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## A Cultural Resource Survey for the Proposed Dawson's West Kermit 3D Seismic Project, Kermit, Loving and Winkler Counties, Texas

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## A Cultural Resource Survey for the Proposed Dawson's West Kermit 3D Seismic Project, Kermit, Loving and Winkler Counties, Texas

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# Cultural Resource Report

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## Dawson's West Kermit 3D Seismic Project Kermit, Loving and Winkler Counties, Texas



### Prepared for

CRC, LLC  
and  
Dawson Geophysical



August 2017

# **Cultural Resources Report**

**A Cultural Resource Survey for  
the Proposed Dawson's West Kermit 3D Seismic Project,  
Kermit, Loving and Winkler Counties, Texas**

**By  
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and  
Christina Chavez**

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and  
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**Under  
Permit No.  
THC 8084**

Prepared for  
CRC, LLC  
and  
Dawson Geophysical

Prepared by  
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Albuquerque, New Mexico 87107

Marron Project No. 17039.09  
August 2017

## MANAGEMENT SUMMARY

CRC, LLC was contracted by Dawson Geophysical of Midland, Texas to conduct a 100-percent intensive pedestrian survey of within a 43-square mile area located within the southern portion of Loving County and western Winkler County, Texas. The proposed project entails 3D seismic survey within this 43-square mile area with both source and receiver lines. The project area is on University of Texas lands.

CRC conducted the cultural resource survey from July 5, to August 9, 2017. Marron was brought onto the project to record cultural resources that were identified by CRC and complete the report. Marron's fieldwork began on August 10 and finished August 20, 2017. Dr. John Griggs of CRC was the Principal Investigator for the project. Toni R. Goar served as Project Manager for Marron's phases of the project. All work was completed under THC Permit 8084.

The total length of seismic lines surveyed was 758.42 kilometers (471.36 miles) with a 30-meter survey width. Total area surveyed within the 43-square mile area was 2,207.53 hectares (5,454.72 acres).

Twenty-three (23) sites and 142 isolated occurrences were recorded. Twenty-two (22) sites are recommended as not eligible to the National Register of Historic Places, due to the lack of radiocarbon material and deflated state of the areas. One site, (41LV87) has an undetermined eligibility based on the unknown potential for buried cultural deposits. Further testing is recommended to best determine the sites integrity. All of the sites will be avoided by a reroute around each site. At each site, a 50-foot buffer was flagged and an additional 50-foot area outside the buffer was inspected for cultural resources. This "work zone" will be used during the seismic survey to avoid the sites. The isolated occurrences do not meet the criteria for eligibility to the NRHP and no further treatment is recommended.

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## PROJECT DESCRIPTION

CRC, LLC (CRC) was contracted by Dawson Geophysical of Midland, Texas to conduct a 100-percent intensive pedestrian survey of within a 43-square mile area located within the southern portion of Loving County and western Winkler County, Texas (Figures 1 through 10). The proposed project entails 3D seismic survey within this 43-square mile area with both source and receiver lines. The project area is on University of Texas lands.

CRC conducted an intensive (100 percent) cultural resource survey from July 5, to August 9, 2017. Dr. John Griggs, Robert d'Aigle, John Salard, Janna Salard, Hamzah Jule, and Tom Hough completed the survey. Dr. John Griggs served as the Principal Investigator and Robert d'Aigle served as Field Director.

Marron and Associates (Marron) was brought onto the project to record cultural resources that were identified by CRC and complete the report. Marron's fieldwork began on August 10 and finished August 20, 2017. Fieldwork for this phase of the project was completed by Toni R. Goar, R. Stanley Kerr, Christina Chavez, Ardale Delena, Robert Debry, Joshua Vallejos, John Salard, and Tom Hough. Toni R. Goar served as Project Manager for Marron's phases of the project. All work was completed under Texas Historical Commission (THC) Permit 8084.

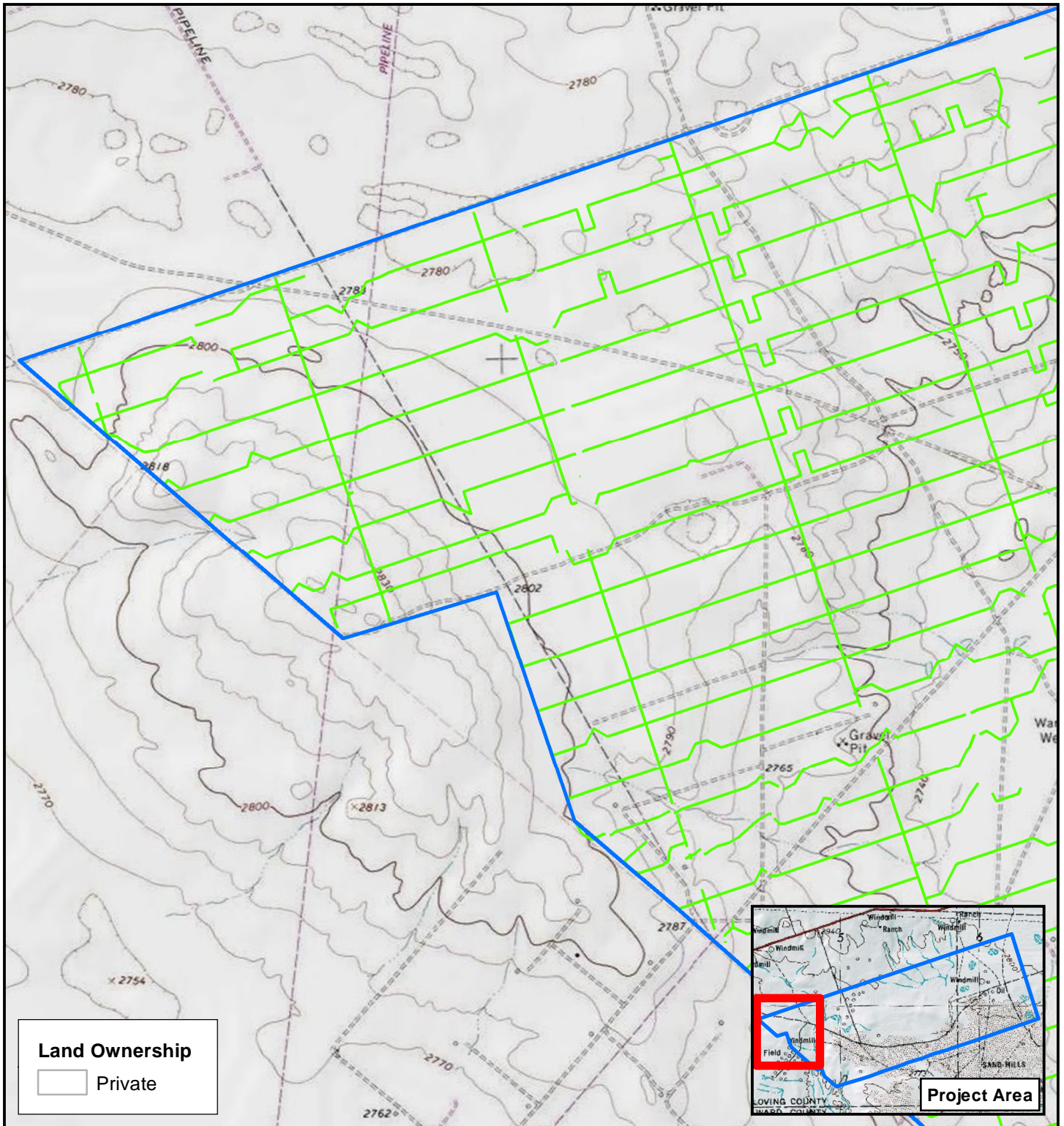
The survey was conducted in order to comply with the National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470, NHPA), 36 CFR 800, and all other federal and state regulations.

### Project Location

The project area is located on University of Texas lands, west of Kermit, Texas. The project is depicted on US Geological Survey (USGS) 7.5-minute topographic quadrangle *Soda Lake* (1981; 31103-E4).

The total length of seismic lines surveyed was 758.42 kilometers (km) (471.36 miles [mi]) with a 30-meter (m) survey width. Total area surveyed within the 43-square mi area was 2,207.53 hectares (ha) (5,454.72 acres [ac]). Universal Transverse Mercator (UTM) coordinates for the corners of the survey area are listed in Table 1.



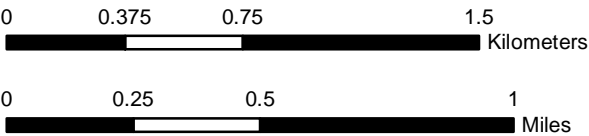


**Land Ownership**  
 □ Private

▭ Project Area  
 ▭ Survey Area

Soda Lake, TX  
 USGS 7.5' Quadrangle

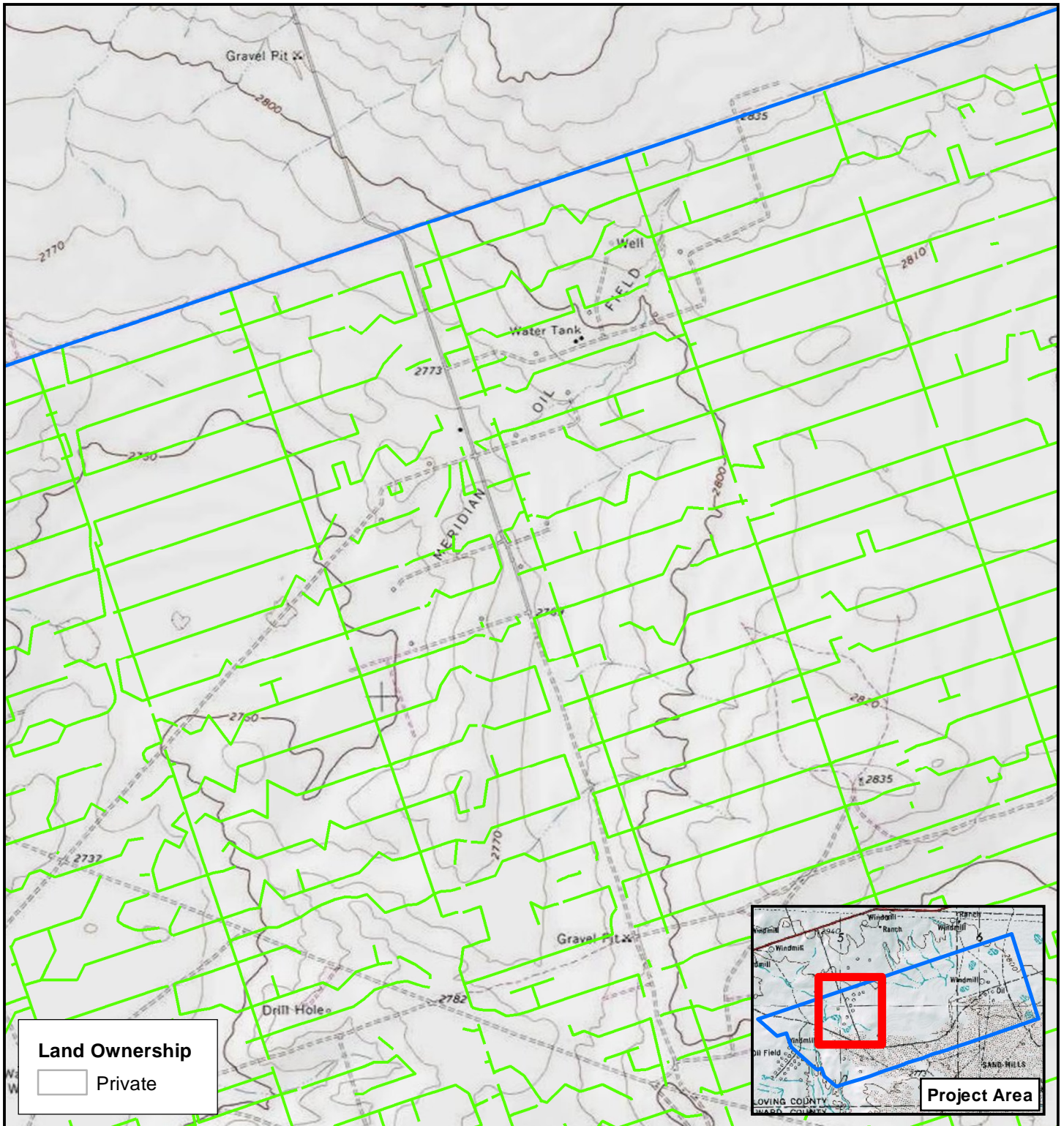
Loving County, Texas



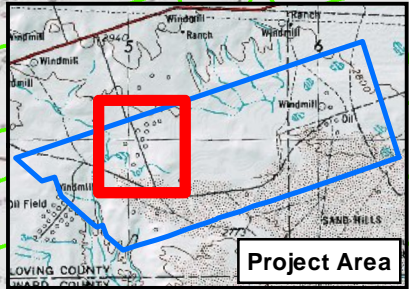
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**Figure 1**  
**Project Location Map**







