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## **An Intensive Cultural Resources Survey of a Rerouted Alignment of Plains All American Pipeline, LP's Proposed Earthstone Benedum CTP to Tie-In Line Project Located on UT Land in Upton County, Texas**

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# An Intensive Cultural Resources Survey of a Rerouted Alignment of Plains All American Pipeline, LP's Proposed Earthstone Benedum CTP to Tie-In Line Project Located on UT Land in Upton County, Texas

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By:

**Russell K. Brownlow and Jesse O. Dalton**



**HJN 200005 06AR**

**Texas Antiquities Committee Permit No. 9616**

**Prepared for:**



**Whitenton Group, Inc.  
San Marcos, Texas**

**Prepared by:**



**Horizon Environmental Services, Inc.  
Austin, Texas**

**October 2020**



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By:

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**Texas Antiquities Committee Permit No. 9616**

**October 2020**



## **ABSTRACT**

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On 30 September 2020, Horizon Environmental Services, Inc. (Horizon) conducted an intensive cultural resources survey of a rerouted alignment of Plains All American Pipeline, LP's (Plains) proposed Earthstone Benedum CTP to Tie-In Line Right-of-way (ROW) Project located on University of Texas property (UT land) in southeastern Upton County, Texas (Project Area). Overall, the proposed rerouted alignment on UT land measures 3.4 miles (5.5 kilometers [km]) long by 100.0 feet (30.5 meters [m]) wide, with a total area of approximately 41.2 acres. However, as the majority of the rerouted alignment follows the same general path as the original alignment, the Texas Historical Commission (THC) indicated that only the southeasternmost portion of the rerouted alignment where it extends away from the original project terminus would require a cultural resources survey. As such, the new Project Area measured approximately 1.2 miles (1.9 km) long by 100.0 feet (30.5 m) wide within an overall area of approximately 14.5 acres. The cultural resources survey of the Project Area was conducted under Texas Antiquities Committee (TAC) permit number 9616 in compliance with the Antiquities Code of Texas (ACT). The purpose of the survey was to determine if any archeological sites were located within the Project Area and, if any existed, to determine if the project had the potential to have any adverse impacts on sites considered eligible for formal designation as State Antiquities Landmarks (SALs).

The cultural resources survey resulted in entirely negative findings. No cultural materials were observed on the surface of the Project Area or within any of the 23 excavated shovel tests. Based on the negative survey results, it is Horizon's opinion that the construction of the rerouted alignment of the proposed Earthstone Benedum CTP to Tie-In Line Project across UT land will have no adverse effect on significant cultural resources designated as or considered eligible for designation as SALs. Horizon therefore recommends that Plains be allowed to proceed with the construction of the proposed pipeline relative to the jurisdiction of the ACT.

All records produced during the investigations have been curated at the Texas Archeological Research Laboratory (TARL) in accordance with the TAC Permit-Terms and Conditions and the Texas Administrative Code Title 13, Part 2, Chapter 26.C.26.17.





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## **ACKNOWLEDGEMENTS**

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Horizon Environmental Services, Inc. (Horizon) conducted the intensive cultural resources survey of the rerouted alignment of Plains All American Pipeline, LP's (Plains) proposed Earthstone Benedum CTP to Tie-In Line Right-of-way (ROW) Project reported herein in compliance with the Antiquities Code of Texas (ACT). Russell Brownlow served as the principal investigator for the project and lead author of this report. Jesse Dalton conducted the field efforts and co-authored the report. McKinzie Froese compiled the field data, while Karlie Schultz was responsible for drafting the figures.



## 1.0 INTRODUCTION

---

This document reports the results of an intensive cultural resources survey of a rerouted alignment of Plains All American Pipeline, LP's (Plains) proposed Earthstone Benedum CTP to Tie-In Line Right-of-way (ROW) Project located in southeastern Upton County, Texas (Project Area) (Figures 1-1 through 1-3). The development of the ROW will be privately funded and will not require any federal permitting or coordination. However, a portion of the proposed ROW is located on property owned by the University of Texas (UT land). As UT is considered to be a political subdivision of the state, the portion of the undertaking on UT land falls under the regulations of the Antiquities Code of Texas (ACT). At the request of Whitenton Group, Inc. (Whitenton), Horizon Environmental Services, Inc. (Horizon) conducted the cultural resources survey of the Project Area on behalf of Plains in compliance with the ACT. The purpose of the survey was to determine if any archeological sites were located within the Project Area and, if any existed, to determine if the project had the potential to have any adverse impacts on sites considered eligible for formal designation as State Antiquities Landmarks (SALs).

Plains' original alignment for the proposed Earthstone Benedum CTP to Tie-In Line Project consisted of a 2.2-mile (3.5-km)-long ROW segment on UT land. In January 2020, Whitenton contracted with Horizon to conduct a cultural resources survey of the original alignment across UT land on behalf of Plains in compliance with the ACT. Horizon field crews assessed the original alignment for cultural resources on 15 January 2020 under Texas Antiquities Committee (TAC) permit number 9616 (Figure 1-4). The original survey produced entirely negative results. As a result, Horizon recommended that the project be allowed to proceed relative to the jurisdiction of the ACT. The Texas Historical Commission (THC) concurred with Horizon's findings and recommendations in a letter dated 11 February 2020.

At this time, Plains is proposing a reroute of the original Earthstone Benedum CTP to Tie-In Line alignment. The proposed reroute now consists of a 3.4-mile (5.5-km)-long ROW segment on UT land. This segment measures 100.0 feet (30.5 meters [m]) in width and has an overall area of 41.2 acres. While the rerouted alignment follows the same general path as the original alignment, it does shift away from the original alignment in several locations. It also extends for an additional 1.2 miles (1.9 km) to the southeast of the original project terminus (see Figures 1-2 through 1-4).

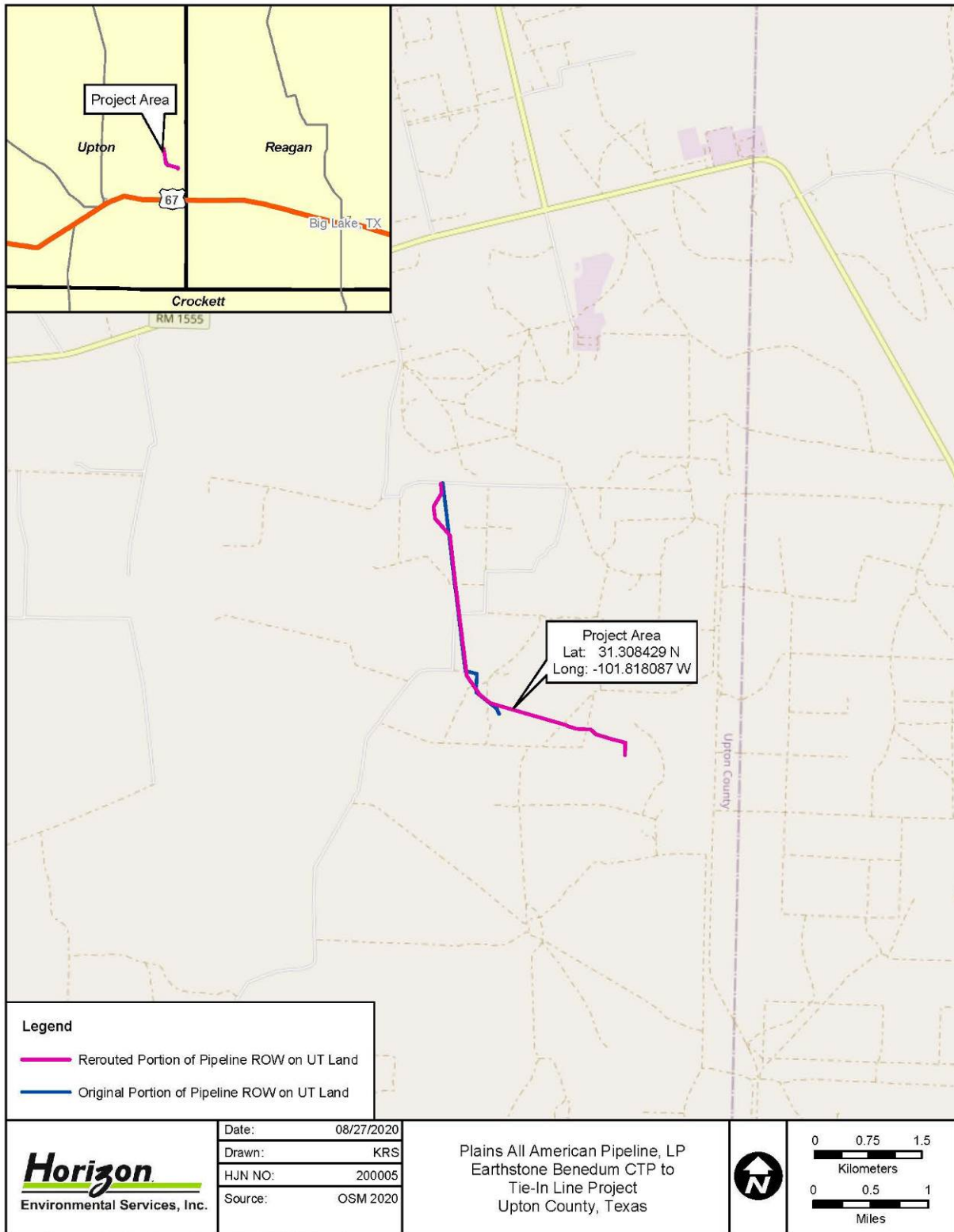
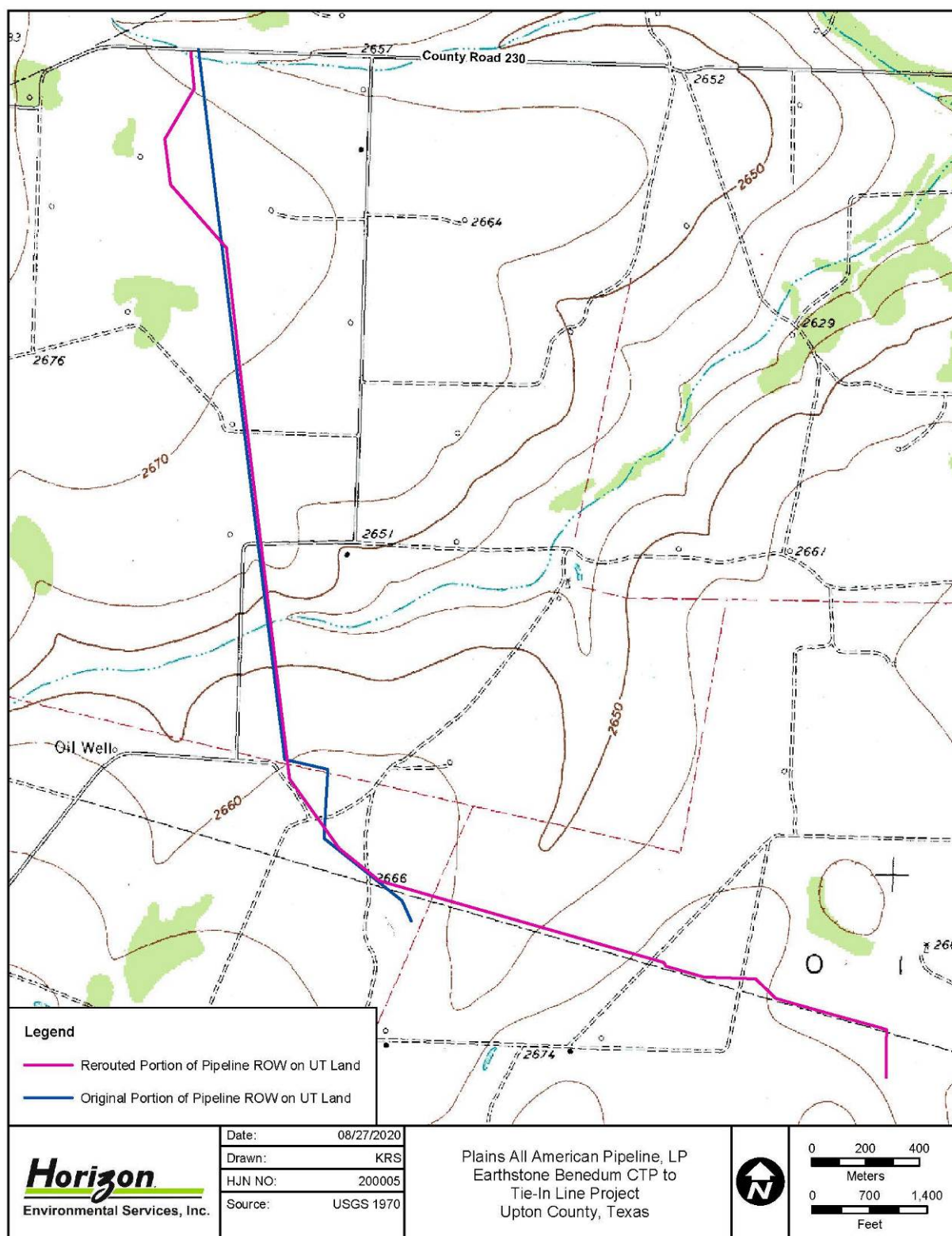


