
175	5188/1199	x		none	70 cm	06/05/08	Lisa Shaddox	sandy clay at 70 cm
176	5188/1198	x		none	80 cm	06/05/08	Lisa Shaddox	sandy clay at 80 cm
177	5188/1197	x		none	50 cm	06/05/08	Lisa Shaddox	sandy clay at 50 cm
178	5188/1196	x		none	30 cm	06/05/08	Lisa Shaddox	sandy clay at 30 cm
179	5188/1195	x		none	10 cm	06/05/08	Lisa Shaddox	sandy clay at 10 cm
180	5188/1194	x		none	20 cm	06/05/08	Lisa Shaddox	sandy clay at 20 cm
181	5188/1193	x		none	40 cm	06/05/08	Lisa Shaddox	sandy clay at 40 cm
182	5188/1192	x		494 ft N	70 cm	06/05/08	Lisa Shaddox	sandy clay at 70 cm
183	5188/1193		x	75m SW	70 cm	06/05/08	Lisa Shaddox	sandy clay at 70 cm
184	5188/1191	x		none	40 cm	06/05/08	Lisa Shaddox	sandy clay at 40 cm
185	5188/1190	x		none	30 cm	06/05/08	Lisa Shaddox	sandy clay at 30 cm
186	5188/1189	x		none	20 cm	06/05/08	Lisa Shaddox	sandy clay at 20 cm
187	5188/1188	x		none	20 cm	06/05/08	Lisa Shaddox	sandy clay at 20 cm
188	5188/1187	x		none	20 cm	06/05/08	Lisa Shaddox	sandy clay at 20 cm
189	5188/1186	x		none	20 cm	06/05/08	Lisa Shaddox	sandy clay at 20 cm
190	5188/1185	x		none	10 cm	06/05/08	Lisa Shaddox	clay at 10 cm
191	5188/1184	x		none	10 cm	06/05/08	Lisa Shaddox	clay at 10 cm
192	5199/1182		x	37m NE	30 cm	06/05/08	Ed Baxter	clay at 30 cm
193	5199/1183	x		none	20 cm	06/05/08	Ed Baxter	clay at 20 cm
194	5199/1184		x	37m NE	70 cm	06/05/08	Ed Baxter	clay at 70 cm
195	5199/1185		x	37m NE	100 cm	06/05/08	Ed Baxter	clay at 100 cm
196	5199/1187	x		none	90 cm	06/05/08	Ed Baxter	clay at 90 cm
197	5199/1187		x	37m NE	80 cm	06/05/08	Ed Baxter	clay at 80 cm
198	5199/1188		x	37m NE	100 cm	06/05/08	Ed Baxter	sandy clay loam
199	5199/1189		x	37m NE	90 cm	06/05/08	Ed Baxter	clay at 90 cm
200	5199/1190	x		none	70 cm	06/05/08	Ed Baxter	large root at 70 cm
201	5199/1190		x	36m ENE	80 cm	06/05/08	Ed Baxter	large roots at 80 cm
202	5199/1182	x		none	10 cm	06/05/08	Robert Vercher	clay at <10 cm
203	5199/1183		x	37m NE	10 cm	06/05/08	Robert Vercher	clay at <10 cm
204	5199/1184	x		none	30 cm	06/05/08	Robert Vercher	clay at 30 cm

