Archeological Survey of Loop 336, from South of Interstate Highway 45 to Farm-to-Market 1314,

Montgomery County, Texas

CSJ: 0338-11-056

Prepared by: Julian A. Sitters

Date: May 2017

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

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by

Julian A. Sitters

Principal Investigator

Julian A. Sitters

Prepared for

Texas Department of Transportation

Houston, Texas

Technical Report No. 198

Prepared by

AmaTerra Environmental, Inc.

Austin, Texas

May 2017

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Abstract

In May of 2017, AmaTerra Environmental, Inc. (AmaTerra) conducted an intensive archeological survey for the proposed improvements to Loop 336, in southern Conroe, Montgomery County, Texas (CSJ No.: 0338-11-056). The total project length is approximately 2.25 miles, or about 86 acres in size, with no new Right-of-Way (ROW). AmaTerra conducted the archeological survey of the existing ROW under Texas Antiquities Permit No. 8006.

Archeological investigations consisted of a thorough pedestrian survey and the excavation of 79 shovel tests throughout the Area-of-Potential Effect (APE) where access was available. Field archeologists observed multiple landscape modifications primarily associated with transportation and suburban development. None of the shovel tests contained any artifacts and no new archeological sites were identified during field investigations. Based on the results of this survey, no additional archeological investigations within the proposed APE are warranted at this time. No artifacts were collected during the survey. All records, project notes, and photographs will be curated at the Texas Archeological Research Laboratory in Austin.

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Chapter 1
Introduction and Management Summary

In May of 2017, under subcontract to Ecosystem Planning and Restoration, Inc. (EPR) and on behalf of the Texas Department of Transportation (TxDOT), AmaTerra Environmental, Inc. (AmaTerra) conducted an archeological survey in advance of the proposed Loop 336 improvement project in southern Conroe, Montgomery County, Texas (CSJ No: 0338-11-056; **Figure 1**). The project will extend from Interstate Highway (IH) 45 to Farm-to-Market (FM) 1314, a distance of approximately 2.25 miles. The proposed project would expand an existing two-lane facility into a divided, four-lane median separated highway with a sidewalk on the south side of the eastbound lanes. All work would take place within an existing dedicated 300-foot right-of-way (ROW).

Area of Potential Effects

The Area of Potential Effects (APE) for archeological resources for this undertaking is defined as the footprint of the proposed project to the maximum depth of impact, including all easements, utility relocations, and project specific locations. Therefore, the APE for archeological resources will cover a total distance of approximately 2.25 miles and encompass an area roughly 86 acres in size. The proposed undertaking will take place entirely within a 300-foot-wide existing ROW. The vertical APE (depth of impacts) is estimated to extend no more than three to five feet below the subsurface. Project schematics provided by the Houston District are in **Appendix A**.

The proposed project is being funded by the Federal Highway Administration (FHWA) through TxDOT and is subject to the National Environmental Policy Act (NEPA) review. Since the project is being built with Federal transportation money on land owned or controlled by the State of Texas, it is also considered an undertaking subject to the provisions outlined under Section 106 of the National Historic Preservation Act (Section 106), as well as the Antiquities Code of Texas (ACT). Therefore, AmaTerra's work conformed to the guidelines under 36 CFR Part 800 and 13 TAC Chapter 26, which outline the regulations for implementing Section 106 and the ACT respectively.

All work was conducted under the terms and conditions of the First Amended Programmatic Agreement for Transportation Undertakings (2005; PA-TU) among the FHWA, TxDOT, the Texas Historical Commission (THC) and the Advisory Council on Historic Preservation, and the Memorandum of Understanding (MOU) between TxDOT and the THC.

Coordination with TxDOT resulted in a survey recommendation for the entire APE. Archeological investigations consisted of a pedestrian survey and shovel testing of all undisturbed portions of the proposed APE, where access was available. The undertaking would be built on public property, of which, AmaTerra had access to 100 percent of the proposed APE at the time of survey. Archeologists excavated a total of 79 shovel tests along

two survey transects. While no new archeological sites were recorded, archeologists did observed a plainware whiteware ceramic sherd, a blue vessel glass shard, and a milk glass shard in the gravels of Stewarts Creek. However, the artifacts are in secondary context and did not originate from within the APE. No additional archeological work is recommended for the APE at this time.

Field investigations took place from May 1–3, 2017 under Texas Antiquities Permit No. 8006. Julian (Drew) Sitters acted as Principal Investigator and field lead, while Noel Steinle assisted with field investigations. A total of 60 person hours were expended in the field in support of this project. Weather conditions were good and archeologists encountered no difficulties in completing the investigations. This was a no collection survey; therefore, all artifacts were returned to their original location.

This report is divided into six chapters. The project background and cultural overview are discussed in Chapters 2 and 3. Chapter 4 includes the field methodology implemented during the project and the results of field investigations are discussed in Chapter 5. Chapter 6 presents the summary and recommendations.

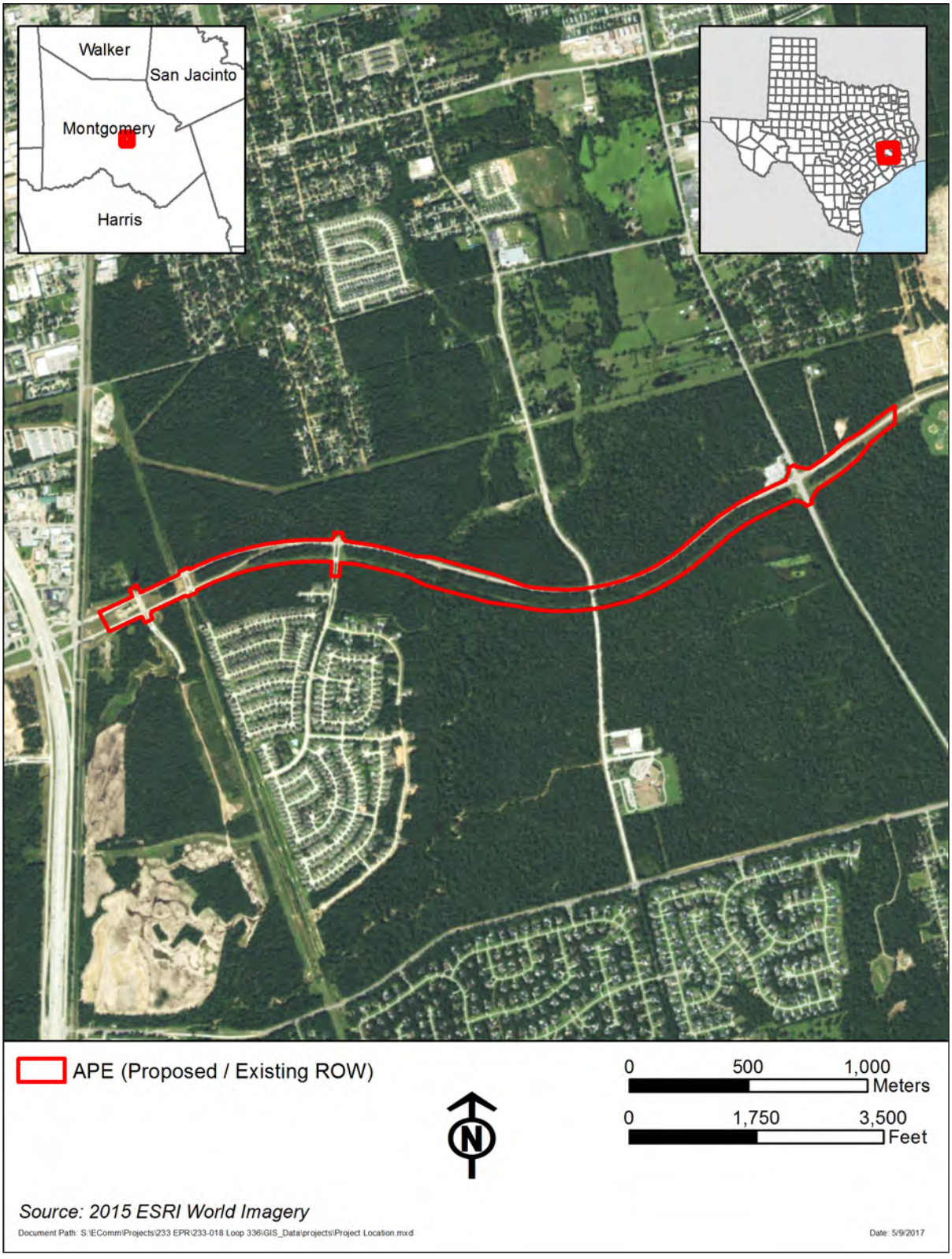

Figure 1. Location of the proposed Loop 336 improvement project located in southern Conroe, Montgomery County, Texas.

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Chapter 2
Project Background

Environmental Setting

Physiography

The APE is located within the Southern Tertiary Uplands, a subregion of the South Central Plains ecoregion (Griffith et al. 2007). This ecoregion, which is locally known as the "piney woods" (Gould 1975), "represents the western edge of the southern coniferous forest belt" (Griffith et al. 2007:87). Encompassing approximately 7,667 square miles, this subregion is characterized by "dissected irregular plains with some low, rolling hills; low to moderate gradient streams with sandy and silty substrates" (Griffith et al. 2007:91). Elevation within the Southern Tertiary Uplands ranges from 90 to 550 feet Above Mean Sea Level (AMSL).

Vegetation

Historically, natural vegetation within the Southern Tertiary Uplands consisted of upland longleaf pine-bluestem (*Pinus palustris-Schizachyrium* spp. and *Andropogon* spp.) woodlands, shortleaf pine-hardwood (*Pinus echinata-Quercus* spp.) forests, and mixed hardwood-loblolly pine (*Pinus taeda*) forests, as well as American beech (*Fagus grandifolia*) or magnolia-beech-forests, bogs, and sandstone glades. Bog plant species include southern sweetbay (*Magnolia virginiana*), hollies or gallberry (*Ilex* spp.), wax-myrtles (*Morella* spp.), insectivorous plants, orchids, and wild azalea (*Rhododendron* spp.). Today, pine forest is the dominant vegetation type with National Forest land making up large parts of this region. Aside from public land, additional land uses include pine plantations, timber production, and some pasture and livestock production (Griffith et al. 2007).

Climate

The climate within the Southern Tertiary Uplands is subtropical with hot, usually humid, and wet summers with mild to cool winters (Peel et al. 2007). Annually, the APE receives roughly 40 to 50 inches of precipitation and has a mean annual air temperature of 67 degrees Fahrenheit (USDA-NRCS 2017).

Geology and Soils

The APE is underlain by the Pliocene-age Willis Formation (Qwc), which is composed mostly of clay, silt, sand, and siliceous granule to pebble gravel (BEG 1992). According to the United States Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS) Web Soil Survey (2017), the APE encompasses eight named soil units (**Table 1; Figure 2**). Soils are characterized by loam to very fine sandy loam with restrictive features, such as clay, encountered as shallow as 36 centimeters below the ground surface (cmbs).

Table 1. Soil Units Found within the APE (USDA-NRCS 2017; Abbott 2001).

