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## Archeological Survey Report Upland Avenue from 66th Street to 114th Street, Lubbock

Scotty Moore

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## Archeological Survey Report Upland Avenue from 66th Street to 114th Street, Lubbock

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FINAL Archeological Survey Report  
Upland Avenue from 66<sup>th</sup> Street to 114<sup>th</sup> Street,  
Lubbock  
Lubbock County

CSJs: 0905-06-095, 0905-06-096, 0905-06-097

Principal Investigator: Scotty Moore, MA, RPA  
Cox | McLain Environmental Consulting, Inc.

December 2019

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

Intensive Archeological Survey for the Proposed  
Improvements to Upland Avenue from 66th Street to 114th  
Street, Lubbock, Lubbock County, Texas  
(CSJs: 0905-06-095, 0905-06-096, 0905-06-097)



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*For*  
Texas Department of Transportation, Lubbock District

*Under*  
Texas Antiquities Permit 9159

Cox|McLain Environmental Consulting Inc. Archeological Report 277  
(CMEC-AR-277)



December 18, 2019

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.

*Archeological site information has been redacted from this report (for public disclosure).*

## Abstract

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A targeted intensive archeological survey was completed to inventory and evaluate archeological resources within the footprint of proposed improvements and roadway widening to Upland Avenue between 66<sup>th</sup> Street and 114<sup>th</sup> Street in the City of Lubbock, Lubbock County, Texas.

The total project is approximately 3.0 miles (4.8 kilometers) in length within a 120-foot- (36.6-meter-) wide corridor; typical depth of impacts is expected to be 2 feet (0.6 meters) along the roadway. The archeological area of potential effects (APE) consists of the entire footprint of the project, which covers approximately 60.44 acres and consists of 46.10 acres of existing right of way, 12.23 acres of proposed right of way, and 2.11 acres of proposed easements. The Texas Department of Transportation control section job (CSJ) numbers for this project are 0905-06-095, 0905-06-096, 0905-06-097.

The majority of the acreage within proposed right of way and easements occurs as a thin sliver of land immediately parallel to the existing right-of-way. Approximately 53.24 acres within the APE was excluded from survey due to evidence of extensive disturbance from roadway construction and maintenance, utility installations, and residential/commercial development. Approximately 7.2 acres of proposed right-of-way and easements, or approximately 12 percent of the total area of potential effects, were targeted for survey due to their location adjacent to two known playas, which would have been seasonally attractive to prehistoric populations.

Fieldwork was conducted under the current Texas Antiquities Permit 9159 on December 3, 2019 by Scotty Moore (Principal Investigator) and Adrienne Campbell of Cox|McLain Environmental Consulting, Inc. Eight shovel test units were excavated; no cultural resources were identified on or below the surface of the APE. Historic-age artifacts possibly associated with a structure present on topographic maps of the area from the 1950s were observed approximately 32.8 to 65.6 feet (10 to 20 meters) outside of the APE. Due to a lack of right-of-entry for the parcel containing these artifacts, their extent and disposition were not evaluated or delineated. No artifacts or features were observed in the APE.

No new archeological sites were identified during the survey and no further work is recommended within the project corridor. However, should future project design changes expand the APE to include the historic artifacts mentioned above, further field survey is recommended. Project records will be curated at the Center for Archeological Studies at Texas State University.

The Texas Historical Commission concurred with these recommendations on December 18, 2019.

## Management Summary

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On December 3, 2019, a targeted intensive archeological survey was completed in order to inventory and evaluate archeological resources within the footprint of proposed improvements and roadway widening to Upland Avenue between 66<sup>th</sup> Street and 114<sup>th</sup> Street (CJSs: 0905-06-095, 0905-06-096, 0905-06-097) in the City of Lubbock, Lubbock County, Texas. The proposed improvements would take place along the existing Upland Avenue, with new right-of-way to be added at various locations on both sides of the existing roadway. Improvements would consist of a five-lane Modified Principal Arterial typical section consisting of two 11-foot wide inside lanes, two 13.5-foot wide outside lanes, and a 14-foot wide center left turn lane. Right turn lanes would be constructed at intersections with other arterials and major collector streets. Drainage would be accomplished via curb and gutters draining to parallel side channels and playa lakes located north of, south of, and adjacent to the project. The proposed typical right-of-way would be 110 to 120 feet wide. Proposed 10-foot Shared Use Paths would be added on both the west and east sides of Upland Avenue, except for one location along the east side of the roadway, between 82<sup>nd</sup> Street to 66<sup>th</sup> Street.

The total project is approximately 3.0 miles (4.8 kilometers) in length within a 120-foot- (36.6-meter-) wide corridor; typical depth of impacts is expected to be 2 feet (0.6 meters) along the roadway. The archeological area of potential effects (APE) consists of the entire footprint of the project, which covers approximately 60.44 acres and consists of 46.10 acres of existing right-of-way, 12.23 acres of proposed right-of-way, and 2.11 acres of proposed easements.

The project is sponsored and funded by the Texas Department of Transportation, rendering it subject to the Antiquities Code of Texas. The project is also subject to Section 106 of the National Historic Preservation Act, as amended, due to federal funding from the Federal Highway Administration.

The majority of the acreage falling within proposed right-of-way and easements occurs as a thin sliver of land immediately parallel to the existing right-of-way; approximately 53.24 acres within the APE was excluded from survey due to evidence of extensive disturbance from roadway construction and maintenance, utility installations, and residential/commercial development. Approximately 7.2 acres of proposed right-of-way and easements, or approximately 12 percent of the total area of potential effects, were targeted for survey due to their location adjacent to two known playas, which would have been seasonally attractive to prehistoric populations.

In all, 8 shovel test pits were excavated across the APE between 109<sup>th</sup> Street and 114<sup>th</sup> Street; no cultural resources were identified on or below the surface of the APE. Historic-age artifacts possibly associated with a structure present on topographic maps of the area from the 1950s were observed approximately 32.8 to 65.6 feet (10 to 20 meters) outside of the APE. Due to

a lack of right-of-entry for the parcel containing these artifacts, their extent and disposition were not evaluated or delineated. No artifacts were observed within the APE, a single shovel test unit excavated within the APE at its closest point to the scatter revealed no buried artifacts or features.

Sediments encountered during survey showed some variability but were widely consistent with published descriptions of local soil associations, most notably Amarillo fine sandy loam and Mansker clay loam. Typical shovel tests excavated along the western margin of Upland Avenue between 109<sup>th</sup> Street and 114<sup>th</sup> Street exhibited loose yellowish brown (10YR 5/4) sandy loam extending approximately 9.8 inches (25 centimeters) below the surface and underlain by friable, dark yellowish brown (10YR 4/4) silty loam from 9.8 to 19.7 inches (25 to 50 centimeters) and friable, dark yellowish brown (10YR 4/4) clay loam from 19.7 to 31.5 inches (50 to 80 centimeters) below surface. This profile is broadly similar to published descriptions of Amarillo sandy loam. Shovel tests excavated south of 114<sup>th</sup> Street exhibited loose, dark yellowish brown (10YR 4/4) gravelly sandy loam extending approximately 9.8 inches (25 centimeters) from the surface that was underlain by brown (10YR 5/3) sandy loam from 9.8 to 19.7 inches (25 to 50 centimeters) and gray (10YR 6/1) sandy loam from 19.7 to 31.5 inches (50 to 80 centimeters) below the surface. This is broadly consistent with published descriptions of Mansker clay loam.

No new archeological sites were identified; therefore, only project records will need to be curated per TAC 26.16 and 26.17. Project records will be permanently housed at the Center for Archaeological Studies at Texas State University.

The Texas Historical Commission concurred with these recommendations on December 18, 2019.