Figure 1-1. Vicinity map with the location of the Project Area

*An Intensive Cultural Resources Survey of a Rerouted Alignment of Plains All American Pipeline, LP's  
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**Figure 1-2. Topographic map with the location of the Project Area**



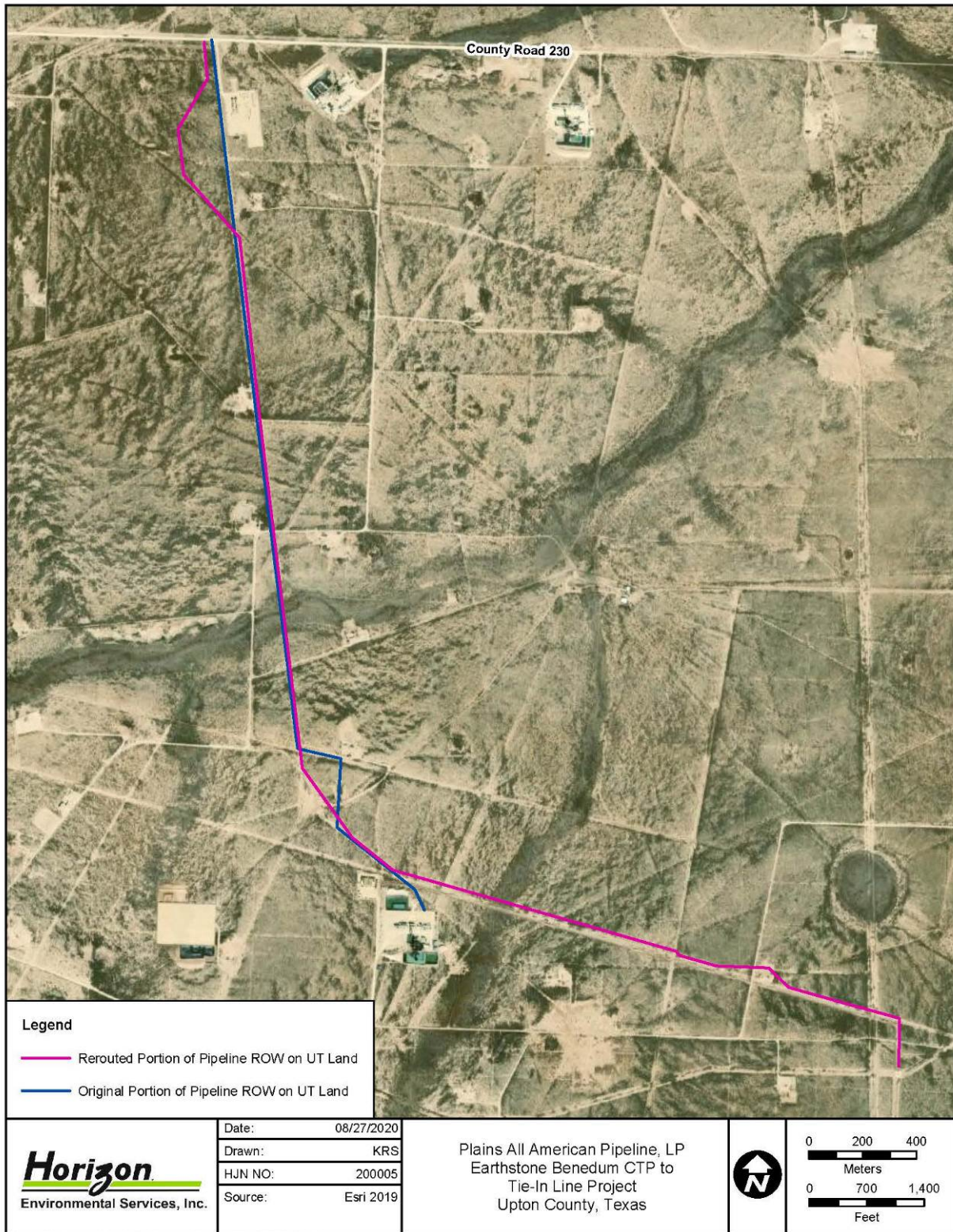
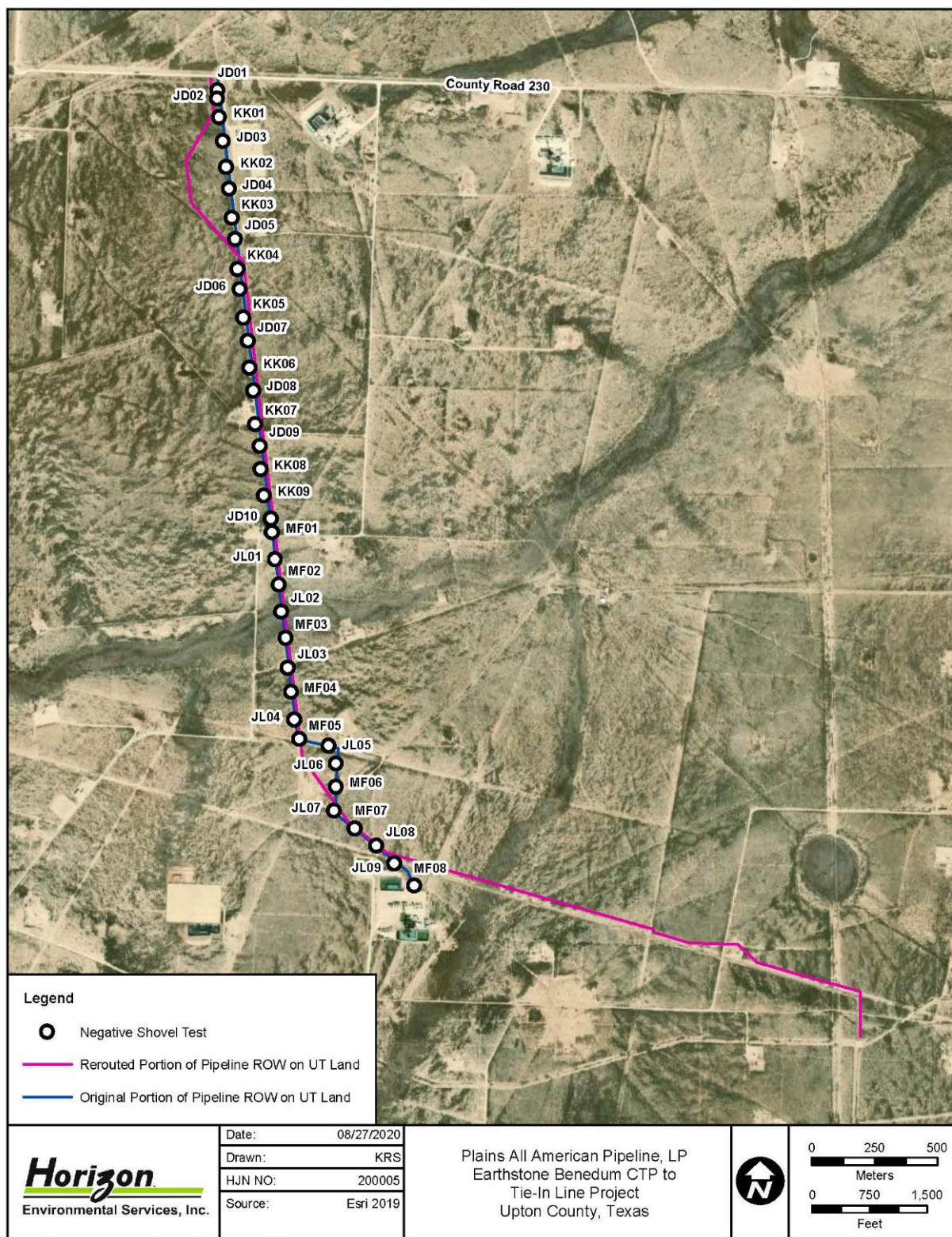


