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CULTURAL RESOURCES SURVEYS CONDUCTED DURING AUGUST 2015
CENTRAL EAGLE FORD ZONE
GONZALES, DE WITT, KARNES, AND WILSON COUNTIES

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MANAGEMENT SUMMARY

During the month of August 2015, Goshawk Environmental Consulting, Inc. (Goshawk) conducted four cultural resources surveys within the Eagle Ford Play, Central Eagle Ford Zone at the request of EOG Resources, Inc. (EOG). The projects subjected to cultural resources investigations were the Winwood Unit #1H and #2H Access Road, Manchaca Unit #5H, #6H, #7H, #8H, #9H, and #10H Flowlines, Winona Unit #14 Gas Lift Line, and Allman-Fleetwood Unit Gas Lift Line. Unless otherwise noted, each Area of Potential Effect (APE) was a 75-foot (23-meter [m]) wide right-of-way (ROW) consisting of a 50-foot (15-m) wide permanent easement and a 25-foot (8-m) wide temporary construction easement. The investigations were conducted by Goshawk archeologists Phil Schoch and Reign Clark with Bear Aspra and Mitch Juenke. Phil Schoch served as primary author and Reign Clark and Ron Ralph served as contributing authors for this report of investigations.

The cultural resources survey was performed according to Council of Texas Archeologists survey standards; in compliance with the Texas Historical Commission's Rules of Practice and Procedure, Chapter 26, Section 27; and under the general guidelines of the Register of Professional Archaeologists. Site files on the THC's Archeological Sites Atlas website database were consulted prior to the commencement of the field effort for previously recorded site locations; references to previous archeological surveys undertaken; and place names of interest in the vicinity of the proposed project.

Streams potentially under the United States Army Corps of Engineers (USACE) jurisdiction, which cross the APEs, were assessed by an ecologist via desktop and field reviews prior to commencement of the cultural resources surveys. As per the established procedure of due diligence, any segment of an APE that falls within an area potentially under federal jurisdiction or any portion of an APE that falls within a 328-foot (100-m) radius of a known cultural site would be subjected to a cultural resources survey. Any segment of an APE to be surveyed under this protocol was labeled as a "review area" and was subjected to cultural resources survey.

During the survey of the projects, shovel tests were placed within the review areas. Shovel testing and surface inspection resulted in no significant cultural deposits documented within the survey areas. Based on these results, it is Goshawk's opinion that no cultural resources will be impacted by construction within the surveyed portions of the APEs. Goshawk recommends that the projects be allowed to proceed as planned with the caveat that construction be limited to the surveyed ROWs. In the unlikely event that cultural resources (including human remains) are discovered, all construction or maintenance activities should be immediately halted and both the USACE and an archeologist should be notified.

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1.0 INTRODUCTION

During the month of August 2015, Goshawk Environmental Consulting, Inc. (Goshawk) conducted four cultural resources surveys within the Eagle Ford Play, Central Eagle Ford Zone, at the request of EOG Resources, Inc. (EOG). The Central Eagle Ford Zone includes portions of De Witt, Gonzales, Karnes, and Wilson Counties (Figure 1-1, Vicinity Map). The projects subjected to cultural resources investigations were the Winwood Unit #1H and #2H Access Road, Manchaca Unit #5H, #6H, #7H, #8H, #9H, and #10H Flowlines, Winona Unit #14 Gas Lift Line, and Allman-Fleetwood Unit Gas Lift Line (Figure 1-2). Each Area of Potential Effect (APE) was a 75-foot (23-meter [m]) wide right-of-way (ROW) consisting of a 50-foot (15-m) wide permanent easement and a 25-foot (8-m) wide temporary construction easement.

2.0 ENVIRONMENTAL CONTEXT OF THE CENTRAL EAGLE FORD ZONE

The Eagle Ford Shale Region covers a large portion of south and southeast Texas totaling approximately 22,000 square miles (35,405.6 square kilometers [km^2]). This region of Texas can be broken down into zones reflecting biologic, geologic, physiographic, and cultural diversity within the Eagle Ford Shale. The Central Eagle Ford Zone is an area characteristic of the Texan Biotic Province (Blair 1950); a transitional vegetative zone between northern hardwoods and the southern scrubland. The Texan Biotic Province is a broad ecotonal area between the forested regions of eastern Texas and the grasslands of western and northern Texas. The region is characterized by a series of gently rolling uplands dissected by few streams and minor tributaries; and as such, riparian areas are somewhat common.

The Central Eagle Ford Zone extends south and southeast from San Antonio to the south Karnes County line. The zone extends northeastward to central Lavaca County and northwest to northern Gonzales County (See Figure 1-1). This area is crisscrossed by two major rivers; the San Antonio and the Atascosa. The San Antonio River crosses the Central Eagle Ford Zone on a west to east axis. Major creeks, including Cibolo, Escondido, and Ecleto Creeks, flow in to the San Antonio River, which connects with the Guadalupe River before it empties into the Gulf of Mexico. The Atascosa River traverses the zone on a roughly north to south axis, joining with the Frio River north of Three Rivers, Texas. The Frio River empties to the Nueces River south of town. The Atascosa is fed by numerous named creeks and their tributaries which are dry for most of the year.

2.1 LAND USE

Currently, the most common uses for land falling within the Central Eagle Ford Zone are cattle ranching, crop cultivation, oil and gas field development, and lease hunting. Many of the common land uses result in the clearing of the omnipresent invasive thorn brush so that development can proceed. The persistent problem of invading brush and cacti is often addressed by “chaining”, whereby a heavy chain is dragged across the landscape by bulldozers, uprooting unwanted brush. Additionally, large senderos are often cut through the vegetation to facilitate wildlife management and seismic surveys. Root plowing, using a large tracked bulldozer and a dragging blade, is also used to clear brush. All clearing methods are disruptive to archeological sites. Poor soil conservation practices have resulted in the depletion of top soil, exposing clay pans across some areas.

The number of higher-energy streams and increased rainfall totals, over the majority of south Texas, provides a greater opportunity for archeological sites to be capped by alluvial or colluvial processes. Many depositional soil types, present along the rivers and major creeks within the Texan Biotic Province, contain temporally stratified deposits and a higher probability for the presence of significant prehistoric sites. On upland terrain, which has been continually cleared of native vegetation, top soils have been depleted. In these areas, many of the soils originally mapped by the Natural Resources Conservation Service (NRCS) possessed pronounced A-horizons. These soils no longer exhibit the characteristics of their pedogenic description. Dense chert gravel outcrop exposures are common across the uplands, while alluvium blankets many areas along creeks.

2.2 GEOLOGY AND PHYSIOGRAPHY

The Central Eagle Ford Zone is one of the most geologically diverse areas of Texas containing at least 21 mapped geologic formations. Some of the major geologic formations across the southern portion of the region include the Catahoula Formation, Oakville Sandstone, and Willis Formation (Texas Water Development Board [TWDB] 1979).

The Catahoula Formation varies in elevation from 100 to 200 feet (30 to 61 m) above mean sea level (AMSL). Soils on the Catahoula Formation tend to be light-colored with tuffaceous sands and bentonitic clays. Some areas also have local concentrations of calcareous material. The Oakville Sandstone overlays the Catahoula Formation and is a mixture of fine to medium grained sand and sandstone, ashy and sandy clay, and bentonitic clay (Griffin 2006). In addition, the Oakville Sandstone contains gravel beds comprised of Austin Chalk and fossils, as well as gravels typically found on high ridges. Oakville Sandstone dates to the Miocene (TWDB 1979).

The Willis Formation dates to the Pliocene (Griffin 2006, TWDB 1979), and is expressed as relict high gravel deposits near major stream channels and along the edges of interfluves. Soils of the area typically contain fluviatile chert, sand, silt, and clay from the Edwards Group strata. The chert outcrops would have been of interest to native peoples as they offered easy access to lithic material.

Numerous geologic formations are banded closely together in a northeast to southwest orientation across the northern portion of the Central Eagle Ford Zone. The major formations include the Cook Mountain Formation, Yegua Formation, Caddell Formation, and Manning Formation. The Catahoula and Oakville Formations previously described extend into this area as well.

The Cook Mountain Formation consists of clay and sandstone. Marine fossils are common in the 200 to 230 foot (61 to 70 m) thick Eocene formation. The Yegua Formation, which forms terraces, is an Eocene age deposit of sandstone and clay. The sandstone is composed of mostly quartz with some chert, and is fine-grained and indurated to friable with a cross-bedded structure. It is calcareous with a thickness of 400 to 1,050 feet (122 to 320 m). The Caddell Formation consists of siltstone, clay, and sandstone. The 50 to 100 foot (15 to 30 m) thick Eocene formation is locally fossiliferous. The Manning Formation consists of clay, sandstone, and Plum Bentonite. This chert-like material is indurated, waxy, and expresses conchoidal fractures. Fossil wood, clay beds, and lignite deposits are common in the 250 to 350 foot (76 to 107 m) thick Eocene formation. Both the

Manning Formation and the fossil wood surface gravels would have been of interest to prehistoric populations.

Lesser formations in the area include the Reklaw Formation, Weches Formation, Fleming Formation, Wellborn Formation, and Whitsett Formation. Also present are three separate bands of sand formations. These include Carrizo Sands, Sparta Sands, and Queen City Sands.

Fluviatile terrace deposits and fluvial sediments are mapped throughout the Central Eagle Ford Zone in the vicinity of larger creeks and rivers. The fluviatile terrace deposits of Pleistocene age are remnants of ancient floodplains. During the Pleistocene, streams flowed between 25 and 50 feet (8 and 15 m) higher than at the present time. These terraces are located above the Holocene-aged alluvial deposits. Later Holocene-aged fluvial sediments are deposited through alluvial deposition on floodplains, levees, and lower terraces within flood zones (Griffin 2006). Many of the major waterways in the region have fairly broad floodplains. The Guadalupe River in particular has a floodplain between 2 and 5 miles (3.2 and 8 km) wide in places. Broad floodplains, such as this one, are indicative of greater water depths and volumes earlier in the Holocene. Quaternary floodplain deposits consist of gravel, sand, clay, silt, and organic material. These recent gravel deposits may have provided raw material for prehistoric peoples in search of tool-making stone.

2.3 Project Area Soils

The Web Soil Survey of the Natural Resources Conservation Service (NRCS 2014), the De Witt County Soil Survey (Miller 1978), the Gonzales County Soil Survey (Griffin 2006), the Karnes County Soils Survey (Molina 1999), and the Wilson County Soil Survey (Taylor 1977) were consulted for each project within the Central Eagle Ford Zone. Generally, soils encountered consist of clay, clay loam, and sandy loam along benches and terraces adjacent to smaller streams. Sometimes very deep sandy alluvium is found along the banks of the larger rivers crossing this zone. In-situ clay soils are commonly found on the wider floodplains of named creeks. Occasionally, expansive outcrops of chert gravels and cobbles are found on eroded uplands and shoulder slopes, which prehistoric native groups used as raw material quarries for tool-making. These outcrops are most common on high uplands along the Guadalupe River.

2.4 Flora and Fauna

Within the Central Eagle Ford Zone, native tree species include mesquite, huisache, pecan, live oak, Texas wild olive, and Texas persimmon. Common shrubs and succulents in the region include prickly pear, fiddlewood, desert yaupon, agave, yucca, and autumn sage. Native grass species include sideoats grama, slender grama, buffalo grass, inland sea-oats, plains lovegrass, and little bluestem (Gould 1978; TPWD 2014a). In the Texas Biotic Province, rainfall totals are barely in excess of water need (Blair 1950). Traditionally, clayey soils supported vast grasslands but much of the native grass areas have been decimated by recent land management practices. Alluvial soils along major drainage ways support trees such as hackberry, pecan, and a variety of oaks; among other hardwoods.