Soil Unit	Landform/ Topographic Position	Parent Material	Typical Soil Profile (0-100 cmbs)	Solum Thickness (cm)	Geoarch. Potential
Atasco fine sandy loam (AtaC)	Terraces/Upland	Loamy alluvium derived from igneous, metamorphic and sedimentary rock	0-15: Fine Sandy Loam 15-35: Very Fine Sandy Loam 35-100: Clay	>60	Low
Conroe gravelly loamy fine sand (CnC)	Interfluves/ Upland	Sandy and gravelly fluviomarine deposits over clayey fluviomarine deposits	0-63: Gravelly Loamy Fine Sand 63-78: Sandy Clay Loam 78-100: Clay	60-100+	Low
Conroe loamy fine sand (CoC)	Interfluves/ Upland	Clayey marine deposits	0-63: Loamy Fine Sand 63-78: Sandy Clay Loam 78-100: Clay	60-100+	Low
Hatliff-Pluck-Kian complex (HatA)	Flood Plains/ Forested Floodplain	Loam alluvium of Holocene-age	0-100 Fine Sandy Loam	10 (Hatliff)	High
Landman fine sand (Ab)	Stream Terraces/ Unknown	Loamy alluvium and/ or sandy alluvium	0-100: Fine Sand	-	-
Lilbert loamy fine sand (Fs)	Interfluves/ Unknown	Loamy marine deposits	0-58: Loamy Fine Sand 58-100: Sandy Clay Loam	-	-
Sorter-Tarkington complex (SosA)	Flats/Upland	Loamy fluviomarine deposits derived from igneous, metamorphic and sedimentary rock	0-100: Very Fine Sandy Loam	60-100+	Low
Splendora fine sandy loam (SplB)	Flatwoods/Upland	Loamy fluviomarine deposits of Early Pleistocene-age	0-38: Fine Sandy Loam 0-100: Loam	60-100+	Low

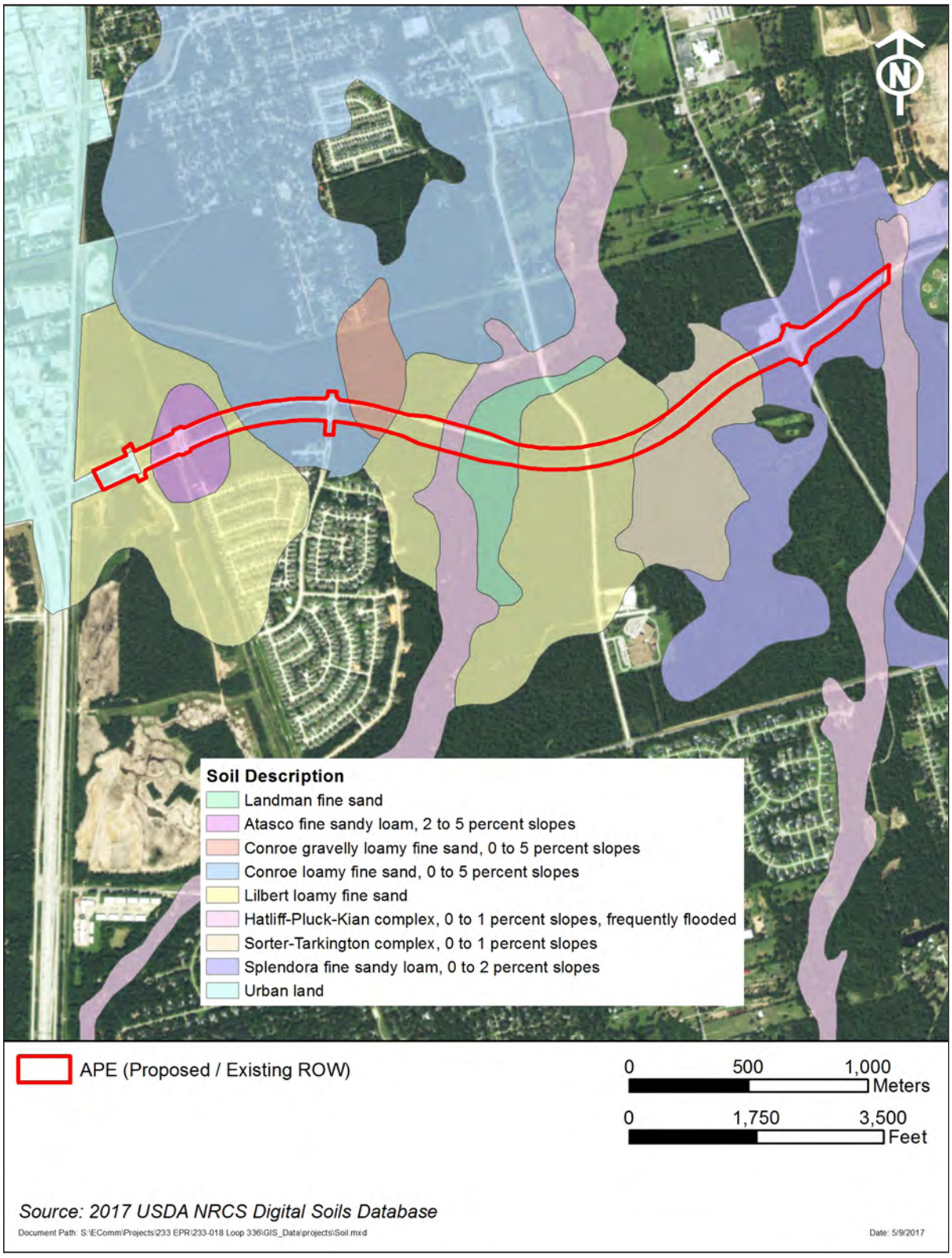

Figure 2. Soil units present within the APE.

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Chapter 3
Regional Chronology and Cultural Background

The project area is situated within the Southeast Texas archeological region (Perttula 2004). Human occupation in the Southeast Texas archeological region can be divided into two stages: Prehistoric and Historic. Furthermore, the Prehistoric Stage can be divided into the Paleoindian, Archaic, and Late Prehistoric Periods. A brief description of these stages and periods is provided below.

Pre-Clovis and Paleoindian

The arrival of humans in the New World may have occurred as early as 16,000 years ago with Pre-Clovis peoples (Jennings and Waters 2014). Pre-Clovis occupation of Texas is evident at the Debra L. Friedkin Site located along Buttermilk Creek in Bell County (Waters et al. 2011). Artifacts found at this site include bifaces, a discoidal core, edge-modified flake tools, blade fragments, bladelets, a polished piece of hematite, and macrodebitage. Other sites in Texas with probable Pre-Clovis components include the Gault Site, situated upstream from the Debra L. Friedkin Site (Collins nd). Following Pre-Clovis is the Paleoindian Period, which dates from 11,500 to 8000 BP.

Diagnostic artifacts (e.g., projectile point types) associated with the Paleoindian Period and found within the Southeast Texas archeological region include Clovis, Folsom, San Patrice, Scottsbluff, Plainview, and Angostura projectile points. No systematic excavation of a Paleoindian site has taken place in this region. However, Paleoindian artifacts have been recovered from mixed contexts of Archaic age. Artifacts associated with the Paleoindian period have been found in abundance on the surface especially along major stream drainages. In fact, one of these sites is situated on an ancient tributary stream drainage currently located offshore of McFaddin Beach.

Archaic

The Archaic Stage is typically divided into three smaller subperiods, Early, Middle and Late, and is characterized by a wider variety of plant and animal exploitation with a slight decrease in group mobility over the Paleoindian Period (Black 1989). Additionally, “the Archaic in Texas is generally defined by pre- or nonhorticultural adaptations and pre-ceramic and pre-bow-and-arrow hunting technologies” (Ricklis 2004: 184). Sites are typically located along stream courses and diagnostic point types include the Bell/Calf Creek, Travis, Yarbrough, Bulverde, Kent, Gary, and Ensor, to name a few.

During the Late Archaic Period, “a shift to the use of poorer quality and more local lithic resources…suggests reduced group mobility and more tightly defined group territories” (Story 1990 cited in Ricklis 2004: 185). This assumption is also supported by the increase

in cemeteries during the Late Archaic times. Due to the numerous Late Archaic sites it is believed this subperiod experienced a significant population growth.

The earliest evidence for estuarine resource exploitation on the upper Texas coast comes from site 41GV53, which produced an uncalibrated radiocarbon date of 5000-4200 BP, and the Eagle's Ridge site. These sites produced large shell middens, a barrel-shaped conch columenlla bed, cut rangia and gastropod shells, perforated oyster shell and rangia valves, and fish remains (Ricklis 2004). While white-tailed deer accounted for 80 percent of the animal biomass at the Eagle Ridge site, fish came in second with 10 percent of the biomass.

The Archaic Period ends with the introduction of ceramic wares.

Ceramic Period

Ceramics appear in the archeological records around AD 100 in the Galveston Bay area. Despite the emergence of ceramics, "there are currently no indications of major changes in lifeways during the Early Ceramic Period" (Ricklis 2004: 189). Dee Ann Story (1990) has suggested that Ceramic Period cultures are archeologically distinct from neighboring regions. Thus, resulting in her coining of the term Mossy Grover Tradition/Culture for the Ceramic Period in the area.

Sites associated with the Mossy Grove Culture are found in the upper Texas Gulf coast, southwestern Louisiana, and the southern portions of the Texas Piney Woods. Utilizing ceramics composed of a sandy paste, the Mossy Grove culture is characterized by thin, decorated ceramics with narrow incised lines and punctations. Many of these ceramics are described as, "sandy paste wares with thin walls, floated surfaces, and rounded or conical-shaped bases" (Ellis 2013:141). Differences in settlement and subsistence patterns, as well as technology has led archeologists to divide this tradition into two sub-periods: the Coastal margins and the Inland Coastal Plain (Ellis 2013). The inland subregion is characterized by a hunter and gatherer subsistence strategy with short term occupation sites consisting of plain sandy paste ceramics, Gary and Kent dart points, sparse lithic scatters, and ground stone. Sites with Mossy Grove cultural components include the Jonas Hill site (41PK8) and the Crawford site (41PK69) (Ensor and Carlson 1988; McClurkan 1968).

Late Prehistoric

The Late Prehistoric Period saw the shift in hunting technology from the atlatl to the bow and arrow around AD 700 (Ricklis 2004). This technology enabled prehistoric hunters to harvest prey from greater distances with a lesser need for brushless, wide open spaces required for atlatl maneuverability. The use of arrows is indicated by "the appearance of small, light straight- and expanding-stem stone arrow points" (Ricklis 2004:194). Projectile points associated with the Late Prehistoric Period include Alba, Catahoula, Perdiz, and Scallorn types. This Period is often divided into two subperiods. The first subperiod involves

the introduction of the bow and arrow, while the second subperiod encompasses the Toyah Phase, a time of extensive bison exploitation.

Historic

Conroe, the county seat of Montgomery County, was established when Houston lumberman Isaac Conroe moved his sawmill from Stewarts Creek to the International & Great Northern Railroad's (I&GN) Houston-Crockett line. By 1884, Conroe's sawmill became a station along the I&GN Railroad. Around this time, the Gulf, Colorado and Santa Fe Railway's Navasota to Montgomery spur was built through Conroe forming the only major junction of rail lines in Montgomery County. Settlers moved to the region with the prospect of profiting from the region's lumber boom. By 1892, the town of Conroe supported five steam-powered saw and planning mills, several brickyards, a cotton gin, a gristmill, several hotels and general stores, and supported a population of 500 residents. Conroe became an important shipping point for lumber, cotton, livestock, tobacco, and bricks (Jackson 2016). Both the agricultural and timber industries continued to thrive through the early twentieth century, but was curtailed with the dwindling supply of local timber and the Great Depression. In 1931, George W. Strake discovered oil seven miles to the southeast of Conroe, which temporarily stimulated the local economy. A revival of the lumber industry, the construction of Interstate Highway 45, and the impounding of the West Fork of the San Jacinto River forming Lake Conroe all helped to promote growth within the community. Today, the City of Conroe supports 63,322 residents (Jackson 2016).

Cultural Resources in Proximity to the Project Area

Background research for this project consisted of an online records search through the THC's Archeological Sites Atlas (Atlas; 2017) and a review of historical maps and aerial photographs. Research focused on the identification of archeological sites, sites listed as State Antiquities Landmarks (SALs), Recorded Texas Historic Landmarks (RTHLs), sites listed on the National Register of Historic Places (NRHP), cemeteries, and previously conducted archeological surveys within one kilometer (0.62 mile) of the APE (**Figure 3**). The search revealed that no previously recorded archeological sites, SALs, RTHLs, or sites listed on the NRHP fall within one kilometer (0.62 mile) of the APE. However, one cemetery and 13 previously conducted archeological surveys are near or bisect the APE.

A least 13 previously conducted archeological surveys fall within one kilometer (0.62 mile) of the APE (**Table 2**). Of these, three bisect the current project area. Surprisingly, only one of the archeological surveys resulted in the recording of new archeological sites; none of which, are located within the APE.

The Conroe Memorial Park Cemetery (Cemetery ID Number: MQ-C011) is situated approximately 825 meters (0.5 mile) to the north of the APE. The cemetery opened in 1944 and reportedly contains over three thousand interments. While still active, the proposed undertaking will not have any foreseen effects on the cemetery.

