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Class I and Class III Cultural Resource Inventory Survey for the Kinder Morgan's Station No. 142 and Oasis Meter Station on NGPL's Lockridge-Delhi Line near Pyote, Ward County, Texas

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Class I and Class III Cultural Resource Inventory Survey for the Kinder Morgan's Station No. 142 and Oasis Meter Station on NGPL's Lockridge-Delhi Line near Pyote, Ward County, Texas

CLASS I AND CLASS III CULTURAL RESOURCE INVENTORY SURVEY FOR KINDER MORGAN'S STATION NO. 142 AND OASIS METER STATION ON NGPL'S LOCKRIDGE-DELHI LINE NEAR PYOTE, WARD COUNTY, TEXAS

Class I and Class III Cultural Resource Inventory Survey for the Kinder Morgan's Station No. 142 and Oasis Meter Station on NGPL's Lockridge-Delhi Line near Pyote, Ward County, Texas

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Abstract

TRC Environmental (TRC) conducted a Class I archival and records search and Class III intensive 100 percent pedestrian survey of a 1.1-acre parcel of private land at Kinder Morgan's Station No. 142 and 1.8-acre parcel of private land at Kinder Morgan's Oasis Meter Station on NGPL's Lockridge-Delhi Line in central Ward County, Texas. Kenneth L. Brown, Ph.D., RPA, served as Principal Investigator and Field Supervisor. Kinder Morgan is designing upgrades and performing maintenance for their existing facilities. The project involves the modification of the Oasis Meter Station and the installation of pig launcher and receivers in order to make the pipeline segment "smart piggable." TRC conducted the Class I and Class III cultural resource investigations according to the Texas Historical Commission (THC) standards. The cultural resource survey was completed on December 8, 2017. The Class I archival research indicated no previously recorded sites were in the project areas or their vicinities. The Class III survey did not find any new sites at either facility. TRC recommends Kinder Morgan be allowed to develop their proposed natural gas facilities.

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1.0 Introduction

TRC Environmental (TRC) conducted a Class I archival and records search and Class III intensive 100 percent pedestrian survey of a 1.1-acre parcel of private land at Kinder Morgan's Station No. 142 (Figure 1.1) and 1.8-acre parcel of private land at Kinder Morgan's Oasis Meter Station on NGPL's Lockridge-Delhi Line (Figure 1.2) in central Ward County, Texas. Kenneth L. Brown, Ph.D., RPA, served as Principal Investigator and Field Supervisor. Kinder Morgan is designing upgrades and performing maintenance for their existing facilities. The project involves the modification of the Oasis Meter Station and the installation of pig launcher and receivers in order to make the pipeline segment "smart piggable." TRC conducted the Class I and Class III cultural resource investigations according to the Texas Historical Commission (THC) standards. The cultural resource survey was completed on December 8, 2017. The Class I archival research indicated no previously recorded sites were in the project areas or their vicinities. The Class III survey did not find any new sites at either facility. TRC recommends Kinder Morgan be allowed to develop their proposed natural gas facilities.

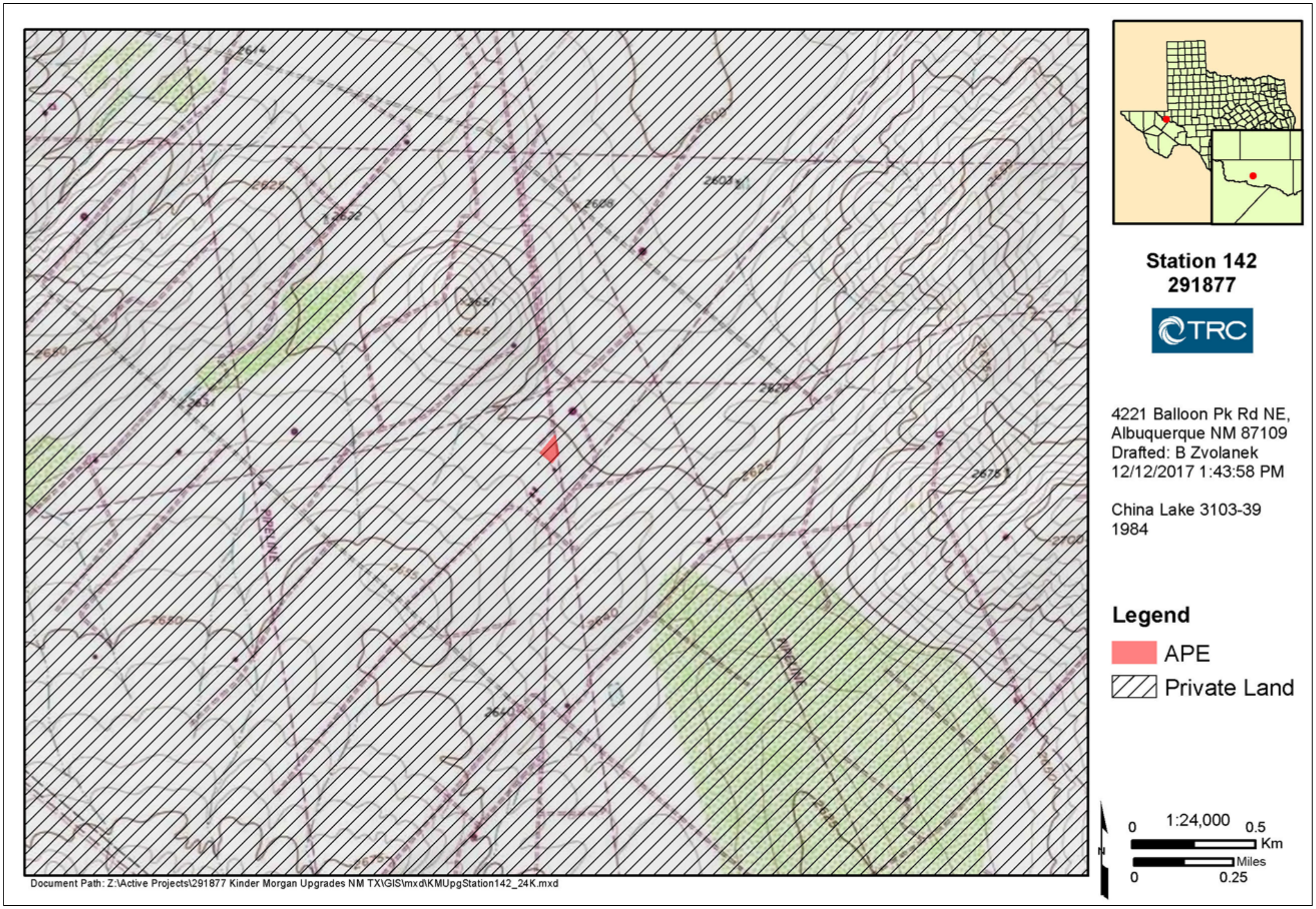

Figure 1.1 Station No. 142 location map in Ward County, Texas

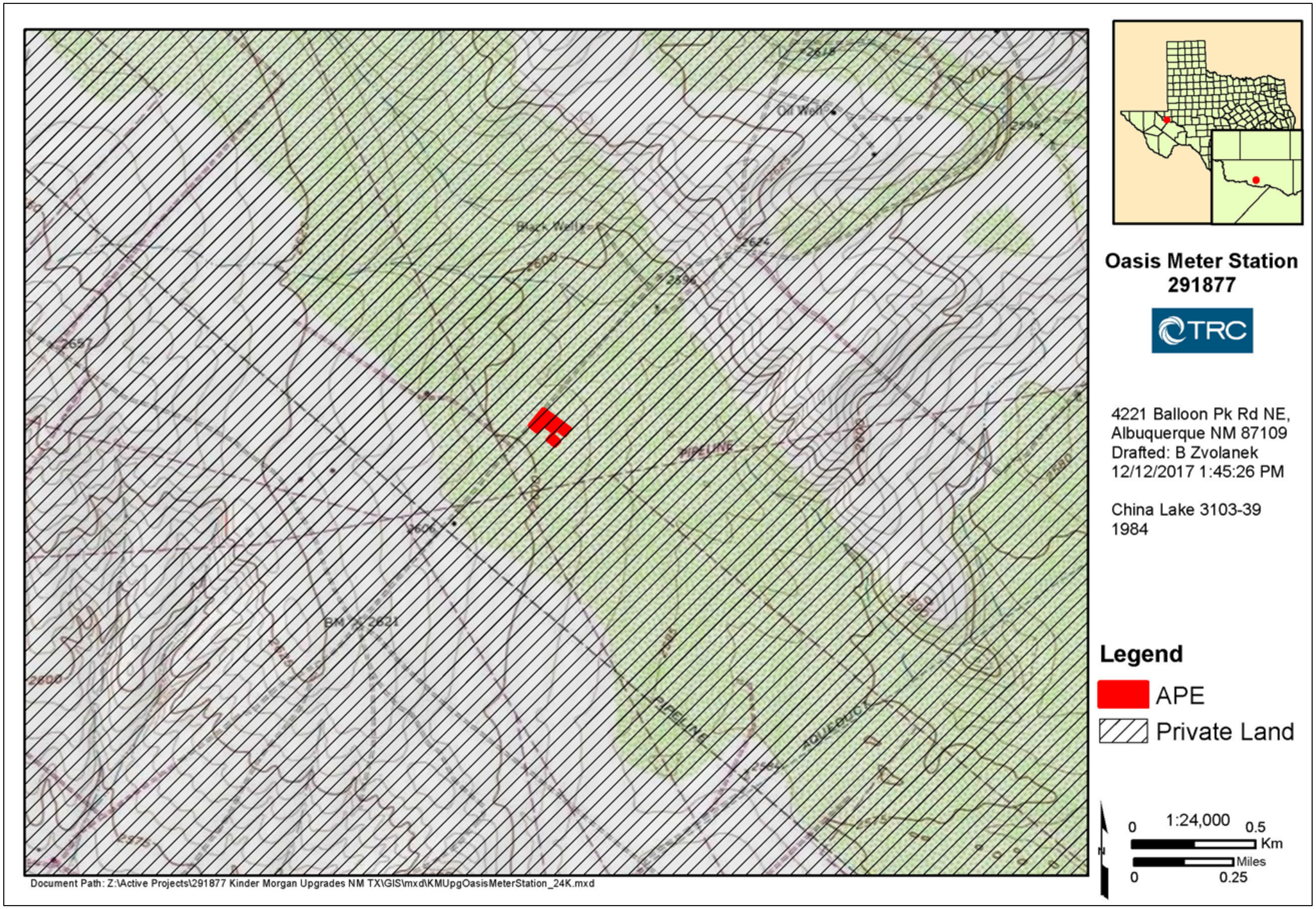

Figure 1.2 Oasis Meter Facility location map in Ward County, Texas

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2.0 Project Location

Kinder Morgan's Station No. 142 (Figure 1.1) and Oasis Meter Station (Figure 1.2) are on the China Lake 7.5-minute quadrangle (1984, 3103-39). Figures 2.1–2.4 show the Station No. 142 overviews and Figure 2.5–2.8 show the Oasis Meter Station overviews.

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3.0 Environmental Setting

Kinder Morgan's proposed upgrades and maintenance projects include the modification of the Oasis Meter Station and the installation of pig launcher and receivers in order to make the pipeline segment "smart piggable." The project is located on NGPL's Lockridge-Delhi Line near Pyote, central Ward County, Texas, in the southwestern portion of the Southern High Plains region of west Texas, in the eastern Trans-Pecos.

3.1 Physiography

Station No. 142 and Oasis Meter Station are in the southwestern portion of the Southern High Plains. The Southern High Plains are a remnant plateau formed from the remaining deposits of the Miocene Ogallala Formation (Holliday 1985, 1995; Johnson 1987; Johnson and Holliday 1989). Escarpments along the western, northern, and eastern sides of the plateau define the Southern High Plains. The western and northern escarpments separate the Southern High Plains from the Pecos River Valley and the Canadian River respectively. Erosion by the Red, Brazos, and Colorado rivers and tributaries form the eastern escarpment. The southern boundary of the Southern High Plains has no obvious topographical delineation from the Edwards Plateau of Central Texas and is recognized by the most northern outcrops of Edwards Limestone (Mead et al. 1974; Mitchell 2001:2; Reeves 1972l).

