Volume 2020 Article 138

2020

Cultural Resources Report For The Salt Creek Midstream, LLC Proposed Halcon Pipeline On Texas General Land Office Lands In Reeves County, Texas

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CULTURAL RESOURCES REPORT FOR THE SALT CREEK MIDSTREAM, LLC PROPOSED HALCON PIPELINE ON TEXAS GENERAL LAND OFFICE LANDS IN REEVES COUNTY, TEXAS

Texas Antiquities Permit No. 8275

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March 2, 2020

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ENERCON Project Number: SCM~00005
Cultural Resources Report Number: 18-96

ABSTRACT

Enercon Services, Inc. (ENERCON), in support of Salt Creek Midstream, LLC, conducted an intensive cultural resources survey for the proposed Halcon Pipeline. The proposed pipeline is approximately 43.3 miles (69.7 km) in length and located near Pecos, Texas in Ward and Reeves counties. This report encompasses only the portion of the proposed Halcon Pipeline located on two tracts of Permanent School Fund land in Reeves County, Texas. The Permanent School Fund is administered by the Texas General Land Office (TGLO), a political subdivision of the State of Texas. The portion of the Halcon Pipeline on TGLO lands is approximately 1.8 miles (2.8 km) in length and depicted on the United States Geological Survey (USGS) Quito Draw, Tex. (1963, Photorevised 1981), Old X Ranch, Tex. (1963, Photorevised 1981), Toyah Lake, Tex. (1963) 7.5 Minute Quadrangle maps. The construction corridor consists of a 50 feet (15 m) wide permanent pipeline right-of-way (ROW) and an additional 50 feet (15 m) wide temporary workspace corridor. The cultural resources survey area of potential effect (APE) consists of the 1.8 mile (2.8 km) by 100 feet (30 m) corridor, totaling 21.3 acres (8.6 hectares).

The cultural resources investigation is intended to assist in adhering to the 1969 Antiquities Code of Texas and the cultural resources survey on TGLO lands was completed under Texas Antiquities Permit No. 8275. The entire project was supervised by Michael M. Margolis, an ENERCON archeologist who meets the U.S. Secretary of the Interior's Professional Qualification Standards for archeology as set forth in 36 CFR 61.

Prior to the survey, a search of the Texas Archeological Sites Atlas (the Atlas) was conducted by Michael M. Margolis to locate previously recorded archeological sites, archeological surveys, National Register of Historic Places (NRHP) properties, and State Antiquities Landmarks (SALs). Based on the Atlas, one site, 41RV60, has been previously recorded within 1-mile of the APE on TGLO lands. Site 41RV60 is an Early Archaic lithic scatter recorded by URS Corporation in March 2014 and was determined ineligible for listing on the NRHP by the State Historic Preservation Officer (SHPO) on April 8, 2014. Site 41RV60 is located approximately 4,500 feet (1,372 m) from the APE and will not be impacted by construction of the proposed Halcon Pipeline. Two archeological surveys or studies are mapped within 1-mile of the APE on TGLO lands.

The cultural resources survey of the Halcon Pipeline APE on TGLO lands was conducted December 1-2, 2017 by Julie Wasinger and Gary D. Edington, ENERCON archeologists who meet the U.S. Secretary of the Interior's Professional Qualification Standards for archeology as set forth in 36 CFR 61. Salt Creek Midstream, LLC procedures dictate that all standing structures be avoided during construction. Fieldwork was conducted in accordance with the Texas Historical Commission (THC) Archeological Survey Standards for Texas.

The cultural resources survey of the Halcon Pipeline APE did not result in finding any historic or prehistoric artifacts, features, cultural lenses, or sites and no artifacts were collected on TGLO lands. Therefore, it is recommended that construction of the proposed Halcon Pipeline on TGLO lands will have no effect on any historic property that may qualify for inclusion on the NRHP or SAL listings. No further cultural resources investigations are recommended prior to construction of the proposed Halcon Pipeline on TGLO lands. If cultural material, including sites, features, or artifacts that are 50 years old or older are encountered within the APE during construction of the Halcon Pipeline on TGLO lands, work in the area must cease and the regional THC Archeologist (512-463-6096) must be notified immediately.

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Enercon Services, Inc. (ENERCON), in support of Salt Creek Midstream, LLC, conducted an intensive cultural resources survey for the proposed Halcon Pipeline. The proposed pipeline is approximately 43.3 miles (69.7 km) in length and located near Pecos, Texas in Ward and Reeves counties (Figure 1). This report encompasses only the portion of the proposed Halcon Pipeline located on two tracts of Permanent School Fund land in Reeves County, Texas. The Permanent School Fund is administered by the Texas General Land Office (TGLO), a political subdivision of the State of Texas. The portion of the Halcon Pipeline on TGLO lands is approximately 1.8 miles (2.8 km) in length and depicted on the United States Geological Survey (USGS) Quito Draw, Tex. (1963, Photorevised 1981), Old X Ranch, Tex. (1963, Photorevised 1981), Toyah Lake, Tex. (1963) 7.5 Minute Quadrangle maps (Figures 2.1 and 2.2). The construction corridor consists of a 50 feet (15 m) wide permanent pipeline right-of-way (ROW) and an additional 50 feet (15 m) wide temporary workspace corridor. The cultural resources survey area of potential effect (APE) consists of the 1.8 mile (2.8 km) by 100 feet (30 m) corridor, totaling 21.3 acres (8.6 hectares).

Construction of the Halcon Pipeline will involve the mechanized clearing of vegetation within the APE and open-cut trenching where the pipeline will be buried. Clearing of vegetation is typically done with bulldozers. The trenches are typically four to six feet (1.2 to 1.8 m) deep and three to four feet (0.9 to 1.2 m) wide and dug by excavators. Interstate, State, County, and private roads, including lease roads, are typically bored by horizonal directional drilling (HDD). Additional impacts within the APE include foot traffic and general vehicle traffic will range from light-duty pickup trucks to heavy mechanized equipment. Once construction is complete and the pipeline is operational, all trenches and pits will be backfilled, and all construction equipment will be removed.

The cultural resources investigation is intended to assist in adhering to the 1969 Antiquities Code of Texas and the cultural resources survey on TGLO lands was completed under Texas Antiquities Permit No. 8275. The entire project was supervised by Michael M. Margolis, an ENERCON archeologist who meets the U.S. Secretary of the Interior's Professional Qualification Standards for archeology as set forth in 36 CFR 61. No artifacts were collected during the survey. Pursuant to 13 TAC 26.17, notes, records, photographs, and photograph logs generated during the survey have been prepared for permanent curation at the Texas Archeological Research Laboratory (TARL) in Austin, Texas.