**Land Ownership**  
 □ Private

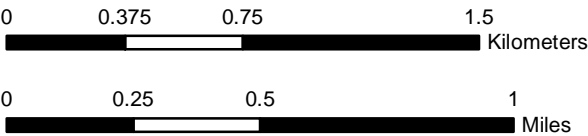


  
**Figure 2**  
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 Project Area  
 Survey Area

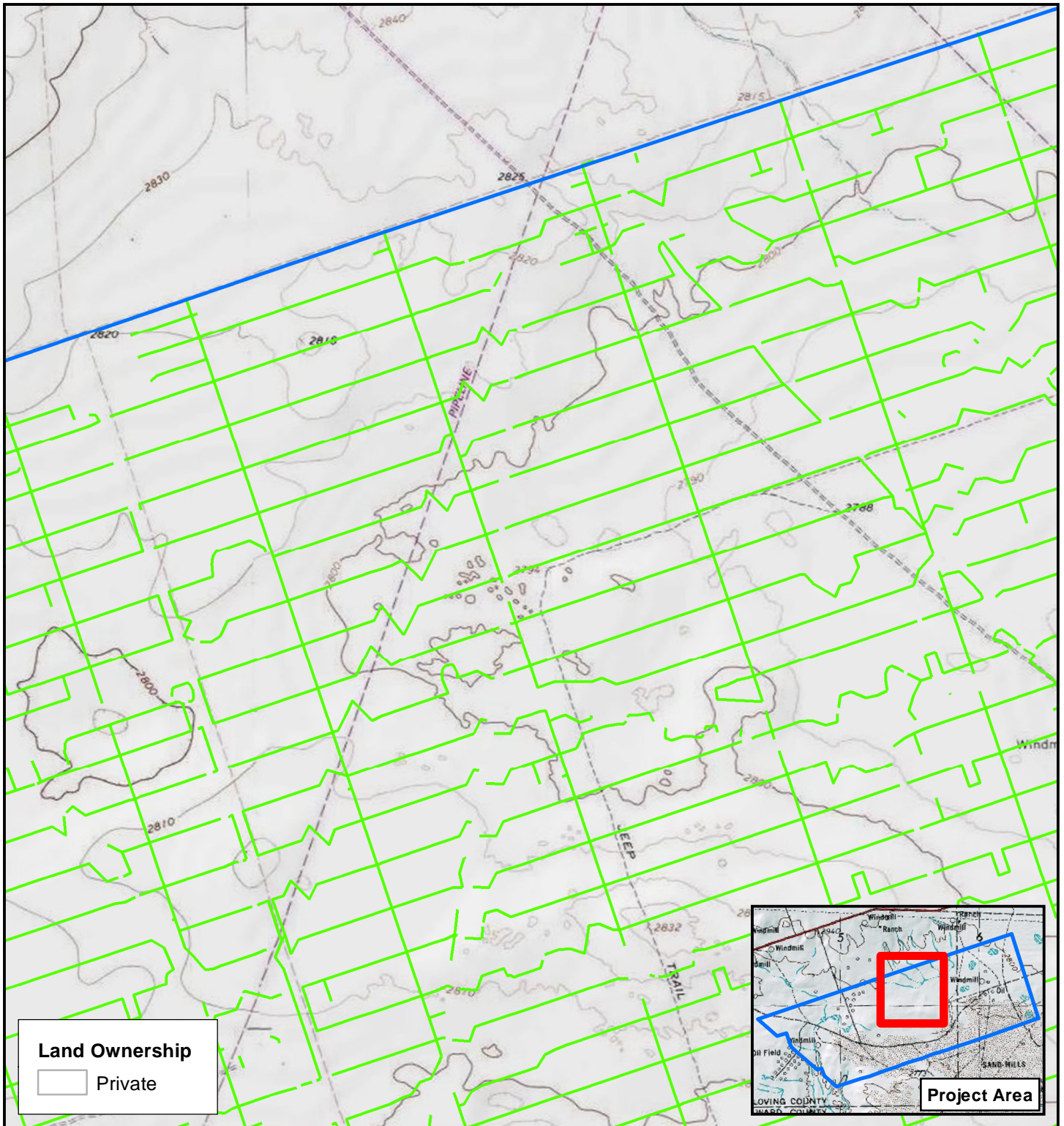
Soda Lake, TX  
 USGS 7.5' Quadrangle

Loving County, Texas



1:24,000

**Dawson's West Kermit 3D Seismic, Loving & Winkler Counties, Texas**



**Land Ownership**  
 □ Private

□ Project Area  
 — Survey Area

Soda Lake, TX  
 USGS 7.5' Quadrangle

Loving County, Texas

0 0.375 0.75 1.5  
 Kilometers

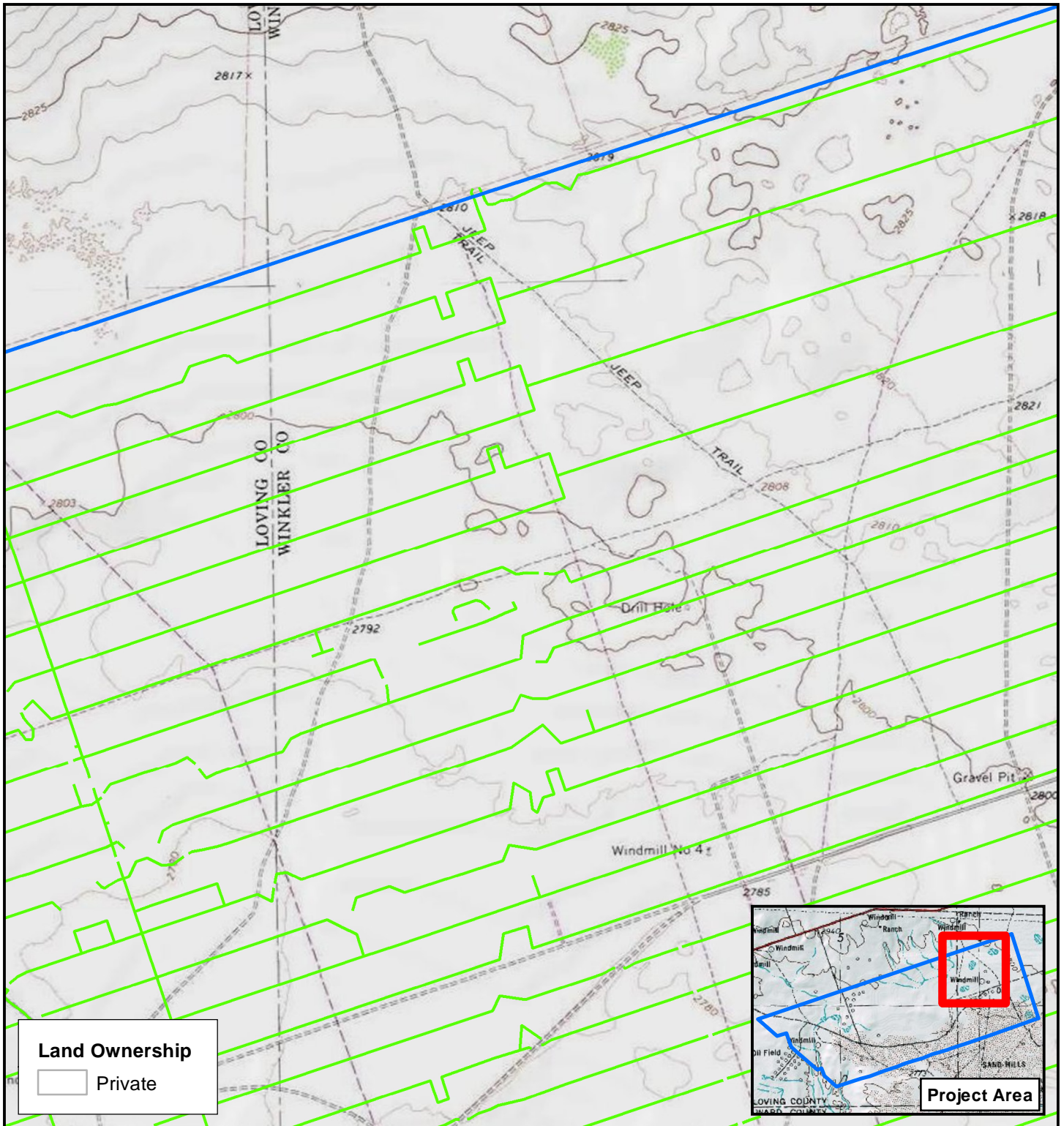
0 0.25 0.5 1  
 Miles



1:24,000

**Figure 3**  
**Project Location Map**





**Land Ownership**  
 □ Private

**Project Area**



**Figure 4**  
**Project Location Map**

□ Project Area  
 — Survey Area

Soda Lake, TX  
 USGS 7.5' Quadrangle

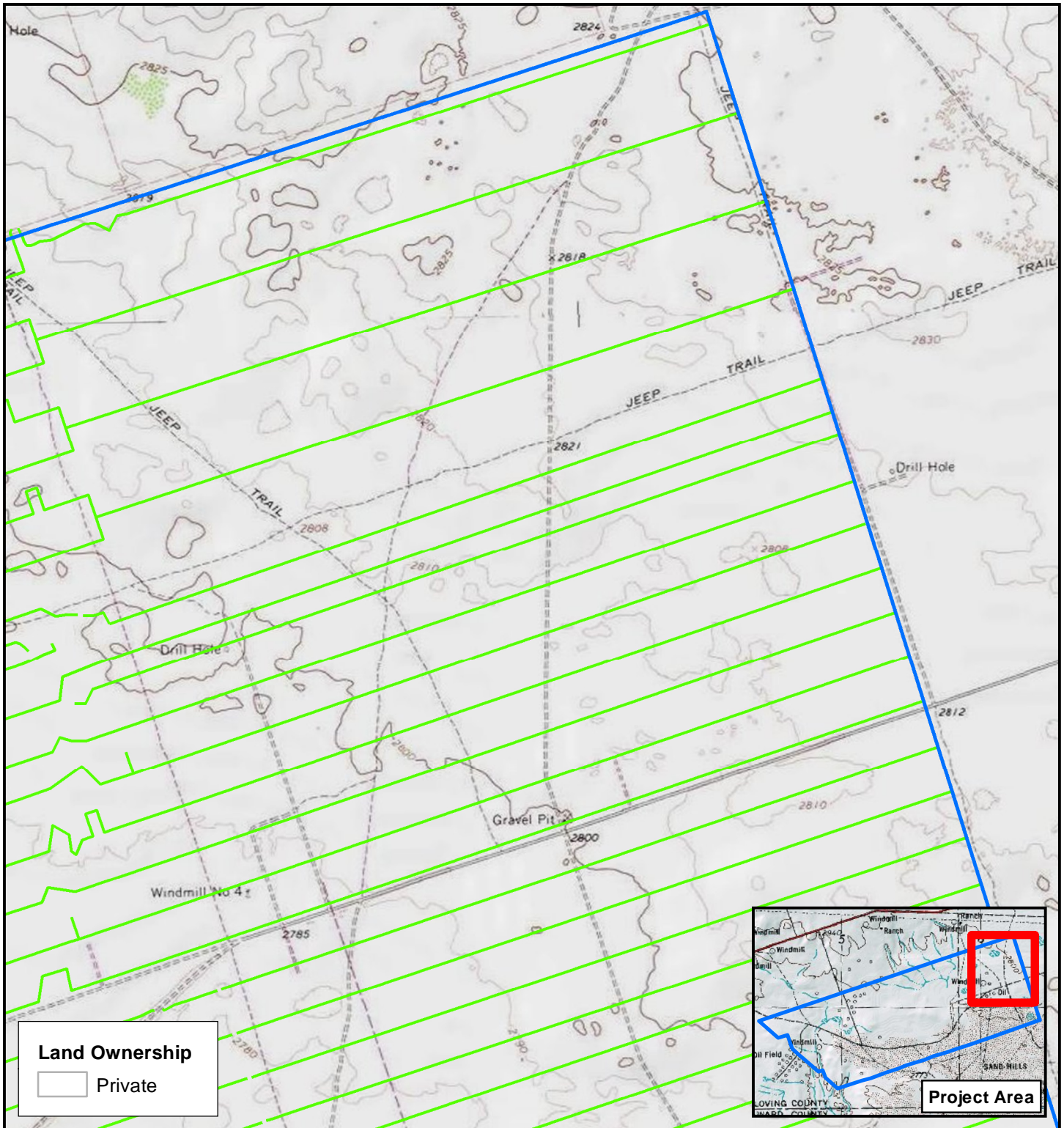
Loving & Winkler  
 Counties, Texas

0 0.375 0.75 1.5  
 Kilometers

0 0.25 0.5 1  
 Miles



1:24,000



**Land Ownership**  
 □ Private

□ Project Area  
 — Survey Area

Soda Lake, TX  
 USGS 7.5' Quadrangle

Winkler County, Texas

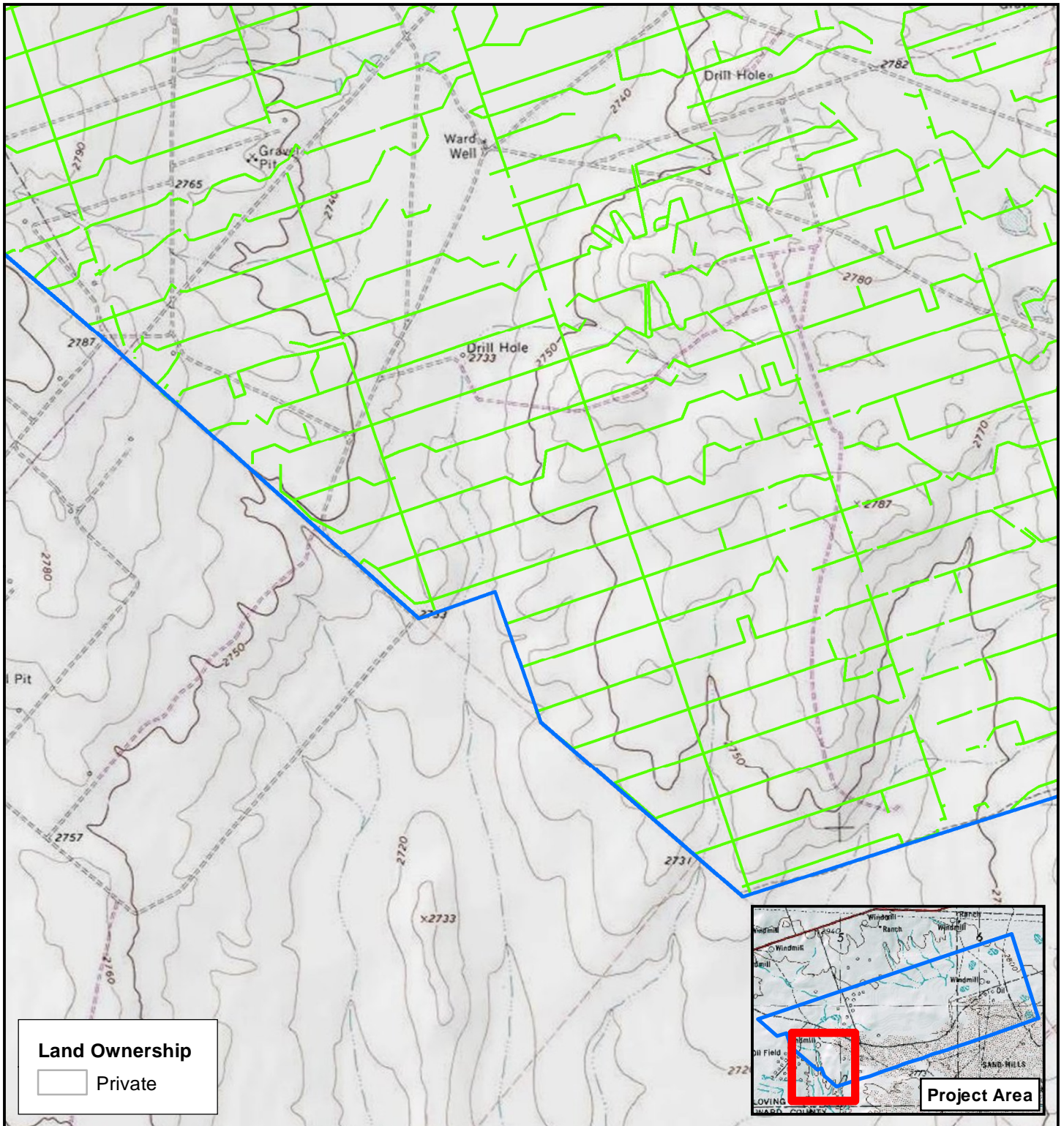
0 0.375 0.75 1.5  
 Kilometers

0 0.25 0.5 1  
 Miles



1:24,000

**Figure 5**  
**Project Location Map**



**Land Ownership**  
 Private

**Project Area**  
 Survey Area

Soda Lake, TX  
 USGS 7.5' Quadrangle

Loving County, Texas

0 0.375 0.75 1.5 Kilometers

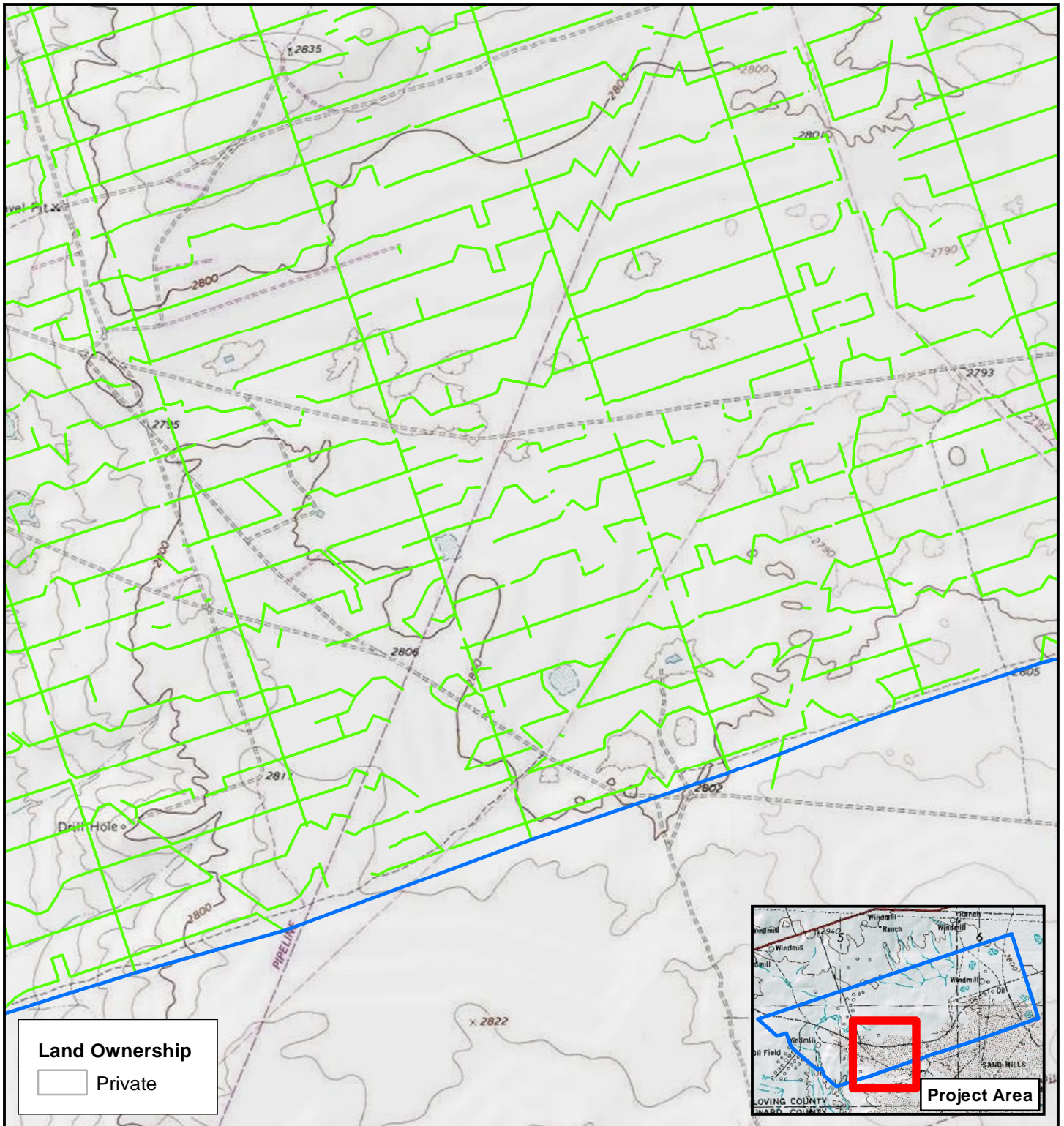
0 0.25 0.5 1 Miles



1:24,000

**Figure 6**  
**Project Location Map**





**Land Ownership**  
 Private

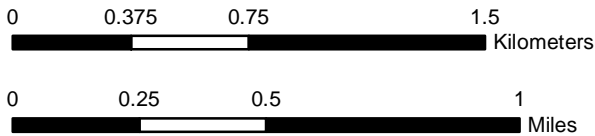


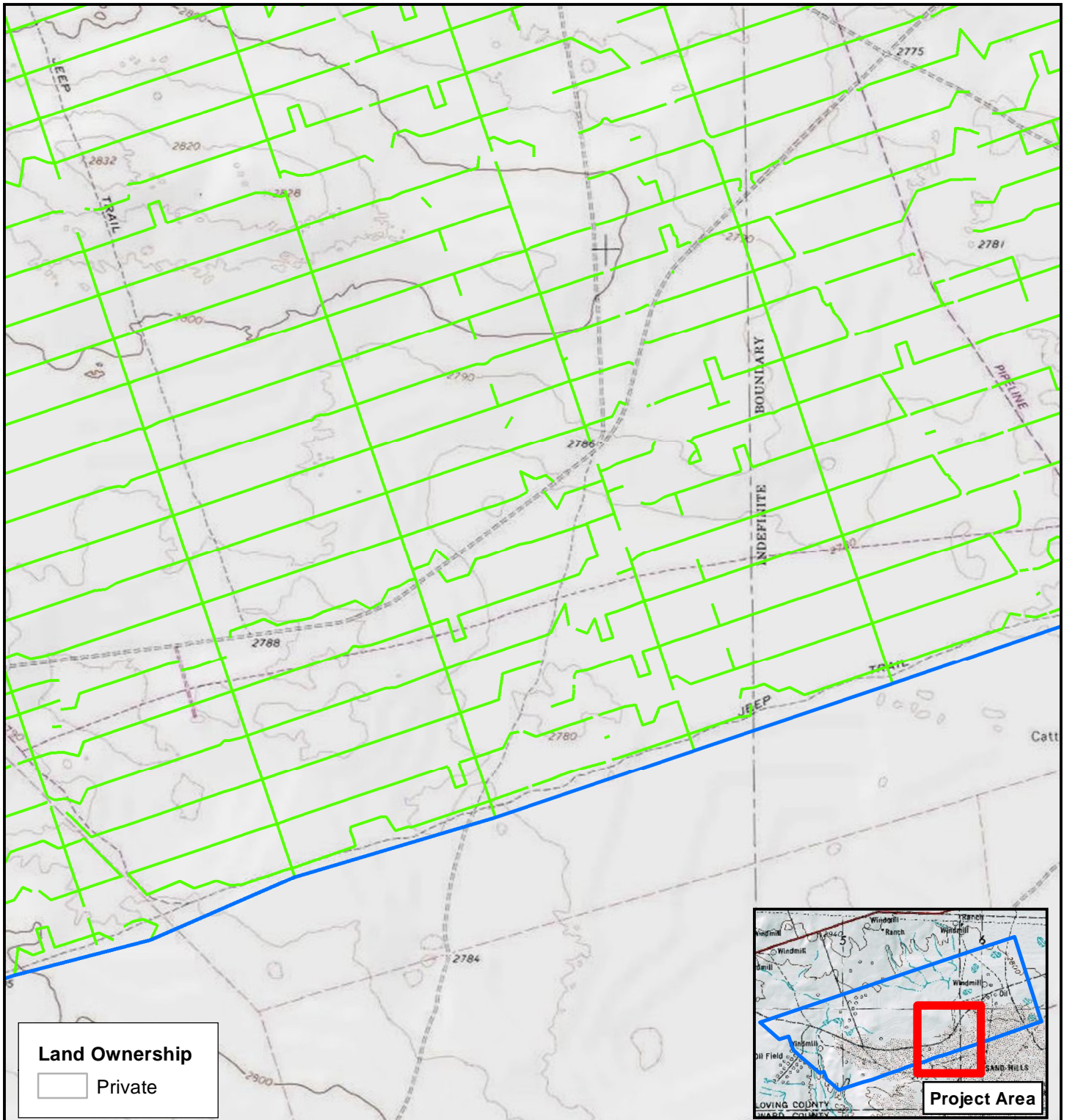
**Figure 7**  
**Project Location Map**

**Project Area**  
 Survey Area

Soda Lake, TX  
 USGS 7.5' Quadrangle

Loving County, Texas






**Land Ownership**  
 □ Private

▭ Project Area  
 — Survey Area

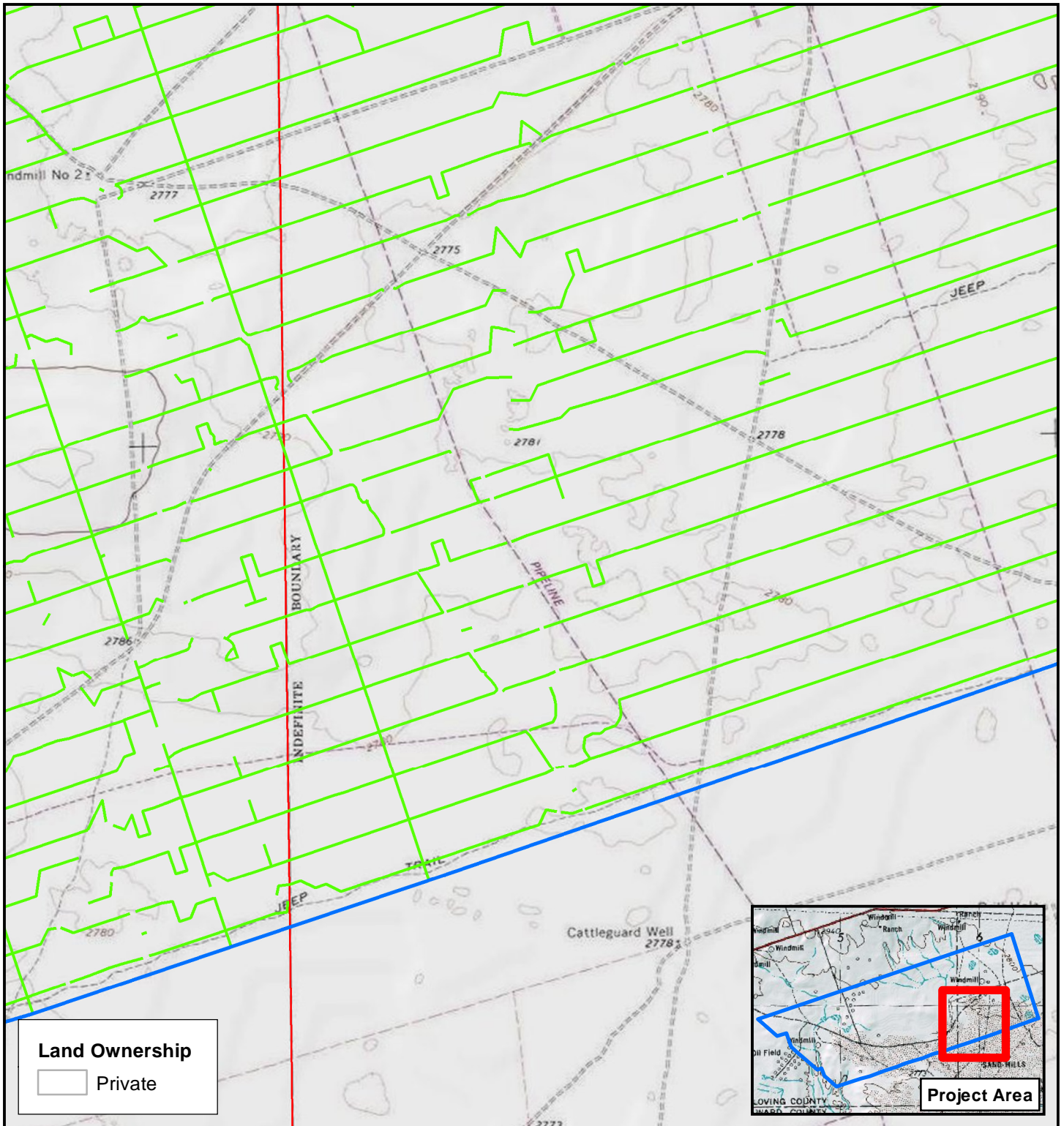
Soda Lake, TX  
 USGS 7.5' Quadrangle

Loving County, Texas

  
**Figure 8**  
**Project Location Map**



1:24,000



**Land Ownership**

□ Private

□ Project Area

— Survey Area

Soda Lake, TX  
USGS 7.5' Quadrangle

Loving & Winkler  
Counties, Texas



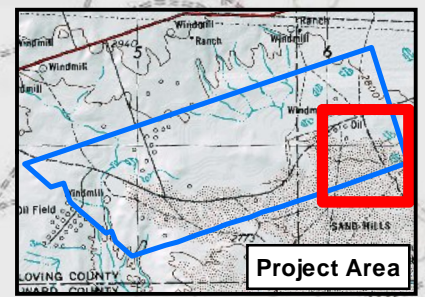
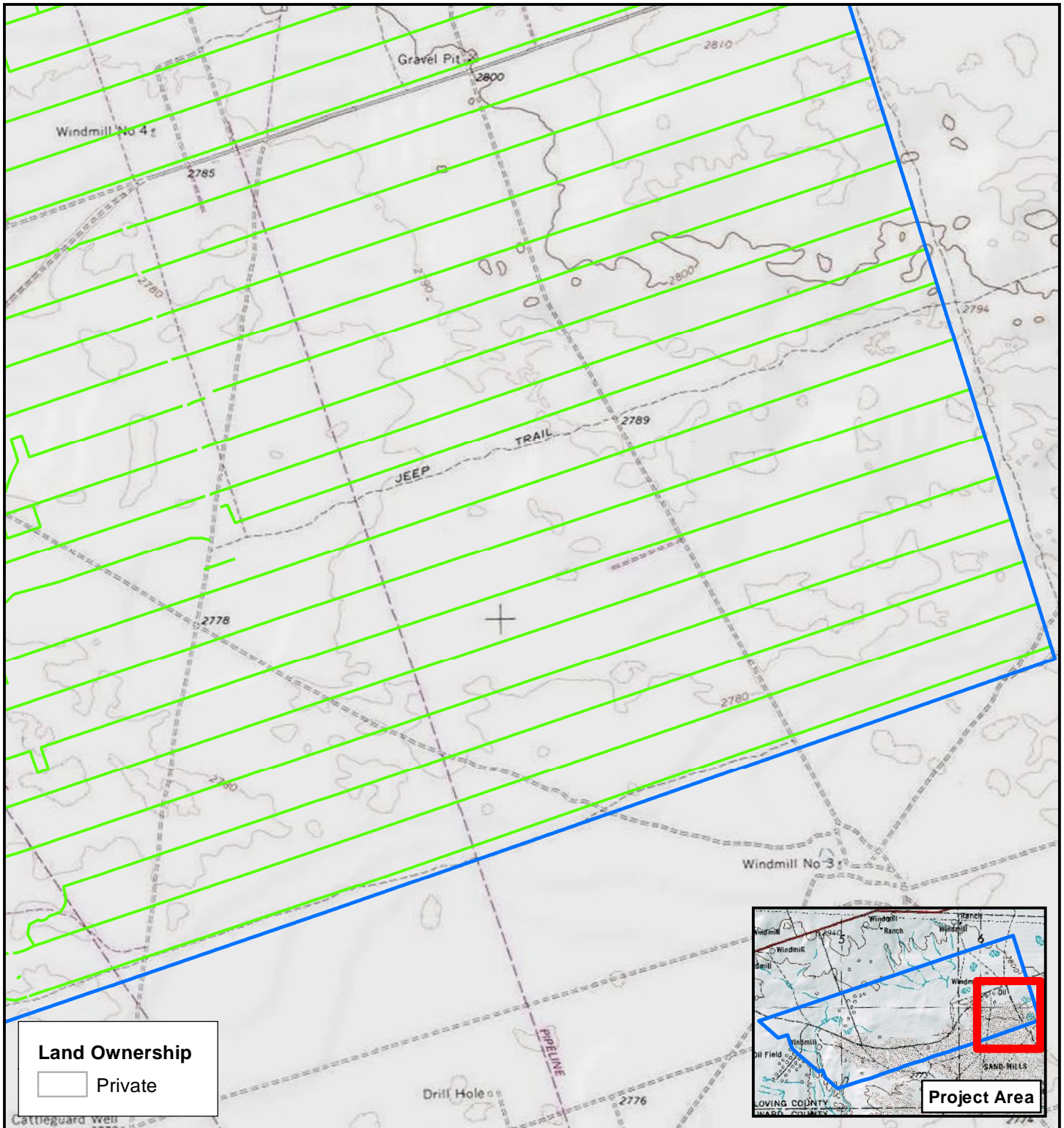
**Figure 9**  
**Project Location Map**

0 0.375 0.75 1.5  
Kilometers

0 0.25 0.5 1  
Miles



1:24,000

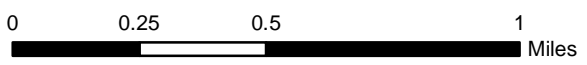


**Figure 10**  
Project Location Map

- Project Area
- Survey Area

Soda Lake, TX  
USGS 7.5' Quadrangle

Winkler County, Texas



1:24,000

**Table 1 — Project Coordinates**

Description	UTMs (NAD 83, Zone 13)	
	Easting	Northing
Northwest corner	643949	3509151
Southwest corner	649677	3504303
Northeast corner	662323	3515319
Southeast corner	664254	3509228

## ENVIRONMENT

### Physiography

This project area is located within the Pecos Valley Section of the Great Plains Province and High Plains Section (Rives 1999:100; Smith 2010a). The Pecos Valley is bounded by the Llano Estacado in the northeastern section. The Llano Estacado has a nearly flat to undulating surface with a slight gradient to the east and southeast of 3.0 m to 4.6 m (10 ft to 15 ft) per mile (Turner et al. 1974:85). The project area elevation ranges from 814.121 m to 973.23 m (2,671 ft to 3,193 ft) above mean sea level (amsl).

Sedimentary rock and deposits within Winkler County are from the Triassic, Cretaceous, Tertiary, and Quaternary age (Rives 1999:100). Geologic parent strata consist of Permian “redbeds” to Holocene alluvial and eolian deposits (Rives 1999:99). The strata consists of “limestone, shale, sandstone, and caliche and unconsolidated gravel, sand, silt, and clay sediment” (Rives 1999:99).

### Soils

The area consists of gently rolling to level terrain. Tall sand dunes create a belt within the central portion of Winkler County. Soils consist of dark brown, to reddish-brown sands, sandy loams, clay loams, and shallow calcareous clay loams (Smith 2010a). Many large and small playas collect rainfall on nearly flat surfaces.

The most common soil deposits within Winkler County consist of Elgee-Penwell complex, Penwell-Dune land complex, Wickett-Pyote complex, and Pyote fine sand ([websoilsurvey.sc.egov.usda.gov](http://websoilsurvey.sc.egov.usda.gov)). The Elgee-Penwell complex is characterized as gently undulating with very deep, sandy soils on upland plains and ridges (Rives 1999:28). The Penwell-Dune land complex consists of hummocky, very deep, and sandy eolian soils in the upland plains (Rives 1999:39). Wickett-Pyote complex soils are gently undulating with moderately deep to very deep deposits on upland plains (Rives 1999:45). Pyote fine sand is gently undulating with very deep hummocky deposits on upland plains (Rives 1999:40).

### Water

Prior to settlement, water was more abundant given that the Pecos River was wider, deeper, and faster with its tributaries functioning as perennial streams (Rives 1999:57). In addition, playas tended to hold

water for many months after rains. Due to unregulated hunting, overgrazing, range fencing, changes in wildlife and vegetation occurred.

### Climate

Winkler County has a semiarid climate characterized by seldom wet soils below the root zone (Rives 1999:99). The average rainfall ranges from about 25.4 centimeters (cm) (10 in) along the Pecos River to approximately 33.02 cm (13 in) in northeastern Winkler County, along the caprock escarpment (Rives 1999:99). Based on the limited amount of rainfall, most soils have an accumulated layer of calcium carbonate. The average temperatures range between -2.22 degrees Celsius (°C) (28 degrees Fahrenheit [°F]) in January and 36.11°C (97°F) in July (Smith 2010a). The low rainfall and high temperatures prevent the accumulation of significant amounts of organic material in the soil (Rives 1999:99).

### Vegetation

Vegetation is characterized by varied grasses, scrub brush, cacti, creosotebush, honey mesquite (*Prosopis glandulosa*), Havard oak, sand sagebrush (*Artemisia filifolia*), catclaw acacia, broom snakeweed (*Gutierrezia sarothrae*), fourwing saltbush (*Atriplex canescens*), yucca (*Yucca* sp.), broom indigobush (*Psoralea scoparius*), sand bluestem (*Andropogon hallii*), hairy grama (*Bouteloua hirsuta*), muhly (*Muhlenbergia* spp.), and dropseed (*Sporobolus* spp.) (Dick-Peddie 1993:128–129, 137–138), and scattered mottes of willows and wild plums (Rives 1999; Smith 2010a).

### Fauna

Prior to settlement, the dessert grasslands supported large herds of migrating bison (*Bison bison*), pronghorn antelope (*Antilocapra americana*), gray wolf (*Canis lupus*), and prairie chicken (*Tympanuchus pallidicinctus*) (Rives 1999:57). Fauna found in the area include desert mule deer (*Odocoileus hemionus*), scaled quail (*Callipepla squamata*), mourning dove (*Zenaida macroura*), and coyote (*Canis latrans*) (Rives 1999). At least 25 different kinds of rodents inhabit the area along with cottontail rabbits (*Lepus sylvaticus*), Black-tailed jackrabbits (*Lepus timidus*), raccoon (*Procyon lotor*), Striped skunk (*Mephitis mephitis*), badger (*Taxidea taxus*), gray fox (*Urocyon cinereoargenteus*), Collared Peccary javelin (*Pecari tajacu*), bobcat (*Lynx rufus*), and on occasion, mountain lion (*Puma concolor*) (Rives 1999:58).

## CULTURAL OVERVIEW

The following section is a general cultural overview of the project area and region. The information is gathered from various publications and investigations conducted in the region (Corley 1965; Jelinek 1967; Applegarth 1976; Leslie 1979; Kelley 1984; Katz and Katz 1985a, 1985b). Specific to the project location and surrounding area, Stuart and Gauthier (1984), Sebastian and Larralde (1989), and Katz and Katz (1993) have prepared comprehensive cultural overviews for southeastern New Mexico and the High Plains and East Trans-Pecos region. More recent publications, such as Hogan (2006), Katz and Katz (2001), and Railey et al. (2009) formed the basis for much of the following, but much of the information yielded from these sources still derives from data collected no later than the early 1990s (Katz and Katz 2001:Preface).