Characterized by a semi-arid continental climate, this "virtually featureless, constructional surface" (Holliday 1989:74) is the most recent of as many as six well-developed but buried soils that comprise the Blackwater Draw Formation formed by multiple episodes of eolian sheet deposition separated by long periods of relative landscape stability over the past 1.4 million years (Holliday 1990). Similarities between the Quaternary Blackwater Draw Formation and underlying Miocene-Pliocene Ogallala Formation suggest that the Southern High Plains has been a grassland or savanna grassland for millions of years (Holliday 1990:510). The topographic monotony is relieved only by Holocene dune fields (formed during droughts of the Altithermal period) along its southwestern and western borders (Holliday 1989), thousands of playas scattered over its surface (Bolen et al. 1989), over two dozen larger saline lakes, and several dry tributaries (or "draws") of the Colorado, Brazos, and Red rivers (Holliday 1990; Wester 2007:25).

The Rolling (or Lower) Plains has been referred to as the "lowland along the Colorado" (Fenneman 1931:58) or "Break of the Plains" (Baker 1915:45). The elevation in this region rises from 244 m (800 ft) above mean sea level (amsl) in the northeast to 853 m (2800 ft) amsl at the base of the Llano Estacado along its western border (Blair 1950; Chambers 1946:4; Fenneman 1931:10). Station No. 142 is at an elevation of 1695 feet amsl and the Oasis Meter Station is at an elevation of 2630 feet amsl. The Rolling Plains can be divided into sloping upper prairies, or mesas, that are cut by canyons of moderate relief, which in turn widen into broad, level lower prairies where occasional isolated mesas or buttes appear. The upper prairies consist of level stretches, vegas or grassland, or arroyos that dissect these grasslands. The canyons are upper tributaries of rivers fed by the upper prairie arroyos. Talus slopes are usually found below the escarpments, and rugged ravines are at the base of narrow side canyons.

Broad, level flood plains are found along the wider canyons. The buttes are remnants of upper plains that have been isolated by extensive arroyo and canyon development. They often have level tops below which are escarpments or slopes that descend to terraces, which in turn descend in lower slopes to the broad, level lower prairies. The latter consist of level meadows (Campbell 1975:4–10) and/or groves of mesquite savannahs (Dice 1953:43) broken by river cuts with slopes, or embankments, that descend to the flood plains and river beds (Campbell 1975:5–6; Julian-Judd 1977:16–20).

3.2 Geology

The Southern High Plains has regional bedrock consisting of Paleozoic and Mesozoic sedimentary rocks deposited across a foundation of Permian and Triassic redbeds with Cretaceous limestone, shale, and sandstone sometimes occurring between these formations (Meade et al. 1974). The formation of the High Plains began approximately 60 million years ago as soils and other materials from the Rocky Mountains were eroded and deposited as alluvial fans (Holliday 1990). These alluvial fans were eroded and buried under extensive deposits during the Tertiary. Most of these Cenozoic deposits are Miocene and Pliocene alluvial and eolian sediments of the Ogallala Formation (Gustavson and Winkler 1988; Reeves 1972; Winkler 1987).

The Ogallala Formation provides the major aquifer for the Southern High Plains (Brune 1981). This aquifer is inset locally by the Pliocene-age Blanco Formation, an extensive lacustrine deposit of dolomites and sands deposited in large east-to-west trending basins that cut into the overlying Ogallala Formation (Holliday 1989). The upper Ogallala Formation is characterized by a thick calcrete (caliche) horizon that forms the deposit known locally as the as "caprock caliche" because it is a prominent ledge-forming unit along the top of the plateau escarpment (Holliday 1990). Upper Ogallala sands are the base material of this silicified calcrete thought to be an ancient calcic horizon of secondary calcium carbonate enrichment in the soil profile (Holliday 1988; Mitchell 2001:3–4). The project area is characterized by Quaternary-age deposits. The material is alluvial fan of the Trans-Pecos. There is relict chert gravel of the Rio Grande and calcareous detritus of the Balcones Escarpment (Bureau of Economic Geology 1999).

3.3 Soils

Station No. 142 occurs in the Sharvana soils, nearly level (SH) which consists of shallow, nearly level, fine sandy loam on rises (Figures 3.1 and 3.2). The unit consists of 100 percent Sharvana soils. Typically, Sharvana soils have an H1 horizon that is a 4-inch thick surface layer of fine sandy loam. It has an underlying H2 horizon of fine sandy loam 4 to 10 inches deep. The next layer is a H3 horizon of cemented material 10 to 26 inches deep that overlies an H4 horizon of variable material that is 26 to 40 inches deep. The parent material is calcareous, loamy eolian deposits from the Blackwater Draw formation of Pleistocene age. The soil is well drained and its available water storage is very low (Natural Resources Conservation Service 2017).

Figure 3.1 Station No. 142 ground view

The Oasis Meter Station occurs in the Pyote soils, undulating (PY) which consists of loamy fine sand and fine sandy loam on the plains (Figures 3.3 and 3.4). The unit consists of 100 percent Pyote soils.

Figure 3.2 Station No. 142 soil map (NRCS 2017)

Figure 3.3 Oasis Meter Station soil map (NRCS 2017)

Figure 3.4 Oasis Meter Station ground view

Typically, Pyote soils have an H1 horizon that is 34 inches thick of loamy fine sand. It has an underlying H2 horizon of fine sandy loam 34 to 62 inches thick that overlies an H3 horizon of fine sandy loam 62 to 76 inches thick. The parent material is sandy alluvium and/or sandy eolian deposits. The soil is well drained and its available water storage is low (Natural Resources Conservation Service 2017).

3.4 Present Climate

Ward County has a continental climate with hot summers and cool winters. Winter days are warm with temperatures at night oftentimes dropping below freezing. Rainfall is sparse during most months but is greatest during the summer when thunderstorms develop in the moist air, which occasionally comes inland from the Gulf of Mexico. Snow cover in winter is not persistent and occurs at higher elevations. Snow is rare, and 70 percent of the winters have no measureable snowfall. January is the coldest month with an average monthly high of 60°F and the average monthly low of 28°F. June, July, and August are the warmest months with average monthly highs of 98°F and the average monthly lows of 65°F to 69°F. The total annual precipitation is 11.55 inches with most falling during April through September. Thunderstorms occur during the summer. The prevailing wind is from the south-southwest (Worldclimate 2017).

3.5 Flora

Station No. 142 and the Oasis Meter Station lie within the Chihuahuan Desert, a predominately shrub desert in Mexico, Arizona, Texas, and New Mexico. The Chihuahuan Desert is the easternmost and southernmost of the four North American deserts, the others being the Great Basin Desert, the Sonoran Desert, and the Mojave Desert. The region is characterized by alternating mountains and valleys (bolsons). Much of the Chihuahuan Desert lies between 1970 and 5500 ft amsl in elevation (Harris n.d.).

Blair (1950) divided Texas into seven biotic provinces, from east to west: 1) Austroriparian, 2) Texan, 3) Tamaulipan, 4) Balconian, 5) Kansan, 6) Navahonian, and 7) Chihuahuan. The present project area is in the latter. The Chihuahuan province includes all of Trans-Pecos Texas except the Guadalupe Mountains of northern Culberson County. This province extends southward into the states of Chihuahua and Coahuila and into southern New Mexico. The eastern boundary coincides with the eastern rim of the

Toyah Basin south to Crockett County and from there it follows the Pecos River south to its junction with the Rio Grande. This province has a greater diversity of physiographic features than any other biotic province in the state. The northeastern part of the province in Reeves, Loving, Winkler, Ward, Crane, and northern Pecos counties is an old bolson now drained by the Pecos River (Blair 1950:105). Vegetation includes a thin cover of grasses such as tobosa (*Hilaria mutica*), galleta (*Hilaria jamesii*), and various species of grama (*Bouteloua*). Desert shrubs include creosote bush (*Larrea*), catclaw (*Acacia greggii*), and blackbrush (*Blourensia*) (Blair 1950:106). Vegetation observed within the project area includes creosote bush (*Larrea tridentata*) and honey mesquite (*Prosopsis glandulosa*). Other common plant species include various yuccas (*Yucca spp*.), small- to medium-size cacti, and grasses such as black grama (*Bouteloua eriopoda*) and tobosa grass (*Hilaria mutica*).

3.6 Fauna

The mammalian fauna of the Chihuahuan biotic province is the richest of any biotic province in Texas (Blair 1950). Most of the mammals are species characteristic of the Southwestern deserts and Mexican tableland. Fourteen species are limited in Texas to the Chihuahuan province. These include Mexican long-nosed bat (*Leptonycteris nivalis)*, Yuma myotis (*Myotis yumanensis)*, long-legged myotis (*Myotis volans)*, myotis (*Myotis subulatus)*, Fringed myotis (*Myotis thysanodes)*, Western pipistrelle (*Pipistrellus Hesperus)*, big free-tailed bat (*Tadarida macrotis)*, Western mastiff bat (*Eumops perotis)*, hooded skunk (*Mephitis macroura)*, desert pocket gopher (*Geomys arenarius)*, yellow-nosed cotton rat (*Sigmodon ochrognathus)*, Nelson's pocket mouse (*Perognathus nelsoni)*, Merriam's kangaroo rat (*Dipondomys merriami)*, and the now extirpated grizzly bear (*Ursus horribilis)*. Characteristic mammals include badger (*Taxidea taxus)*, Mexican vole (*Microtus mexicanus)*, Mexican woodrat (*Neotoma mexicana)*, yellow-faced pocket gopher (*Cratogeomys castanops)*, desert pocket mouse (*Perognathus penicillatus)*, Ord's kangaroo rat (*Dipodomys ordii)*, Merriam's kangaroo rat (*Dipodomys merriami)*, Banner-tailed kangaroo rat (*Dipodomys spectabilis)*, deer mouse (*Peromyscus maniculatus)*, black-tailed jackrabbit (*Lepus californicus)*, desert cottontail (*Sylvilagus audubonii)*, pronghorn (*Antilocapra americana)*, striped skunk (*Mephitis mephitis)*, common hog-nosed skunk (*Conepatus mesoleucus)*, Merriam's pocket mouse (*Perognathus merriami)*, long-tailed grasshopper mouse (*Onychomys torridus)*, and Western harvest mouse (*Reithrodontomys megalotis)*. The only widely distributed turtle in the region is the ornate box turtle (*Terrapene ornata)*. Numerous species of lizards, snakes, toads, and frogs also occur in the province (Blair 1950:107–108; Davis 1974; Davis and Schmidly 1994:7).

Other species commonly occurring within the Chihuahuan Desert include cactus mouse (*Peromyscus eremicus*), kit fox (*Vulpes velox*), cactus wren (*Campylorhynchos brunneicapillus*), greater roadrunner (*Geococcyx californianus*), Mojave rattlesnake (*Crotalus scutulatus*), coachwhip snake (*Masticophis flagellum*), New Mexican whiptail lizard (*Cnemidophorus neomexicanus*), red-spotted toad (*Bufo punctatus*), and tiger salamander (*Ambystoma tigrinum*) (Harris n.d.). Animals observed during the survey include black-tailed jackrabbit and cottontail.

4.0 Culture History

Archaeologists have devised various frameworks to address culture history in the region. Mallouf (1985) arbitrarily divides the Trans-Pecos region into eastern and western segments, the latter of which contains most of the region's known sites. Ward County is within the eastern portion and is not well known archaeologically. Currently, 103 sites have been recorded in Ward County but none is in the project areas. The following culture history, therefore, is primarily based on West Texas as a whole, on adjacent portions of New Mexico, and on the eastern Trans-Pecos as appropriate and follows a traditional cultural-historical outline. As presented herein, the human occupation of West Texas is divided into five major periods—Paleoindian (10,000–6000 B.C.), Archaic (6000 B.C.–A.D. 200), Formative (A.D. 200–1450), Late Prehistoric/ Protohistoric (A.D. 1450–1659), and Historic (A.D. 1659–present). Similarities exist across the region for the Paleoindian and Archaic periods, but later prehistory exhibits greater variability.