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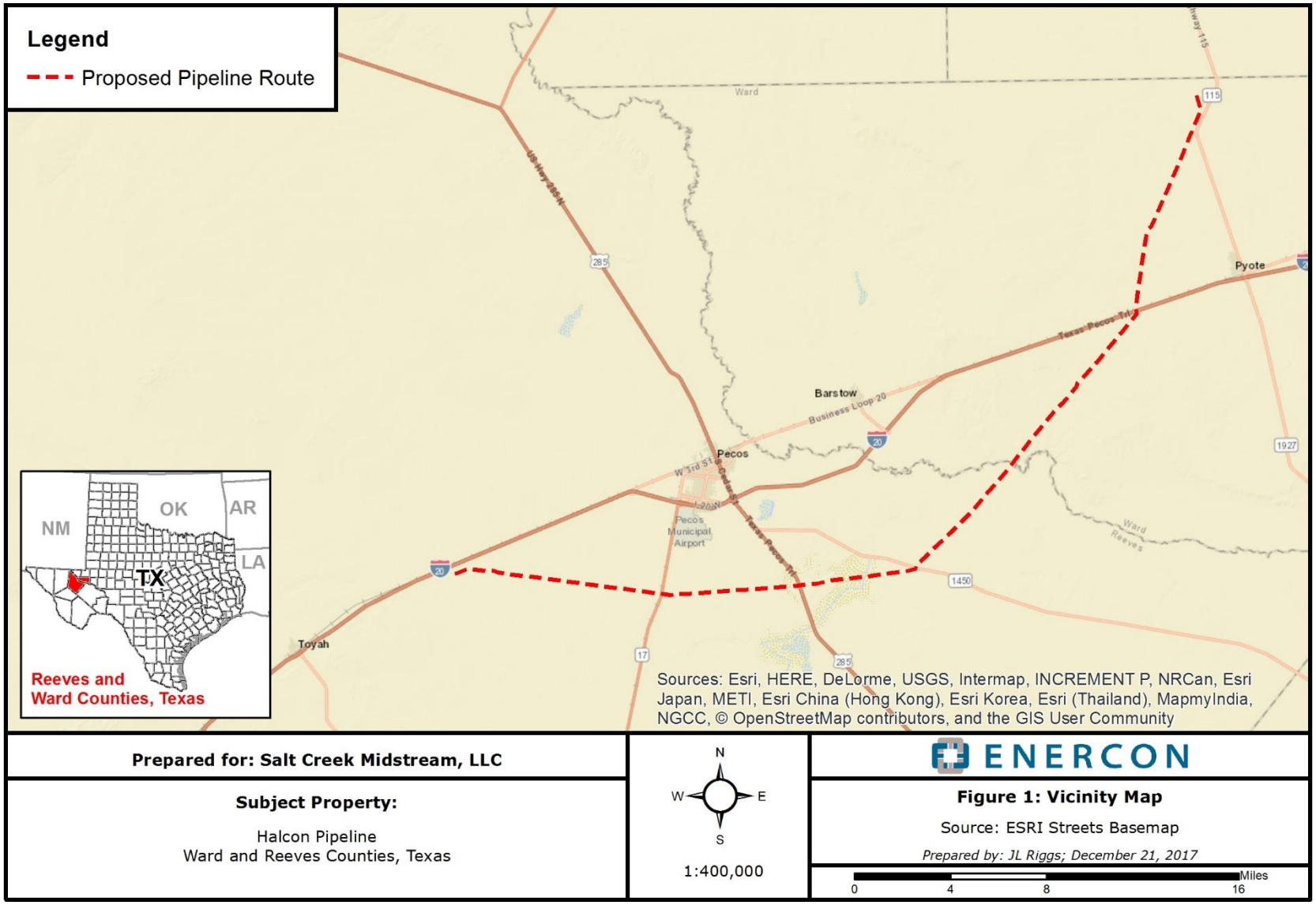
Legend
Proposed Pipeline Route
Ward
Pyote
Barstow
Business Loop 20
Pecos
Pecos Municipal Airport
Toyah
Ward
Reeves
1450
1927
115
285
20
17
NM
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AR
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TX
Reeves and Ward Counties, Texas
Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community
Prepared for: Salt Creek Midstream, LLC
Subject Property:
Halcon Pipeline
Ward and Reeves Counties, Texas
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ENERCON
Figure 1: Vicinity Map
Source: ESRI Streets Basemap
Prepared by: JL Riggs; December 21, 2017
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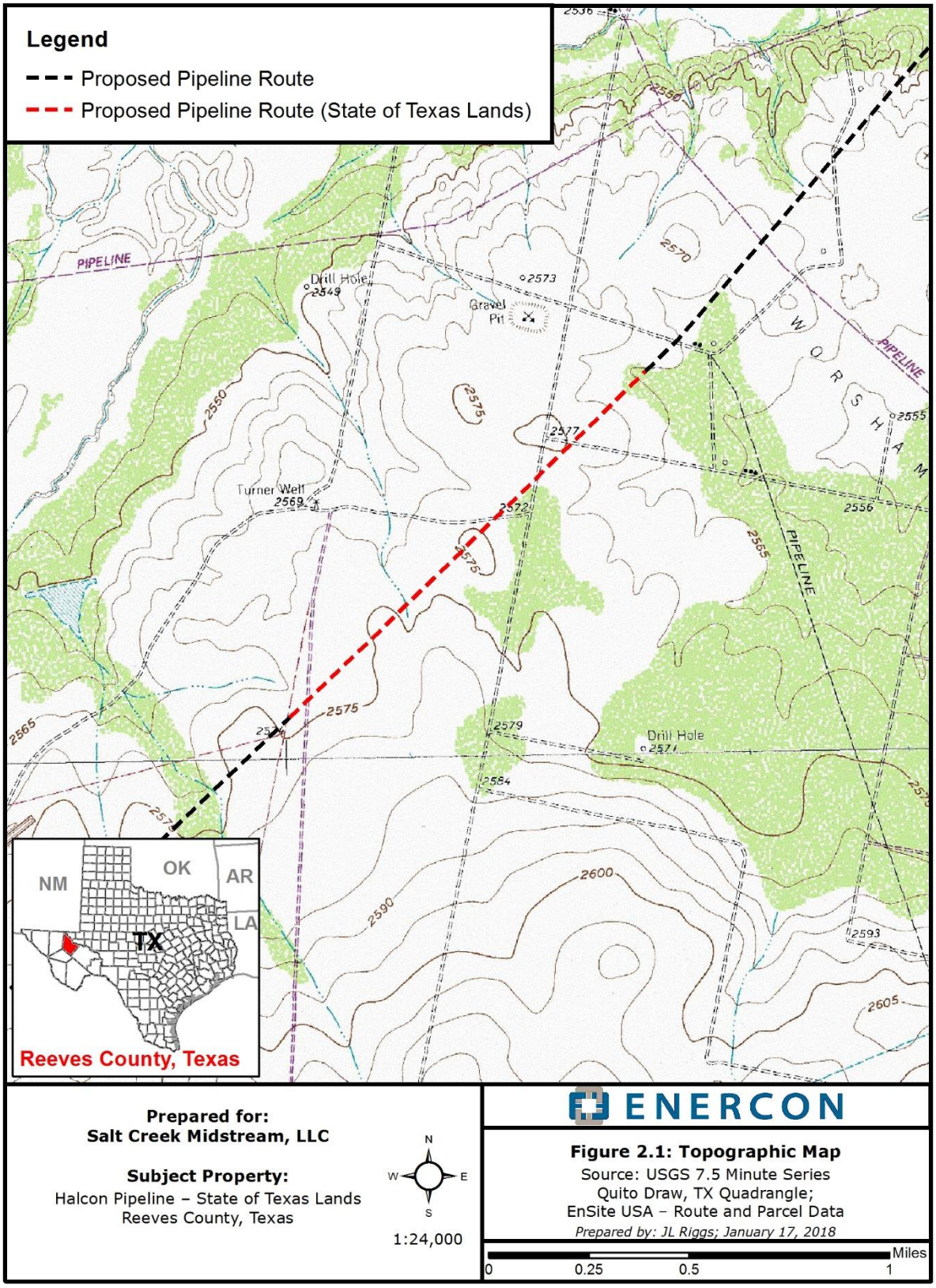
Legend
Proposed Pipeline Route
Proposed Pipeline Route (State of Texas Lands)
PIPELINE
Drill Hole
2549
Gravel Pit
2573
Turner Well
2569
Drill Hole
2571
2579
2584
WORSHAM
NM
OK
AR
LA
TX
Reeves County, Texas
Prepared for:
Salt Creek Midstream, LLC
Subject Property:
Halcon Pipeline – State of Texas Lands
Reeves County, Texas
N
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1:24,000
ENERCON
Figure 2.1: Topographic Map
Source: USGS 7.5 Minute Series
Quito Draw, TX Quadrangle;
EnSite USA – Route and Parcel Data
Prepared by: JL Riggs; January 17, 2018
Miles
0
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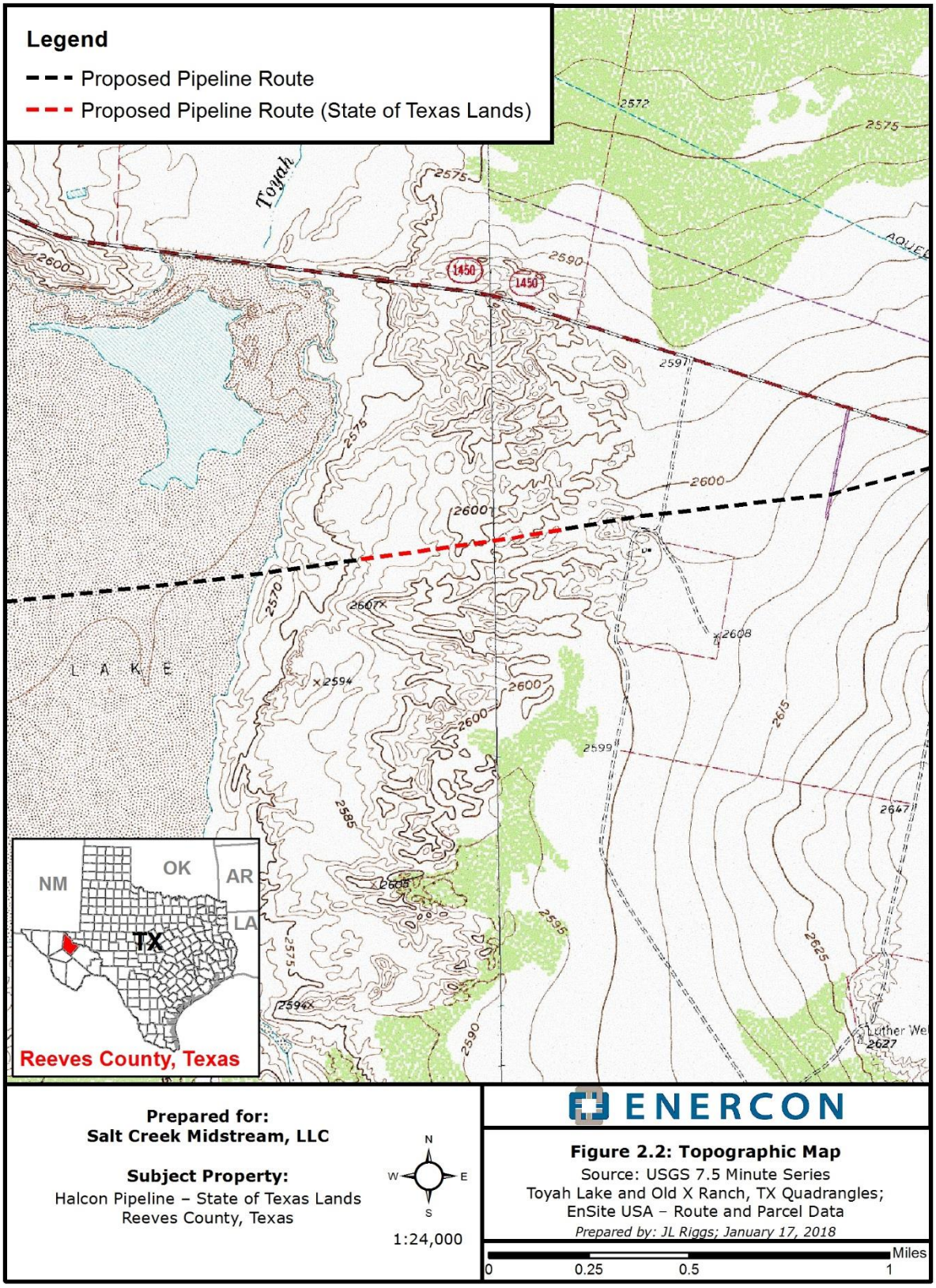
Legend
Proposed Pipeline Route
Proposed Pipeline Route (State of Texas Lands)
Toyah
L A K E
NM
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LA
TX
Reeves County, Texas
Prepared for:
Salt Creek Midstream, LLC
Subject Property:
Halcon Pipeline – State of Texas Lands
Reeves County, Texas
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ENERCON
Figure 2.2: Topographic Map
Source: USGS 7.5 Minute Series
Toyah Lake and Old X Ranch, TX Quadrangles;
EnSite USA – Route and Parcel Data
Prepared by: JL Riggs; January 17, 2018
Miles
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0.25
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1