There are at least 61 mammal species, 57 reptile species, and 22 amphibian species within the Central Eagle Ford Zone (Schmidly 2004). Common small mammals in the region include several

species of rats, mice, and bats; the Texas pocket gopher; the eastern mole; the eastern cottontail rabbit; and the Mexican ground squirrel (Blair 1950). Medium to large mammals include white-tailed deer, American hog-nosed skunk, and armadillo. Another of the mammalian species located in the ecoregion is the Mexican opossum, the only marsupial in the ecoregion. Rare or extinct mammalian species in the area include ocelot, jaguar, javelina, bison, and jaguarondi (TPWD 2014b). Reptile species within the region include the western box turtle, Texas banded gecko, Texas spiny lizard, red racer, western diamondback rattlesnake, and diamond-backed water snake (Blair 1950, TPWD 2014a). Rare reptilian species include the Texas tortoise, indigo snake, and Texas horned lizard (TPWD 2014b). Despite the drier climate within the Tamaulipan, the region is host to several water-loving urodeles (salamanders and newts) and anurans (frogs and toads) (Blair 1950; Davis 1978). There are three species of urodeles and 18 species of anurans. Raptors, songbirds, doves, gulls, and terns are the dominant birds near the APE (Bryan et al. 2006). The rare Cactus Ferruginous pygmy-owl is also occasionally found within the ecoregion (TPWD 2014a, TPWD 2014b).

2.5 CLIMATE

The Central Eagle Ford Zone exhibits a subtropical, mild climate. Average temperatures range from a high of 96.8 degrees Fahrenheit in August to a low of 63.7 degrees Fahrenheit in January, with a yearly average of 81.9 degrees Fahrenheit. Temperatures can reach 104 degrees Fahrenheit or drop as low as 15 degrees Fahrenheit. Average rainfall is approximately 29 inches (74 centimeter [cm]) per annum. The greatest amount of rainfall occurs during May, June, September, and October averaging 3.5 inches (8.9 cm) per month. The growing season ranges between 222 days and 351 days in duration.

3.0 CULTURAL CONTEXT OF THE CENTRAL EAGLE FORD ZONE

The Central Eagle Ford Zone is located in the South Texas Archeological Region where nomadic hunter-gatherer groups migrated seasonally, following resources and sharing cultural traits with other groups. This is evidenced in the dispersal of point types and ceramic styles across the region (Prewitt 1995). Open camps are the most common type of archeological site found in the South Texas Archeological Region. Open camps can be shallow or deeply buried; are often adjacent to streams; and usually contain clustered archeological material such as burned rocks, lithic debris, hearths, or middens. Bone and shell are less common in the assemblages, as organics rarely survive due to the alkaline nature of the soils.

Notable work in South Texas archeological research has been conducted by Fox, et al. (1974), Mallouf, et al. (1977), Mercado, et al. (1996), Hall, et al. (1986), Black (1989), and Hester (1980). However, the lack of intensive investigations, high rate of looting, and levels of erosion that occur throughout South Texas have left barriers to fully understanding and dating the periods of occupation in the area (Perttula 2004).

The following cultural background is divided into several periods in this portion of the state: Paleoindian (9,500 to 6,000 B.C.), Early Archaic (6,000 to 2,500 B.C.), Middle Archaic (2,500 B.C. to A.D. 400), Late Archaic (A.D. 400 to 700), Late Prehistoric (A.D. 700 to 1750), and Historic (A.D. 1750 to present) (Aten 1983; Perttula 2004; Turner and Hester 1999). Some scholars include

another period, the Protohistoric, but it will not be included here due to the lack of a useful definition and contextual information available in this region.

3.1 PREHISTORY

3.1.1 Paleoindian Period (ca. 9,500 to 6,000 b.c.)

Recent archeological evidence indicates prehistoric people may have occupied this area prior to the Paleoindian Period. However, the controversial sites that show evidence of an earlier period of habitation have not yet been widely accepted by the archeological community. For this reason, the prehistoric period will begin with Paleoindians.

Beginning around 9,500 B.C., the Paleoindian is the earliest identified cultural period in the vicinity of the Central Eagle Ford Zone. It spans over 3,000 years to about 6,000 B.C. (Ensor and Ricklis 1998). According to some authors, the Paleoindian period begins approximately 1,200 years earlier (11,500 B.C.) further to the south in the South Texas region. It has been postulated that this is most likely due to the earlier habitation of the Paleoindian Clovis peoples coming north from central Mexico (Perttula 2004).

Coinciding with the decline of the Wisconsinan Glaciation, the Paleoindian period is characterized by a relatively cool, moist climate that encouraged the development of now-extinct species of Pleistocene megafauna, such as bison. This period is sometimes called the Big Game Hunting tradition (Willey 1966), due to a presumed heavy reliance by Paleoindian peoples on megafauna as a food source during the earlier portion of the period. Environmental changes that brought about the extinction or dislocation of megafauna precipitated a shift toward smaller game, creating the transition into the Archaic (Aten 1983:146-148; Willey and Phillips 1958:107).

Temporally diagnostic tool types attributed to this period include a variety of finely chipped, sometimes fluted, lanceolate projectile point styles, such as Clovis, Folsom, Plainview, and Scottsbluff (Meltzer and Bever 1995; Prikryl 1990; Willey 1966). The Paleoindian projectile point types show a transitional change between the earlier Paleoindian points and the Early Archaic. By the late Paleoindian period, unfluted lanceolate projectile points such as Plainview, Golondrina, and Angostura were more common (Story, et al. 1990).

3.1.2 Archaic Period (6,000 B.C. to A.D. 400)

Following the close of the Pleistocene, the South Texas region experienced a trend toward a warmer and drier climate. It has been postulated that this climate shift was at least partially responsible for the extinction of megafaunal species. The archeological record of this period exhibits evidence of a gradual diversification in subsistence patterns. This is the beginning of the Archaic, which lasts from about 6,000 B.C. to A.D. 400 (Aten 1983:152-157). The Archaic period is divided into three time periods: the Early Archaic (6,050 to 2,500 B.C.), the Middle Archaic (2,500 B.C. to 1,000 B.C.), and the Late Archaic (1,000 B.C. to A.D. 400) (Perttula 2004; Turner and Hester 1999). Few Archaic sites are recorded on the Upper Texas Coast (Aten 1983:153; Story 1985:28-29). Story (1985:31–34) suggests site density was low on the coastal plain during this period. Archaic sites tested or excavated near the modern shoreline generally consist of shell-bearing sites with varying degrees of lithic tools and debitage, shell or bone tools, and the bones of fish, mammals, and reptiles (Ambler

1967, 1970, 1973; Aten 1979, 1983; Ensor 1998; Howard et al. 1991). Inland sites tend to contain more lithic artifacts and debitage with terrestrial mammal bones comprising the bulk of the inland faunal assemblages. Archaic patterns in tool-making for the South Texas region are centered on corner-notching technology and triangular points, moving away from the basal-notching technology.

3.1.2.1 Early Archaic Period (6,000 to 2,500 B.C.)

Late Paleoindian unfluted lanceolate projectile points such as Plainview, Golondrina, and Angostura were replaced by un-stemmed triangular points and basal or corner notched points in the Early Archaic. The Early Archaic in the South Texas region is significantly shorter than in other regions due to the onset of specific regional cultural patterns occurring around 2,500 B.C., which emphasized un-stemmed dart points and smaller bifacial and unifacial beveled tools (Perttula 2004). In addition to these cultural patterns, the archeological record shows the diet of the people in this area consisted of turtles, snails, and freshwater mussels. Land snails (*Rabdotus* sp.) are often present at prehistoric sites, but there is debate regarding whether the prehistoric peoples were consuming them or if the snails were merely "cleaning up" after the group moved out of the area.

3.1.2.2 Middle Archaic Period (2,500 to 1,000 B.C.)

For the South Texas region, the Middle Archaic is more thoroughly represented in the archeological record than the Early Archaic. It is during this time period that the triangular Tortugas and Abasolo points were developed. In addition, the archeological record shows the development of smaller, unifacial, distally beveled tools that show a high amount of reworking and resharpening. Evidence supports that these common tools were used in wood-working (Perttula 2004). During this period, most open campsites were placed in flood-prone zones along low terraces, and while information concerning their diet is scant, numerous types of fuel materials have been identified including mesquite, acacia, oak, and hackberry (Perttula 2004). There is also significant data concerning treatment of the dead (Patterson et al. 1998), especially later in the period. Cemeteries were commonly used, most of which contained grave goods such as points, flakes, cores, and sandstone pieces (Perttula 2004; Hall et al. 1986). One such cemetery, Loma Sandia, is dated to the late Middle Archaic and is` located in Live Oak County (Taylor and Highley 1995). With its hundreds of burials and thousands of artifacts, it remains one of the most studied archeological sites in South Texas.

3.1.2.3 Late Archaic Period (1,000 B.C. to A.D. 400)

In general, Late Archaic sites in the South Texas Region show a marked increase in site utilization and heavy dependence on seasonal base camps, where various maintenance, extractive, and processing tasks were used in exploiting local resources. Assemblages characterizing these technological activities include a variety of dart point styles, a suite of ground and polished stone tools, and the beginning use of ceramics.

3.1.3 Late Prehistoric Period (A.D. 400 to 1750)

The Late Prehistoric period in the South Texas Region saw a continuation of many of the same cultural and subsistence patterns in place during the Late Archaic (e.g. cemeteries and burned rock features) with two very significant technological adaptations: a heavier reliance on ceramics by certain groups and the introduction of the bow and arrow (Ensor 1998).

3.2 HISTORIC PERIOD (A.D. 1750 TO PRESENT)

3.2.1 Historic Native Groups in the Area

Early Spanish expeditions in Texas afford the primary evidence of the relevant historic Indian tribes in the South Texas Region during the late sixteenth through early eighteenth-centuries. Initial exploration of the Gulf of Mexico and the American Southwest was accomplished by Spanish explorers Alonso Alvarez Piñeda (1519) and Alvar Nunez Cabeza de Vaca (1528). Following Piñeda's initial maritime effort to map the Gulf Coast, the earliest exploration of the South Texas Region was accomplished by de Vaca, who shipwrecked in the Gulf of Mexico in 1528 along with other members of an expedition led by Pánfilo de Narváez (Weddle 1985).

De Vaca's account served as the basis upon which subsequent explorations of the region were conducted by Hernando de Soto (1539) and Luis de Moscoso (1542). By 1561, Spain was facing increasing difficulties in maintaining its few colonies in Florida. The relatively poor economic prospects for these colonies and increasing competition from other colonial powers quelled the Spanish Crown's interest in colonizing their Florida territories which included Texas. As a result, the Texas Gulf Coast remained relatively uninhabited by Europeans for the next two centuries until the threat of increased French exploration in the territory stimulated the Spanish government to establish more permanent settlements in the area (Weddle 1991). In 1685, René Robert Cavelier and Sieur de la Salle established Fort St. Louis along the Gulf Coast (Gilmore 1984, Tunnel and Ambler 1967). Plagued by disease, starvation, and Indian attacks, Fort St. Louis was no longer in use by late 1688 or early 1689 (Bruseth and Turner 2005).

Spanish expeditions to the South Texas Region include the 1689 expedition of Governor Alonso de León; the 1691 to 1692 expedition of Governor Domingo Terán de los Ríos; the Espinosa-Olivares-Aguirre expedition of 1709; Ramón's expedition of 1716; Alarcón's expedition of 1718; and Rivera's inspection tour of 1727 (Campbell 1983; Foster 1995). The Indians encountered during those journeys included indigenous Sanan speakers and displaced and migrating tribes from well outside the region, such as the Jumano of west Texas, the Wichita-speaking Yojuane of north central Oklahoma, and the Simaomo and Tusonibi of northeastern Mexico (Campbell 1979). According to Chapa, an early historian who documented over 160 groups annihilated during the 1600s, many other tribes had been decimated by European disease in Coahuila and Nueva Leon (Foster 2008:108).

3.2.2 European Settlement (ca. 1750)

Although there were no permanent Spanish settlements established in the area now known as La Salle and McMullen Counties, Spaniards did traverse the area at various times. Alonso De León passed through the area in 1689 and 1690, as did Diego Ortiz Parrilla in 1766. In the early 1800s, the Old Laredo-San Antonio road passed to the east of the survey area. Even earlier, a large waterhole on Esperanza Creek was the meeting place where presidio soldier escorts passed off their charges before returning to their posts in Laredo and San Antonio (Leffler 2014).

3.2.3 Anglo Settlement

After Spain recognized Mexico's independence in the early nineteenth century, the first land grants were issued by the Mexican government to encourage foreign settlement. Two empresario land

grants went to Stephen F. Austin and Green C. DeWitt. It wasn't originally Stephen F. Austin's desire, but that of his father's, Moses Austin, to become an empresario in Spanish Texas. In 1820, Moses had been in negotiations with Governor Antonio María Martínez when he offered a proposal to bring 300 colonial families to Texas. His offer was flatly rejected, due to omissions reflecting little understanding of Spanish colonial law. Moses returned with the Baron de Bastrop, second alcalde of Bexar, and a revised proposal (Moore 2014). With the Baron's help, Moses was granted permission to begin colonization of Texas, but died before a single colonist was brought to Texas from the east.