Figure 1-3. Aerial imagery with the location of the Project Area



*An Intensive Cultural Resources Survey of a Rerouted Alignment of Plains All American Pipeline, LP's Proposed Earthstone Benedum CTP to Tie-In Line Project Located on UT Land in Upton County, Texas*



**Figure 1-4. Previously surveyed portions of original alignment**

In a letter dated 27 August 2020, Horizon consulted with the THC to determine what cultural resources investigations, if any, would be required for the proposed rerouted alignment. In an email response dated 23 September 2020, the THC provided the following comments:

*We concur that there is little to no potential for archeological resources where the rerouted segment deviates from the original surveyed route; however, we believe there is potential for undocumented cultural resources within the 1.2-mile addition at the southeastern end of the project's original terminus. While the 1.2-mile addition overlaps with a previous cultural resources survey (TA Permit No. 6098) conducted in advance of a seismic survey, source and receiver lines were spaced between 250 and 300 meters apart. As a result, the cultural resources survey conducted under Texas Antiquities Permit No. 6098 did not result in a 100 percent cultural resource assessment of the project area. Furthermore, the 1.2-mile addition crosses a second order stream, which may have attracted prehistoric occupation. Therefore, a cultural resource survey of the 1.2-mile addition is warranted prior to breaking ground.*

Based on these comments, the new Project Area (i.e., the surveyed segment of the proposed ROW that crosses UT land) measures approximately 1.2 miles (1.9 km) long by 100.0 feet (30.5 m) wide within an overall area of approximately 14.5 acres.

The cultural resources investigations consisted of pre-field background research, an intensive cultural resources survey of the Project Area, and the production of a report suitable for review by the State Historic Preservation Officer (SHPO) in accordance with the THC's *Rules of Practice and Procedure*, Chapter 26, Section 27, and the Council of Texas Archeologists (CTA) *Guidelines for Cultural Resources Management Reports*. Russell Brownlow (Horizon's president) served as the project's principal investigator, while Jesse Dalton (Horizon staff archeologist) conducted the field investigations. The cultural resources investigations were conducted under Texas Antiquities Committee (TAC) permit number 9616.

Following this introductory chapter, Chapters 2.0 and 3.0 present the environmental and cultural backgrounds, respectively, of the Project Area. Chapter 4.0 describes the results of the pre-field background research. The cultural resources survey methodology is presented in Chapter 5.0, and the results of the investigations are presented in Chapter 6.0. A summary of the investigations and Horizon's recommendations are provided in Chapter 7.0, while Chapter 8.0 provides the references cited. Shovel test data are summarized in Appendix A.

## **2.0 ENVIRONMENTAL SETTING**

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### **2.1 GENERAL PROJECT AREA DESCRIPTION**

Plains' proposed Earthstone Benedum CTP to Tie-In Line Project is located in southeastern Upton County, approximately 21.5 miles (34.6 km) northwest of Big Lake, Texas. It can be found on the US Geological Survey (USGS) 7.5-minute Sevenmile Corner SE, Texas, topographic quadrangle map (see Figure 1-2). The majority of the proposed reroute is adjacent to an existing pipeline ROW and several other pipeline ROWs that bisect this corridor, located within an area that has been extensively disturbed via mechanical grazing and erosion. The area is also subject to regular oil field vehicular traffic. Representative images of the Project Area at the time of the cultural resources survey are presented in Figures 2-1 through 2-3.

### **2.2 PHYSIOGRAPHY AND HYDROLOGY**

The Project Area is located in southeastern Upton County in West Texas. It is situated within an area of flat to gently undulating desert hills that are dissected by drainages linked to Centralia Draw (see Figure 1-2). The proposed ROW initiates at an existing centralized tank battery (CTB) meter station at its northern end and extends to the south to another existing CTB facility at its southeastern end. Elevations within the Project Area range between 2,640.0 and 2,680.0 feet (804.7 and 816.9 m) above mean sea level.

Hydrologically, the proposed ROW is situated within the Middle Colorado-Concho River basin. It is drained to the east and northeast by drainages linked to Centralia Draw. Centralia Draw flows northeasterly, joining South Mustang Draw approximately 31.6 miles (50.9 km) northeast of the Project Area. South Mustang Draw flows northeasterly before joining the Middle Concho River approximately 34.0 miles (54.6 km) northeast of the Project Area. The Middle Concho River eventually joins the Concho River in Twin Buttes Reservoir approximately 75.0 miles (120.7 km) east of the Project Area.





**Figure 2-1. View along central portion of Project Area (facing northwest)**



**Figure 2-2. View along central portion of Project Area (facing southeast)**



**Figure 2-3. Section of undisturbed area in southeastern portion of Project Area (facing northwest)**

## **2.3 CLIMATE**

Winters are mild in Upton County, with an average temperature of 47.0 degrees Fahrenheit (°F). The summer months are hot, with an average temperature exceeding 95.0°F. The average annual total precipitation is about 14.0 inches (35.6 centimeters [cm]), with most of it falling between April and September (NRCS 2003).

## **2.4 FLORA AND FAUNA**

The Project Area is situated at the northwestern corner of the Edwards Plateau ecoregion near the confluence of the High Plains from the north, the Trans Pecos to the west, and the Edwards Plateau to the east (Griffith et al. 2007). This region consists of a hilly limestone plateau that is dissected by networks of perennial streams. Juniper-oak and mesquite-oak savannas cover most of the region, while arid desert settings containing a variety of cacti and grasslands are common in the northwestern portion of this region (Griffith et al. 2007). Common species in the region include white-tailed deer, coyotes, foxes, skunk, a variety of lizards and snakes, quail, and other birds of prey.

## **2.5 SOILS**

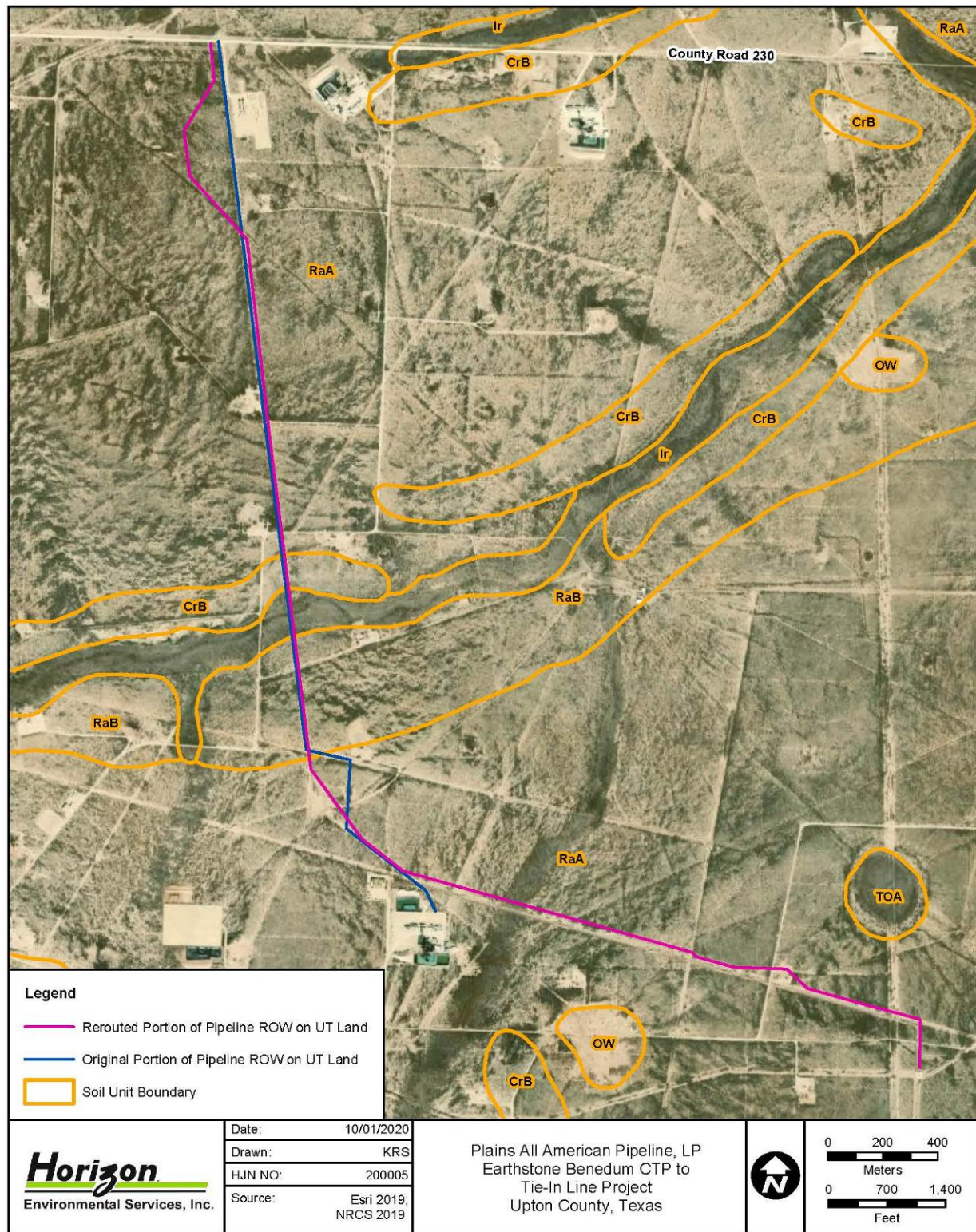
Four soil types are mapped within the boundaries of the Project Area on UT land. These soils presented in Table 2-1 (NRCS 2003 and 2019) and in Figure 2-4.