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ENVIRONMENTAL BACKGROUND

The APE on TGLO lands is situated within the Chihuahuan Basin and Playas biotic province of the Chihuahuan Deserts ecoregion (Griffith et al. 2007). The Chihuahuan Basins and Playas are part of the larger Chihuahuan Deserts which extend from the Madrean Archipelago of Arizona in the west to the Edwards Plateau of central Texas. The boundaries of this area are defined by an arid climate with some of the lowest precipitation rates in Texas, which support desert shrub vegetation dominated by creosote bush and honey mesquite on the alkaline or gypsiferous soils (Griffith et al. 2007). The elevation of the Chihuahuan Basins and Playas range from 1,200 to 4,500 feet above mean sea level (amsl) with local relief varying from 25 to 500 feet (Griffith et al. 2007:10). The major drainages of the approximately 12,625 square mile ecoregion are the Pecos River which carries runoff from the Sangre de Cristo Mountains in northern New Mexico and the Rio Grande which carries runoff from the San Juan Mountains in southern Colorado (Griffith et al. 2007:8-9). Otherwise, the ecoregion is primarily internally drained, resulting in alkaline soils, but an efficient recharge rate of local aquifers.

The presence of the quality groundwater did not go unnoticed by settlers and early 20th century inhabitants who made use of the abundant ground water with irrigation wells which had flow rates between several hundred to 2000 gallons per minute (Griffith et al. 2007:9). The primary crops on these irrigated agricultural fields have included cotton, pecans, alfalfa, tomatoes, onions, chili peppers, and the famous melons, particularly cantaloupe from Reeves County (Griffith el al. 2007; Geiser 2010). Although it is well known that prehistoric and protohistoric populations made use of irrigation in the region in the past (Long 2010, Dethloff and Nall 2010), the ranching and irrigation based agricultural practices developed from the late 19th to mid-20th century in the region have altered the natural environment. In the El Paso area and to the west, aquifer drawdown has led to over a 100 foot decline in ground water levels from those recorded at the turn of the 20th century and salt build up in soils has led to the abandonment of many Pecos River Valley agricultural fields which were previously productive farmlands in the 1900s (Griffith et al. 2007:9). Early settlers and observers described the river as generally 4 to 15 feet deep and up to 100 feet wide with a fast current and fordable in only a few places (Griffith et al. 2007:9; Hayter 2010). The agricultural and industrial uses of the Pecos River in New Mexico and Texas have drastically reduced water levels, transforming the Pecos into a gentle, slow river with a shallow, narrow channel. As an example, the early history of settlement in the region of modern Pecos, Texas was related to the encampments of cowboys in the region due to the safe ford for cattle across the mighty Pecos River to the east of the modern town site (Hayter 2010). The historic to modern grazing practices have also altered the environment in the region. The former grasslands which supported cattle have been reduced by overgrazing to dessert shrub lands mostly suitable for only sheep and goats (Griffith et al. 2007:8).