4.1 Paleoindian Period (ca. 10,000–6000 B.C.)

Although work at Pendejo Cave in southern New Mexico suggests humans were in Texas as early as 37,000 to 55,000 years ago (Chrisman et al. 1996; MacNeish and Libby 2003; MacNeish et al. 1993), this research remains controversial (Moore 1996:40; Riley 1995:37). The earliest well documented and accepted human presence in Texas, the Paleoindian period (10,000–6000 B.C.), is divided into three subperiods or complexes—Clovis (10,000–9000 B.C.), Folsom (9000–8000 B.C.), and Plano (8000–6000 B.C.)—named for different cultural groupings. Stylistically distinct projectile points associated with late Pleistocene and early Holocene megafauna characterize these complexes. In addition, Paleoindian chipped stone assemblages exhibit a very refined and standardized technology.

Formerly, all Paleoindians were considered big-game hunters. Clovis was associated with the hunting of mammoths and other late Pleistocene fauna. Folsom and Plano complexes were associated with the hunting of now-extinct forms of bison. Currently, many researchers now view Clovis peoples as more generalized hunter-gatherers who also exploited a variety of floral and smaller faunal resources (Cordell 1997:96, 99; Ferring 1995; Haynes and Haury 1982; Johnson 1987; Moore 1996:40). Recent research by Waguespack and Surovell (2003), however, suggests Clovis hunting behavior was more specialized (i.e., focal) rather than generalized (i.e., diffuse). Folsom and Plano groups likely "placed more emphasis on large-game hunting and less on collecting plant foods that required extensive processing" (Moore 1996:40). By the end of the period, only modern fauna remained.

Packrat (*Neotoma* sp.) nests indicate the climate in the Southwest during the early Paleoindian period was cooler and moister than today (Van Devender 1977:190; Van Devender et al. 1978, 1979; Van Devender and Everitt 1977; Van Devender and Riskind 1979; Van Devender and Spaulding 1979). The vegetation consisted of juniper-oak woodland with a grass understory (Van Devender and Spaulding 1979). As suggested by Carmichael (1985:10), "large areas of savanna or open woodlands associated with heavily forested mountains" characterized far west Texas and southern New Mexico. In addition, the area contained numerous lakes and permanent streams that attracted a variety of large late Pleistocene/early Holocene fauna—mammoth, mastodon, bison, camelid, horse, and sloth—which, in turn, attracted Paleoindian hunters (Anschuetz 1990:20; Carmichael 1985:10).

Low population densities prevailed among the early inhabitants of the region, highly mobile hunting and gathering groups that were probably small and socially fluid. These conditions worked to homogenize projectile point styles and other cultural marker traits over vast areas (Anschuetz 1990:20–21; Carmichael 1985:10; O'Laughlin 1980). Kill sites and butchering stations are next to ancient playas and ponds (Beckes 1977a; Broilo 1973; Carmichael 1985:10; Hilley et al. 1982; Judge 1973; Judge and Dawson 1972). Identified campsites are rare and generally have few cultural remains (Cordell 1997). Paleoindian cave sites are also rare, although Carmichael (1985:11) suggests dry caves in the mountains around the

Hueco Bolson and Tularosa Basin contain Folsom materials. "[H]owever, the generally poor documentation of most known cave sites currently hinders the reliable designation of Paleoindian components" (Anschuetz 1990:21). As indicated by Kirkpatrick et al. (2000:111), the low incidence or sparsity of Paleoindian materials may be due to removal by artifact collectors, preservation in buried deposits, and recycling and reuse by later prehistoric peoples. Most recorded Paleoindian components are part of multicomponent sites or are badly eroded, suggesting the remains were covered by soils deposited after occupation or are mixed with later occupations of peoples who either mined earlier sites for useable materials or occupied the same loci (Moore 1996:41).

4.1.1 Clovis Complex (ca. 10,000–9000 B.C.)

The Clovis complex in western Texas is known primarily from surface finds of the Clovis point—a diagnostic, large lanceolate spear point with a single short basal flute on both faces. The Clovis type site, Blackwater Draw, is between the towns of Clovis and Portales in eastern New Mexico. The Clovis tool kit also includes spurred end scrapers; large unifacially flaked side scrapers; keeled scrapers on large blades; flake knives; backed worked blades; gravers; perforators; shaft straighteners; and bone points and foreshafts (Gunnerson 1987:10).

Although extensive and intensive surveys have occurred in West Texas (e.g., Lukowski and Stuart 1996; Lynn et al. 1975; Whalen 1977, 1978) and adjacent southern New Mexico (e.g., Beckes et al. 1977; Camilli et al. 1988; Doleman et al. 1991; Mauldin et al. 1997; Ravesloot 1988; Seaman et al. 1988), Clovis points are rare and few Clovis sites have been identified (Miller and Kenmotsu 2004:214). Isolated Clovis points have been found in the southern Tularosa Basin (Krone 1976) and the nearby Rio Grande Valley (Harkey 1981). Ridges overlooking water, edges of playas, and eroded slopes of major topographic features are common open-air settings (Broilo 1971). In general, the nature of Clovis hunting and subsistence adaptations, settlement and mobility patterns, and technological organization in West Texas is poorly known. In addition, no habitation or kill sites are known for the eastern Trans-Pecos (Miller and Kenmotsu 2004:214–215).

4.1.2 Folsom Complex (9000–8000 B.C.)

The Folsom complex is characterized by the small, finely made lanceolate Folsom projectile point which exhibits a single flute, extending most of the entire length of the point, on each face. Technologically, the Folsom point developed from the preceding Clovis point form. Unlike Clovis points, however, "though heavily utilized and often damaged by impact fractures, Folsom points were frequently recovered, repaired, and re-used. For this reason, they often show evidence of extensive resharpening" (Boldurian and Cotter 1999:116). The Folsom tool kit also includes unfluted Midland points, knives, pointed scrapers, choppers, drills, gravers, spokeshaves, abrading stones, awls, and needles (Gunnerson 1987:13). Folsom assemblages are "oriented toward butchery and the working of hides, bone and wood" (Amick 1996:411). The Folsom type site is in northeastern New Mexico, near Folsom.

The association of Folsom points with *Bison antiquus*—a late Pleistocene bison that was larger than modern bison (*Bison bison*) (McDonald 1981)—suggests Folsom groups were primarily bison hunters (Amick 1994, 1996; Figgins 1927; Judge 1973; Staley and Turnbow 1995). Unlike modern bison, *Bison antiquus* formed smaller herds and were adapted to savannah grasslands (McDonald 1981:204–205). On the other hand, like modern bison, *Bison antiquus* may have wintered in protected foothills and intermontane basins and during spring and summer, may have moved to the open grassland plains. Consequently, Folsom groups may have preferred intermontane basins during the winter and plains during the warm season. Although the seasonality data are limited, Folsom bison assemblages on the Southern Plains represent summer/early fall procurement (Amick 1996:412–413). In addition, the earliest evidence for communal hunting occurs with Folsom assemblages. These communal hunts required greater social organization and control than that evidenced in Clovis sites (Frison 1978:243–250, 1991:276–288). Pronghorn, canid, and rabbit bones have also been recovered from Folsom sites (Frison 1978, 1991).

Folsom manifestations include isolated projectile points, small kill sites, butchering stations, and other modest site types (Carmichael 1985:11; Krone 1975). Several sites have been recorded in the desert lowlands along the shorelines of ancient lakes or modern playas (Beckes et al. 1977; Peter and Mbutu 1993; Zeidler et al. 1996). Other locations include caves, canyons, and foothills that may have been base camps (Carmichael 1985:11, 1986). Folsom manifestations are better known than Clovis in West Texas. Folsom material is well represented in the Franklin and Organ mountains (Amick 1994; Beckes 1977a, 1977b; Beckett 1983; Carmichael 1986; O'Hara 1988). A cluster of Folsom components has been recorded around a drainage extending from a fault line escarpment north of El Paso (Stuart 1997). In addition, Folsom finds have been recorded in the Guadalupe Mountains (Boisvert 1980; Katz 1978), in the Salt Flat Basin (Hedrick 1989), and along the Pecos River valley (Sommer 1974) of the eastern Trans-Pecos. Excavations at a site on Chispa Creek south of Van Horn in Culberson County yielded more than 100 Folsom points, numerous channel flakes, and about 500 scrapers, as well as other chipped stone tools and large quantities of chipping debris (Miller and Kenmotsu 2004:216).

4.1.3 Plano Complex (8000–6000 B.C.)

Evidence of increasingly drier conditions appears around 10,000 years ago (Judge and Dawson 1972; Peter and Mbutu 1993). Adaptive changes to this more xeric environment are associated with the emergence of the Plano complex. Plano sites tended to be located in areas with relatively easy access to increasingly restricted water sources. Although many Plano sites in the western United States represent mass bison kills, campsites have also been reported. Changes in subsistence economies between Folsom and subsequent Plano complexes consisted of a shift from hunting now-extinct fauna (e.g., *Bison antiquus, Equus* sp., *Camelops* sp.) to hunting modern, extant species. Communal hunting techniques were employed and focused primarily on bison. The earliest Plano complexes are frequently associated with now-extinct forms of bison, but by 7000 B.C., only modern fauna were available (Carmichael 1983, 1986; Cordell 1979:20, 1997:96, 99; Judge 1982:48–49; Wheat 1972).

Plano complex projectile points lack flutes and instead, consist of large lanceolate forms with basal grinding and long parallel flaking (Wheat 1972; Wormington 1957). The Plainview complex contains laterally thinned points—Plainview, Meserve, Milnesand, and Frederick—and is generally considered the earliest Plano complex. The indented base series includes Firstview, Alberta, and Cody complex points, such as Eden and Scottsbluff. Agate Basin and Hell Gap points comprise the constricted base series (Cordell 1979:21). Eden and Scottsbluff points occur primarily in the western Trans-Pecos (Miller and Kenmotsu 2004:217).

Although numerous surface finds of Plano complex points have been documented for the western Trans-Pecos region of Texas and southern New Mexico, well-documented or substantial Plano occupation sites are rare. Most finds have occurred along the margins of the Rio Grande Valley or near major playas in basins (Miller and Kenmotsu 2004:217). LA 63880, north of El Paso, near a playa in the southern Tularosa Basin, represents one of the largest known Paleoindian sites in the area. Of the 132 formal tools recovered from the site, 101 are transverse end scrapers. The other tools include two Cody-like projectile point midsections, bifaces, side scrapers, a spokeshave, an abrader, and a burin spall. The site is interpreted as a series of base camps or processing loci used by several small bands (Elyea 1988; Miller and Kenmotsu 2004:217–218). Possibly due to better site visibility and recognition, Late Paleoindian materials are more common than that of earlier Paleoindian components in the eastern Trans-Pecos (Miller and Kenmotsu 2004:217).

4.2 Archaic Period (6000 B.C.–A.D. 200)

Around 6000 B.C., the North American climate shifted to a much warmer and drier pattern, causing widespread faunal and floral changes (Cordell 1997; Miller and Kenmotsu 2004:218). Most megafauna became extinct, and smaller modern species became predominant. Paleoclimatic reconstructions by various researchers (e.g., Martin 1963; Van Devender and Spaulding 1979:709) suggest a drying trend, characterized by decreased winter precipitation and an intensification of the summer monsoon pattern, occurred between 6000 and 2000 B.C., producing environmental conditions resembling those of today. With these changes, the dominant juniper-oak woodland and savanna grassland communities of the Paleoindian period gave way to increasingly xeric desert scrub and grassland species. This environmental shift is indicated by the presence of creosotebush, acacia, mesquite, agave, sotol, and ocotillo in prehistoric packrat middens (Van Devender et al. 1984; Van Devender and Riskind 1979). In addition, perennial water sources became constricted. Thus, resultant shifts in technology and settlement herald the beginning of the Archaic period (6000 B.C.–A.D. 200) (Miller and Kenmotsu 2004:218).