Table 2-1. Soils mapped within the Project Area

Soil Name	Soil Type	Soil Depth (inches)	Setting
Conger-Reagan association, 0 to 3% slopes (CrB)	<u>Conger</u> Loam	<u>Conger</u> 0 to 17: Loam 17 to 80: Caliche	<u>Conger</u> Nearly level to gently sloping ridges and divides on dissected plateaus
	<u>Reagan</u> Loam	<u>Reagan</u> 0 to 8: Loam 8 to 80: Clay loam	<u>Reagan</u> Broad flats
Iraan silty clay loam, 0 to 2% slopes, occasionally flooded (Ir)	Silty clay loam	0 to 80: Silty clay loam	Flood plains along streams on dissected plateaus and river valleys
Reagan loam, 0 to 1% slopes (RaA)	Loam	0 to 8: Loam 8 to 80: Clay loam	Broad flats
Reagan loam, 1 to 3% slopes (RaB)	Loam	0 to 8: Loam 8 to 80: Clay loam	Broad flats



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**Figure 2-4. Soils mapped within the Project Area**





## **3.0 CULTURAL BACKGROUND**

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The general temporal framework for most prehistoric archeological sites in Texas is based on the seriation of projectile point types originally established by Suhm et al. (1954) and later revised by Suhm and Jelks (1962), Prewitt (1981, 1985), and Turner and Hester (1999). This temporal framework, consisting of a tri-partite system based on technological changes in diagnostic artifacts that occurred as a result of indigenous adaptation to changing environments and subsistence strategies, is broken down into three main periods: the Paleoindian (pre-8500 B.P.), the Archaic (8500 to 1250 B.P.), and the Late Prehistoric (1250 to 250 B.P.). The Archaic period is further subdivided into the Early Archaic (8500 to 6000 B.P.), the Middle Archaic (6000 BP to 3500 B.P.), and the Late Archaic (3500 to 1250 B.P.).

### **3.1 PALEOINDIAN (PRE-8500 B.P.)**

The Paleoindian period is characterized by highly mobile groups hunting over large areas. Although now-extinct megafauna such as mammoth and bison are often found associated with sites of this time period, smaller game such as deer and turtles were also likely utilized as food items. Plant foods undoubtedly made up a portion of the diet as well. Based upon the low number of diagnostic artifacts recovered from sites of this period, as well as the low frequency of sites, population densities are considered low and probably consisted of small family groups. An increase in projectile point frequency toward the end of the period may suggest an increased population density or, perhaps, an increase in macro-band aggregation for the purpose of communal hunts. Sites from this time period are found mostly in upland tributary and spring settings, as well as deeply buried in floodplain alluvium. Clovis and Folsom points are indicative of Early Paleoindian occupations, while Plainview, Golondrina, Scottsbluff, Meserve, Eden, Dalton, San Patrice, and Angostura points are characteristic of the later span of the period. Numerous sites representative of this time period in the region are located around the extensive Big Lake playa basin in Reagan County, roughly 20.0 miles (32.2 km) to the southeast of the current Project Area. Of the numerous sites, 41RG13 represents a Late Paleoindian bison kill site where hunters drove a small herd of bison into the playa lake, where they became mired in the mud prior to being dispatched (Turpin et al. 1997).

### **3.2 EARLY ARCHAIC (8500 TO 6000 B.P.)**

Like the Paleoindian period, Early Archaic population densities remained low, still consisting of small, mobile bands. However, a more generalized hunting-and-gathering strategy

is evidenced by the use of river mussels. Early Archaic sites are typically located on terraces along tributary watercourses but are also often found deeply buried in floodplain alluvium. Site locale and an increased use of river mussels possibly indicate a shift in subsistence strategies in order to exploit the bottomlands of major waterways during this period of wetter climates. Split-stemmed points such as Gower, Martindale, and Uvalde, as well as Big Sandy, Hardin, and Hoxie, are diagnostic of Early Archaic occupations.

### **3.3 MIDDLE ARCHAIC (6000 TO 3500 B.P.)**

During the Middle Archaic, the trend to bottomland exploitation increased, with fewer sites found along minor tributaries. Population density remained relatively low, but obviously increased over prior periods, with broad-spectrum hunting and gathering represented at larger sites where food sources were more abundant.

### **3.4 LATE ARCHAIC (3500 TO 1250 B.P.)**

In contrast to earlier time periods, the Late Archaic represents a period of increased population and site density. Subsistence was focused on hunting and gathering within the bottomlands of major creeks and rivers. Deer remains are quite common at Late Archaic sites, and the exploitation of plant foods (nuts) seems to have increased during this period, based upon an increase in plant-processing tools. Late Archaic sites are typically found on sandy terraces along tributaries, as well as on clayey floodplains.

### **3.5 LATE PREHISTORIC (1250 TO 250 B.P.)**

The Late Prehistoric, in general, is characterized by the advent of ceramics and the bow and arrow in Texas. Hunting and gathering continued, with an emphasis on deer and other small game. Horticulture also became evident in some areas. As in the Late Archaic, sites continue to be located on sandy terraces along major creeks and rivers. In fact, the majority of Late Prehistoric sites contain some traces of Late Archaic occupations. A marked population increase is highly evident, and increased territorial conflicts possibly explain the recovery of burials with indications of violent deaths. Furthermore, differentiated burial practices also suggest the development of non-egalitarian societies.

## 4.0 PRE-FIELD BACKGROUND RESEARCH

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### 4.1 DATABASE REVIEW

Background research conducted via the THC's *Texas Archeological Sites Atlas* (Atlas) online database indicated the presence of four previously recorded archeological sites within a 0.6-mile (1.0-km) perimeter of the Project Area (THC 2020), while a review of the National Park Service's (NPS) National Register of Historic Places (NRHP) Google Earth map layer indicated the presence of no historic properties listed on the NRHP within the review perimeter (NPS 2020). These documented cultural resources and their distances from the Project Area are summarized in Table 4-1, while their locations relative to the Project Area are presented in Figure 4-1. No documented cultural resources, including any listed on the NRHP or formally designated as SALs, are located within or adjacent to the boundaries of the Project Area.

**Table 4-1. Summary of documented cultural resources within 1.0 km of Project Area**

Site Trinomial, Cemetery, or Historic Property	Site Type	NRHP Eligibility Status	Distance/Direction from Project Area	Potential to be Impacted by Project?
41UT128	Prehistoric campsite with associated hearth features	Determined ineligible	0.6 km west	No
41UT81	Prehistoric campsite with associated hearth features	Undetermined	0.5 km north	No
41UT80	Prehistoric campsite with associated hearth features	Determined ineligible	0.3 km north	No
41UT79	Prehistoric campsite	Determined ineligible	0.9 km south	No

Based on the Atlas database, the proposed ROW extends through an area of UT land that is crisscrossed by numerous linear cultural resources survey transects that were assessed in 2012 as part of the Reagan NW 3D Seismic Development Block Project. This prior assessment resulted in the documentation of the noted previously recorded archeological sites within the review perimeter. While the currently proposed ROW is crossed by the seismic survey corridors at several locations, the vast majority of the proposed ROW has not been directly assessed for cultural resources.

*Sensitive Site Location Data Omitted*

## **4.2 MAP REVIEW**

A review of topographic maps and aerial imagery indicates that the area has been used primarily for oil and gas extraction in the latter quarter of the twentieth century. Nothing aside from oil/gas wells and access roads is visible on topographic maps dating as early as 1970 and aerial imagery dating as early as 1968 (NETROnline 2020).

## **4.3 PROBABILITY ASSESSMENT**

Prehistoric archeological sites are commonly found in upland areas and on alluvial terraces near stream/river channels or drainages. Additionally, in this part of the state, they are often found in proximity to playa lake beds and dune blowouts. Based on the location of the Project Area above drainages linked to Centralia Draw, it was Horizon's opinion prior to the field efforts that there existed at least a moderate potential for undocumented prehistoric cultural deposits within the Project Area.

In regard to historic-era resources, the lack of visible standing structures in immediate proximity to the Project Area on the relevant topographic quadrangle map and Google Earth imagery suggested a decreased potential for historic-era standing structures and associated historic-era cultural deposits within the Project Area.



## **5.0 SURVEY METHODOLOGY**

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A Horizon archeologist completed the intensive pedestrian survey of the Project Area on 30 September 2020. This entailed intensive surface inspection and subsurface shovel testing efforts. The TSMASS require a minimum of 16 shovel tests per mile for linear projects measuring up to 100.0 feet (30.5 m) wide. As the Project Area totals 1.2 miles (1.9 km) in length, a minimum of 19 shovel tests were necessary within the Project Area in order to comply with the TSMASS. Horizon exceeded the TSMASS by excavating a total of 23 shovel tests across the Project Area (Figure 5-1). All excavated matrices were screened through 0.25-inch (6.3-millimeter [mm]) hardware mesh or were trowel-sorted if the dense clay soils prohibited successful screening.