Moses' dream of colonization would come to fruition under his son, Stephen Fuller Austin. In December of 1821, Austin began bringing the first families to settle on the Austin land grants. For each married head of household, a grant comprised of one league (4,428 acres) and one labor (177 acres) of land would be issued. Unmarried males were eligible for a single land grant of one-third league (1,476 acres). While grant selection began in late 1821, actual titles were not issued by Mexican authority until mid-summer 1824. Austin would be awarded two additional large empresario grants expanding his colony along the Brazos, Colorado, and Trinity Rivers.

In January 1825, confident that a grant would be awarded, Green C. DeWitt appointed James Kerr to survey his colony and its capitol. Kerr and his assistants built cabins near a creek that to this day is called Kerr's Creek. This group became the first Anglo community west of the Colorado River (Baumgartner and Vollentine 2014). In April 1825, empresario Green DeWitt was authorized by the Mexican government to settle 400 families between the Guadalupe and Lavaca Rivers. These pioneers began landing at the mouth of the Lavaca River which became the site of the Old Station settlement (Roell 2014a) about 6 miles (9.7 km) from the mouth of the Lavaca River. However, the Mexican government refused their request to remain at Old Station and in late 1827, some settlers returned to the original Gonzales townsite surveyed by Kerr (Baumgartner and Vollentine 2014). These settlers enjoyed relative peace and a treaty with the Karankawas was negotiated in 1827. Tonkawa raids were only occasional, and boundary disputes with De León's colony to the south were settled without bloodshed. The only towns in the area were Gonzales and Guadalupe Victoria to the south and Bexar (the seat of government) to the northwest (Roell 2014). Within three years more than 100 families, primarily from Tennessee, Kentucky, Missouri, and other southern states, had arrived to settle in DeWitt's colony (Baumgartner and Vollentine 2014).

Unfortunately, the Mexican government refused to recognize Kerr as the official surveyor, and Byrd Lockhart was appointed in 1831 to resurvey the Gonzales townsite. In 1831, Gonzales colonists (population of 532) convinced the Mexican government to send a canon for protection against Indian raids (Baumgartner and Vollentine 2014). The Mexican government complied by sending a small signal cannon to the settlers. This "fieldpiece" would later be at the center of the beginning of the war with Mexico for Texas.

3.2.4 Texas Revolution and the Runaway Scrape

Mexico continued in the tradition of Spain with regard to the settlement of Texas. Although few Mexican colonies were established by the government, Mexico was more willing to grant land to Anglo-Americans in their territory; increasing settlement throughout the territory, especially in the

coastal plain area where land was fertile and less likely to have Indian problems. Between 1832 and 1835, several problems began to arise between the Anglo-American settlers and the Mexican government (Barker and Pohl 2014). Adding to the growing tensions, Antonio López de Santa Anna was elected president in 1833 and declared a dictatorship in 1834 (Callcott 2014). His military force and personal policies seemed to encourage the displacement of the Anglo-American settlers through political action and veiled threats (Barker and Pohl 2014). Tension between Anglo settlers and the Mexican government remained high until 1835 when dissatisfaction with Mexican rule came to a head at Gonzales.

According to the historical monument on Highway 97 West, just south of Gonzales, the first shot of the Texas Revolution was fired 2 October 1835 from the small cannon which Mexican forces were trying to take back from the colonists. After a short skirmish and attempts between the Mexican leader Francisco de Castañeda and the head of Gonzales' forces, John Henry Moore, to settle the disagreement, Mexican troops withdrew in an attempt to prevent all-out war (Hardin 2014). However, distrust between the Mexican government and Anglo-American settlers in Texas by this time had become so great that instead of preventing war, the Texas Revolution began (Barker and Pohl 2014).

After the Battle of Gonzales, Stephen F. Austin, James Bowie, and James W. Fannin, Jr. led a troop of volunteers toward San Antonio and set up a defensive position along the San Antonio River (Barker and Pohl 2014). The Texan army was quite successful at fending off Mexican advances and even seized San Antonio; however, their lack of organization and discipline created major military problems. Several of the men decided to split off from the main group, essentially fracturing an already small army. It was not until 2 March 1836, at Washington-on-the-Brazos, that a convention voted for Texas independence and Sam Houston was appointed the major general of the Texas fighting force.

Between the Battle of Gonzales and the declaration of independence, Santa Anna decided to deal with the insurgents by treating them as pirates. By labeling the rebels as pirates, Santa Anna was allowed to handle them outside the rules of war and without mercy (Barker and Pohl 2014). Santa Anna began his march to San Antonio early in 1836, amassing an army of 8,000 men. Although Santa Anna met problems related to weather and food, he arrived in San Antonio on 23 February 1836. The Alamo fell after 13 days of siege. All of the defenders were killed; only 30 women, children, and blacks were left alive. Although the bloody way Santa Anna dealt with the defenders of the Alamo initially instilled fear in the Texans, the events in San Antonio would later become a rallying cry.

At the same time Santa Anna was busy with the Alamo, General José de Urrea was fighting his way toward where Fannin was stationed in Goliad (Barker and Pohl 2014). Although Fannin attempted to escape and move toward Sam Houston's location, his troops were overwhelmed by the Mexican army. After negotiating surrender terms, Fannin and his men were taken back to Goliad and imprisoned. Despite assurances by one of Santa Anna's officers that they would be treated as prisoners of war, Santa Anna felt they should be executed. The sentence was carried out on 27 March 1836, and 342 men, including Fannin, were killed (Davenport and Roell 2014). Because the Mexican army took the prisoners to a field near a tree line for execution, 28 men were able to escape.

In addition, another 20 were spared due to their skills as physicians, orderlies, interpreters, or mechanics.

Houston arrived in Gonzales around the time of the Goliad Massacre (Barker and Pohl 2014). There he learned from Susanna Dickinson, a wife of an Alamo defender, of the fall of the Alamo and the advancement of the Mexican army towards Gonzales. He decided to retreat, burning the town to the ground to prevent the Mexican army from being able to use anything. Houston also sank his cannons in the Guadalupe River since he lacked transport for them. In what was later known as the Runaway Scrape, he and numerous others began to make their escape toward the Colorado River with refugees from south-central Texas (Barker and Pohl 2014, Covington 2014). This flight took Houston and his army through Gonzales, Lavaca, Colorado, Austin, Waller, and Harris Counties (www.latinamericanstudies.org 2014).

Originally, Santa Anna believed that the Alamo and Goliad were proof that the war was over (Barker and Pohl 2014). It was only at the insistence of his officers that Santa Anna decided to pursue the Texan army. However, upon learning the President, David G. Burnet, and his cabinet had fled New Washington for Harrisburg, Santa Anna changed objectives and began pursuing the political party. By the time Santa Anna arrived in Harrisburg, Burnet and his group had fled. Unknown to Santa Anna, he and Houston were both heading toward Lynch's Ferry (near modern-day Lynchburg), where the two armies met in a brief clash on 20 April 1836. Santa Anna decided to pull back and wait for reinforcements despite the fact that his army number approximately 13,000 to Houston's 900. Houston launched a surprise attack on 21 April 1836. In a battle that lasted 18 minutes, Houston and his men managed to kill, scatter, and capture Santa Anna's entire army, while only losing nine men. The war was officially over with the two treaties of Velasco that were signed on 14 May 1836 (Barker and Pohl 2014, Barker 1901). Troops withdrew 26 May 1836.

3.2.5 Post Revolution

After the Texas Revolutionary War, Texas remained an independent nation until its annexation into the United States in 1845 (Bauer 2014). Texas's annexation, attempts at purchasing northern California, and continued disputes with Mexico over the border between Texas and Mexico ultimately led to the Mexican-American War in 1846. After several political and subtle military attempts to secure the Rio Grande as the border, President Polk finally ordered General Zachary Taylor and his men to the Rio Grande. Mexico interpreted this as a declaration of war and attacked Taylor's army on 25 April 1846. Polk used the incident to secure a declaration of war from congress, which was given on 13 May 1846.

On 9 March 1847, the United States launched its first large-scale amphibious assaults at Veracruz, Mexico, under Commodore David Conner and General Winfield Scott (Bauer 2014). Scott began the march to Mexico City. He received reinforcements from Colonel John Coffee Hays in Puebla, who led a contingency of Texas Rangers. Upon arriving in Mexico City, Scott began attacks on the city and outlying towns. The final assault began on 13 September and ended on 14 September 1847. Although Santa Anna escaped, the Mexican government essentially collapsed. Due to the lack of government, it was not until February 1848 that a functioning governing body could be formed in Mexico and the Treaty of Guadalupe Hidalgo could be signed. With the end of the Mexican-

American War, the United States gained California, Arizona, and New Mexico along with portions of Utah, Nevada, and Colorado. In addition, the Rio Grande was officially established as the Texas-Mexico boundary.

3.2.6 Karnes County

Karnes County was first settled by Europeans around April 1758 when the first land grant was given to Andrés Hernández and Luis Antonio Menchaca (Long 2014). Around 1770, Fuerte de Santa Cruz del Cibolo was established near the settlement to provide protection from attacks by native groups. However, by 1783, the fort had come under repeated Comanche attacks and much of the area was abandoned.

Throughout the early nineteenth-century, the area gradually grew in population (Long 2014). The first Anglo-American settlers began to arrive in the region at this time, and by 1852, they had established a settlement at Helena, Texas. The town of Helena, founded by Thomas Ruckman and Lewis S. Owings, was originally the site of a Mexican settlement known as Alamita, which had previously been abandoned. Helena's location was a great boon to the settlers in the area. The town was located on a bend of the San Antonio River, where the Chihuahua Trail and the wagon road from Gonzales to San Patricio met, which increased the opportunities for trade and growth. The growth of the town, and region in general, led to Ruckman and Owings petitioning for the creation of a new county. On 4 February 1854, the Texas legislature recognized Karnes County, which was created from portions of Bexar, Gonzales, DeWitt, Goliad, and San Patricio Counties.

The residents of Karnes County mainly focused on livestock ranching before the Civil War (Long 2014). By 1858, tax assessment rolls indicated some 50,000 head of cattle and 2,000 head of horses were present within the county. In addition to livestock ranching, Polish immigrants focused on growing a wide variety of crops, including corn, melons, potatoes, cucumbers, and pumpkins. Agricultural practices changed in the mid-1880s with the arrival of railroads. Farmers and ranchers of the area suddenly had improved access to markets and the farming economy became more diversified. By the turn of the century, the principle crops of the area included cotton, sorghum, and potatoes.

In 1894, the county seat was moved to where the new railroad town of Karnes City was located. Karnes City remains the county seat of Karnes County to this day. Agricultural crops continued to change and vary through time. In the 1930s, boll weevils began to appear in the south, causing cotton production to drop. By 1990, approximately 80 percent of the income from Karnes County was from ranching. Agricultural crops increased in variety and included peanuts, peas, broom corn, onions, small grains, guar, and winter legumes.

3.2.7.1 Panna Maria

As previously mentioned, a large Polish population began settling in Karnes County in the mid-nineteenth-century. The oldest permanent Polish colony in America is located in Karnes County, Texas (THC 2015a). Over 100 European families journeyed to Texas in 1854, landing in Galveston, Texas, after nine weeks at sea. The families, including 800 women, men, and children, walked over 200 miles to the present day location of Panna Maria.

Economic, ethnic, and national turmoil in Europe drove Polish immigrants to Texas, pursuing the promise of new beginnings in the United States. A Polish priest, named Father Leopold Moczygemba, ministered in the German community of New Braunfels and throughout central Texas (THC 2015a). There he saw the opportunities available to newly arrived German immigrants, giving him the idea to bring his fellow Polish countrymen to Texas to escape the chaos in Europe.

Today, Panna Maria is still a small community, but many of its residents are decedents of the original settlers. A pride in one's Polish heritage was first fostered among the original settlers and is still evident in the community today.

3.2.7.2 Gillett

The town of Gillett, Texas was first settled by Carl Edward Riedel who built a pioneer dam in 1869 to power his sawmill, gristmill, and ginning operation (THC 2015b). The following year a steam gin, the first in Karnes County, was installed, as well as a series of barracks to house United States soldiers (THC 2015b). By 1873 a town had emerged and was named Riddleville in honor of the founding pioneer, Carl Edward Riedel. The name was changed in 1905 to its current name, Gillett. Toward the end of the nineteenth-century, the town of Riddleville was one of the five principle population centers in Karnes County (THC 2015a).