Although some Plano groups undoubtedly followed the bison out of the desert Southwest and onto the Plains at the end of the Paleoindian period, other Plano groups remained that were adapted to a broader resource base and were less affected by major environmental changes signaling the Pleistocene's end (Moore 1996:40). The Archaic is marked by several notable developments—construction of residential pithouses and huts, the first evidence for agriculture, and widespread use of rock or caliche for thermal features. In addition, diversification of subsistence strategies is reflected in an increase in the range of plants exploited and by technological changes in processing plant foods. Archaic peoples were seasonally mobile, broad spectrum hunter-gatherers. Over time, however, mobility range became increasingly restricted and territoriality developed (Miller and Kenmotsu 2004:218). Archaic populations probably had a flexible social structure in which group size and composition varied in response to changing economic opportunities. Areas where the density and distribution of key plant resources were predictable on a seasonal basis were reoccupied (Judge 1982:49). A greater dependence on plant foods is reflected in a higher frequency of grinding tools during the Archaic. "Increasing population levels coupled with more diverse subsistence economies led to an intensification of land use patterns as well as the exploitation of a continually increasing range of environmental zones" (Miller and Kenmotsu 2004:218). These processes eventually culminated in the appearance of horticulture between ca. 1500 and 1000 B.C. (Miller and Kenmotsu 2004:218). Kearns et al. (2001:22) see a connection between the stabilization of drought conditions ca. 3,500 years ago and the commencement of horticultural pursuits during the mesic interlude. Unlike the western Trans-Pecos, however, Archaic components in the eastern Trans-Pecos have not yielded evidence of an early agricultural subsistence base (Miller and Kenmotsu 2004:218, 226). Wild food resources continued to dominate prehistoric diet throughout the Archaic.

Human populations adapted to the changes and material culture diversified. Archaic point styles are smaller than those of the preceding Paleoindian period, with shouldered hafting elements appearing ca. 3200 B.C. During the Archaic, hafting elements changed from strong-stemmed or split-stemmed forms (Early Archaic) to contracting stemmed, expanding stemmed, and concave base forms (Middle Archaic) to convex or flat base or side-notched forms (Late Archaic) (Miller and Kenmotsu 2004:232). Archaic sites are usually identified as lithic scatters with fire-cracked rock, hearths, ground stone tools, and specific projectile point types. Distinctive Archaic artifacts include a variety of stemmed or corner-notched dart point styles, basin metates, and one-hand manos. Although varied, the remainder of the stone tool assemblage—scrapers, drills, choppers, knives—is non-diagnostic and chipping debris is abundant (Cordell 1984, 1997). The Archaic is also associated with a biface-oriented chipped stone technology and a diversity of lithic raw materials (Lintz et al. 1988).

The Archaic period of Trans-Pecos region is generally divided into Early (6000–4000/3000 B.C.), Middle (4000/3000–1200 B.C.), and Late (1200 B.C.–A.D. 200/900). The Early and Middle Archaic periods in the eastern Trans-Pecos are not well known. Both are represented by a variety of dart point styles suggestive of groups from the Desert Archaic area to the west and from the eastern Llano Estacado and central Texas (Leslie 1979:188).

4.2.1 Early Archaic (6000–4000/3000 B.C.)

In the western Trans-Pecos, the Early Archaic dates from 6000 to 4000 B.C. (Miller and Kenmotsu 2004:220), but in the eastern portion, Mallouf (1985) dates it from 6500 to 3500/3000 B.C. The Early Archaic period is poorly known in the Trans-Pecos, especially in the eastern portion, which is "distinguished by a perplexing lack of substantive data concerning even the barest outlines of Early Archaic Cultures" (Mallouf 1985:101). Only one radiocarbon date is available for the eastern Trans-Pecos (Charles 1994). Manifestations in the western portion of the region consist of surface finds of Early Archaic projectile points, thin deposits in rockshelters, and radiocarbon dates from hearths and rockshelter deposits. Recognition of Early Archaic components is based primarily on projectile point forms. Projectile points changed from the lanceolate forms of the Paleoindian period to stemmed forms—Jay, Bajada, and Uvalde. Uvalde and Nolan-like dart points are more common in the eastern region and Jay and Bajada are much more common in the western. In general, the projectile points are made from coarser-grained materials than those of the preceding Paleoindian period. A greater use of locally available raw materials is indicated. The use of rocks or caliche for cooking and heating appeared during the Early Archaic. The appearance of ground stone suggests a greater dietary reliance on plant resources (Miller and Kenmotsu 2004:220–223). In general, the data "suggest a seasonally mobile settlement system of small bands" (Miller and Kenmotsu 2004:223). This assessment, however, may be the result of survey bias.

4.2.2 Middle Archaic (4000/3000–1200 B.C.)

The population of the Trans-Pecos increased during the Middle Archaic. Due to the possible restricted and variable timing and distribution of food resources resulting from an ongoing climatic drying trend, land use patterns may have been more seasonally intensive and more focused on specific resources (Mallouf 1985; Miller and Kenmotsu 2004:223). Sites in the eastern Trans-Pecos are more numerous and larger than in the preceding periods, with increased settlement along drainages and in a variety of settings, "suggesting an expansion into and exploitation of new environmental niches" (Miller and Kenmotsu 2004:223). The earliest evidence for semi-sedentary settlements in the Southwest is from the western Trans-Pecos during the Middle Archaic. The Keystone Dam site, which is on an alluvial fan adjacent to the Rio Grande floodplain in northwest El Paso, contains the first identified Archaic structures—round (2-m diameter), shallow (15–20 cm deep) constructions with a brush or jacal superstructure—in the El Paso area (O'Laughlin 1980). Exploitation of plant foods continued and, as suggested by burned rock middens and extensive hearth fields, processed cacti and desert succulents were subsistence staples in the eastern Trans-Pecos. Projectile point types diversified during the Middle Archaic and regional spatial patterning increased. Western Trans-Pecos sites tend to have Trans-Pecos, Coahuilan, and Cochise dart point forms and the eastern area exhibits point forms similar to central Texas, Coahuilan, and Lower Pecos forms (Mallouf 1985; Miller and Kenmotsu 2004:224–225). Expanding stem/concave base forms are more common in the western Trans-Pecos and contracting stem forms are more common in the eastern (Miller and Kenmotsu 2004:225). "The majority of [Middle Archaic] sites consist of isolated hearths, burned rock accumulations, or clusters of several thermal features" (Miller and Kenmotsu 2004:225).

4.2.3 Late Archaic (1200 B.C.–A.D. 200/900)

In the western Trans-Pecos, the Late Archaic dates from 1200 B.C. to A.D. 200 (Miller and Kenmotsu 2004:220), but in the eastern portion, it dates from ca. 1000 B.C. to A.D. 1000. Late Archaic sites increased greatly in number over that of the previous periods and expanded into all regionally available ecological zones. Although the first evidence for the use of cultigens in the western Trans-Pecos occurred during the Late Archaic, an early agricultural subsistence base is currently unknown for the eastern Trans-Pecos. Characteristic Late Archaic dart points consist of side-notched and corner-notched forms. In addition, the prominence of ring middens, indicative of the exploitation of desert succulents, is characteristic of the Late Archaic (Miller and Kenmotsu 2004:226, 229).

The current project area is within the southern extent of the Eastern Jornada Mogollon—an extension of the Jornada Mogollon proper—defined by Corley (1965). Leslie (1979:188) equates the Late Archaic of the Eastern Jornada with the Hueco phase of the Jornada Mogollon proper. A variety of dart point styles are associated with the Hueco phase. The small size of some projectile points late in the phase suggests use of the bow and arrow. In addition, plain brownware pottery appeared near the end of the phase. Plant processing tools include slab metates, one-hand manos, and possible mortars and pestles. Most known Hueco phase sites are gathering sites and most are around waterholes (Leslie 1979:188).

4.3 Formative Period (A.D. 200–1450)

The Formative period (A.D. 200–1450) of the Eastern Jornada Mogollon is marked by the appearance of the bow and arrow and brownware pottery and by 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 and a purely horticultural strategy has not been well documented for the region (Stuart and Gauthier 1984:274–275). As summarized by Stuart and Gauthier (1984:275), “culture development in southeastern New Mexico [and adjacent portions of the eastern Trans-Pecos] loosely parallels developments in both the Anasazi and Mogollon areas to the west between roughly A.D. 800 and A.D. 1300, though on a far more modest scale.” By A.D. 1400, agriculturalists had largely abandoned the area. “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). In spite of changes that occurred in the western Trans-Pecos, the settlement and subsistence patterns and group mobility strategies of the Late Archaic persisted in the eastern region during the Formative period (Miller and Kenmotsu 2004:255).

As discerned by Corley (1965), extreme southeastern New Mexico and adjacent portions of the eastern Trans-Pecos were inhabited by groups closely related to the Jornada Mogollon (Lehmer 1948) during the Formative period. Corley (1965) identified three Formative phases—Querecho, Maljamar, and Ochoa. This sequence was revised slightly by Leslie (1979:188–192), who added a Transitional phase between the Maljamar and Ochoa phases.

4.3.1 Querecho Phase (A.D. 950–1100/1150)

The Querecho phase, the first ceramic phase of the Eastern Jornada Mogollon, is characterized by the introduction of pottery and the bow and arrow. The major ceramic types consist of local variants of Jornada Brown. Imported pottery includes Mimbres Black-on-white and Cebolleta Black-on-white. Arrow points are various corner-notched forms. Basin metates replaced slab metates. No structural sites have been identified for the early portion of the phase, but small rectangular pit structures are known for late Querecho sites. In addition, Querecho habitation sites, those with pit structures, generally occur around the better waterholes (Leslie 1979:188–190).”More gathering sites of this period occur within the shinnery-covered sandy areas than any other period of the Eastern Jornada” (Leslie 1979:190).

4.3.2 Maljamar Phase (A.D. 1100/1150–1300)

The Maljamar phase exhibits a more sedentary pattern. Pit structure villages are larger but tend to occur in the same locations as the Querecho villages. Maljamar pit structures are rectangular, with natural caliche walls. Firepits with slightly raised rims occur near the center of one wall, and an entrance ramp, if present, is on the opposite wall. The absence of roof support posthole patterns on pit structure floors suggests the support posts were placed outside the structures, along the edges of the pits. Gathering sites are not as common as in the Querecho phase. During the early Maljamar, side-notched arrow points replaced the corner-notched forms. The earlier side-notched forms have straight or convex bases and the later types have concave bases. Grinding implements include one-hand manos with one or two grinding surfaces, basin metates, and mortars and pestles. Variants of Jornada Brown continue as the major ceramic types. Corrugated wares appeared late. Imported pottery includes Chupadero Black-on-white, Three Rivers Red-on-terracotta, and El Paso Polychrome. Burials occur in trash mounds, in pit structure fill, and in nearby sandy areas. Except for a few sites in the southern portion and occasional seasonal use, the Eastern Jornada area was temporarily abandoned at the end of the Maljamar phase (Leslie 1979:189–190).

4.3.3 Transitional Phase (A.D. 1300–1350)

The Transitional phase—also referred to as the Post-Maljamar/Pre-Ochoa phase—represents either an intrusion from areas west of the Pecos River, such as the Sacrament Moutains, or a southward movement by Eastern Jornada groups from the area along the Mescalero Ridge. The data tend to support the latter possibility. The phase is marked by an increase in the imported decorated wares of the late Maljamar and by the appearance of new pottery types—Glaze A on Red, Glaze A on Yellow, Gila Polychrome, Ramos Polychrome, and Lincoln Black-on-red. Arrow points consist of triangular unnotched and side-notched types with straight and concave bases. The vast majority of Transitional sites occur south of US 62/180 (Leslie 1979:189, 191–192).

4.3.4 Ochoa Phase (A.D. 1350–1450)

The final phase of the Eastern Jornada sequence is the Ochoa phase. Ochoa sites contain pit structures or surface rooms or both. Surface rooms occur as single units or as room blocks. The early Ochoa exhibits the same ceramic variety as the preceding Transitional phase. By the late Ochoa, however, only the locally produced Ochoa Indented was present. The main imported ceramic type is Chupadero Black-on-white. The artifact assemblage also includes triangular arrow points with notched or indented bases, shaft smoothers or polishers, notched ribs, alternately beveled diamond-shaped knives, and small thumbnail end scrapers (Leslie 1979:189, 192).