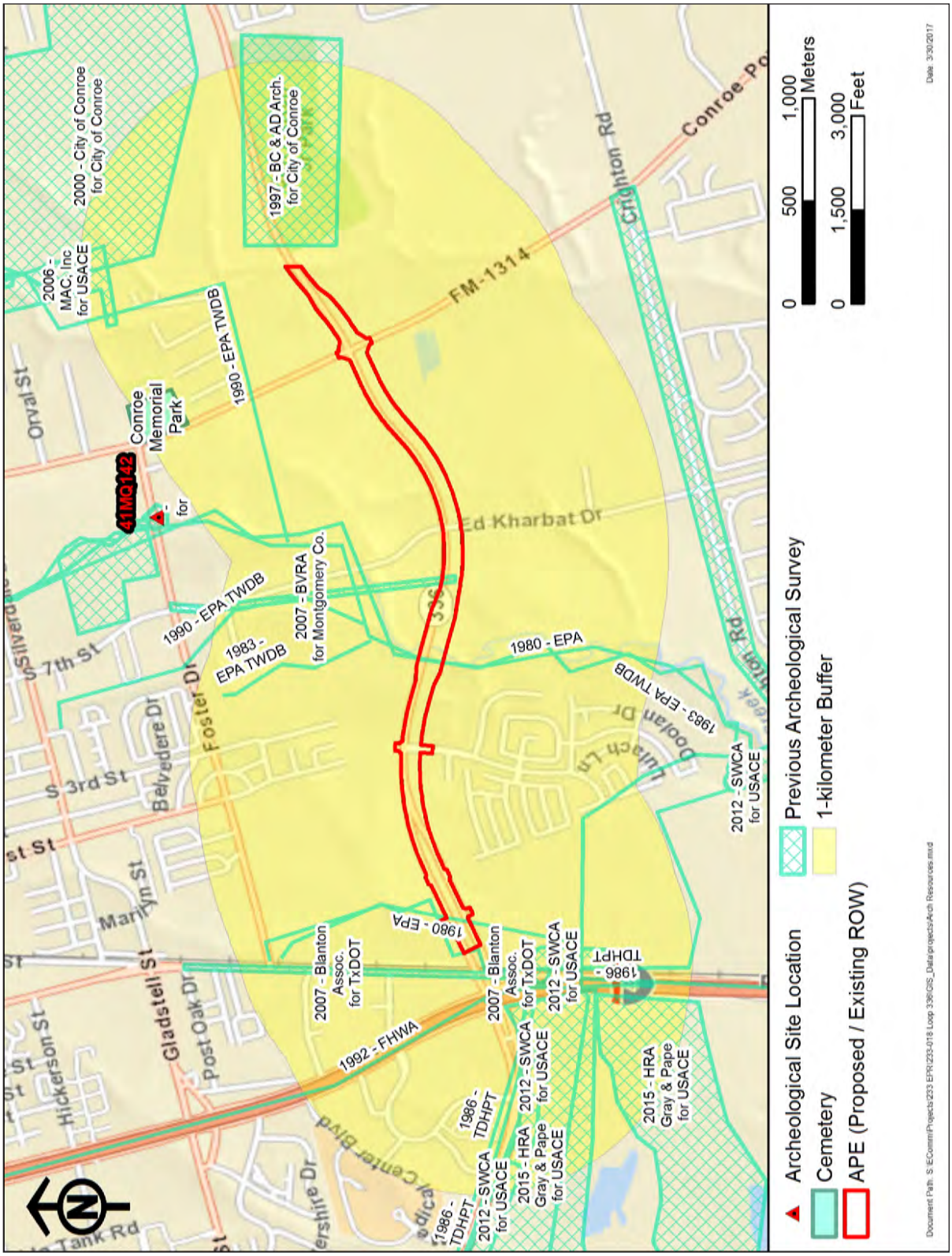

Figure 3. Previously conducted archeological surveys within one kilometer (0.62 mile) of the APE.

Table 2. Summary of Previously Conducted Archeological Surveys within One Kilometer (0.62 mile) of the APE (Atlas 2017).

Antiquities Permit No.	Fieldwork Year	Contractor	Sponsor or Agency	Proximity to APE (meters)	No. of New Sites
-	1980	-	EPA	Bisects	0
-	1983	-	EPA – TWDB	Bisects	0
-	1986	-	SDHPT	70	0
-	1990	-	EPA - TWDB	450	0
-	1992	-	FHWA	50	0
1807	1997	BC and AD Archaeology	City of Conroe	110	0
2358	2000	-	City of Conroe	645	0
-	2006	Moore Archeological Consulting, Inc.	USACE-Galveston	860	0
4314	2007	Blanton and Associates, Inc.	TxDOT	Bisects	0
4733	2007	Brazos Valley Research Associates	Montgomery County	Bisects	0
6220	2012	SWCA	USACE	230	0
-	2013 and 2015	HRA Gray & Pape	Private	160	~5

Prehistoric Land Use

A review of archeological sites near, but outside of the one kilometer (0.62 mile) buffer (41MQ62, 41MQ299, 41MQ321, 41MQ322, 41MQ323, 41MQ324, and 41MQ325), revealed multiple short to long-term prehistoric occupation sites situated along the edge of stream terraces that overlook small creeks or drainages. These sites contained a range of cultural materials including lithic debitage composed of chert, petrified wood, and quartzite, a flake core, both dart and arrow points, ceramic sherds, and non-human faunal remains. Artifacts were recorded between 10 and 100+ cmbs within the Landman fine sand soil unit. According to the sites' recorder(s), all but one site (41MQ62) lacked research potential and were recommended ineligible for listing to the NRHP or as a SAL.

Historic Land Use

According to a 1901 General Land Office Map of Montgomery County, Texas, the APE crosses land originally patented by Hansom House and A. M. Folks (**Figure 4**). A 1938 USDA Map of the Sam Houston National Forest depicts the APE as devoid of development with the exception of a pipeline owned by the Prairie Pipe Line Company (**Figure 5**). In 1953, the APE remained undeveloped with the exception of a transmission line corridor and the construction of FM 1314 at the project's easternmost end (**Figure 6**). Urban development began to encroach upon the APE by the late 1970s (**Figure 7**). Two cleared, linear features are visible crossing the APE at this time and are either pipelines or unimproved roads. Loop 336 was constructed sometime prior to 1989. However, aside from the construction of FM 336 and the pipelines or transmission lines, the APE has remained forested and relatively free of development (see Figure 1).

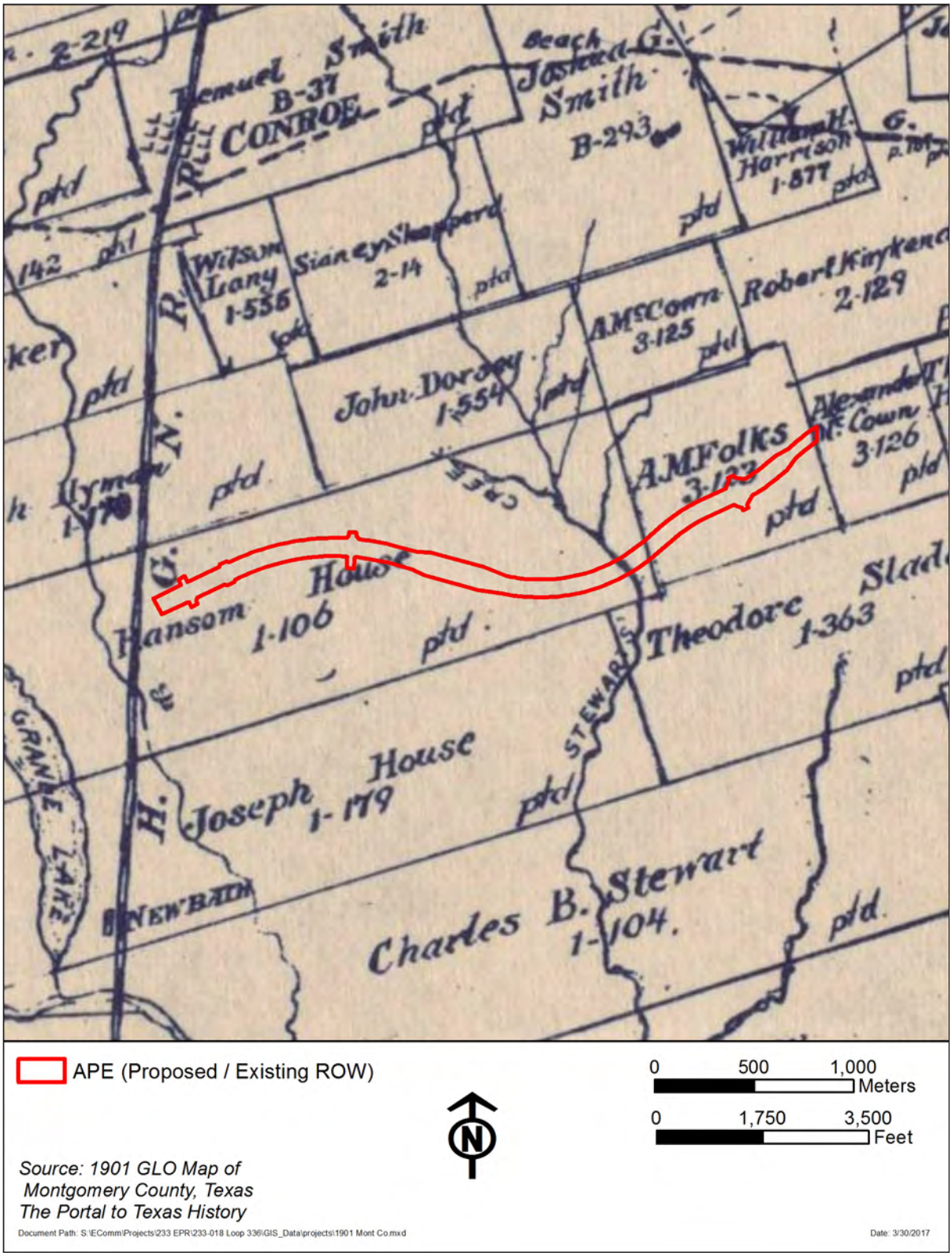

Figure 4. The APE depicted on a 1901 General Land Office Map of Montgomery County, Texas.

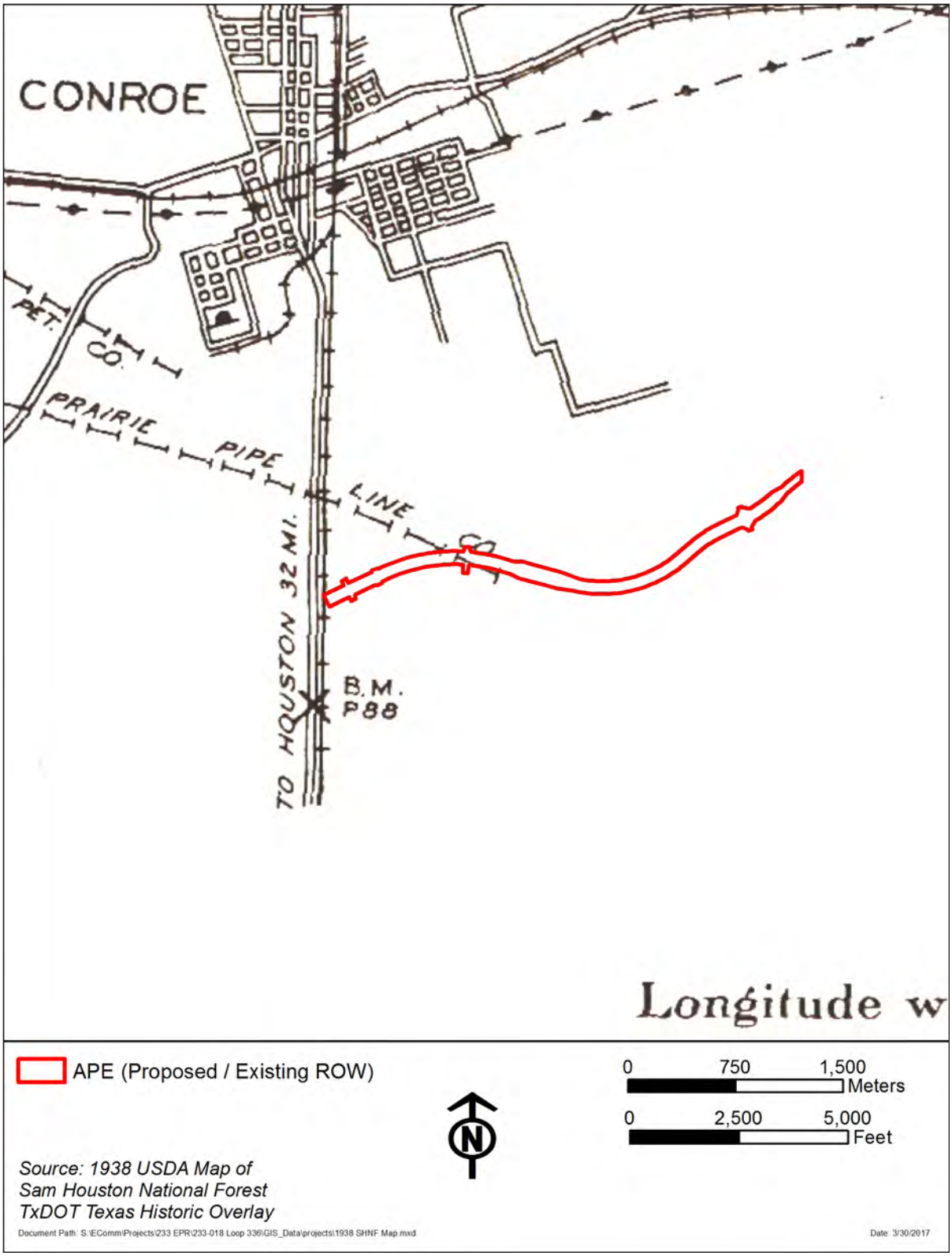

Figure 5. The APE depicted on a 1938 USDA map of the Sam Houston National Forest.