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205	5199/1185	x		none	70 cm	06/05/08	Robert Vercher	clay at 70 cm
206	5199/1186	x		none	60 cm	06/05/08	Robert Vercher	clay at 60 cm
207	5199/1186		x	37m NE	100 cm	06/05/08	Robert Vercher	sandy clay loam
208	5199/1188	x		none	100 cm	06/05/08	Robert Vercher	sandy clay loam
209	5199/1189	x		none	80 cm	06/05/08	Robert Vercher	clay at 80 cm
210	5199/1191	x		165 ft S	100 cm	06/05/08	Robert Vercher	sandy clay loam
211	5199/1192	x		331 ft S	100 cm	06/05/08	Robert Vercher	sandy clay loam
212	5199/1193	x		496 ft S	100 cm	06/05/08	Robert Vercher	sandy clay loam
213	5188/1183	x		none	10 cm	06/05/08	Robert Vercher	clay at <10 cm
214	5166/1193		x	37m NE	10 cm	06/06/08	Matt Carter	clay at 5 cm
215	5166/1194		x	30m NE	70 cm	06/06/08	Matt Carter	clay at 65 cm
216	5166/1195		x	30m NE	70 cm	06/06/08	Matt Carter	clay at 70 cm
217	5166/1196		x	37m NE	30 cm	06/06/08	Matt Carter	silty clay at 25 cm
218	5166/1197		x	37m NE	60 cm	06/06/08	Matt Carter	sandy clay at 60 cm
219	5166/1198		x	37m NE	30 cm	06/06/08	Matt Carter	sandy clay at 30
220	5166/1199		x	37m NE	25 cm	06/06/08	Matt Carter	sandy clay at 25 cm
221	1201/5366		x	none	55 cm	06/06/08	Matt Carter	wet sandy clay
222	5144/1198	x		830 ft N	15 cm	06/06/08	Matt Carter	clay at 10 cm
223	5144/1199		x	30m E	15 cm	06/06/08	Matt Carter	clay at 10 cm
224	1201/5346		x	15m N	30 cm	06/06/08	Matt Carter	clay at 25 cm
225	5166/1193	x		none	20 cm	06/06/08	Lisa Shaddox	clay at 20 cm
226	5166/1194	x		none	10 cm	06/06/08	Lisa Shaddox	clay at 10 cm
227	5166/1195	x		none	20 cm	06/06/08	Lisa Shaddox	clay at 20 cm
228	5166/1196	x		none	40 cm	06/06/08	Lisa Shaddox	clay at 40 cm
229	5166/1197	x		none	20 cm	06/06/08	Lisa Shaddox	clay at 20 cm
230	5166/1198	x		none	no test	06/06/08	Lisa Shaddox	in disturbed road
231	5166/1199	x		none	15 cm	06/06/08	Lisa Shaddox	sandy clay at 15 cm
232	5166/1200	x		none	40 cm	06/06/08	Lisa Shaddox	sandy clay at 40 cm
233	5144/1197	x		1028 ft N	20 cm	06/06/08	Lisa Shaddox	clay at 20 cm
234	5144/1199	x		662 ft N	20 cm	06/06/08	Lisa Shaddox	clay at 20 cm