4.4 Late Prehistoric/Protohistoric Period (A.D. 1450–1659)

Few Late Prehistoric sites in the eastern Trans-Pecos contain evidence of cultigens. Subsistence strategies continued to focus on hunting and desert succulents. The residents of the Salt Flat Basin, on the west side of the Delaware and Guadalupe Mountains, however, lived in small permanent or semi-permanent villages, made pottery, and planted cultigens (Miller and Kenmotsu 2004:256). In general, the Late Prehistoric/Protohistoric period of the project area is similar to that of southeastern New Mexico. The presence of definite tipi rings is a primary criterion of the period. All nonlocal pottery disappeared and only the locally made Ochoa Indented, a textured brownware, remained (Katz and Katz 1993:I-137). Associated projectile points—small, triangular forms—include Leslie's (1978) 2D (Washita), 2E, and 2F (Toyah). The occupation of some large late Formative structural sites may have continued into the Protohistoric (Katz and Katz 1993:I-137). The first Apachean groups probably entered the region during the early portion of this period (cf. Opler 1983a:385).

Early Spanish expeditions—Coronado (A.D. 1540–1542), Espejo (A.D. 1582), de Sosa (A.D. 1590)—into West Texas and eastern New Mexico occurred during the Protohistoric. Chroniclers of these expeditions provided the first information concerning the inhabitants of the region. Contacts, however, with the various groups was brief and did not cause any major changes within those groups (Katz and Katz 1993:I-138). Late Protohistoric sites are distinguished by the presence of metal, such as metal projectile points. It was during this period that the Spanish began to keep official written records concerning the native inhabitants of the region.

4.4.1 The Apache

There is little disagreement among anthropologists that the Apache, Athapascans, came from Central Alaska and Northwestern Canada (Carlson 1965; Gunnerson 1956, 1974; Gunnerson and Gunnerson 1971, 1988:1–2; Hall 1944; Harrington 1940; Hester 1962; Huscher and Huscher 1942; Opler 1975; Schaafsma 1981; Steward 1936:62; Wilcox 1981; Worcester 1951). However, there is little agreement as to how and when the Athapascans arrived in the American Southwest (Seymour 2012a, 2012b; White 2005:36). Some researchers rely upon glottochronology to designate a time frame for separation from the Northern Athapascan area and their arrival in the American Southwest. Other authors have used diagnostic architecture and dendrochronology to identify the earliest Apachean presence in the Southwest. Opler (1983a) offers a thorough examination of the various timelines and sources of evidence, but his synthesis is becoming outdated. Seymour (2013) presents more recent ideas on Athapascan migrations.

Regardless of the timing and route(s) by which the Apache peoples came to the American Southwest, they were present in southeastern New Mexico prior to the arrival of the Spanish. Opler (1983a:368) argues that the area was frequented by the Apache during early historic and late prehistoric times. Gunnerson (1987:135) notes ceramic traditions in the area as being at the periphery of the Puebloan world. Seymour (2012a, 2012b, 2013) has argued the Apache were in the Southwest prior to 1300.

Early Spanish chroniclers refer to the presence of several nomadic (probable Apachean) bison-hunting groups on the Llano Estacado, including Q*uerechos*, *Teyas*, *Vaqueros*, and *Faraones*. The relationship of these groups with known historic native groups, however, is problematic, given the uncertainty as to which group or groups the names apply.

In September 1598, Juan de Oñate first used the word *Apache* as a cultural term (Opler 1983a:385–386). "[A]lthough the first use of the term included Athapaskans, it also included other tribes that were linguistically unrelated to the Athapaskan Apache but confused with them or assumed to be sufficiently similar to them to justify the same name" (Opler 1983a:386). 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. This group was also called *Faraón* until 1726, when *Natagé* replaced both names. The *Faraones* were first mentioned in 1675 as *Paraonez*. Prior to 1720, the name *Faraón* did not refer to any specific geographical group. It was applied to Apachean groups living both west and east of the Rio Grande. From 1720–1726, all Apaches between the Rio Grande and the Pecos River were called Faraones. Although *Mescalero* replaced the name *Faraón* in 1814, the earlier 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 the century plant, as a staple food" (Opler 1983b:437). The Mescalero established their territory east of the Rio Grande, in southeastern New Mexico, 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 located 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 Apache raided settlements to obtain horses and cattle. By the 1770s, Apache raids had evidently reached levels that the Spanish felt were intolerable. The Spanish mounted a major military expedition in the Sierra Blanca and Sacramento Mountain area, driving some Apache eastward, where they were promptly attacked by the Comanche. The remaining Apache groups established a temporary peace with the Spanish (Sonnichsen 1958:48). The Spanish Crown made the Apache sign a treaty in 1810 that provided the Mescalero with rations and territory between El Paso and Sacramento. Although Apache raiding continued, the treaty was later renewed under Mexican rule in 1832 (Walt 1980:63).

In 1846, Mexico ceded ownership and control of New Mexico to the Americans. In 1850, New Mexico officially became a U.S. Territory. Pressure on the Apache was increased, however, and several military expeditions were sent into Mescalero country during the 1850s. The Mescalero ultimately were persuaded to sign the Treaty of Santa Fe on July 1, 1852 (10 Stat. 975). The treaty was ratified by Congress on March 23, 1853 and proclaimed on March 25, 1853. The Americans also established Fort Stanton in 1855, and one band of Apache settled near the fort. Apaches who ceased raiding were rewarded with hunting and gathering territory. The lands, however, were inadequate and chronic starvation resulted. The Mescalero surrendered in 1863 (Bender 1974:127).

A reservation for the Apache was created by executive order in 1873. The reservation was primarily located on the eastern slopes of the White and Sacramento mountains. Indian title to the land was not confirmed by Congress until 1922. Although the Mescalero considered the reservation too small, they shared it briefly with the Jicarilla during the mid-1880s. Lipan and Chiricahua Apache also moved onto the reservation in 1903 and 1913, respectively (Opler 1983b:422–424). "The descendants of the three Apache Tribes—the Chiricahua, the Mescalero, and the Lipan—who have been housed on the [Mescalero] reservation have amalgamated politically and economically and, after some initial resistance, have intermarried freely" (Opler 1983c:409). Today, due to skillful management of its natural resources, the Mescalero Apache Reservation is one of the most prosperous reservations in the country (Julyan 1996:226). Recent economic development also includes a ski resort and casino.

4.4.2 The Jumano

The Jumano—also spelled Humano, Xumana, Jumana, Jumane, Jumenes, Xoman, Xumano, Chomenes, Choumans, Chome, Chomanes, and Chomas—were first mentioned by the Espejo expedition (1582–1583) during its return to Mexico via the Pecos River to the vicinity of Toyah Creek. This small tribe of nomadic hunter-gatherers and traders moved frequently and traveled great distances. The Espejo expedition recorded the Jumano along the Pecos and its tributaries, such as Toyah Creek, in the eastern Trans-Pecos. The Jumano lived in skin or brush tipis, hunted, and gathered wild plant foods, such as mesquite, prickly pear, and calabashes (Kelley 1986:14–16). They traveled to the Tompiro pueblos of the Salinas region to trade and barter. In 1629, the Jumano sent a delegation to Isleta to ask the priests for missionaries. They were baptized and settled briefly at Quarai, but by 1632, they were living on the "Rio Nueces" (probably the Concho River) in west-central Texas. The area contained an abundance of bison, deer, and wild turkey. The Jumano maintained a generally permanent focus of settlement on the "Rio Nueces" from 1632 to 1654. They were constantly at war with the Vaquero Apache (Kelley 1986:19–21). Because of friendship with the Jumano, the Spaniards went to their villages yearly, prior to the Pueblo Revolt of 1680, to trade for buckskins and bison hides. Continuing requests for missionaries and baptism in 1683 may have been related to a desire to use the Spanish for forcing the intruding Apache from Jumano territory. By 1686, the Apache had driven the Jumano from the Rio Nueces to the Rio del Norte (i.e., the Rio Grande) (Kelley 1986:23–26). The Jumano attended annual fairs held among the Tejas and the Indians of the various Texas rivers on a regular basis (Kelley 1986:31). The missions in the La Junta area of Texas operated sporadically between 1684 and 1715 due to a revolt by the Manso Indians in the El Paso area in 1684 and to protest slave raids for the silver mines. When the missions were reestablished in 1715, the Jumano still occupied their old range but their political affiliations changed. Although the Jumano and Apache had formerly been deadly enemies, they had become friends and allies (Cloud and Piehl 2008:23; Kelley 1986:41). "After 1732 the Jumanos gradually came to be regarded not only as allies of the Apache but as Apaches themselves" (Kelley 1986:42) and were referred to as "Apaches Jumanes" and were eventually absorbed by the Apache (Kelley 1986:42, 44).

4.4.3 The Comanche

The Comanche are Shoshonean-speakers who probably split from the Shoshone ca. A.D. 1550. The Shoshone 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. Alliances and animosities between the Comanche and other tribes, therefore, 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).

In 1846, the Comanche reportedly ranged east of the mountains of New Mexico. In 1850, George McCall (1851) stated that, at least once a year, the Comanche met Mescalero on the Pecos River for a joint expedition to Chihuahua and Sonora, Mexico to obtain mules and captives. Returning to the Pecos River, the Comanche exchanged both with New Mexico traders (e.g., Comancheros) for arms, ammunition, cloth, paint, and other items. In 1855, Colonel John Garland reported the Comanche on the eastern border of New Mexico because they were being forced west from Texas. A reservation was established for the Comanche in southwestern Oklahoma in 1867. By 1875, the Comanche, as well as the Kiowa and Kiowa Apache, had settled on it (Gunnerson and Gunnerson 1988:32–34).

Trade was an important part of Comanche life. In the early 1700s, the Comanche participated in trade fairs held by the Spaniards at the pueblos of Taos and Picuris and later in the Pecos River valley. The primary method of Comanche trade, however, was through Comancheros and other roving traders. The recognized trading sites of these itinerant traders included the Bosque Redondo on the Pecos River. The Comanche traded Plains products—bison and deer hides, dressed bison robes, a variety of furs, dried bison tongues and meat, tallow, beeswax—for agricultural, European-made, and Euro-American products. Trade in horses and captives was also important (Kavanagh 2001:889–890). The eventual restriction of the Comanche and Apache to reservations signaled the end of the Comanchero trade (Katz and Katz 1985:64).

4.5 Historic Period (A.D. 1659–Present)

Most of the early portion of the Historic period did not affect the present project area, which lay outside the Spanish and Mexican occupations of Texas and was virtually ignored until after the Civil War. The Republic of Texas was established in 1836 and was annexed by the United States in 1844. Annexation led to poor relations between Mexico and the United States and eventually resulted in the outbreak of war in 1846. The Treaty of Guadalupe Hidalgo ended the Mexican War in 1848.

4.5.1 Ward County

Ward County is in the southwestern edge of the High Plains region of southwest Texas. Monahans is the county seat. The county, covering 539,460 acres or 836 square miles, is named for Thomas W. Ward. Elevation above mean sea level ranges from 2400 to 2800 feet. The Pecos River is the only perennial source of surface water in the area. The production of petroleum and natural gas are important to the local economy.

In 1881, the Texas and Pacific Railway crossed the region and established a station in Pyote. Ward county was carved from a portion of Tom Green County in 1887 but by 1890 only 75 people lived in the county. The county was organized in 1892 and Barstow was the county seat. The 1900 census recorded 167 farms and ranches with only 5,500 acres described as "improved" with 13,000 cattle and 4,400 sheep. Severe droughts occurred in 1907 and 1910. Cotton production increased during the 1910s with 20,000 acres devoted to cotton by 1920 with 238 farms and ranches and a population of 2,615 (Texas State Historical Association 2017).