**Paleoindian Period (ca. 11,600–5200 BC)**

The Paleoindian period (ca. 11,600–5200 BC) is the earliest substantiated cultural manifestation in the region. It has been divided into three subperiods or complexes—Clovis (11,600–10,900 BC), Folsom (10,900–10,000 BC), and Plano/Cody (10,000–5200 BC)—based on cultural groupings as determined by projectile point morphologies (Perttula 2004; Huckell and Judge 2006). These generally correspond with the Paleoindian 1, 2, and 3 phases of Katz and Katz (2001:33-34), who also postulated a hiatus (6200–5200 BC) at the end of the period that included the late Plano and extended into the beginning of the Archaic.

The climate at the beginning of the Paleoindian period was considerably cooler and wetter than today, with regions such as the Llano Estacado dotted with shallow lakes; however, little is known about Pecos Valley climate during this period, with the exception of the Blackwater Draw locality (Katz and Katz 2001:32). Paleoindian chipped-stone assemblages exhibit a very refined and standardized technology, and stylistically distinct projectile points associated with late Pleistocene and early Holocene megafauna differentiate these complexes. These three primary complexes and the characteristics that define them are further outlined below. Additional information on individual sites representative of these complexes are thoroughly described in Hogan (2006) and Huckell and Judge (2006).

Clovis sites are typified by the Clovis point, which are relatively large, bifacially-flaked lanceolate points with a concave base and fluting on both sides. The fluting rarely extends the length of the point and often reaches only halfway (Huckell and Judge 2006:150). These projectile points are generally associated with hunting mammoths, bison, and other extinct Pleistocene megafauna such as mastodon, camel and horse. Primary Clovis site types are kill sites, camps, caches and lithic quarries, all of which tend to be closely associated with streams or marshy ponds, as these locations would be prime gathering sites for fauna (Huckell and Judge 2006:150). The Clovis tool kit also includes blade cores, large bifaces, spurred end scrapers, large unifacially-flaked side scrapers, keeled scrapers on large blades, flake knives, backed-worked blades, graters, perforators, shaft straighteners, as well as bone points and foreshafts (Gunnerson 1987:10; Stanford 1999). An example of a Clovis type site is Blackwater Draw, located between the towns of Clovis and Portales, New Mexico.

Folsom sites are defined by the Folsom point, which are smaller, thinner, and more delicate than Clovis points (Huckell and Judge 2006:154). They are primarily distinguished by flutes on both faces that extend the entire length of the point, though in some cases only one side may be fluted. The base is generally concave and the edges finished with fine pressure flaking; overall, the Folsom point exhibits a high degree of craftsmanship (Huckell and Judge 2006; Katz and Katz 2001). Sites typical of the Folsom complex are similar to Clovis, though the primary faunal food source for this period was now-extinct forms of bison, as the late Pleistocene megafauna had disappeared with the gradual warming of the Holocene. The Folsom tool kit also includes unfluted Midland points, knives, pointed scrapers, choppers, drills, graters, spokeshaves, abrading stones, awls, and needles (Gunnerson 1987:13 Stanford 1999). Folsom assemblages are indicative of a hunting and gathering subsistence economy that focused on the seasonal availability of animal and plant resources. At least one Folsom type site is located near Folsom, New Mexico.

Plano/Cody cultures are characterized by a variety of projectile point types and knife forms. Projectile points consist of large lanceolate forms with basal grinding and large parallel flaking. This complex is also associated with the hunting of now-extinct forms of bison. These Late Paleoindian complexes are admittedly the least understood of the Paleoindian cultures while being the most numerous (Stanford 1999:326). During the transitional shift to the Archaic, human populations were expanding, which caused a reduction in band territory sizes. This reduction resulted in a greater reliance on local resources and often, movement to higher elevations or river valleys (Stanford 1999:326). The current project area did not locate or identify any Paleoindian type sites.

### **Archaic Period (ca. 5,200 BC – AD 500)**

While Archaic populations began to grow, other regions saw the adoption of maize; however, there is no similar evidence of this in the Permian Basin area (Railey et al. 2009; Stuart and Gauthier 1984:267). It is likely that the Archaic populations in the region were still primarily reliant on hunting and gathering. As the climate became warmer and more arid, there was a shift towards resource diversification in addition to the continuation of the mobile hunting and gathering pattern of the Paleoindian period. In other words, the Archaic adaptation was a “diffuse” economy (Judge 1982:49). The resource base included a variety of plants and the modern suite of Plains fauna. Archaic populations most likely had a primary dependence on plant foods, a seasonally mobile settlement pattern, and a flexible social structure in which group size and composition varied in response to changing economic opportunities. Seasonal reoccupation occurred in areas where the density and distribution of key plant resources was predictable (Judge 1982:49).

The Archaic period of the region is generally divided into Early (5200–3000 BC), Middle (3000–1800 BC), and Late phases (1800 BC–AD 500). Archaic projectile points include a combination of both Southwestern and Texas traditions, but are not as uniformly associated with clear temporal periods as they are in the Paleoindian period. The only projectile point directly associated with the Early Archaic in this region is the Jay point, (similar to the Mojave type) which is a highly variable, stemmed lanceolate point with an elongated, slender design and weak shoulders (Irwin Williams 1979; Justice 2002:97).

The Middle and Late Archaic periods are associated with medium-size stemmed dart points including Darl and Leslie's (1978) types 8C (Palmillas), 8D (Carlsbad), and 9. Darl points are described as carefully flaked with a long and slender shape. They exhibit slight shoulders and an expanding or rectangular stem (Hogan 2006: 4-7; Turner and Hester 1999:101). Palmillas are small leaf-shaped points with slight to well-barbed shoulders and an expanding stem with a knob-like convex base (Katz and Katz 1985b:67; Turner and Hester 1999:167). Points resembling Palmillas are found frequently in the Guadalupe Mountain Area (Hogan 2006:4-7). Carlsbad points appear to be a local style, with a triangular blade, wide corner notches and a long, widely expanding stem (Hogan 2006: 4-7; Katz and Katz 1985b:67; Lord and Reynolds 1985:153).

The end of the Late Archaic period (0 to AD 500) is characterized by projectile points such as San Pedro; Leslie's 6C, 6D, and 8A; and three varieties of Pecos points (Hogan 2006: 4-8; Katz and Katz 2001:36). San Pedro points are typically long slender points with deep lateral notches and a straight to slightly convex base. Pecos is a provisional type defined by Katz and Katz (1985 b:68–69). It is described as a triangular



point with small but prominent barbs and a slightly contracting stem. The stem is long and the base may be convex, rectangular, or indented (Hogan 2006: 4-8).

