



INDEX OF TEXAS ARCHAEOLOGY

Open Access Gray Literature from the Lone Star State

Volume 2020

Article 134

2020

An Intensive Cultural Resources Survey of the USACE Jurisdictional Areas within Western Midstream Partners, LP's Proposed Red Bluff HP Pipeline Reroute Project in Reeves County, Texas

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Available at: <https://scholarworks.sfasu.edu/ita/vol2020/iss1/134>

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An Intensive Cultural Resources Survey of the USACE Jurisdictional Areas within Western Midstream Partners, LP's Proposed Red Bluff HP Pipeline Reroute Project in Reeves County, Texas

By:

Russell K. Brownlow, Jesse O. Dalton, and Jacob R. Lyons



HJN 200101 AR

Prepared for:



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San Marcos, Texas

Prepared by:



Horizon Environmental Services, Inc.
Austin, Texas

June 2020

**An Intensive Cultural Resources Survey of the
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Red Bluff HP Pipeline Reroute Project in
Reeves County, Texas**

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ABSTRACT

On 5 May and 2 June 2020, Horizon Environmental Services, Inc. (Horizon) conducted an intensive cultural resources survey of the US Army Corps of Engineers (USACE) jurisdictional areas within Western Midstream Partners, LP's (WMP) proposed Red Bluff HP Pipeline Reroute Project located in northwestern Reeves County, Texas (Project Area). Although the undertaking is located entirely on private property and will be constructed with private funds, its development may require the usage of a Regional General Permit (RGP) and/or Nationwide Permit (NWP) issued by the USACE. As these are federal permits, the portions of the undertaking under the purview of the USACE also fall under the regulations of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. At the request of Whitenton Group, Inc. (Whitenton), Horizon conducted the cultural resources survey of the USACE jurisdictional areas on behalf of WMP in compliance with Section 106 of the NHPA. The purpose of the survey was to determine if any archeological sites were located within the USACE jurisdictional areas and, if any existed, to determine if the project had the potential to have any adverse impacts on sites eligible for inclusion in the National Register of Historic Places (NRHP).

The proposed pipeline right-of-way (ROW) reroute measures approximately 4,022.0 feet (1,226.0 meters [m]) in length and approximately 100.0 feet (30.5 m) wide, with a total area of 9.2 acres. In addition, the project has approximately 3.0 acres of additional temporary workspaces (ATWS) on opposing sides of Salt Creek, resulting in an overall all area of 12.2 acres for the undertaking. However, the Project Area (i.e., the portions of the undertaking within the purview of the USACE) consists of Salt Creek and four adjacent jurisdictional "waters of the US" (WOUS) that are traversed by the proposed ROW reroute and ATWS as well as a portion of the proposed ROW reroute adjacent to previously recorded archeological site 41RV209. To assess all areas that the USACE could determine to be within their purview, Horizon surveyed the vast majority of the proposed ROW reroute and ATWS with the exception of the easternmost 700.0 feet (213.4 m) of the proposed ROW reroute where no WOUS were delineated. This Survey Area totaled approximately 10.6 acres.

The cultural resources survey resulted in the expansion of the boundaries of previously recorded site 41RV209. This site was found to be a low-density scatter of prehistoric lithic debris on a terrace situated to the north and west of the channel of Salt Creek. The presence of lithic debris (cores and debitage) on the site suggests that the surface gravels of the area were

utilized as a source of raw material for stone tools. In addition, the presence of scattered fire-cracked rock (FCR) across the site, the presence of one FCR concentration, and a sandstone metate fragment on the site also indicate that the location served as a campsite where food was prepared. Based on the surficial, sparse, and generally disturbed nature of this site's deposits in addition to its lack of temporally diagnostic materials, intact features, and preserved floral/faunal remains, it is Horizon's opinion that the portion of site 41RV209 within the limits of the current Project Area is considered to be ineligible for inclusion in the NRHP and that no additional cultural resources investigations are warranted on the site in connection with the current undertaking.

Based on the assessment that the portion of site 41RV209 within the current Project Area is ineligible for inclusion in the NRHP, it is Horizon's opinion that development of the Project Area will have no adverse effects on any significant cultural resources located within the USACE jurisdictional areas. Horizon therefore recommends that WMP be allowed to proceed with the development of the proposed pipeline ROW reroute relative to the jurisdiction of the USACE and Section 106 of the NHPA.

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ACKNOWLEDGEMENTS

Horizon Environmental Services, Inc. (Horizon) conducted the intensive cultural resources survey of Western Midstream Partners, LP's (WMP) proposed Red Bluff HP Pipeline Reroute Project reported herein in compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. Russell Brownlow served as the principal investigator for the project and lead author of this report. He was assisted with contributions by Jesse Dalton and Jacob Lyons. Jacob Lyons, Jesse Dalton, and McKinzie Froese conducted the field investigations, while Jacob Lyons was also responsible for the drafting of the figures.

1.0 INTRODUCTION

This document reports the results of an intensive cultural resources survey of the US Army Corps of Engineers (USACE) jurisdictional areas within Western Midstream Partners, LP's (WMP) proposed Red Bluff HP Pipeline Reroute Project located in northwestern Reeves County, Texas (Project Area) (Figures 1-1 through 1-3). Although the undertaking is located entirely on private property and will be constructed with private funds, its development may require the usage of a Regional General Permit (RGP) and/or Nationwide Permit (NWP) issued by the USACE. As these are federal permits, the portions of the undertaking under the purview of the USACE also fall under the regulations of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. At the request of Whintont Group, Inc. (Whintont), Horizon Environmental Services, Inc. (Horizon) conducted the cultural resources survey of the USACE jurisdictional areas on behalf of WMP in compliance with Section 106 of the NHPA. The purpose of the survey was to determine if any archeological sites were located within the USACE jurisdictional areas and, if any existed, to determine if the project had the potential to have any adverse impacts on sites eligible for inclusion in the National Register of Historic Places (NRHP).

The proposed pipeline right-of-way (ROW) reroute measures approximately 4,022.0 feet (1,226.0 meters [m]) in length and approximately 100.0 feet (30.5 m) wide, with a total area of 9.2 acres. In addition, the project has approximately 3.0 acres of additional temporary workspaces (ATWS) on opposing sides of Salt Creek, resulting in an overall all area of 12.2 acres for the undertaking. However, the Project Area (i.e., the portions of the undertaking within the purview of the USACE) consists of Salt Creek and four adjacent jurisdictional "waters of the US" (WOUS) that are traversed by the proposed ROW reroute and ATWS as well as a portion of the proposed ROW reroute adjacent to previously recorded archeological site 41RV209. To assess all areas that the USACE could determine to be within their purview, Horizon surveyed the vast majority of the proposed ROW reroute and ATWS with the exception of the easternmost 700.0 feet (213.4 m) of the proposed ROW reroute where no WOUS were delineated. This Survey Area totaled approximately 10.6 acres.