During the 1920s there was economic prosperity with the opening of the Hendrick oilfield in 1926 with pipelines and railroad loading tanks constructed at Pyote and other towns. The Texas and New Mexico Railroad built tracks from the New Mexico state line to Monahans. Cotton production decreased to 9,000 acres by 1930. During the 1930s US 80 was paved from Big Spring to Pecos and oil, gas, potash, and sodium sulfate industries developed. Nearly 9,720,000 barrels of crude oil were produced in 1938 (Texas State Historical Association 2017).

Pyote experienced economic growth in 1942 with construction of the Pyote Army Air Field. By 1950 the county population was 13,346 with oil production reaching 22,235,000 barrels in 1960. More than 28,245,000 barrels of oil was produced in 1965 but then dropped dramatically in 1968 to 15,172,000 barrels. The population declined to 13,019 by 1970. In 1982 gas-well production reached 122,243,000,000 cubic feet and casinghead gas reached 18,742,000,000 cubic feet with 8,707,000 barrels of oil produced (Texas State Historical Association 2017).

4.5.2 Pyote, Texas

Pyote was originally called Pyote Tank, named for the Chinese railroad workers' pronunciation of coyote or for the commonly occurring peyote cacti in the area. J. A. Stewart established the 7S Ranch in 1885, covering 40 sections. A post office was established in 1907. Cicero S. Sitton and his sons operated a store. In 1925 the population was 100 but when oil was discovered in 1928 the population boomed to 3,500 and by 1931 it dropped to 1,097. During the oil boom 31 rooming houses and hotels were quickly built. The boom ended in the 1930s when the railroad built a spur to Monahans which eliminated Pyote from oilfield shipping. The town incorporated in 1933 with the number of businesses declining to 36 by 1940. By 1941 the population was 201 and the number of businesses was 15 (Texas State Historical Association 2017).

The Pyote Army Air Base was built in 1942 on land owned by the University of Texas. It was used for bomber training. After World War II 4,000 bombers and fighter planes were sent to Pyote for melting into scrap metal. Among those stored there was the Enola Gay, which dropped the first atomic bomb, and Swoose. Both planes were rescued from destruction by the Smithsonian Institution. During the early 1960s Pyote had a population of 420 and during the 1970s it had fewer than 200 people and only one business or none. Pyote is the site of the West Texas State School and the Pyote Museum and Rattlesnake Bomber Base which displays World War II memorabilia in an old building on the base (Texas State Historical Association 2017).

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5.0 Records Searches

Rebecca Wells and Kenneth L. Brown conducted an electronic site records search for the Station No. 142 and Oasis Meter Station areas prior to, and following, the field work. The searches, on November 27 and December 12, 2017, included consulting the Texas Archeological Sites Atlas established by the Texas Historical Commission (THC). The purpose of the searches was to assess the presence of documented archaeological sites, historical markers, properties designated on the National Register of Historic Places (NRHP), archaeological surveys, cemeteries, and cultural resources on the two parcels of land. This assessment assisted in locating documented archaeological sites and cultural resources which may be impacted by the proposed projects. Results of the searches indicated no known archaeological sites within three miles of the Station No. 142 and Oasis Meter Station project areas (Appendix A).

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6.0 Previous Investigations

No cultural resources have been recorded in or near the Station No. 142 and Oasis Meter Station project areas. Several surveys have been completed in Ward County resulting in the recording of 103 sites with the largest cluster of sites being in the northeast corner of the county and most sites, in general, being north of I-20. A total of 103 sites have been recorded for Ward County, but none is within 3 miles of the Station No. 142 and Oasis Meter Station project areas (Appendix A). The culture history section (see above) summarizes the prehistory and history of the project area.

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7.0 Field Methods

One person, Kenneth L. Brown, from TRC conducted the Class III (100 percent) pedestrian cultural resource surveys of the Station No. 142 and Oasis Meter Station project areas on December 8, 2017. Kenneth L. Brown (Ph.D.) served as field supervisor and Principal Investigator. The project areas were surveyed by walking parallel transects spaced no greater than 10 m (33 feet) apart. Because the project involved private land, the following criteria were used to identify an archaeological site: (1) 10 or more artifacts of two or more artifact classes or types within a 20 x 20-m (66 x 66-foot) area, or (2) the presence of a structure, feature, or midden. Resources not meeting these criteria—single artifacts, small clusters of less than 10 artifacts, clusters of artifacts derived from a single behavioral event (e.g., a pot drop)—were recorded as isolated occurrences (IOs). No buildings with construction dates prior to 1965 are in the project areas or within 30 m (100 feet) of them. If present, such buildings would have been documented.

Following the guidelines of the THC for parcels 0 to 2 acres, at least 3 shovel tests per acre were dug. Shovel tests were dug to ascertain the presence of subsurface cultural deposits. Shovel tests were minimally 50 x 50 cm. The shovel tests were dug to what was believed to be Pleistocene deposits in 10 cm deep or greater in levels of no greater than 20 cm. When feasible the matrix was dry sifted through $^{1}/_{8}$-inch hardware cloth. Afterwards, the holes were backfilled. Shovel test pits were photographed and Munsell soil colors were recorded on the moist matrix.

Although no sites were found, if a site had been found, a datum, consisting of a rebar and aluminum cap with "TRC Do Not Disturb" and stamped with a field site number, would have been placed in each site. The project location information was recorded with a TrimbleXH GPS unit using NAD83. After post-field differential correction, the GPS unit data has an error of less than 1 m (3.3 feet). The project areas were photographed with a Fujifilm Corporation FinePix XP85 digital camera with a Fujinon 5X wide optical zoom lens. Ground surface visibility averaged greater than 90 percent. Atmospheric conditions during the survey were cool, dry, with clear to partly cloudy skies, calm to breezy, with temperatures in the 50s to 60s°F.

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8.0 Survey Results

The records search indicated no previously recorded sites were within more than 3 miles of the Station No. 142 and Oasis Meter Station project areas. The present 100 percent pedestrian cultural resource inventory survey did not find any cultural resource sites, stains, rock clusters, rock concentrations, structural remains, or other loci that fit the definition of a cultural site. No isolated occurrences (IOs) were documented during the survey.

8.1 Station No. 142

Station No. 142 surveyed area is 127 m (417 feet) long and 91 m (298.5 m) wide for a total of 1.1 acres. Disturbed grounds (graveled parking areas, building facilities) fenced with chain link fencing were not examined except through the fencing. Six shovel tests were dug at the Station No. 142 (Figures 1.1, 2.1–2.4, 8.1–8.7). No cultural resources or evidence of buried soils or anthrosols were found in any of the shovel tests. Table 8.1 and Figures 8.1–8.7 summarize the shovel tests dug at Station No. 142. The eastern part of the surveyed area is the existing buried pipeline, oriented north-south. In addition, a wooden pole for a distribution power line is in the northeast part of the surveyed parcel. The intensive 100 percent pedestrian survey at Station No. 142 required 2.75 person hours to complete.

Table 8.1 Shovel test pits Station No. 142 (1.1 acres)

STP	UTM Zone 13		Depth cm	Description	Munsell (moist)
	Easting	Northing			
1	671918	3484288	0–24	Fine sandy loam with caliche gravel, cobbles	7.5YR 4/4
2	671901	3484257	0–15	Fine sandy loam with caliche gravel, cobbles	7.5YR 4/4
3	671911	3484240	0–12	Fine sandy loam with caliche gravel, cobbles	7.5YR 4/4
4	671922	3484249	0–10	Fine sandy loam with gravel, cobbles	2.5YR 4/6
			10–16	Fine sandy loam with gravel, cobbles	2.5YR 5/3
5	671929	3484235	0–18	Fine sandy loam with gravel, cobbles	2.5YR 5/3
6	671920	3484225	0–7	Pea gravel, limestone, intrusive	7.5YR 8/1
			7–10	Fine sandy loam with gravel, cobbles	7.5YR 4/4
Pole	671917	3484291			

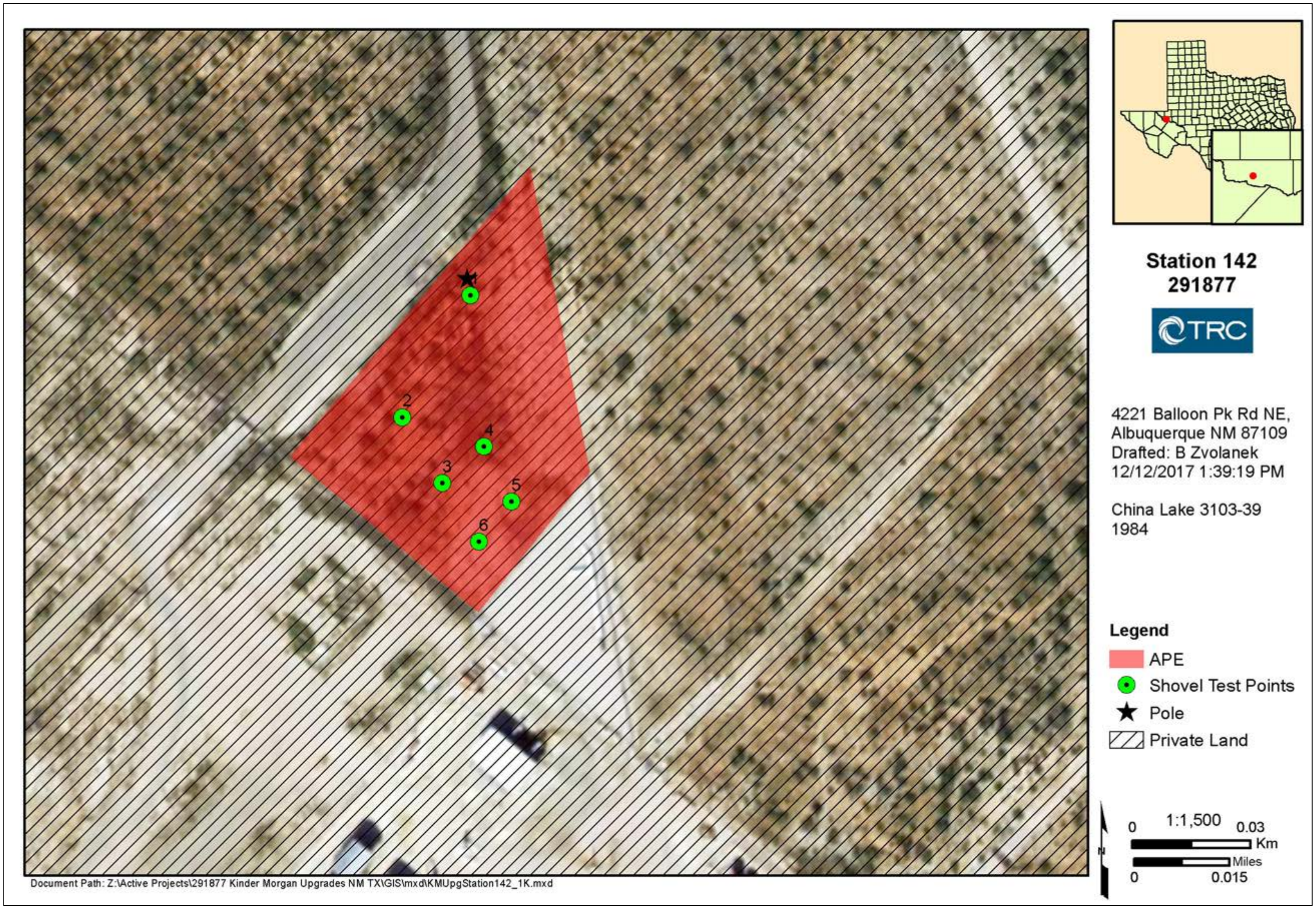

Figure 8.1 Station No. 142 aerial map showing the locations of shovel tests

Figure 8.2 Station No. 142 shovel test pit 1

Figure 8.3 Station No. 142 shovel test pit 2

Figure 8.4 Station No. 142 shovel test pit 3

Figure 8.5 Station No. 142 shovel test pit 4

Figure 8.6 Station No. 142 shovel test pit 5

Figure 8.7 Station No. 142 shovel test pit 6

8.2 Oasis Meter Station

Oasis Meter Station surveyed area is 147 m (482 feet) long and 102 m (335 m) wide for a total of 1.8 acres. Disturbed ground (graveled parking areas, building facilities) fenced with chain link fencing were not examined except through the fencing. Seven shovel tests were dug at the Oasis Meter Station area (Figures 1.2, 2.5–2.8, 8.8–8.15). No cultural resources or evidence of buried soils or anthrosols were found in any of the shovel tests. Table 8.2 and Figures 8.9–8.15 summarize the shovel tests dug at the Oasis Meter Station. The intensive 100 percent pedestrian survey at the Oasis Meter Station required 3.75 person hours to complete.