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# 1 INTRODUCTION

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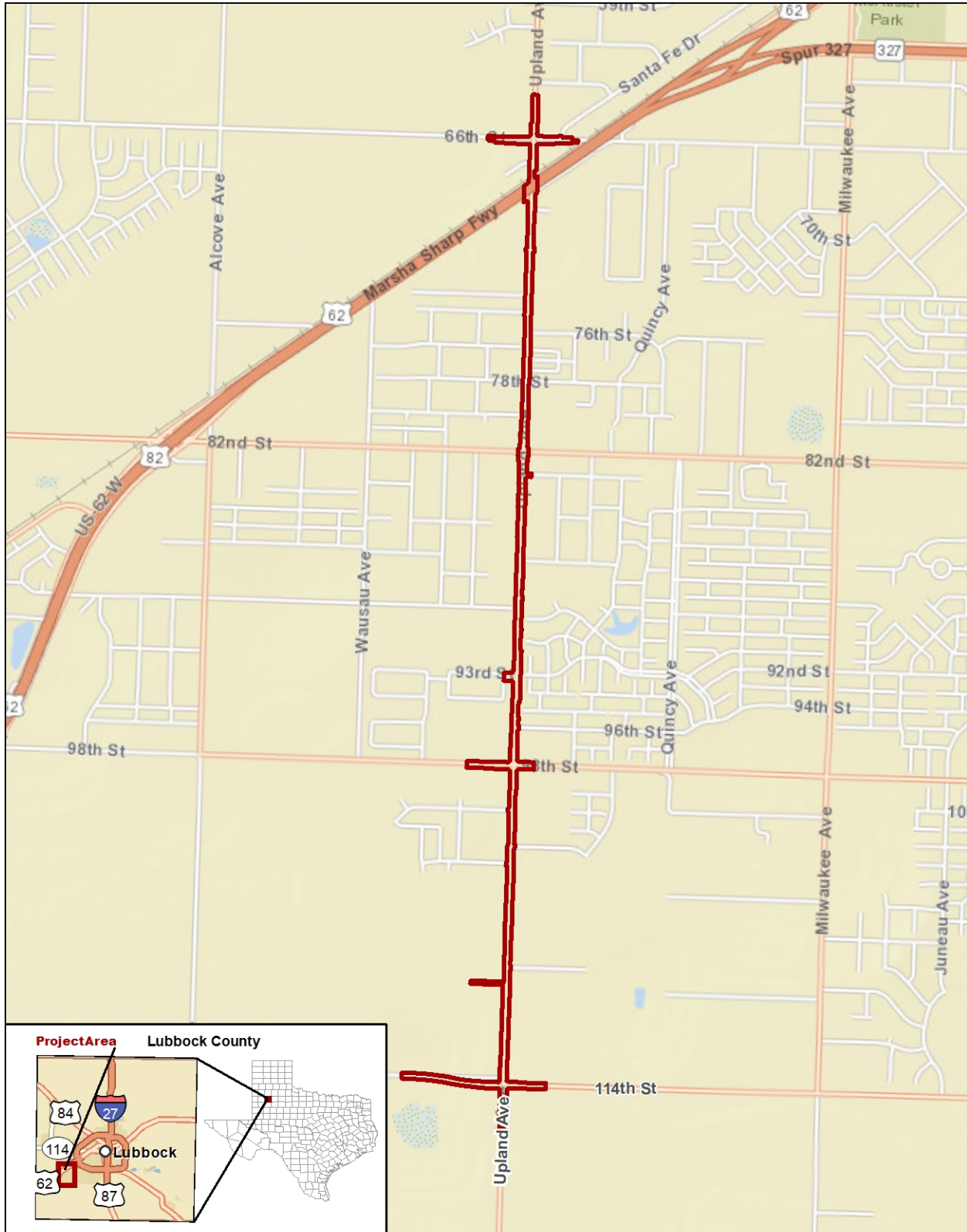
## Overview of the Project

The purpose of the investigation described in this document was to identify and evaluate archeological resources within the footprint of proposed improvements and road widening to Upland Avenue between 66<sup>th</sup> Street and 114<sup>th</sup> Street in the City of Lubbock, Lubbock County, Texas (**Figure 1**).

The Lubbock District of the Texas Department of Transportation (TxDOT) proposes improvements to Upland Avenue between 66<sup>th</sup> Street and 114<sup>th</sup> Street in Lubbock, Lubbock County, Texas. Improvements would take place along the existing Upland Avenue, with new right-of-way to be added at various locations on both sides of the existing roadway. Improvements would consist of a five-lane Modified Principal Arterial typical section consisting of two 11-foot wide inside lanes, two 13.5-foot wide outside lanes, and a 14-foot wide center left turn lane. Right turn lanes would be constructed at intersections with other arterials and major collector streets. Drainage would be accomplished via curb and gutters draining to parallel side channels and playa lakes located north of, south of, and adjacent to the project. The proposed typical right-of-way would be 110 to 120 feet wide. Proposed 10-foot Shared Use Paths would be added on both the west and east sides of Upland Avenue, except for one location along the east side of the roadway, between 82<sup>nd</sup> Street to 66<sup>th</sup> Street (CSJs: 0905-06-095, 0905-06-096, 0905-06-097).

The current existing facility of Upland Avenue consists of two 12-foot-wide southbound lanes, with the exception of two 12-foot-wide southbound lanes and one 12-foot-wide northbound lane between 98<sup>th</sup> Street and 104<sup>th</sup> Street. No center medians or bike lanes are present throughout the entire corridor.

The archeological area of potential effects (APE) includes the footprint for the entire project, which is composed of approximately 46.10 acres of existing right-of-way, 12.23 acres of proposed right-of-way, and 2.11 acres of proposed easements. The maximum depth of impacts throughout the APE is not anticipated to exceed 2 feet (0.61 meters). The majority of the acreage falling within proposed right-of-way and easements occurs as a thin sliver of land immediately parallel to the existing right-of-way; approximately 53.24 acres within the APE was excluded from survey due to evidence of extensive disturbance from roadway construction and maintenance, utility installations, and residential/commercial development. Approximately 7.2 acres of proposed right-of-way and easements, or approximately 12 percent of the total area of potential effects, were targeted for survey due to their location adjacent to two known playas, which would have been seasonally attractive to prehistoric populations.



**Figure 1**  
**Project Location**  
 Upland Avenue from 66th Street to 114th Street

Project Location/APE

	CSJs: 0905-06-095, 0905-06-096, 0905-06-097	
		1 in = 2,500 feet
		Scale: 1:30,000
		Date: 7/31/2019

G:\Projects\CityofLubbock\KHA\_Upland\_Ave\Arch\_Figure 1\_Project Location\_20190731.mxd

Basemap Source: ESRI (2019)

Scotty Moore (Principal Investigator) and Adrienne Campbell of Cox|McLain Environmental Consulting, Inc. (CMEC) performed fieldwork on December 3, 2019. Eight shovel test units were excavated, but no cultural resources were identified on or below the surface of the APE. Historical artifacts were identified on the surface approximately 32.8 to 65.6 feet (10 to 20 meters) outside of the APE on property to which right-of-entry had not been granted; as a result, their extent and disposition were not evaluated. All work followed guidelines established by the Council of Texas Archeologists (CTA) and approved by the Texas Historical Commission (THC). The methods employed during this study and relevant constraints are discussed further in Sections 3 and 4.

## Regulatory Context

Upland Avenue is owned and sponsored by TxDOT, a political subdivision of the State of Texas, rendering the project subject to the Antiquities Code of Texas (9 TNRC 191). Antiquities Permit 9159 was assigned to this project by the THC. The project also has a federal nexus due to funding from the Federal Highway Administration, triggering Section 106 of the NHPA, as amended (16 USC 470; 36 CFR 800).

No new archeological sites were identified, and no artifacts were collected. All other materials (notes, photographs, administrative documents, and other project data) generated from this work will be curated at the Center for Archaeological Studies (CAS) at Texas State University where they will be made permanently available to future researchers per 13 TAC 26.16-17.

## Structure of the Report

Following this introduction, Section 2 presents environmental background information, a brief cultural context, and a summary of previous archeological research near the APE. Section 3 discusses research goals, relevant methods, and the underlying regulatory considerations. Section 4 presents the results of the survey and summarizes the implications of the investigations. References are in Section 5.

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## 2 ENVIRONMENTAL AND CULTURAL CONTEXT

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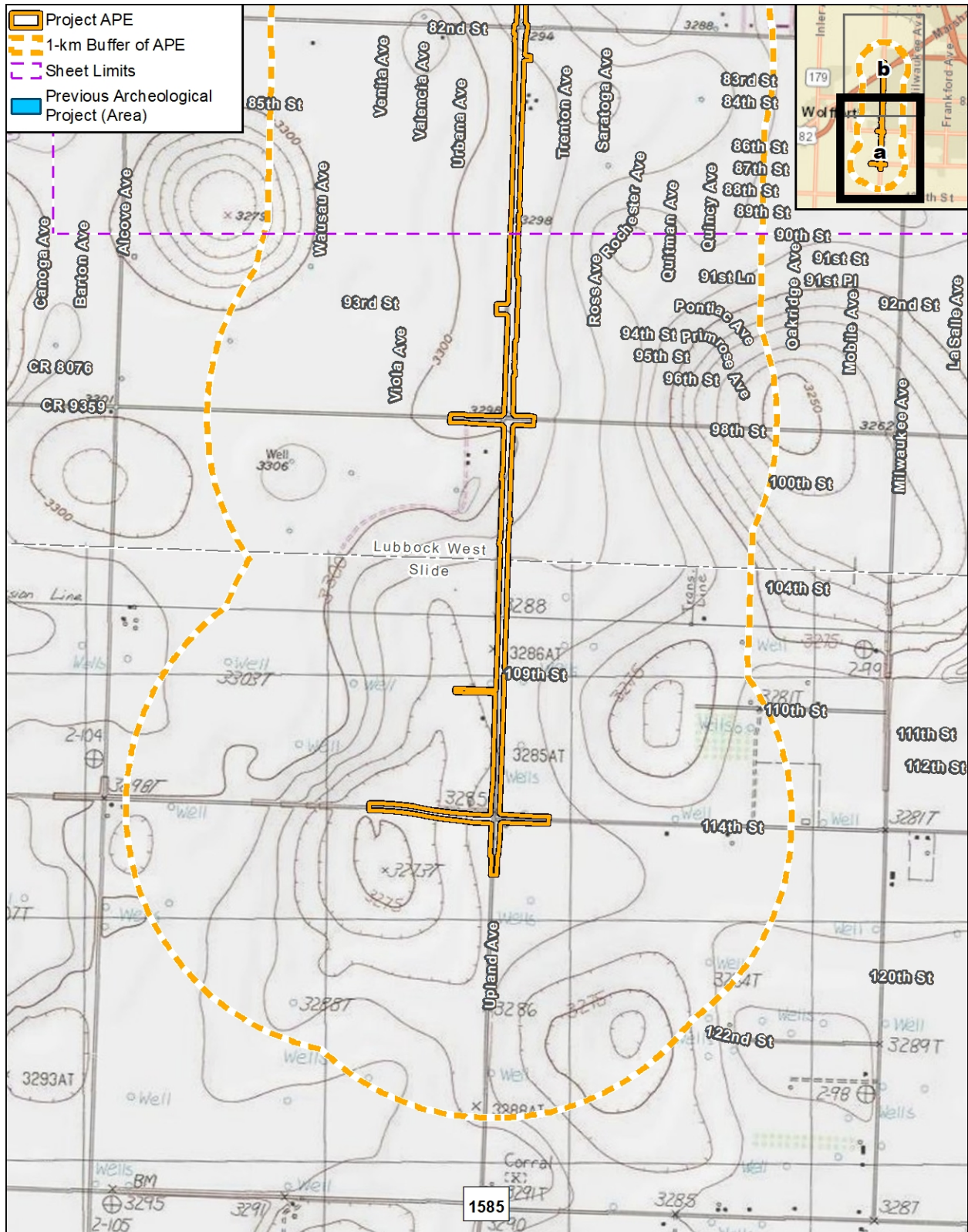
### Topography, Geology, and Soils

The approximately 60.44-acre APE ranges in elevation from approximately 3,280.8 to 3,307.1 feet (1,000 to 1,008 meters) above mean sea level in Lubbock County, Texas (**Figures 1 and 2a–2b**). The project area is located within the Llano Estacado subregion of the High Plains Ecoregion, a region characterized by smooth to slightly irregular plains interspersed with shallow depressions (Griffith et al. 2004).