The cultural resources investigations consisted of pre-field background research, an intensive cultural resources survey of the USACE jurisdictional areas, and the production of a report suitable for review by the State Historic Preservation Officer (SHPO) in accordance with the Texas Historical Commission's (THC) *Rules of Practice and Procedure*, Chapter 26, Section

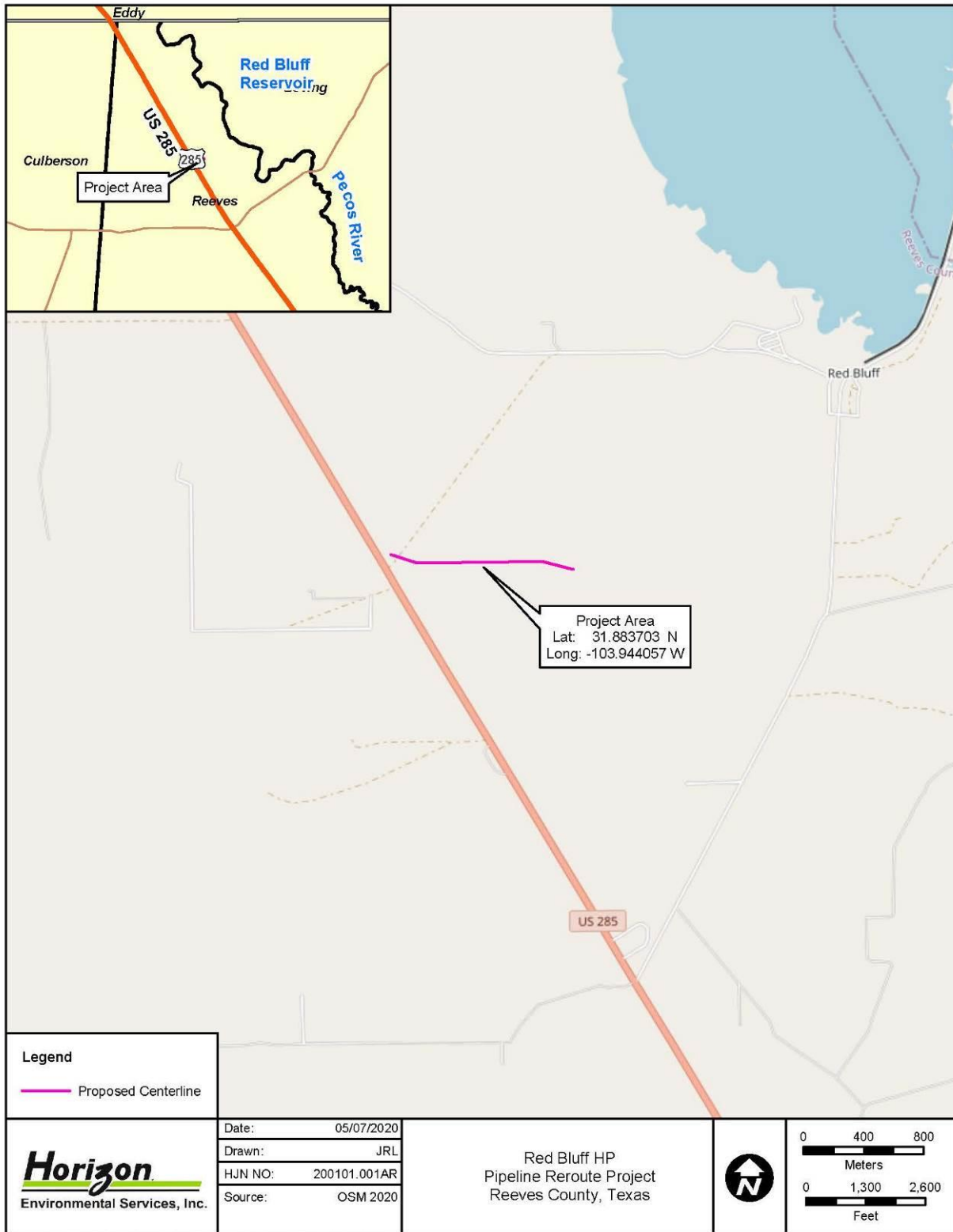


Figure 1-1. General vicinity map with the location of the Project Area

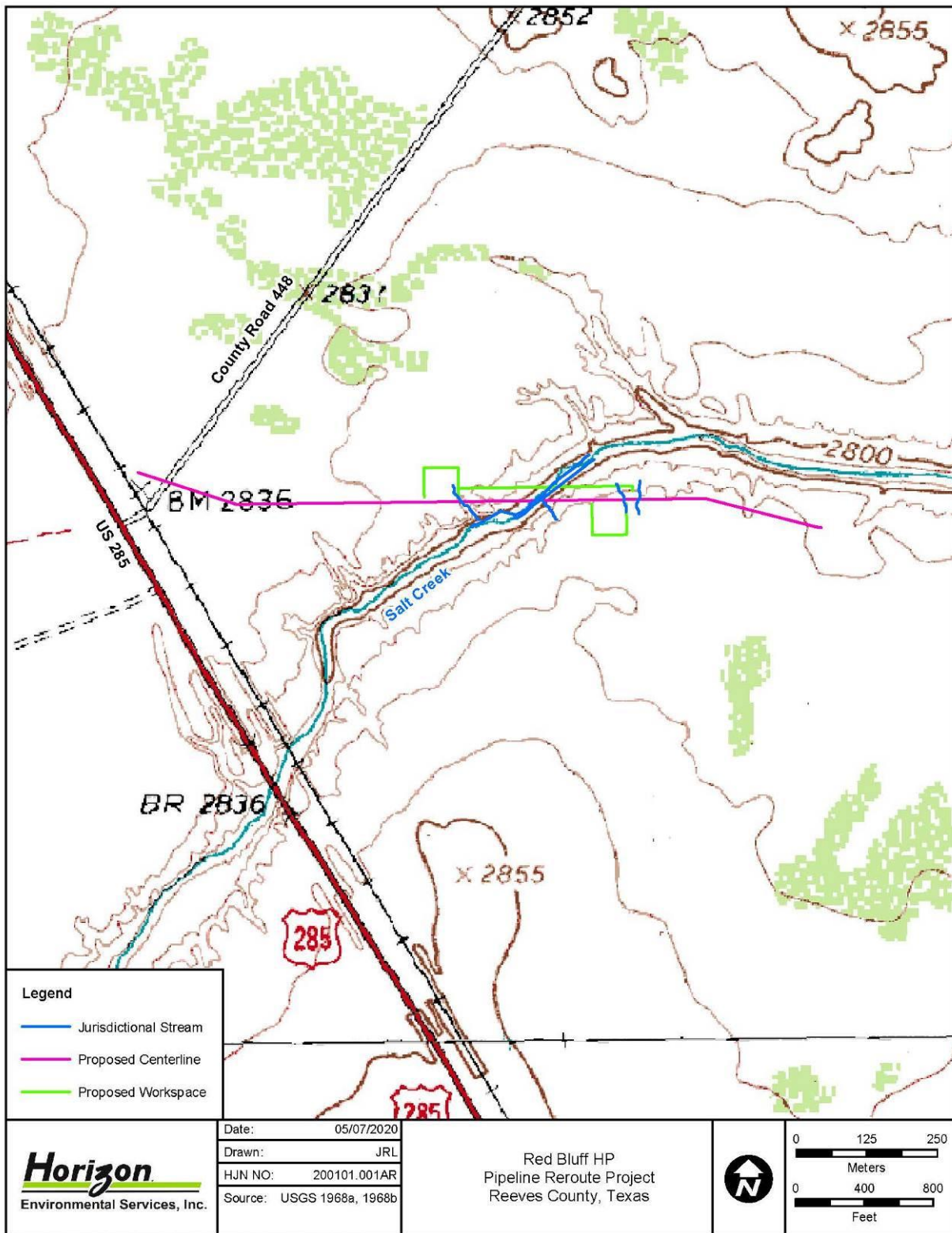


Figure 1-2. Topographic map with the location of the Project Area

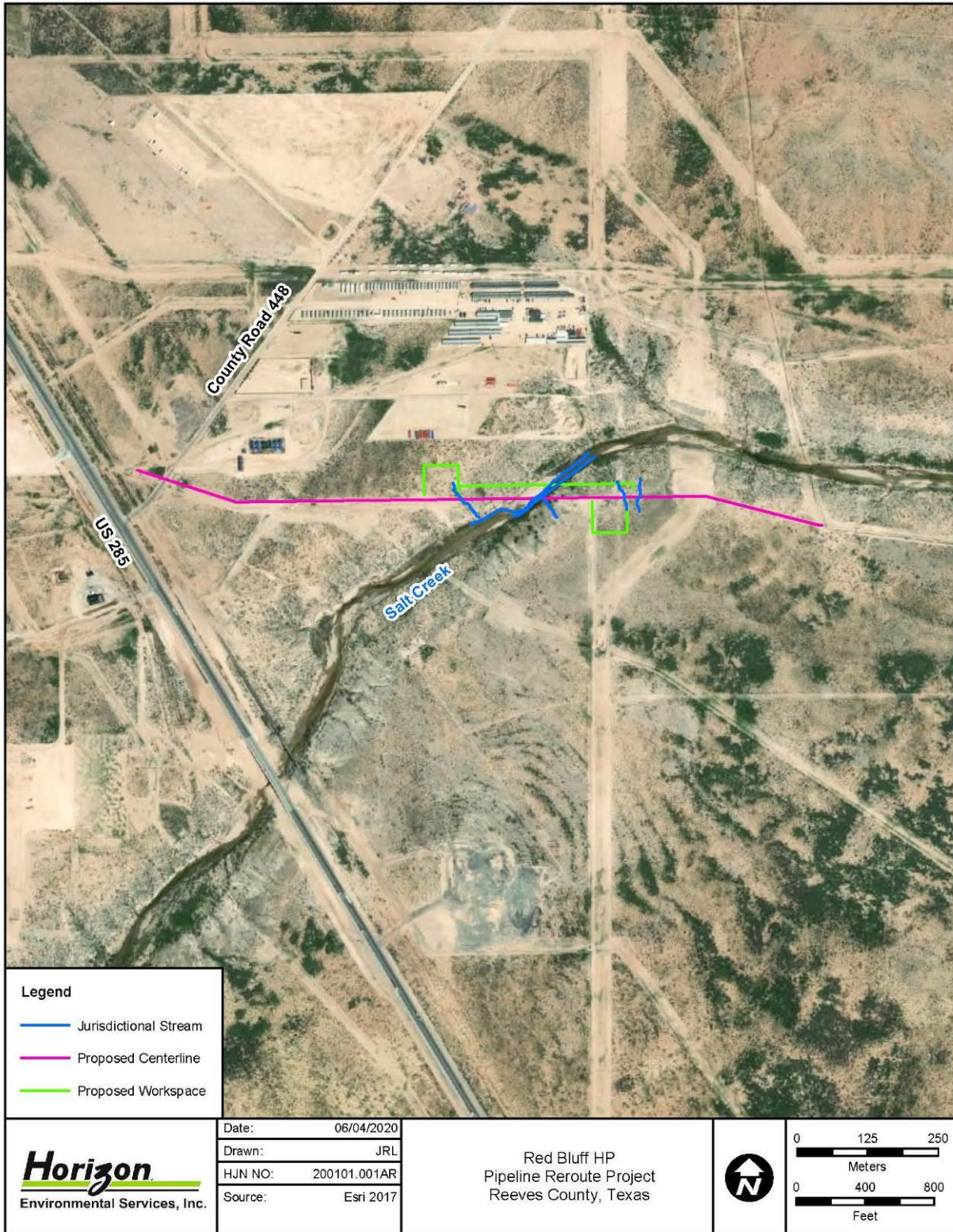


Figure 1-3. Aerial photograph with the location of the Project Area

27, and the Council of Texas Archeologists (CTA) *Guidelines for Cultural Resources Management Reports*. Russell Brownlow served as the project's principal investigator, while Jacob Lyons, Jesse Dalton, and McKinzie Froese conducted the field investigations.

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

2.1 GENERAL PROJECT AREA DESCRIPTION

WMP's proposed Red Bluff HP Pipeline Reroute Project is located in northwestern Reeves County, approximately 4.5 miles (7.3 kilometers [km]) northwest of Orla, Texas. It can be found on the US Geological Survey (USGS) 7.5-minute Red Bluff, Texas, topographic quadrangle map (see Figure 1-2).

The proposed pipeline ROW reroute measures approximately 4,022.0 feet (1,226.0 m) in length and approximately 100.0 feet (30.5 m) wide, with a total area of 9.2 acres. In addition, the project has approximately 3.0 acres of ATWS on opposing sides of Salt Creek, resulting in an overall all area of 12.2 acres for the undertaking. However, the Project Area (i.e., the portions of the undertaking within the purview of the USACE) consists of Salt Creek and four adjacent jurisdictional WOUS that are traversed by the proposed ROW reroute and ATWS as well as a portion of the proposed ROW reroute adjacent to previously recorded archeological site 41RV209. Representative images of the Project Area at the time of the cultural resources survey are presented in Figures 2-1 through 2-4.