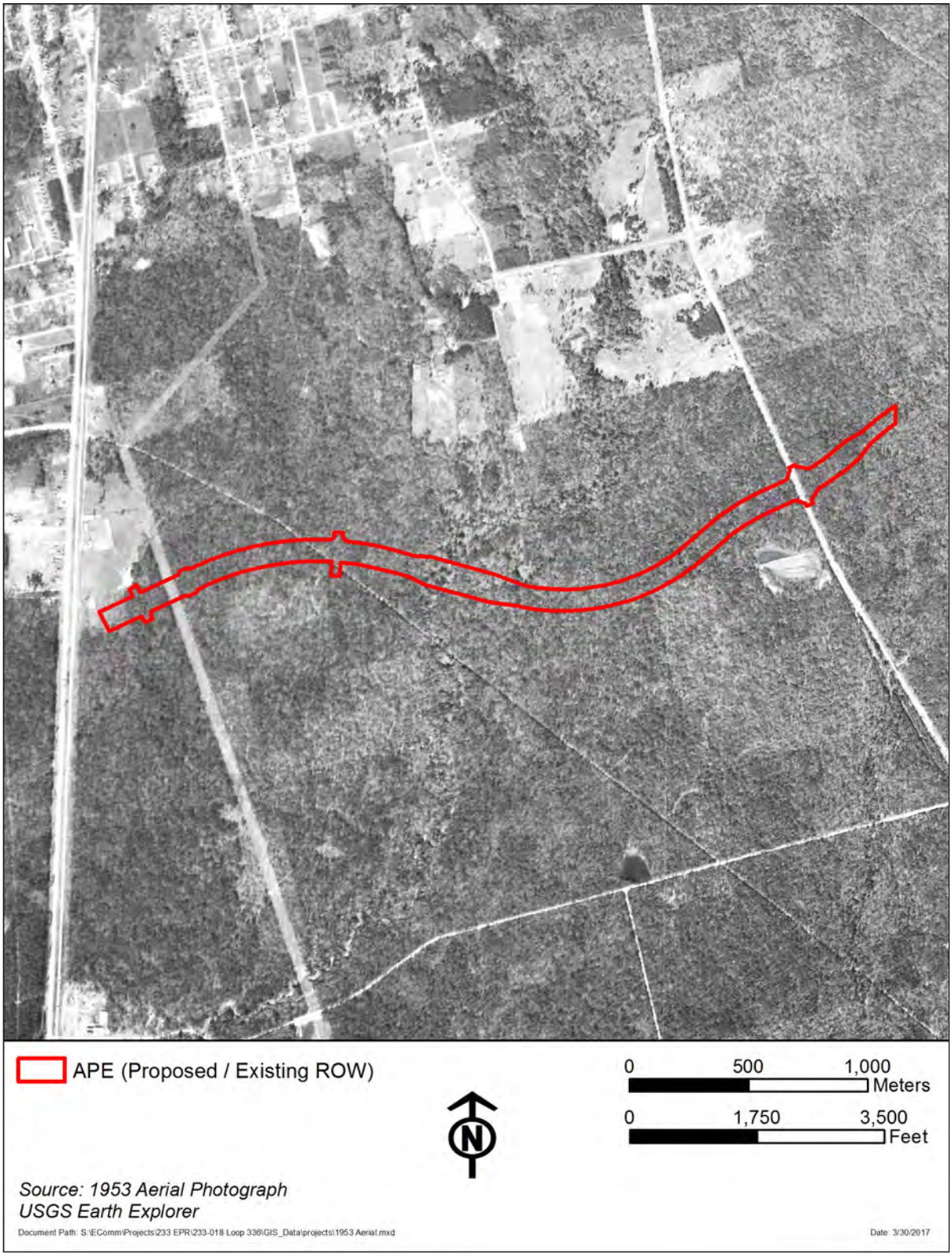

Figure 6. Detail from a 1953 aerial photograph depicting the location of the APE.

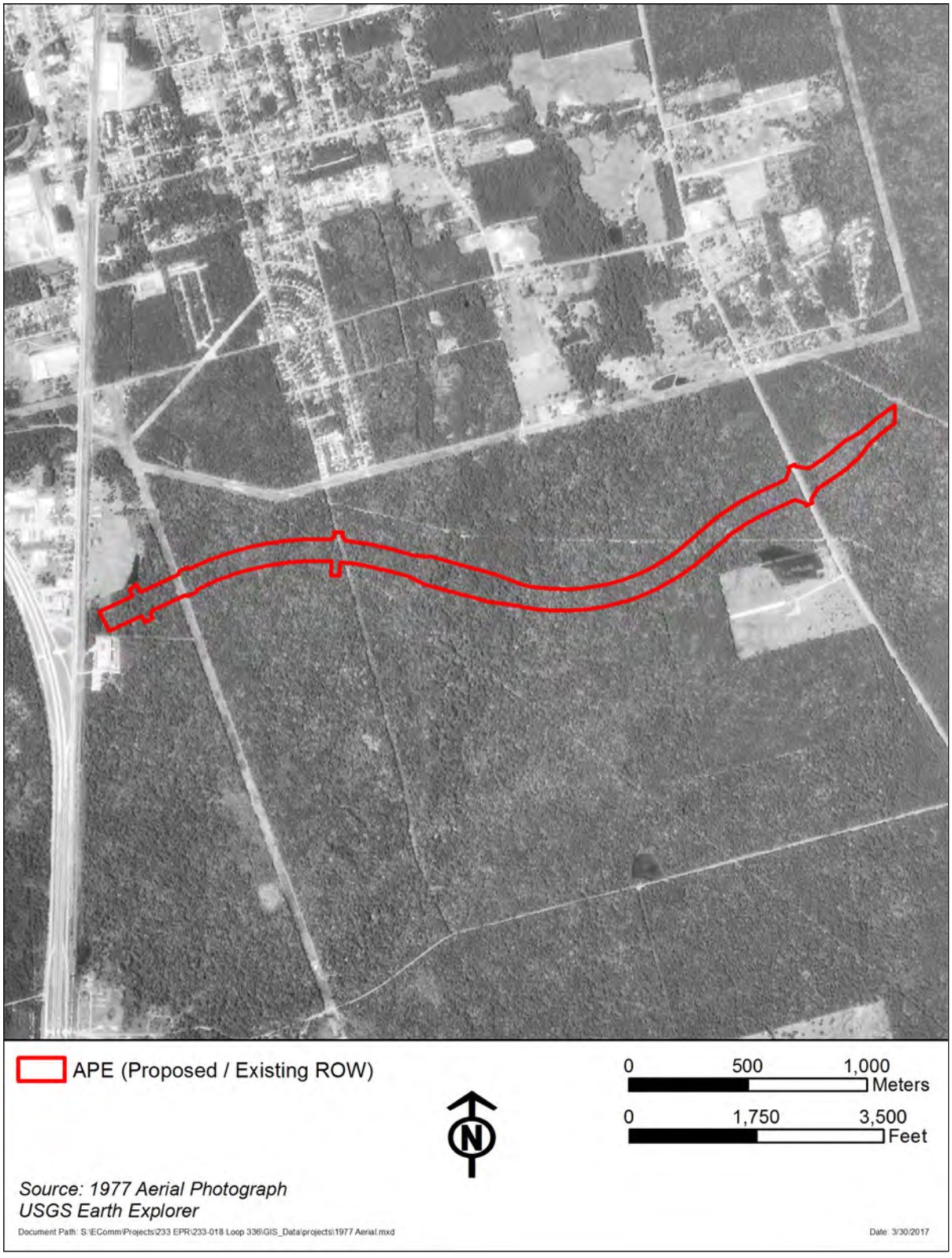

Figure 7. Detail from a 1977 aerial photograph depicting the location of the APE.

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Chapter 4
Methodology

Prior to field investigations, archeologists conducted archival research to assess the potential for buried historic and prehistoric archeological materials. This research involved examining historical maps, aerial photographs, soil maps, and the Potential Archeological Liability Map of the Houston District (Abbott 2011). As mentioned above, archeologists consulted the Atlas to assess the potential for prehistoric archeological sites within the APE. This not only allowed investigators to determine the presence of previously recorded archeological sites within the APE, but also to gain a sense of site types, artifact types, and average depth of cultural materials below the surface, among other things. This information coupled with topography and proximity to water, allowed investigators to define areas of high probability for archeological sites (**Figure 8**). The background study determined that the APE has archeological potential mainly around Stewarts Creek and Little Caney Creek. The APE limits, along with areas deemed to have potential for containing archeological materials, were overlaid on topographic maps and loaded onto hand-held DeLorme GPS units to aid in navigation.

Archeological fieldwork consisted of a pedestrian survey supplemented by both systematic and strategically placed shovel tests. Investigators manually excavated 79 shovel tests at approximately 100-meter intervals along two survey transects within APE. However, shovel test spacing was reduced within those areas having higher archeological potential (**Appendix B**). While conducting the pedestrian survey, archeologists observed multiple areas of disturbance. Areas of disturbances were thoroughly photographed and archeologists made notes on the conditions they encountered during their investigations. Archeologists attempted to avoid these observed disturbances during shovel testing. In addition, investigators visually assessed the banks and beds of both Little Caney and Stewarts Creeks for cultural material and/or features.

Shovel tests measured 30 centimeters in diameter and extended to a maximum depth of 80 centimeters below surface (cmbs) or until encountering restrictive features (e.g., dense clay). The shovel tests were excavated in 10-centimeter increments and all soil was screened through a ¼-inch hardware cloth. Relevant information for all shovel tests was recorded on a standardized form. Shovel tests were backfilled upon completion. This archeological investigation was a non-collection survey; therefore, artifacts, were returned to their original location.

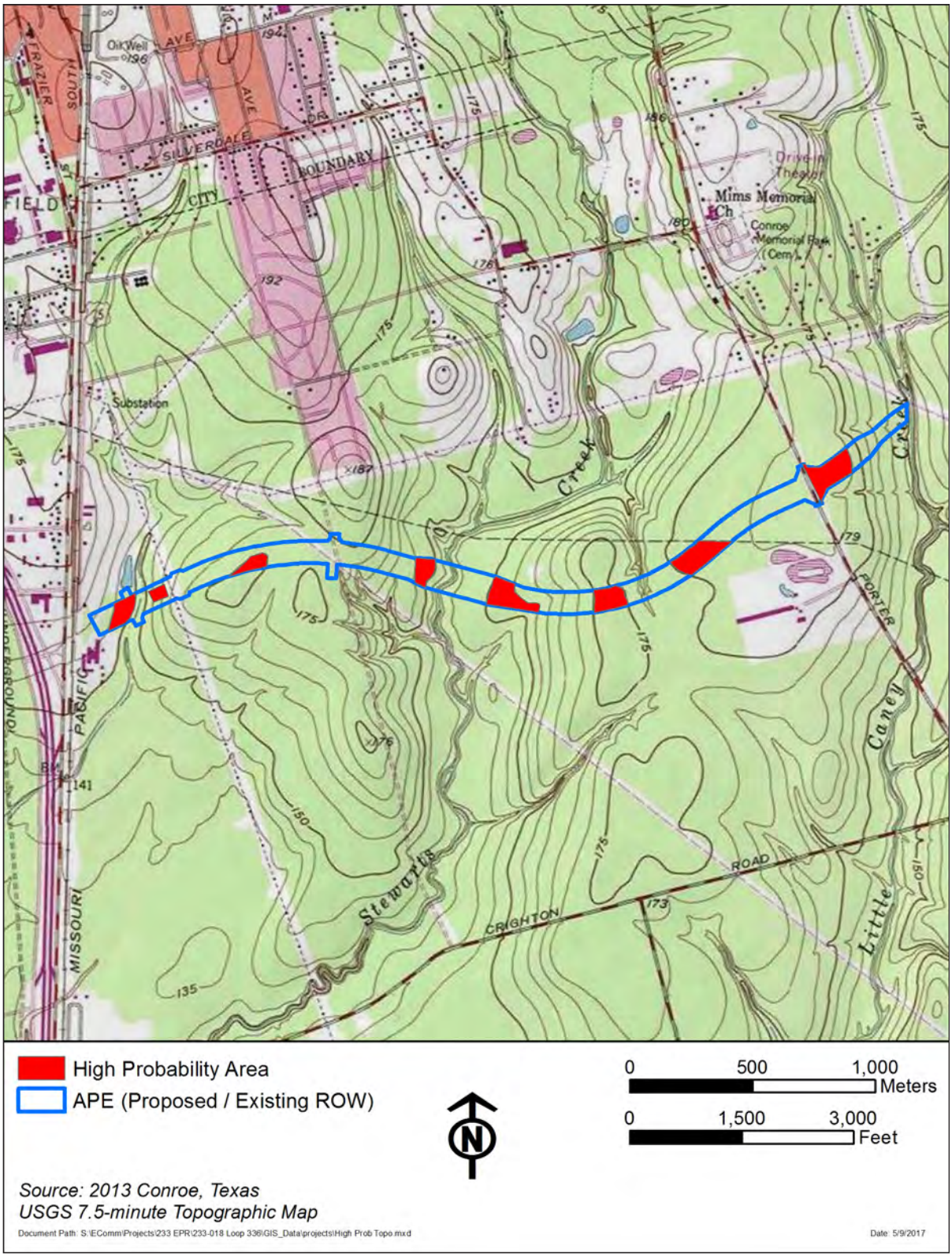

Figure 8. Areas defined as having high archeological potential depicted on a 2013 Conroe, TX 7.5-minute topographic map.