Geologically, the APE is predominantly underlain by the Pleistocene Blackwater Draw Formation, which is characterized by fine to medium-grained quartz and silty, calcareous caliche nodules (BEG 1993; USGS 2019a). The only exceptions are found near the northern and southwestern termini of the project corridor, where the APE is underlain by Pleistocene-age playa deposits consisting of clay and silt in shallow depressions (USGS 2019a). According to Natural Resources Conservation Service data, the APE is underlain by alternating bands of sediments from six soil series (**Table 1**). All of these soils are derived from Pleistocene-age deposits and are geomorphically associated with playas, which would have been attractive to prehistoric populations both for access to water and other lacustrine resources. All soil series include relatively shallow B horizons (20 to 30 centimeters [7.87 to 11.81 inches] below the surface), indicating that deeply buried archeological deposits are unlikely.

### Vegetation, Physiography, and Land Use

Vegetation habitats within and surrounding the APE include (in descending contribution): shortgrass prairie, row crops, low-intensity urban land, improved grassland, high intensity urban land, mixed grass prairie, mesquite shrubland, and playa grassland (TPWD 2019). The parcels surrounding the APE near the northern terminus are currently utilized as commercial developments. Traveling south along the Upland Avenue corridor, the commercial developments give way first to suburban developments (e.g., residences, schools, churches) and finally to agricultural development at the southern terminus.



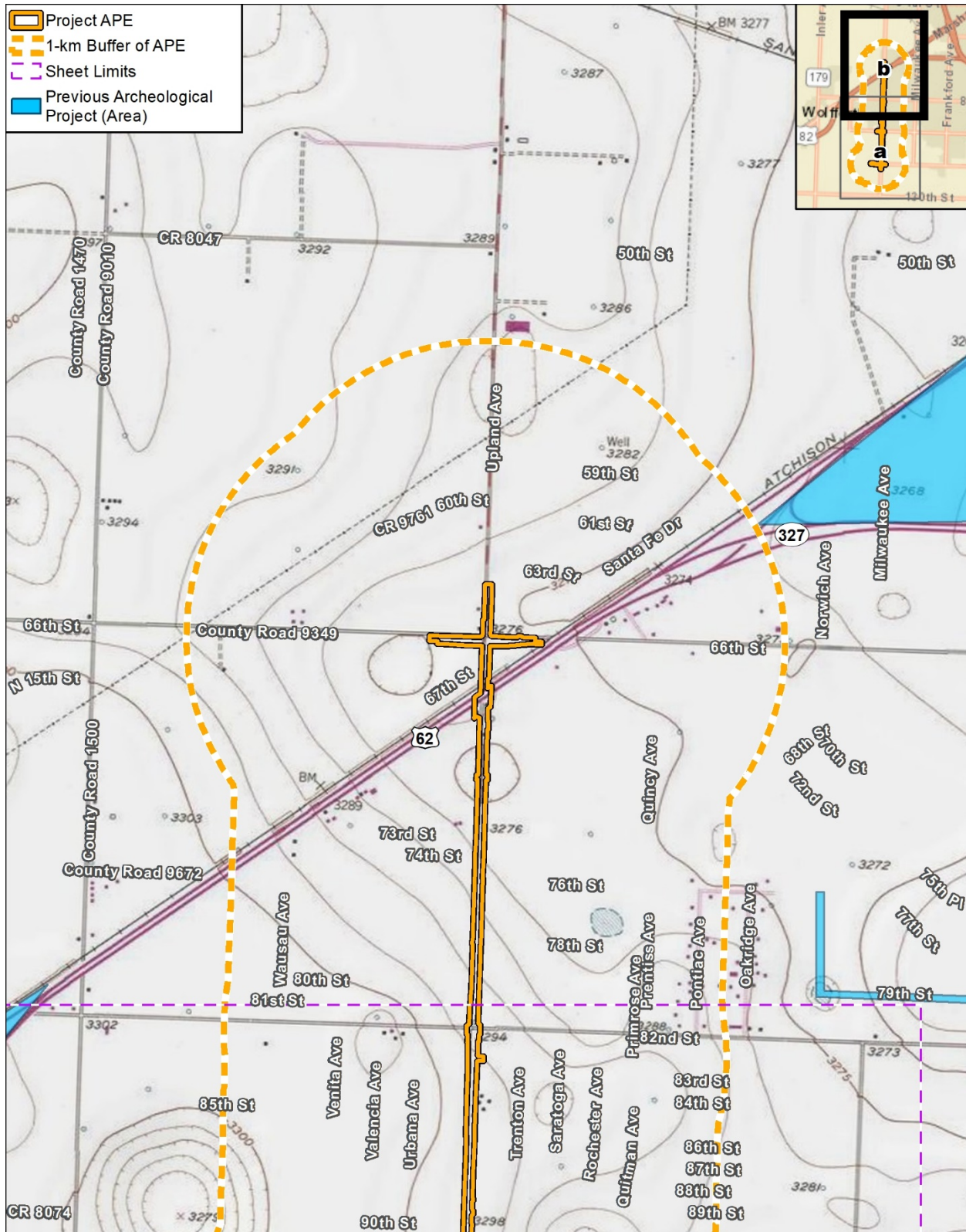
**Figure 2a**  
**Location of Archeological APE**  
**Upland Avenue from 66<sup>th</sup> Street to 114<sup>th</sup> Street**

Data Sources: THC (2019), TARL (2019), NHD (2018), Topographic Source: USGS Lubbock West (1957) and Slide (1985) 7.5' Quadrangles

CSJs: 0905-06-095, 0905-06-096, 0905-06-097

0 2,000 Feet 1 in = 2,000 feet  
 0 500 Meters Scale: 1:24,000  
 Date: 7/31/2019

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**Figure 2b**  
**Location of Archeological APE**  
**Upland Avenue from 66<sup>th</sup> Street to 114<sup>th</sup> Street**

Data Sources: TARL (2019), NHD (2018);  
 Topographic Source: USGS Lubbock West  
 (1957) and Slide (1985) 7.5' Quadrangles

CSJs: 0905-06-095,  
 0905-06-096, 0905-06-097

0 2,000 Feet 1 in = 2,000 feet  
 0 500 Meters Scale: 1:24,000  
 Date: 12/18/2019

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Table. 1 Soils within the APE			
Soil Series Name	Soil Description	Parent Material / Age	Landform
Amarillo fine sandy loam	Very deep, well drained, moderately permeable	Eolian deposits / Pleistocene	Plains and playa slopes (0-5% slope)
Lofton clay loam	Very deep, moderately well drained, very slowly permeable	Lacustrine deposits / Pleistocene	Play steps or shallow depression (nearly level)
Olton clay loam	Very deep, well drained, moderately slowly permeable	Eolian deposits / Pleistocene	Plains and playa slopes (0-5%)
Acuff loam	Very deep, well drained, moderately permeable	Eolian deposits / Pleistocene	Plains and playa slopes (0-3% slope)
Estacado clay loam	Very deep, well drained, moderately slowly permeable	Eolian deposits / Pleistocene	Plains and playa slopes (1-3% slope)
Randall clay	very deep, poorly drained, very slowly permeable	Lacustrine deposits / Pleistocene	Playa basin (nearly level)
<i>Data source: Soil Survey Staff 2019</i>			

## Archeological Chronology for West Texas

The APE lies is located in a culturally and physiographically liminal zone just inside the West-central Texas archeological region, which does not have sharp boundaries (Perttula 2004). Like most spatial constructs used to classify the material cultures of past peoples, West-central Texas and surrounding regions are based on varying combinations of archeological patterns and geography, geology, soils, climate, vegetation, and other environmental factors (Perttula 2004). Unfortunately, although the region was identified in Perttula’s synthesis (2004), no regionally specific description has been developed. Nearby prehistoric population groups—for instance, Pecos and Southwestern peoples to the north, south, and west (Oglesby et al. 1993); Central Texas/Edwards Plateau peoples to the south (Collins 2004; Owens and Duke 2000); Caprock Canyonlands peoples to the north and west (Boyd 2004); and Plains groups to the north and east (Hofman et al. 1989)—were often nomadic or semi-nomadic, leading to extensive overlaps in occupation zones. Interpretive confusion regarding the archeology of the area is exacerbated by a lack of recent, large-scale research. **Table 2** presents a general chronology for the regions relevant to this study.