2.2 PHYSIOGRAPHY AND HYDROLOGY

The Project Area is located in far West Texas, just southwest of Red Bluff Reservoir. It is situated within an area of undulating desert hills that are dissected by Salt Creek and its tributaries and associated drainages (see Figure 1-2). The proposed ROW initiates on an existing pipeline ROW just east of State Highway (SH) 285 and west of Salt Creek. It extends eastward, crossing Salt Creek and several adjacent drainages before connecting to another existing pipeline east of the Salt Creek crossing. Elevations within the Project Area range between 2,795.0 and 2,840.0 feet (851.9 and 865.6 m) above mean sea level.

Hydrologically, the Project Area is situated within the Pecos River basin. It is drained to the east, north, and west by Salt Creek and its associated drainages. Salt Creek flows easterly and joins the Pecos River approximately 3.2 miles (5.2 km) southeast of the Project Area.



Figure 2-1. View of Salt Creek crossing, facing south



Figure 2-2. View of proposed ROW within upland area south of Salt Creek, facing east



Figure 2-3. Typical drainage feature traversed by proposed ROW, facing north



Figure 2-4. View of gravel-covered surface common across most of Project Area

2.3 CLIMATE

Winters in Reeves County are generally cool, with an average temperature of 46.0 degrees Fahrenheit (°F). The summer months are hot, with an average temperature of 83.0°F. The average annual total precipitation is about 8.6 inches (21.8 centimeters [cm]), with roughly 70% of it falling between April and September (NRCS 1980).

2.4 FLORA AND FAUNA

The Project Area is located in the Chihuahuan Biotic Province, which includes all of Trans-Pecos Texas except the Guadalupe Mountains (Blair 1950). Blair (1950) notes that portions of Reeves and the surrounding counties were once part of an old bolson now drained by the Pecos River.