235	5144/1200	x		495 ft N	15 cm	06/06/08	Lisa Shaddox	clay at 15 cm
236	5177/1188	x		331 ft S	35 cm	06/06/08	Anna Warren	clay at 30 cm
237	5177/1188		x	37m NE	15 cm	06/06/08	Anna Warren	clay at <10 cm
238	5177/1189	x		329 ft S	25 cm	06/06/08	Anna Warren	clay at 25 cm
239	5177/1189		x	37m NE	no test	06/06/08	Anna Warren	in disturbed floodplain
240	5177/1190	x		330ft S	20 cm	06/06/08	Anna Warren	clay at 20 cm
241	1191/5365		x	37m N	no test	06/06/08	Anna Warren	steep slope
242	5166/1191	x		661 ft N	30 cm	06/06/08	Anna Warren	clay at 25 cm
243	5155/1196	x		459 ft N	no test	06/06/08	Anna Warren	on railroad
244	5155/1198	x		35 ft S	no test	06/06/08	Anna Warren	on railroad
245	5144/1202	x		NA	40 cm	06/06/08	Anna Warren	clay at 40 cm
246	5144/1202		x	37m W	10 cm	06/06/08	Anna Warren	clay at <10 cm
247	5144/1201	x		166 ft N	15 cm	06/06/08	Anna Warren	clay at <10 cm
248	5144/1201		x	37m W	25 cm	06/06/08	Anna Warren	clay at 25 cm
249	5177/1186	x		344 ft S	50 cm	06/06/08	Robert Vercher	clay at 50 cm
250	5177/1186		x	37m NE	10 cm	06/06/08	Robert Vercher	clay at surface
251	5177/1187	x		331 ft S	30 cm	06/06/08	Robert Vercher	root at 30 cm
252	5177/1187		x	37m NE	35 cm	06/06/08	Robert Vercher	clay at 35 cm
253	5166/1191		x	37m E	20 cm	06/06/08	Robert Vercher	clay at 20 cm
254	5166/1192	x		466 ft N	25 cm	06/06/08	Robert Vercher	clay at 25 cm
255	5155/1197	x		209 ft N	no test	06/06/08	Robert Vercher	on railroad
256	5155/1199	x		312 ft S	no test	06/06/08	Robert Vercher	on railroad

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257	5144/1203	x		166 ft S	30 cm	06/06/08	Robert Vercher	clay at 30 cm
258	5144/1203		x	37m W	30 cm	06/06/08	Robert Vercher	clay at 30 cm
259	5210/1182	x		none	80 cm	06/06/08	Ed Baxter	clay at 80 cm
260	5210/1182		x	37m NE	70 cm	06/06/08	Ed Baxter	clay at 70 cm
261	5210/1183	x		none	60 cm	06/06/08	Ed Baxter	clay at 60 cm
262	5210/1183		x	37m N	60 cm	06/06/08	Ed Baxter	clay at 60 cm
263	5210/1183		x	74m N	100 cm	06/06/08	Ed Baxter	clay at 100 cm
264	5210/1184		x	74m SW	90 cm	06/06/08	Ed Baxter	clay at 90 cm