### **Formative Period (AD 500–1450)**

The Formative period is marked by the appearance of the bow and arrow, brownware pottery, and a reliance on bison hunting. Later, sedentism and horticulture occurred in some portions of the region (Turnbow et al. 2000:10). Agriculture was practiced on a very modest scale near major rivers (Stuart and Gauthier 1984:274–275). As summarized by Stuart and Gauthier (1984), “culture development in southeastern New Mexico loosely parallels developments in both the Anasazi and Mogollon areas to the west between roughly AD 800 and AD 1300, though on a far more modest scale” (Stuart and Gauthier 1984:275). By AD 1400, agriculturalists had largely abandoned the area, although an end date of AD 1450 is proposed to close the gap with the beginning of the Protohistoric period (Hogan 2006:4-18). “The initial appearance of Formative period traits occurred primarily along major river valleys and probably reflects the addition of new traits to the Late Archaic assemblage base” (Turnbow et al. 2000:10).

As listed by Hogan (2006:4-17), some of the more common Formative ceramic types are: Jornada Brown (ca. AD 200–1350), El Paso Brown (ca. AD 400–1300), Chupadero Black-on-white (ca. AD 1100–1500), and El Paso Polychrome (ca. AD 1100–1400).

### **Proto/Ethnohistoric Period (AD 1450–1750)**

As indicated by Sebastian and Levine (1989:93), “the Protohistoric is the least understood and least studied period in the entire prehistoric–historical continuum in the Southwest.” The beginning date for the Protohistoric period in this region is tentatively set at AD 1450, when it seems as though agriculture was largely abandoned and local hunting and gathering adaptations became increasingly mobile and focused more and more on the procurement of bison (Hogan 2006:4-18). This economic shift may have resulted from deteriorating environmental conditions or from an increased availability of bison (Sebastian and Levine 1989:94).

It is probable that pre-Apache, nonsedentary groups had inhabited portions of the region during the Formative period. In addition, it is also likely that pre-Apache Plains nomads were pushed into the area by the southward migration of Athapaskan groups (Sebastian and Levine 1989:94). Although the Protohistoric period in extreme southeastern New Mexico/High Plains is poorly understood, some sites contain evidence of later groups, such as the Apache, Kiowa, and Comanche (Leslie 1979:193; Sebastian and Levine 1989:95). As with Paleoindian sites, Proto/Ethnohistoric sites are generally small and located primarily in elevated settings close to water. The vast majority of recorded Proto/Ethnohistoric-period sites are in the southern Pecos Valley portion of the region. Although known sites of this period include hearths, burned-rock scatters, chipped-stone scatters, and ring middens, these sites cannot be distinguished from Archaic or Formative sites in the absence of diagnostic artifacts. The tipi ring, however, is a distinctive feature of the Proto/Ethnohistoric period. Definite tipi rings replaced the small stone circles of the Late Formative (Katz and Katz 2001).

## The Apache

One controversial issue among anthropologists and archaeologists in the Southwest concerns the arrival of the Apache and Navajo—Southern Athapaskan groups—in the region. One hypothesis suggests Apachean groups arrived in the Southwest and Southern High Plains via the High Plains shortly before the arrival of Spaniards in the area in 1540 (Carlson 1965; Gunnerson 1956, 1974; Gunnerson and Gunnerson 1971, 1988:1–2; Hester 1962; Schaafsma 1981; Wilcox 1981). A date of ca. AD 1525 has been postulated. If this interpretation is correct, the southward Apachean migration coincided with the maximum of the “Little Ice Age.” Apachean peoples may have followed bison herds along the front range of the Rocky Mountains (Gunnerson 1956; Gunnerson and Gunnerson 1988:2). Glottochronological data suggest Apachean linguistic differentiation began ca. AD 1300. Prior to that time, the Apacheans were a single group or very closely related groups (Opler 1983a:381, 385). Based on the linguistic data, Opler (1983a:385) suggests the first Apachean groups entered the Southwest ca. AD 1400. Apache emergence and origin stories, however, place them in the Southwest from the beginning of creation (Blue Panther 2006; Welker 2006).

Early Spanish chroniclers refer to the presence of several nomadic (probable Apachean), bison-hunting groups—Querechos, Teyas, Vaqueros, Faraones—on the Llano Estacado. The relationship of these groups, however, with known historic native groups is problematic, given the uncertainty as to which group or groups the names apply. The Sierra Blanca Apache were first reported in the Sierra Blanca Mountains in 1653. Apaches de Siete Rios, an Apachean group living in the Seven Rivers area, between the Pecos River and the Guadalupe Mountains, were first mentioned in 1659. Prior to 1720, the name Faraón did not refer to any specific geographical group. It was applied to Apachean groups both west and east of the Rio Grande. From 1720 to 1726, all Apaches between the Rio Grande and the Pecos River were called Faraones. Although Mescalero replaced the name Faraón in 1814, the latter name was still used on maps until 1858 (Opler 1983a:389–390). “The Faraones have not been firmly identified with a modern Apache tribe, but it seems likely that they merged with the Mescaleros” (Opler 1983a:390). The first reported use of the name Mescalero was in 1745 and as indicated above, use of this name eventually replaced that of Faraón in the north and Natagé in the south (Opler 1983b:438).

“In Spanish, Mescaleros (also spelled Mezcaleros) means ‘people of the mescal,’ a reference to the Mescaleros’ use of this plant (*Agave* spp.), also called century plant, as a staple food” (Opler 1983b:437). The Mescalero established their territory east of the Rio Grande, in southeastern New Mexico and northwestern Texas and adjacent portions of northern Mexico (Opler 1983a:385, 1983b:419). The Rio Grande formed the western boundary of Mescalero territory. Although Mescalero settlements were west of the Pecos River, “buffalo and antelope hunts, expeditions for salt and horses, and forays against enemies frequently took them farther east” (Opler 1983b:419). In the early 1700s, the Comanche forced the Mescalero to withdraw into mountainous areas. By the 1820s, the western border of the Comanche extended to the Pecos River (Kavanagh 2001:886).

## The Comanche

The Comanche are Shoshonean-speakers who probably split from the Shoshoni ca. AD 1550. The Shoshoni occupied parts of Wyoming. The Comanche may also have lived there before their arrival in the Southwest. The earliest Spanish record of the Comanche was in 1706, after which date they were

mentioned frequently. By 1730, after pushing the Cuartelejo and Jicarilla Apache farther south, the Comanche dominated the High Plains. The Comanche functioned as independent bands. Therefore, alliances and animosities between the Comanche and other tribes did not necessarily apply to all Comanche bands. In 1767, the Comanche became hostile toward the Spanish and remained so until 1787 (Gunnerson and Gunnerson 1988:29–30). By 1810, the Comanche began to lose their domination of the Central High Plains as more northerly tribes—Arapaho, Cheyenne, Kiowa, Kiowa Apache, Dakota (Sioux), Crow, and Shoshoni—moved south to the Arkansas River and beyond. The Comanche also felt pressure from eastern tribes, such as the Pawnee and Wichita, who ventured onto the High Plains in pursuit of bison (Gunnerson and Gunnerson 1988:32). By the late 1820s, the Cheyenne and Arapaho had forced the Comanche south, from the upper Arkansas River region, to the Canadian River (Kavanagh 2001:888).

### **Historic Period (AD 1750–Present)**

The 1540 to 1542 entrada of Francisco Vasquez de Coronado was the first official European entry onto the western plains of North America. However, for much of the ensuing two centuries, European interest and activity was focused on the Rio Grande Valley. Well into the 19th century, the Llano Estacado remained largely in the hands of Native American tribes, whose relations with the Spanish (and, after independence in 1821, the Mexicans), fluctuated between friendship and hostility.

Also in 1821, non-Indian populations or Spanish Tejanos numbered about 2,000 within the Mexican controlled Tejas territory. The Mexican government opened the area for outside settlement and accepted a petition from Moses Austin. Mexico awarded a large land grant to Austin with the stipulations that new American settlers become Mexican citizens, pay taxes, and not bring slaves into Mexican territory (Foner 2014). Moses agreed but died soon after and his son, Stephen began selling smaller plots of land to American settlers at 12 cents per acre (Foner 2014). By 1830, “Texans” numbered in the 7,000s, well-outnumbering the Tejanos (Foner 2014). Tensions began to rise as Texans stopped paying taxes and demanded more autonomy from the Mexican government; specifically, because slaves were continuously brought into the Tejas territory and Mexico had abolished slavery. By 1835, General Antonio Lòpez de Santa Ana sent an army to impose central authority, but the Texans viewed his actions as hostile and was “to give liberty to our slaves and make slaves of ourselves” (Foner 2014:461). On March 13, 1836, Santa Ana stormed the Alamo. All 187 Texans and Tejanos were killed. By April, Sam Houston surrounded Santa Ana and defeated the Mexican Army at the Battle of San Jacinto, forcing the recognition of Texan independence. Houston became the first president of the Republic of Texas and by 1837, Texas Congress petitioned the United States to enter the union (Foner 2014).

After the Mexican War of 1848, nearly all of present-day New Mexico was ceded to the United States (Jenkins and Schroeder 1974). The controversial Treaty of Guadalupe Hidalgo was signed by the United States and Mexico, confirming the annexation of Texas, doubling United States territory, making all previous Mexican citizens now American citizens (those who chose to stay on the northern side of the newly delineated international boundary), and creating the present U.S.-Mexico boundary. By September of 1849, Captain Randolph B. Marcy entered the region in search of a wagon route to California (Smith 2010a). By 1850, the Territory of New Mexico had been created; solidifying the state boundaries of Texas.

In 1854, Bvt. Capt. John Pope surveyed the 32nd parallel, which was the boundary between New Mexico Territory and the current Winkler County, Texas. Pope was in search of the location for railroad construction (Smith 2010a).

Until the Civil War, southeastern New Mexico remained largely unsettled by Euroamericans due to the frequent presence of Kiowas, Comanches, Apaches, and other plains tribes (Wiseman 2001:4). After the war, a large westward movement of settlers and ranchers came to the area and started a local economy based on cattle ranching. The passage of the Homestead Act in 1862 and the Desert Land Act of 1877 opened the area to legal settlement, and the establishment of US military posts and their demand for fresh beef provided the impetus for cattle ranching throughout New Mexico and the rest of the Southwest (Frazer 1983:1–2). Texas ranchers looked westward to New Mexico to find fresh range and new markets. Charles Goodnight and Oliver Loving blazed the first cattle trail toward the Pecos in 1866, and by the 1870s, John Chisum had established a vast ranch that stretched from Fort Sumner to Seven Rivers.

In 1875, Colonels William R. Shafter and Ranald S. Mackenzie conducted military campaigns in an effort to remove Comanches from their own territory. The military campaigns were successful and the area was opened to white settlement (Smith 2010a). In 1881, the Texas and Pacific Railway was built near Ward County, providing easy access to the area. Because the region provided lush grasslands, a good supply of water, open range ranching became common place (Smith 2010a). Several large-scale ranchers, such as John Avery, J.J. Draper, and the Cowden brothers (Doc, Tom, and Walter) took advantage of “free state land” (Smith 2010a).

By 1900, major changes were affecting the character of cattle ranching in New Mexico and Texas. Uninhibited use of the open range produced extensive overgrazing. The grasslands were declared public domain and large portions of it were offered to homesteaders. Drift fences were removed and replaced by barbed wire fences that delimited the new ranches. The size of these ranches was reduced to several thousand acres each. The building of windmills provided water for the pastures formed by the fencing. Although these changes helped signal the end of the huge cattle empires of the open range era, the changes contributed to the development of smaller-scale stock farming (Jordan 1993:236–240; Simmons 1988:12–13; Williams 1986:122). Legislation such as the Kinkaid Homestead Act of 1904 and the Enlarged Homestead Act of 1909 encouraged the acquisition of public land by homesteaders, and the onset of railroads in the 1890s-improved access, resulting in increased settlement. However, droughts in 1909 and 1912 and the Great Depression of the 1930s effectively brought about the end of the era of small stock farms and the abandonment of many homesteads. Since that time, farm and ranch sizes have again increased with the help of technological advances. In mid-1926, oil was discovered on land owned by Thomas G. and Ada Hendrick of central Winkler County (Smith 2010a). Oil production began to displace farming and ranching as the economic engine of the region. Currently, the oil and ranching industries dominate the economy of Winkler County.

### **Winkler County**

Winkler County was established on February 26, 1887 from territory in Tom Green County (Smith 2010a). Like most place names in Texas, the county name was to honor Confederate Col. Clinton M. Winkler. The 1890 census indicated that only 11 men and 7 women (all white) lived in Winkler County (Smith 2010a).



The census of 1900 indicated that 12 ranches were in operation by 4 owners and 8 non-owners (Smith 2010a). These 12 ranches totaled 67,537 acres with 11,982 head of cattle (Smith 2010a). The total county residents were 60 (Smith 2010a).

Between 1901 and 1905, the state allowed the sale of school lands on generous credit terms in West Texas, triggering a rush of new settlers (Smith 2010a). In 1905, the law changed to the highest bidder (Smith 2010a). With the increased population, a post office was opened in Duval on April 3, 1908, approximately 1.5 miles west of present Kermit (Smith 2010a). By 1910, the post office closed due to Duval losing the bid for county seat to Kermit. Lots in the townsite of Duval were promoted at a reasonable price, but Kermit offered theirs for free (Smith 2010a). Kermit opened a post office that same year, and by April 15, 1910, Winkler County was organized (Smith 2010a).

### **Kermit**

Kermit was named after Kermit Roosevelt, the son of President Theodore Roosevelt. A few months before the town selected a name, Kermit Roosevelt visited the T Bar Ranch to hunt antelope (Smith 2010a, 2010b). Because of a severe drought in 1916, many residents were forced to leave behind their homesteads and farms. With the discovery of oil on the Hendrick property on July 16, 1926, the town experienced a boom (Smith 2010b).

### **METHODOLOGY**

The intensive pedestrian survey was conducted using 15-m interval transects. The survey was conducted in order to comply with the National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470, NHPA), 36 CFR 800, and other federal and state regulations. The Area of Potential Effect (APE) is limited to the sources lines and receiver lines.

Documentation of all surface cultural artifacts, features, and sites was conducted. A total of 23 new sites were identified and fully recorded. Archaeological sites are defined by the presence of either a cultural feature or 10 or more artifacts older than 50 years and separated by no more than 20 m (66 ft). Areas where cultural materials are sparse (fewer than 10 items) and are 50 years or older are recorded as isolated occurrences. Archaeological sites are mapped both digitally and manually on graph paper. Digital maps are created using a Global Positioning System (GPS) unit with sub-meter accuracy. Each map includes the site boundary and the locations of the datum, any features identified, distinctive or diagnostic artifacts, drainages or other landscape features, and buffers. Identified features were fully recorded to include size and type. Each site is photographed and any cultural features. Diagnostic artifacts were collected by CRC. Curation will be at the Texas Archeological Research Laboratory (TARL). A 50-ft buffer was flagged around the site and another 50-ft area outside the buffer was inspected for cultural resources. This area will be used by Dawson to avoid all sites.

Isolated occurrences were recorded on an isolated occurrence form, analyzed in entirety, and location coordinates were recorded with a Trimble Juno GPS device.



Following field investigations, all GPS data were downloaded and differentially corrected to ensure sub-meter accuracy. Project area maps and site maps were produced using shapefiles created from the downloaded data and existing background layers, and checked against manually drawn field maps.

The Archeological Survey Standards for Texas guidelines, require shovel testing when the ground surface visibility is less than 70 percent. The proposed project area has more than 70 percent ground surface visibility, thus shovel testing was not conducted.

## PREVIOUS INVESTIGATIONS

Archival research was conducted by CRC prior to the beginning of the survey fieldwork in order to determine the potential for significant cultural deposits. The detailed site-file search identified 2 previously recorded sites within the project area. No other sites, surveys, historic buildings, or significant cultural deposits within a 1-mile radius of the proposed project boundaries were discovered during the file search.

In 1991, Site 41LV9 was recorded (State Forms, accessed August 21, 2017). The site consisted of 4 deflated burned caliche features, chipped-stone flakes, 1 unifacial tool, and 1 burned grinding slab fragment. The site was recorded during the Mitre Project on University Lands (State Forms, accessed August 21, 2017). No other data was provided and no recommendations were given. The site remains undetermined for National Register of Historic Places (NRHP) eligibility. The site is located outside the surveyed seismic lines and will not be affected.

Site 41LV10 was also recorded in 1991 during the Mitre Project (State Forms, accessed August 21, 2017). The site consisted of 8 deflated hearths, 1 quartzite flake, and scattered burned rock. No other data was provided and no recommendations were given. The site remains undetermined for NRHP eligibility. The site is located outside the surveyed seismic lines and will not be affected.

## RESULTS

Twenty-three (23) sites and 142 isolated occurrences were recorded. Maps of site and isolated occurrence locations, site plan views, and UTM coordinates for the resources are contained in Appendix A.

### Sites

#### 41LV69

<b>Field Number:</b>	Site 1
<b>Site Type:</b>	Artifact scatter
<b>Affiliation:</b>	Archaic: Unspecific (5,200 BC to AD 500)
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV69 (Site 1) is an artifact scatter located on a hillslope (Figures 11 and A11). The site measures 114 m by 82 m (374 ft by 269 ft) and is situated at an elevation of 835 m (2,740 ft) amsl. Vegetation includes grasses, cacti, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include

wind and water erosion, oil drilling, a two-track road, and cattle grazing. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 11 — 41LV69 (Site 1), Overview, View Southeast**

### Features

No features were found. Approximately 75 pieces of burned caliche were scattered across the site.

### Artifacts

Surface artifacts were analyzed in the field and include flakes, shatter, scrapers, a polishing stone, a hammerstone, and a projectile point fragment (Table 2). The flakes are both non-cortical and cortical core-reduction types (29), a pressure flake, and an edge-modified flake. The projectile point fragment is the base of a point that resembles an Archaic dart point (Figure 12). As the point is a fragment further identification was not possible. Lithic material found on the site includes various cherts, chalcedony, quartzite, and fine-grained granite. The granite (polishing stone) is likely non-local and is not a common lithic material found on sites in the region.

Table 2 — 41LV69 (Site 1) Lithic Assemblage

Raw Material	Size Category	Core-reduction Flakes	Pressure	Edge Modified	Shatter Debris	Tools
Pink chert	1-2 cm	Cortical: 1				
	2-4 cm	Cortical: 4				
Gray chert	1-2 cm	Cortical: 3	1		1	1 cortical, bifacially retouched scraper, 4 x 4.5 x 2 cm
	2-4 cm	Cortical: 1 Non-cortical: 1			1	1 projectile point fragment (5 x 2.5 x 3 cm)
	>4 cm	Cortical: 4 Non-cortical: 1				1 hammerstone 5.5 cm
Brown chert	1-2 cm	Cortical: 2				
	2-4 cm	Cortical: 1 Non-cortical: 1				
	>4 cm	Non-cortical: 1				
Jasper	2-4 cm	Cortical: 1 Non-cortical: 1				
Black chert	2-4 cm	Cortical: 2 Non-cortical: 1				
White chert	2-4 cm	Cortical: 2		1 retouched unifacial		
Yellow chert	>4 cm	Cortical: 1				
Chalcedony	2-4 cm	Non-cortical: 1				
Quartzite	>4 cm					1 retouched bifacial scraper (10 x 7.5 x 3 cm)
Fine-grained granite						1 polishing stone
Total		Cortical: 22 Non-cortical: 7	1	Non-cortical: 1	2	5





**Figure 12 — Dart Point Base**

### Evaluation

41LV69 (Site 1) is an artifact scatter with no defined features. The site does have scattered burned caliche, but the area has been impacted by erosional processes and oil and gas activities, which has scattered this burned caliche from their original locations. The assemblage is fairly diverse for the area and includes core-reduction flakes, smaller flakes that are indicative of tool manufacturing, and tools. The tools are scrapers, a hammerstone, a polishing stone, and a projectile point fragment. The fragment is a base and identification was not possible; however, the base does resemble a dart point. This point fragment, therefore, tentatively dates the site to the Archaic period (5,200 BC to AD 500). Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV69 is recommended as not eligible to the NRHP.