The Project area is also located within the Chihuahuan Basins and Playas region of the Chihuahuan Deserts ecoregion and is situated within geologic formations composed of sand sheet and caliche deposits (Griffith et al. 2007). Three native plant communities dominate the Chihuahuan Basins and Playas: saline flats and alkaline playa margins, gypsum land, and desert shrubland. The dominant species associated with the saline flats and alkaline playa margins plant community include *Atriplex canescens* (fourwing saltbush), *Suaeda* spp. (seepweed), *Salicornia* spp. (pickleweed), and *Sporobolus airoides* (alkali sacaton). The dominant species associated with the gypsum land plant community include *Bouteloua breviseta* (gypsum grama), *Mentzelia* spp. (blazingstar), and *Ephedra torreyana* (Torrey's jointfir). The dominant species associated with the desert shrubland plant community include *Larrea tridentata* (creosote bush), *Flourensia cernua* (American tarwort), *Yucca* spp. (yucca), *Artemisia filifolia* (sand sagebrush), *Acacia rigidula* (blackbrush acacia), *Cylindropuntia leptocaulis* (Christmas cactus), *Agave lechuguilla* (lechuguilla), and *Leucophyllum frutescens* (cenizo) (Griffith et al. 2007).

2.5 SOILS

Two soil types are mapped within the boundaries of the Project Area. These soils are presented in Table 2-1 (NRCS 1980) and in Figure 2-5.

Table 2-1. Soils mapped within the Project Area

Soil Name	Soil Type	Soil Depth (inches)	Setting
Hoban-Reeves-Holloman association, nearly level (17)	<u>Hoban</u> Silty clay loam	<u>Hoban</u> 0 to 72: Silty clay loam	<u>Hoban</u> Broad, nearly level to very gently sloping valleys, alluvial outwash plains or broad basins
	<u>Reeves</u> Loam	<u>Reeves</u> 0 to 7: Loam 7 to 31: Clay loam 31 to 40: Loam 40 to 79: Clay loam	<u>Reeves</u> Alluvium derived from gypsum beds
	<u>Holloman</u> Loam	<u>Holloman</u> 0 to 9: Loam 9 to 60: Gypsum	<u>Holloman</u> Basins, valley floors, or adjacent terraces
Holloman-Reeves association, gently undulating (20)	<u>Holloman</u> Loam	<u>Holloman</u> 0 to 9: Loam 9 to 60: Gypsum	<u>Holloman</u> Basins, valley floors, or adjacent terraces
	<u>Reeves</u> Loam	<u>Reeves</u> 0 to 7: Loam 7 to 31: Clay loam 31 to 40: Loam 40 to 79: Clay loam	<u>Reeves</u> Alluvium derived from gypsum beds

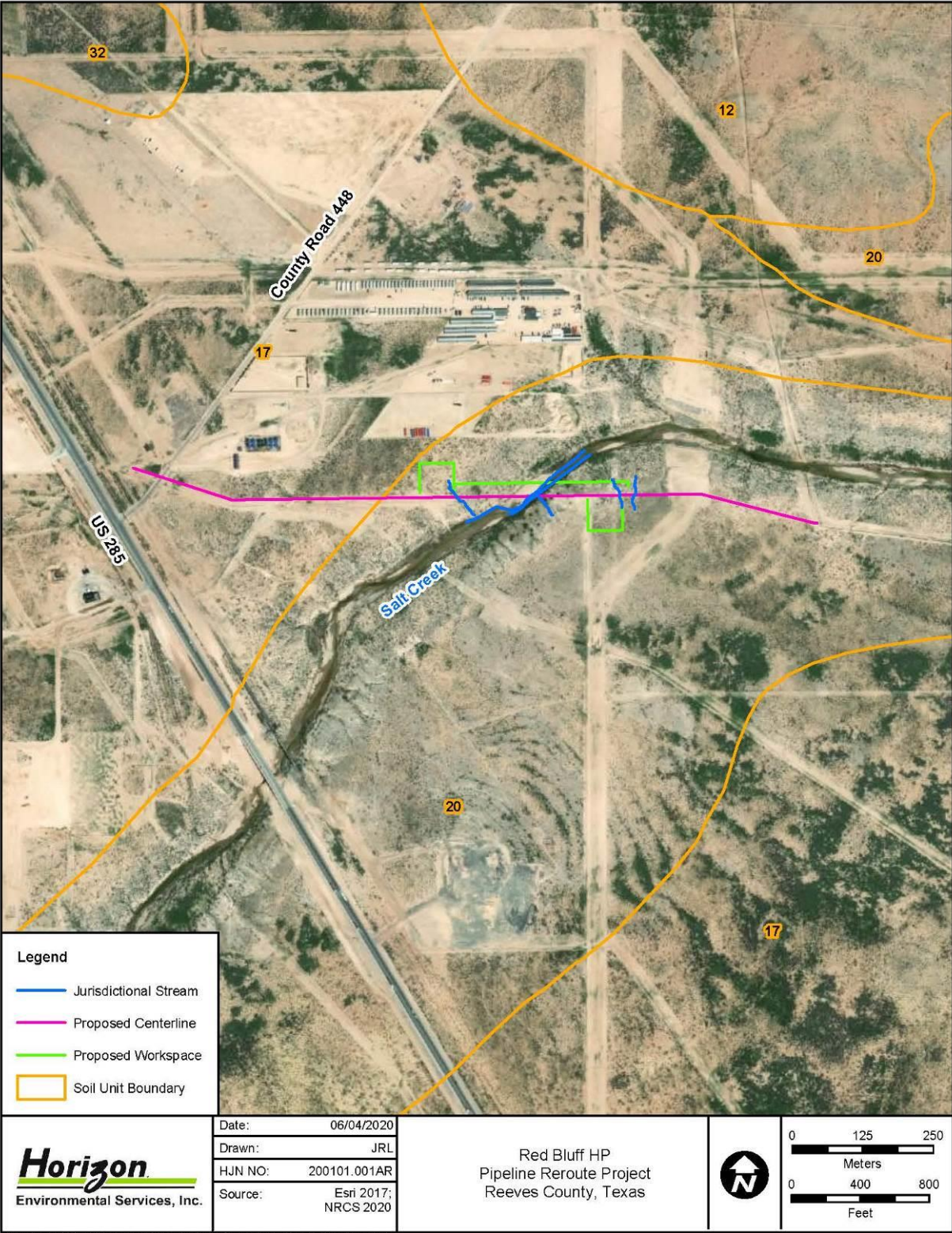


Figure 2-5. Soils mapped within the Project Area

3.0 CULTURAL BACKGROUND

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 3 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 B.P. 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. Undoubtedly, plant foods 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.

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 locations 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 I (1250 TO 250 B.P.)

The Late Prehistoric, in general, is characterized by the advent of the bow and arrow (as well as ceramics) 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.

3.6 HISTORIC-ERA TO MODERN (400 B.P. TO PRESENT)

Located in the unforgiving terrain of the Trans-Pecos region of west Texas, the territory known as present-day Reeves County was relatively unexplored by the Spanish of the sixteenth century as they slowly pushed their frontier northward from the Rio Grande. The first known historical excursion into the area by was by Antonio de Espejo in 1583 as he sojourned back from New Mexico, where he had failed to settle the chaos ignited by the indigenous insurgents at Taos and other pueblos (Mecham 1926). As Espejo traversed the Guadalupe Mountains eastward into the Pecos River Valley, he witnessed several Puebloan Native American bands, likely comprising the Mescalero Apaches who dominated the area at the time (Hickerson 1994). Desperate to get back to the Rio Grande from the inhospitable topography of West Texas, Espejo was guided by several amicable Jumano Natives who led his entrada to a Jumano rancheria (settlement) near Toyah Lake. There, the Spaniards were bequeathed bounties of maize, calabashes, and catfish, and were entertained by elaborate dances and festivities interpreted as gestures of peace (Hickerson 1994).