3.3 Cultural Resources of the Central Eagle Ford Zone

Gonzales County currently lists more than 250 recorded archeological sites. According to the Atlas, five sites have been designated as State Antiquities Landmarks (SALs) including, the Leesville Schoolhouse, Fort Waul, Gonzales County Museum and Amphitheater, Gonzales County Jail, and Gonzales County Courthouse. All of the SAL-designated properties are also listed on the National Register of Historic Places (NRHP) with the exception of Fort Waul. There are a total of 9 listed NRHP sites in Gonzales County. Neighborhood surveys have resulted in the addition of over 1,200 historic structures to the database for Gonzales County, and at least 65 historic cemeteries and 128 historical markers have been recorded (THC 2015b).

De Witt County currently lists more than 316 recorded archeological sites, many listings are the direct result of surveys initiated by the recent expansion of oil and gas exploration. According to the Atlas, only one site has been designated as a SAL in De Witt County, the De Witt County Courthouse in Cuero, Texas. The county courthouse is one of 58 listed NRHP sites in De Witt County. Neighborhood surveys have resulted in listing over 1,700 historic structures to the database, withe 60 recorded historic cemeteries and 95 historical markers (THC 2015b).

Currently, there are more than 215 recorded archeological sites in Karnes County with only one of those sites listed as a SAL. The Karnes County Courthouse is listed both as a SAL and a NRHP property. There are two other NRHP listings in the county including the John Ruckman House and the Panna Maria National Register District (NRD). An additional 18 historic homes have been added to the THC database as a result of neighborhood surveys, and there are 24 recorded historic cemeteries and 30 historical markers (THC 2015a).

Wilson County lists more than 125 recorded archeological sites. According to the Atlas, there are two properties which have been designated as SALs in Wilson County; the Wilson County Courthouse and Jail in Floresville, Texas and the Rancho de las Cabras State Historical site. Both sites are also listed on the NRHP, along with the Polley Mansion and the Mueller Bridge. The Wilson County Courthouse, designed by architect Alfred Giles, was completed in 1884 and was a two story stucco brick structure with Italianate architectural elements. There are 137 recorded historic cemeteries and 57 historical markers in the county (THC 2015a).

4.0 METHODOLOGY

The cultural resources survey was performed in compliance with the National Historic Preservation Act of 1966 (NHPA), as amended (16 U.S.C. 470 et seq., P.L. 89-665, 80 Stat. 915), and the implementing regulations 36 CFR800. The surveys complied with the National Environmental Policy Act (NEPA) of 1969; the NEPA of 1974 (PL 81-190, 83 Stat. 915, 41 USC 4321, 1970); the Archeological and Historic Preservation Act of 1974 (PL 93-291); the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 Fed. Reg. 44716-42, Sept. 29, 1983); the National Register Bulletin Series of the National Park Service; and the Archaeological Resources Protection Act of 1979. The surveys conformed to standards of the United States Department of the Interior (1977) and the guidelines set forth by the Council of Texas Archeologists (1995) and the Register of Professional Archeologists (2015). Cultural resources investigations consisted of archival research, pedestrian survey, shovel testing, and preparation of a report suitable for review by the USACE, the regulatory agency responsible for oversight in most situations.

Streams potentially under USACE jurisdiction which cross a project alignment were assessed by an ecologist via desktop and field reviews prior to commencement of the cultural resources survey. As per the established procedure of due diligence, any segment of an alignment that falls within an area potentially under federal jurisdiction or any portion of a project alignment that falls within a 328-foot (100-m) radius of a known cultural site would be subjected to a cultural resources survey. Any segment of a project alignment to be surveyed under this protocol would be labeled as a "review area" and subjected to a cultural resources survey. The project alignment consisted of a 75-foot (23-m) wide ROW. The ROW consisted of a 50-foot (15-m) wide permanent easement and a 25-foot (7.6-m) temporary construction easement.

During the survey efforts, the ground surface of the proposed project alignments was visually inspected on foot within the established review areas. Shovel tests were administered in the portions of the review areas which harbored the greatest potential for temporally stratified soil deposits. Shovel tests, typically 12 inches (30 cm) in diameter, were excavated to sterile substratum. The shovel probe matrix was sifted through ¼-inch (0.6-cm) hardware cloth. If soils of high clay constituency were encountered, the matrix was hand sorted. Shovel test locations were recorded with hand-held Global Positioning System (GPS) units and transferred to topographic maps. If present, newly discovered or revisited sites were documented using standard State of Texas site recording forms and plotted by GPS coordinates for entry into the Atlas database. Shovel testing was conducted to ascertain the horizontal and vertical limits of any cultural manifestation discovered within the review areas. Hand-drawn sketch maps were produced for each cultural site recorded or

revisited. The field efforts reported herein were performed on private property and were funded by a private source. No artifacts were collected during the surveys. If present, artifact assemblages would be photographed in the field and left where found.

5.0 WINWOOD UNIT #1H AND #2H ACCESS ROAD

Goshawk conducted a cultural resources survey of the proposed ±558-foot (170-m) Winwood Unit #1H and #2H Access Road ROW in DeWitt County, Texas. One review area was identified within the proposed ROW in the vicinity of potentially regulated "Waters of the US." The cultural resources survey, including shovel testing and surface inspection, was conducted within the area of review totaling approximately 0.9 acres (0.4 ha). A field investigation was conducted by Goshawk archeologist Phil Schoch with Mitch Juenke on 4 August 2015.

The Winwood Unit #1H and #2H Access Road originates at County Road (CR) 144 and is located approximately 0.4 mile (0.6 km) due south of CR 329. The APE proceeded from CR 144, and crossed a third-order tributary of Shoats Creek (review area). The APE traversed gently undulating terrain, vegetated with various grasses, forbs, oak, mesquite, and prickly pear. The APE was located on the Sample, Texas, United States Geological Survey (USGS) topographic quadrangles (Figure 5-1). The dominant local land use was for rangeland, oil and gas development, and lease hunting.

5.1 ARCHIVAL RESEARCH

Archival research conducted using the THC's Atlas online database identified one site, 41GZ164, located within a 2.5-mile (4-km) radius from the APE. This site is discussed in detail below. The nearest NRD to the ROW is the Cuero 1 NRD located 9.8 miles (15.8 km) east-northeast of the proposed ROW. Designated in 1974, the Cuero I NRD encompasses 580,000 acres (235,000 hectares [ha]) along the Guadalupe River Basin. It was created to define and preserve cultural resources in a region threatened by a proposed reservoir. Work conducted in 1972 to 1973 resulted in the documentation of 352 significant prehistoric and historic sites spanning 9,000 years. The sites ranged in age from Late Paleoindian to early Anglo-American settlements that date to the 1820s and 1830s. According to the Atlas, the nearest NRHP-listed property is the Eckhardt Store, located in the town of Yorktown, Texas, approximately 12.8 miles (20.6 km) southeast of the proposed ROW (THC 2015b).

5.1.1 Site 41GZ164

Site 41GZ164 was recorded in 1980 as a light lithic scatter. This site is located 2.5 miles (4 km) northwest of the proposed ROW. The site measured 246 by 246 feet (75 by 75 m) in size. The recorder did not specify the nature of the artifacts observed and did not recommend the site for any further work. The site, at current, is not eligible for listing on the NRHP or designation as a SAL.

5.2 SURVEY RESULTS

A cultural resources survey was conducted on 4 August 2015. One review area was established within the proposed ROW in the vicinity of potentially regulated "Waters of the US."

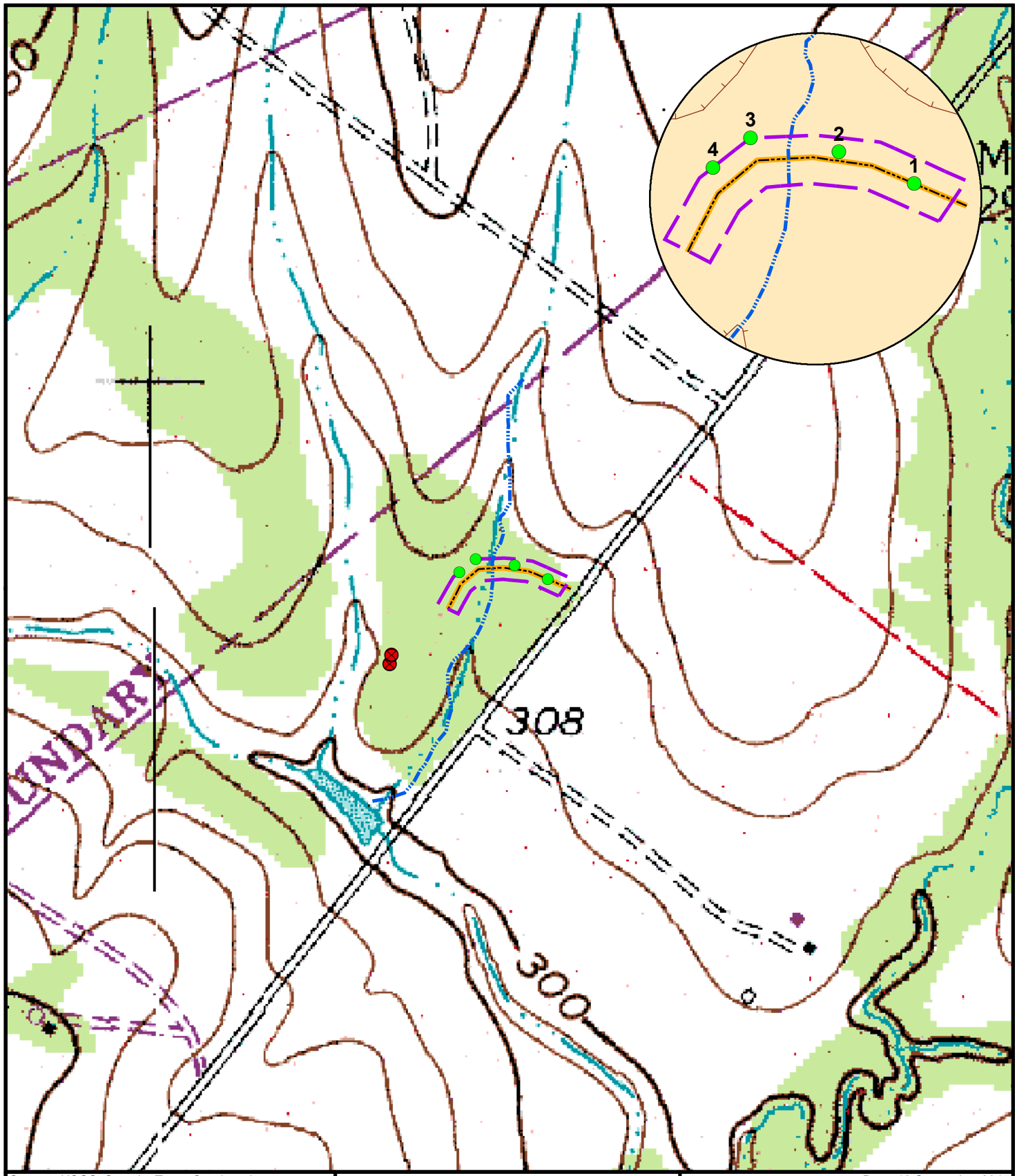
5.2.1 Review Area

The single review area encompassed a crossing of a third-order tributary of Shoats Creek (Photo 5-1). Four shovel tests were dug within the review area; two on the west side of the tributary and two on the east. Soils in the shovel tests consisted of very firm light grey sandy loams and sandy clays. Shovel tests were dug to depths of between 16 and 31 inches (40 and 80 cm), and yielded entirely negative results (Table 5-1). Vegetation within the review area consisted of very dense oak,

hackberry, mesquite, short grasses, prickly pear, green briar, and forbs along the stream bed (Photo 5-2). Surface visibility in the review area was very poor at less than 5 percent (Photo 5-3). No cultural materials were observed in either a surficial or subsurface context.