The arid climate of the APE results in relatively sparse vegetation and excellent ground surface visibility (GSV). The dominant creosote bush is an example of the resilient regional flora which can tolerate the diurnal temperature range, low moisture conditions, and high evapotranspiration rates of the region. Additional ecotones include the high saline environments of the playas where saltbush and alkali sacaton

may be found along the margins of these dry saltpans and playas (Griffith et al. 2007:8). Honey mesquite, yucca, and mixed grasses are found intermittently in the region.

The APE on TGLO lands ranges from approximately 2,565 to 2,600 feet (782 to 792 m) amsl (Figures 2.1 and 2.2). The highest point within the APE on TGLO lands is located near the center of the southwestern TGLO tract on the ridge above Toyah Lake (Dry Salt Lake). The lowest point within the APE on TGLO lands at the northern edge of the northeastern TGLO tract. Surface waters within the APE in the southwestern TGLO tract drain into Toyah Lake, which is drained by Toyah Creek. County Road 1450 forms a dam on Toyah Creek north of the natural playa lake. To the south of the road lies the dry lakebed, and to the north of the road, Toyah Creek flows northeast for approximately 5.3 miles (8.5 km) before draining into the Pecos River. Surface waters within the APE in the northeastern TGLO tract drain into Toyah Creek or unnamed intermittent tributary drainages that flow directly into the Pecos River. The Pecos River is a major tributary of the Rio Grande. The APE within the northeastern TGLO tract is underlain by Pleistocene alluvium, colluvium, and caliche composed of sand, pebbles, cobbles, and boulders up to four feet (1.2 m) in size, unconsolidated to partly consolidated by caliche cement, composed of chert, quartzite, limestone, and volcanic rocks (Barnes et al. 1992). The APE within approximately the eastern half of the southwestern TGLO tract, sloping away from the dry bed of Toyah Lake, is underlain by Holocene windblown sand dune deposits (Barnes et al. 1992). The APE within approximately the western half of the southwestern TGLO tract, sloping down towards the dry bed of Toyah Lake, is underlain by the Pleistocene-age Tahoka Formation which is composed of calcareous lacustrine clay, silt, sand, and gravel, which are coarser towards the margins of the deposits (Barnes et al. 1992).

The soils encountered within the APE on TGLO lands are presented alphabetically in Table 1. The APE in the northeastern TGLO tract crosses the Delnorte-Chilicotal association, rolling soils and the APE in the southwestern TGLO tract crosses the Orla association, nearly level soil (USDA 2017). The Delnorte soils are very shallow, with up to five inches (13 cm) of gravelly loam underlain by very gravelly loam and cemented material (caliche). The Chilicotal soils are also very shallow, with up to 10 inches (25 cm) of very gravelly fine sandy loam underlain by more very gravelly and extremely gravelly loam. The Orla association soils are also very shallow, with up to five inches (13 cm) of clay loam underlain by gypsiferous material. Due to aridity, salinity, high alkalinity, slope, gravel content, and shallow depth to bedrock, the Delnorte-Chilicotal association and Orla association soils are considered to be "not prime farmland" (USDA 2018). Additionally, the relatively shallow, gravelly soils, and the generally degrading topography of the area largely preclude the potential for buried cultural deposits.

Table 1. Soil types within the APE including slope, parent material, and bedrock depth*

Soil Unit*	Parent Material	Depth to Restrictive Feature
Delnorte-Chilicotal association soils, rolling	**Delnorte** = Pleistocene-age gravelly alluvium derived from igneous and sedimentary rock **Chilicotal** = Gravelly fan alluvium derived from igneous rock	**Delnorte** = 7 to 20 inches (18 to 50 cm) **Chilicotal** = >80 inches (203 cm)
Orla association soil, nearly level	Saline loamy lacustrine deposits	>80 inches (203 cm)

* from USDA 2017

Reeves County has a subtropical-semi desert climate with relatively short, cool winters and long hot summers. In winter, the average high temperature is 46°F, with an average low of 29°F. In summer, the average high temperature is 99°F, with an average low of 83°F (Jaco 1980). The record low in winter is 9°F, recorded on January 11, 1962, and the record high in summer is 118°F, recorded on June 29, 1968 (Jaco 1980). Annual rainfall averages about 12 inches (29.5 cm) or less and is distributed evenly throughout the year, with a long growing season for crops from April through September which averages 226 days.

Thunderstorms occur on an average of 40 days per year and snowfall is rare with 70 percent of winters having is no measurable snowfall. The average humidity ranges from a low of 40 percent in midafternoon to a high of 70 percent at dawn (Jaco 1980).

ARCHEOLOGICAL BACKGROUND

Based on the archeological record, people have inhabited the region for the last 12,000 years. The archeological chronology has commonly been broken into five temporal periods. The dates assigned to those periods differ between authors but generally include the Paleoindian Period (ca. 10,000 to 6,000 B.C.), Archaic Period (ca. 6,000 B.C. to A.D. 500), Late Prehistoric Period (ca. A.D. 500 to 1500), Protohistoric Period (ca. A.D. 1500 to 1700), and Historic Period (ca. A.D. 1700 to 1950) (adapted from Boyd 2004, Perttula 2004, and Raily 2016:54). A summary of the culture history of the region is presented below. For additional information on the cultural history of the region and a more detailed review, the reader is directed to the works by Perttula (2004), Railey (2013, 2016), and Turner, Hester, and McReynolds (2011).

Paleoindian Period

Evidence for prehistoric occupation of the area is relatively scarce in the Paleoindian Period (ca. 10,000 to 6,000 B.C.). It is probable that earlier sites have been lost to erosion due to the geological context of the area (Boyd 1997:7). Paleoindian sites are more common and more reliably dated on the eastern Edwards Plateau and southern High Plains, although sites and isolated artifacts have been recorded. Although there is growing evidence for an earlier human presence in the Americas, Clovis is the first well-defined cultural horizon in the region. The remains of large herbivores are found in association with Clovis artifacts but there is more recent research supporting the procurement of smaller animals and plants during this time. The Clovis projectile points are lanceolate in shape and have fluted bases. Subsequent Paleoindian projectile points include Folsom and Plainview (Turner, Hester, and McReynolds 2011:45). These projectile points were typically hafted to spears, which were often thrown with the aid of atlatls.

Archaic Period

With the extinction of megafauna, the Archaic Period (ca. 6,000 B.C. to A.D. 500) is generally defined by broader subsistence practices and an increase in intensity of resource exploitation. The climate transitioned from the dryer Altithermal in the Early Archaic through the Late Holocene Wet Period to the relatively dry Late Archaic Medieval Period (Railey 2016:59-83). Additionally, temperatures appear to have increased which resulted in changes to the biotic community and the subsequent subsistence strategies of the Archaic Period populations of the region. Fire cracked rock and oxidized rock is relatively common during this period and likely results from hearths and ovens. Although resource exploitation is inferred to be more intense, subsistence appears to be focused on seasonal mobility tied in part to bison hunting (Boyd 1997). Campsites and rock shelters have been identified from this period, mostly from the Late Archaic. Projectile points are normally barbed spear or dart points, and plant-processing tools increase through time (Johnson and Holliday 2004). There is an increase in the number of recorded sites in the region attributed to the Late Archaic in terms of both diagnostic points and radiocarbon dates (Railey 2016:75, 86). The overall inference is an increase in the population of the region during the Late Archaic (Railey 2016:75).