Table 8.2 Shovel test pits Oasis Meter Station (1.8 acres)

STP	UTM Zone 13		Depth cm	Description	Munsell (moist)
	Easting	Northing			
1	674983	3479221	0–30	Loamy sand	2.5YR 4/6
			30–60	Sandy loam	5YR 4/6
2	674972	3479232	0–22	Loamy sand, disturbed	2.5YR 4/8
			22–65	sandy loam	5YR 4/6
3	674906	3479286	0–33	Loamy sand	5YR 4/6
			33–45	Loamy, clayey sand, cemented	5YR 4/6
4	674927	3479307	0–30	Loamy sand	5YR 4/6
			30–55	Loamy, clayey sand, cemented	5YR 4/6
5	674953	3479337	0–35	Loamy sand	5YR 4/6
			35–60	Loamy, clayey sand, cemented	5YR 4/6
6	674989	3479306	0–32	Loamy sand	5YR 4/6
			32–58`	Loamy, clayey sand, cemented	5YR 4/6
7	675027	3479269	0–32	Loamy sand, disturbed	5YR 4/6
			32–62	Loamy, clayey sand, cemented	2.5YR 4/6

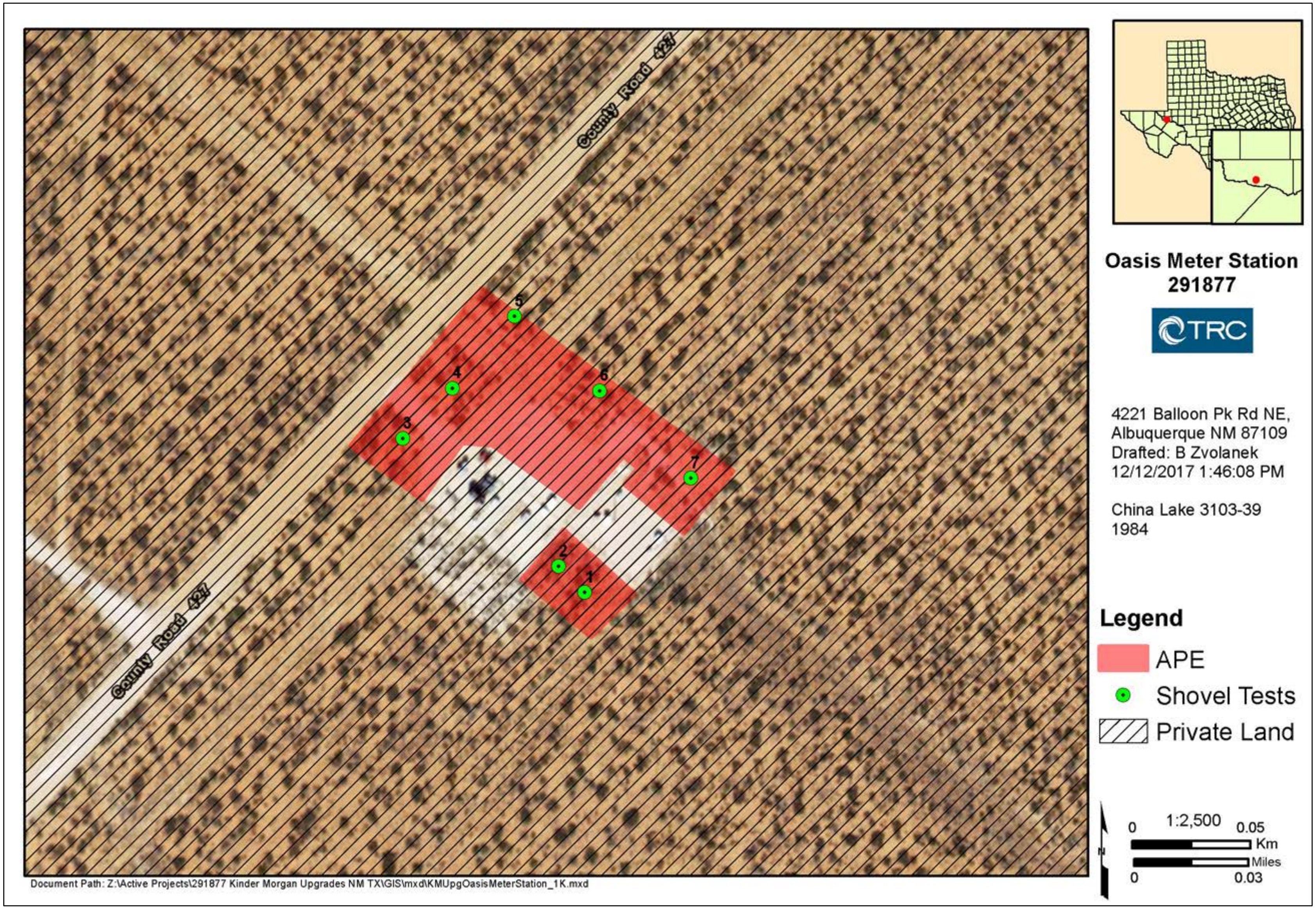

Figure 8.8 Oasis Meter Station aerial map showing the locations of shovel tests

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Figure 8.9 Oasis Meter Station shovel test pit 1

Figure 8.10 Oasis Meter Station shovel test pit 2

Figure 8.11 Oasis Meter Station shovel test pit 3

Figure 8.12 Oasis Meter Station shovel test pit 4

Figure 8.13 Oasis Meter Station shovel test pit 5

Figure 8.14 Oasis Meter Station shovel test pit 6

Figure 8.15 Shovel test pit 7

In addition to the 13 shovel test pits dug at the two project areas, animal burrows and their spoil dirt were examined for cultural materials, which provided additional subsurface tests. No cultural materials were noted in the animal burrows at either of the two project areas.

9.0 SUMMARY

This cultural resource survey was conducted by TRC for Kinder Morgan for proposed construction activities on private land at Station No. 142 and Oasis Meter Station on NGPL's Lockridge-Delhi Line in central Ward County, Texas. This report presents the results of an intensive cultural resource survey (100 percent coverage) of the 1.1-acre parcel (Figures 1.1, 2.1–2.4, and 8.1) at Station No. 142 and 1.8-acre parcel (Figures 1.2, 2.5–2.8, and 8.8) at the Oasis Meter Station. No previously recorded or new archaeological sites were documented within the two project areas. TRC recommends Kinder Morgan be allowed to develop their proposed facilities on the Station No. 142 and Oasis Meter Station parcels. If cultural materials or human burials are encountered during construction activities, work in that area should stop and the THC in Austin, Texas should be notified immediately (512-463-6096).

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Appendix

Texas Historical Commission Site File Information

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cultural materials

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Nearby Archaeological Projects (Blue)

1. Details for (Atlas Number 8400004682)

(Area location recdacted)

Atlas Number : 8400004682
Project Type : Survey
Field Work :
TAC Permit : 0
Report Author :
Principal Investigator :
New Trinomial :
Sponsor :
Investigator :
Note :
Report to THC :
Project :
Map Number : 3103-412
Map Id : 1
Project Type :
Project Date : 07/95
Agency : EPA
TAC Number : 0

2. Details for (Atlas Number 8400004691)

(Area location redacted)

Atlas Number : 8400004691
Project Type : Survey
Field Work :
TAC Permit : 0
Report Author :
Principal Investigator :
New Trinomial :
Sponsor :
Investigator :
Note :
Report to THC :
Project :
Map Number : 3103-143
Map Id : 1
Project Type :
Project Date : 06/95
Agency : EPA
TAC Number : 0

3. Details for (Atlas Number 8500014761)

Ca. 2.4 miles WSW of Station 142, ca. 4.5 miles NW of Oasis Meter Station

Atlas Number : 8500014761
Project Type :
Field Work :
TAC Permit :
Report Authors :
Principal Investigator :
Sponsor :

Investigating Firm :
Title Keywords :
Notes :
THC Review Date :
Project Proponent :
Abstract Number :

4. Details for (Atlas Number 8500014762)
(Site Location Redacted)

Atlas Number : 8500014762
Project Type : survey
Field Work : 11/15/2007 12:00:00 AM
TAC Permit :
Report Authors : Brownlow, Russell K.
Principal Investigator : Brownlow, Russell K.
Sponsor : Federal Energy Regulatory Commission
Investigating Firm : Horizon
Title Keywords :
Notes :
THC Review Date : 1/22/2008 12:00:00 AM
Project Proponent : Longhorn Partners Pipeline
Abstract Number :

Nearby Archaeological Sites (Red)

1. 41WR72

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Details for Site 41WR72 (Atlas Number 9475007201)

Archeological Site Form — Atlas Number 9475007201

Print all detailed data

Example THSA2 Form   Report an error with this data

- **Record Data**
- **Images**

Form THSA2 Data

Trinomial	41WR72
Initial Form	Yes
Recorded Visited	No
Other Source	
Type of Site	Prehistoric chipped stone scatter
Registration	Potentially eligible for NRHP under Criterion D
Site Name(s) and #'s	HSR 9509-2
Recorder(s)	Jeanie Hart, Pete Finney, Jill Mayo, and Brent Slensker
Affiliation	Human Systems Research, Inc., (HSR), Las Cruces, NM, and Roberts/Schornick and Assoc., Inc. (RSA), Norman, OK
Date of Form	19950525
Project Name & #'s	Warren Petroleum Worsham Gathering System, HSR 9509, RSA 9400914
Project Funding Source	Warren Petroleum Company

Permitting Sources & #'s	State of Texas, Texas Historical Commission, 1574
Owner/Address/Phone	State of Texas, P.O. Box 13528, Austin, TX 78711
Informants/Address/Phone	No informants contacted.
Additional Sources of Information	Bussey, Stanley D., and J.K. Finney, 1995, Final Report Cultural Resources Inventory of the Warren Petroleum Company Worsham Gathering System Corridor, Reeves and Ward Counties, Texas, Roberts/Schornick and Assoc., Inc. Report 9400914.2, Norman, OK
Observe/Record	Yes
Observe/Record Date	5/21,22,25/95
Surface Inspect/Collect	No
Surface Inspect/Collect Date	5/22/95
Surface Inspect/Collect Techniques	Four subsurface flakes were collected from test holes 2, 5, and 7.
Mapping	Yes
Mapping Date	5/22,24/95
Mapping Method	Compass bearing and pacing
Testing	Yes
Testing Date(s)	5/22/95
Testing Techniques	Seven shovel tests were placed in the site at 50 m intervals along the center of the pipeline corridor.
Excavation	No
Excavation Date(s)	N/A
Excavation Methods & Extent	
Daily Journal	No
Testing/Unit/Square Records	Yes
Artifact Sketches	No
Maps/Drawings	Yes
Archival Records	No
Field Catalog	No
Lab Inventory	No
Analysis Notes	Yes
Slides	No
Slide Log	No
Prints	No
Print Log	Yes
Aerials	No
Other	
Kinds of Materials Collected	Four chert flakes were collected, one from test hole 2, one from test hole 5, and two from test hole 7. Test hole depths varied. Test hole 2 is located in the northern portion of the site while test holes 5 and 7 are both in the more central and southern portion of the site.
Special Samples, Collection Strategy & Technique	N/A
Temporary Housing	Human Systems Research, Las Cruces, New Mexico
Permanent Housing	TARL
County	Ward
Site Location in County	SW
USGS Map Series	7.5 min
USGS Map Name	China Lake