5.3 RECOMMENDATIONS

Goshawk conducted a cultural resources survey consisting of an intensive surface inspection and a total of four shovel tests within the proposed Winwood Unit #1H and #2H Access Road ROW. No cultural resources were observed during the survey. It is Goshawk's opinion that construction of the Winwood Unit #1H and #2H Access Road, as proposed, will cause no impacts to significant cultural resources within the surveyed portion of the APE. Therefore, Goshawk recommends that construction be allowed to proceed as planned. In the unlikely event that cultural resources (including human remains) are discovered, all construction or maintenance activities should be halted immediately and the USACE and a qualified archeologist should be notified.



Source: USGS, Sample, Texas Quadrangle.

Date: 18 September 2015

0 125 250 500 Feet

0 37.5 75 150 Meters

GOSHAWK ENVIRONMENTAL CONSULTING, INC.

Figure 5-1
Shovel Test Locations
DeWitt County, Texas

Winwood Unit #1H
Winwood Unit #2H

LEGEND

- Proposed Access Road
- Waters of the US
- Review Area
- SHL(s)
- Negative Shovel Test

N

Photo 5-1: Overview of Tributary in Review Area

Photo 5-2: Typical Vegetation in Review Area

Photo 5-3: Typical Ground Surface in Review Area

Winwood #1H #2H Access Road Table 5-1: (14 NAD 1983)										
Report ST#	ST#	WP#	Easting	Northing	Depth (cm)	Soil color	Soil composition	Artifacts	Review Area	Comments
1	MJ1	284	642252	3227128	0-30 cm	Light gray	Fine sandy clay loam	None	1	Indurated. Lots of gravel & cobbles throughout
					30-40 cm	Grayish brown	Sandy clay	None		Very firm
2	MJ2	285	642214	3227144	0-25 cm	Gray/dark grayish brown	Fine sandy clay loam w/ Sandy clay	None	1	Sandy clay mottling at 20 cm
					25-80+ cm	Light grayish brown	Fine sandy clay loam	None		Indurated after 75 cm w/ cobbles and roots. Some gravel
3	MJ3	286	642162	3227163	0-60 + cm	Light brown	Fine sandy clay loam	None	1	Indurated after 50 cm. Gravel throughout. Lots of cobbles <5 cm and roots
4	MJ4	287	642157	3227141	0-40 cm	Light brown w/ Dark grayish brown	Fine sandy clay loam w/ Sandy clay	None	1	Indurated after 50 cm. Lots of gravel, roots, and small cobbles.
					40-60 + cm	Light brown w/ Dark grayish brown	Fine sandy clay loam w/ Sandy clay	None		Some sandy clay mottling at 40 cm

6.0 MANCHACA #5H, #6H, #7H, #8H, #9H, AND #10H FLOWLINES

Goshawk conducted a cultural resources survey of the proposed ±5,990-foot (1,826-m) Manchaca Unit #5H, #6H, and #7H Flowlines; the ±6,694-foot (2,040-m) Manchaca Unit #8H and #9H Flowlines; and the ±6,985-foot (2,129-m) Manchaca Unit #10H Flowline ROWs in Karnes County, Texas. A single shared review area was identified within a proposed collocated 100-foot (33-m) APE, and was established at a crossing of potentially regulated "Waters of the US." The review area encompassed a segment of a tributary of the San Antonio River. The cultural resources survey, including shovel testing and surface inspection, was conducted within the area of review totaling approximately 2.3 acres (0.9 ha). The field investigation was conducted by Goshawk archeologists Reign Clark and Phil Schoch with Bear Aspra on 18 August 2015.

The Manchaca Unit #5H, #6H, #7H, #8H, #9H, and #10H Flowlines APE was located approximately 1.5 miles (2.4 km) due east of the intersection of Farm-to-Market (FM) 887 and CR 229 and 3.5 miles (5.6 km) due north of the town of Hobson. The APE originates at three separate well pad locations on both sides of CR 228. The proposed ROW traverses generally southward across undulating terrain that was vegetated with honey mesquite, huisache, prickly pear, coastal Bermudagrass, along with various other forbs and grasses. The proposed ROW crossed a tributary of the San Antonio River (review area) then terminated at a facility location. The APE was located on the Karnes City and Kosciusko, Texas, USGS topographic quadrangles (Figure 6-1). The dominant local land use was for rangeland and oil and gas development.

6.1 ARCHIVAL RESEARCH

According to the Atlas, no previously recorded archeological sites were found within the proposed ROW. The nearest recorded archeological site, 41KA36, was documented 0.6 mile (1 km) southwest of the proposed ROW. This site is discussed in detail below. The nearest NRD is the Panna Maria NRD, located 3.9 miles (6.3 km) southeast of the proposed ROW. Designated in 1976, the Panna Maria NRD encompasses 24,000 acres (9,712 ha) of the town of Panna Maria. The NRD represents a historic Polish community. According to the Atlas, the nearest NRHP-listed property is the John Ruckman House located 10.7 miles (17.2 km) east-southeast of the proposed ROW near the town of Helena, Texas. (THC 2015b).

6.1.1 Site 41KA36

Site 41KA36 was documented in 1976 by the University of Texas at San Antonio. The site was recorded as a diffuse Paleoindian lithic scatter or possible camp site. The artifact assemblage consisted of a Golondrina dart point, a Plainview dart point basal fragment, a small hammerstone, and a few deeply patinated chert flakes. No further work was recommended for the site past the initial recording. No mention of the site's eligibility for inclusion to the NRHP or designation as a SAL was made.

6.2 SURVEY RESULTS

One review area was identified within the proposed Manchaca Unit #5H, #6H, #7H, #8H, #9H, and #10H Flowlines ROWs, containing a segment of a tributary of the San Antonio River. The stream was identified as "Waters of the US" by desktop review, ecological desk top review, and field survey

conducted prior to the commencement of the cultural resources survey. No other potentially jurisdictional streams were identified during the field effort.

6.2.1 Review Area

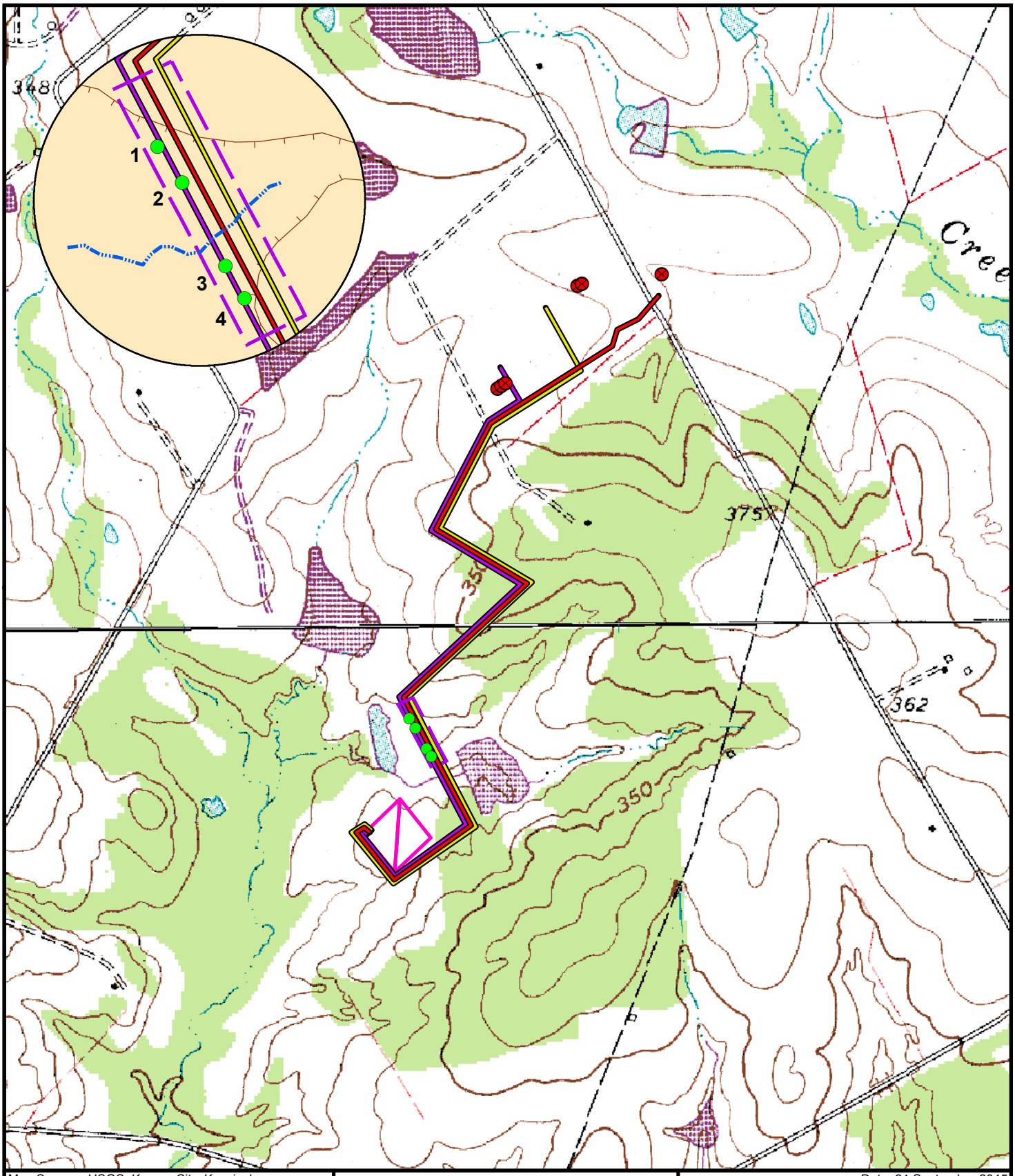
The review area traversed a segment of a single unnamed tributary of the San Antonio River (Photo 6-1). The tributary snaked around the north side of a small hill, located just east of the review area, where bedrock exposures were observed in profile (Photo 6-2). Surface visibility within the area of review was variable, ranging between 60 and 80 percent (Photo 6-3). Although surface visibility was excellent, an intensive surface inspection conducted within the review area yielded entirely negative results. Vegetation within the APE consisted of prickly pear, mesquite, persimmon, grasses, and forbs.

Soils within the review area were mapped as Gillett fine sandy loam, 1 to 4 percent slopes; and Gullied land series. Gillett soils are well-drained soils. A typical soil column consists of fine sandy loam at 0 to 7 inches (0 to 18 cm), overlying clay at 7 to 27 inches (18 to 69 cm), overlying gravelly sandy clay loam at 27 to 34 inches (69 to 86 cm), and overlying deep deposits of stratified bedrock to a depth of 80 inches (203 cm). These soils are derived from clayey alluvium and are typically located on ridges, foot slopes, and base slopes. The Gullied land series consist of a variety of highly erodible soils, all of which contain a high constituent of lime. Both of the soils present within the review area exhibit a low potential for containing stratified deposits.

Four shovel tests were conducted in the vicinity of the stream. Shovel tests conducted on the north side of the tributary yielded sandy or silty clay loam overlying calcareous clay, while those administered south of the tributary produced calcareous clay at the surface. Shovel tests were dug to depths ranging between 2 and 12 inches (5 and 31 cm) below surface, all of which yielded negative results (Table 6-1). No cultural materials were observed on the surface or recovered from any of the shovel tests conducted within the review area.

6.3 RECOMMENDATIONS

Goshawk conducted a cultural resources survey consisting of an intensive surface inspection and four shovel tests within the proposed Manchaca Unit #5H, #6H, #7H, #8H, #9H, and #10H Flowline ROWs. None of the shovel tests conducted within the APE yielded positive results and no cultural materials were observed upon the ground surface. It is Goshawk's opinion that construction of the Manchaca Unit #5H, #6H, #7H, #8H, #9H, and #10H Flowlines, as proposed, will cause no impacts to significant cultural resources within the surveyed portion of the APE. Therefore, Goshawk recommends that construction be allowed to proceed, as planned. In the unlikely event that cultural resources (including human remains) are discovered, all construction or maintenance activities should be halted immediately and the USACE and an archeologist should be notified.



Map Source: USGS, Karnes City, Kosciusko, Texas Quadrangles.

0 250 500 1,000 Feet

0 75 150 300 Meters

GOSHAWK ENVIRONMENTAL CONSULTING, INC.