Late Prehistoric Period

The Late Prehistoric or Ceramic Period (ca. A.D. 500 to 1500) is marked by the presence of ceramics and smaller projectile points indicating the switch from atlatl and spear to the bow and arrow (Johnson and Holliday 2004). This period is also known as the Formative Period in the nearby western Trans-Pecos

because of the area's inclusion within the Jornada Mogollon culture of the greater Southwest archeological region (Railey 2016: 9). Due to further drying of the climate, bison appear to become scarcer in this region. Trading is inferred to have occurred with Southwestern groups including the Jornada Mogollon (Boyd 1997). Brownware pottery was imported from the Puebloans and habitation structures from this period include pit houses. Campsites were still likely used during parts of the year and would be representative of seasonal mobility. Subsistence practices in the Southern High Plains of the Texas Panhandle to the northeast included the introduction of maize by A.D. 1000 (Drass 2008), and maize has been found in caves to the west in the Guadalupe Mountains, and to the south on the Marfa Plain (Railey 2016:99-101, 132). However, the region continued to be dominated by mobile hunter-gatherers (Railey 2016:132), and regional subsistence in Reeves County does not include evidence of cultivated resources (Railey 2016: 99-101, 132). In the latter part of the period, prestige goods like Olivella shell beads, turquoise, non-local pottery, and obsidian become more common.

Protohistoric Period

The Protohistoric Period (ca. A.D. 1500 to 1700) begins with direct and indirect European influences in the region. This period is also known as the Post-Formative or Post-Pueblo Period in the nearby western Trans-Pecos and New Mexico (Railey 2016:134-140). European settlement did not begin to seriously disrupt aboriginal habitation until after A.D. 1700. European diseases, probably introduced by explorers and early traders, did have impacts as early as A.D. 1528. At least 30 epidemics were recorded among Texas tribes between A.D. 1528 and 1890 (Ewers 1974). Further to the west in the project region Railey defines this era as the Post-Formative Native Americans (After A.D. 1450). There is widespread abandonment of the villages and associated lifestyle on the southern High Plains, the Jornada Mogollon and even the Casa Grandes Region (Railey 2016:134). There is limited evidence of sites dating to the Post Formative Period in the study region and in Southeast New Mexico (Railey 2016:137). With the abandonment of the village lifeway, the nomadic bison hunters either did not leave a record that is temporally recognizable via radiocarbon dating, or material culture that can only be attributed to this era. Railey refers to this as a 'low archaeological visibility" problem for sites from the Post-Formative Period (2016:140). Whether populations totally abandoned the region remains unclear.

Historic Period (A.D. 1700 to 1950)

Spanish explorers began expeditions in the Gulf of Mexico beginning in the early 1500s followed by Catholic missionaries accompanied by Spanish soldiers. The Spanish, while teaching locals Christianity and farming, attempted to make loyal Spanish citizens. The first missions were established in Mexico, but were later built in California, Arizona, New Mexico, and Texas (Campbell 2003:36-38). The French, partially to stem the advance of the Spanish, wanted to increase their fur trading territory and gain control of the Mississippi River valley. By 1682, LaSalle, a Frenchman, launched an expedition down the Mississippi River that claimed all of the lands drained by the river for France followed by a colonization effort to settle the mouth of the Mississippi River. Subsequent to the French incursion into the region, the Spanish increased the rate of establishing settlements in Texas (Campbell 2003:41-45, 48).

The Spanish mission system did not expand during the eighteenth century. Native American attacks and a lack of colonists contributed to the decline of Spanish settlement in Texas. In 1762, the Spanish acquired Louisiana from the French, which slowed the need to settle east Texas. In 1800, Spain ceded Louisiana to France, who then sold it to the United States. From 1800 to the 1820s, the population of Texas decreased as a result of the effects of the Mexican Revolution. In 1821, Mexico finally became an independent nation, separate from Spain. This newly independent country encouraged Anglo-American settlement within Texas; this effort was led by Stephen F. Austin. Austin came to an agreement with the Mexican government in which he would bring settlers to Texas and, in return, he would be rewarded with land and money. By

1830, ten thousand Anglo-Americans, mostly from the American southeast, had settled in Texas (Campbell 2003:105-110).

Texas operated as an independent nation for 10 years (1836 to 1846) and during this time, the Mexican government never truly recognized its independence. In 1846, Texas was annexed by the United States and it was now up to the U.S. government to settle the border dispute with Mexico. The Mexicans claimed the international border as the Nueces River, while the U.S. claimed the Rio Grande as the demarcation line. After two years of skirmishes and an attack on Mexico City, the United States succeeded in its efforts; with the treaty of Guadalupe Hidalgo. Mexico recognized the Rio Grande as the border and ceded the entire southwest to the Pacific Ocean to the U.S. (McComb 1989:57).

At the time of annexation by the United States, west Texas was relatively unexplored territory, home to various Native American groups. Settlers began slowly pushing into this territory in the mid-nineteenth century. In 1848, the U.S. Army stationed troops in west Texas and created travel routes through this new territory, which would become corridors for pioneers traveling to California. These included the Chihuahua Trail, which led from Mexico to Indianola, Texas, and Horsehead Crossing and Castle Gap in Crane County, all of which were utilized as trade networks during the prehistoric period as well as forming part of a historic transportation corridor linking Mexico, the U.S. and Canada. Castle Gap functioned as a primary route for the U.S. Cavalry, California Forty-niners, cattle drives, stagecoaches, and wagon trains.

During the Civil War, Texas was a large contributor to the Confederacy, but differed significantly from other southern states. Texas was a frontier state, with a diversified population of Mexicans, Anglo-Americans, and Native Americans. The state also had a large European immigrant population, many of whom were small farmers. Two-thirds of the farmers in the state were non-slave holding, which meant that the agricultural economy was maintained following the Civil War. In addition, cattle ranches were a large industry, resulting in economic diversity. Thus, Texas was not as negatively impacted economically as other southern states during post-Civil War Reconstruction (Campbell 2003:209, 213).

The Native American groups of Texas saw the defeat of the Confederacy and the weakening of Texas as a chance to regain lands they had lost. During this period, the Comanche and Apache occupied the areas of west Texas. In response to this increase of Native American attacks, the United States sent troops to reoccupy several forts. By 1874, a major campaign was initiated in Texas that took away Native Americans' horses, destroyed their villages, and forced them to return to their reservations. The consolidation of Native Americans on reservations allowed Anglo-Americans to settle permanently in west Texas (Campbell 2003:291, 295).

Following these campaigns, the military sent troops to conduct detailed expeditions of the former Native American lands. By 1876, several of the counties northeast of the APE were surveyed by parties from Fort Concho. Ranchers moved into these areas and began raising large herds of cattle, as the demand for beef had risen after the Civil War. New cattle trails developed throughout west Texas, where large herds were driven hundreds of miles north to the mid-western railroad routes. In 1881, the Texas and Pacific Railway extended their rail lines through west Texas; up to this point, rail transportation was only available in east Texas. Between the 1870s and 1890s, 8,000 miles of railway track were laid, connecting the entire state. The new railroads significantly reduced the time and distance it took the cattle industry to transport their herds to market (Campbell 2003:297, 306).