An archeological site was considered to minimally consist of the presence of five or more artifacts and/or an intact cultural feature with either surface or subsurface provenience that are at least 50 years old within an area no greater than 98.4 by 98.4 feet (30.0 by 30.0 m). The field archeologist was to exercise their professional judgement in determining whether artifact scatters represented by less than five artifacts or distributed over more than 98.4-foot (30.0-m) intervals should be considered archeological sites. The field archeologist was also to exercise their professional judgement in determining whether a cultural feature or object should be documented as an archeological site. Archeological sites with clearly visible surface expressions were to be delineated based on the extent of surficial cultural resources and judgmental shovel testing to confirm the absence of subsurface archeological deposits. Archeological sites without clearly visible surface expressions and/or low visibility were to be delineated by excavating additional shovel tests extending in all cardinal directions from the initial discovery at intervals of no more than 49.2 feet (15.0 m). In the latter case, site boundaries were to be defined by the presence of two consecutive negative shovel tests. Shovel tests used to define a site's boundary may not provide enough information to elucidate eligibility for inclusion in the NRHP or designation as a SAL. Therefore, additional and strategically placed shovel tests were to be excavated to adequately sample a site's deposits, if encountered, in order to make a sound, well-informed, and data-driven eligibility recommendation. If artifacts found at any given cultural resources locale (i.e., on the modern ground surface or within one or more adjacent shovel tests) did not meet the minimum definition for an archeological site, the find was to be recorded as an isolated occurrence (IO) of artifacts rather than an archeological site.

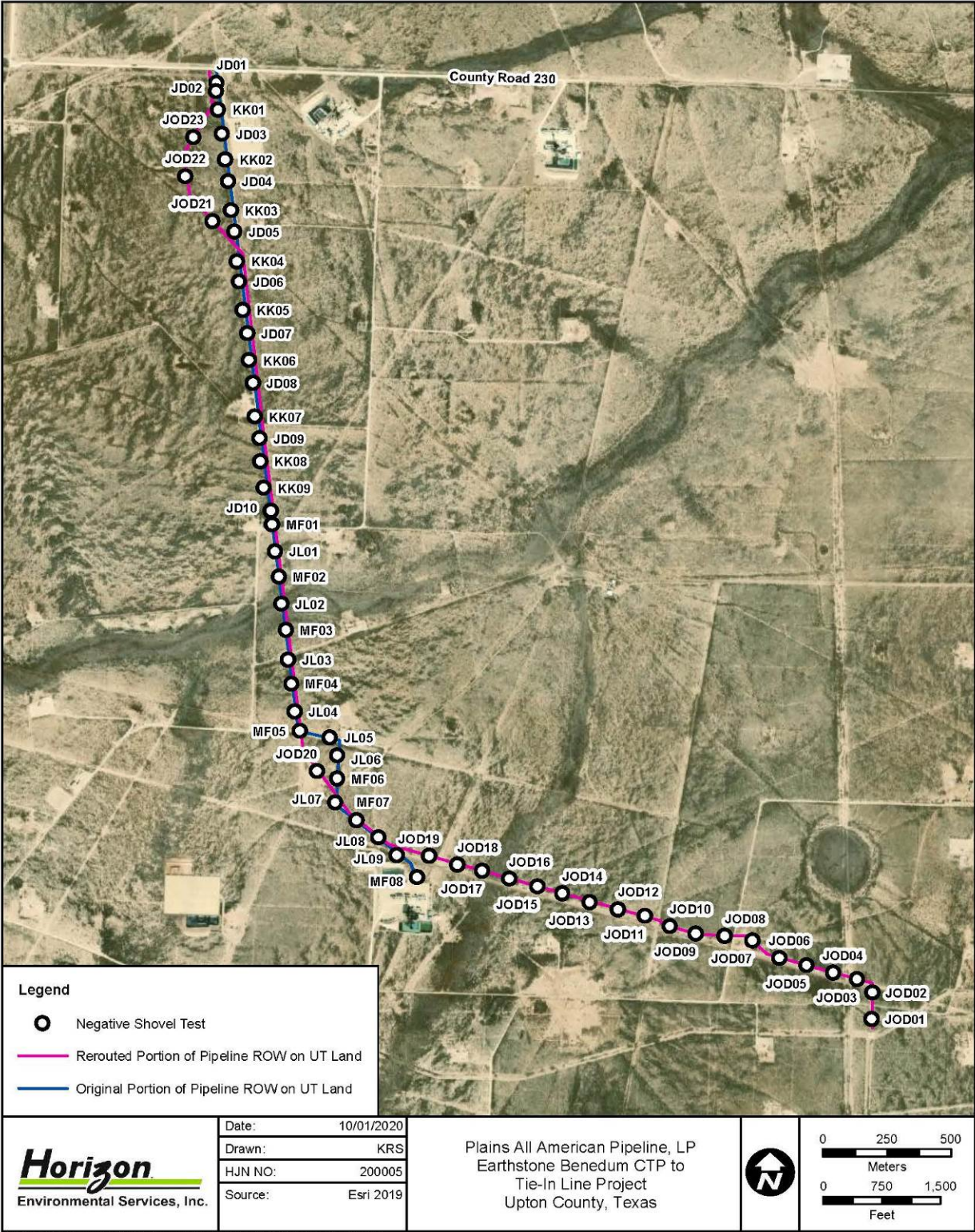


Figure 5-1. Shovel test locations within the Project Area



Field notes were maintained on terrain, vegetation, soils, landforms, shovel tests, cultural material observed (if any), etc. Standardized shovel test forms were completed for every shovel test. These forms included location data, depth, soil type, and notations on any artifacts encountered. For any new archeological sites recorded, standard site forms were completed and filed at the Texas Archeological Research Laboratory (TARL) for permanent housing. Similarly, for any previously recorded archeological sites that were assessed, updated site forms were completed and filed at the TARL.

A selective collection strategy was utilized during the survey efforts wherein only diagnostic cultural materials were to be collected for eventual curation at an approved facility. Non-diagnostic artifacts were to be tabulated and assessed in the field and placed back where they were found. Digital photographs with a photo log were completed as appropriate. The locations of all shovel tests were recorded via handheld GPS units utilizing the Universal Transverse Mercator (UTM) coordinate system and the North American Datum of 1983 (NAD 83). Shovel test locations have been presented in Figure 5-1. Shovel test data are presented in Appendix A.

All records produced during the investigations have been curated at TARL in accordance with the TAC Permit-Terms and Conditions and the Texas Administrative Code Title 13, Part 2, Chapter 26.C.26.17.



## **6.0 RESULTS**

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### **6.1 GENERAL FINDINGS**

The Project Area consisted of an erosional brush-grassland environment where the Edwards Plateau transitions into the Trans Pecos desert province in an area dominated by a mixture of short trees, including mesquite and acacia interspersed by prickly pear and other cactus and desert shrubs. The sparse nature of the vegetation provided excellent ground surface visibility (75%+) over most of the Project Area (Figures 6-1 and 6-2; see also Figures 2-1 through 2-3). The field archeologist generally noted loamy soils that were typically shallow overlying a clay loam with an abundance of medium- and small-sized cobbles lying on the surface. In general, the depths of the excavated shovel tests within the Project Area ranged between 11.8 and 15.7 inches (30.0 and 40.0 cm) below surface, although many of the shovel tests were terminated between depths of 11.8 and 13.7 inches (30.0 and 35.0 cm) below surface where a weak and blocky weathered B horizon (Bw1) was encountered (Figure 6-3). Only small portions of the Project Area lacked evidence of significant ground surface disturbance from oil/gas activities prominent in the surrounding area. Almost the entirety of the proposed pipeline reroute follows an existing pipeline ROW and associated two-track road that is currently used by oil field vehicular traffic. There was an existing oil pad composed of a pumpjack and associated materials in the middle of the proposed ROW location in the center portion of the Project Area and existing CTB facilities located both at the northwestern and southeastern terminuses of the proposed pipeline ROW reroute (Figures 6-4 through 6-6). Additionally, several pipeline ROWs bisect the proposed ROW perpendicularly; thus, large portions of the ROW have been previously disturbed from previous pipeline construction and associated oil field activities. Overall, the field archeologist noted a low potential for any buried or stratified cultural deposits along the length of the proposed ROW.

### **6.2 RESULTS**

The cultural resources survey resulted in entirely negative findings within the rerouted alignment. No cultural materials were observed on the surface of the Project Area or within any of the 23 excavated shovel tests.



**Figure 6-1. Existing pipeline parallel to the current Project Area (facing southeast)**



**Figure 6-2. Another view of adjacent pipeline and disturbances (facing southeast)**





**Figure 6-3. Typical shovel test (JOD05) within the Project Area**



**Figure 6-4. Existing pumpjack and pad in central portion of Project Area (facing south)**





**Figure 6-5. View of disturbed well pad in central portion of Project Area (facing north)**



**Figure 6-6. View of existing CTB facility at southeastern portion of Project Area (facing south)**

## **7.0 SUMMARY AND RECOMMENDATIONS**

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### **7.1 SUMMARY**

On 30 September 2020, Horizon conducted an intensive cultural resources survey of a rerouted alignment of Plains' proposed Earthstone Benedum CTP to Tie-In Line ROW Project located in southeastern Upton County, Texas. The development of the pipeline ROW will be privately funded and will not require any federal permitting or coordination. However, a portion of the proposed reroute alignment is located on property owned by UT. As UT is considered to be a political subdivision of the state, the portion of the undertaking on UT land falls under the regulations of the ACT. At the request of Whitenton, Horizon conducted the cultural resources survey of the Project Area on behalf of Plains in compliance with the ACT. The purpose of the survey was to determine if any archeological sites were located within the Project Area and, if any existed, to determine if the project had the potential to have any adverse impacts on sites considered eligible for formal designation as SALs. The cultural resources survey was conducted under TAC permit number 9616.