Figure 6-1
Shovel Test Locations
Karnes County, Texas

Manchaca Unit #5H, #6H #7H, #8H, #9H & #10H

Date: 24 September 2015

LEGEND

- #5H, #6H, #7H Flowline
- #8H, #9H Flowline
- #10H Flowline
- Review Area
- Production Facility
- SHL(s)
- Negative Shovel Test

N

Photo 6-1: Stream within Review Area, Facing Southwest

Photo 6-2: Bedrock Exposures, Facing Southeast

Photo 6-3: Ground Surface Visibility

Table 6-1: Manchaca Unit #10H Flowline (Zone 14, NAD 1983)									
Map ST#	ST#	WP#	Easting	Northing	Depth (cm)	Soil color	Soil composition	Artifacts	Comments
1	RC1	878	598490	3208221	0-25	Pale brown	Sandy clay loam	None	Little gravel, calcium carbonate inclusions throughout
					25-30	Grayish brown	Clay with CaCo3	None	Clay with calcium carbonate inclusions
2	RC2	879	598504	3208200	0-25	Pale brown	Silty clay loam	None	Little gravel, calcium carbonate inclusions throughout
					25-30	Dark brown	Clay with CaCo3	None	Clay with calcium carbonate inclusions
3	RC3	880	598529	3208152	0-5	Dark gray	Clay	None	Clay at 5 cmbs, indurated
4	RC4	881	598536	3208141	0-5	Dark brown	Clay	None	Clay at 5 cmbs, 75% rock & gravel, calcareous

7.0 WINONA UNIT #14H GAS LIFT LINE

Goshawk conducted a cultural resources survey of the proposed ±2,981-foot (908-m) Winona Unit #14H Gas Lift Line ROW in Karnes County, Texas. One review area was identified within the proposed ROW. The review area contained a single stream potentially under federal-jurisdiction of the "Waters of the US." The cultural resources survey, including shovel testing and surface inspection, was conducted within the area of review totaling approximately 0.8 acres (0.3 ha). The review area encompassed a portion of a Rhymes Creek. The field investigation was conducted by Goshawk archeologists Reign Clark and Phil Schoch with Bear Aspra on 18 August 2015.

The Winona Unit #14H Gas Lift Line APE was located approximately 6.6 miles (10.6 km) southwest of the town of Gillett, Texas. The eastern terminus of the APE is located 0.1 mile from CR 261. The APE traverses west-southwest crossing a section of Rhymes Creek (Review Area). From Rhymes Creek, the APE continues west-southwest, ascending the toe slope of an upland landform, before terminating at a facility location, approximately 0.1 mile (0.2 km) north of FM 627. The APE was located on the Ecleto, Texas, USGS topographic quadrangle (Figure 7-1). The vegetation within the ROW consisted of oaks, dewberry, various trees, various grasses, and forbs. The dominant local land use was for rangeland and oil and gas development.

7.1 ARCHIVAL RESEARCH

According to the Atlas, no previously recorded archeological sites were found within the proposed Winona Unit #14H Gas Lift Line ROW. The nearest recorded archeological sites (41KA59 and 41KA60) were documented 620 feet (189 m) north-northwest and 770 feet (235 m) east of the proposed ROW, respectively. The sites were documented in 1980 during the Ecleto Creek Assessments conducted on behalf of the Soil Conservation Service (THC 2015b). These sites are discussed in detail below.

The nearest NRD is the Panna Maria NRD, located approximately 6.5 miles (10.5 km) southwest of the proposed ROW. Designated in 1976, the Panna Maria NRD encompasses 24,000 acres (9712.5 ha) of the town of Panna Maria and represents a historic Polish community (THC 2015b). No NRHP-listed properties or SALs have been recorded in the vicinity of the proposed ROW. According to the Atlas, the nearest NRHP-listed property is the John Ruckman House located 6.9 miles (11.1 km) south of the proposed ROW near the town of Helena, Texas. This structure is a detached two and a half story residence that exemplifies the provisional interpretation of the Greek revival style of architecture.

7.1.1 Site 41KA59

Site 41KA59 was documented as the historic Rhymes family cemetery dating between 1856 and 1876. The site is located on the south bank of Rhymes Creek, and is approximately 65 by 65 feet (20 by 20 m) in size. Materials observed in a surficial context include one gravestone, several pieces of shaped sandstone foot or head markers, and two areas of unshaped sandstone blocks. The original recorder did not comment on the site's eligibility for listing on the NRHP or designation as a SAL (THC 2015b).

7.1.1 Site 41KA60

Site 41KA60 was recorded as a diffuse, undifferentiated prehistoric lithic scatter. The site is located on the south bank of Rhymes Creek with a small unnamed tributary exposing a light lithic scatter. The site is approximately 328 by 164 feet (100 by 50 m) in size. The artifact assemblage was comprised of a few burned rock fragments, cores, and both primary and interior chert flakes. The original recorder did not mention whether the site was eligible for listing on the NRHP or designation as a SAL (THC 2015b).

7.2 SURVEY RESULTS

One review area was identified within the proposed Winona Unit #14H Gas Lift Line ROW. The review area encompassed a segment of the well-channelized Rhymes Creek. No other potentially jurisdictional streams were identified during the field effort.

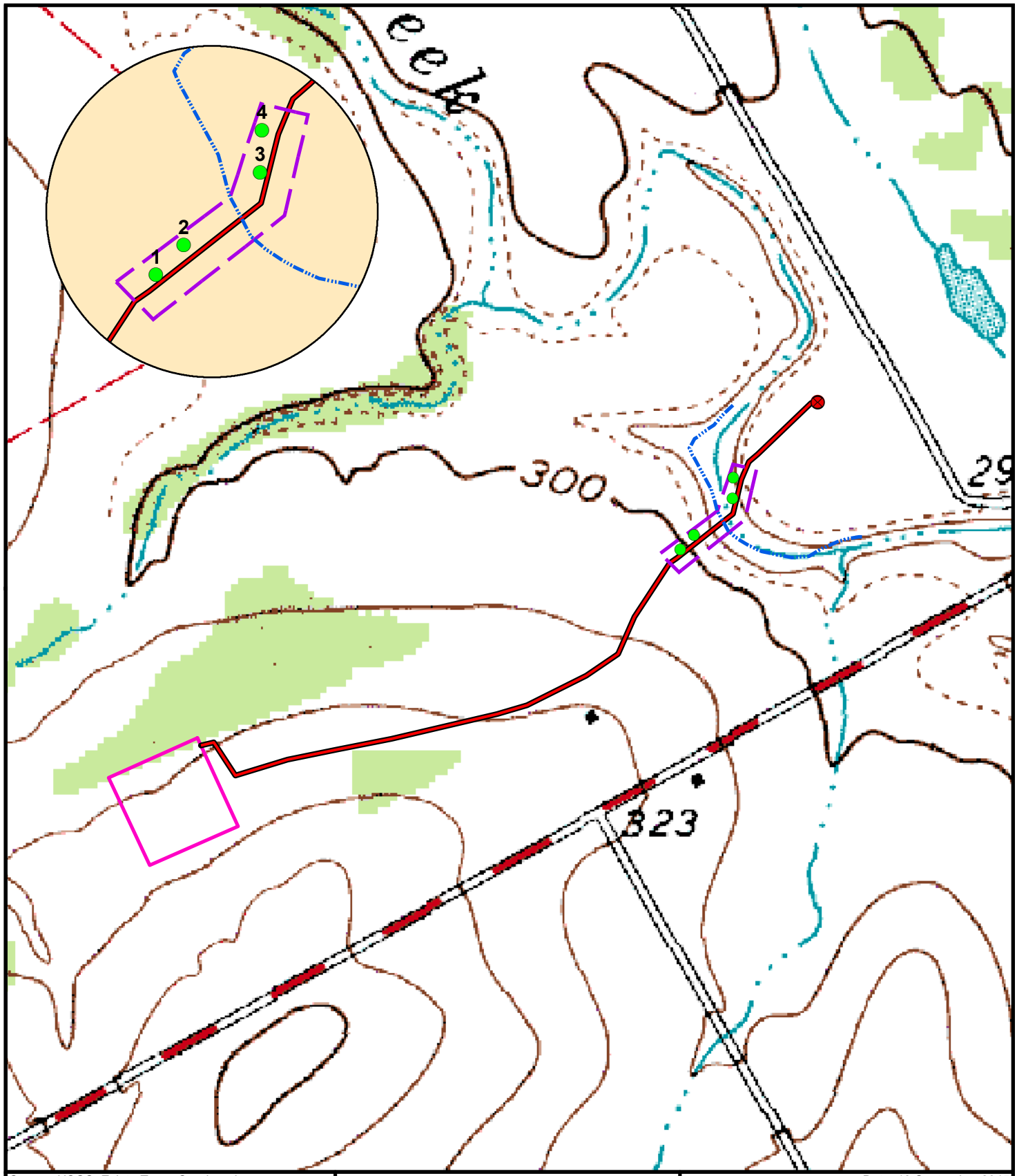
7.2.1 Review Area

The creek was well-channelized within the ROW and had incised into the landscape approximately 4.9 feet (1.2m) in depth and 23 feet (7m) in width and contained water at the time of survey (Photo 7-1). Northeastern and southwestern banks of the creek sloped down steeply from a flat terrace. Ground surface visibility within the APE was poor, ranging between zero and 10 percent (Photo 7-2). Vegetation within the APE consisted of oaks, dewberry, various trees, various grasses, and forbs.

Soils mapped within the review area consisted primarily of Ustarents soils, with minor constituents of Imogene fine sandy loam and Papalote fine sandy loam (NRCS 2015). Four shovel tests yielded clay underlying sandy clay or clay at the surface. Tests conducted on the southwest side of the creek produced either deep, indurated silty clay loam or gravel bed. Shovel tests were dug to depths ranging between 2 and 22 inches (5.1 and 55.9 cm) below surface (Table 7-1). All four shovel tests were negative for cultural materials and no cultural materials were recovered during surface inspection within the review area.

7.3 RECOMMENDATIONS

Goshawk conducted a cultural resources survey consisting of an intensive surface inspection and four shovel tests within the proposed Winona Unit #14H Gas Lift Line ROW. None of the shovel tests conducted within the APE yielded positive results and no cultural materials were observed upon the ground surface. It is Goshawk's opinion that construction of the Winona Unit #14H Gas Lift Line, as proposed, will cause no impacts to significant cultural resources within the surveyed portion of the APE. Therefore, Goshawk recommends that construction be allowed to proceed, as planned. In the unlikely event that cultural resources (including human remains) are discovered, all construction or maintenance activities should be halted immediately and the USACE and an archeologist should be notified.



Source: USGS, Ecleto,Texas Quadrangle.

Date: 18 September 2015

0 125 250 500 Feet

0 37.5 75 150 Meters

Figure 7-1
Shovel Test Locations
Karnes County,Texas

Winona Unit #14H Gas Lift Line

LEGEND

- Gas Lift Line
- Waters of the US
- Production Facility
- Review Area
- Negative Shovel Test
- SHL

N

Photo 7-1: Stream Overview in Review Area, Facing West

Photo 7-2: Typical Surface Visibility within Review Area

Table 7-1: Winona #14H Gas Lift Line (14 NAD 1983)									
Map ST#	ST#	WP#	Easting	Northing	Depth (cm)	Soil color	Soil composition	Artifacts	Comments
1	PS1	882	612810	3213756	0-20	Grayish brown	Sandy clay	None	
					20+	Dark brown	Clay	None	Indurated, rock & gravel
2	PS2	883	612826	3213773	0-5	Grayish brown	Clay	None	Clay at surface
3	PS3	884	612870	3213815	0-55	Light gray	Silty clay loam	None	Dense, dry silt. Modern charcoal
4	PS4	885	612871	3213839	0-30	Light grayish brown	Silty clay loam	None	Gravel bed with silty clay loam matrix

8.0 ALLMAN-FLEETWOOD UNIT GAS LIFT LINE

Goshawk conducted a cultural resources survey of the proposed ±10,001-foot (3,048-m) Allman-Fleetwood Unit Gas Lift Line ROW in Karnes County, Texas. One review area was identified within the proposed ROW at a crossing of potentially regulated "Waters of the US". The cultural resources survey, including shovel testing and surface inspection, was conducted within the area of review totaling approximately 0.7 acres (0.3 ha). A field investigation was conducted by Goshawk archeologist Phil Schoch with Bear Aspra on 25 August 2015.