Chapter 5
Survey Results

The proposed Loop 336 improvement project is taking place within a rapidly growing suburban community. The natural landscape within the APE is generally flat with subtle topographic relief ranging in elevation from approximately 141 to 182 feet AMSL. The APE crosses two named creeks, Little Caney and Stewarts Creeks, and one unnamed wet weather drainage. Vegetation within the APE consisted of young to mature pine, young oak, and magnolia trees, palmetto, greenbrier, medium grasses, blackberry, and wildflowers (**Figure 9**). During field investigations the temperature ranged from 42 to 88 degrees Fahrenheit and the project area received 0.23 inches of rain.

Soils encountered within the APE were relatively deep (Depth: min 5 cmbs; max 80 cmbs; average 65 cmbs) and were characterized by pale brown (10YR 6/3) to light yellowish brown (10YR 6/4) fine to very fine sandy loam containing colored pebbles underlain by a dense yellowish brown (10YR 5/6) sandy clay. Ground surface visibility ranged from poor to good across the APE (**Figures 10a–c**). Within the tree line ground surface visibility was hampered by leaf litter; thus, considered poor (0 percent). On the other hand, ground surface visibility within the treeless corridor was moderate (ranging from 30 to 70 percent). Lastly, around disturbances the ground surface visibility was good (from 70 to 90 percent).

Investigators had access to 100 percent of the proposed APE. Along the 2.25-mile stretch, archeologists excavated a total of 79 shovel tests (**Appendices B** and **C**) for a rate of one shovel test every 75 meters, or one shovel test for every 1.08 acres. Within the 21.5 acres defined as having high potential for prehistoric archeological sites, 33 of the 79 shovel tests were excavated for a rate of one shovel test for every 0.65 acre. None of the shovel tests contained any artifacts. Archeologists walked the creek beds looking for cultural materials. There was no stream flow within Little Caney Creek (**Figure 11A**) exposing a large gravel bar composed of colored gravels under the Loop 336 bridge. No cultural materials were observed within Little Caney Creek. However, Stewarts Creek (**Figure 11B**), with a weak current and sandy gravel bars, contained one plain whiteware sherd, a blue vessel glass shard, and a milk glass shard. The historic materials are in secondary context and did not originate from within the APE.

Visual reconnaissance revealed disturbances associated with both transportation and urban development within the APE. For example, roadside drainages border both sides of Loop 336 (**Figure 12**), buried utilities are present in numerous locations along the roadway (**Figure 13**), and artificially leveled and paved surfaces are present at many of the intersections (**Figure 14**). Archeologists did not shovel test within these localities.

Ultimately, no new archeological sites were observed within the APE.

Figure 9. Typical setting within the APE, photographed facing southeast.

Figure 10. Variability in ground surface visibility across the APE: A) poor (0%) ground surface visibility within the tree line, photographed facing east; B) moderate (30 to 70%) ground surface visibility within the treeless corridor, photographed facing southwest; and C) good (70 to 90%) ground surface visibility within disturbed areas, photographed facing southwest.

Figure 11. A view of Little Caney and Stewarts Creeks: A) Little Caney Creek, photographed facing south; and B) Stewarts Creek, photographed facing northeast.

Figure 12. Disturbances associated with transportation land use: A and B) drainages located within the roadside drainage ditches; and C) roadside drainage ditch paralleling existing Loop 336, photographed facing northwest.

Figure 13. Utility line corridor with buried pipeline, photographed facing southeast.

Figure 14. Typical disturbances observed at the intersections within the APE: A) view of the northeast corner of the Loop 336 and Conroe Porter Road intersection, photographed facing west; B) view of the northeast corner of the Loop 336 and Stewarts Forest Drive intersection, photographed facing northwest; C) view of the southwest corner of the Loop 336 and Conroe Porter Road intersection, photographed facing southeast; and D) view of the northern portion of the westernmost unnamed intersection along Loop 336, photographed facing west.

Chapter 6
Recommendations

AmaTerra surveyed the proposed 2.25-mile long Loop 336 improvement project, from IH-45 to FM 1314, in southern Conroe, Montgomery County, Texas. The project was conducted under Section 106 and the ACT and work conformed to the guidelines for implementation of these regulations under 36 CFR Part 800 and 13 TAC Chapter 26. Access was available to 100 percent of the proposed APE. Conditions affecting fieldwork included poor ground surface visibility, and disturbances associated within transportation and urban development.

Archeologists conducted a thorough pedestrian survey and excavated 79 shovel tests in support of this project. Shovel tests were placed at regular intervals (approximately every 100 meters) along the proposed improvement project, as well as strategically placed within areas having high archeological potential. No archeological materials of any sort were observed on the ground surface or found in any of the shovel tests. However, investigators did document a plain whiteware sherd, a blue vessel glass shard, and a milk glass shard in the bed of Stewarts Creek. The artifacts are in secondary context and did not originate from within the APE. No shovel tests were conducted within disturbed areas; specifically, within the transmission and pipeline corridor or in the roadside drainage ditches. A visual inspection of these areas suggests that the potential for buried, in situ archeological materials is low. Based on the results of the archeological survey AmaTerra recommends no further work for any portion of the APE.

Archeologists did not collect any artifacts during this survey and therefore none will be curated at TARL. This report is submitted in fulfillment of Antiquities Permit No. 8006.

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APPENDIX A

SCHEMATICS AND TYPICAL SECTIONS

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HOUSTON DISTRICT
PROJECT DEVELOPMENT

LP 336 SOUTH

SCHEMATIC LAYOUT

LP 336 SOUTH

COUNTY: MONTGOMERY
LIMITS FROM: I-45
LIMITS TO: 0.2 MI EAST OF FM 1314

CSJ: 0338-11-020
DATE: 11/30/2016
APPROVED: / /

NOT A BIDDING DOCUMENT
__________ P.E.
TBPE NO. __________

LEGEND

DESCRIPTION	SYMBOLOGY	WEIGHT	COLOR CODE
PROPOSED MAIN LANES		2	BLACK -0
PROPOSED TOLL LANES		2	PURPLE -80
PROPOSED FRONTAGE ROADS		5	BLUE -1
PROPOSED RAMPS		5	BLUE -1
PROPOSED DIRECT CONNECTOR		2	ORANGE -6
PROPOSED EMBANKMENT		2	RED -3
PROPOSED RETAINING WALL		8	RED -3
PROPOSED BRIDGE BENTS		2	RED -3
PROPOSED NOISE WALL		5	MAGENTA -37
PROPOSED SIDEWALKS		2	MAGENTA -200
PROPOSED STRIPING		1	ORANGE -6
PROPOSED LANE INDICATOR		1	BLACK -0
PROPOSED RIGHT-OF-WAY		1	BLACK -0
CONTROL OF ACCESS		2	RED -3
PLANIMETRIC		1	GREEN -2
EXISTING RIGHT-OF-WAY		1	BLACK -0
EXISTING ROADWAY		2	GREEN -2
EXISTING ROADWAY TO BE REMOVED		1	BLACK -0
EXISTING LANE INDICATOR		1	GREEN -2
TRAFFIC COUNT YEAR ( ) DHV		1	BLACK -0