The expansion of the railroad connected the rural communities of west Texas with the booming cities to the east. Towards the end of the nineteenth century, cattle ranchers began to fence off their herds and create small communities on the frontier. In 1895, a law was passed that broke up these larger ranches, allowing farmers to purchase smaller tracts of land. This led to the end of open-range ranching and attracted additional settlers. West Texas communities generally grew slowly due to poor soil conditions and the

difficulty of accessing water. People began to farm corn and cotton on the newly settled land, but ranching was still the dominant economic activity of west Texas at the end of the nineteenth century.

Reeves County is located in the Trans-Pecos region of Texas and is bordered to the northeast across the Pecos River by Loving and Ward Counties, to the southeast by Pecos County, to the southwest by Jeff Davis County, to the west by Culberson County, and along a very narrow 2.5 mile (4.0 km) strip to the north by Eddy County, New Mexico. Reeves County covers 2,538 square miles (6,573 km^2) of primarily flat to undulating lands, with mountainous areas found in the southern point of the county (Smith 2010). The Texas and Pacific Railway was constructed through the area in 1881 with railway section houses at Pecos and Toyah, and in 1883 Reeves County was separated from Pecos County to the southwest, and Pecos was designated the county seat in 1884 during the formal organization of the county (Smith 2010). By 1885, the community of Pecos reported 150 residents and the community of Toyah reported 75 residents, and by 1890, Reeves County had a population of 1,290 persons (Smith 2010). The census of 1900 counted 1,847 residents in the county, with 63 farms being reported totaling 900,000 acres of farmland and 51,000 head of cattle (Smith 2010). Intermittent droughts affected the region, as noted above, and the acres of farmland and size of the cattle herds in the county fluctuated over the next 20 years, but the population had increased to 4,457 residents (Smith 2010). The discoveries of oil in the county in the 1920s contributed to the economy, but the large boom experienced in the Hendrick Field to the east did not extend into Reeves County, and it was not until the 1930s that oil fields in Reeves County brought significant economic and population growth, and by 1940 the population had increased to 8,006 residents (Smith 2010). The 1950s discoveries of the of the Toyah Gas Field and the Geraldine-Ford Field were significant in the county, but again did not compare to the "giant fields" discovered elsewhere in the region. Nevertheless, the population of the county enumerated in 1960 was 17,644 and had declined to 16,526 residents in 1970, and then to 15,801 residents in 1980. The population decline is intriguing as the area experienced a significant oil boom in the 1970's and early 1980s (Smith 2010). In 1990, the population was 12,069 and in 2000, 9,501 residents were enumerated, with a decline to 8,780 residents listed in the 2010 census, and a current estimate of 9,666 residents for the July 1, 2016 (Smith 2010, USCB 2017). Since inception in 1883, the economy has been based on agriculture and mineral extraction, with oil and gas development being the primary economic activity over the last nine decades, while crops have included cotton, hay, wheat, barley and fruits and vegetables such as onions, peppers, pecans and peaches, and cantaloupes (Smith 2010, Jaco 1980).

METHODOLOGY

The cultural resources survey followed the THC's *Archeological Survey Standards for Texas*. The APE was surveyed by using parallel pedestrian transects spaced no more than 50 feet (15 m) apart. The entire 100 foot (30 m) wide APE within the proposed Halcon Pipeline APE on TGLO lands was subjected to pedestrian survey for cultural resources.

Shovel testing density within the survey corridor followed minimum standards outlined by the THC's and the Council of Texas Archeologists' (CTA) practices and procedures, which call for 16 shovel tests per mile is settings which have the potential for buried deposits. Shovel testing is not required in areas with slopes greater than 20 percent or which do not exhibit potential for buried deposits. Shovel test pits are also not excavated in areas with standing water or in areas in which underground utilities are present.

Shovel tests generally measure 30 cm in diameter and are excavated by digging to bedrock, a stratigraphic deposit (e.g. subsoil) that is determined to be below Holocene aged deposits, or to 80-100 cm (dependent on soil matrix consistency and hardness). All shovel test pit fill is passed through ¼ inch mesh screen or gone through by hand if the soil will not pass through the screen. Shovel test pits are excavated in arbitrary 10 cm levels unless stratigraphic changes are observed. The cultural resources survey of the 100 foot (30

m) wide APE met the minimum standards outlined by the THC's and the CTA's practices and procedures (13 TAC 26.5 and 26.20).

BACKGROUND RESEARCH

Pre-field background research was conducted to determine if any cultural resources have been previously recorded within the proposed Halcon Pipeline APE or within 1-mile of the APE. This research assists in determining the types of resources in the area and the probability of encountering those resources during fieldwork Prior to the survey, a search of the Atlas was conducted by Michael M. Margolis to locate previously recorded archeological sites, archeological surveys, NHRP properties, and SALs. Four archeological sites, 41WR11, 41WR12, 41RV6, and 41RV60 have been previously recorded within 1-mile of the APE. Only one of the four archeological sites, 41RV60, has been previously recorded within 1-mile APE on TGLO lands.

Site **41WR11** is a large multi-component prehistoric site recorded by Durral M. Shirey in December 1990. A large quantity of Paleoindian Period projectile points, Archaic Period projectile points, burins, scrapers, manos, metates, and burned rock hearths were recorded in 1990, but collections from the site are noted as far back as the mid-1960s. The site was determined eligible for listing on the NRHP by the SHPO on June 8, 2004. Site 41WR11 is over 1,300 feet (396 m) from the APE and will not be impacted by construction of the Halcon Pipeline.

No information other than the location of site **41WR12** is included within the Atlas. Site 41WR12 is mapped over 3,400 feet (1,036 m) from the APE and will not be impacted by construction of the Halcon Pipeline.

Site **41RV6** is a Late Prehistoric lithic scatter recorded by Donny L. Hamilton in May 1979. Materials recorded at the site include dart points, Toyah and Scallorn arrow points, and stone beads. The site has not been assessed for NRHP eligibility. Site 41RV6 is located over 2,700 feet (823 m) from the APE and will not be impacted by construction of the Halcon Pipeline.

Site **41RV60** is an Early Archaic lithic scatter recorded by URS Corporation in March 2014. Materials recorded at the site include an Andice-like dart point fragment, two core fragments, seven flakes, and a possible ground stone fragment. The site was determined ineligible for listing on the NRHP by the SHPO on April 8, 2014. Site 41RV60 is located over 4,500 feet (1,372 m) from the APE and will not be impacted by construction of the Halcon Pipeline.

Based on the Atlas, 12 archeological surveys or studies are mapped within 1-mile of the APE. Only three of the 12 surveys or studies are mapped within 1-mile of the APE on TGLO lands: Atlas Numbers 8400004696, 8400004697, and 8500058345. No information is provided on Atlas Numbers 8400004696 and 8400004697, other than that they were surveys conducted in April 1984 for Department of Housing and Urban Development (HUD) projects. Atlas Number 8500058345 is a survey conducted by URS Corporation in February and March 2014 in advance of the Delaware Basin NGL Pipeline.