The Allman-Fleetwood Unit Gas Lift Line is located approximately 0.9 mile (1.4 km) east of SH 199, and approximately 0.6 mile (2.3 km) west of CR 271. From its western terminus, the APE traversed eastward, paralleling. The ROW continues to the east again, crossing Brushy Creek (review area), then headed to the north before ending at the production facility. The ROW ends at the production facility located approximately 1 mile (1.6 km) due north of SH 199 and 0.3 mile (0.5 km) due north of CR 270. The APE was located on the Garfield, Texas, USGS topographic quadrangle (Figure 8-1). The dominant local land use was for rangeland and oil and gas development.

8.1 ARCHIVAL RESEARCH

Archival research conducted using the THC's Atlas online database identified no previously recorded archeological sites found within the proposed Allman/Fleetwood Unit Gas Lift Line ROW. The nearest recorded archeological sites (41KA50, 41KA51, 41KA58, and 41KA155) are located 0.8 mile (1.3 km) to 1.1 miles (1.8 km) north and northwest of the proposed ROW. The two closest sites, 41KA51 and 41KA155, are discussed in greater detail below. No NRHP-listed properties or SALs have been recorded in the vicinity of the proposed ROW. According to the Atlas, the nearest NRHP-listed property is the Eckhardt Store located 12.6 miles (20 km) southeast of the proposed ROW near the town of Helena, Texas. The nearest NRD is the Panna Maria Historic District located 16.3 miles (26.2 km) southwest of the proposed ROW.

8.1.1 Site 41KA51

Site 41KA51 was initially recorded as an undifferentiated prehistoric lithic scatter and open campsite. The site measured 492-feet (150-m) in diameter and was located along a flat upland terrace west of Brushy Creek. The prehistoric artifact assemblage included an unspecified amount of lithic debris and one unifacial gouge. The initial evaluation of the site concluded that the site was not eligible for designation as a SAL or for listing on the NRHP.

8.1.2 Site 41KA155

Site 41KA155 was documented by Goshawk archeologists in 2012. The site was recorded as an historic barn structure located in the uplands north of a Dry Ecleto Creek tributary. The observed historic artifacts included barn remains, glass shards, one dry-cell battery, historic ceramics, and one glass marble. The initial evaluation concluded that this site was neither eligible for designation as a SAL nor listing on the NRHP.

8.2 SURVEY RESULTS

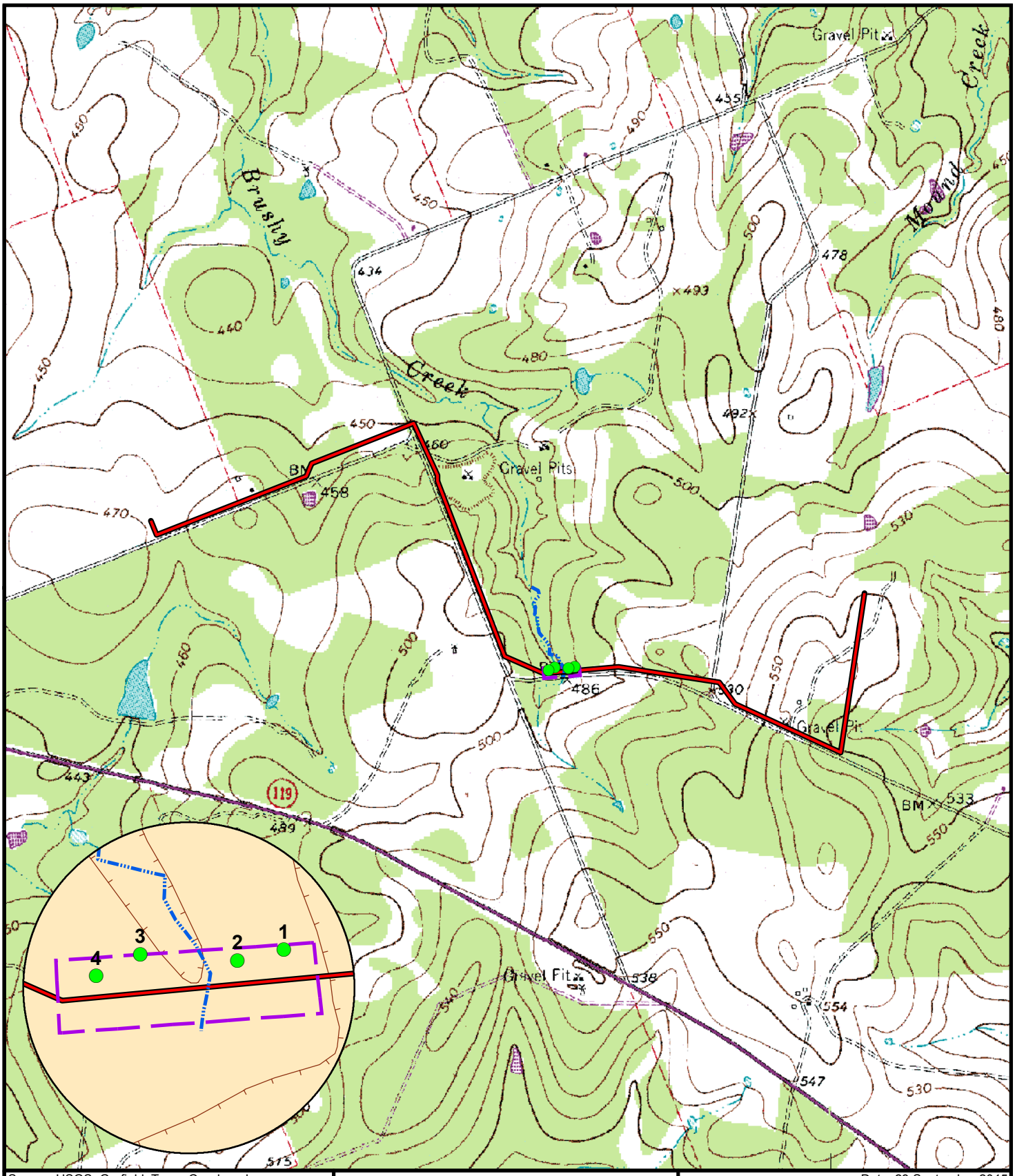
A cultural resources survey was conducted on 25 August 2015. One review area was established within the proposed ROW at the potentially regulated "Waters of the US."

8.2.1 Review Area

The ROW traversed gently undulating terrain at a crossing of one potentially regulated "Waters of the US" identified as Brushy Creek. Surface visibility within the review area was considered poor ranging between 10 and 20 percent (Photos 8-1). The stream was not well-defined within the ROW exhibiting a maximum width of 3 feet (1 m) and a depth of 1.5 feet (0.5 m) (Photo 8-2 and 8-3). Four shovel tests were conducted within the review area (Figure 8-1). The tests were placed in locations that exhibited the highest likelihood of containing intact, temporally stratified deposits. Vegetation within the review area consisted of mesquite, persimmon, oak, and various grasses and forbs (Photo 8-4). Shovel testing yielded soils consisting of compact, light gray sandy clay loam overlying dark brown and black clay. Shovel tests were dug to depths ranging between 6 and 16 inches (15 and 41 cm) below surface (Table 8-1). No cultural resources were found on the ground surface or during shovel testing.

8.3 RECOMMENDATIONS

Goshawk conducted a cultural resources survey consisting of an intensive surface inspection and a total of four shovel tests within the proposed Allman-Fleetwood Unit Gas Lift Line ROW. No cultural resources were observed during the survey. It is Goshawk's opinion that construction of the Allman-Fleetwood Unit Gas Lift Line, as proposed, will cause no impacts to significant cultural resources within the surveyed portion of the APE. Therefore, Goshawk recommends that construction be allowed to proceed as planned. In the unlikely event that cultural resources (including human remains) are discovered, all construction or maintenance activities should be halted immediately and the USACE and an archeologist should be notified.



Source: USGS, Garfield, Texas Quadrangle.

Date: 23 September 2015

0 375 750 1,500 Feet

0 115 230 460 Meters

GOSHAWK ENVIRONMENTAL CONSULTING, INC.

Figure 8-1
Shovel Test Locations
Karnes County, Texas

Allman - Fleetwood Gas Lift Line

LEGEND

- Gas Lift Line
- Waters of the US
- Review Area
- Negative Shovel Test

N

Photo 8-1: Typical Surface Visibility within Review Area

Photo 8-2: Brushy Creek within Review Area, Facing South

Photo 8-3: Brushy Creek, Facing North

Photo 8-4: Typical Vegetation within Review Area, Facing Southwest

Allman - Fleetwood Unit Gas Lift Line ROW Table 8-1: (14 NAD 1983)										
Report ST#	ST#	WP#	Easting	Northing	Depth (cm)	Soil color	Soil composition	Artifacts	Review Area	Comments
BA1	1	103	628859	3219861	0-5	Light gray	Sandy clay loam	None	1	Clay at 5cm. Indurated after clay.
					5-15	Dark grayish brown	Clay	None	1	Very compact. Some fine sand mottling in 1st strat.
BA2	2	104	628837	3219856	0-10	White/Light gray	Sandy clay loam	None	1	Dark clay at 10 cm.
					10-25	Dark gray	Clay	None	1	1st strat very chalky and sandy. Little gravel
BA3	3	105	628790	3219864	0-25	Dark gray	Sandy clay loam	None	1	Dark clay at 25 cm.
					25-40	Black	Clay	None	1	Firm and compact. Lots of organic material throughout
BA4	4	106	628769	3219849	0-5	Light gray w/ light yellow	Sandy clay loam w/ sandy loam	None	1	Indurated at 5 cm. Extremely firm and compact

9.0 DISCUSSION

The goal of the cultural resource surveys was not only to locate and record sites, but to provide conclusions and site recommendations based on NRHP criteria of significance (36 CFR 60.4), and the requirements of Section 106 and 36 CFR 800. According to the NRHP "The quality of significance in American history, architecture, archaeology, engineering, and culture is present in district, sites, materials, workmanship, feeling, and association that:

a. are associated with events that have made a significant contribution to the broad patterns of our history;
b. are associated with the lives of persons significant in our past;
c. embody distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or
d. have yielded, or may be likely to yield, information important in prehistory or history."

10.0 CONCLUSIONS AND RECOMMENDATIONS

During the month of August 2015, Goshawk conducted four cultural resources surveys within the Eagle Ford Play, Central Eagle Ford Zone. The projects subjected to cultural resources investigations were the Winwood Unit #1H and #2H Access Road, Manchaca Unit #5H, #6H, #7H, #8H, #9H, and #10H Flowlines, Winona Unit #14 Gas Lift Line, and Allman-Fleetwood Unit Gas Lift Line. During the survey of each project, shovel tests were placed within each review area near the streams and upon the adjacent slopes or within the review radius of previously recorded archeological sites according to due diligence protocol. Shovel testing and surface survey resulted in the documentation of no significant cultural deposits within the survey areas.

Based on the results of investigations, it is Goshawk's opinion that no significant cultural resources will be impacted by construction within the surveyed portions of the ROWs. Goshawk recommends that the projects be allowed to proceed as planned with the caveat that construction be limited to the established surveyed ROWs. In the unlikely event cultural resources (including human remains) are discovered, all construction or maintenance activities should be immediately halted and both the USACE and an archeologist should be notified.

11.0 REFERENCES CITED

Ambler, J.R.
1967 *Three Prehistoric Sites near Cedar Bayou, Galveston Bay Area*. Archeology Research Program 8. Texas State Building Commission, Austin.
1970 *Additional Archeological Survey of the Wallisville Reservoir Area, Southeast Texas*. Survey Report 6. Texas Archaeological Salvage Project, The University of Texas, Austin.
1973 *Excavation in the Trinity River Delta: The Lost River Phase*. Texas Archeological Survey, The University of Texas, Austin.

Arnn, John Wesley III
2012 *Land of the Tejas: Native American Identity and Interaction in Texas, A.D. 1300 to 1700*. The University of Texas Press, Austin.

Aten, L.E.
1979 *Indians of the Upper Texas Coast: Ethnohistoric and Archaeological Frameworks*. Ph.D. dissertation, Department of Anthropology, The University of Texas at Austin.
1983 *Indians of the Upper Texas Coast*. Academic Press, New York.

Barker, Eugene C. and James W. Pohl
2014 Texas Revolution, *Handbook of Texas Online*, http://tshaonline.org/handbook/online/articles/qdt01 (accessed February 2014).

Barnes, Virgil E.
1976 Geologic Atlas of Texas: Crystal City – Eagle Pass Sheet. Bureau of Economic Geology, Dolan Hoye Eargle Memorial Edition, The University of Texas at Austin.