The Jumanos occupied a vast territory based on seasonal cycles that stretched from the Rio Grande to the Balcones Escarpment, and were described as a cohesion of different tribes and bands unified by a language and cultural customs; they practiced lifeways as both semi-sedentary maize growers and nomadic bison-hunters and traded well beyond the limits of their homeland (Hickerson 1994). In addition to occupying settlements on the Rio Grande and Toyah Lake, the Jumanos were also connected with San Solomon Spring, near Balmorhea Springs, where they were documented as having practiced maize intensification (Smith 2010).

During the 1700s and 1800s, the Comanches perfected their relationship with the horse and ventured down from the Great Southern Plains on the Llano Estacado, dominating the Mescalero Apache homeland which by then had tightened into small hamlets nestled in the Guadalupe Mountains (Kohout 2010). Due to the threat of both Comanche and Apache attacks, the region was left relatively untouched by both Spaniard and Anglo settlers for the next several hundred years. In 1849, while mapping out a route for pioneers that would eventually link San Antonio and El Paso, John S. Ford noted that Mescalero Indians had a settlement on the shores of Toyah Lake, which was formerly occupied by Jumanos during Espejo's excursion some 266 years prior (Smith 2010). During the latter half of the nineteenth century, Hispanic farmers of Mexican descent produced crops from irrigation techniques at San Solomon Spring, which they sold at the markets at neighboring Fort Davis (Smith 2010). George B. and Robert E. Lyle were the first Anglo-Americans to farm the Toyah Valley in 1871, and open livestock ranchers began to settle the Davis Mountains region by 1875 (Smith 2010).

The Texas and Pacific Railway laid its tracks through Reeves County in 1881, which further opened the region to settlement and ranching pursuits. Reeves County's boundaries were carved from the original boundaries of Pecos County in 1883, and Pecos was elected the county seat of government. Thereafter, Pecos established a post office, sectional housing, and a public-school system. Similarly, the townships of Toyah, Toyahvale, and Saragosa began to follow this trend. By the turn of the century, the population of Reeves County was 1,847. Open ranching upon free public land was officially terminated in 1900, and the state auctioned off sections of land on generous credit contracts, which inevitably attracted a rush of land grabbers. Various ephemeral communities developed and flourished soon after, such as Pera, Dixieland, Orla, and Panama. By 1908, Balmorhea established both a public school and a post office. Most of the families who moved into the region either practiced agriculture (with an emphasis on cotton, grain, and vegetable crops) or engaged in cattle or sheep ranching.

After a drought in the 1920s and the stock market crash of 1929, the agricultural economy experienced major setbacks and began a negative trend that would last until a rebound in the 1950s. After oil was discovered in the Toyah Field in 1952 and the Geraldine Ford field in 1956, the petroleum industry began its start in Reeves County (Smith 2010). In the 1950s, after a surge in crop values to over \$224 million, a negative slump occurred once again, and both crop and farm values plummeted as the number of farms and ranches had fallen. The population of the county hit its zenith in 1960 at 17,644, which is 2,000 more people than were listed in 2018 census data. An oil boom hit West Texas in the early 1980s, and drilling activities brought in blue-collar jobs and families. However, this prosperity was short-lived, as the price of crude oil dropped and the local industry suffered throughout the turn of the century. More

recently, the growth of the Permian Basin and its rich, oil-bearing strata has piloted a new economic boom wherein oil production has doubled from the previous decade. As of 2019, the Permian Basin was even outpacing the famous Ghawar Field in Saudi Arabia.

4.0 PRE-FIELD BACKGROUND RESEARCH

4.1 DATABASE REVIEW

Pre-field background research conducted via the THC's *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, while a review of the National Park Service's (NPS) NRHP Google Earth map layer indicated the presence of no historic properties listed on the NRHP within the review perimeter (THC 2020; NPS 2020). The previously recorded archeological site and its distance from the Project Area are summarized in Table 4-1, while its location relative to the Project Area is presented in Figure 4-1. No documented cultural resources, including any listed on the NRHP, are located within the boundaries of the Project Area. However, the one noted site within the review perimeter is located only a short distance south of the proposed pipeline centerline. Based on the Atlas database, no previous cultural resources surveys have been undertaken within the boundaries of the current Project Area.

Table 4-1. Documented cultural resources within 0.6 miles (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?
41RV209	Prehistoric campsite composed of a diffuse scatter of lithic debris	Determined ineligible	40.0 feet south	Not as currently defined

4.2 MAP REVIEW

A review of topographic maps and aerial imagery indicates that the Project Area consisted of generally undisturbed desert terraces above Salt Creek until 2014, when the first pipeline ROWs appeared in the general vicinity on aerial imagery (NETROnline 2020). No structures or other developments are visible in immediate proximity to the Project Area on aerial imagery dating back to 1967 or topographic quadrangle maps dating back to 1925 (NETROnline 2020).

Sensitive Site Location Data Omitted

Figure 4-1. Documented cultural resources within 0.6 miles (1.0 km) of the Project Area

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 on terraces on opposing banks of Salt Creek, coupled with the presence of a previously recorded prehistoric campsite a short distance to the south of the currently proposed centerline, it was Horizon's opinion, prior to the field efforts, that there existed a high potential for undocumented prehistoric cultural deposits within the Project Area.

In regard to historic-era resources, the lack of visible structures in immediate proximity to the Project Area on the reviewed topographic quadrangle maps and aerial imagery suggested a decreased potential for historic-era standing structures or associated cultural deposits within the boundaries of the Project Area.

5.0 SURVEY METHODOLOGY

A two-person Horizon archeological field crew completed the intensive pedestrian survey of the Project Area on 5 May 2020. This entailed primarily intensive surface inspection on opposing sides of Salt Creek and four adjacent WOUS that are traversed by the proposed pipeline ROW reroute due to the erosional nature of the Project Area setting. However, the surface inspection was supplemented by subsurface shovel testing. The 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) in width. As the linear portion of the Survey Area totaled approximately 3,322.0 feet (1,012.5 m) in length, a minimum of 10 shovel tests were necessary within the USACE jurisdictional areas traversed by the proposed ROW reroute in order to comply with the TSMASS. For the ATWS, the TSMASS require a minimum of two shovel tests per acre. This equated to a minimum of six shovel tests within the USACE jurisdictional areas covered by the 3.0 acres of ATWS. In all, a minimum of 16 shovel tests were necessary within the Survey Area in order to comply with the TSMASS. Horizon exceeded the TSMASS by excavating a total of 42 shovel tests within the Survey Area. All excavated matrices were screened through 0.25-inch (6.4-millimeter [mm]) hardware mesh or were trowel-sorted if dense clay soils prohibited successful screening.

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 are presented in Figure 5-1. Shovel test data are presented in Appendix A.

Sensitive Site Location Data Omitted

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

6.0 RESULTS

6.1 GENERAL FINDINGS

The Project Area follows the northern edge of an existing pipeline corridor from its western end to Salt Creek and is bisected by a paved portion of County Road 448, modern-era two-track oil/gas access roads, and several other pipeline corridors (Figures 6-1 and 6-2). Only small portions of the Project Area east of Salt Creek lacked evidence of significant ground surface disturbance from oil/gas activities prominent in the surrounding area.