COLORFILL LEGEND

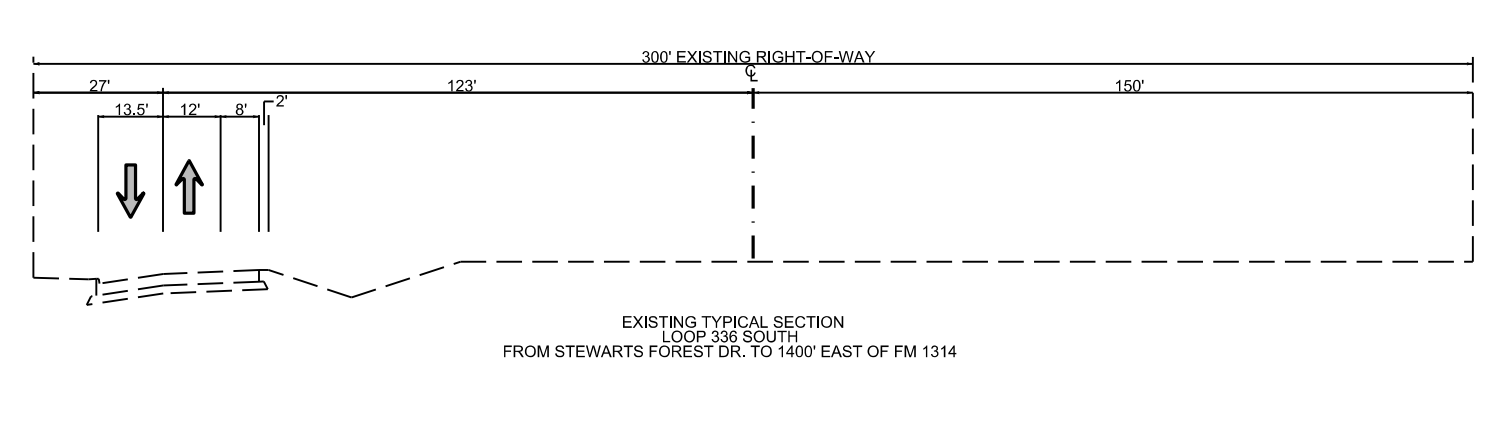
FRONTAGE ROAD/RAMPS	
BRIDGE	

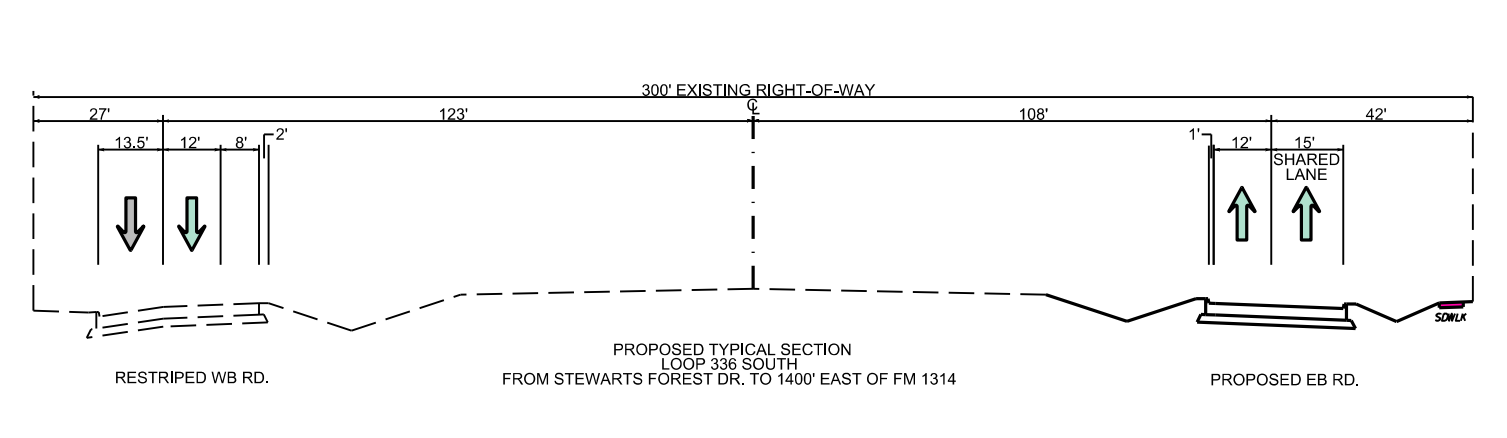
SCALE

0 100 200 300 400

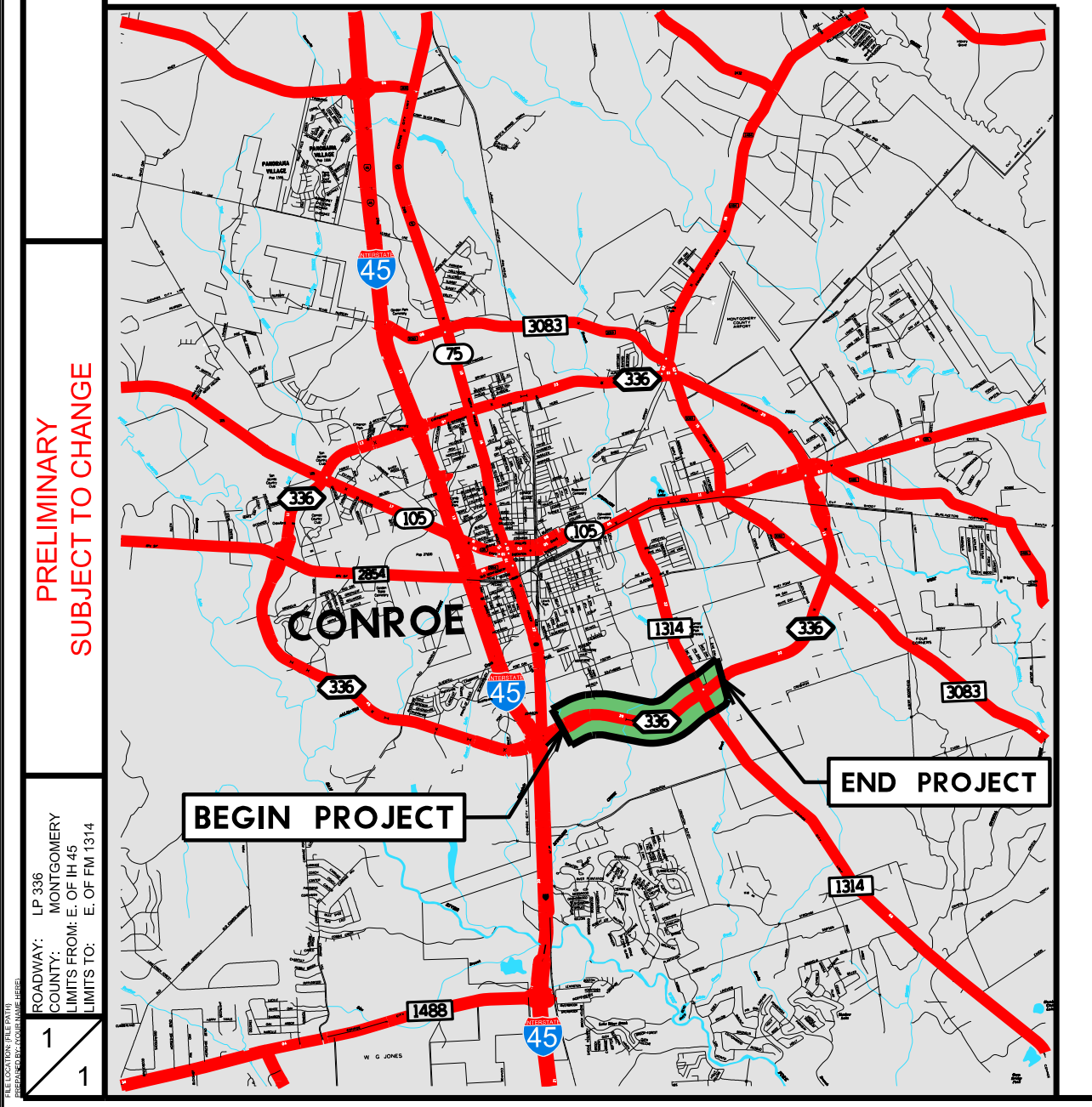
DESIGN CRITERIA

FUNCTIONAL CLASSIFICATION: URBAN PRINCIPAL ARTERIAL
FRONTAGE ROAD DESIGN CRITERIA: URBAN COLLECTOR
FRONTAGE ROAD DESIGN SPEED: 45 MPH





VICINITY MAP



LP 336 SOUTH

PRELIMINARY
SUBJECT TO CHANGE

ROADWAY: LP 336
COUNTY: MONTGOMERY
LIMITS FROM: E. OF IH 45
LIMITS TO: E. OF FM 1314

1 / 1

Appendix B

Shovel Test Locations

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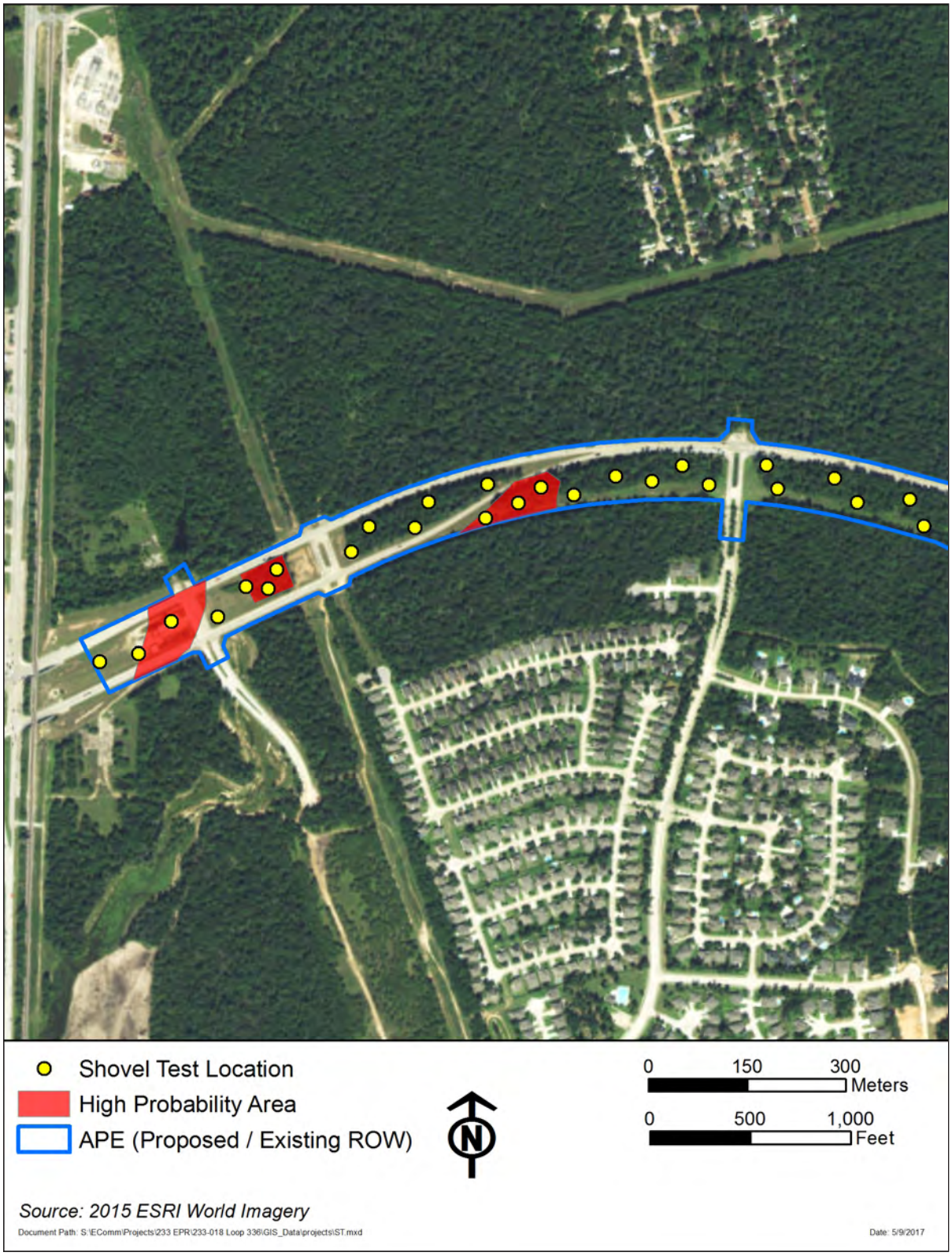
Shovel Test Location
High Probability Area
APE (Proposed / Existing ROW)
N
0 150 300
Meters
0 500 1,000
Feet
Source: 2015 ESRI World Imagery
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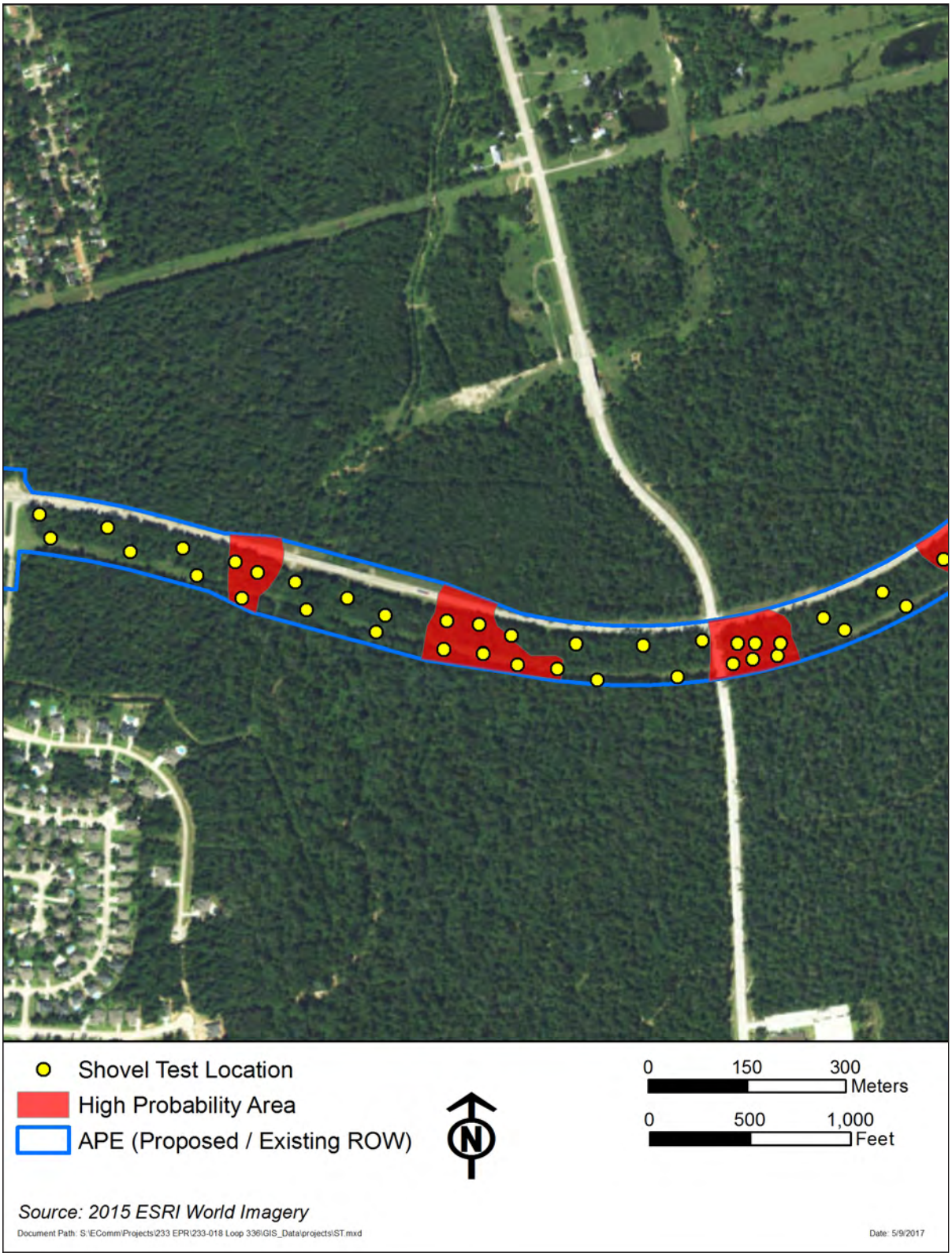
Date: 5/9/2017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High Probability Area
APE (Proposed / Existing ROW)
N
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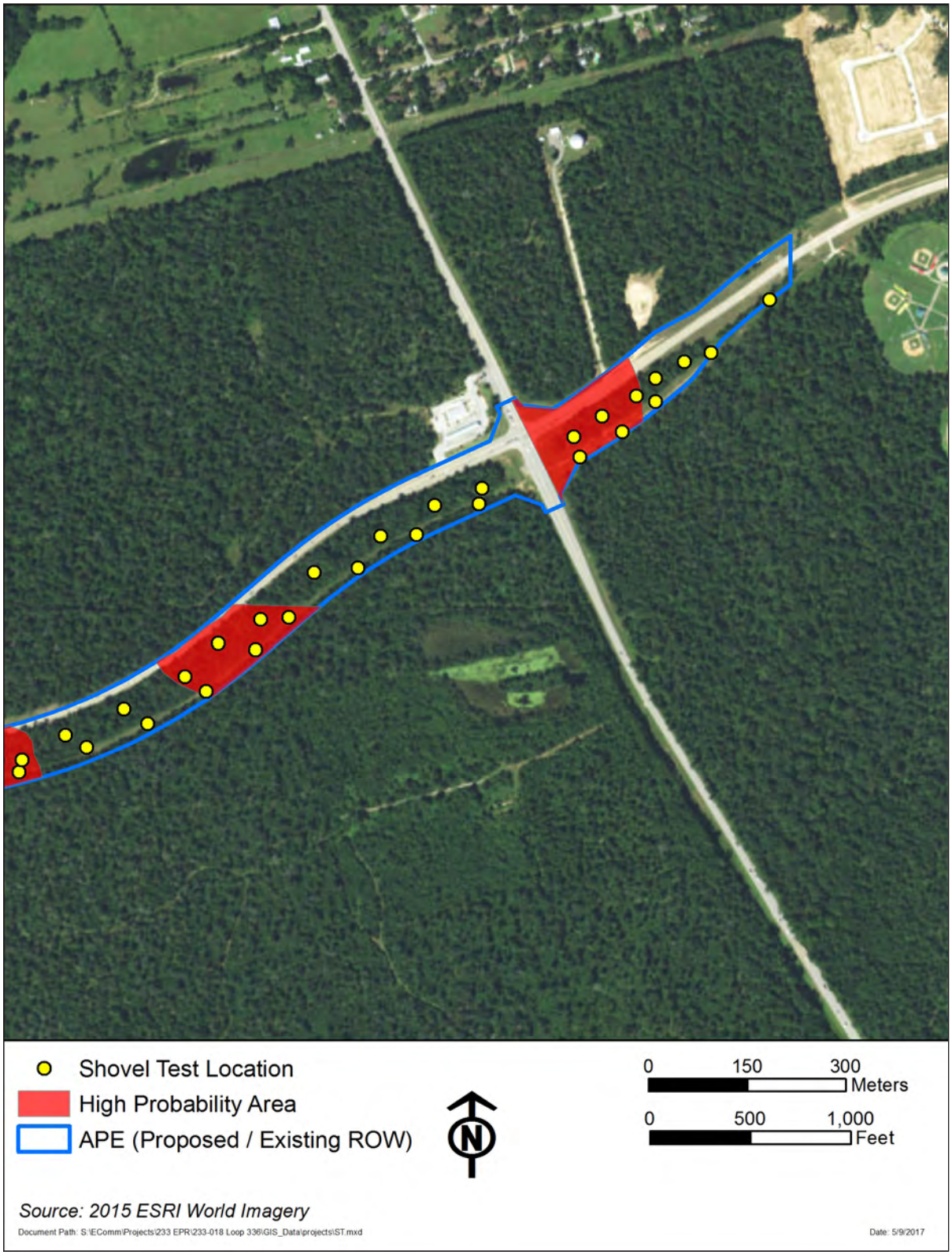
Meters
0 500 1,000
Feet
Source: 2015 ESRI World Imagery
Document Path: S:\EComm\Projects\233 EPR\233-018 Loop 336\GIS_Data\projects\ST.mxd
Date: 5/9/2017