265	5210/1184		x	37m SW	90 cm	06/06/08	Ed Baxter	clay at 90 cm
266	5210/1184	x		330ft N	80 cm	06/06/08	Ed Baxter	clay at 80 cm
257	5210/1184		x	37m NE	80 cm	06/06/08	Ed Baxter	clay at 80 cm
268	5210/1184		x	74m NE	70 cm	06/06/08	Ed Baxter	clay at 70 cm
269	5210/1185	x		495 ft N	100 cm	06/06/08	Ed Baxter	clay at 100 cm
270	5210/1185		x	37m E	80 cm	06/06/08	Ed Baxter	clay at 80 cm
271	5210/1186	x		330 ft N	80 cm	06/06/08	Ed Baxter	clay at 80 cm
272	5001/1312	x		338 ft S	no test	06/07/08	Anna Warren	disturbed logging road
273	5001/1313	x		671 ft S	65 cm	06/07/08	Anna Warren	clay at 65 cm
274	5001/1313		x	37m NW	no test	06/07/08	Anna Warren	in crossroads
275	5001/1310	x		53 ft S	55 cm	06/07/08	Anna Warren	clay at 50 cm
276	5001/1310		x	30m W	15 cm	06/07/08	Anna Warren	clay at <10 cm
277	5001/1308	x		none	40 cm	06/07/08	Anna Warren	clay at 40 cm
278	5001/1307	x		none	15 cm	06/07/08	Anna Warren	clay at <10 cm
279	5001/1306	x		none	10 cm	06/07/08	Anna Warren	clay at <10 cm
280	5001/1306		x	37m SW	20 cm	06/07/08	Anna Warren	clay at surface
281	5001/1304	x		none	no test	06/07/08	Anna Warren	clay at surface
282	5001/1304		x	37m SW	no test	06/07/08	Anna Warren	clay at surface
283	5001/1302	x		13 ft N	15 cm	06/07/08	Anna Warren	clay at <10 cm
284	5001/1302		x	37m SW	no test	06/07/08	Anna Warren	clay at surface
285	1301/5301		x	none	30 cm	06/07/08	Anna Warren	clay at 30 cm
286	5001/1299	x		none	25 cm	06/07/08	Anna Warren	clay at 25 cm
287	5001/1298		x	37m SW	20 cm	06/07/08	Anna Warren	clay at 20 cm
288	5001/1296	x		469 ft N	10 cm	06/07/08	Anna Warren	clay at <10 cm
289	5001/1296		x	37m SE	no test	06/07/08	Anna Warren	in disturbed floodplain
290	5001/1312		x	37m W	30 cm	06/07/08	Robert Vercher	clay at 25 cm
291	5001/1311	x		180 ft S	25 cm	06/07/08	Robert Vercher	clay at 20 cm
292	5001/1311		x	37 m WSW	30 cm	06/07/08	Robert Vercher	clay at 20 cm
293	5001/1309	x		none	30 cm	06/07/08	Robert Vercher	clay at 30 cm
294	5001/1309		x	37m SW	35 cm	06/07/08	Robert Vercher	clay at 35 cm
295	5001/1308		x	37m SW	35 cm	06/07/08	Robert Vercher	clay at 35 cm