### Impacts and Recommendations

41LV69 (Site 1) will be impacted by a single vibratory line. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

41LV70

<b>Field Number:</b>	Site 2
<b>Site Type:</b>	Features
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV70 (Site 2) is 2 burned caliche concentrations with no artifacts that is located in an open area (Figures 13 and A12). The site is on gentle slope with oil well pads and access roads in the vicinity. It measures 41 m by 53 m (135 ft by 174 ft) and is situated at an elevation of 823 m (2,700 ft) amsl. Vegetation includes grasses and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion, which affected the site as the concentrations are deflated and pieces of burned caliche are washing downslope. The site is, therefore, estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted and it appears that there is more sediment deposition on the south side of the site and more deflated on the north.



**Figure 13 — 41LV70 (Site 2) Overview, View South**

Features

Two (2) features were found and both are burned caliche concentrations. Feature 1 measures 1 m by 3 m and is composed of approximately 40 pieces of burned caliche (Figure 14). The burned caliche measures from 1 cm to 20 cm. It is more concentrated on the east side of the feature. Feature 1 is deflated and no surface staining or associated artifacts were observed.



**Figure 14 — 41LV70 (Site 2) Feature 1, View South**

Feature 2 measures 1.5 m by 1.5 m and is composed of approximately 50 pieces of burned caliche. The burned caliche is 3 to 8 cm in size. The center of the feature is more concentrated and it appears that erosional processes are scattering the burned caliche. Feature 2 is deflated, and no surface staining or associated artifacts were observed.

#### Artifacts

No artifacts were found.

#### Evaluation

41LV70 (Site 2) is 2 deflated burned caliche concentrations. No artifacts were found. Feature 1 measures approximately 1 m by 3 m and is composed of 40 pieces of burned caliche ranging in size between 1 and 20 cm. Feature 2 is another burned caliche concentration that measures 1.5 m by 1.5 m and is composed of 50 pieces of burned caliche. Scattered burned caliche is present indicating that erosional processes have affected the features. No surface staining was noted associated with the features and sediment build up was not observed. Natural surface caliche was noted on the site indicating that the area is deflated. Site 41LV70 is 2 deflated burned caliche concentrations without associated artifacts in a deflated area. Subsurface cultural remains are unlikely and the features no longer have staining that could provide radiocarbon dating material or other samples to analyze such as macrobotanical remains. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV70 is recommended as not eligible to the NRHP.

## Impacts and Recommendations

41LV70 (Site 2) will be impacted by a single vibratory line and a receiver line is located nearby. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

### 41LV72

<b>Field Number:</b>	Site 3
<b>Site Type:</b>	Feature with artifacts
<b>Affiliation:</b>	Archaic: Late (1800 BC to AD 500)
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV72 (Site 3) is a single burned caliche feature and 2 lithics that are located along the northern edge of a playa (Figures 15 and A13). The site measures 63 m by 116 m (207 ft by 381 ft) and is situated at an elevation of 820 m (2,690 ft) amsl. Vegetation includes rabbit brush, grasses, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion, which have affected the site as evidenced by scattered burned caliche. The site is, therefore, estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted throughout the site.



**Figure 15 — 41LV72 (Site 3) Overview, View Northeast**

## Features

One (1) burned caliche feature, Feature 1, was recorded on the site. Feature 1 is a 2 m by 3 m burned caliche concentration with approximately 18 pieces measuring between 1 to 9 cm in size. The feature is

concentrated in the northwest and is eroding in a southwest direction. No staining or charcoal flecks were present in or near the feature and sand build-up is not present. The feature is deflated. One (1) petrified wood projectile point and 1 sandstone ground stone fragment were found in association with Feature 1. Approximately 150 pieces of burned caliche were noted scattered throughout the site.

### Artifacts

Only 2 artifacts were found on the site. They include 1 petrified wood projectile point and 1 sandstone ground stone fragment (Table 3). The projectile point is a San Pedro point that dates to the Late Archaic (Figure 16).

**Table 3 — 41LV72 (Site 3) Lithic Assemblage**

Raw Material	Size Category	Tools
Sandstone	>4 cm	1 ground stone fragment (10 x 6 x 2 cm)
Petrified Wood	2-4 cm	1 projectile point (4 x 3 cm)
Total		2



**Figure 16 — San Pedro Point**

### Evaluation

41LV72 (Site 3) is a single burned caliche feature with 2 lithics. Feature 1 measured approximately 2 m by 3 m in size and consisted of 18 pieces of burned caliche ranging in size between 1 to 9 cm. The site is situated along the northern edge of a playa. It seems likely that other similar campsites outline the existing

playa, affording easy access to water and food. Based on the projectile point, the site dates to the Late Archaic (1800 BC to AD 500). Scattered burned caliche is present indicating that the site is fairly deflated. Natural surface caliche was noted on the site as well. The feature is not intact, no staining was noted that could be radiocarbon dated, and the area does not have sediment build up that could be covering buried cultural remains. Site 41LV72 is a deflated burned caliche concentration with 2 artifacts in a deflated area. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV72 is recommended as not eligible to the NRHP.

#### Impacts and Recommendations

41LV72 (Site 3) will be impacted by vibratory and receiver lines that bisects the site. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

#### 41LV73

<b>Field Number:</b>	Site 4
<b>Site Type:</b>	Single feature
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV73 (Site 4) is a single burned caliche feature located along a gentle southeast facing slope (Figures 17 and A14). The site measures 13 m by 12 m (43 ft by 39 ft) and is situated at an elevation of 820 m (2,690 ft) amsl. Vegetation includes grasses and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion. The site is approximately 50 percent intact. Both alluvial and aeolian soils were noted throughout the site.



**Figure 17 — 41LV73 (Site 4) Overview, View South**

### Features

One (1) burned caliche feature, Feature 1, was recorded on the site. Feature 1 is a 1.5 m by 1.5 m burned caliche concentration with approximately 33 pieces measuring between 5 to 10 cm in size (Figure 18). The feature is located on a gentle southeast slope. The feature is irregular in shape. A small drainage bisects the feature running in a northwest-southeast direction. Burned caliche is scattered northwest and south of the feature. No artifacts were recorded in association with the feature.



**Figure 18 — Feature 1 at 41LV73 (Site 4)**

#### Artifacts

No artifacts were recorded on the site.

#### Evaluation

41LV73 (Site 4) is a single burned caliche feature. Feature 1 measured approximately 1.5 m by 1.5 m in size and consisted of 33 pieces of burned caliche ranging in size from 5 to 10 cm. The site is situated along a gentle southeast facing slope. No artifacts and diagnostic artifacts were present on the site. The site is, therefore, unknown for cultural and temporal affiliation. No staining or additional features were found. The site is deflated with scattered burned caliche and natural surface caliche. Subsurface cultural remains are unlikely and the site appears not to have additional data potential. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV73 is recommended as not eligible to the NRHP.

#### Impacts and Recommendations

41LV73 (Site 4) will be impacted by a single vibratory line that runs east-west next to the site. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.



41LV74

<b>Field Number:</b>	Site 5
<b>Site Type:</b>	Artifact scatter with features
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV74 (Site 5) is an artifact scatter with 2 features located along a small rise with well pads noted in the vicinity (Figures 19 and A15). The site measures 71 m by 100 m (233 ft by 328 ft) and is situated at an elevation of 820 m (2,690 ft) amsl. Vegetation includes broom snakeweed, acacia, grasses, and mesquite. Surface visibility is 70 percent. Sources of disturbance to the site include wind and water erosion, especially along the site's western edge. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted throughout the site.



**Figure 19 — 41LV74 (Site 5), View Southeast**

### Features

Two (2) features were recorded at the site. Feature 1 is a 1.0 m by 1.0 m burned caliche concentration with approximately 50 pieces measuring between 1 to 6 cm in size. The feature is irregular in shape and eroding northwest to southwest in direction. The feature is deflated with burned caliche scattered around the feature. No charcoal, staining, or associated artifacts were present.

Feature 2 is a 1.0 m by 0.8 m burned caliche concentration with approximately 50 pieces measuring between 1 to 10 cm in size (Figure 20). The feature is irregular in shape and eroding northwest to

southwest in direction. The feature is deflated with burned caliche scattered around the feature. No charcoal or staining was present. In addition, no associated artifacts were noted.



**Figure 20 — Feature 2 at 41LV74**

#### Artifacts

Ten (10) artifacts were found at the site (Table 4). The assemblage includes 4 cortical core-reduction flakes, 1 bifacial-thinning flake, 2 hammerstones, 1 slab metate, 1 one-handed mano, and 1 tested cobble. Materials include quartzite, petrified wood, sandstone, and chert. Approximately 80 pieces of burned caliche were noted scattered throughout the site.

**Table 4 — 41LV74 (Site 5) Lithic Assemblage**

Raw Material	Size Category	Core-reduction Flakes	Non-cortical Interior Thinning	Tools
Limestone	2-4 cm	Cortical: 1		
Quartzite	1-2 cm		1	
	>4 cm			1 tested cobble, 2 hammerstone
Chert	1-2 cm	Cortical: 1		
Petrified Wood	2-4 cm	Cortical: 1		
	>4 cm	Cortical: 1		
Sandstone	1-2 cm			1 handed mano
	>4 cm			1 slab metate
Total		Cortical: 4	1	5

### Evaluation

41LV74 (Site 5) is an artifact scatter with 2 burned caliche features. Feature 1 measured approximately 1 m by 1 m in size and consisted of 50 pieces of burned caliche. Feature 2 measures 1 m by 0.8 m in size with approximately 50 pieces of burned caliche. The site is situated on a small rise surrounded by well pads. Based on the lack of diagnostic artifacts, the site is unknown for cultural and temporal affiliation. The artifacts include flakes, hammerstones, a tested cobble, and ground stone. These artifacts indicate that this site was likely utilized for a short time, possibly to process plants. Although this site has both features and associated artifacts, the area is deflated as evidenced by the lack of sediment accumulation and natural surface caliche nodules, and subsurface cultural remains are unlikely. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV74 is recommended as not eligible to the NRHP.

### Impacts and Recommendations

41LV74 (Site 5) will be impacted by vibratory and receiver lines. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

### 41LV75

<b>Field Number:</b>	Site 6
<b>Site Type:</b>	Features with 1 artifact
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV75 (Site 6) is 2 features with 1 artifact located along a southwest facing low hillslope with a shallow drainage located to the west (Figures 21 and A16). The site measures 57 m by 42 m (187 ft by 138 ft) and is situated at an elevation of 817 m (2,680 ft) amsl. Vegetation includes broom snakeweed, acacia, grasses, and mesquite. Surface visibility is 90 percent. Sources of disturbance to the site include wind and water

erosion moving artifacts downslope to the southwest. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with caliche present throughout the site.



**Figure 21 — 41LV75 (Site 6), Overview, View West**

#### Features

Two (2) features were recorded on the site. Feature 1 is a 1.0 m by 2.0 m burned caliche concentration with approximately 60 pieces measuring between 1 and 8 cm in size. The feature, which is irregular in shape and eroding south in direction, is deflated with burned caliche scattered throughout. No artifacts were recorded in association with the feature. No charcoal or staining were present.

Feature 2 is a 1.0 m by 2.0 m burned caliche concentration with approximately 40 pieces measuring between 2 and 20 cm in size. The feature, which is irregular in shape and eroding downslope towards the southwest, is deflated with burned caliche scattered around the feature. No artifacts were recorded in association with the feature. No charcoal or staining were present.

#### Artifacts

One (1) sandstone slab metate fragment was recorded along the southeast edge of the site. No other artifacts were identified.

#### Evaluation

41LV75 (Site 6) is an artifact with 2 burned caliche features. Feature 1 is a 1.0 m by 2.0 m burned caliche concentration with approximately 60 pieces measuring between 1 and 8 cm in size. Feature 2 is a 1.0 m

by 2.0 m burned caliche concentration with approximately 40 pieces measuring between 2 and 20 cm in size. The site is situated along a southwest facing low hill slope with a shallow drainage noted to the west. One (1) slab metate fragment was found, indicating that plant processing occurred in the area. Based on the lack of diagnostic artifacts, the site is unknown for cultural and temporal affiliation. Both features are deflated and not intact, and natural surface caliche was noted. No staining was observed indicating that material to radiocarbon date no longer exists. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV75 is recommended as not eligible to the NRHP.

#### Impacts and Recommendations

41LV75 (Site 6) will be impacted by a single vibratory line. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

#### 41LV76

<b>Field Number:</b>	Site 7
<b>Site Type:</b>	Features
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV76 (Site 7) consists of 2 burned caliche features located near a well-established cattle tank surrounded by large trees and thick vegetation (Figures 22 and A17). The site measures 74 m by 114 m (236 ft by 374 ft) and is situated at an elevation of 823 m (2,710 ft) amsl. Vegetation includes snakeweed, creosote, grasses, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion moving artifacts along the northern edge of the site. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 22 — 41LV76 (Site 7), Overview, View East**

### Features

Two (2) features were recorded on the site. Feature 1 is a 2.0 m by 2.0 m burned caliche concentration with approximately 50 pieces measuring between 2 and 5 cm in size. No sediment has accumulated around the feature and it is deflated. No artifacts were recorded in association with the feature. No charcoal or staining was present.

Feature 2 is a 3.0 m by 2.0 m burned caliche concentration with approximately 40 pieces measuring between 2 to 10 cm in size. Erosional processes have affected the feature as burned caliche is scattered around the feature. No artifacts were recorded in association with the feature. No charcoal or staining was present.

### Artifacts

No artifacts were identified during the recording of the site.

### Evaluation

41LV76 (Site 7) consists of 2 burned caliche features with no artifacts present. Feature 1 is a 2.0 m by 2.0 m burned caliche concentration with approximately 50 pieces. Feature 2 is a 3.0 m by 2.0 m burned caliche concentration with approximately 40 pieces. The site is situated along a small gentle downslope towards the cattle tank. Based on the lack of diagnostic artifacts, the site is unknown for cultural and temporal affiliation. Both features are deflated and not intact, and natural surface caliche was noted. No staining was observed indicating that material to radiocarbon date the features no longer exists. In addition, the

area does not have sediment build up and subsurface cultural remains are unlikely. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV76 is recommended as not eligible to the NRHP.

#### Impacts and Recommendations

41LV76 (Site 7) will be impacted by vibratory and receiver lines. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

#### 41LV77

<b>Field Number:</b>	Site 8
<b>Site Type:</b>	Artifact scatter with a feature
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV77 (Site 8) is a small artifact scatter with a burned caliche feature. The site located near a low-lying area gently sloping towards the playa (Figures 23 and A18). The site measures 45 m by 35 m (148 ft by 115 ft) and is situated at an elevation of 823 m (2,700 ft) amsl. Vegetation includes broom snakeweed, creosote, grasses, and mesquite. Surface visibility is 95 percent. Sources of disturbance to the site include wind and water erosion moving artifacts downslope towards the playa. Current construction of a pipeline and road is occurring approximately 150 m to the east of the site. The site is estimated to be approximately 75 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 23 — 41LV77 (Site 8) Overview, View South**

#### Features

One (1) feature was recorded at the site. Feature 1 is a 1.0 m by 1.2 m burned caliche concentration with approximately 40 pieces measuring between 1 and 13 cm in size. The feature is semi-ovate in shape and eroding west in direction. The feature is deflated with burned caliche scattered throughout the site. No artifacts were recorded in association with the feature. No charcoal or staining was present.

#### Artifacts

Three (3) core-reduction flakes were recorded on the site. Materials include chert and chalcedony. At least 30 pieces of burned caliche are scattered throughout the site (Table 5).

**Table 5 — 41LV77 (Site 8) Lithic Assemblage**

<b>Raw Material</b>	<b>Size Category</b>	<b>Core-reduction Flakes</b>	<b>Pressure</b>	<b>Edge Modified</b>	<b>Shatter Debris</b>
Chert	1-2cm	Non-cortical: 1			
Chalcedony	2-4 cm	Cortical: 1 Non-cortical: 1			
Total		Cortical: 1 Non-cortical: 2			



## Evaluation

41LV77 (Site 8) is a small artifact concentration with 1 burned caliche feature. Feature 1 is a 1.0 m by 1.2 m burned caliche concentration with approximately 40 pieces measuring between 1 and 13 cm in size. The site located near a low-lying rise gently sloping towards the playa. The artifacts are core-reduction flakes indicating that lithic reduction occurred at the site. Based on the lack of diagnostic artifacts, the site is unknown for cultural and temporal affiliation. The site sits on caliche and some aeolian sand, however, the feature does not have charcoal sediments, which can provide a date for the site. In addition, much of the area is deflated and subsurface cultural remains are unlikely. Therefore, Site 41LV77 is recommended as not eligible to the NRHP.

## Impacts and Recommendations

41LV77 (Site 8) will be impacted by vibratory and receiver lines. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

## 41LV78

<b>Field Number:</b>	Site 9
<b>Site Type:</b>	Artifact scatter with features
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV78 (Site 9) is an artifact scatter with 4 burned caliche features located on a slight slope eroding west into a low-lying playa (Figures 24 and A18). The site measures 173 m by 215 m (568 ft by 705 ft) and is situated at an elevation of 823 m (2,700 ft) amsl. Vegetation includes snakeweed, yucca, grasses, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion, which have moved artifacts downslope to the southwest. The site is estimated to be

approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 24 — 41LV78 (Site 9) Overview, View East**

#### Features

Four (4) features were recorded at the site. Feature 1 is a 1.5 m by 1.5 m burned caliche concentration with approximately 40 pieces measuring between 2 and 10 cm in size. The feature has been affected by erosional processes and burned caliche is scattered nearby. No artifacts were recorded in association with the feature. No charcoal or staining was present.

Feature 2 is a 1.5 m by 1.5 m burned caliche concentration with approximately 30 pieces measuring between 1 to 15 cm in size (Figure 25). The feature is semi-circular in shape with burned caliche scattered throughout. No artifacts were recorded in association with the feature. No charcoal or staining was present.



**Figure 25 — 41LV78 (Site 9), Feature 2**

Feature 3 is a 1.0 m by 2.0 m burned caliche concentration with approximately 50 pieces measuring between 1 to 15 cm in size (Figure 26). The feature is irregular in shape with burned caliche scattered throughout. No artifacts were recorded in association with the feature. No charcoal or staining was present.



**Figure 26 — 41LV78 (Site 9), Feature 3**

Feature 4 is a 1.0 m by 1.0 m burned caliche concentration with approximately 40 pieces measuring between 1 to 10 cm in size (Figure 27). The feature is irregular in shape with burned caliche scattered throughout. No artifacts were recorded in association with the feature. No charcoal or staining was present. At least 100 pieces of burned caliche are scattered throughout the site.



**Figure 27 — 41LV78 (Site 9), Feature 4**

Artifacts

Five (5) artifacts were recorded at the site. These include 2 core-reduction flakes, 1 biface, 1 scraper and 1 piece of indeterminate ground stone (Table 6). The core reduction flakes are from quartzite and chert material. The single biface is made of a white chert, the ground stone is made of a red sandstone, and the scraper is made of a gray chert.