Standard chronologies for the surrounding regions follow the model used in most of the rest of Texas and throughout North America. In these chronologies, the first uncontroversial human occupations occur approximately 11,500–12,000 radiocarbon years before present (BP), or approximately 13,000–13,500 calendar years ago. The bulk of the prehistoric record is contained within a long Archaic period lasting 7,000–8,000 years.



**Table 2: Archeological Chronology for the Central and High Plains\***

<b>Period</b>	<b>Years Before Present (BP)**</b>
Paleoindian	11,000–12,000 to 8,000–9,000
Archaic	8,000–9,000 to 1,000–1,200
Late Prehistoric	1,000–1,200 to 250–400
Historic/Protohistoric	250–400 to 50

\* After Perttula 2004:9, Table 1.1 (Central and High Plains columns).  
 \*\* Based on uncalibrated radiocarbon dates, which are typical in Texas archeology (see Perttula 2004:14, Note 1).

The last two centuries saw the immigration of substantial populations who displaced earlier groups and extensively documented their lives, thus creating what is commonly referred to as the Historic Period. In brief, the landscape and material culture of west Texas during this time are characterized by the overwhelming dominance of European-derived populations, the expansion of agriculture/ranching activities, the discovery and exploitation of petroleum resources, the supplanting of small tenant farming by mechanized agriculture and urban sprawl, and various waves of commercial and industrial development. The most recent example of development is the rise of the service and information economies (Campbell 2003).

### *Lubbock County*

Lubbock County was formed in 1876 and named for Thomas S. Lubbock, who was a former Texas Ranger and brother of Francis Lubbock, the governor of Texas during the Civil War. The census of 1880 reported twenty-five people living in the county, most of them sheep raisers who had immigrated from the Midwest. The fertile soil and favorable land laws were the primary attractions for potential settlers, but the population of the county grew slowly over the last decades of the nineteenth century. The county saw a population boom in the decades after World War II, however, and the population doubled between 1950 and 1980. In the early twenty-first century, agriculture remains the primary economic driver for the county, but oil and gas extraction within the Permian Basin to the south has also contributed to economic growth (Lawrence 2010).

## **Previous Investigations and Previously Identified Resources**

A search of the *Texas Archeological Sites Atlas* (Atlas) maintained by the THC and the Texas Archeological Research Laboratory (TARL) was conducted in order to identify previously conducted surveys, archeological sites, historical markers, Recorded Texas Historic

Landmarks (RTHLs), properties or districts listed on the National Register of Historic Places (NRHP), State Antiquities Landmarks (SALs), and cemeteries within the 1-kilometer (0.62-mile) buffer zone around the APE, as well as previous surveys undertaken in the area.

According to the Atlas, no cultural resources surveys have been previously conducted within 1 kilometer of the APE. The closest recorded survey is a 2009 linear survey conducted by Prewitt and Associates, Inc. located approximately 1.1 kilometers (0.69 miles) northeast of the APE (see **Figure 2b**; THC 2019).

The Atlas data indicates that no cultural resources have been identified within the 1-kilometer study area; the closest recorded resource is archeological site 41LU120, a historic farmstead located approximately 1.9 kilometers (1.2 miles) northeast of the APE (see **Figure 2b**; THC 2019).

A review of available historic aerials and topographic maps on Google Earth™, the USGS Historic Topographic Map Viewer, and the Nationwide Environmental Title Research (NETR) online database, was also undertaken to determine how the corridor has been utilized over time. Topographic maps of varying scales (from 1954, 1957, 1970, 1975, 1976, 1985, and 1986) were reviewed (USGS 2019b). The earliest map (1:250,000 scale; 1954) depicts the playa that intersects the southwestern portion of the APE as well as an unpaved road in the current location of Upland Avenue. U.S. Highway 62 and a parallel railroad track are also depicted. The earliest map to show fine details is the 1957 1:62,500 scale New Home map, which depicts the roadways for Upland Avenue and 114<sup>th</sup> Street and shows 12 structures located along their margins, including one just west of the APE south of 109<sup>th</sup> Street (see **Figure 2a–b**). None of these structures were mapped within the APE. Revisions of this map from 1970 and 1976 show no noticeable changes to the APE or its surrounding areas, but the 1985 Slide map (1:24,000 scale) shows that extensive suburban and limited commercial develop has occurred along the northern and central portions of the APE by this time (USGS 2019b).

The earliest aerial imagery available for the area, produced in 1991 depicts the APE and its surroundings in much the same condition that they are found today: agricultural development is prevalent south of the intersection of Upland Avenue and 98<sup>th</sup> Street while suburban and commercial development is prevalent to the north (NETR 2019). Subsequent aerials (1995, 2004, 2008, 2010, 2012, 2014) show increasing suburban development in the surrounding area with some expansion south of 98<sup>th</sup> Street observable after 2004.

Known and perceived disturbances in the APE include those associated with driveways, road construction, maintenance, contoured and culvert ditches, and buried and aerial utilities. The extent of these disturbances is sufficient to have destroyed the integrity of shallowly buried

cultural resources throughout all of the existing right of way and the majority of the proposed right of way and easement locations.

### 3 RESEARCH GOALS AND METHODS

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#### Purpose of the Research

The present study was carried out to accomplish three major goals:

1. To identify all historic and prehistoric archeological resources located within the APE defined in chapter 1;
2. To perform a preliminary evaluation of the identified resources' potential for inclusion in the NRHP and/or for designation as a SAL (typically performed concurrently); and
3. To make recommendations about the need for further research concerning the identified resources based on the preliminary NRHP/SAL evaluation, with guidance on methodology and ethics from the THC and CTA.

#### Section 106 of the National Historic Preservation Act

Section 106 of the NHPA of 1966, as amended (16 USC 470; 36 CFR 800), directs federal agencies and entities using federal funds to “take into account the effects of their undertakings on historic properties” (36 CFR 800.1a). The CFR defines “historic property” as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places [NRHP] maintained by the Secretary of the Interior” (36 CFR 800.16).

In order to determine the presence of historic properties (with this phrase understood in its broad Section 106 sense), an APE is first delineated. The APE is the area in which direct impacts (and in a federal context, indirect impacts as well) to historic properties may occur. Within the APE, resources are evaluated to determine whether they are eligible for inclusion in the NRHP, and to determine the presence of any properties that are already listed on the NRHP. To determine whether a property is significant, cultural resource professionals and regulators evaluate the resource using these criteria:

...The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association and

- a. that are associated with events that have made a significant contribution to the broad patterns of our history; or
- b. that are associated with the lives of persons significant in our past; or
- c. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic

- values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- d. that have yielded or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

Note that significance and NRHP eligibility are determined by two primary components: integrity *and* at least one of the four types of association and data potential listed under 36 CFR 60.4(a-d). The criterion most often applied to archeological sites is the last—and arguably the broadest—of the four; its phrasing allows regulators to consider a broad range of research questions and analytical techniques that may be relevant to the specific resource (36 CFR 60.4[d]).

Occasionally, certain resources fall into categories which require further evaluation using one or more of the following Criteria Considerations. If a resource is identified and falls into one of these categories, the Criteria Considerations listed below may be applied in conjunction with one or more of the four National Register criteria listed above:

- a. A religious property deriving primary significance from architectural or artistic distinction or historical importance, or
- b. A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event, or
- c. A birthplace or grave of a historical figure of outstanding importance if there is no other appropriate site or building directly associated with his or her productive life, or
- d. A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events, or
- e. A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived, or
- f. A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own historical significance, or
- g. A property achieving significance within the past 50 years if it is of exceptional importance (36 CFR 60.4).

Resources listed in the NRHP or recommended eligible for the NRHP are treated the same under Section 106; they are generally treated the same at the state level as well.

After cultural resources within the APE are identified and evaluated, effects evaluations are completed to determine whether the proposed project has no effect, no adverse effect, or an adverse effect on the resources. Effects are evaluated by assessing the impacts that the

proposed project will have on the characteristics that make the property eligible for listing in the NRHP and on its integrity. Types of potential adverse effects considered include physical impacts, such as the destruction of all or part of a resource; property acquisitions that adversely impact the historic setting of a resource, even if built resources are not directly impacted; noise and vibration impacts evaluated according to accepted professional standards; changes to significant viewsheds; and cumulative effects that may occur later in time. If the project will have an adverse effect on cultural resources, measures can be taken to avoid, minimize, or mitigate this adverse effect. In some instances, changes to the proposed project can be made to avoid adverse effects. In other cases, adverse effects may be unavoidable, and mitigation to compensate for these impacts will be proposed and agreed upon by consulting parties.