Shovel Test Location
High Probability Area
APE (Proposed / Existing ROW)
N
0 150 300
Meters
0 500 1,000
Feet
Source: 2015 ESRI World Imagery
Document Path: S:\EComm\Projects\233 EPR\233-018 Loop 336\GIS_Data\projects\ST.mxd
Date: 5/9/2017

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Appendix C

Shovel Test Logs

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Shovel Test Record									
ST #	Northing	Easting	Depth	Color	Texture	Disturbances	Date	Excavator	Notes
DS-01	3352983	266700	0-30	10 YR 5/3	Sa Lo	Gravels (plinthite, Manganese)incresing density w/ depth	5/1/2017	D. Sitters	in flat wooded area, pine and oak mostly young trees, no ground visibility
DS-01			50+	10 YR 5/4 W 5/8	Sa Cl	Gravels (plinthite, Manganese)incresing density w/ depth	5/1/2017	D. Sitters	DS-1/DS-07 shallow SaLo underlain by Cl Sa w/ colored pebbles and in some cases dense amounts of manganese
DS-02	3352956	266628	0-25	10 YR 6/2	Sa Lo	Gravels, roots	5/1/2017	D. Sitters	SAA
DS-02			25-60	10 YR 6/3	Sa Lo	Gravels, roots	5/1/2017	D. Sitters	
DS-02			60-70+	10 YR 5/4	Sa Cl	Gravels , increasing in density w depth	5/1/2017	D. Sitters	
DS-03	3352910	266545	0-50	10 YR 6/3	Sa Lo	Gravels, roots	5/1/2017	D. Sitters	SAA
DS-03			50+	10 YR 5/4	Sa Cl	Gravels, roots, oxidation, mottled w/ 10YR 5/8	5/1/2017	D. Sitters	
DS-04	3352864	266444	0-50	10 YR 5/3	Sa Lo	Gravels, roots	5/1/2017	D. Sitters	
DS-04			50-60	10 YR 5/4	Sa Cl	Gravels, roots, oxidation, mottled w/ 10YR 5/8	5/1/2017	D. Sitters	
DS-05	3352783	266363	0-30	10 YR 5/3	Sa Lo	dense, high concentration of manganese,plinthite	5/1/2017	D. Sitters	recently cleared of understory with pitted surface
DS-05			30-45	10 YR 5/6	Sa Cl	dense, high concentration of manganese,plinthite w/ mottling	5/1/2017	D. Sitters	
DS-06	3352747	266298	0-40	10 YR 5/3	Sa Lo	Dense, high concentration of manganese,plinthite w/ mottling	5/1/2017	D. Sitters	
DS-06			40-50	10 YR 5/4	Sa Lo	Gravels	5/1/2017	D. Sitters	
DS-06			50+	10 YR 5/6	Sa Cl	dense gravels	5/1/2017	D. Sitters	
DS-07	3352696	266248	0-25	10 YR 6/3	Sa Lo	gravels, roots	5/1/2017	D. Sitters	
DS-07			25-50	10 YR 5/ 3	Sa Lo	dense gravels, roots	5/1/2017	D. Sitters	
DS-07			50+	10 YR 5/4	Sa Cl	very dense, few gravels, mottled with 10 Yr 5/8	5/1/2017	D. Sitters	

Shovel Test Record									
ST #	Northing	Easting	Depth	Color	Texture	Disturbances	Date	Excavator	Notes
DS-08	3352647	266155	0-80	10 YR 6/4	Sa Lo	roots, gravels, density increases with depth	5/1/2017	D. Sitters	Deep SaLo with low density of colored pebbles
DS-09	3352608	266066	0-40	10 YR 6/3	Sa Lo	roots, pebbles	5/1/2017	D. Sitters	
DS-09			40-50	10 YR 5/4	Sa Cl	dense, few pebbles	5/1/2017	D. Sitters	
DS-10	3352570	266000	0-80	10 YR 6/4	Sa Lo	roots, pebbles	5/1/2017	D. Sitters	
DS-11	3352570	265962	0-80	10 YR 6/4	Sa Lo	roots, colored pebbles, density increases with depth	5/1/2017	D. Sitters	
DS-12	3353061	266840	0-12	10 YR 4/2	Lo	roots, colored pebbles	5/2/2017	D. Sitters	
DS-12			12-59	10 YR 6/4	Sa Lo	roots, colored pebbles	5/2/2017	D. Sitters	
DS-12			59-61+	10 YR 5/4	Sa Cl	very dense colored pebbles	5/2/2017	D. Sitters	
DS-13	3353092	266883	0-10	10 YR 4/2	Lo	roots, colored pebbles	5/2/2017	D. Sitters	
DS-13			10-70	10 YR 6/4	Sa Lo	roots, colored pebbles	5/2/2017	D. Sitters	
DS-13			70+	10 YR 5/4	Sa Cl	very dense colored pebbles, oxidation	5/2/2017	D. Sitters	
DS-14	3353150	266934	0-10	10 YR 4/2	Lo	roots, colored pebbles	5/2/2017	D. Sitters	Sa Cl unit was much more clayey and dense with large redish orange mottles
DS-14			10-60	10 YR 6/4	Sa Lo	roots, colored pebbles	5/2/2017	D. Sitters	
DS-14			60+	10 YR 5/4	Sa Cl	very dense colored pebbles, oxidation/ mottling w 5 YR 4/6	5/2/2017	D. Sitters	
DS-15	3353150	266964	0-10	10 YR 4/2	Lo	roots, colored pebbles	5/2/2017	D. Sitters	
DS-15			10-70	10 YR 6/4	Sa Lo	roots, colored pebbles	5/2/2017	D. Sitters	
DS-15			70+	10 YR 5/4	Sa Cl	very dense colored pebbles	5/2/2017	D. Sitters	
DS-16	3353175	264008	0-10	10 YR 4/2	Lo	roots, colored pebbles	5/2/2017	D. Sitters	much like DS-14

Shovel Test Record									
ST #	Northing	Easting	Depth	Color	Texture	Disturbances	Date	Excavator	Notes
DS-16			10-38	10 YR 6/4	Sa Lo	copious amounts of colored gravels	5/2/2017	D. Sitters	
DS-16			38+	10 YR 5/4	Sa Cl	w/ oxidation and mottling w/5 YR 4/6	5/2/2017	D. Sitters	
DS-17	3352467	263859	0-10	10 YR 5/4	Sa Cl	colored pebbles, extreamly dense mixed w/ 5 YR 4/6	5/2/2017	D. Sitters	
DS-18	3352528	263968	0-5	10 YR 5/4	Sa Cl	colored pebbles, extreamly dense mixed w/ 5 YR 4/6	5/2/2017	D. Sitters	exactly like DS-17 unable to dig
DS-19	3352580	264082	0-18	10 YR 5/6	Cl	Dense mixed clay peds coaded in silt	5/2/2017	D. Sitters	silt 10YR 6/3, clay peds 10 YR 5/3- 5/2
DS-19			18-45	10 YR 5/6		dense mixed, some oxidation, few to no gravels	5/2/2017	D. Sitters	
DS-20	3352606	264129	0-25	10 YR 4/4	Sa Lo	roots, colored pebbles	5/2/2017	D. Sitters	ST should have been fruther to the NE but would have landed in a modifed utility corridor with a buried line 46m too short
DS-20			25-30+	7.5 YR 4/6	Cl Sa	dense, few pebbles	5/2/2017	D. Sitters	
DS-21	3352672	264269	0-10	10 YR 5/3	Lo	rootlets, colored pebbles	5/2/2017	D. Sitters	
DS-21			10-80	10 YR 6/4	fine Sa Lo	colored pebbles	5/2/2017	D. Sitters	
DS-21			80+	10 YR 5/4	Sa Cl	oxidation	5/2/2017	D. Sitters	
DS-22	3352710	264359	0-70	10 YR 6/4	F Sa Lo	rootlets, colored pebbles	5/2/2017	D. Sitters	
DS-22			70+	10 YR 5/4	Sa Cl	dense	5/2/2017	D. Sitters	
DS-23	3352736	264450	0-80	10 YR 6/4	F Sa Lo	rootlets, colored pebbles	5/2/2017	D. Sitters	high concentration of manganese concreations or plinthite @ depth
DS-24	3352764	264745	0-25	10 YR 6/4	F Si Sa Lo	roots, colored pebbles	5/2/2017	D. Sitters	
DS-24			25-40	10 YR 6/4	Sa Cl	oxidation, mottled with 10YR 5/4, colored pebbles,plinthite, Manganese, very dense	5/2/2017	D. Sitters	
DS-25	3352748	264644	0-60	10 YR 6/4	F Sa Lo	roots, colored pebbles	5/2/2017	D. Sitters	