**Table 6 — 41LV78 (Site 9) Lithic Assemblage**

Raw Material	Size Category	Core-reduction Flakes	Tools
Quartzite	>4 cm	Cortical: 1	
Chert	1-2 cm	Non-Cortical: 1	
White Chert	2-4 cm		1 biface (3 x 2 x 1 cm)
Grey Chert	>4		1 scraper (4 x 3 x 1 cm)
Red Sandstone			1 ground stone (5 x 4 x 2 cm)
Total		Cortical: 1 Non-cortical: 1	3

Evaluation

41LV78 (Site 9) is a small artifact scatter with 4 burned caliche features. Feature 1 is a 1.5 m by 1.5 m burned caliche concentration with approximately 40 pieces measuring between 2 and 10 cm in size. Feature 2 is a semi-circular, 1.5 m by 1.5 m burned caliche concentration with approximately 30 pieces

measuring between 1 to 15 cm in size. Feature 3 is an irregular-shaped 1.0 m by 2.0 m burned caliche concentration with approximately 50 pieces measuring between 1 to 15 cm in size. Feature 4 is an irregular-shaped 1.0 m by 1.0 m burned caliche concentration with approximately 40 pieces measuring between 1 to 10 cm in size. The site is located along a slight slope eroding west into a low-lying playa. The artifacts include core-reduction flakes, a biface, a scraper, and a piece of ground stone. The assemblage indicates that the area was used to reduce lithic material, and to process plant material. Based on the lack of diagnostic artifacts, the site is unknown for cultural and temporal affiliation. The site sits on natural caliche and a little aeolian sand; however, the features do not have charcoal or ashy sediments, which can provide a date for the site. In addition, the features are not intact and have been dispersed by erosional processes. The area is fairly deflated with little sediment build up, and subsurface cultural remains are unlikely. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV78 is recommended as not eligible to the NRHP.

#### Impacts and Recommendations

41LV78 (Site 9) will be impacted by vibratory and receiver lines. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

#### 41LV79

<b>Field Number:</b>	Site 10
<b>Site Type:</b>	Artifact scatter
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV79 (Site 10) is a small artifact scatter with burned caliche scattered throughout the site. The site is located in a low-lying area eroding east into a playa (Figures 28 and A19). The site measures 85 m by 96 m (279 ft by 315 ft) and is situated at an elevation of 823 m (2,700 ft) amsl. Vegetation includes creosote, grasses, and mesquite. Surface visibility is 95 percent. Sources of disturbance to the site include wind and water erosion moving artifacts downslope to the east towards a playa. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 28 — 41LV79 (Site 10) Overview, View North**

### Features

No features were identified during the recording of the site.

### Artifacts

Six (6) artifacts were recorded at the site. These include 4 core-reduction flakes, 1 piece of shatter, and 1 scraper (Table 7). The core-reduction flakes are made of quartzite and chert. The piece of shatter and the 1 scraper are also made of chert. At least 90 pieces of burned caliche are scattered throughout the site

**Table 7 — 41LV79 (Site 10) Lithic Assemblage**

Raw Material	Size Category	Core-reduction Flakes	Edge Modified	Shatter Debris	Tools
Quartzite	1-2 cm	Non-cortical: 2			
Chert	2-4 cm	Cortical: 1		1	
	>4 cm	Cortical: 1			1 scraper (5 x 4 x 1 cm)
Total		Cortical: 2 Non-cortical: 2		1	1

## Evaluation

41LV79 (Site 10) is a small artifact scatter with approximately 90 pieces of burned caliche scattered throughout the site. No features were identified on the site; however, over 90 pieces of scattered burned caliche was noted, indicating that a feature once existed at this site. The site is located in a low-lying area eroding east into a playa. Based on the lack of diagnostic artifacts, the site is unknown for cultural and temporal affiliation. The assemblage includes core-reduction lithics indicating that lithic reduction occurred at the site. Also, the scraper suggests that either hide or plant processing also occurred in the area. The site sits on natural caliche, which indicates that the area is deflated and subsurface cultural remains are unlikely. Therefore, 41LV79 is recommended as not eligible to the NRHP.

## Impacts and Recommendations

41LV79 (Site 10) will be impacted by a single vibratory line. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

## 41LV80

<b>Field Number:</b>	Site 11
<b>Site Type:</b>	Artifact scatter
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV80 (Site 11) is a small artifact scatter with burned caliche scattered throughout the site. The site is located in a low-lying area eroding east/southeast into a playa (Figures 29 and A20). The site measures 77 m by 54 m (253 ft by 177 ft) and is situated at an elevation of 826 m (2,710 ft) amsl. Vegetation includes creosote, grasses, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion, which have moved artifacts downslope to the east/southeast towards a playa. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.





**Figure 29 — 41LV80 (Site 11) Overview, View West**

#### Features

No features were observed within the site.

#### Artifacts

Five (5) artifacts were recorded on the site. All are non-cortical core reduction flakes made from chalcedony, chert, and quartzite (Table 8). At least 75 pieces of burned caliche are scattered throughout the site, with no concentrations.

**Table 8 — 41LV80 (Site 11) Lithic Assemblage**

Raw Material	Size Category	Core-reduction Flakes	Tools
Chalcedony	2-4 cm	Non-cortical: 1	
Brown chert	2-4 cm	Non-cortical: 1	
Brown chalcedony	1-2 cm	Non-cortical: 1	
	2-4 cm	Non-cortical: 1	
Red quartzite	2-4 cm	Non-cortical: 1	
Total		Non-cortical: 5	

## Evaluation

41LV80 (Site 11) is a small artifact scatter with approximately 75 pieces of burned caliche scattered throughout the site. No features were identified at the site; however, the presence of the burned caliche indicates that at least 1 feature was originally present at the site, but has been affected by erosional processes. The site is located in a low-lying area eroding east/southeast into a playa. All of the artifacts found are core-reduction flakes indicating that lithic reduction occurred at the site. Based on the lack of diagnostic artifacts, the site is unknown for cultural and temporal affiliation. The site sits on natural caliche, which is mixed with the scattered burned caliche, indicating that the area has been affected by erosional processes. The area is deflated with little sediment build up, and subsurface cultural remains are unlikely. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV80 is recommended as not eligible to the NRHP.

## Impacts and Recommendations

41LV80 (Site 11) will be impacted by a single vibratory line. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

## 41LV81

<b>Field Number:</b>	Site 12
<b>Site Type:</b>	Artifact scatter
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV81 (Site 12) is a small artifact scatter with burned caliche scattered throughout the site. The site is located in a low-lying area bounded by a two-track road to the east and an existing oil well pad to the south (Figures 30 and A21). The site measures 128 m by 79 m (420 ft by 259 ft) and is situated at an elevation of 828 m (2,715 ft) amsl. Vegetation includes creosote, acacia, grasses and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 30 — 41LV81 (Site 12) Overview, View North**

#### Features

No features were observed within the site. At least 150-200 pieces of burned caliche are scattered throughout the site, with no concentrations, indicating that features were once present at the site.

#### Artifacts

Seven (7) artifacts were recorded on the site. Artifacts include 5 core-reduction flakes, 1 core, and 1 uniface (Table 9). Material types include chalcedony, quartzite, rhyolite, and chert. The core is multidirectional and made of gray quartzite. The uniface is cortical and made of purple quartzite. One (1) can was also noted.

**Table 9 — 41LV81 (Site 12) Lithic Assemblage**

Raw Material	Size Category	Core-reduction Flakes	Core	Tools
Chalcedony	2-4 cm	Non-cortical: 1		
Tan chert	2-4 cm	Cortical: 1		
Gray chert	1-2 cm	Cortical: 1		
	2-4 cm	Cortical: 1		
Gray quartzite	>4 cm		1 multidirectional, 6 scars, (6 x 5 x 3 cm)	
Purple quartzite	2-4 cm			1 uniface, (4 x 4 x 1.5 cm)
Rhyolite	2-4 cm	Cortical: 1		
Total		Cortical: 4 Non-cortical: 1	1	1

### Evaluation

41LV81 (Site 12) is a small artifact scatter with approximately 150-200 pieces of burned caliche scattered throughout the site. No features were identified on the site; however, the scattered burned caliche present indicates that there was at least 1 feature at the site prior to erosional processes affecting the feature. The site is located in a low-lying area bounded by a two-track road to the east and an existing well pad to the south. The artifact assemblage includes core-reductions flakes and a core, indicating that lithic reduction occurred at the site. In addition, a uniface was recorded, suggesting that tool manufacturing occurred in the area as well. Based on the lack of diagnostic artifacts, the site is unknown for cultural and temporal affiliation. The site sits on natural caliche, which is mixed with the scattered burned caliche, indicating that the area has been affected by erosional processes. The area is fairly deflated with little sediment build up, and subsurface cultural remains are unlikely. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV81 is recommended as not eligible to the NRHP.

### Impacts and Recommendations

41LV81 (Site 12) will be impacted by a single vibratory line. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

41LV82

<b>Field Number:</b>	Site AD 12
<b>Site Type:</b>	Single feature
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV82 (Site AD 12) is a single burned caliche feature located in a low-lying flat area between 2 playas (Figures 31 and A22). The site measures 67 m by 56 m (220 ft by 197 ft) and is situated at an elevation of 826 m (2,710 ft) amsl. Vegetation includes snakeweed, yucca, acacia, grasses, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion allowing for ponding along the eastern edge of the site. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 31 — 41LV82 (AD 12) Overview, View East**

Features

One (1) feature was recorded on the site. Feature 1 is a 1.2 m by 1.0 m burned caliche concentration with approximately 60 pieces measuring between 2 and 15 cm in size. The feature, which is semi-ovate in shape is situated next to a barbed-wire fence and two-track road. No artifacts were recorded in association with the feature. No charcoal or staining was present. Scattered burned caliche was noted in the area.

Artifacts

No artifacts were recorded on the site.

Evaluation

41LV82 (Site AD 12) is a single burned caliche feature. The feature is a 1.2 m by 1.0 m burned caliche concentration with approximately 60 pieces measuring between 2 and 15 cm in size. The site is located in a low-lying flat area between 2 playas. Based on the lack of diagnostic artifacts, the site is unknown for cultural and temporal affiliation. The site sits on natural caliche and is mixed with the scattered burned caliche, indicating that the area has been affected by erosional processes. The feature itself has also been affected by erosion as no staining was apparent and several pieces of burned caliche is scattered about. The area is fairly deflated with little sediment build up, and subsurface cultural remains are unlikely. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV82 is recommended as not eligible to the NRHP.

Impacts and Recommendations

41LV82 (Site AD 12) will be impacted by vibratory and receiver lines. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

41LV83

<b>Field Number:</b>	Site 13
<b>Site Type:</b>	Features with artifacts
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV83 (Site 13) is 3 burned caliche features and 2 associated artifacts located north of a playa (Figures 32 and A23). The site measures 52 m by 88 m (171 ft by 289 ft) and is situated at an elevation of 826 m (2,710 ft) amsl. Vegetation includes grasses, creosote, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 32 — 41LV83 (Site 13) Overview, View East**

### Features

Three (3) features were recorded at the site. Feature 1 is a 0.9 m by 0.9 m burned caliche concentration with approximately 40 pieces measuring between 4 and 12 cm in size (Figure 33). The feature is semi-ovate in shape and burned caliche is mixed with natural caliche indicating that the feature is deflated. No artifacts were recorded in association with the feature. No charcoal or staining was present.



**Figure 33 — Feature 1 at 41LV83 (Site 13)**

Feature 2 is a 3.6 m by 2.6 m burned caliche concentration with approximately 70 pieces measuring between 5 and 13 cm in size (Figure 34). Sheetwash has impacted the feature and dispersed the burned caliche pieces; therefore, the feature is no longer intact. No artifacts were recorded in association with the feature. No charcoal or staining was present.





**Figure 34 — Feature 3 at 41LV83 (Site 13)**

Feature 3 is a 0.9 m by 0.9 m burned caliche concentration with approximately 50 pieces measuring between 2 and 17 cm in size. Disturbances to the feature include animal digging, roots, and wind and water erosion. No artifacts were recorded in association with the feature. No charcoal or staining was present.

#### Artifacts

Two (2) artifacts were recorded at the site. Both are cortical core-reduction flakes made from chert (Table 10). In addition to the burned caliche present in the feature areas, 50 to 60 pieces of scattered burned caliche were observed.

**Table 10 — 41LV83 (Site 13) Lithic Assemblage**

Raw Material	Size Category	Core-reduction Flakes	Shatter Debris	Tools
Red/Tan chert	2-4 cm	Cortical: 1		
Brown chert	2-4 cm	Cortical: 1		
Total		Cortical: 2		

#### Evaluation

41LV83 (Site 13) is 3 burned caliche features and 2 flakes. Feature 1 is a 0.9 m by 0.9 m burned caliche concentration that has burned caliche mixed with natural caliche indicating that the feature is deflated. No artifacts were recorded in association with the feature. No charcoal or staining was present. Feature

2 is a 3.6 m by 2.6 m concentration that has been affected by sheetwash and is not intact. Feature 3 is another 0.9 m by 0.9 m burned caliche concentration that has been affected by animal digging and erosional processes. It is no longer intact. The artifacts are both core-reduction flakes suggesting that lithic reduction of chert material occurred at the site. The site is located north of a playa. Based on the lack of diagnostic artifacts, the site is unknown for cultural and temporal affiliation. The site sits on natural caliche and is mixed with the scattered burned caliche, indicating that the area has been affected by erosional processes. The features themselves have also been affected by erosion as no staining was apparent, and pieces of burned caliche are scattered about. The area is fairly deflated with little sediment build up and subsurface cultural remains are unlikely. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV83 is recommended as not eligible to the NRHP.

#### Impacts and Recommendations

41LV83 (Site 13) will be impacted by a single vibratory line. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

#### 41LV84

<b>Field Number:</b>	Site 15
<b>Site Type:</b>	Single feature
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV84 (Site 15) is a burned caliche feature located next to a playa (Figures 35 and A24). The site measures 31 m by 25 m (102 ft by 82 ft) and is situated at an elevation of 826 m (2,710 ft) amsl. Vegetation includes grasses, acacia, creosote, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 35 — 41LV84 (Site 15), Overview, View South**

#### Features

One (1) feature was recorded on the site. Feature 1 is a 1.2 m by 0.6 m burned caliche concentration with approximately 25 pieces measuring between 3 and 10 cm in size. The feature has been affected by sheetwashing, and natural caliche is mixed with burned caliche. No artifacts were recorded in association with the feature. No charcoal or staining was present. Scattered burned caliche was noted in the area of the feature. At least 50 pieces of scattered burned caliche were noted.

#### Artifacts

No artifacts were found.

#### Evaluation

41LV84 (Site 15) is a single burned caliche feature. The feature is a 1.2 m by 0.6 m burned caliche concentration with approximately 25 pieces measuring between 3 and 10 cm in size. The feature has been affected by sheetwashing and natural caliche is mixed with burned caliche. No artifacts were recorded in association with the feature. No charcoal or staining was present. Scattered burned caliche was noted in the area of the feature. At least 50 pieces of scattered burned caliche was noted. The site is located next to a playa. Based on the lack of any diagnostic artifacts, the site is unknown for cultural and temporal affiliation. The site sits on natural caliche and is mixed with the scattered burned caliche, indicating that the area has been affected by erosional processes. The feature itself has also been affected by sheetwashing as no staining was apparent, and several pieces of burned caliche are scattered about. The

area is fairly deflated with little sediment build up, and subsurface cultural remains are unlikely. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV84 is recommended as not eligible to the NRHP.

Impacts and Recommendations

41LV84 (Site 15) will be impacted by a single vibratory line. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

41LV85

<b>Field Number:</b>	Site 16
<b>Site Type:</b>	Features with 1 artifact
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV85 (Site 16) is 2 burned caliche features with 1 artifact located next to a playa (Figures 36 and A25). The site measures 31 m by 18 m (102 ft by 59 ft) and is situated at an elevation of 826 m (2,710 ft) amsl. Vegetation includes grasses, acacia, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 36 — 41LV85 (Site 16), Overview, View North**

## Features

Two (2) features were recorded at the site. Feature 1 is a 1.5 m by 1.6 m burned caliche concentration with approximately 25 pieces measuring between 3 and 12 cm in size. The feature has been affected by sheetwashing, and natural caliche is mixed with burned caliche. No artifacts were recorded in association with the feature. No charcoal or staining was present.

Feature 2 is a 2.1 m by 2 m burned caliche concentration with approximately 35 pieces measuring between 5 and 17 cm in size (Figure 37). Natural caliche is located in the vicinity of the feature. No charcoal or staining was present. One (1) chalcedony exhausted core is associated with this feature. Scattered burned caliche was observed within the site boundary.



**Figure 37 — 41LV85 (Site 16), Feature 2**

## Artifacts

The only artifact is the exhausted core associated with Feature 2. The core is made of chalcedony and is over 4 cm in size.

## Evaluation

41LV85 (Site 16) is 2 burned caliche features with 1 artifact. Feature 1 is a 1.5 m by 1.6 m burned caliche concentration with approximately 25 pieces. The feature has been affected by sheetwashing, and natural caliche is mixed with burned caliche. No artifacts were recorded in association with the feature. No charcoal or staining was present. Feature 2 is a 2.1 m by 2 m burned caliche concentration with approximately 35 pieces. Natural caliche is located in the vicinity of the feature. No charcoal or staining

was present. One (1) chalcedony exhausted core is associated with this feature. Scattered burned caliche was observed within the site boundary. The site is located next to a playa. Based on the lack of any artifacts, the site is unknown for cultural and temporal affiliation. The site sits on natural caliche and is mixed with the scattered burned caliche, indicating that the area has been affected by erosional processes. Feature 1 has been affected by sheetwashing as no staining was apparent and several pieces of burned caliche is scattered about the site. Feature 2 is not as dispersed as Feature 1, but is not intact. The area is fairly deflated with little sediment build up and subsurface cultural remains are unlikely. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV85 is recommended as not eligible to the NRHP.

#### Impacts and Recommendations

41LV85 (Site 16) will be impacted by a single vibratory line. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

#### 41LV86

<b>Field Number:</b>	Site 17
<b>Site Type:</b>	Artifact scatter
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV86 (Site 17) is an artifact scatter located in an area of low-lying dunes (Figures 38 and A26). The site measures 30 m by 27 m (98 ft by 89 ft) and is situated at an elevation of 826 m (2,710 ft) amsl. Vegetation includes grasses, acacia, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 38 — 41LV86 (Site 17) Overview, View East**

#### Features

No features were found. At least 50 pieces of burned caliche are scattered throughout the site, indicating that features were once present at the site.

#### Artifacts

All surface artifacts were analyzed in the field and include 3 core-reduction flakes, 1 edge-modified flake, 2 pieces of shatter, 1 biface, and 1 hammerstone/chopper (Table 11). Chert, chalcedony, quartzite, and rhyolite were the lithic material found at the site. The biface is made from rhyolite, and the hammerstone/chopper is quartzite (Figure 39).

**Table 11 — 41LV86 (Site 17) Lithic Assemblage**

Raw Material	Size Category	Core-reduction Flakes	Edge Modified	Shatter Debris	Tools
Gray chert	2-4 cm	Non-cortical: 1		1	
Tan chert	1-2 cm			1	
Chalcedony	1-2 cm	Cortical: 1			
Red chert	1-2 cm	Cortical: 1			
Purple rhyolite			1 retouched lateral edge, cortical flake, 20% cortex		1 biface 48 x 38 x 12 mm
Purple quartzite					1 hammerstone/ chopper 85 x 70 x 57 mm
Total		Cortical: 2 Non-cortical: 1	1	2	2

**Figure 39 — Hammerstone/Chopper****Evaluation**

41LV86 (Site 17) is an artifact scatter with no defined features. At least 50 pieces of burned caliche are scattered in the area, indicating that at least 1 feature existed at some point in time. The artifact assemblage is small but diverse with core-reduction flakes, an edge-modified flake, a biface, and a hammerstone/chopper. Lithic reduction occurred at the site, but tool manufacturing is likely to have



occurred at the site too. The lithic material is diverse as well with cherts, quartzite, chalcedony, and rhyolite present. No surface charcoal or staining was present within the burned caliche scattering. Although the area does have some aeolian sands, natural caliche is present on the surface, indicating that the area is deflated. Based on the lack of any diagnostic artifacts, the site is unknown for cultural and temporal affiliation. The site sits on natural caliche and is mixed with the scattered burned caliche, indicating that the area has been affected by erosional processes. Subsurface cultural remains are unlikely due to the surface natural caliche. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV86 is recommended as not eligible to the NRHP.