296	5001/1307		x	37m SW	15 cm	06/07/08	Robert Vercher	clay at surface
297	5001/1305	x		10 ft S	15 cm	06/07/08	Robert Vercher	clay at 15 cm
298	5001/1305		x	37m SW	10 cm	06/07/08	Robert Vercher	clay at 10 cm
299	5001/1303	x		NA	10 cm	06/07/08	Robert Vercher	clay at 10 cm
300	5001/1303		x	37m SW	30 cm	06/07/08	Robert Vercher	clay at 30 cm
301	5001/1301	x		none	10 cm	06/07/08	Robert Vercher	clay at <10 cm
302	5001/1300	x		18 ft S	35 cm	06/07/08	Robert Vercher	clay at 35 cm
303	5001/1300		x	37m SW	30 cm	06/07/08	Robert Vercher	clay at 30 cm
304	5001/1299		x	37m SW	10 cm	06/07/08	Robert Vercher	clay at <10 cm
305	5001/1298	x		28 ft N	25 cm	06/07/08	Robert Vercher	clay at 20 cm
306	5001/1297	x		NA	30 cm	06/07/08	Robert Vercher	clay at 30 cm
307	5001/1297		x	37m SW	30 cm	06/07/08	Robert Vercher	clay at 25 cm
308	4990/1315	x		none	<10 cm	06/07/08	Lisa Shaddox	in disturbed road

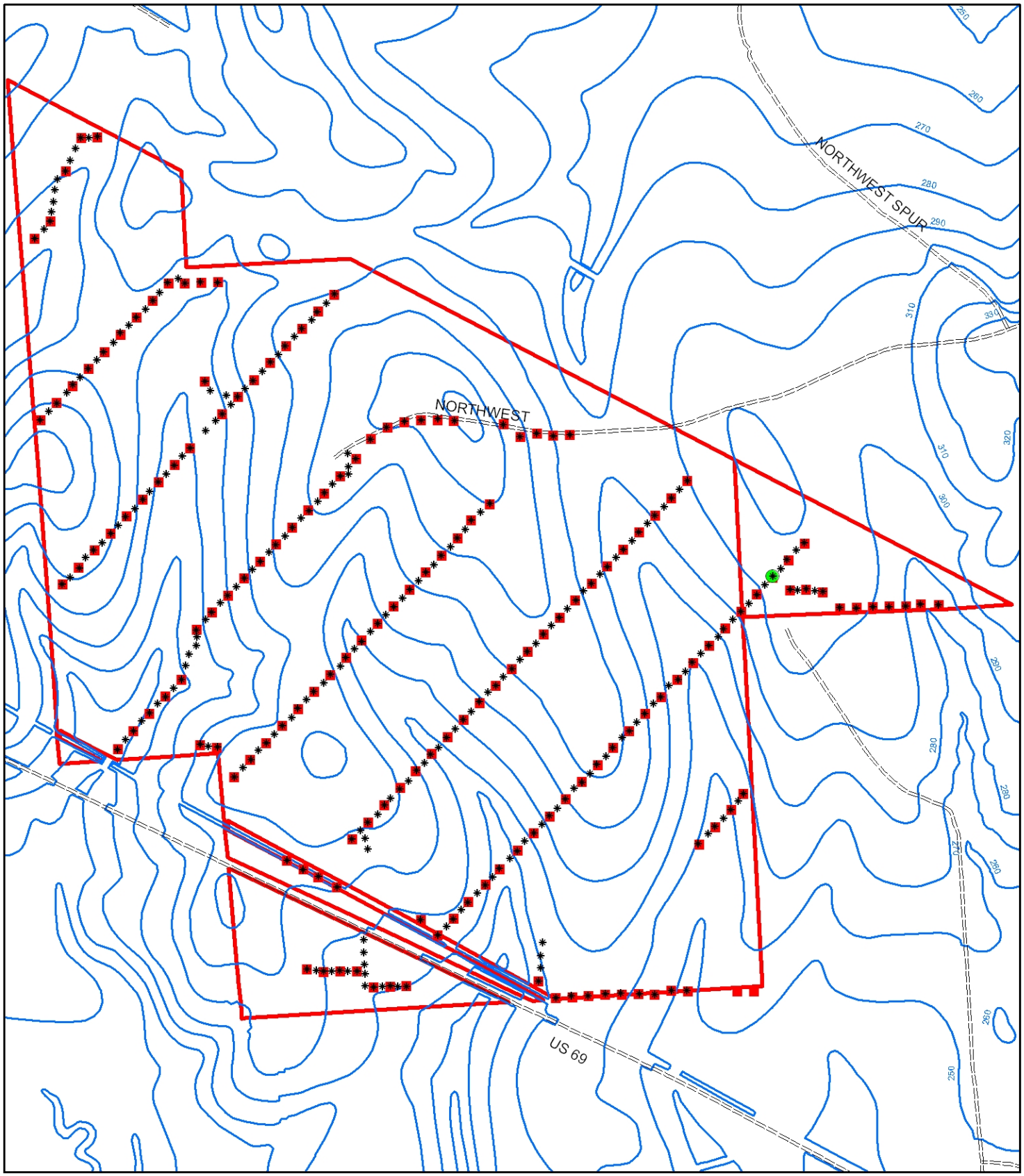
Area	Source Point Receiver Point	Source Point	Access	Offset: Distance / Direction	Shovel Test Depth*	Date	Recorders	Comments
309	4990/1313	x		none	15 cm	06/07/08	Lisa Shaddox	clay at 15 cm
310	4990/1312	x		none	10 cm	06/07/08	Lisa Shaddox	clay at 10 cm
311	4990/1311	x		none	20 cm	06/07/08	Lisa Shaddox	clay at 20 cm
312	4990/1310	x		none	15 cm	06/07/08	Lisa Shaddox	clay at 15 cm
313	4990/1309	x		none	10 cm	06/07/08	Lisa Shaddox	clay at 10 cm
314	4990/1302	x		394 ft N	<10 cm	06/07/08	Lisa Shaddox	in disturbed road
315	4990/1304	x		89 ft N	20 cm	06/07/08	Lisa Shaddox	clay at 20 cm
316	4990/1316	x		454 ft S	<10 cm	06/07/08	Lisa Shaddox	in ditch
317	4979/1315	x		495 ft N	20 cm	06/07/08	Lisa Shaddox	clay at 20 cm
318	4979/1317	x		165 ft N	15 cm	06/07/08	Lisa Shaddox	clay at 15 cm
319	4979/1319	x		164 ft S	40 cm	06/07/08	Lisa Shaddox	clay at 40 cm
320	4990/1314	x		none	5 cm	06/07/08	Matt Carter	clay at surface
321	4990/1313		x	37m NE	20 cm	06/07/08	Matt Carter	clay at 10 cm
322	4990/1312		x	37m NE	20 cm	06/07/08	Matt Carter	clay at 20 cm
323	4990/1311		x	37m NE	20 cm	06/07/08	Matt Carter	clay at 20 cm