## Antiquities Code of Texas

Because the project is currently owned and funded by TxDOT Lubbock District, a political subdivision of the State of Texas, the project is subject to the Antiquities Code of Texas (9 TNRC 191), which requires consideration of effects on properties designated as—or eligible to be designated as—SALs, which are defined as:

. . . sites, objects, buildings, structures and historic shipwrecks, and locations of historical, archeological, educational, or scientific interest including, but not limited to, prehistoric American Indian or aboriginal campsites, dwellings, and habitation sites, aboriginal paintings, petroglyphs, and other marks or carvings on rock or elsewhere which pertain to early American Indian or other archeological sites of every character, treasure imbedded in the earth, sunken or abandoned ships and wrecks of the sea or any part of their contents, maps, records, documents, books, artifacts, and implements of culture in any way related to the inhabitants, prehistory, history, government, or culture in, on, or under any of the lands of the State of Texas, including the tidelands, submerged land, and the bed of the sea within the jurisdiction of the State of Texas. (13 TAC 26.2)

Rules of practice and procedures for the evaluation of cultural resources as SALs and/or for listing on the NRHP, which is also explicitly referenced at the state level, are detailed at 13 TAC 26. An archeological site identified on lands owned or controlled by the State of Texas may be of sufficient significance to allow designation as a SAL if at least one of the following criteria applies:

1. the site has the potential to contribute to a better understanding of the prehistory and/or history of Texas by the addition of new and important information;
2. the site's archeological deposits and the artifacts within the site are preserved and intact, thereby supporting the research potential or preservation interests of the site;

3. the site possesses unique or rare attributes concerning Texas prehistory and/or history;
4. the study of the site offers the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge;
5. there is a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is needed to ensure maximum legal protection, or alternatively, further investigations are needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected. (13 TAC 26.10)

For archeological resources, the state-level process requires securing a valid Texas Antiquities Permit from the THC, the lead state agency for Antiquities Code compliance. This permit must be maintained throughout all stages of investigation, analysis, and reporting.

## Survey Methods and Protocols

With the goals and guidelines above in mind, CMEC personnel conducted a targeted intensive survey on December 3, 2019 to search for previously unidentified archeological sites per category 6 under 13 TAC 26.15 and using the definitions in 13 TAC 26.3. Field methods complied with the coverage requirements of 13 TAC 26.15, as elaborated by the THC and CTA, as well as applicable TxDOT standards.

Survey was restricted to south of 109<sup>th</sup> Street where the APE lies adjacent to two known playas. Shovel test units were placed in areas where ground surface visibility was below 30 percent, soils appeared to have sufficient depth and integrity to contain intact subsurface cultural materials, and/or previous disturbances appeared minimal. Due to the predominantly very good ground surface visibility encountered throughout most of the survey (e.g., 50–75 percent) and evidence for disturbance along Upland Avenue, shovel tests were placed judgmentally in locations thought to be the most likely candidates for undisturbed sediments.

All shovel test pits were excavated in natural levels until obstructions, subsoil or a depth of 60 centimeters (23.6 inches) was encountered. Excavated matrix was screened through 0.635-centimeter (0.25-inch) hardware cloth. Deposits were described using conventional texture classifications and Munsell color designations. Deviations from THC and CTA standards are explicitly justified.

The project had a low probability of encountering human burials; if burials had been found, all work would have ceased, TxDOT and Lubbock County would have immediately been notified and all requirements of 8 THSC 711 followed. Minimally, remains or grave shafts would have been left in place and covered or fenced while additional coordination proceeds.

Had any sites been recorded during the investigation would be identified by a temporary marker placed on the site. The marker would have an identifying number in the form of the

initials of the CMEC employee who recorded the site, followed by a consecutively assigned number that would indicate the order in which the sites were discovered (e.g., MG-01, MG-02, etc.). This number is a temporary field number to be superseded by a formal site trinomial obtained following the completion of fieldwork. Site designations would be applied only to features (whether surface or subsurface) that appear to represent occupation or activity areas and/or to clusters of artifacts (whether surface or subsurface) with the minimum threshold of two contiguous positive shovel test pits.

CMEC defines an archeological site on the basis of content and extent. When a shovel test yields cultural material, additional shovel tests are excavated in a cruciform pattern at 5-m intervals around the initial test, where right-of-way limits and/or soil conditions permit, until two sterile shovel tests are encountered. For surficial materials, a site is defined as five or more cultural items of at least two different artifact materials or classes (e.g., prehistoric stone tool manufacturing debris of different raw materials, or manufacturing debris in combination with stone tools; or for historic sites, several different historic-era ceramic [or glass] types, or ceramics in addition to glass) within a 20-m (65.6-ft) square. A site is then defined within the extent of positive shovel tests and/or surface scatter.

Conversely, isolated finds of individual artifacts or small groups of similar non-diagnostic artifacts (for example, fewer than five flakes composed of the same material) not meeting the above site definition criteria were recorded as an “Isolated Find” and given an Isolated Find number but not assigned a locus number or considered for listing in the NRHP. Likewise, a stationary and unmovable object – such as brick piers, etc. – with no or limited associated cultural materials and not meeting the above definition criteria was designated a “Locality,” and as with Isolates, given a Locality number but not considered for eligibility in the NRHP. The locations of both Isolates and Localities were recorded.

CMEC personnel keep a complete record of field notes with observations including (but not limited to) identified sites, cultural materials, location markers, contextual integrity, estimated time periods of occupations, vegetation, topography, hydrology, land use, soil exposures, general conditions at the time of the survey, and field techniques employed. The field notes were supplemented by digital photographs.

## **Reporting and Curation**

Had any sites been encountered, relevant field observations for any new sites discovered during these investigations would have been transferred to TexSite forms and submitted to TARL for official recording and integration into the trinomial system. Since no cultural materials were identified, project records and photographs will be made available to future researchers through curation at the CAS at Texas State University in San Marcos, Texas per 13 TAC 26.16 and 26.17.



## 4 RESULTS AND RECOMMENDATIONS

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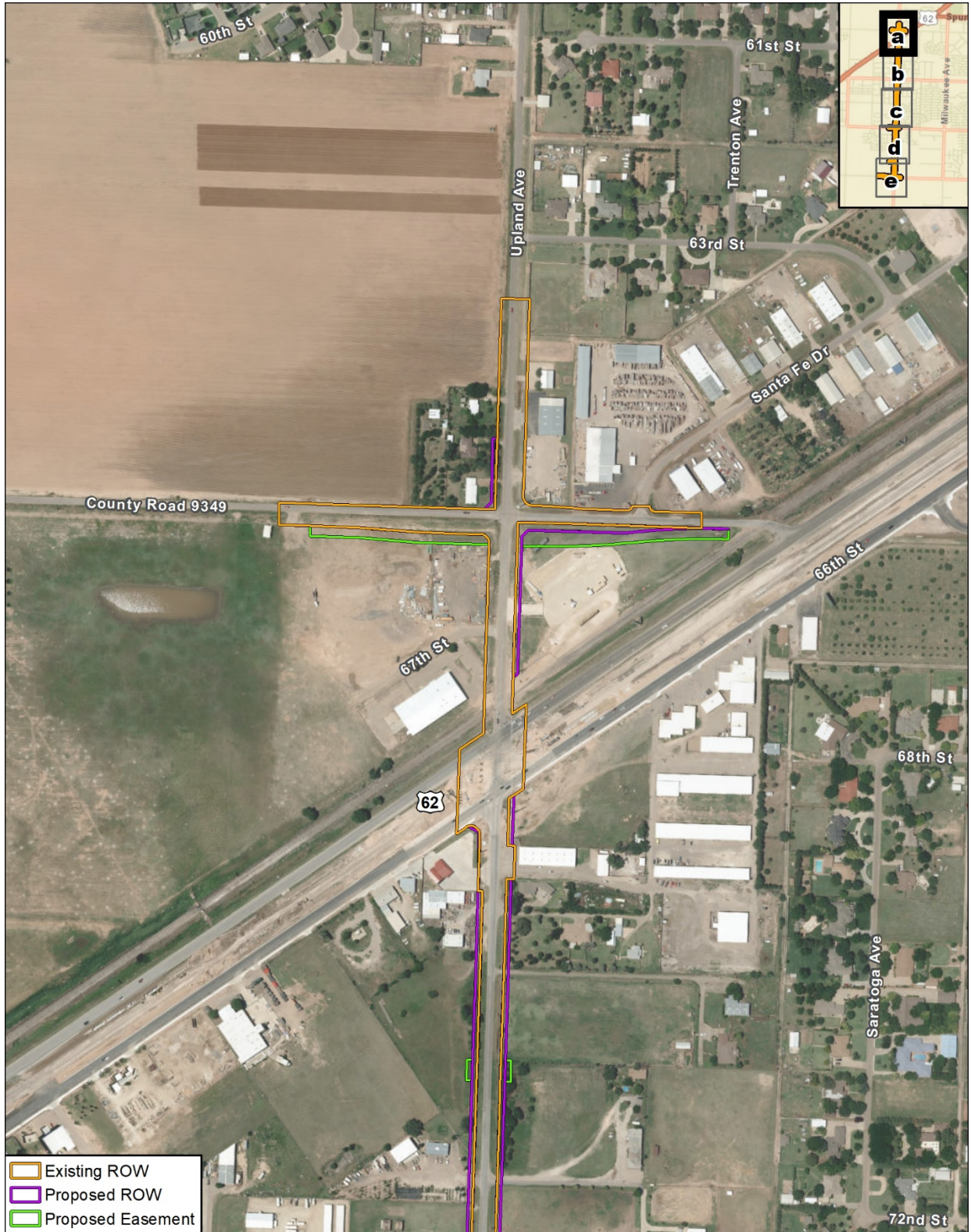
### General Field Observations and Results

A targeted intensive archeological survey was conducted on December 3, 2019 by Scotty Moore (Principal Investigator) and Adrienne Campbell of CMEC. Per the research design outlined in the Texas Antiquities Permit application for permit 9159, survey was focused adjacent to two known playas south of 109<sup>th</sup> Street (**Figures 3a–e**). Field conditions were clear and cool; no major logistical obstacles were encountered during the course of fieldwork.