Shovel Test Record									
ST #	Northing	Easting	Depth	Color	Texture	Disturbances	Date	Excavator	Notes
DS-25			60-70	10 YR 6/4	Sa Cl	oxidation, mottled with 10YR 5/4, colored pebbles,plinthite, Manganese, very dense	5/2/2017	D. Sitters	
DS-26	3352732	264531	0-60	10 YR 6/4	F Sa Lo	roots, colored pebbles	5/2/2017	D. Sitters	
DS-26			60-70	10 YR 6/4	Sa Cl	oxidation, mottled with 10YR 5/4, colored pebbles,plinthite, Manganese, very dense	5/2/2017	D. Sitters	
DS-27	3352765	264873	0-25	10 YR 5/3	Sa Cl	very dense, mixed, trash	5/2/2017	D. Sitters	
DS-27			25-61	10 YR 6/4	Sa Lo	rootlets, some pebbles, light oxidation	5/2/2017	D. Sitters	
DS-27			61+	10 YR 6/4	Sa Cl	dense, oxidation, mottled with 10YR 5/4	5/2/2017	D. Sitters	
DS-28	3352745	264977	0-80	10 YR 7/3	F Sa Lo	colored pebbles, roots, light oxidation at base	5/2/2017	D. Sitters	
DS-29	3352714	264092	0-80	10 YR 6/3	F Sa Lo	roots, colored pebbles	5/2/2017	D. Sitters	
DS-30	3352693	265172	0-80	10 YR 6/3	F Sa Lo	roots, colored pebbles	5/2/2017	D. Sitters	
DS-31	3352677	265205	0-80	10 YR 6/3	F Sa Lo	roots, colored pebbles	5/2/2017	D. Sitters	
DS-32	3352573	265881	0-20	10 YR 6/2	Lo	rootlets, few colored pebbles	5/3/2017	D. Sitters	
DS-32			20-80	10 YR 6/4	F Sa Lo	few colored pebbles, light oxidation at base	5/3/2017	D. Sitters	
DS-33	3352567	265792	0-20	10 YR 6/2	Lo	rootlets, few colored pebbles	5/3/2017	D. Sitters	
DS-33			20-80	10 YR 6/4	F Sa Lo	few colored pebbles, light oxidation at base	5/3/2017	D. Sitters	
DS-34	3352569	265690	0-12	10 YR 5/3	Lo	rootlets, few colored pebbles	5/3/2017	D. Sitters	
DS-34			12-33	10 YR 5/4	F Sa Lo	roots, few colored pebbles	5/3/2017	D. Sitters	
DS-34			33-45	10 YR 5/8	Sa Cl	dense, mottled	5/3/2017	D. Sitters	

Shovel Test Record									
ST #	Northing	Easting	Depth	Color	Texture	Disturbances	Date	Excavator	Notes
DS-35	3352581	265591	0-10	10 YR 5/3	Lo	rootlets, few colored pebbles	5/3/2017	D. Sitters	
DS-35			10-40	10 YR 5/4	F Sa Lo	roots, few colored pebbles	5/3/2017	D. Sitters	
DS-35			40-50	10 YR 5/8	Sa Cl	dense, mottled	5/3/2017	D. Sitters	
DS-36	3352598	265542	0-20	10 YR 6/3	F Sa Lo	roots, few colored pebbles	5/3/2017	D. Sitters	
DS-36			20-60	10 YR 6/3	Si Cl	few pebbles, lightly mottled,rootlets, dense with depth	5/3/2017	D. Sitters	
DS-37	3352603	265493	0-12	10 YR 6/3	Sa Lo	few to no pebbles, rootlets	5/3/2017	D. Sitters	this area has been cleared of understory with pig activity
DS-37			12-40	10 YR 4/2	Cl Lo	dense, lightly mottled	5/3/2017	D. Sitters	
DS-38	3352612	265399	0-60	10 YR 6/3	Sa Lo	few pebbles, roots	5/3/2017	D. Sitters	
DS-38			60+	10 YR 4/6	Cl Lo	dense	5/3/2017	D. Sitters	
NS-1	3352959	266695	0-60	10 YR 7/2	Sa Lo	gravels	5/1/2017	N. Steinle	
NS-1			60-80	10 YR 7/2	Sa Cl Lo	gravels and mottling 10 YR 7/6	5/1/2017	N. Steinle	
NS-2	3352912	266600	0-60	10 YR 7/2	Sa Lo	gravels	5/1/2017	N. Steinle	
NS-2			60-80	10 YR 7/2	Sa Cl Lo	gravels and mottling 10 YR 7/6	5/1/2017	N. Steinle	
NS-3	3352861	266511	0-20	10 YR 6/2	Sa Lo	gravels	5/1/2017	N. Steinle	
NS-3			20-80	10 YR 5/3	Sa	gravels and mottling 10 YR 7/6, rootlets,oxidation	5/1/2017	N. Steinle	
NS-4	3352786	266406	0-40	10 YR 6/2	Sa Lo	gravels	5/1/2017	N. Steinle	
NS-4			40-80	10 YR 5/3	Sa	gravels and mottling 10 YR 7/6, rootlets, oxidation	5/1/2017	N. Steinle	
NS-5	3352737	266355	0-20	10 YR 6/6	Sa Lo		5/1/2017	N. Steinle	

Shovel Test Record									
ST #	Northing	Easting	Depth	Color	Texture	Disturbances	Date	Excavator	Notes
NS-5			20-30	10 YR 7/2	Sa Lo	heavily mottled with 10 YR 3/2, oxidation, burned root	5/1/2017	N. Steinle	
NS-5			30-80	10 YR 7/2	Sa		5/1/2017	N. Steinle	
NS-6	3352674	266280	0-30	10 YR 7/2	Sa Lo		5/1/2017	N. Steinle	
NS-6			30-80	10 YR 5/3	Sa Lo	some gravel and dead roots	5/1/2017	N. Steinle	
NS-7	3352625	266191	0-30	10 YR 7/2	Sa Lo		5/1/2017	N. Steinle	
NS-7			30-80	10 YR 5/3	Sa Cl Lo	some gravels, and oxidation	5/1/2017	N. Steinle	
NS-8	3352589	266098	0-80	10 YR 7/2	Sa Lo	compact at 40cm, oxidation	5/1/2017	N. Steinle	
NS-9	3352551	265995	0-30	10 YR 5/3	Sa Lo	coompact at 50cm	5/1/2017	N. Steinle	
NS-9			30-80	10 YR 7/2	Sa Lo		5/1/2017	N. Steinle	
NS-10	3352546	265958	0-80	10 YR 7/2	Sa Lo	compact at 50cm, oxidation	5/1/2017	N. Steinle	
NS-11	3352539	265928	0-5	10 YR 4/4	Lo	rootlets	5/1/2017	N. Steinle	
NS-11			5-60	10 YR 7/2	Si Sa	roots	5/1/2017	N. Steinle	
NS-11			60-80	10 YR 5/3	Sa Lo	compact,	5/1/2017	N. Steinle	next to road and trash dump
NS-12	3352569	265935	0-80	10 YR 7/2	F Sa	lots of roots	5/1/2017	N. Steinle	
NS-13	3353030	266849	0-60	10 YR 7/2	Si Sa	Very compact, with gravels	5/2/2017	N. Steinle	
NS-13			60-80	10 YR 5/3	Sa Lo		5/2/2017	N. Steinle	next to road
NS-14	3353069	266913	0-15	10 YR 7/2	Si Sa Lo	heavy gravel, mottled with 10YR 5/6, blocky soil	5/2/2017	N. Steinle	
NS-14			15-60	10 YR 6/4	Sa Cl Lo		5/2/2017	N. Steinle	

Shovel Test Record									
ST #	Northing	Easting	Depth	Color	Texture	Disturbances	Date	Excavator	Notes
NS-15	3353114	266964	0-15	10 YR 7/2	Si Sa Lo	mottled with 10YR 5/6 and 10YR 8/2, oxidation	5/2/2017	N. Steinle	
NS-15			15-60	10 YR 6/4	Sa Cl Lo		5/2/2017	N. Steinle	
NS-16	3353189	264048	0-60	10 YR 7/2	Si Sa CL		5/2/2017	N. Steinle	
NS-16			60-80	10 YR 6/4	Cl	heavily mottled with 10YR 6/6 and 6/1, oxidation	5/2/2017	N. Steinle	
NS-17	3353270	267137	0-80	10 YR 7/2	Si Sa Lo	oxidation, some roots	5/2/2017	N. Steinle	near the creek
NS-18	3352479	263918	0-20	5 YR 5/6	Sa	disturbed area, too hard to dig	5/2/2017	N. Steinle	
NS-19	3352534	264039	0-5	10 YR 5/3	Sa	Very compact, with gravels	5/2/2017	N. Steinle	
NS-19			5-30	5 YR 5/6	Sa Cl	mottled with 10YR 6/6	5/2/2017	N. Steinle	
NS-20	3352577	264116	0-50	10 YR 7/2	Sa	roots	5/2/2017	N. Steinle	
NS-20			50-80	10 YR 6/6	Sa Cl	roots	5/2/2017	N. Steinle	higher area in trees
NS-21	3352633	264242	0-80	10 YR 7/2	Sa	some roots	5/2/2017	N. Steinle	
NS-22	3352670	264339	0-80	10 YR 7/2	Sa	some roots	5/2/2017	N. Steinle	
NS-23	3352685	264447	0-50	10 YR 5/6	Sa	gravels	5/2/2017	N. Steinle	
NS-23			50-80	10 YR 5/2	Sa		5/2/2017	N. Steinle	
NS-24	3352708	264496	0-45	10 YR 7/2	Sa Lo	gravels	5/2/2017	N. Steinle	
NS-24			45+	5 YR 6/6	Cl		5/2/2017	N. Steinle	
NS-25	3352720	264580	0-45	10 YR 7/2	Sa Lo	gravels	5/2/2017	N. Steinle	
NS-25			45+	5 YR 6/6	Cl		5/2/2017	N. Steinle	
NS-26	3352735	264786	0-60	10 YR 5/6	Sa	disturbed area	5/2/2017	N. Steinle	modern trash
NS-26			60+	5 YR 6/6	Cl		5/2/2017	N. Steinle	

Shovel Test Record									
ST #	Northing	Easting	Depth	Color	Texture	Disturbances	Date	Excavator	Notes
NS-27	3352741	264699	0-80	10 YR 7/2	Sa	some roots and gravels	5/2/2017	N. Steinle	
NS-28	3352729	264891	0-80	10 YR 7/2	Sa	roots throughout	5/2/2017	N. Steinle	
NS-29	3352708	265012	0-50	10YR 5/3	Sa	lots of roots	5/2/2017	N. Steinle	
NS-29			50+	10 YR 5/6	Sa Cl Lo		5/2/2017	N. Steinle	
NS-30	3352673	265113	0-25	10 YR 6/6	Sa Lo	disturbed top soil	5/2/2017	N. Steinle	
NS-30			25-80	10 YR 4/4	Sa	roots	5/2/2017	N. Steinle	
NS-31	3352638	265181	0-80	10 YR 7/2	Sa	compact at 40 cm	5/2/2017	N. Steinle	
NS-32	3352620	265280	0-60	10 YR 7/2	Sa		5/2/2017	N. Steinle	
NS-32			60-80	10YR 5/6	Sa Cl		5/2/2017	N. Steinle	
NS-33	3352663	265262	0-80	10 YR 7/2	Sa		5/2/2017	N. Steinle	
NS-34	3352519	265844	0-10	10 YR 7/2	Sa		5/3/2017	N. Steinle	
NS-34			10-60	10 YR 5/3	Sa	some roots and gravels	5/3/2017	N. Steinle	
NS-35	3352514	265721	0-40	10 YR 7/2	Sa		5/3/2017	N. Steinle	
NS-35			40-80	10 YR 8/4	Sa	Very compact, with gravels	5/3/2017	N. Steinle	
NS-36	3352531	265661	0-10	10 YR 7/2	Sa		5/3/2017	N. Steinle	
NS-36			10-30	5 YR 6/6	Sa Cl	very compact	5/3/2017	N. Steinle	
NS-37	3352537	265600	0-25	10 YR 8/4	Sa		5/3/2017	N. Steinle	
NS-37			25-80	10 YR 8/4	Sa Cl	compact, lots of gravels, mottled with 10 YR 7/2 and 10 YR 5/3	5/3/2017	N. Steinle	

Shovel Test Record									
ST #	Northing	Easting	Depth	Color	Texture	Disturbances	Date	Excavator	Notes
NS-38	3352554	265548	0-25	10 YR 8/4	Sa		5/3/2017	N. Steinle	
NS-38			25-80	10 YR 8/4	Sa Cl	compact, lots of gravels, mottled with 10 YR 7/2 and 10 YR 5/3	5/3/2017	N. Steinle	
NS-39	3352560	265489	0-30	10 YR 8/4	Sa		5/3/2017	N. Steinle	
NS-39			30-80	10 YR 8/4	Sa Cl	compact, lots of gravels, mottled with 10 YR 7/2 and 10 YR 5/3, large root at 70 cm	5/3/2017	N. Steinle	
NS-40	3352586	265385	0-5	10 YR 7/2	Si Sa		5/3/2017	N. Steinle	
NS-40			5-20	10 YR 7/8	Sa		5/3/2017	N. Steinle	
NS-40			20-50	10 YR 7/2	Sa Si	oxidation, no gravel	5/3/2017	N. Steinle	
NS-41	3352638	265342	0-60	10 YR 7/2	Sa		5/3/2017	N. Steinle	
NS-41			60-70	5 YR 6/6	Cl	mottled	5/3/2017	N. Steinle	1 meter from creek

This report was written on behalf of the Texas Department of Transportation by:

AmaTerra ENVIRONMENTAL, INC.

4009 Banister Lane, Suite 300
Austin, Texas 78704

Technical Report No. 198

AmaTerra Project No. 233-018