324	1311/5300		x	none	30 cm	06/07/08	Matt Carter	silty clay at 30 cm
325	4990/1309		x	37m NE	30 cm	06/07/08	Matt Carter	silty clay at 30 cm
326	4990/1308		x	37m NE	15 cm	06/07/08	Matt Carter	silty clay at 15 cm
327	4990/1303	x		245 ft N	<10 cm	06/07/08	Matt Carter	in disturbed road
328	4990/1305	x		none	<10 cm	06/07/08	Matt Carter	in disturbed road
329	4990/1317	x		737 ft S	<10 cm	06/07/08	Matt Carter	in disturbed road
330	4979/1316	x		330 ft N	25 cm	06/07/08	Matt Carter	silty clay at 25 cm
331	4979/1318	x		none	65 cm	06/07/08	Matt Carter	clay loam at 65 cm
332	4979/1320	x		331 ft S	<10 cm	06/07/08	Matt Carter	in disturbed road
333	5001/1295		x	65m WNW	15 cm	06/08/08	Ed Baxter	clay at 15 cm
334	5001/1295	x		664 ft N	30 cm	06/08/08	Ed Baxter	clay at 30 cm
335	5012/1293		x	none	20 cm	06/08/08	Ed Baxter	clay at 20 cm
336	5012/1293		x	65m W	20 cm	06/08/08	Ed Baxter	clay at 20 cm
337	5001/1294	x		1321 ft N	<10 cm	06/08/08	Ed Baxter	clay at <10 cm
338	5001/1294		x	37m S	<10 cm	06/08/08	Ed Baxter	clay at <10 cm
339	5001/1294		x	74m S	<10 cm	06/08/08	Ed Baxter	clay at <10 cm
340	5001/1294		x	107m S	<10 cm	06/08/08	Ed Baxter	clay at <10 cm
341	5001/1294		x	144m S	30 cm	06/08/08	Ed Baxter	clay at 30 cm
342	5001/1300		x	20 m SW	10 cm	06/08/08	Ed Baxter	clay at <10 cm
343	5001/1295		x	176m WNW	20 cm	06/08/08	Anna Warren	clay at 15 cm
344	1291/5305		x	10m N	55 cm	06/08/08	Anna Warren	clay at 50 cm
345	5012/1294	x		none	15 cm	06/08/08	Anna Warren	clay at <10 cm
346	5012/1295		x	30m NE	10 cm	06/08/08	Anna Warren	clay at <10 cm
347	5012/1296	x		none	10 cm	06/08/08	Anna Warren	clay at <10 cm
348	5012/1297	x		none	15 cm	06/08/08	Anna Warren	clay at <10 cm
349	5001/1295		x	139 WNW	15 cm	06/08/08	Robert Vercher	clay at 15 cm
350	5001/1295		x	102 WNW	20 cm	06/08/08	Robert Vercher	clay at <10 cm
351	5012/1293		x	102m W	30 cm	06/08/08	Robert Vercher	clay at surface
352	5012/1293	x		none	<10 cm	06/08/08	Robert Vercher	clay at surface
353	5012/1293		x	37m NE	10 cm	06/08/08	Robert Vercher	clay at <10 cm