The majority of the APE consists of scraped and bermed corridors located on either side of Upland Avenue and 114<sup>th</sup> Street with some slivers of proposed right-of-way and easements extending into agricultural fields. The ground surface in these locations was clearly disturbed by buried utilities, road grading, and informal trash disposal (**Figure 4**). Intermittent invasive grasses grew in rows along the side of Upland Avenue in these locations, and ground surface visibility ranged from excellent (90–100 percent) where grasses were absent to fair (25–50 percent) where clumps of grass were present (**Figure 5**). The agricultural fields to the west of Upland Avenue were planted in cotton, which had been recently harvested; in these locations ground surface visibility was very good (75–90 percent; **Figure 6**).

Proposed right-of-way adjacent to 114<sup>th</sup> Street consists of approximately 3.8 acres of new location that currently exists as a terraced agricultural field. The majority of this area was covered in a cleared agricultural field devoid of vegetation; here, the ground surface visibility was excellent (90–100 percent (**Figure 7**). The far western terminus of the APE along 114<sup>th</sup> Street, however, was covered in unmanicured, knee-high grasses that completely obscured the ground surface and exhibited visibility that was effectively zero (**Figure 8**).


No cultural resources were identified on the surface of APE during the course of survey. However, several artifacts of potential historic age were observed adjacent to the APE (see **Figure 3e**). These artifacts consisted of brick and cement fragments (**Figures 9–10**) that lacked diagnostic features or makers' marks and were located in a stand of trees surrounded by an agricultural field that purposely avoided it (**Figure 11**). It is possible that the observed artifacts represent the remnants of a structure that is depicted on the 1957 1:24,000-scale New Home map approximately 164 feet (50 meters) west of the APE. Since the observed artifacts fell outside of the APE and since right-of-entry for the parcel upon which the mapped location of the structure fell was not available at the time of survey, no attempt was made to establish the surface or sub-surface disposition of the artifact scatter. The portion of the APE adjacent to the artifact scatter was examined for artifacts, but none were observed. Finally, a single shovel test unit (SM02) excavated within the APE adjacent to the scatter failed to reveal any cultural materials.



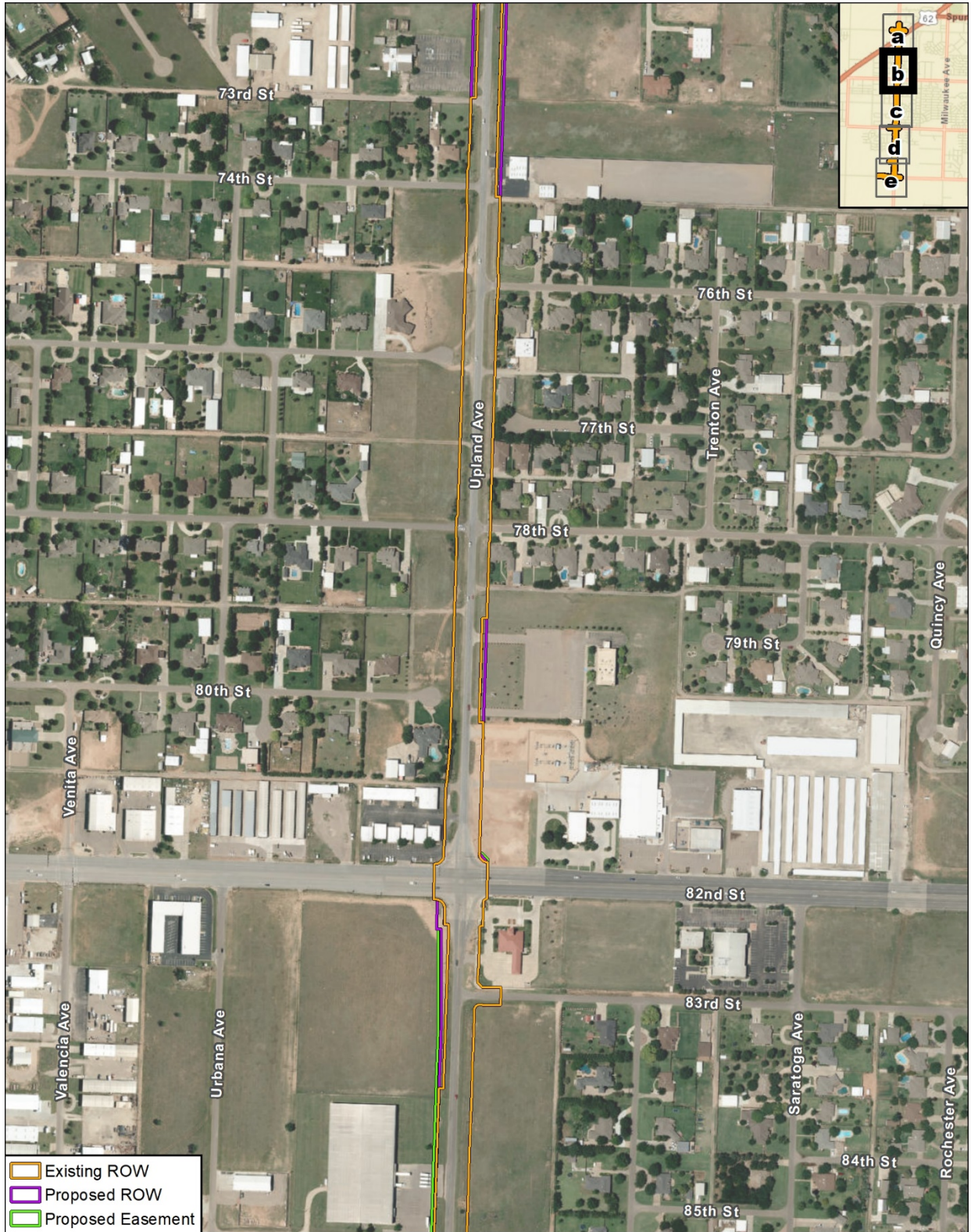
**Figure 3a**  
**Survey Results**

**Upland Avenue from 66th Street to 114th Street**

Data Source: CMEC (2019)  
 Aerial Source: City of Lubbock (2016)

	CSJs: 0905-06-095, 0905-06-096, 0905-06-097	
	0 500 Feet 0 150 Meters	1 in = 500 feet Scale: 1:6,000 Date: 12/9/2019

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**Figure 3b**  
**Survey Results**

**Upland Avenue from 66<sup>th</sup> Street to 114<sup>th</sup> Street**

Data Source: CMEC (2019)  
 Aerial Source: City of Lubbock (2016)

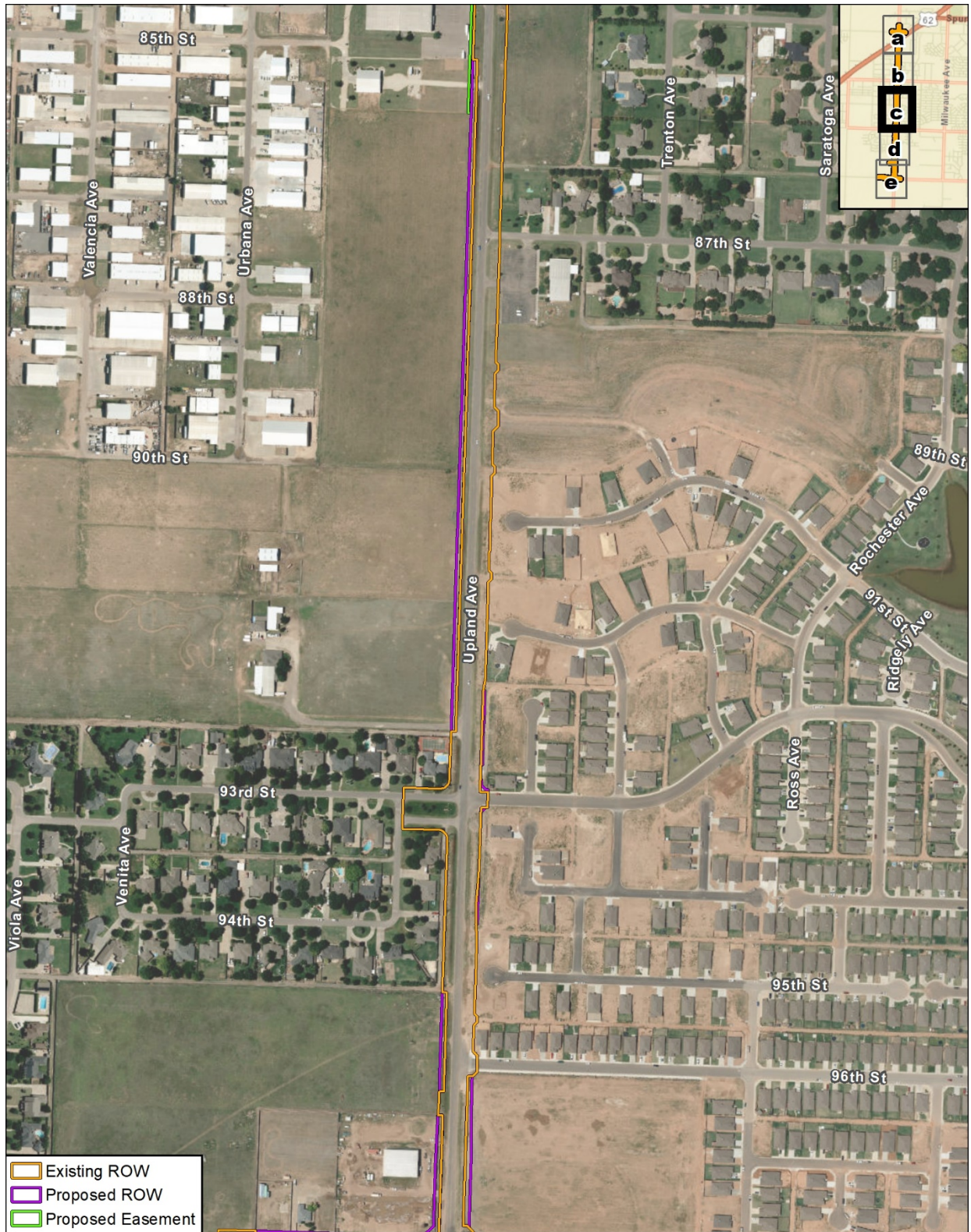


CSJs: 0905-06-095,  
 0905-06-096, 0905-06-097

0 500 Feet  
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1 in = 500 feet  
 Scale: 1:6,000  
 Date: 12/9/2019