Bauer, K. Jack
2014 Mexican War. *Handbook of Texas Online*, s.v. http://www.tshaonline.org/handbook/online/articles/qdm02.html (accessed May 2014).

Baumgartner, Dorcas Huff, and Genevieve B. Vollentine
2014 Gonzales County. *Handbook of Texas Online*, s.v. http://www.tshaonline.org/handbook/online/articles/GG/hcg7.html (accessed February 2014).

Black, S.L.
1989 South Texas Plains. In *From the Gulf to the Rio Grande: Human Adaptation in Central, South, and Lower Pecos Texas*, edited by T.R. Hester, S.L. Black, D.G. Steele, B.W. Olive, A.A. Fox, K.J. Reinhard, and L.C. Bement, pp. 39–62. Research Series No. 33. Arkansas Archeological Survey, Fayetteville.

Blair, Frank W
1950 The Biotic Provinces of Texas. *Texas Journal of Science*, 2(1).

Bruseth, J. E. and Toni S. Turner
2005 *From a Watery Grave: The Discovery and Excavation of La Salle's Shipwreck, La Belle.* The Texas Historical Commission, Austin.

Bryan, Kelly, T. Gallucci, G. Lasley, M. Lockwood and D. H. Riskind
2006 A Checklist of the Birds of Texas. 7th Edition, Technical Series No. 32, Texas Parks and Wildlife Department, Natural Resources Program, Austin., Texas.

Calcott, Wilfred H.
2014 Santa Anna, Antonio Lopez de. *Handbook of Texas Online*, s.v. http://www.tshaonline.org/ handbook/online/articles/fsa29.html (accessed June 2014).

Campbell, T.N.
1979 *Ethnohistoric notes on Indian Groups Associated with Three Spanish Missions at Guerrero, Coahuila.* Archaeology and History of the San Juan Bautista Mission Area, Coahuila and Texas, Report No. 3. Center for Archaeological Research, University of Texas at San Antonio.

1983 Espinosa, Olivares and Colorado River Indians, 1709. *La Tierra* 10(2):2–12.

Cooper, B
1974 A Fluted Point from McMullen County, Texas. *La Tierra* 1(3):18.

Council for Texas Archeologists (CTA)
1995 *Council of Texas Archeologist Guidelines: Guidelines for Cultural Resources Management Reports*. Distributed by the Council for Texas Archeologists, Austin.

Covington, Carolyn Callaway
2014 Runaway Scrape. *Handbook of Texas Online*, s.v. http://www.tshaonline.org/ handbook/online/articles/pfr01.html (accessed February 2014).

Davenport, Harbert and Craig H. Roell
2014 Goliad Massacre. *Handbook of Texas Online*, s.v. http://www.tshaonline.org/ handbook/online/articles/qug02.html (accessed February 2014).

Davis, W. B.
1978 *The Mammals of Texas.* Texas Parks and Wildlife Department, Bulletin 41:1-298.

Dittmar, Glenn W; Jack W Stevens
1980 Soil Survey of Atascosa County, Texas. United States Department of Agriculture, Soil Conservation Service in cooperation with the Texas Agricultural Experimentation Station.

Ensor, H.B.
1998 Summary and Conclusions. In *Eagle's Ridge: A Stratified Archaic and Clear Lake Period Shell Midden, Wallisville Lake Project, Chambers County, Texas*, edited by H.B. Ensor, pp. 453–469. Geo-Marine, Inc., Plano.

Ensor, H.B., and R.R. Ricklis

1998 Archaeological Background: Culture History, Previous Research, and Formulation of Research Design. In *Eagle's Ridge: A Stratified Archaic and Clear Lake Period Shell Midden, Wallisville Lake Project, Chambers County, Texas*, edited by H.B. Ensor, pp. 13–25. Geo-Marine, Inc., Plano.

Fisher, W. L.

1979 Geologic Atlas of Texas: Seguin Sheet. Bureau of Economic Geology, Donald Clinton Barton Memorial Edition, The University of Texas at Austin.

Foster, W.C.

1995 *Spanish Expeditions into Texas, 1689–1768*. University of Texas Press, Austin.

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

Fox, Daniel E., Robert J Mallouf, Nancy O'Malley, and William M Sorrow

1974 *Archaeological Resources of the Proposed Cuero I Reservoir, DeWitt and Gonzales Counties, Texas*. Texas Historical Commission and Texas Water Development Board Archaeological Survey Report 12. Austin.

Gilmore, Kathleen

1984 La Salle's Fort St. Louis in Texas. *Bulletin of the Texas Archeological Society* 55:61-72.

Gould, Frank W.

1978 *Common Texas Grasses: An Illustrated Guide*. Texas A & M University Press, College Station, Texas.

Griffin, Edward L.

2006 *Soil Survey of Gonzales County, Texas*. United States Department of Agriculture, Soil Conservation Service

Hall, Grant D., T. R. Hester and Stephen L. Black

1986 *The Prehistoric Sites at Choke Canyon Reservoir, Southern Texas: Results of Phase II Archaeological Investigations, Choke Canyon Series #10.* Center for Archaeological Research, University of Texas at San Antonio.

Hester, T.R.

1980 A Survey of Paleoindian Archeological Remains along the Texas Coast. In *Papers on the Archeology of the Texas Coast*, edited by L. Highley and T.R. Hester, pp. 1–12. Special Report No. 11. Center for Archaeological Research, The University of Texas at San Antonio.

Howard, M.A., G.L. Bailey, C.B. Bousman, K.M. Gardner, and R.C. Fields
1991 *National Register Testing at the Spanish Moss Site (41GV10) and 41GV53, Galveston County, Texas*. Reports of Investigations Number 77. Prewitt and Associates, Inc., Austin.

Leffler, John
2014 "LA SALLE COUNTY," *Handbook of Texas Online* (http://www.tshaonline.org/handbook/online/articles/hcl04), accessed May, 2014. Published by the Texas State Historical Association.

Long, Christopher
2014 *Handbook of Texas Online*, s.v. "Karnes County," http://www.tshaonline.org/handbook/online/articles/KK/hck1.html (accessed February 2014).

Mallouf, R. F., B. F. Baskin, and K. L. Killen
1977 *A Predictive Assessment of Cultural Resources in Hidalgo and Willacy Counties, Texas*. Archaeological Survey Report. No. 23. Office of the State Archaeologist, Texas Historic Commission, Austin.

Meltzer, D. J. and M. R. Bever
1995 Paleoindians of Texas: An Update on the Texas Clovis Fluted Point Survey. *Bulletin of the Texas Archeological Society* 66:47—82.

Mercado-Allinger, Patricia A.; Nancy A. Kenmotsu; and Timothy K. Perttula
1996 *Archeology in the Central and Southern Planning Region, Texas: A Planning Document*. Cultural Resources Management Report 7, Division of Antiquities Protection, Texas Historical Commission, Austin.

Miller, W.
1978 Soil Survey of DeWitt County, Texas. United States Department of Agriculture in Cooperation with the Texas Agriculture Experiment Station.

Molina Ramiro
1999 Soil Survey of Karnes County, Texas. United States Department of Agriculture, Soil Conservation Service in cooperation with the Texas Agricultural Experimentation Station.

Moore, Richard W.
2014 "BASTROP, BARON DE," *Handbook of Texas Online* (http://www.tshaonline.org/handbook/online/articles/fbaae), accessed May 13, 2014. Uploaded on June 12, 2010. Published by the Texas State Historical Association.

Natural Resources Conservation Service (NRCS)
2015 http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx, (accessed February and March 2015).

Patterson, L.W., J.D. Hudgins, S.M. Kindall, W.L. McClure, Maryann. Marek, T. Nuckols, and R.L. Gregg
1998 Additional Excavations at the Bowser Site, 41FB3, Fort Bend County, Texas. *Houston Archeological Society*, Report No. 18, Houston.

Perttula, Timothy K.
2004 *The Prehistory of Texas*. Texas A&M University Press, College Station.

Prewitt, E.R.
1995 Distribution of Typed Projectile Points in Texas. *Bulletin of the Texas Archeological Society* 66:83–174.

Prikryl, D.J.
1990 *Lower Elm Fork Prehistory: A Redefinition of Cultural Concepts and Chronologies along the Trinity River, North-Central Texas*. Office of the State Archeologist, Report 37. Texas Historical Commission, Austin.

Register of Professional Archaeologists (RPA)
2014 Code of Conduct and Standards of Research Performance. Register of Professional Archaeologists website. www.rpanet.org/displaycommon.cfm?an=2 accessed February 2014.

Roell, Craig H.
2014 DeWitt County. *Handbook of Texas Online*, http://www.tshaonline.org/handbook/online/articles/DD/hcd7.html (accessed February 2014).

Russell, Phillip
2010 *The History of Mexico: From Pre-Conquest to Present*. Routledge Taylor and Francis Group, New York and London.

Schmidly, David J.
2004 The Mammals of Texas. Revised edition, University of Texas Press, Austin.

Story, D.A.
1985 Adaptive Strategies of Archaic Cultures of the West Gulf Coastal Plain. in *Prehistoric Food Production in North America*, edited by R.I. Ford, pp. 19–56. Anthropological Papers No. 75. Museum of Anthropology, University of Michigan, Ann Arbor.

Story, Dee Ann, J. A. Guy, B. A. Burnett, M. D. Freeman, J. C. Rose, D. C. Steele, B. W. Olive and K. J. Reinhard
1990 *The Archeology and Bioarcheology of the Gulf Coastal Plain: Volume I*. Research Series No. 38. Arkansas Archeological Survey, University of Arkansas, Fayetteville, Arkansas.

Taylor, Frank B.

1977 *Soil Survey of Wilson County, Texas*. United States Department of Agriculture, Natural Resources Conservation Service in cooperation with the Texas Agricultural Experiment Station.

Taylor, Anna Jean and Cheryl Lynn Highley

1995 Archeological investigations at the Loma Sandia Site (41LK28): A Prehistoric cemetery and Campsite in Live Oak County, Texas. Two volumes, Studies in Archeology 20, Texas Antiquities Committee Permit No. 228, Texas Archeological Research Laboratory, The University of Texas at Austin.

Texas Historical Commission

2015a s.v. "Rules and Regulations" http://www.thc.state.tx.us/rulesregs/rrdefault.shtml (accessed February 2015).

2015b Archeological Site Atlas (accessed February and March 2015).

Texas Parks and Wildlife Department (TPWD)

2014a Ecoregion 6-South Texas Brush Country. *Plant Guidance by Ecoregions*. http://www.tpwd.state.tx.us/huntwild/wild/wildlife_diversity/wildscapes/ecoregions/ecoregion_6.phtml (accessed May 2014).

2014b *Nongame and Rare Species Program: Federal/State Threatened and Endangered Species*. https://www.tpwd.state.tx.us/huntwild/wild/wildlife_diversity/texas_rare_species /listed_species/ (accessed May 2014).

Texas Water Development Board (TWDB)

1979 *Geologic Atlas of Texas, Seguin Sheet* [map]. Donald Clinton Barton Memorial Edition. 1:25,000.

Troesser, John

2014 *History in a Pecan Shell*. Texas Escapes Online Magazine (Texas Escapes.com), http://www.texasescapes.com/SouthTexasTowns/Fowlerton-Texas.htm (accessed February 2014).

Tunnel, Curtis D., and J. Richard Ambler

1967 *Archeological Excavations at Presidio San Augustin de Ahumada*. Texas State Building Commission, Archeological Program Report No. 6. Austin.

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

1999 *A Field Guide to Stone Artifacts of Texas Indians*. Gulf Publishing, an Imprint of Rowman and Littlefield Publishers, Inc., Lanham, Maryland.

U.S. Department of the Interior

1977 Recovery of Scientific Prehistoric, Historic, and Archeological Data: Methods, Standards, and Reporting Requirements (36 CFR Part 66, Proposed). Federal Register (42 FR 81184), 19 January 1977.

Weddle, R.S.

1985 *Spanish Sea: The Gulf of Mexico in North American Discovery, 1500–1685.* Texas A&M University Press, College Station.

1991 *The French Thorn: Rival Explorers in the Spanish Sea, 1682–1762.* Texas A&M University Press, College Station.

Willey, G.R.

1966 *An Introduction to American Archaeology*. Prentice-Hill, Englewood, New York.

Willey, G.R., and Philip Phillips

1958 *Method and Theory in American Archaeology*. University of Chicago Press, Chicago, Illinois.