354	5012/1294		x	37m NE	20 cm	06/08/08	Robert Vercher	clay at 15 cm
355	5012/1295	x		none	10 cm	06/08/08	Robert Vercher	clay at <10 cm
356	5012/1296		x	37m NE	10 cm	06/08/08	Robert Vercher	clay at surface
357	5012/1297		x	37m NE	15 cm	06/08/08	Robert Vercher	clay at <10 cm
358	5012/1298	x		none	10 cm	06/08/08	Robert Vercher	clay at <10 cm
359	5012/1298		x	37m NE	10 cm	06/08/08	Robert Vercher	clay at surface
360	5012/1299	x		none	10 cm	06/08/08	Robert Vercher	clay at <10 cm

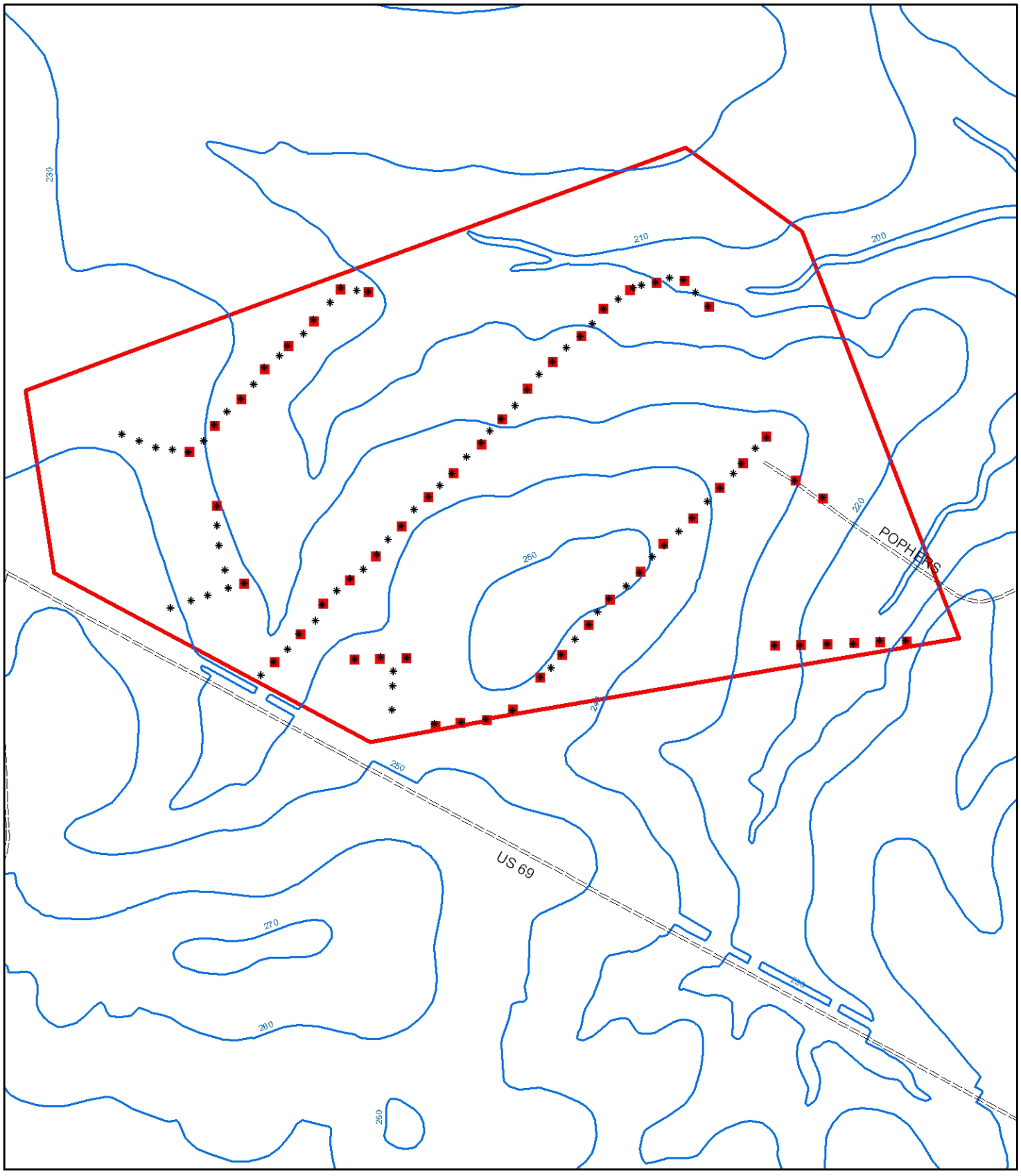
Area	Source Point Receiver Point	Source Point	Access	Offset: Distance / Direction	Shovel Test Depth*	Date	Recorders	Comments
361	5012/1300	x		176 ft S	30 cm	06/08/08	Robert Vercher	clay at 25 cm
362	4990/1306		x	37m NE	<10 cm	06/08/08	Matt Carter	in disturbed road
363	4990/1307		x	37m NE	45 cm	06/08/08	Matt Carter	silty clay at 45 cm
364	4990/1300	x		1155 ft N	10 cm	06/08/08	Matt Carter	clay at 10 cm
365	4990/1299	x		1321 ft N	15 cm	06/08/08	Matt Carter	sandy clay at 15 cm
366	1301/5296		x	10m S	<10 cm	06/08/08	Matt Carter	clay at <10 cm
367	1301/5294		x	15m N	<10 cm	06/08/08	Matt Carter	clay at <10 cm
368	5133/1213	x		166 ft S	<10 cm	06/08/08	Matt Carter	clay at <10 cm
369	5133/1214		x	37m E	<10 cm	06/08/08	Matt Carter	clay at <10 cm
370	5133/1215	x		479 ft S	no test	06/08/08	Matt Carter	in disturbed road
371	5133/1218	x		993 ft S	no test	06/08/08	Matt Carter	in disturbed road
372	5133/1219	x		1126 ft S	no test	06/08/08	Matt Carter	in disturbed road
273	5133/1211		x	37m N	15 cm	06/08/08	Matt Carter	clay at 15 cm
374	5133/1211		x	111m N	30 cm	06/08/08	Matt Carter	sandy clay at 30 cm
375	4990/1306	x		none	20 cm	06/08/08	Lisa Shaddox	clay at 20 cm
376	4990/1307	x		none	30 cm	06/08/08	Lisa Shaddox	clay at 30 cm
377	4990/1308	x		none	10 cm	06/08/08	Lisa Shaddox	clay at 10 cm
378	4990/1301	x		990 ft N	20 cm	06/08/08	Lisa Shaddox	clay at 20 cm
379	1301/5295		x	none	10 cm	06/08/08	Lisa Shaddox	clay at 10 cm
380	5133/1212	x		none	no test	06/08/08	Lisa Shaddox	in disturbed road
381	5133/1214	x		324 ft S	no test	06/08/08	Lisa Shaddox	in disturbed road