The field crew found the Project Area to consist of flat to gently undulating, desiccated desert plains that are dissected by Salt Creek and numerous small to medium-sized erosional drainages that flow across the Project Area directly into Salt Creek just east of the center of the Project Area (see Figures 2-1 through 2-3). Vegetation in the area generally consisted of a sparse mixture of short mesquite and acacia trees, creosote brush, yucca, sand sage, prickly pear, and thin mixed grasses (see Figures 2-1 and 2-2). The sparse nature of the vegetation provided excellent ground surface visibility (75%+) over most of the Project Area, though some heavily eroded areas with exposed caliche bedrock presented 100% ground surface visibility (see Figures 6-1 and 6-2; see also Figure 2-4). Soils were anticipated to range in depth from very shallow to moderately deep but were capable of being assessed via surface inspection and shovel testing efforts. The field crew found soils to consist primarily of fine silty loams over caliche bedrock of varying depths (Figures 6-3 and 6-4). Shallower soils were typically noted east of Salt Creek and at the crest of the heavily eroded upland terrace west of Salt Creek, within areas of exposed deteriorating caliche or stream gravels and small-sized cobbles. Deeper soils were briefly documented along the gentle rising slope of the upper plateau west of Salt Creek. Moderate to high amounts of exposed small-sized cobbles and gravels, particularly more frequent in the Project Area east of Salt Creek, were prevalent only along the ground surface and not within shovel tests. In general, the depths of the excavated shovel tests within the Project Area ranged between 2.0 and 25.6 inches (5.0 and 65.0 cm) below surface, although many of the shovel tests were terminated between depths of 2.0 and 11.8 inches (5.0 and 30.0 cm) below surface where either indurated or deteriorated caliche bedrock was encountered (see Figures 6-3 and 6-4).

The cultural resources survey of the Project Area resulted in the expansion of the boundaries of site 41RV209, which was previously recorded a short distance to the south of the current Project Area. A detailed description of the newly recorded site is presented below.



Figure 6-1. Existing pipeline parallel to the current Project Area, facing northwest



Figure 6-2. Another view of adjacent pipeline and disturbances, facing northwest



Figure 6-3. Typical shovel test within the Project Area



Figure 6-4. Another typical shovel test within the Project Area

6.2 SITE 41RV209

General Description

Site 41RV209 is a prehistoric campsite that was originally documented in January 2020 by Halff Associates, Inc. (Halff) during the survey of Oncor Electric Delivery Company, LLC's then-proposed Owl Hills – Tunstill 138kV Transmission Line Project (THC 2020; see Figure 4-1). The site recorder noted the presence of a diffuse scatter of fire-cracked rock (FCR), lithic debitage, cores, and several expediently flaked implements observed on an actively eroding surface. The site's cultural materials are further described as secondary deposits that have been displaced by construction and clearing of an adjacent pipeline corridor to the north. Based on the displaced deposits, the site recorder noted that the actual site was likely located further north of the current secondary deposit in an area of naturally occurring chert and gypsiferous gravels that were exploited for raw material for lithic tool production. Based on the heavily disturbed nature of the site, Halff recommended it as ineligible for inclusion in the NRHP. It was subsequently formally determined to be ineligible for inclusion in the NRHP by permitting agencies (THC 2020).

Horizon's investigations revealed that the cultural deposits on site 41RV209 extend to the north into the current Project Area and further to the north beyond it (Figures 6-5 and 6-6). Like the original recorders, the Horizon field crew also found the site to consist of a diffuse and surficial scatter of prehistoric lithic debris on an upland terrace to the north and west of Salt Creek (see Figure 6-5). Vegetation present on the site includes mesquite, creosote, prickly pear, yucca, Spanish dagger, and various scrub brushes (Figures 6-7 and 6-8). Soils consisted of pale brown, silty loam over shallow, indurated caliche bedrock, as well as loamy, calcareous, and gypsiferous sediments (Figure 6-9; see also Figure 6-4). Some areas of exposed caliche were observed along the edge of the terrace adjacent to several erosional drainages/gullies that cut through the site. The area has been heavily disturbed by several pipeline ROWs, associated access roads, and natural wind/water erosion likely expedited by surrounding oil/gas activity.

All cultural materials on the site were observed strictly in surface contexts. A total of 13 shovel tests were excavated across site 41RV209, and all 13 produced negative results for subsurface cultural materials.

Observed Cultural Materials

Observed cultural materials on site 41RV209 consisted entirely of prehistoric lithic specimens. These include 15 to 25 fragments of lithic debitage (coarse chert and rhyolite), two rhyolite/chert cores, 40 to 50 fragments of FCR, two expediently flaked implements, and one sandstone metate fragment (Figures 6-10 through 6-14). Although no formal stone tools or ceramics were noted on the site, the FCR specimens and the metate fragment suggest that the site was utilized as a campsite where food was prepared in addition to a raw lithic material procurement area.

Sensitive Site Location Data Omitted

Figure 6-5. Location map of site 41RV209

Sensitive Site Location Data Omitted

Figure 6-6. Sketch map of site 41RV209



Figure 6-7. General view of site 41RV209, facing south toward Salt Creek



Figure 6-8. General view of site 41RV209, facing west



Figure 6-9. Typical surface exposure on site 41RV209



Figure 6-10. Examples of debitage specimens on site 41RV209



Figure 6-11. Examples of FCR specimens on site 41RV209



Figure 6-12. Expediently flaked specimens observed on site 41RV209



Figure 6-13. Core specimen observed on site 41RV209



Figure 6-14. Sandstone metate fragment observed on site 41RV209

Observed Cultural Features

The site was generally devoid of cultural features, likely due to the fact that much of the area has experienced considerable surface impacts from oil/gas activities (Figure 6-15). No evidence of any intact cultural features was observed on the surface of the site, but the presence of the scattered FCR suggests that features were once present. One FCR concentration was observed in surface contexts within the western ATWS (Figure 6-16; see also Figures 6-5 and 6-6). This concentration measured approximately 3.3 feet (1.0 m) in diameter and contained approximately 20 FCR specimens. While it is not considered to be an entirely intact feature, it was the only concentration of FCR observed on the site. No evidence of charred floral or faunal remains was observed within the extent of the concentration.

Horizontal and Vertical Extents of Cultural Materials

Based on the distribution of cultural materials on the modern ground surface, site 41RV209 was originally documented as measuring approximately 229.7 feet (70.0 m) east to west by 131.2 feet (40.0 m) north to south. Horizon's assessment of the site found the cultural deposits to extend further to the north and northeast of the original site boundaries. The newly revised horizontal extent of the site now measures approximately 689.0 feet (210.0 m) northeast to southwest by 262.5 feet (80.0 m) northwest to southeast (see Figures 6-5 and 6-6).

The original recorders of site 41RV209 noted that all observed cultural deposits on the site were confined entirely to surface contexts. The Horizon field crew excavated a total of 13 shovel tests across the portion of the site within the current Project Area. All 13 produced negative results, confirming that the cultural deposits on the site are confined strictly to surface contexts.

Site Summary

Site 41RV209 consists of a low-density scatter of prehistoric lithic debris on a terrace situated to the north and west of the channel of Salt Creek. The presence of lithic debris (cores and debitage) on the site suggests that the surface gravels of the area were utilized as a source of raw material for stone tools. In addition, the presence of scattered FCR across the site, the presence of one FCR concentration, and the sandstone metate fragment on the site also indicate that the location served as a campsite where food was prepared. Modern oil/gas activities have disturbed a large portion of the site, and no temporally diagnostic specimens, intact features, or preserved floral/faunal remains were noted within its deposits.