USGS Map Number	3103-143
Description of Location	(Site location redacted)
Elevation	2613
Elevation Range	2605-2613
UTM Zone	13
UTM Easting	(Site location redacted)
UTM Northing	
UTM Range	
Latitude	
Longitude	
Nearest Natural Water	The Pecos River is 2.3 miles south
Major Creek Drainage	None
Name of Drainage Basin & Type	Pecos River Basin, Pecos River
SCS Soil Series Name	Delnorte-Sharvana association; Delnorte series (DE) and Sharvana series (SH)
Genetic Type	Aridosol Subgroup typic paleorthids
Surface Texture	Loam
In Situ	No
Marine	No
Eolian	Yes
Colluvial	No
Alluvial	No
Other Soil Source	
Percentage of Ground Surface Visible	75 percent
Environmental Topographic Setting	The site is located on a creosote/mesquite covered flat or plain that gently slopes downward to the south and east. Slope is no more than 3 degrees. Grass and various cacti (prickly pear and Christmas) are present on the site. This flat area lies between two minor intermittent stream drainages, one east of the site and the other west of the site. (Site location information redacted)
Time Periods of Occupation	Unknown prehistoric chipped stone scatter.
Single Component	Yes
Multiple Component	No

Unknown Component	No
Basis for Determination	Presence of chipped stone artifacts only. No other prehistoric or historic artifacts were found.
Cultural Features	None observed
Approximate Site Size	240 m by 75 m ; N/NE to S/SW
Basis for Site Size Determination	Distribution of artifacts on ground surface
Top of Cultural Deposit	5 cm
Basis for determining top of Deposit	Positive shovel test results between ground surface and 10 cm below ground surface
Thickness Range of Cultural Deposit	Approx. 10 cm
Basis for Determination of Thickness Range	Positive shovel test results above 10 cm below ground surface.
Artifactual Materials Present	In R-O-W corridor, two chalcedony flakes, eight chert flaked, seven chert cobble/pebble tools and one chert core. Retouch was observed on two cobble/pebble tools. Artifacts outside ROW corridor include eight chert and one coarser-grained undifferentiated flakes, one chert and one sandstone alternate flake, seven chert angular debris, nine chert cobble/pebble tools and nine chert cores. One artifact per 333 square meters. Only the four flakes recovered from shovel tests were collected.
Additional Comments on Cultural Manifestations	
Circumstances Affecting Observations	Site visibility was minimally obscured by vegetation.
Approximate Percentage of Site Remaining Intact	80 percent
Current Land Use	Oil/gas production and cattle ranching
Natural Impacts	Site impacted by eolian action uncovering and burying artifacts over time. Surface affected by cattle and subsurface by insects and rodents.
Artificial Impacts	Off-road vehicle tire tracks observed.
Known or Perceived Future Impacts	Proposed oil pipeline installation
Research Value of Site	Research value to contribute to lithic technology, lithic resource procurement patterns and subsistence patterns. Possible subsurface materials may provide chronological data.
What Further Investigations and Why	None, impact has been avoided
If No Further Investigations, Why Not	Impact has been avoided.
SAL Potential	No
SAL Submitted	No
SAL Nominated	No
SAL Determined Eligible	No
SAL Listed	No
NRHP Potential	Yes
NRHP Submitted	No
NRHP Nominated	No
NRHP Determined Eligible	No
NRHP Listed	No

CE Potential	No
CE Submitted	No
CE Nominated	No
CE Determined Eligible	No
CE Listed	No
Other Registration	
Other Potential	No
Other Submitted	No
Other Nominated	No
Other Determined Eligible	No
Other Listed	No
Additional Comments	Site consists of low-density lithic artifact scatter. Material types include chert, fine-grained quartzite and sandstone. Artifact density is 1 per 333 square meters. Pipeline was rerouted to avoid site. State permitted area did not include this part of the line

Data

Trinomial	41WR72
ID	TARL_CHI-CLAP-77
Map	3103-143
UTM Zone (NAD 27)	13
UTM Northing (NAD 27)	(Site location redacted)
UTM Easting (NAD 27)	(Site location redacted)
Latitude (NAD 27)	(Site location redacted)
Longitude (NAD 27)	(Site location redacted)
Digitizer	MICHAEL
Approximate Location	F

Data

Determination ID	12257
Tracking Number	199509728
Trinomial	41WR72
Determination Type	Prehistoric
Review Date	7/27/1995
SHPO Eligibility Determination	Ineligible
Notes	
Modified by	
Date Modified	

2. 41WR9
   (Site location redacted)

Details for Site Digitization Record for Trinomial 41WR9 (Atlas Number 9475000999)

Site Digitization Data — Atlas Number 9475000999

Print all detailed data

Report an error with this data

- **Record Data**

Data

Trinomial	41WR9
ID	TARL_PUN-RAZ-3
Map	3103-412
UTM Zone (NAD 27)	13
UTM Northing (NAD 27)	(Site location redacted)
UTM Easting (NAD 27)	(Site location redacted)
Latitude (NAD 27)	(Site location redacted)
Longitude (NAD 27)	(Site location redacted)
Digitizer	MICHAEL
Approximate Location	F

3. 41WR10
   (Site location redacted)

Details for Site Digitization Record for Trinomial 41WR10 (Atlas Number 9475001099)

Site Digitization Data — Atlas Number 9475001099

Print all detailed data

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- **Record Data**

Data

Trinomial	41WR10
ID	TARL_SOA-SOZ-5
Map	3103-421
UTM Zone (NAD 27)	13
UTM Northing (NAD 27)	(Site location redacted)
UTM Easting (NAD 27)	(Site location redacted)
Latitude (NAD 27)	(Site location redacted)
Longitude (NAD 27)	(Site location redacted)
Digitizer	VICTORIA
Approximate Location	F

4. 41WR101
   (Site location redacted)

Details for Site 41WR101 (Atlas Number 9475010101)

Archeological Site Form — Atlas Number 9475010101

Print all detailed data

Example THSA139 Form Report an error with this data

- **Record Data**

Form THSA139 Data

Form Number	
Form Date	3/9/2016
Trinomial	41WR101
Site Type	Historic
Explanation of Type	Sandstone foundation and windmill remnants
Site Name	
Site Number	
Project Name	Permian Basin to Culberson 138 kV Transmission Line Project
Funding Source	Oncor Electric Delivery Company LLC
Project Number	60477880
Permitting Source	N/A
Permit Number	
Additional Sources of Info.	
Recorder	Chris von Wedell
Recorder's Organization	AECOM
Recorder's Address	1950 N. Stemmons FWY, Suite 6000
Recorder's City	Dallas
Recorder's State	TX
Recorder's Zip Code	75207
Recorder's Phone Number	214-741-7777
Recorder's Fax Number	
Recorder's Email	chris.von.wedell@aecom.com
Observe/Record Dates	12/14/2015
Surface Inspect/Collect Dates	12/14/2015
Surface Inspect/Collect Techniques	Intensive Level Pedestrian Survey
Mapping Dates	12/14/2015
Mapping Methods	GPS
Testing Dates	
Testing Methods	
Excavation Dates	
Excavation Methods	
Types of Records	digital photos; photo logs; location map; project report
Materials Collected	No materials collected.
Special Samples	
Temporary Housing	AECOM, Dallas, TX
Permanent Housing	TARL
Primary County	Ward
Site Location in County	West Central
Secondary Counties	
USGS Map	Pyote West (3103-412)
Recorder Visited Site	Yes
Time Periods of Occupation	Historic
Description of Location	(Site location redacted)
UTM Zone	13
UTM Easting	(Site location redacted)

UTM Northing	(Site location redacted)
UTM Datum	NAD 1983
Nearest Natural Water	Unnamed spring and ephemeral drainage located 325 m to the north
Major Drainage	Rio Grande River
Name and Type of Drainage Basin	Unnamed
Owner Information	
Informant Information	
Soil Description	Kinco fine sandy loam, 0 to 3 percent slopes (NRCS)
Soil Surface Texture	sandy loam
Soil Derivation	Derivation Situ
Other Soil Derivation	
Ground Surface Visible	85%
Environmental Description	Mesquite scrub and sparse grasses on a flat upland plain.
Time Periods of Occupation	Presence of timber windmill remnants and solder dot tin cans
Component	Unknown Components
Basis for Determining Components	It is unclear if the windmill and sandstone foundation were constructed at the same time.
Cultural Features	The windmill is constructed of collapsed timber with steel bolts connecting the tower legs to several cross beams. Measurement of the collapsed windmill indicates that it had a minimum original height 36 feet with an indeterminate base width/length. A small sandstone and mortar foundation is located six feet north of the base of the collapsed windmill. The foundation is 2-3 feet tall and measures 11 x 12 feet with a northwest-southeast orientation. It is constructed of asymmetrical sandstone cobbles which do not occur on-site. Similar non-local sandstone cobbles are arranged in a pile located approximately 12 feet west of the sandstone foundation.
Site Size	46 m x 21 m
Basis for Size	Extent of artifacts within the ROW
Top of Deposits Below Surface	0 m
Basis for Top of Deposit	Deflated ground surface lacking testable soils
Thickness of Deposit	N/A
Basis for Thickness	
Artifactual Materials Present	Artifacts located near the windmill include several hole-in-top cans and amethyst glass shards suggest the site may pre-date 1910.
Circumstances Affecting Observations	None
Percentage of Site Intact	Unknown/less than 25% within Right-of-Way
Current Land Use	Ranching, mineral development, transportation
Natural Impacts	Erosion
Artificial Impacts	Multiple road constructions, grazing
Future Impacts	Transmission line construction
Research Value	
Further Investigations	No further archeological work is recommended for the portion of this site within the ROW.
State Archeological Landmark	
National Register	
Conservation Easement	

Recorded TX Historical Landmark	
Comments on Registration	Recommended Not Eligible within ROW.
Additional Comments	This site consists of remnants of a collapsed historic windmill and associated sandstone and mortar foundation and sandstone cobbles bisected by the proposed project centerline.
Attachments	
Local Identifier	H05
Revisit Form	No
Materials Collected	No

Details for National Register Eligibility Reviews (Atlas Number 8600032984)

Atlas Number 8600032984

Print all detailed data

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- **Record Data**

Data

Determination ID	32984
Tracking Number	201803373
Trinomial	41WR101
Determination Type	Historic
Review Date	11/3/2017
SHPO Eligibility Determination	Ineligible within ROW
Notes	
Modified by	
Date Modified	

Nearby Historical Markers (Green)

Marker No. 4204

Ca. 5 miles NE of Station 142, ca. 6.6 miles NE of Oasis Meter Station

1. Details for Rattlesnake Bomber Base (Atlas Number 5475004204)

Historical Marker — Atlas Number 5475004204

Print all detailed data

Report an error with this data

- **Record Data**

Data

Marker Number	4204
Atlas Number	5475004204
Marker Title	Rattlesnake Bomber Base
Index Entry	Rattlesnake Bomber Base
Address	IH-20 at Exit 66
City	Pyote
County	Ward
UTM Zone	13

UTM Easting	677460
UTM Northing	3489723
Subject Codes	World War II; aviation; military topics
Marker Year	1984
Designations	
Marker Location	On IH-20 West bound service Rd, Exit 66 (Pyote Kermit Exit) across IH-20 from West Texas children Jail., Pyote
Marker Size	27" x 42"
Marker Text	Nicknamed for the numerous rattlesnake dens that were uncovered during its construction, Pyote Army Air Base was established in 1942 to train replacement crews for bombers during World War II. Located on 2,700 acres of University of Texas land, the base consisted of two 8,400-foot runways, five large hangars, and hundreds of buildings used to house 3,000 to 4,000 soldiers an 2,000 civilians. On Jan. 1, 1943, the 19th Bombardment Group (later known as the 19th Combat Crew training B-17 bomber crews. Pyote came to be highly regarded as a top training field, and its crews set many new records for flying hours. This reputation continued after the transition to B-29s was made in July 1944. During the post-war years, the base served as a storage facility, at one time housing as many as 2,000 aircraft, including the "Enola Gay", the plane that dropped the first atomic bomb. Pyote also was used for a short time as a radar station, but by 1966 it was no longer economical to maintain such a large base for so small an operation, and the facility was closed.

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