Overall, the entire proposed reroute alignment measures 3.4 miles (5.4 km) long by 100.0 feet (30.5 m) wide, with a total area of approximately 41.2 acres. However, the Project Area (i.e., the segment of the rerouted ROW that crosses UT land) measures approximately 1.2 miles (1.9 km) long by 100.0 feet (30.5 m) wide within an overall area of approximately 14.5 acres.

The cultural resources survey consisted of intensive surface inspection and subsurface shovel testing effort. The TSMASS require a minimum of 16 shovel tests per mile for linear projects measuring up to 100.0 feet (30.5 m) wide. As the Project Area totals 1.2 miles (1.8 km) in length, a minimum of 19 shovel tests were necessary within the Project Area in order to comply with the TSMASS. Horizon exceeded the TSMASS by excavating a total of 23 shovel tests within the Project Area.

The cultural resources survey of the Project Area resulted in entirely negative findings. No cultural materials were observed on the surface of the Project Area or within any of the 23 excavated shovel tests.

## 7.2 RECOMMENDATIONS

Based on the negative survey results, it is Horizon's opinion that the construction of the rerouted alignment of the proposed Earthstone Benedum CTP to Tie-In Line ROW Project across UT land will have no adverse effect on significant cultural resources designated as or considered eligible for designation as SALs. Horizon therefore recommends that Plains be allowed to proceed with the construction of the proposed pipeline relative to the jurisdiction of the ACT. However, in the unlikely event that any cultural materials (including human remains or burial features) are inadvertently discovered at any point during construction, use, or ongoing maintenance of the proposed pipeline ROW, even in previously surveyed areas, all work at the location of the discovery should cease immediately, and the THC and UT should be notified of the discovery.



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## **APPENDIX A:**

### **SHOVEL TEST DATA**



**Table A-1. Shovel Test Summary Data**

ST No.	UTM Coordinates <sup>1</sup>		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
JOD01	234194	3464586	0-30	Fine brown loam	None
			30-40+	Medium brown clay loam	None
JOD02	234197	3464692	0-25	Brown fine loam	None
			25-35+	Weak blocky brown clay loam	None
JOD03	234137	3464745	0-25	Brown fine loam	None
			25-35+	Weak blocky brown clay loam	None
JOD04	234044	3464771	0-25	Brown fine loam	None
			25-35+	Weak blocky brown clay loam	None
JOD05	233940	3464800	0-35	Brown fine loam	None
			35-40+	Weak blocky brown clay loam	None
JOD06	233834	3464829	0-25	Brown fine loam	None
			25-35+	Weak blocky brown clay loam	None
JOD07	233728	3464898	0-20	Brown fine loam	None
			20-30+	Weak blocky brown clay loam	None
JOD08	233621	3464917	0-25	Brown fine loam	None
			25-35+	Weak blocky light brown clay loam	None
JOD09	233508	3464927	0-20	Brown fine loam	None
			20-30+	Weak blocky light brown clay loam	None
JOD10	233406	3464955	0-25	Brown fine loam	None
			25-35+	Weak blocky light brown clay loam	None
JOD11	233309	3464996	0-25	Compacted Brown fine loam	None
			25-35+	Weak block brown clay loam	None
JOD12	233204	3465022	0-25	Compacted brown fine loam	None
			25-35+	Weak blocky brown clay loam	None
JOD13	233095	3465051	0-25	Compacted brown fine loam	None
			25-35+	Weak blocky brown clay loam	None
JOD14	232988	3465086	0-25	Compacted brown fine loam	None
			25-35+	Weak blocky brown clay loam	None
JOD15	232891	3465113	0-25	Compacted brown fine loam	None
			25-35+	Weak blocky brown clay loam	None
JOD16	232781	3465143	0-25	Brown fine loam	None
			25-35+	Weak blocky brown clay loam	None
JOD17	232676	3465175	0-25	Brown fine loam	None
			25-35+	Weak blocky clay loam	None
JOD18	232577	3465201	0-30	Brown fine loam	None
			30-40+	Weak blocky brown clay loam	None

ST No.	UTM Coordinates <sup>1</sup>		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
JOD19	232468	3465235	0-25	Brown fine loam	None
			25-35+	Weak blocky brown clay loam	None
JOD20	232031	3465572	0-20	Brown fine loam	None
			20-30+	Weak blocky brown clay loam	None
JOD21	231624	3467761	0-7	Platy gray loam	None
			7-30	Brown fine loam	None
			30-35+	Blocky weak brown clay loam	None
JOD22	231518	3467940	0-30	Brown fine loam	None
			30-40+	Weak blocky light brown clay loam	None
JOD23	231549	3468095	0-5	Platy light grayish-brown loam	None
			5-35	Brown fine loam	None
			35-40+	Blocky weak light brown clay loam	None

<sup>1</sup> All UTM coordinates are located in Zone 14 and utilize the North American Datum of 1983 (NAD 83)

cmbs = Centimeters below surface

ST = Shovel test

UTM = Universal Transverse Mercator

**APPENDIX B:**

**ADDENDUM (ADDITIONAL REROUTED ALIGNMENT)**

## **ADDENDUM (ADDITIONAL REROUTED ALIGNMENT)**

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### **1.1 INTRODUCTION**

In early November 2020, Horizon Environmental Services, Inc. (Horizon) was informed of an additional reroute of Plains All American Pipeline, LP's (Plains) proposed Earthstone Benedum CTP to Tie-In Line right-of-way (ROW) located in southeastern Upton County, Texas (Project Area). This latest reroute consisted of a new alignment of the northern extent of the overall ROW (Figures B-1 through B-3). The development of the ROW will be privately funded and will not require any federal permitting or coordination. However, a portion of the proposed rerouted ROW is located on property owned by the University of Texas (UT land). As UT is considered to be a political subdivision of the state, the portion of the undertaking on UT land falls under the regulations of the Antiquities Code of Texas (ACT).

The main body of this report documents the cultural resources survey of the first reroute that Plains proposed for the Earthstone Benedum CTP to Tie-In Line alignment. This survey, conducted under Texas Antiquities Committee (TAC) permit number 9616, produced negative results. At this time, Plains is proposing an additional reroute of the northern extent of this ROW that totals approximately 2.0 miles (3.2 kilometers [km]) in length. Of this overall reroute, an approximately 0.5-mile (0.8-km) segment is located on UT land. This segment measures 100.0 feet (30.5 meters [m]) in width and has an overall area of 6.1 acres.

At the request of Whitenton Group, Inc. (Whitenton), Horizon conducted the cultural resources survey of the Project Area on behalf of Plains in compliance with the ACT. The purpose of the survey was to determine if any archeological sites were located within the Project Area and, if any existed, to determine if the project had the potential to have any adverse impacts on sites considered eligible for formal designation as State Antiquities Landmarks (SALs). The investigations were conducted under an amended version of TAC permit number 9616.

### **1.2 PRE-FIELD RESEARCH**

Background research conducted via the Texas Historical Commission's (THC) Texas Archeological Sites Atlas (Atlas) online database indicated the presence of one previously recorded archeological site within a 0.6-mile (1.0-km) perimeter of the Project Area (THC 2020),