Overall background research of the region suggests that the APE is located within a larger area where climatic conditions, burrowing rodents, and the effects of ranching and oil and gas exploration have each effected the cultural landscape leading to two types of general settings. Wind erosion and extensive bioturbation from rodent burrowing, and sheep and cattle grazing have exposed the upper surface of the landscape within the Chihuahuan Basins and Playas. With the exception of a few geomorphological locations, archeological sites of all ages may be located on the exposed ground surface and/or were never buried (Hall 2006:2-7). The majority of archeological sites are located on eroded surfaces and therefore

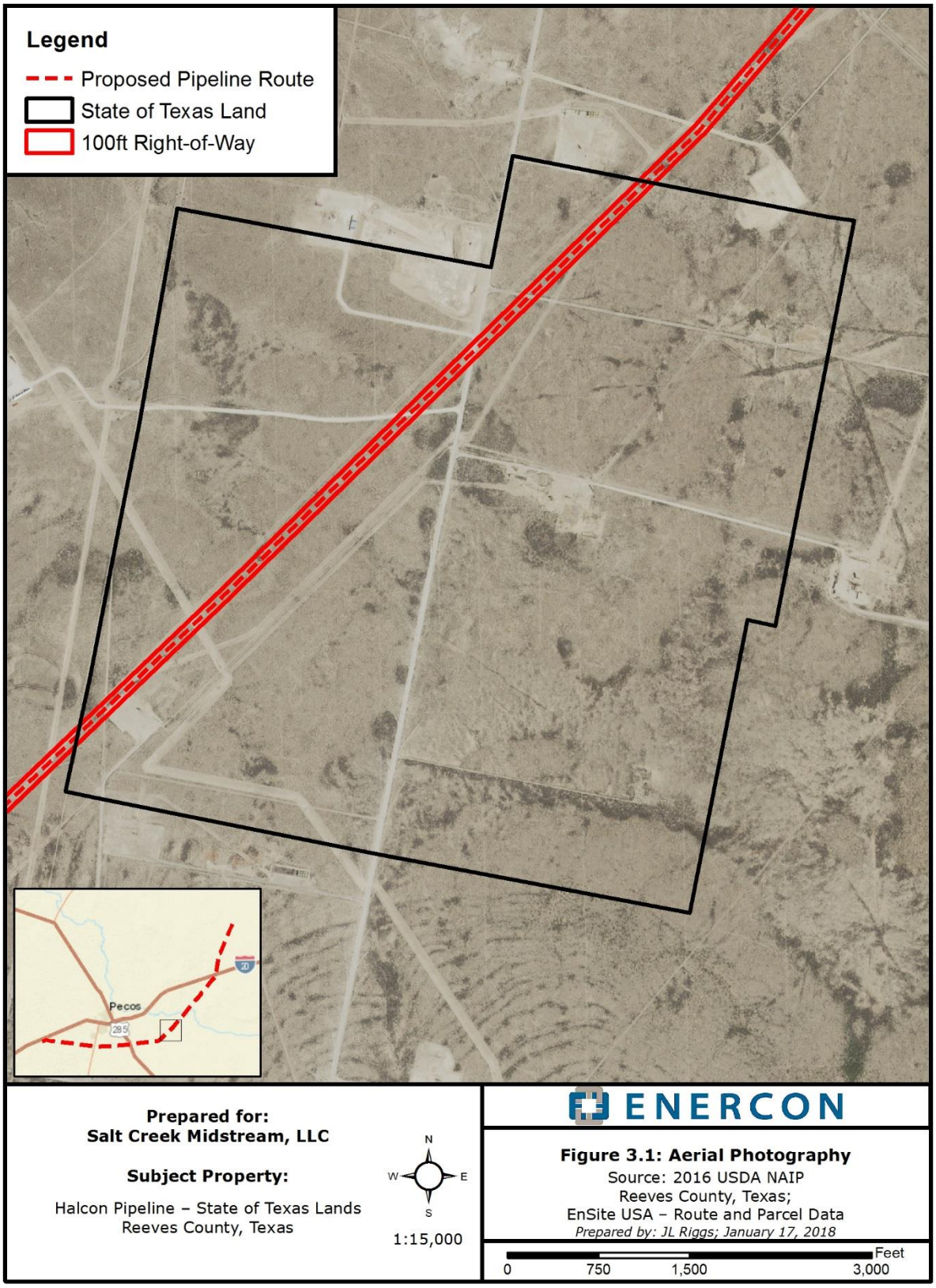
lack vertical integrity and stratigraphy (Hall 2006:2-15). While intact archeological deposits may be encountered where depositional processes, such as (a) colluvial; (b) eolian sand deposits associated with the playa margins; (c) upland playa and lake fill deposits; and (d) within and adjacent to extant and/or extinct draws and/or drainages of Late-Pleistocene to early Holocene age (Hall 2006:2-7, 2-11; Johnson and Holliday 2004:285, 290, 294). The APE on TGLO lands is located within the areas of eroded and exposed surfaces, and sites would be expected to be resting on the surface, or ephemerally exposed by shifting sand dunes.

RESULTS

The cultural resources survey of the Halcon Pipeline APE on TGLO lands was conducted December 1-2, 2017 by Julie Wasinger and Gary D. Edington, ENERCON archeologists who meet the U.S. Secretary of the Interior's Professional Qualification Standards for archeology as set forth in 36 CFR 61. All aspects of the project were supervised by Michael M. Margolis, an ENERCON archeologist who meets the U.S. Secretary of the Interior's Professional Qualification Standards for archeology as set forth in 36 CFR 61. Fieldwork was conducted in accordance with the THC Archeological Survey Standards for Texas. The cultural resources survey APE on TGLO lands consists of the combined approximately 1.8 mile (2.8 km) by 100 feet (30 m) survey corridor located within two separate tracts of land, totaling approximately 21.3 acres (8.6 hectares).

During the fieldwork, the weather was seasonal, with temperatures as low as 30°F in the morning and afternoon highs ranging from 60-75°F with partly cloudy skies and relatively low winds. Vegetation within the APE was typically desert scrub-shrub with creosote bush, mesquite, intermittent thin mixed grasses, and occasional narrow leaf yucca. The northeastern tract of TGLO land, located south of the Pecos River and north of County Road 1450, was flat to gently sloped with some rolling active sand dunes and the vegetation consisted of creosote bush, and thin mixed grasses with occasional mesquite trees and an average GSV above 80 percent (Figures 2.1, 3.1, and 4-6). The APE parallels an existing pipeline ROW along this segment (Figure 3.1). The southwestern tract of TGLO land, located south of County Road 1450 and east of the Toyah Lake Basin, was generally sloped to the southwest towards Toyah Lake, several areas are eroded to heavily eroded with minor areas of vegetation was dominated by creosote bush with thin grasses and occasional mesquite trees and an average GSV above 80 percent (Figures 2.2, 3.2, and 7) Overall much of this tract is deflated to caliche and gravels (Figure 2.2 and 7).

The cultural resources survey of the Halcon Pipeline APE on TGLO lands did not result in finding any historic or prehistoric artifacts, features, cultural lenses, or sites and no artifacts were collected.