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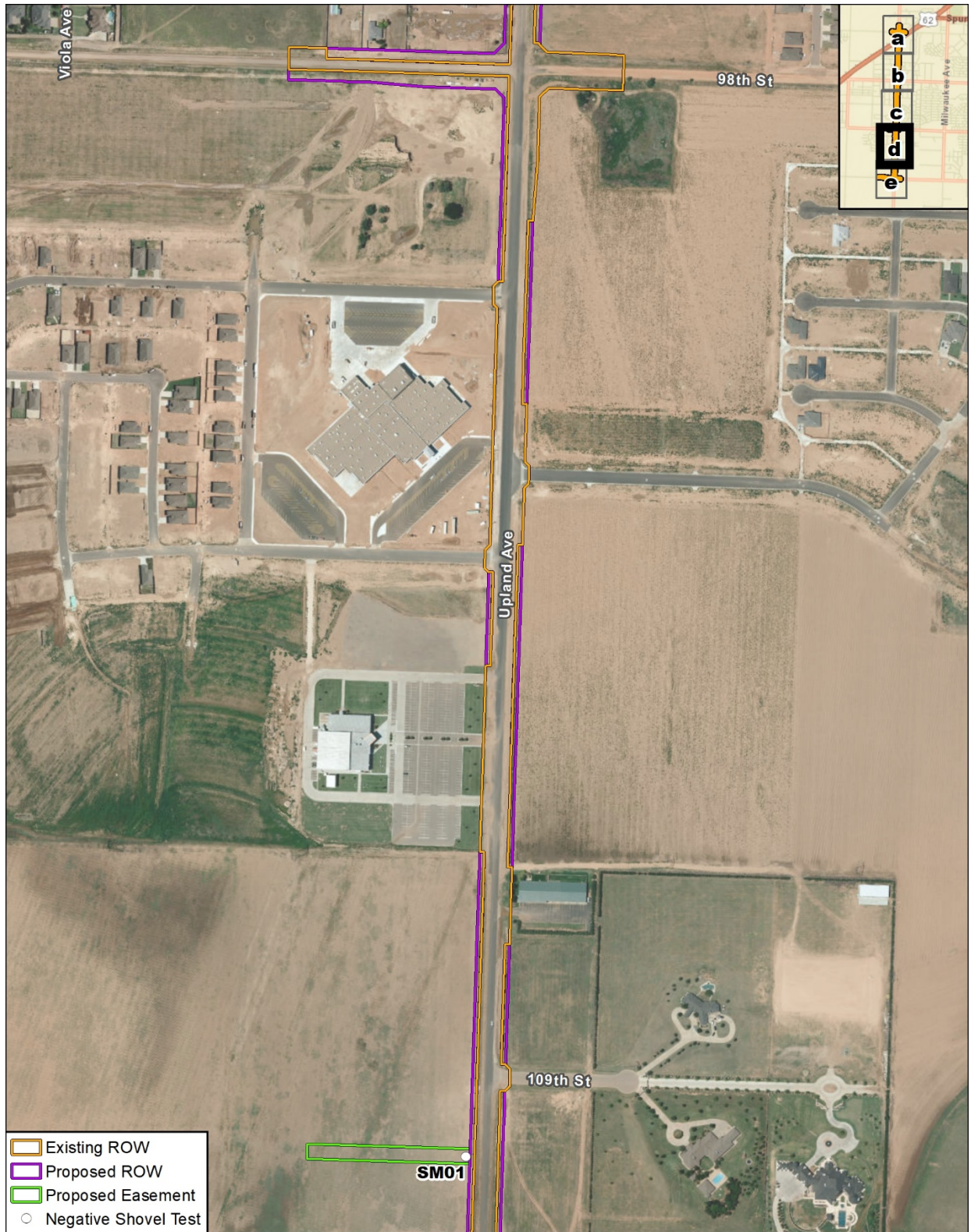
**Figure 3c**  
**Survey Results**

**Upland Avenue from 66th Street to 114th Street**

Data Source: CMEC (2019)  
 Aerial Source: City of Lubbock (2016)

	CSJs: 0905-06-095, 0905-06-096, 0905-06-097	
	0 500 Feet 0 150 Meters	1 in = 500 feet Scale: 1:6,000 Date: 12/9/2019

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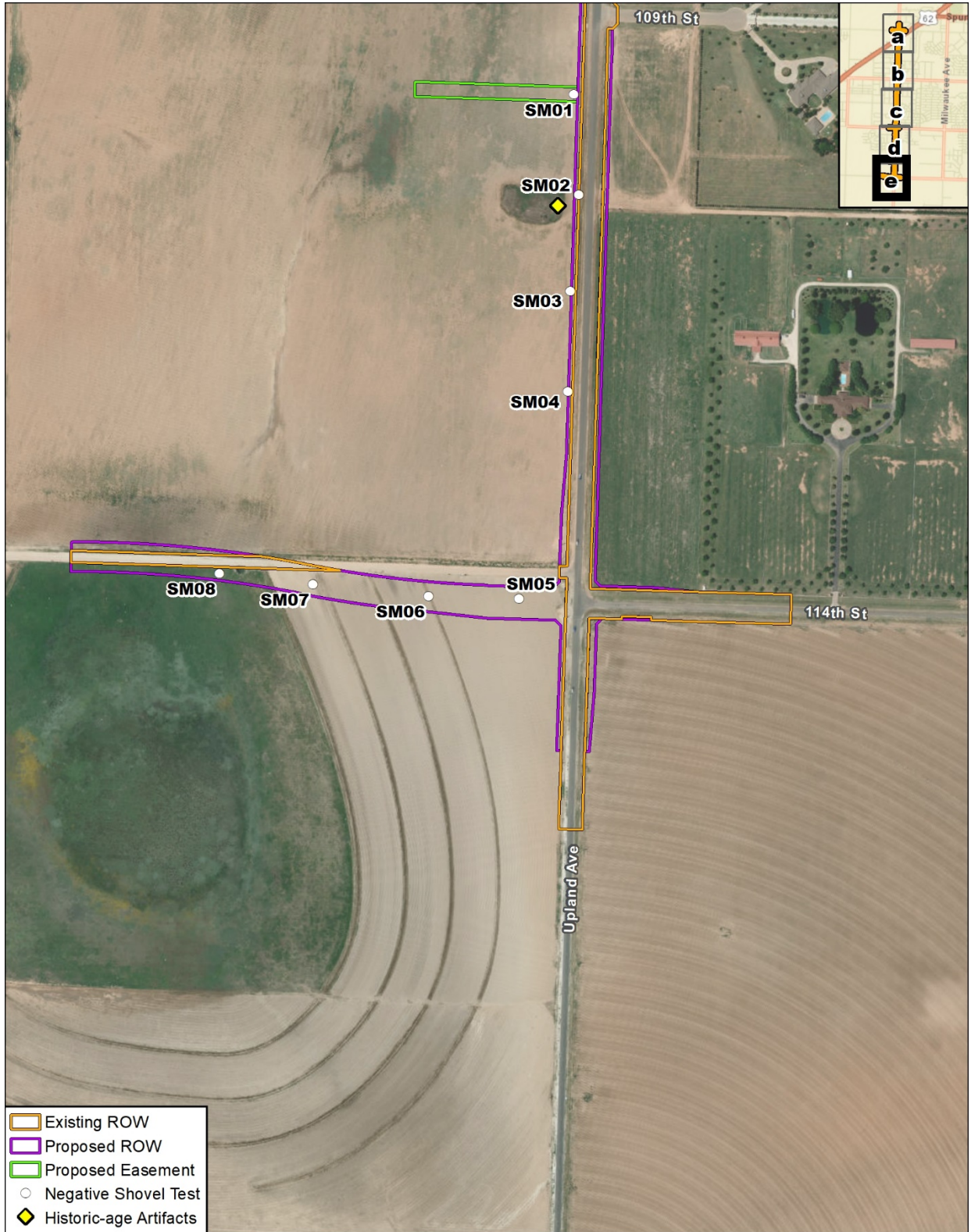
**Figure 3d**  
**Survey Results**

**Upland Avenue from 66th Street to 114th Street**

Data Source: CMEC (2019)  
 Aerial Source: City of Lubbock (2016)

	CSJs: 0905-06-095, 0905-06-096, 0905-06-097	
	0 500 Feet 0 150 Meters	1 in = 500 feet Scale: 1:6,000 Date: 12/9/2019

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- Existing ROW
- Proposed ROW
- Proposed Easement
- Negative Shovel Test
- Historic-age Artifacts

**Figure 3e**  
**Survey Results**

**Upland Avenue from 66<sup>th</sup> Street to 114<sup>th</sup> Street**

Data Source: CMEC (2019)  
 Aerial Source: City of Lubbock (2016)

	CSJs: 0905-06-095, 0905-06-096, 0905-06-097	
	0      500 Feet 0      150 Meters	1 in = 500 feet Scale: 1:6,000 Date: 12/9/2019

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Figure 4. View of western side of APE at 109<sup>th</sup> Street, facing north.