### Impacts and Recommendations

41LV86 (Site 17) will be impacted by a single vibratory line. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

### 41LV87

<b>Field Number:</b>	Site 18
<b>Site Type:</b>	Artifact scatter with features
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV87 (Site 18) is an artifact scatter with 4 burned caliche features located next to a playa (Figures 40 and A27). The site measures 105 m by 250 m (344 ft by 820 ft) and is situated at an elevation of 826 m (2,710 ft) amsl. Vegetation includes grasses, acacia, creosote, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 40 — 41LV87 (Site 18), Overview, View East**

#### Features

Four (4) features were recorded at the site. Feature 1 is a 1.2 m by 1.8 m burned caliche concentration with approximately 50 pieces measuring between 3 and 10 cm in size (Figure 41). The feature is circular in shape and is somewhat intact due to the overall shape of the feature. No artifacts were recorded in association with the feature. No charcoal or staining was present.



**Figure 41 — 41LV87 (Site 18), Feature 1**

Feature 2 is a 1.5 by 1.5 m burned caliche concentration with approximately 50 pieces measuring between 3 and 10 cm in size (Figure 42). Natural caliche is mixed with burned caliche. One (1) piece of ground stone and 2 flakes were recorded in association with the feature. No charcoal or staining was present.



**Figure 42 — 41LV87 (Site 18), Feature 2**

Feature 3 is a 1.2 by 1 m burned caliche concentration with approximately 50 pieces measuring between 3 and 10 cm in size (Figure 43). A few pieces of natural caliche are mixed with the burned caliche. No artifacts were in association with the feature. No charcoal or staining was present.



**Figure 43 — 41LV87 (Site 18), Feature 3**

Feature 4 is a 1 by 1 m burned caliche concentration with approximately 25 pieces measuring between 1 and 5 cm in size. Two (2) scrapers and 2 flakes were recorded in association with the feature. No charcoal or staining was present.

In addition, approximately 200 pieces of burned caliche mixed with natural caliche are scattered across the site.

#### Artifacts

All surface artifacts were analyzed in the field and included 19 core-reduction flakes, 1 bifacial-thinning flake, 1 piece of shatter, 1 core, 2 scrapers, 1 biface fragment, 1 hammerstone, and 5 pieces of ground stone (Table 12). Chert, chalcedony, quartzite, petrified wood, sandstone, and rhyolite were the lithic materials found at the site. The ground stone are made of sandstone and included 1 slab metate, 1 slab metate fragment, 1 bifacial metate fragment, 1 one-handed mano, and 1 ground stone slab.

Table 12 — 41LV87 (Site 18) Lithic Assemblage

Raw Material	Size Category	Core-reduction Flakes	Non-cortical Interior Thinning	Shatter Debris	Tools
Chalcedony	1-2 cm	Cortical: 1 Non-cortical: 2			
	2-4 cm	Cortical: 1 Non-cortical: 3			
	>4 cm	Cortical: 1			
Chert	2-4 cm	Cortical: 1 Non-cortical: 2			
	>4 cm	Non-cortical: 1			1 hammerstone (5 x 5 x 4 cm)
Gray chert	1-2 cm				1 unifacial retouched scraper (42 x 32 x 8 mm)
	2-4 cm	Cortical: 1			
Tan chert	1-2 cm				1 bifacial retouched scraper (59 x 32 x 18 mm)
White chert	1-2 cm				1 biface fragment (28 x 40 x 8 mm)
Sandstone	>4 cm				1 slab metate (6 x 6 x 1 cm), 1 slab metate fragment (4 x 4 x 2 cm), 1 bifacial metate fragment (6 x 5.5 x 2 cm), 1 handed mano (13 x 10 x 5 cm), 1 ground stone slab (85 x 42 x 22 mm)
Brown quartzite	>4 cm	Cortical: 1 Non-Cortical: 1			
Quartzite	1-2 cm	Non-cortical: 1	1		
	2-4 cm	Non-cortical: 1			
	>4 cm	Cortical: 1			1 core (7 x 4 x 5 cm)
Petrified wood	1-2 cm	Cortical: 1			
Rhyolite	2-4 cm			1	
Total		Cortical: 8 Non-cortical: 11	1	1	10

### Evaluation

41LV87 (Site 18) is an artifact scatter with 4 burned caliche concentrations. It is located along the edge of a playa and is likely to have been occupied during a time when water was available in the playa. Two (2) of the features are more intact than the other 2, but all showed evidence of deflation. The 2 features that were more intact had associated artifacts, including flakes, ground stone, and scrapers. At least 200 pieces

of burned caliche are scattered in the area, indicating that additional features existed at some point in time. The artifact assemblage is somewhat diverse and includes flakes, shatter, a core, ground stone, scrapers, a biface fragment, and a hammerstone. The assemblage indicates that lithic reduction, tool manufacturing, and plant processing occurred at the site and more so than what other sites in the vicinity indicated. Also, the lithic material is diverse with cherts, quartzite, chalcedony, rhyolite, petrified wood, and sandstone present. No surface charcoal or staining was present within the burned caliche concentrations; however, shovel tests or trowel tests may result in buried deposits related to the site and its function. Due to the unknown depth potential of the site and of buried cultural deposits, 41LV87 is recommended as undetermined eligibility to the NRHP.

#### Impacts and Recommendations

41LV87 (Site 18) will be impacted by a single vibratory line. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

#### 41LV88

<b>Field Number:</b>	Site 19
<b>Site Type:</b>	Single feature
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV88 (Site 19) is a burned caliche concentration located next to a playa (Figures 44 and A28). The site measures 55 m by 85 m (180 ft by 279 ft) and is situated at an elevation of 829 m (2,720 ft) amsl. Vegetation includes creosote, acacia, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion. The site is estimated to be approximately 50 percent intact. Alluvial soils were noted with natural caliche present throughout the site.



**Figure 44 — 41LV88 (Site 19) Overview, View West**

#### Features

One (1) feature was recorded at the site. Feature 1 is a 2 m by 2 m burned caliche concentration with approximately 30 pieces of burned caliche measuring between 3 and 20 cm in size. The feature has been affected by sheetwashing, and several pieces of burned caliche have been displaced. No artifacts were recorded in association with the feature. No charcoal or staining was present.

In addition, the general site area has over 100 pieces of burned caliche scattered by sheetwash and other erosional processes.

#### Artifacts

No artifacts were found.

#### Evaluation

41LV88 (Site 19) is a single burned caliche feature with no associated artifacts. No staining or charcoal was observed. The site is located on the edge of a playa, where water was easily accessible prehistorically. Over 100 pieces of burned caliche is scattered in the general site area, indicating that sheetwashing and other erosional processes have affected the site. No sediment build up was noted in the field. Based on the lack of any artifacts, the site is unknown for cultural and temporal affiliation. The site sits on natural caliche and is mixed with the scattered burned caliche. Subsurface cultural remains are unlikely due to the surface natural caliche. Because the integrity of the site has been greatly affected by erosional

processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV88 is recommended as not eligible to the NRHP.

Impacts and Recommendations

41LV88 (Site 19) will be impacted by a single vibratory line. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

41LV89

<b>Field Number:</b>	Site 20
<b>Site Type:</b>	Artifact scatter with a feature
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV89 (Site 20) is an artifact scatter with a burned caliche concentration that is located next to a playa (Figures 45 and A29). The site measures 53 m by 43 m (174 ft by 141 ft) and is situated at an elevation of 826 m (2,710 ft) amsl. Vegetation includes snakeweed, grasses, acacia, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 45 — 41LV89 (Site 20) Overview, View West**



### Features

One (1) feature was recorded at the site. Feature 1 is a 2.5 m by 2 m burned caliche concentration with approximately 30 pieces measuring between 3 and 20 cm in size. The feature is ovoid in shape. Evidence of water ponding over the feature was noted during recording, which has impacted the feature as many pieces of burned caliche have been displaced. No artifacts were recorded in association with the feature. No charcoal or staining was present. In addition, approximately 50 pieces of burned caliche mixed with natural caliche are located across the site.

### Artifacts

All surface artifacts were analyzed in the field and include 12 core-reduction flakes (Table 13). The flakes are all made of chert.

**Table 13 — 41LV89 (Site 20) Lithic Assemblage**

Raw Material	Size Category	Core-reduction Flakes
Chert	2-4 cm	Non-cortical: 4 Cortical: 4
	>4 cm	Cortical: 4
Total		Cortical: 8 Non-cortical: 4

### Evaluation

41LV89 (Site 20) is an artifact scatter with 1 burned caliche feature. The feature is 2.5 m by 2 m and has evidence of water ponding over the feature. This has affected the feature as many pieces of burned caliche have been displaced. No artifacts were recorded in association with the feature. No charcoal or staining was present. In addition, approximately 50 pieces of burned caliche mixed with natural caliche are located across the site, indicating that the area has also been affected by erosional processes. The artifacts are all core-reduction flakes made of chert. Based on the lack of diagnostic artifacts, the site is unknown for cultural and temporal affiliation. The site sits on natural caliche and is mixed with the scattered burned caliche, indicating that the area is deflated. Subsurface cultural remains are unlikely due to the surface natural caliche. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV89 is recommended as not eligible to the NRHP.

### Impacts and Recommendations

41LV89 (Site 20) will be impacted by vibratory and receiver lines. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

41LV90

<b>Field Number:</b>	Site 21
<b>Site Type:</b>	Artifact scatter
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV90 (Site 21) is an artifact scatter located in an area of low-lying dunes (Figures 46 and A30). The site measures 31 m by 30 m (102 ft by 98 ft) and is situated at an elevation of 838 m (2,750 ft) amsl. Vegetation includes grasses, acacia, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 46 — 41LV90 (Site 21), Overview, View North**

Features

No features were found. At least 15 pieces of burned caliche are scattered throughout the site, indicating that at least 1 feature was once present at the site.

Artifacts

All surface artifacts were analyzed in the field and include 10 core-reduction flakes, 1 bifacial-thinning flake, and 3 pieces of ground stone (Table 14). Chert, quartzite, and sandstone were the lithic material

found at the site. One (1) mano fragment, 1 one-handed mano, and 1 metate fragment were recorded; all are sandstone.

**Table 14 — 41LV90 (Site 21) Lithic Assemblage**

Raw Material	Size Category	Core-reduction Flakes	Non-cortical Interior Thinning	Tools
Tan chert	2-4 cm	Cortical: 1 Non-cortical: 2		
	>4 cm	Cortical: 1		
Gray chert	2-4 cm	Non-cortical: 1		
White chert	1-2 cm		1	
Tan quartzite	2-4 cm	Cortical: 1 Non-cortical: 2		
	>4 cm	Cortical: 1		
Gray quartzite	2-4 cm	Cortical: 1		
Sandstone	>4 cm			1 mano (140 x 79 x 30 mm), 1 hand mano (127 x 110 x 10 mm), 1 metate fragment (120 x 140 x 30 mm)
Total		Cortical: 5 Non-cortical: 5	1	3

### Evaluation

41LV90 (Site 21) is an artifact scatter with no defined features. At least 15 pieces of burned caliche are scattered in the area, indicating that at least 1 feature existed at some point in time. The artifact assemblage is small but diverse with core-reduction flakes, a bifacially-thinning flake, 2 manos, and 1 metate fragment. Lithic reduction occurred at the site, but tool manufacturing is likely to have occurred at the site too. In addition, it appears that plant processing occurred at the site, based on the ground stone artifacts. No surface charcoal or staining was present within the burned caliche scattering. Although the area does have some aeolian sands, natural caliche is present on the surface, indicating that the area is deflated. Based on the lack of diagnostic artifacts, the site is unknown for cultural and temporal affiliation. The area does not have any material for radiocarbon dating, and subsurface cultural remains are unlikely due to the surface natural caliche. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV90 is recommended as not eligible to the NRHP.

### Impacts and Recommendations

41LV90 (Site 21) will be impacted by a single vibratory line. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

41LV91

<b>Field Number:</b>	Site 22
<b>Site Type:</b>	Artifact scatter
<b>Affiliation:</b>	Jornada Mogollon: Unspecific (AD 500 to 1450)
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV91 (Site 22) is an artifact scatter located in an area of low-lying dunes (Figures 47 and A31). The site measures 29 m by 42 m (95 ft by 138 ft) and is situated at an elevation of 838 m (2,750 ft) amsl. Vegetation includes grasses, snakeweed, acacia, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 47 — 41LV91 (Site 22), Overview, View North**

### Features

No features were found. At least 15 pieces of burned caliche are scattered throughout the site, indicating that at least feature was once present at the site.

### Artifacts

All surface artifacts were analyzed in the field and included 3 core-reduction flakes, 1 multidirectional core, 2 pieces of ground stone, and 1 sherd (Tables 15 and 16). Chert, chalcedony, quartzite, and

sandstone were the lithic materials found at the site. The ground stone includes 1 one-handed mano and 1 metate fragment. The metate fragment is heavily ground on both sides and is basin shaped. The ground stone fragments are both sandstone. The sherd is a small, brownware jar fragment. It is the only fragment found during this project.

**Table 15 — 41LV91 (Site 22) Lithic Assemblage**

Raw Material	Size Category	Core-reduction Flakes	Tools
Chalcedony	1-2 cm	Cortical: 1	
Tan chert	2-4 cm	Non-cortical: 2	
Sandstone	>4 cm		1 hand mano (143 x 122 x 35 mm), 1 metate (117 x 104 x 36 mm)
Tan quartzite	>4 cm		1 core multidirectional (72 x 65 x 38 mm)
Total		Cortical: 1 Non-cortical: 2	3

**Table 16 — 41LV91 (Site 22) Ceramic Assemblage**

Ceramic Type	Form	Temper	Finish/Slip	Portion	Counts
Brownware	Jar	Coarse sand	Red color	Body	1

### Evaluation

41LV91 (Site 22) is an artifact scatter with no defined features. At least 15 pieces of burned caliche are scattered in the area, indicating that at least 1 feature existed at some point in time. The artifact assemblage is small but diverse with core-reduction flakes, a core, ground stone, and a sherd. Lithic reduction occurred at the site. The ground stone also indicates that plant processing also occurred at the site. The lithic material is diverse as well, with cherts, quartzite, and sandstone present. No surface charcoal or staining was present within the burned caliche scattering. Although the area does have some aeolian sands, natural caliche is present on the surface, indicating that the area is deflated. Based on the 1 sherd, the site tentatively dates to an unspecific time during the Jornada Mogollon period (AD 500 to 1450). The site is a small artifact scatter with no defined features and little likelihood for subsurface cultural remains. In addition, charcoal flecking or staining was not found, which could have been radiocarbon dated. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site that is unlikely to contain any additional data potential, 41LV91 is recommended as not eligible to the NRHP.

### Impacts and Recommendations

41LV91 (Site 22) will be impacted by vibratory and receiver lines. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

41LV71

<b>Field Number:</b>	Site TS2
<b>Site Type:</b>	Single feature with artifacts
<b>Affiliation:</b>	Unknown
<b>NRHP Recommendation:</b>	Not eligible
<b>Project Recommendation:</b>	Avoided by reroute

41LV71 (Site TS2) is a single feature with 2 artifacts located next to a playa (Figures 48 and A32). The site measures 67 m by 55 m (220 ft by 180 ft) and is situated at an elevation of 823 m (2,700 ft) amsl. Vegetation includes grasses, snakeweed, acacia, and mesquite. Surface visibility is 80 percent. Sources of disturbance to the site include wind and water erosion. The site is estimated to be approximately 50 percent intact. Both alluvial and aeolian soils were noted with natural caliche present throughout the site.



**Figure 48 — 41LV71 (Site TS2), Overview, View West**

### Features

One (1) feature was recorded at the site. Feature 1 is a 2 m by 2 m burned caliche concentration with approximately 60 pieces measuring between 1 and 10 cm in size (Figure 49). The feature is irregular in shape and is located on a slight slope. Erosional processes have affected the feature as several pieces of burned caliche have redeposited downslope. Two (2) flakes are adjacent to the feature to the north. No charcoal or staining was present. In addition, approximately 10 pieces of burned caliche mixed with natural caliche scattered across the site.



**Figure 49 — 41LV71 (Site TS2), Feature, View East**

Artifacts

All surface artifacts were analyzed in the field and include 1 core-reduction flake, and 1 edge-modified flake (Table 17). Both flakes are made of chert.

**Table 17 — 41LV71 (Site TS2) Lithic Assemblage**

Raw Material	Size Category	Core-reduction Flakes	Edge Modified
Tan chert	2-4 cm	Cortical: 1	1
Total		1	1

Evaluation

41LV71 (Site TS2) is a single feature with 2 associated flakes. In addition to the burned caliche concentration (Feature 1) 10 additional pieces of burned caliche are scattered across the site. The pieces of burned caliche may be associated with the feature or may have been an additional feature. The 2 flakes are a core-reduction flake and an edge-modified flake and may represent tool manufacturing occurred at the site. Natural caliche is present on the surface, indicating that the area is deflated. Based on the lack of any diagnostic artifacts, the site is unknown for cultural and temporal affiliation. The site sits on natural caliche and is mixed with the scattered burned caliche, indicating that the area has been affected by erosional processes. Subsurface cultural remains are unlikely due to the surface natural caliche. Because the integrity of the site has been greatly affected by erosional processes and deflation, resulting in a site

that is unlikely to contain any additional data potential, 41LV71 is recommended as not eligible to the NRHP.

### Impacts and Recommendations

41LV71 (Site TS2) will be impacted by a single vibratory line. A reroute was flagged, to avoid the site by the seismic survey. The site will not be affected by the proposed project.

### **Isolated Occurrences**

One hundred and forty-two (142) isolated occurrences were recorded within the project area (Table 18). As shown in the table below, Isolated Occurrence 109 was located within a site and, therefore, was deleted. Most of the isolated occurrences are burned caliche scatters. These isolated occurrences do not meet the criteria for eligibility to the NRHP, and no further treatment is recommended.