Based on the surficial, sparse, and generally disturbed nature of this site's deposits, as well as its lack of temporally diagnostic materials, intact features, and preserved floral/faunal remains, it is Horizon's opinion that the portion of site 41RV209 within the limits of the current Project Area is considered to be ineligible for inclusion in the NRHP and no additional cultural resources investigations are warranted on the site in connection with the current undertaking.



Figure 6-15. Typical existing artificial impacts observed on site 41RV209



Figure 6-16. FCR concentration observed on site 41RV209

7.0 SUMMARY AND RECOMMENDATIONS

7.1 SUMMARY

On 5 May and 2 June 2020, Horizon conducted an intensive cultural resources survey of the USACE jurisdictional areas within WMP's proposed Red Bluff HP Pipeline Reroute Project located in northwestern Reeves County, Texas. Although the undertaking is located entirely on private property and will be constructed with private funds, its development may require the usage of an RGP and/or NWP issued by the USACE. As these are federal permits, the portions of the undertaking under the purview of the USACE also fall under the regulations of Section 106 of the NHPA of 1966, as amended. At the request of Whintont, Horizon conducted the cultural resources survey of the USACE jurisdictional areas on behalf of WMP in compliance with Section 106 of the NHPA. The purpose of the survey was to determine if any archeological sites were located within the USACE jurisdictional areas and, if any existed, to determine if the project had the potential to have any adverse impacts on sites eligible for inclusion in the NRHP.

The proposed pipeline ROW reroute measures approximately 4,022.0 feet (1,226.0 m) in length and approximately 100.0 feet (30.5 m) wide, with a total area of 9.2 acres. In addition, the project has approximately 3.0 acres of ATWS on opposing sides of Salt Creek, resulting in an overall all area of 12.2 acres for the undertaking. However, the Project Area (i.e., the portions of the undertaking within the purview of the USACE) consists of Salt Creek and four adjacent jurisdictional WOUS that are traversed by the proposed ROW reroute and ATWS as well as a portion of the proposed ROW reroute adjacent to previously recorded archeological site 41RV209. To assess all areas that the USACE could determine to be within their purview, Horizon surveyed the vast majority of the proposed ROW reroute and ATWS with the exception of the easternmost 700.0 feet (213.4 m) of the proposed ROW reroute where no WOUS were delineated. This Survey Area totaled approximately 10.6 acres.

Due to the erosional nature of the Project Area setting, the intensive pedestrian survey of the Project Area entailed primarily intensive surface inspection on opposing sides of Salt Creek and five adjacent WOUS that are traversed by the proposed pipeline ROW reroute. However, the surface inspection was supplemented by subsurface shovel testing. The TSMASS require a minimum of 16 shovel tests per mile for linear projects measuring up to 100.0 feet (30.5 m) in width. As the linear portion of the Survey Area totaled approximately 3,322.0 feet (1,012.5 m) in length, a minimum of 10 shovel tests were necessary within the USACE jurisdictional areas traversed by the proposed ROW reroute in order to comply with the

TSMASS. For the ATWS, the TSMASS require a minimum of two shovel tests per acre. This equated to a minimum of six shovel tests within the USACE jurisdictional areas covered by the 3.0 acres of ATWS. In all, a minimum of 16 shovel tests were necessary within the Survey Area in order to comply with the TSMASS. Horizon exceeded the TSMASS by excavating a total of 42 shovel tests within the Survey Area.

The cultural resources survey resulted in the expansion of the boundaries of previously recorded site 41RV209. This site was found to be a low-density scatter of prehistoric lithic debris on a terrace situated to the north and west of the channel of Salt Creek. The presence of lithic debris (cores and debitage) on the site suggests that the surface gravels of the area were utilized as a source of raw material for stone tools. In addition, the presence of scattered FCR across the site, the presence of one FCR concentration, and the sandstone metate fragment on the site also indicate that the location served as a campsite where food was prepared. Based on the surficial, sparse, and generally disturbed nature of this site's deposits, as well as its lack of temporally diagnostic materials, intact features, and preserved floral/faunal remains, it is Horizon's opinion that the portion of site 41RV209 within the limits of the current Project Area is considered to be ineligible for inclusion in the NRHP and no additional cultural resources investigations are warranted on the site in connection with the current undertaking.

7.2 RECOMMENDATIONS

Based on the assessment that the portion of site 41RV209 within the current Project Area is ineligible for inclusion in the NRHP, it is Horizon's opinion that development of the Project Area will have no adverse effects on any significant cultural resources located within the USACE jurisdictional areas. Horizon therefore recommends that WMP be allowed to proceed with the development of the proposed pipeline ROW reroute relative to the jurisdiction of the USACE and Section 106 of the NHPA. 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 the USACE should be notified of the discovery.

8.0 REFERENCES CITED

Blair, W.F.

1950 The Biotic Provinces of Texas. *The Texas Journal of Science* 2(1):93-117.

(Esri) Environmental Systems Research Institute

2017 Digital topographic quadrangles and orthographic photography sourced by Esri for ArcGIS Online, <arcgis.com>. Orthographic photography dated 2017. Accessed 7 May 2020.

Foster, W.C.

2008 *Historic Native Peoples of Texas*. University of Texas Press: Austin.

Griffith, G., S. Bryce, J. Omernik, and A. Rogers

2007 Ecoregions of Texas. Prepared for the Texas Commission on Environmental Quality. <ftp://ftp.epa.gov/wed/ecoregions/tx/TXeco_Jan08_v8_Cmprsd.pdf>. Accessed 23 June 2014.

Hickerson, N.P.

1994 *The Jumanos: Hunters and Traders of the South Plains*. University of Texas Press: Austin.

Kohout, M.D.

2010 Culberson County. *The Handbook of Texas Online*. <<https://tshaonline.org/handbook/online/articles/hcc28>>. Uploaded on 15 June 2010. Uploaded on 8 April 2020.

Mecham, J.L.

1926 Antonio de Espejo and His Journey to New Mexico. In *The Southwestern Historical Quarterly*, Vol. 30, No. 2, pp. 114-138.

NETROnline

2020 Historic Aerials by NETROnline, <<https://www.historicaerials.com/viewer>>. Accessed 8 March 2020.

(NPS) National Park Service

- 2020 National Park Service National Register of Historic Places Google Earth Map Layer – South Region. <http://nrhp.focus.nps.gov/natreg/docs/Google_Earth_Layers.html>. Accessed 8 March 2020.

(NRCS) US Department of Agriculture, Natural Resources Conservation Service

- 1980 Soil Survey of Reeves County, Texas. <http://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/texas/TX389/0/Reeves.pdf>. Accessed 4 May 2020.
- 2020 Soil Survey Geographic (SSURGO) Database for Reeves County, Texas.

(OSM) OpenStreetMap contributors

- 2020 Open Street Map, <<http://www.openstreetmap.org>>. Available under the Open Database License (www.opendatacommons.org/licenses/odbl). Accessed 7 May 2020.

Prewitt, E.R.

- 1981 Cultural Chronology in Central Texas. *Bulletin of the Texas Archeological Society* 52:65-89.
- 1985 From Circleville to Toyah: Comments on Central Texas Chronology. *Bulletin of the Texas Archeological Society* 54 (for 1983): 201-238.

Smith, J.C.

- 2010 Reeves County. *The Handbook of Texas Online*. <<https://tshaonline.org/handbook/online/articles/hcr06>>. Uploaded on 15 June 2010. Accessed 8 April 2020.