Figure 5. View of western side of APE south of 109<sup>th</sup> Street; facing south. Note 2018 surveyor's cap in foreground.



Figure 6. Ground surface visibility within agricultural fields west of Upland Avenue.



Figure 7. Ground surface visibility within agricultural fields south of 114<sup>th</sup> Street, facing south.





Figure 8. Very poor ground surface visibility at western end of APE, facing west.



Figure 9. Broken brick observed adjacent to APE



Figure 10. Concrete fragment observed adjacent to APE

## Shovel Test Pits

A total of eight judgmentally-placed shovel test units were excavated (see **Figure 3d–e**); no cultural resources were identified in any of them. Sediment encountered during survey showed some variability but was widely consistent with published descriptions of local soil associations, most notably Amarillo fine sandy loam and Mansker clay loam.

Typical shovel tests excavated along the western margin of Upland Avenue between 109<sup>th</sup> Street and 114<sup>th</sup> Street exhibited loose, yellowish brown (10YR 5/4) sandy loam extending approximately 9.8 inches (25 centimeters) below the surface and underlain by friable, dark yellowish brown (10YR 4/4) silty loam from 9.8 to 19.7 inches (25 to 50 centimeters) and friable, dark yellowish brown (10YR 4/4) clay loam from 19.7 to 31.5 inches (50 to 80 centimeters) below surface (**Figure 11**).

Shovels tests excavated south of 114<sup>th</sup> Street exhibited loose, dark yellowish brown (10YR 4/4) gravelly sandy loam extending approximately 9.8 inches (25 centimeters) from the surface that was underlain by brown (10YR 5/3) sandy loam from 9.8 to 19.7 inches (25 to 50 centimeters) and gray (10YR 6/1) sandy loam from 19.7 to 31.5 inches (50 to 80 centimeters) below the surface (**Figure 12**). A complete record of stratigraphy encountered in the shovel test units is found below in **Table 3**.



Figure 11. View of Shovel test unit SM01



Figure 12. View of shovel test unit SM05

Table 3. Shovel Test Unit Excavation Results		
Shovel Test #	Depth (cmbs*)	Description/ Notes
SM01	0-25	Yellowish brown (10YR 5/4) sandy loam; loose consistency
	25-50	Dark yellowish brown (10YR 4/4) silty loam; firm consistency
	50-80	Dark yellowish brown (10 4/4) clay loam; very firm consistency. Unit terminated at permit depth.
SM02	0-25	Yellowish brown (10YR 5/4) sandy loam; loose consistency
	25-50	Dark yellowish brown (10YR 4/4) silty loam; firm consistency
	50-80	Dark yellowish brown (10 4/4) clay loam; very firm consistency. Unit terminated at permit depth.
SM03	0-25	Yellowish brown (10YR 5/4) sandy loam; loose consistency
	25-50	Dark yellowish brown (10YR 4/4) silty loam; firm consistency
	50-80	Dark yellowish brown (10 4/4) clay loam; very firm consistency. Unit terminated at permit depth
SM04	0-25	Yellowish brown (10YR 5/4) sandy loam; loose consistency
	25-50	Dark yellowish brown (10YR 4/4) silty loam; firm consistency
	50-80	Dark yellowish brown (10 4/4) clay loam; very firm consistency. Unit terminated at permit depth
SM05	0-30	Yellowish brown (10YR 5/4) sandy loam; loose consistency
	30-50	Brown (10YR 5/3) sandy loam with 20% yellowish brown (10YR 5/6) clay; firm consistency
	50-80	Gray (10YR 6/1) sandy clay loam; loose consistency. Unit terminated at permit depth.
SM06	0-30	Yellowish brown (10YR 5/4) sandy loam; loose consistency
	30-50	Brown (10YR 5/3) sandy loam with 20% yellowish brown (10YR 5/6) clay; firm consistency
	50-80	Gray (10YR 6/1) sandy clay loam; loose consistency. Unit terminated at permit depth.
SM07	0-30	Yellowish brown (10YR 5/4) sandy loam; loose consistency
	30-50	Dark yellowish brown (10YR 4/4) silty loam; firm consistency
	50-80	Brown (10YR 5/3) sandy clay loam; firm consistency. Unit terminated at permit depth.
SM08	0-25	Yellowish brown (10YR 5/4) gravelly sandy loam; loose consistency
	25-80	Dark yellowish brown (10YR 4/6) clay loam; very firm consistency. Unit terminated at permit depth.
*cmbs – centimeters below surface		

## Recommendations

Results of the intensive survey indicate that all locations within the APE have been heavily disturbed by a combination of roadway improvements, utility installations, commercial and residential development, and/or agricultural pursuits. No evidence was found of preserved deposits with a high degree of integrity, associations with distinctive architectural and material culture styles, rare materials and assemblages, the potential to yield data important to the study of preservation techniques and the past in general, or potential attractiveness to relic hunters (13 TAC 26.10; 36 CFR 60.4). No additional archeological investigations are recommended prior to proposed construction activities. However, should future project design changes expand the APE to include the historic artifacts mentioned above, further field survey is recommended.

In accordance with 36 CFR 800.4, CMEC archeologists made a reasonable and good faith effort to evaluate the potential for the proposed undertaking to affect archeological historic properties (36 CFR 800.16.(1)) or State Archeological Landmarks (13 TAC 26.12).

No artifacts were collected; therefore, only project records will need to be curated per 13 TAC 26.16 and 26.17. Project records will be curated at the CAS at Texas State University where they will be made permanently available to future researchers.

If any unanticipated cultural materials or deposits are found at any stage of clearing, preparation, or construction, the work should cease in that area and TxDOT personnel should be notified immediately. During evaluation of any unanticipated finds and coordination between TxDOT and THC, clearing, preparation, and/or construction could continue in any other areas along the corridor where no such deposits or materials are observed.

The Texas Historical Commission concurred with these recommendations on December 18, 2019.

## 5 REFERENCES

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- Boyd, D. E.  
2004 Palo Duro Complex. In *The Prehistory of Texas*, edited by T. K. Perttula, pp. 296-330. Texas A&M University Press, College Station.
- Collins, M.  
2004 Archeology in Central Texas. In *The Prehistory of Texas*, edited by T. K. Perttula, pp. 101-151. Texas A&M University Press, College Station.
- Griffith, G.E., S.A. Bryce, J.A. Comstock, A.C. Rogers, B. Harrison, S.L. Hatch, and D. Bezanson  
2004 *Ecoregions of Texas*. U.S. Geological Survey. Available at [ftp://ftp.epa.gov/wed/ecoregions/tx/tx\\_front.pdf](ftp://ftp.epa.gov/wed/ecoregions/tx/tx_front.pdf). Accessed October 14, 2019.
- Hofman, J. L., R. L. Brooks, J. S. Hays, D. W. Owsley, R. L. Jantz, and M. K. Marks  
1989 *From Clovis to Comanchero: Archeological Overview of the Southern Great Plain*. Research Series No. 35. Arkansas Archeological Survey, Fayetteville.
- Lawrence, K.G.  
2010 "Lubbock County," in Handbook of Texas Online. <http://www.tshaonline.org/handbook/online/articles/hcl14>, accessed December 2, 2019. Texas State Historical Association, Austin.
- Nationwide Environmental Title Research (NETR)  
2019 *Historic Aerials Database*. Nationwide Environmental Title Research. Available at <http://historicalaerials.com>. Accessed April 23, 2019.
- Oglesby, F. M., C. Lintz, W. Doering, and M. McFaul  
1993 Project Location, Environment, and Cultural Background. In *The Testing Phase at Mitchell Reservoir, Mitchell County, Texas*, edited by J. M. Quigg, C. Lintz, F. M. Oglesby, and A. C. Treece, pp. 5–24. Technical Report 485. Mariah Associates, Austin.
- Owens, J. D., and D. G. Duke  
2000 *Cultural Resources Survey of a Proposed 520.6-Acre Drop Zone Site for Dyess Air Force Base, Runnels County, Texas*. Miscellaneous Reports of Investigations No. 199. Geo-Marine, Inc., Plano.
- Soil Survey Staff, Natural Resources Conservation Service, U.S. Department of Agriculture.  
2019 *Soil Survey Geographic (SSURGO) Database for Lubbock County, Texas*. Natural Resources Conservation Service. Available at <http://casoilresource.lawr.ucdavis.edu/soilweb/>. Accessed April 23, 2019.

Texas Historical Commission (THC)

- 2019 *Texas Archeological Sites Atlas*. Texas Archeological Research Laboratory and the Texas Historical Commission. Available at <https://atlas.thc.state.tx.us/Account/Login>. Accessed April 23, 2019.

Texas Parks and Wildlife Department (TPWD)

- 2019 Texas Ecological Analytical Mapper. Texas Parks and Wildlife Department. Available at <https://tpwd.texas.gov/gis/team/#>. Accessed April 23, 2019.

U.S. Geological Survey (USGS)

- 2019a Texas Geology Map Viewer. United States Geological Survey. Available at <http://txpub.usgs.gov/dss/texasgeology/>. Accessed April 23, 2019.
- 2019b Historical Topographic Map Viewer. United States Geological Survey. Available at <http://historicalmaps.arcgis.com/usgs/index.html>. Accessed April 23, 2019.