382	5133/1216	x		652 ft S	no test	06/08/08	Lisa Shaddox	in disturbed road
383	5133/1217	x		814 ft S	no test	06/08/08	Lisa Shaddox	in disturbed road
384	5133/1220	x		1301 ft S	no test	06/08/08	Lisa Shaddox	in disturbed road
385	5133/1211	x		331 ft N	60 cm	06/08/08	Lisa Shaddox	sandy clay at 60 cm
386	5133/1211		x	74 m N	20 cm	06/08/08	Lisa Shaddox	clay at 20 cm
387	5133/1236	x		165 ft S	10 cm	06/09/08	Robert Vercher	clay at <10 cm
388	5133/1235	x		11 ft N	30 cm	06/09/08	Robert Vercher	clay at 20 cm
389	5133/1234	x		165 ft N	10 cm	06/09/08	Robert Vercher	clay at <10 cm
390	1201/5347		x	6 m N	30 cm	06/09/08	Robert Vercher	clay at 30 cm
391	5133/1232	x		497 ft N	10 cm	06/09/08	Lisa Shaddox	clay at 10 cm
392	5133/1230	x		826 ft N	10 cm	06/09/08	Matt Carter	clay at 10 cm
393	5133/1231	x		661 ft N	<10 cm	06/09/08	Matt Carter	clay at surface
394	5133/1233		x	330 ft N	25 cm	06/09/08	Matt Carter	clay at 25 cm
395	1201/5348		x	65 m N	25 cm	06/09/08	Matt Carter	clay at 25 cm

* All Shovel Tests Negative

APPENDIX II

SHOVEL TEST LOCATIONS


NORTHWEST SPUR
NORTHWEST
US 69
250
260
270
280
290
310
320
300
N
0
250
500
Meters
Area A
Project Area
Shovel Test
Source Point
Locality 1


230
210
200
220
250
270
260
250
POPHERS
US 69
N
0
250
500
Meters
Area B
Project Area
Shovel Test
Source Point

APPENDIX III

LOCALITY 1 SHOVEL TEST LOG

Shovel Test	Grid Coordinates	Depth of Artifacts	Depth of Shovel Test	Comments
1	00/00	0-10 cm*	30 cm	wire nail and metal fragments
2	N10-00	negative	40 cm	loose sandy loam over sandy clay
3	S10-00	negative	30 cm	semi-moist loose sandy loam with roots over semi-moist sandy clay loam
4	00-E10	negative	30 cm	semi-moist loose sandy loam with roots over sandy clay
5	N20-00	negative	35 cm	semi-moist loose sandy loam over semi-moist sandy clay
6	S20-00	negative	10 cm	dry sandy clay loam
7	00-W8	negative	25 cm	dry sandy loam over semi-moist clay loam
8	00-E20	negative	30 cm	sandy loam over sandy clay
9	00-W20	negative	30 cm	semi-moist, loose sandy loam over sandy clay

* All depths are below ground surface