**Table 18 — Isolated Occurrence Summary**

<b>IO No.</b>	<b>Waypoint</b>	<b>Setting</b>	<b>Description</b>
1	4079-4089	Flat	20 pieces burned caliche, 10 by 10 m area
2	3241	Flat	25+ pieces burned caliche, 3 to 10 cm, 3 by 10 m area
3	1119	Flat	20 pieces burned caliche, 1.5 m diameter
4	3010	Flat	3 pieces burned caliche
5	4091-4094	Flat	22 pieces burned caliche, 5 by 5 m area
6	3195	Flat	35 pieces burned caliche, 2 by 2 m area
7	1092	Desert Scrub	100 pieces burned caliche, 3 to 15 cm, 50 by 50 m area
8	1093	Desert Scrub	15 pieces burned caliche, 10 cm; 1 hammerstone 8 x 8 x 2 cm
9	1094	Desert Scrub	30 pieces burned caliche, 3 to 10 cm, 25 by 25 m area
10	1097	Desert Scrub	40 pieces burned caliche, 3 to 15 cm, 20 by 20 m area
11	1096	Desert Scrub	20 pieces burned caliche, 3 to 10 cm, 15 by 15 m area
12	1082	Desert Scrub	10 pieces burned caliche, 10 to 15 cm, 5 m area
13	1074	Desert Scrub	12 pieces burned caliche, 3 to 10 cm, 20 m area
14	1078-1081	Flat	140 pieces burned caliche, 8 by 30 m area
15		Flat	50 pieces of burned caliche, 5 by 5 m area
16	1075-1077	Flat	210 pieces burned caliche, 20 by 30 m area



IO No.	Waypoint	Setting	Description
17		Flat	60 pieces burned caliche, 5 by 4 m area
18	3190	Flat	15 pieces burned caliche, 8 by 8 m area
19	2041	Flat	15 pieces burned caliche, 20 by 0 m area
20	2032, 2033	North edge of pipeline/Flat	1 red-yellow jasper, heat treated, cortical core-reduction flake, 20% cortex, 2 to 4 cm; 2 pieces burned caliche, 2 by 13 m area
21	2031	Flat	15 pieces burned caliche, 2 to 5 cm, 4 m area
22	2039	Flat	35 pieces burned caliche, 2 to 4 cm, 3 by 3 m area
23	2044	Flat	70+ pieces burned caliche, 2-4 cm, 15 by 15 m area; 1 pink chert, non-cortical core-reduction flake 2 to 4 cm
24	2043	Flat	30 pieces burned caliche, 3 cm, 10 by 10 m area
25	2042	Flat	15 pieces burned caliche, 8 by 5 m area
26	2029	Flat	18 pieces burned caliche, 2 by 2 m area
27	2030	Flat	50 pieces burned caliche, 10 by 15 m area
28	3041, 3042	Flat	25 pieces burned caliche 4 by 9 m area
29	3019	Flat	27 pieces burned caliche, 2 to 8 cm diameter, 5 by 12 m area
30	3020	Flat	20 pieces burned caliche, 2 to 5 cm, 2 m diameter area
31	3021, 3022	Flat	100 pieces burned caliche, 2 cm, 12 by 20 m diameter area
32	1065	Flat	24 pieces burned caliche, 2 to 5 cm, 4 by 19 m area
33	1068	Flat	30 pieces burned caliche, 5 cm, 5 by 15 m area
34	4026	Flat	8 pieces burned caliche, 5 cm diameter area
35	4028	Flat	1 chalcedony non-cortical, bifacial-thinning flake, 1 cm; 3 pieces burned caliche, 2 m area
36	3058	Flat	20+ pieces burned caliche, 2 to 5 cm diameter, 1 by 2 m area
37	1002, 1003	Flat	50 pieces burned caliche, 2-5 cm; 3 tan chert, cortical core-reduction flakes, 10 to 20% cortex, 2 to 4 cm in size, 9 by 12 m area

IO No.	Waypoint	Setting	Description
38	3053, 3054	Flat	13 pieces burned caliche, 5 cm diameter, 10 by 14 m area
39	1025	North-facing slope	1 chalcedony cortical core-reduction flake, 50% cortex, 4+ cm
40	1027, 1028	West-facing slope	50 pieces burned caliche, 1 to 4 cm diameter, 4 by 4 m area
41	1070	Flat	4 pieces burned caliche, 3 cm diameter, 1 by 10 m area; 1 tan chert non-cortical core-reduction flake, 2 to 4 cm
42	1009	Flat	1 tan chert cortical core-reduction flake, 10% cortex, 2 to 4 cm in size
43	1020	Flat	25 pieces burned caliche, 1 to 5 cm diameter, 1.5 by 1.5 m area
44	4001	Small dune area	1 tan quartzite cortical core-reduction flake, 50% cortex, 2 to 4 cm
45	4050	Playa	17 pieces burned caliche, 5 to 10 cm diameter, 4 by 6 m area
46	4048	Playa	12 pieces burned caliche, 6 cm diameter, 6 by 6 m area
47	4047	Playa	15 pieces burned caliche, 5 cm diameter, 3 by 6 m area
48	3078, 3079	Flat	26 pieces burned caliche, 6 cm diameter, 15 by 20 m area
49	3077	Flat	30 pieces burned caliche, 5 to 15 cm diameter, 7 by 20 m area
50	3076	Flat	100 pieces burned caliche, 2 cm diameter, 14 by 32 m area
51	3075	Flat	60 pieces burned caliche, 4 cm diameter, 15 by 30 m area
52	3073, 3074	Flat	90+ pieces burned caliche, 3 cm diameter, 17 by 27 m area
53	4072	Low dunes	1 tan chert cortical core-reduction flake, 2 to 4 cm, 10% cortex; 1 gray chert cortical core-reduction flake, 2 to 4 cm, 40% cortex; 1 projectile point fragment (collected by CRC; Figure 50); 1 piece burned caliche
54	1113,1114,1115	Low dunes	1 tan chert cortical core-reduction flake, 2 to 4 cm, 5% cortex; 1 tan chert cortical core-reduction flake, 2 to 4 cm, 10% cortex; 3 pieces burned caliche, 5 to 10 cm, 8 by 3 m area

IO No.	Waypoint	Setting	Description
55	1103	Flat	30+ pieces burned caliche, 3 to 5 cm, 4 by 10 m area
56	3239	Flat	150+ pieces burned caliche, 2 to 5 cm, 20 m area
57	3008	Flat	15 pieces burned caliche, 10 by 10 m area
58	3009	Playa	10 pieces burned caliche, 2 by 3 m area
59	3012	Flat	5 pieces burned caliche, 3 by 8 m area
60	1126, 1127	Flat	50 pieces burned caliche, large 5 cm
61	2012	Flat	60 pieces burned caliche, 5 cm
62	4099-4101	Flat	35 pieces burned caliche, 20 m area
63	4095-4098	Flat	8 pieces burned caliche, 20 x 20 m area
64	4105-4107	Flat	10 pieces burned caliche, 10 by 10 m area
65	3242-326	Flat	3 pieces burned caliche, 5 by 4 m area
66	3247	Flat	15 pieces burned caliche, 2 by 2 m area
67	3215	Flat	4 pieces burned caliche, 5 by 3 m area
68	3213	Flat	3 pieces burned caliche, 1 by 1 m area
69	1102	Flat	8 pieces burned caliche, 1 by 10 m area
70	3208	Flat	10 pieces burned caliche, 1 by 4 m area
71	3209	Flat	15 pieces burned caliche, 3 by 2 m area
72	3210	Flat	25 pieces burned caliche, 30 by 30 m area, 2 ground stone fragments, 11 cm long
73	3193	Flat	12 pieces burned caliche, 5 by 5 m area
74	3206	Flat	40 pieces burned caliche, 10 by 5 m area
75		Desert scrub, gentle slope	50 pieces burned caliche, 2 to 7 cm, 5 by 5 m area
76		Desert scrub, gentle slope	6 pieces burned caliche, 2 to 6 cm
77		Desert scrub, gentle slope	1 grey chert cortical core-reduction flake, 2 to 4 cm, 30% cortex

IO No.	Waypoint	Setting	Description
78		Built-up sandsheet	1 white chert cortical core-reduction flake, 10% cortex; 1 tan chert cortical core-reduction flake 1 to 2 cm, 50% cortex; 1 tan chert cortical core-reduction flake, 4+ cm, 40% cortex; 6 by 5 m area
79		Built-up sandsheet	1 chert cortical core reduction flake, >4 cm, 40% cortex
80		Built-up sandsheet	1 chalcedony angular debris
81	1056	Built-up sandsheet	1 grey chert cortical core-reduction flake, 2 to 4 cm, 25% cortex; 1 rhyolite flake, 25% cortex; 3 chalcedony non-cortical core reduction flakes, 2 to 4 cm, projectile point, (possible Shumla) (collected by CRC; Figure 51); 1 piece burned caliche
82		Blowout	4 pieces burned caliche, 20 by 4 m area
83		Desert scrub	22 pieces burned caliche, 20 m area, 1 quartzite core, 8 by 5.5 by 4 cm
84		Desert scrub, gentle slope	2 pieces burned caliche, 2 cm; 1 chalcedony angular debris; 1 chalcedony 2 to 2 cm, 35% cortex
85		Desert scrub	30 pieces burned caliche, 10 by 20 m area
86		Desert scrub	30 pieces burned caliche, 4 by 4 m area
87		Desert scrub	15 pieces burned caliche, 5 by 5 m area
88	3031	Desert scrub	15 pieces burned caliche, 2 by 2 m area
89	3030	Desert scrub	8 pieces burned caliche, 2 by 3 m area
90		Desert scrub	5 pieces burned caliche, 1 by 1 m area
91		Desert scrub	4 pieces burned caliche, 6 by 6 m area
92		Desert scrub	30 pieces burned caliche, 20 by 20 m area; 1 chalcedony non-cortical core reduction flake, 1 to 2 cm
93		Desert scrub	20 pieces burned caliche, 10 by 20 m area
94		Desert scrub	12 pieces burned caliche, 30 by 30 m area
95		Hill slope	1 quartzite core, 4+ cm, 30% cortex; 1 gray chert non-cortical core-reduction flake; 25 pieces burned caliche, 10 by 15 m area
96		Hill slope	9 pieces burned caliche, 5 by 5 m area
97		Hill slope	17 pieces burned caliche, 3 by 2 m area
98		Hill top	4 pieces burned caliche, 3 by 1 m area

IO No.	Waypoint	Setting	Description
99		Hill slope	20 pieces burned caliche, 10 by 10 m area
100		Wash	10 pieces burned caliche, 10 x 1 m area
101		Drainage	15 pieces burned caliche, 15 by 5 m area
102		Flat	15 pieces burned caliche, 10 by 5 m area
103	2001	Flat	20 pieces burned caliche, 10 by 10 m area
104		Flat	80 pieces burned caliche, 40 by 20 m area, 1 chert non-cortical core-reduction flake, 3 to 4 cm
105		Flat	65 pieces burned caliche, 30 by 20 m area
106		Flat	5 pieces burned caliche, 1 by 1 m area
107		Flat	20 pieces burned caliche, 20 by 7 m area; 1 hammerstone 9 by 8 by 7 cm
108		Wash	19 pieces burned caliche, 2 by 2 m area
109	Deleted		Part of AD 12
110		Flat	15 pieces burned caliche, 30 by 7 m area
111	3098	Flat	4 pieces burned caliche, 1 by 2 m area
112		Flat	13 pieces burned caliche, 12 by 10 m area, 1 hole-in-top can
113	4039,4038	Flat	32 pieces burned caliche, 25 by 15 m area, 1 chert cortical core-reduction flake, 4+cm, 50% cortex
114	4040	Flat	4 pieces burned caliche, 6 by 1 m area
115	4045	Flat	33 pieces burned caliche, 40 by 15 m area
116	4046	Flat	7 pieces burned caliche, 3 by 1 m area
117	1106	Flat	10 pieces of burned caliche, 5 by 5 m area
118	1109	Flat	10 pieces burned caliche, 10 by 2 m area
119	1107, 1108	Flat	50 pieces burned caliche, 20 by 20 m area
120		Flat	1 limestone tested cobble
121		Flat	30 pieces burned caliche, 5 by 3 m area
122	3102	Flat	50 pieces burned caliche, 30 by 1 m area

IO No.	Waypoint	Setting	Description
123	3197	Flat	4 pieces burned caliche, 2 by 2 m area
124	3205	Flat	60 pieces burned caliche, 30 by 20 m area
125	1085, 1086	Flat	23 pieces burned caliche, 15 by 15 m area
126	1054, 1057	Flat	45 pieces burned caliche, 30 by 15 m area; projectile point (possible Gower) (CRC collected earlier; Figure 52); 1 chert non-cortical core reduction flake, 1 to 2 cm
127	3118, 3117	Flat	75 pieces burned caliche, 35 by 20 m area; 1 chert cortical core-reduction flake, 3 by 5 by 4 cm
128	3121, 3122	Flat	70 pieces burned caliche, 50 by 50 m area; 1 quartzite ground stone, 7 by 4 by 2 cm; 1 chalcedony non-cortical core-reduction flake, 1 to 2 cm; 1 chalcedony cortical core-reduction flake, 4+ cm, 10% cortex
129	3110	Flat	1 chert non-cortical core-reduction flake, 1 to 2 cm; 1 petrified wood, non-cortical core-reduction flake, 3 to 2 cm; 20 pieces burned caliche, 10 by 5 m area
130	3163	Flat	11 pieces burned caliche, 5 to 10 cm, 10 m diameter area
131	3162	Flat	70 pieces burned caliche, 2 to 5 cm, 5 by 10 area
132	3161	Flat	45 pieces burned caliche, 4 to 8 cm in size, 4 by 15 m diameter area; 1 chert, cortical core-reduction flake, 20% cortex, 2 to 4 cm in size
133	3160	Flat	12 pieces burned caliche, 3 to 4 cm, 3 by 3 diameter area
134	3159	Flat	16 pieces burned caliche, 4 to 10 cm, 3 by 3 m area
135	3151	Flat	85 pieces burned caliche, 3 to 15 cm, 8 by 4 m diameter area
136	3149	Flat	12 pieces burned caliche, 1 to 10 cm, 3 by 7 m area
137	3142	Flat	83 pieces burned caliche, 3 to 15 cm, 20 by 8 m diameter area
138	3083, 3084	Flat	70+ pieces burned caliche, 3 cm diameter, 13 by 24 m area
139	3085-3092	Flat	200+ pieces burned caliche, 80 by 35 m area; 1 gray quartzite, cortical core-reduction flake, 30% cortex, 4+ cm in size
140	3148,3147	Flat	40 pieces burned caliche, 3 to 10 cm, 3 by 18 m area

IO No.	Waypoint	Setting	Description
141	3154-3158	Flat	85 pieces burned caliche, 3 to 15 cm, 43 by 16 m diameter area
142	3127-3130	Flat	16 pieces burned caliche, 4 by 15 m area
143	1083	Slope	115 pieces burned caliche, 1 to 10 cm, 50 by 30 m area



Figure 50 — IO 53

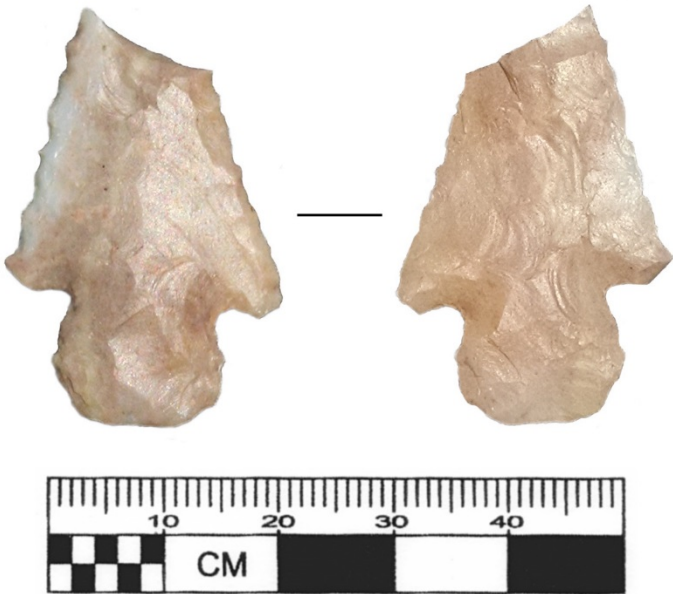


Figure 51 — IO 81



Figure 52 — IO 126



## CULTURAL RESOURCE SUMMARY AND RECOMMENDATIONS

CRC was contracted by Dawson Geophysical of Midland, Texas to conduct a 100-percent intensive pedestrian survey of a 43-square mile area located within the southern portion of Loving County and western Winkler County, Texas. The proposed project entails 3D seismic survey within this 43-square mile area with both source and receiver lines. The project area is on University of Texas lands.

CRC conducted a cultural resource survey from July 5, to August 9, 2017. Dr. John Griggs, Robert d'Aigle, John Salard, Janna Salard, Hamzah Jule, and Tom Hough completed the survey. Dr. John Griggs served as the Principal Investigator and Robert d'Aigle served as Field Director.

Marron was brought onto the project to record cultural resources that were identified by CRC and complete the report. Marron's fieldwork began on August 10 and finished August 20, 2017. Fieldwork for this phase of the project was completed by Toni R. Goar, R. Stanley Kerr, Christina Chavez, Ardale Delena, Robert Debry, Joshua Vallejos, John Salard, and Tom Hough. Toni R. Goar served as Project Manager for Marron's phases of the project. All work was completed under THC Permit 8084. Curation will be at TARL.

The total length of seismic lines surveyed was 758.42 km (471.36 mi) with a 30-m survey width. Total area surveyed within the 43-square mi area was 2,207.53 ha (5,454.72 ac).

Archival research was conducted prior to the cultural resource survey. Two (2) sites (41LV 9 and 41LV 10) were located within the 43-square mi project area. Both sites are located outside the surveyed seismic lines and will not be affected.

Twenty-three (23) sites and 142 isolated occurrences were recorded (Table 19). Most of the cultural resources found in the project area are burned caliche concentrations that were defined as features and recorded as sites, or scatters, which were recorded as isolated occurrences. Most of the sites are unknown for cultural and temporal affiliation. Two (2) sites are Archaic sites and 1 site is Jornada Mogollon, based on 1 sherd. This is the only ceramic found, during the project suggesting this area was used in the Archaic period, rather than later. The content of the sites, specifically the presence of burned caliche and ground stone, indicates seasonal use of the project area for the collection and processing of vegetal materials. Also indicated is the manufacture of stone tools, though this was likely a secondary activity at the sites. Based on the location of many of the sites at the edges of playas, seasonal use was likely focused on wet times of the year when the playas were full of water and the vegetation was matured.

Twenty-two (22) sites are recommended as not eligible to the NRHP, due to the lack of additional data potential caused by impacts to site integrity by wind and water erosion and the deflated condition of the areas. One site, (41LV87) has an undetermined eligibility based on the unknown potential for buried cultural deposits. Further testing is recommended to best determine the sites integrity. All 23 sites will be avoided by a reroute around each site. At each site, a 50 ft buffer was flagged and an additional 50 ft area outside the buffer was inspected for cultural resources. This "work zone" will be used during the seismic survey to avoid the sites. The isolated occurrences do not meet the criteria for eligibility to the NRHP and no further treatment is recommended.



**Table 19 — Cultural Resource Summary**

<b>Site No.</b>	<b>Type</b>	<b>NRHP Eligibility Recommendation</b>	<b>Treatment Recommendation</b>
41LV69 (1)	Artifact scatter – Archaic	Not eligible	Avoided by reroute
41LV70 (2)	Features – unknown	Not eligible	Avoided by reroute
41LV72 (3)	Feature with artifacts – Late Archaic	Not eligible	Avoided by reroute
41LV73 (4)	Feature – unknown	Not eligible	Avoided by reroute
41LV74 (5)	Artifact scatter with features – unknown	Not eligible	Avoided by reroute
41LV75 (6)	Features with artifacts – unknown	Not eligible	Avoided by reroute
41LV76 (7)	Features – unknown	Not eligible	Avoided by reroute
41LV77 (8)	Feature with artifacts – unknown	Not eligible	Avoided by reroute
41LV78 (9)	Features with artifacts – unknown	Not eligible	Avoided by reroute
41LV79 (10)	Artifact scatter – unknown	Not eligible	Avoided by reroute
41LV80 (11)	Artifact scatter – unknown	Not eligible	Avoided by reroute
41LV81 (12)	Artifact scatter – unknown	Not eligible	Avoided by reroute
41LV82 (AD 12)	Feature – unknown	Not eligible	Avoided by reroute
41LV83 (13)	Features with artifacts – unknown	Not eligible	Avoided by reroute
41LV84 (15)	Feature – unknown	Not eligible	Avoided by reroute
41LV85 (16)	Features with artifacts – unknown	Not eligible	Avoided by reroute
41LV86 (17)	Artifact scatter – unknown	Not eligible	Avoided by reroute
41LV87 (18)	Artifact scatter with features – unknown	Undetermined	Avoided by reroute
41LV88 (19)	Feature – unknown	Not eligible	Avoided by reroute
41LV89 (20)	Artifact scatter with features – unknown	Not eligible	Avoided by reroute
41LV90 (21)	Artifact scatter – unknown	Not eligible	Avoided by reroute
41LV91 (22)	Artifact scatter – Jornada Mogollon	Not eligible	Avoided by reroute
41LV71 (TS2)	Feature with artifacts – unknown	Not eligible	Avoided by reroute

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