Suhm, D.A. and E. B. Jelks

- 1962 *Handbook of Texas Archeology: Type Descriptions*. The Texas Archeological Society Special Publication No. 1 and The Texas Memorial Museum Bulletin No. 4. Austin.

Suhm, D.A., A.D. Krieger, and E. B. Jelks

- 1954 An Introductory Handbook of Texas Archeology. *Bulletin of the Texas Archeological Society* 25: 1-562.

(THC) Texas Historical Commission

- 2020 *Texas Archeological Sites Atlas Restricted Database*. <<https://atlas.thc.state.tx.gov/>>. Accessed 8 March 2020.

Turner, E.S., and T.R. Hester

- 1999 *A Field Guide to Stone Artifacts of Texas Indians*. Third Revised Edition. Gulf Publishing Company, Houston.

(USGS) US Geological Survey

- 1968a 7.5-minute series topographic map, Red Bluff, Texas, quadrangle.
- 1968b 7.5-minute series topographic map, Orla, Texas, quadrangle.

APPENDIX A:

Shovel Test Data

Table A-1. Shovel Test Summary Data

ST No.	UTM Coordinates ¹		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
MF01	600293	3528037	0-5+	Caliche with heavy gravels/cobbles on surface	None
MF02	600241	3528034	0-5+	Brown extremely compact, gravelly silty loam	None
MF03	600191	3528036	0-10+	Indurated caliche	None
MF04	600141	3528038	0-5+	Indurated caliche	None
MF05	600085	3528033	0-10+	Compact indurated caliche with many gravel/cobbles on surface	None
MF06	600028	3528033	0-10+	Very pale brown extremely compact silty clay loam	None
MF07	599822	3528040	0-15	Pale brown silty clay loam	None (41RV209)
			15-40	Strong brown silty clay loam	None (41RV209)
			40+	Compact indurated caliche	None (41RV209)
MF08	599750	3528033	0-50	Pale brown silty clay loam	None (41RV209)
			50-55+	Compact indurated caliche	None (41RV209)
MF09	599622	3528032	0-25	Pale brown silty clay loam	None
			25-30+	Compact indurated caliche	None
MF10	599522	3528030	0-15	Pale brown silty clay loam	None
			15+	Compact indurated caliche	None
JL01	599888	3528035	0-30+	Deteriorated caliche	None
JL02	599852	3528039	0-35	Pale brown silty clay loam	None (41RV209)
			35-45+	Compact indurated caliche	None (41RV209)
JL03	599783	3528035	0-60	Pale brown silty clay loam	None (41RV209)
			60-65+	Compact indurated caliche	None (41RV209)
JL04	599718	3528035	0-25	Pale brown silty clay loam	None (41RV209)
			25-60	Reddish-brown compact silty clay loam	None (41RV209)
			60-65+	Compact indurated caliche	None
JL05	599667	3528037	0-25	Pale brown silty clay loam	None
			25-65	Reddish-brown compact silty clay loam	None

Appendix A: Shovel Test Data

ST No.	UTM Coordinates ¹		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
			65+	Limestone bedrock	None
JL06	599564	3528036	0-25	Pale brown compact silty clay loam	None
			25+	Limestone bedrock	None
JL07	599474	3528034	0-10	Pale brown silty clay loam	None
			10-15+	Compact indurated caliche	None
JD01	599336	3528072	0-40	Light pale brown silty loam	None
			40-45+	Compacted pale grayish-white caliche	None
JD02	599306	3528083	0-10	Pale brown fine compact silty loam	None
			10-15+	Indurated compacted pale grayish-white caliche	None
JD03	599371	3528061	0-10	Pale brown compacted silty loam	None
			10-15+	Indurated compacted pale grayish-white caliche	None
JD04	599402	3528052	0-60	Pale brown silty loam	None
			60-70+	Light pale brown compacted silty clay loam with small gravels	None
JD05	599432	3528039	0-30	Pale brown silty loam	None
			30-35+	Light reddish-brown compacted blocky silty clay loam	None
JD06	599820	3528083	0-65	Pale brown silty loam	None (41RV209)
			65-70	Reddish-pale brown silty clay loam	None (41RV209)
			70-75+	Pale grayish-white compacted caliche	None (41RV209)
JD07	599857	3528084	0-35	Pale brown silty loam	None (41RV209)
			35-40+	Indurated compacted pale grayish-white caliche	None (41RV209)
JD08	599843	3528063	0-25	Pale brown silty loam	None (41RV209)
			25-30+	Indurated compacted pale grayish-white caliche	None (41RV209)
JD09	599876	3528054	0-10	Pale brown silty loam	None
			10-12+	Indurated compacted pale grayish-white caliche	None
JD10	599925	3528051	0-25	Pale brown silty loam	None
			25-30+	Indurated compacted pale grayish-white caliche	None

An Intensive Cultural Resources Survey of the USACE Jurisdictional Areas within Western Midstream Partners, LP's Proposed Red Bluff HP Pipeline Reroute Project in Reeves County, Texas

ST No.	UTM Coordinates ¹		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
JD11	599945	3528041	0-10	Pale brown silty loam	None
			10+	Indurated compacted pale grayish-white caliche	None
JD12	599971	3528054	0-50	Pale brown silty loam	None
			50-55+	Indurated compacted pale grayish-white caliche	None
JD13	600069	3528057	0-10	Very gravelly pale brown silty loam	None
			10+	Indurated compacted gravelly pale grayish-white caliche	None
JD14	600115	3528058	0-10	Gravelly pale brown silty loam	None
			10+	Indurated compacted pale grayish-white caliche	None
JD15	600175	3528057	0-15+	Indurated compacted gravelly pale grayish-white caliche	None
JD16	600156	3527987	0-10+	Indurated gravelly compacted pale grayish-white caliche	None
JD17	600125	3527988	0-10+	Indurated compacted pale grayish-white caliche	None
JD18	600140	3528010	0-10	Pale brown gravelly silty loam	None
			10+	Indurated compacted pale grayish-white caliche	None
JD19	600155	3528026	0-10+	Indurated compacted pale grayish-white caliche	None
JD20	600117	3528022	0-5+	Indurated compacted pale grayish-white caliche	None
JD21	599837	3528103	0-45	Pale brown silty loam	None (41RV209)
			45-55	Reddish-brown blocky silty clay loam	None (41RV209)
			55-60+	Indurated compacted pale grayish-white caliche	None (41RV209)
JD22	599804	3528102	0-45	Pale brown silty loam	None (41RV209)
			45-55	Reddish-brown blocky silty clay loam	None (41RV209)
			55-60+	Indurated compacted pale grayish-white caliche	None (41RV209)
JD23	599885	3528080	0-10	Pale brown silty loam	None (41RV209)
			10-12+	Indurated compacted pale grayish-white caliche	None (41RV209)
JD24	599910	3528070	0-10+	Indurated compacted pale grayish-white caliche	None (41RV209)
JD25	599872	3528101	0-15	Pale brown silty loam	None (41RV209)

ST No.	UTM Coordinates ¹		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
			15-55	Reddish-brown silty clay loam	None (41RV209)
			55-60+	Indurated compacted pale grayish-white caliche	None (41RV209)
JD26	599793	3528070	0-15	Pale brown silty loam	None (41RV209)
			15-65	Reddish-brown silty clay loam	None (41RV209)
			65-70+	Indurated compacted pale grayish-white caliche	None (41RV209)

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

cmbs = Centimeters below surface

ST = Shovel test

UTM = Universal Transverse Mercator