Legend
Proposed Pipeline Route
State of Texas Land
100ft Right-of-Way
Pecos
285
20
Prepared for:
Salt Creek Midstream, LLC
Subject Property:
Halcon Pipeline – State of Texas Lands
Reeves County, Texas
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ENERCON
Figure 3.1: Aerial Photography
Source: 2016 USDA NAIP
Reeves County, Texas;
EnSite USA – Route and Parcel Data
Prepared by: JL Riggs; January 17, 2018
Feet
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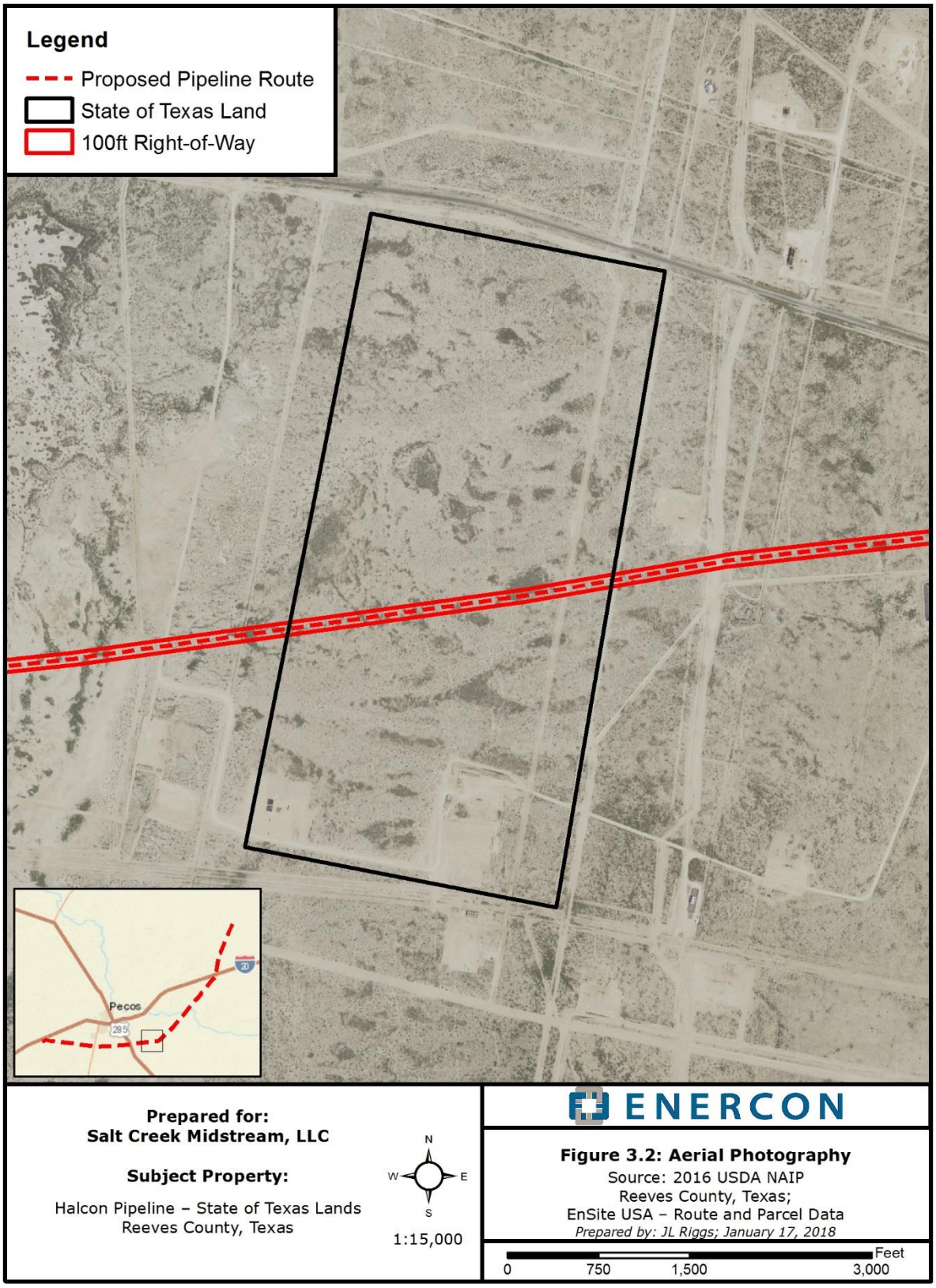
Legend
Proposed Pipeline Route
State of Texas Land
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Pecos
285
20
Prepared for:
Salt Creek Midstream, LLC
Subject Property:
Halcon Pipeline – State of Texas Lands
Reeves County, Texas
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ENERCON
Figure 3.2: Aerial Photography
Source: 2016 USDA NAIP
Reeves County, Texas;
EnSite USA – Route and Parcel Data
Prepared by: JL Riggs; January 17, 2018
Feet
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Figure 4. General overview of the APE from the northern edge of the northeast tract of TGLO land, facing southwest.

Figure 5. General overview of the APE from a lease road near the middle of the northeast tract of TGLO land, facing southwest.

Figure 6. General overview of the APE from the western edge of the northeast tract of TGLO land, facing northeast.

Figure 7. General overview of the APE from the eastern edge of the southwestern tract of TGLO land, facing southwest.

RECOMMENDATIONS

ENERCON, in support of Salt Creek Midstream, LLC, conducted an intensive cultural resources survey for the proposed Halcon Pipeline. The proposed pipeline is approximately 43.3 miles (69.7 km) in length and located near Pecos, Texas in Ward and Reeves counties. This report encompasses only the portion of the proposed Halcon Pipeline located on two tracts of Permanent School Fund land in Reeves County, Texas. The Permanent School Fund is administered by the TGLO, a political subdivision of the State of Texas. The portion of the Halcon Pipeline on TGLO lands is approximately 1.8 miles (2.8 km) in length and depicted on the USGS Quito Draw, Tex. (1963, Photorevised 1981), Old X Ranch, Tex. (1963, Photorevised 1981), Toyah Lake, Tex. (1963) 7.5 Minute Quadrangle maps. The construction corridor consists of a 50 feet (15 m) wide permanent pipeline ROW and an additional 50 feet (15 m) wide temporary workspace corridor. The cultural resources survey APE consists of the 1.8 mile (2.8 km) by 100 feet (30 m) corridor, totaling 21.3 acres (8.6 hectares).

The cultural resources investigation is intended to assist in adhering to the 1969 Antiquities Code of Texas and the cultural resources survey on TGLO lands was completed under Texas Antiquities Permit No. 8275. The entire project was supervised by Michael M. Margolis, an ENERCON archeologist who meets the U.S. Secretary of the Interior's Professional Qualification Standards for archeology as set forth in 36 CFR 61.

Prior to the survey, a search of the Atlas was conducted by Michael M. Margolis to locate previously recorded archeological sites, archeological surveys, NRHP properties, and SALs. Based on the Atlas, one site, 41RV60, has been previously recorded within 1-mile of the APE on TGLO lands. Site 41RV60 is an Early Archaic lithic scatter recorded by URS Corporation in March 2014 and was determined ineligible for listing on the NRHP by the SHPO on April 8, 2014. Site 41RV60 is located approximately 4,500 feet (1,372 m) from the APE and will not be impacted by construction of the proposed Halcon Pipeline. Two archeological surveys or studies are mapped within 1-mile of the APE on TGLO lands.

The cultural resources survey of the Halcon Pipeline APE on TGLO lands was conducted December 1-2, 2017 by Julie Wasinger and Gary D. Edington, ENERCON archeologists who meet the U.S. Secretary of the Interior's Professional Qualification Standards for archeology as set forth in 36 CFR 61. Salt Creek Midstream, LLC procedures dictate that all standing structures be avoided during construction. Fieldwork was conducted in accordance with the THC Archeological Survey Standards for Texas.

The cultural resources survey of the Halcon Pipeline APE did not result in finding any historic or prehistoric artifacts, features, cultural lenses, or sites and no artifacts were collected on TGLO lands. Therefore, it is recommended that construction of the proposed Halcon Pipeline on TGLO lands will have no effect on any historic property that may qualify for inclusion on the NRHP or SAL listings. No further cultural resources investigations are recommended prior to construction of the proposed Halcon Pipeline on TGLO lands. If cultural material, including sites, features, or artifacts that are 50 years old or older are encountered within the APE during construction of the Halcon Pipeline on TGLO lands, work in the area must cease and the regional THC Archeologist (512-463-6096) must be notified immediately.

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