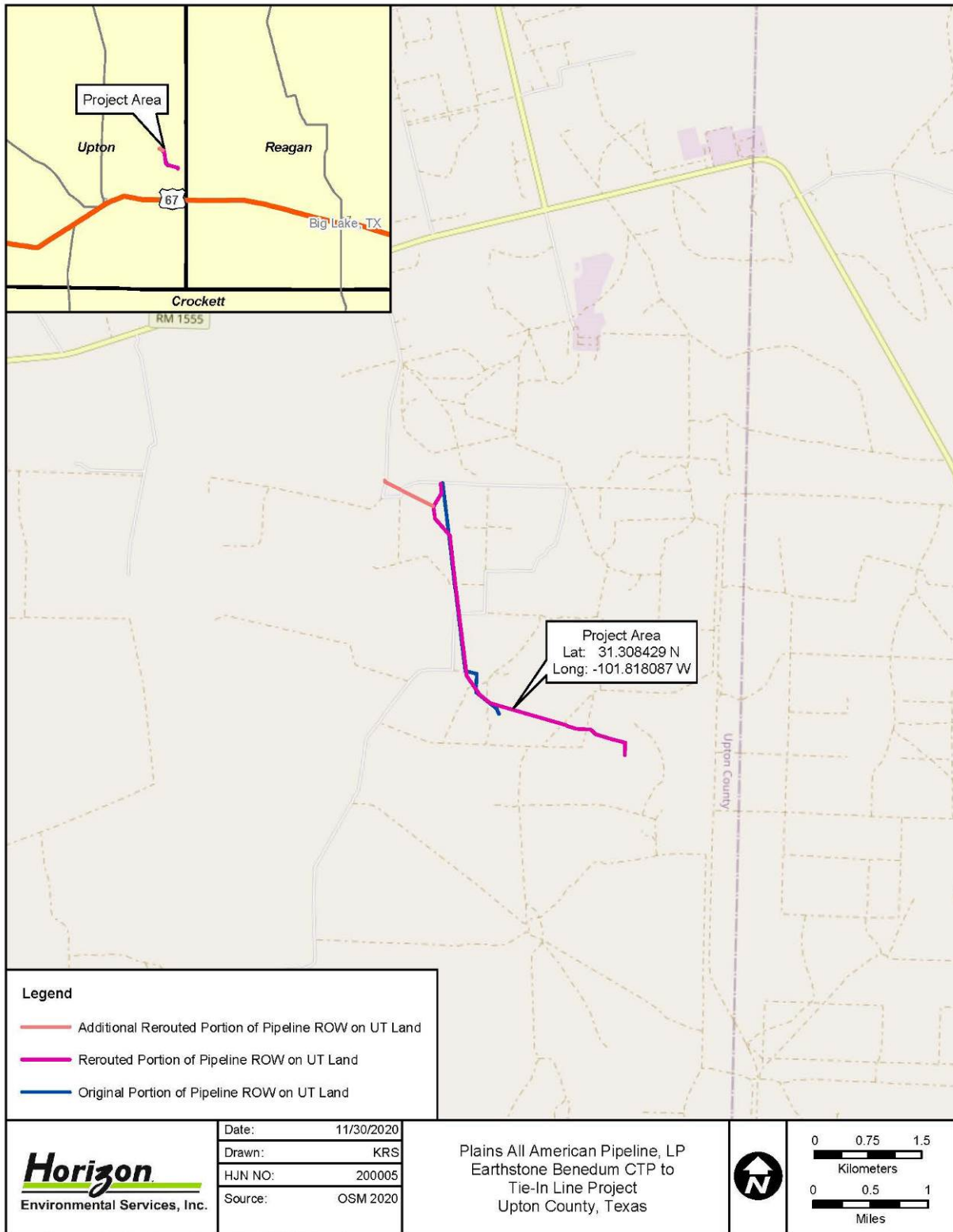
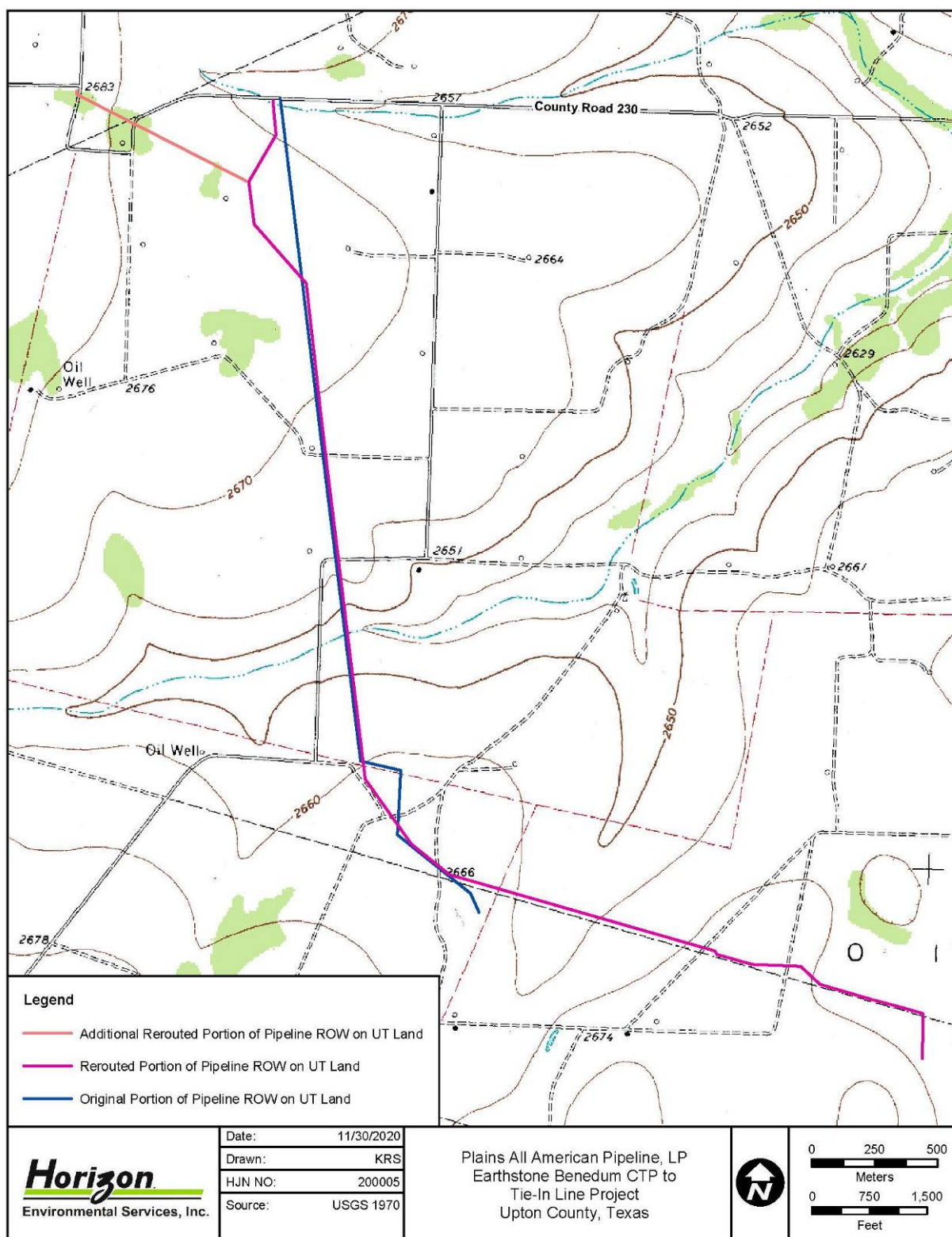


Figure B-1. General vicinity map with the location of the proposed reroute

*An Intensive Cultural Resources Survey of a Rerouted Alignment of Plains All American Pipeline, LP's  
Proposed Earthstone Benedum CTP to Tie-In Line Project Located on UT Land in Upton County, Texas*



**Figure B-2. Topographic map with the location of the proposed reroute**



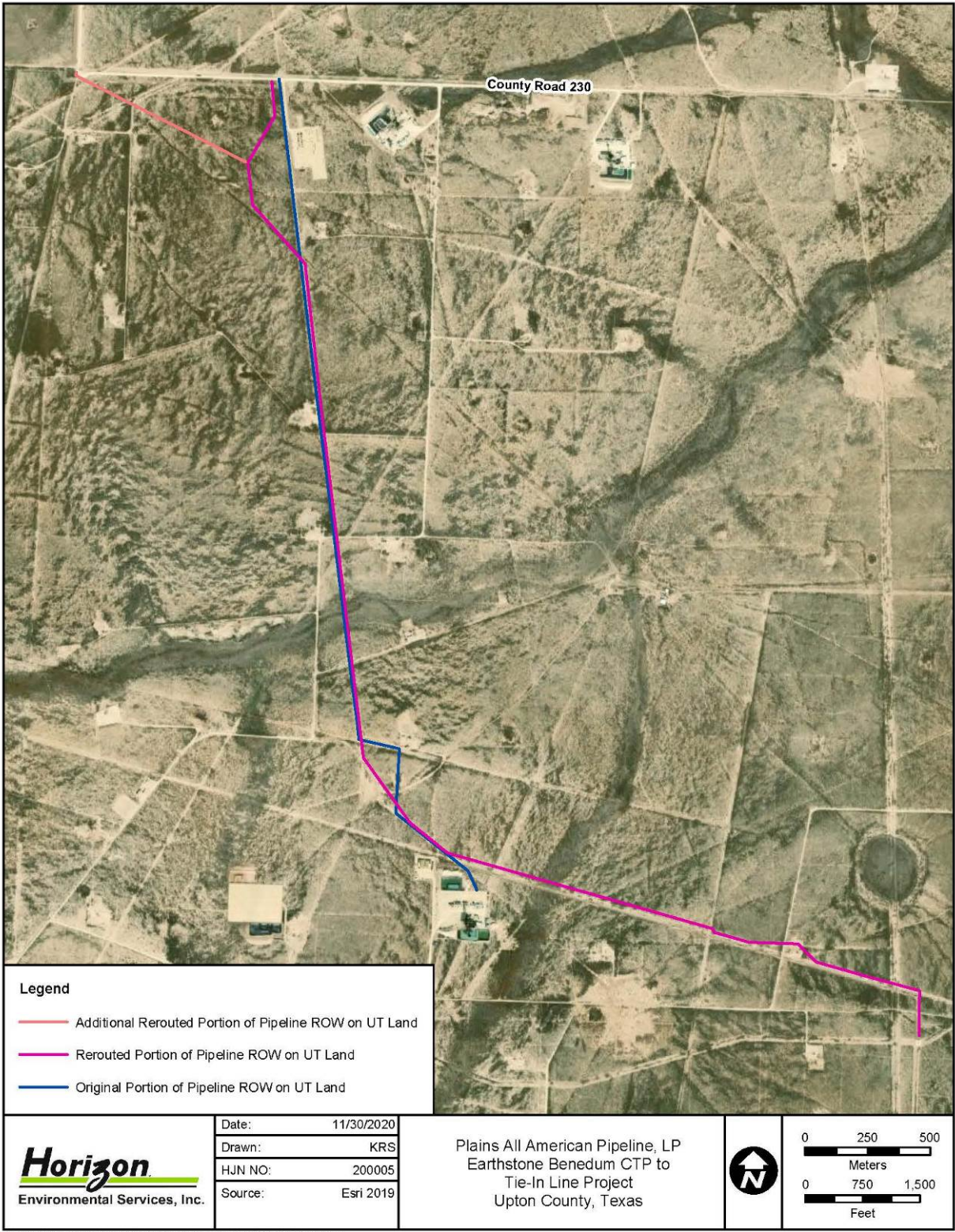


Figure B-3. Aerial photograph with the location of the proposed reroute

while a review of the National Park Service's (NPS) National Register of Historic Places (NRHP) Google Earth map layer indicated the presence of no historic properties listed on the NRHP within the review perimeter (NPS 2020). The previously recorded archeological site and its distance from the Project Area are summarized in Table B-1, while its location relative to the Project Area is presented in Figure B-4. No documented cultural resources, including any listed on the NRHP or formally designated as SALs, are located within or adjacent to the boundaries of the Project Area.

**Table B-1. Summary of documented cultural resources within 1.0 km of Project Area**

Site Trinomial, Cemetery, or Historic Property	Site Type	NRHP Eligibility Status	Distance/Direction from Project Area	Potential to be Impacted by Project?
41UT128	Prehistoric campsite with associated hearth features	Determined ineligible	0.4 km southwest	No

Based on the Atlas database, the proposed ROW extends through an area of UT land that is crisscrossed by numerous linear cultural resources survey transects that were assessed in 2014 as part of the UL Reagan NW 3D Seismic Project. This prior assessment resulted in the documentation of the noted previously recorded archeological site within the review perimeter. While the currently proposed ROW is crossed by the seismic survey corridors at several locations, the vast majority of the proposed ROW has not been directly assessed for cultural resources.

A review of topographic maps and aerial imagery indicates that the area has been used primarily for oil and gas extraction in the latter quarter of the twentieth century. Nothing aside from oil/gas wells and access roads is visible on topographic maps dating as early as 1970 and aerial imagery dating as early as 1968 (NETROnline 2020).

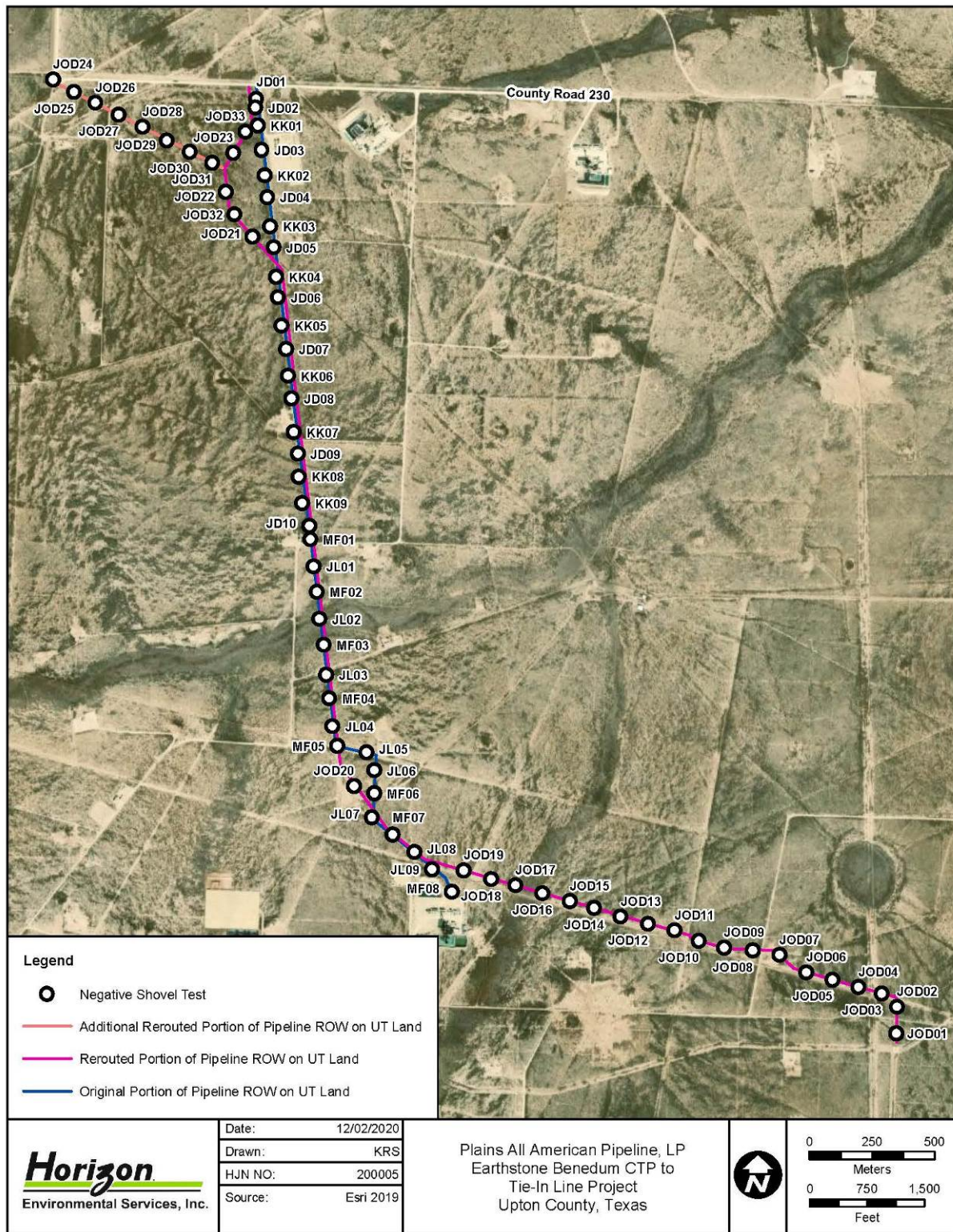
### **1.3 METHODS**

Jesse Dalton (Horizon staff archeologist) completed the intensive pedestrian survey of the Project Area on 1 December 2020. The overall field methodology utilized during this effort was consistent with that already presented in the main body of this report (see Chapter 5.0: Survey Methodology in the main body of this report). Specific to this Project Area, the survey effort entailed intensive surface inspection and subsurface shovel testing efforts. The recently updated 2020 Texas State Minimum Archeological Survey Standards (TSMASS) require a minimum of 16 shovel tests per mile for linear projects measuring up to 100.0 feet (30.5 m) wide. As the Project Area totals approximately 0.5 miles (0.8 km) in length, a minimum of eight shovel tests were necessary within the Project Area in order to comply with the TSMASS. Horizon met the TSMASS by excavating a total of eight shovel tests across the Project Area. All excavated matrices were screened through 0.25-inch (6.3-millimeter [mm]) hardware mesh or were trowel-sorted if the dense clay soils prohibited successful screening efforts. Shovel test locations are presented in Figure B-5, while shovel test data are provided in Table B-2.

*Sensitive Site Location Data Omitted*



*An Intensive Cultural Resources Survey of a Rerouted Alignment of Plains All American Pipeline, LP's Proposed Earthstone Benedum CTP to Tie-In Line Project Located on UT Land in Upton County, Texas*



**Figure B-5. Shovel test locations within the Project Area**



## **1.4 RESULTS**

The cultural resources survey of the rerouted alignment resulted in entirely negative findings. No cultural materials were observed on the surface of the Project Area or within any of the eight excavated shovel tests.

Generally speaking, the assessed areas comprised gently sloping and highly deflated and eroded areas where surficial cultural deposits were possible but buried deposits were unlikely (Figure B-6). Shovel tests generally revealed a fine grayish-brown loam overlying a weak, blocky, pale brown calcareous clay loam at depths of approximately 7.8 to 11.8 inches (20.0 to 30.0 cm) below the modern ground surface (Figure B-7). Several existing pipeline ROWs and unpaved two-track roads bisect the northwestern portion of the Project Area (Figures B-8 through B-10). The presence of surficial loamy clay deposits over the majority of the Project Area also precluded the potential for any buried cultural deposits. Any cultural materials, if present, would have been confined to surface contexts that would have been easily detectable.



**Figure B-6. Overview of deflated modern ground surface in central Project Area (facing southwest)**



**Figure B-7. Typical shovel test (JOD30) (facing down)**



**Figure B-8. Two-track road in central Project Area (facing north)**





**Figure B-9. Existing pipeline ROW in northwestern portion of Project Area (facing north)**



**Figure B-10. Overview of northwestern terminus of proposed ROW (facing southwest)**

## **1.5 RECOMMENDATIONS**

Based on the negative survey results, it is Horizon's opinion that the construction of the rerouted alignment of the proposed Earthstone Benedum CTP to Tie-In Line ROW Project across UT land will have no adverse impacts on significant cultural resources designated as or considered eligible for designation as SALs. Horizon therefore recommends that Plains be allowed to proceed with the proposed construction relative to the jurisdiction of the ACT. However, in the unlikely event that any cultural materials (including human remains or burial features) are inadvertently discovered at any point during construction, use, or ongoing maintenance of the proposed pipeline ROW, even in previously surveyed areas, all work at the location of the discovery should cease immediately, and the THC and UT should be notified of the discovery.

**Table B-2. Shovel Test Summary Data**

ST No.	UTM Coordinates <sup>1</sup>		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
JOD24	230828	3468389	0-20	Fine light grayish-brown loam	None
			20-30+	Weak, blocky brown clay loam	None
JOD25	230912	3468339	0-20	Fine friable light grayish-brown loam	None
			20-30+	Weak, blocky, calcareous brown clay loam	None
JOD26	230997	3468296	0-20	Fine light grayish-brown loam	None
			20-30+	Weak, blocky, calcareous brown clay loam	None
JOD27	231091	3468248	0-20	Blocky grayish-brown loam	None
			20-30+	Weak, blocky brown clay loam	None
JOD28	231186	3468200	0-20	Fine friable grayish-brown loam	None
			20-30+	Weak, blocky, calcareous pale brown clay loam	None
JOD29	231283	3468146	0-20	Fine friable pale grayish-brown loam	None
			20-30+	Weak, blocky, calcareous pale brown clay loam	None
JOD30	231374	3468101	0-30	Fine grayish-brown loam	None
			30-40+	Weak, blocky pale brown clay loam	None
JOD31	231463	3468057	0-20	Fine friable pale grayish-brown loam	None
			20-30+	Weak, blocky, calcareous pale brown clay loam	None

<sup>1</sup> All UTM coordinates are located in Zone 13 R and utilize the North American Datum of 1983 (NAD 83)

cmbs = Centimeters below surface

ST = Shovel test

UTM = Universal Transverse Mercator