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Intensive Cultural Resources Survey for the Proposed Coon Marsh Gully Drainage Improvements Project, Hardin County, Texas

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Texas Antiquities Permit No. 7167
HJN 150023 AR

Prepared for:

Future Link Technologies

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Austin, Texas

Prepared by:

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March 2015

MANAGEMENT SUMMARY

Horizon Environmental Services, Inc. (Horizon) was selected by Future Link Technologies, Inc. (Future Link) on behalf of Hardin County to conduct a cultural resources inventory survey and assessment of the proposed Coon Marsh Gully Drainage Improvements Project in south-central Hardin County, Texas. The proposed undertaking would involve channel improvements along an approximately 2.6-kilometer- (1.6-mile-) long segment of Coon Marsh Gully and an approximately 1.4-kilometer- (0.9-mile-) long artificial diversion channel that wind through the Pinewood Estates residential subdivision between State Highway (SH) 105 on the south and Pine Island Bayou on the north. For purposes of the cultural resources survey, it is assumed that all channel improvements, temporary construction easements, and work areas would be constrained to a linear right-of-way (ROW) measuring no more than approximately 30.5 meters (100.0 feet) in width, or 15.2 meters (50.0 feet) on either side of the centerlines of the channels. Thus, the Area of Potential Effect (APE) is assumed to consist of a linear ROW measuring approximately 4.0 kilometers (2.5 miles) in length by 30.5 meters (100.0 feet) in width, covering an area of approximately 12.4 hectares (30.6 acres).

The proposed project is being sponsored by Hardin County, a political subdivision of the state of Texas, utilizing funding provided by the disaster-recovery program administered by the General Land Office (GLO) on behalf of the US Department of Housing and Urban Development (HUD). Consequently, the proposed project falls under the jurisdiction of both the Antiquities Code of Texas and Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. As the project represents a publicly sponsored undertaking with the potential to impact potentially significant cultural resources, the Texas Historical Commission (THC) requested that the project sponsor perform a cultural resources inventory and assessment of the APE.

On February 12, 2015, Horizon archeological technicians Briana Nicole Smith and Jared Wiersema, under the overall direction of Jeffrey D. Owens, Principal Investigator, performed an intensive cultural resources survey of the APE to locate any cultural properties that potentially would be impacted by the proposed undertaking. The survey was performed under Texas Antiquities Permit No. 7167. Horizon's archeologists traversed the APE and thoroughly inspected the modern ground surface for aboriginal and historic-age cultural resources. The APE consists of existing drainages that wind through the Pinewood Estates residential subdivision; as such, residential backyards front against both banks of the creeks. In some areas, vegetation along the creek banks was relatively open, though in most areas it consisted of exceedingly dense thickets

of oak, cedar, and hackberry trees with a dense groundcover of tall grasses, shrubs, and greenbrier. Both channels contained numerous “choke points” where accumulated vegetation formed natural dams, producing alternating wet and dry areas within the channels. Some modifications from residential landscaping were evident in some areas, though most of the Coon Marsh Gully channel was relatively intact aside from some evident stream bank erosion. The diversion channel between Coon Marsh Gully and Pine Island Bayou is an artificial drainage feature.

In addition to pedestrian walkover, the Texas State Minimum Archeological Survey Standards (TSMASS) require excavation of a minimum of 16 subsurface probes per mile per 30.5-meter (100.0-foot) width of linear ROW. Thus, the TSMASS would require a minimum of 40 shovel tests within the combined 4.0-kilometer- (2.5-mile-) long ROWs of Coon Marsh Gully and the artificial diversion canal. Horizon excavated a total of 39 shovel tests during the survey. While the TSMASS requirements were missed by 1 shovel test, shovel testing was able to fully penetrate Holocene-age sediments within the APE with the potential to contain subsurface archeological deposits; as such, it is Horizon’s opinion that the pedestrian walkover with surface inspection and shovel testing was adequate to evaluate the cultural resources potential of the APE.

No cultural resources, historic or prehistoric, were identified within the APE as a result of the survey. Based on the results of the survey-level investigations documented in this report, no potentially significant cultural resources would be affected by the proposed undertaking. In accordance with 36 CFR 800.4, Horizon has made a reasonable and good-faith effort to identify historic properties within the APE. No cultural resources were identified that meet the criteria for inclusion in the National Register of Historic Places (NRHP) according to 36 CFR 60.4 or for designation as State Antiquities Landmarks (SAL) according to 13 TAC 26, and no further archeological work is recommended in connection with the proposed undertaking. However, it should be noted that human burials, both prehistoric and historic-era, are protected under the Texas Health and Safety Code. In the event that any human remains or burial objects are inadvertently discovered at any point during construction, use, or ongoing maintenance in the APE, even in previously surveyed areas, all work should cease immediately at the location of the inadvertent discovery until a qualified archeologist can assess the find, and the THC should be notified immediately.

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1.0 INTRODUCTION

Horizon Environmental Services, Inc. (Horizon) was selected by Future Link Technologies, Inc. (Future Link) on behalf of Hardin County to conduct a cultural resources inventory survey and assessment of the proposed Coon Marsh Gully Drainage Improvements Project in south-central Hardin County, Texas. The proposed undertaking would involve channel improvements along an approximately 2.6-kilometer- (1.6-mile-) long segment of Coon Marsh Gully and an approximately 1.4-kilometer- (0.9-mile-) long artificial diversion channel that wind through the Pinewood Estates residential subdivision between State Highway (SH) 105 on the south and Pine Island Bayou on the north. For purposes of the cultural resources survey, it is assumed that all channel improvements, temporary construction easements, and work areas would be constrained to a linear right-of-way (ROW) measuring no more than approximately 30.5 meters (100.0 feet) in width, or 15.2 meters (50.0 feet) on either side of the centerlines of the channels. Thus, the Area of Potential Effect (APE) is assumed to consist of a linear ROW measuring approximately 4.0 kilometers (2.5 miles) in length by 30.5 meters (100.0 feet) in width, covering an area of approximately 12.4 hectares (30.6 acres) (Figures 1 and 2).

The proposed project is being sponsored by Hardin County, a political subdivision of the state of Texas, utilizing funding provided by the disaster-recovery program administered by the General Land Office (GLO) on behalf of the US Department of Housing and Urban Development (HUD). Consequently, the proposed project falls under the jurisdiction of both the Antiquities Code of Texas and Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. As the project represents a publicly sponsored undertaking with the potential to impact potentially significant cultural resources, the Texas Historical Commission (THC) requested that the project sponsor perform a cultural resources inventory and assessment of the APE.

On February 12, 2015, Horizon archeological technicians Briana Nicole Smith and Jared Wiersema, under the overall direction of Jeffrey D. Owens, Principal Investigator, performed an intensive cultural resources survey of the APE to locate any cultural properties that potentially would be impacted by the proposed undertaking. The survey was performed under Texas Antiquities Permit No. 7167. The investigation consisted of an archival review, an intensive pedestrian survey, and the production of a report suitable for review by the State Historic Preservation Office (SHPO) in accordance with the THC's Rules of Practice and Procedure, Chapter 26, Section 27, and the Council of Texas Archeologists' (CTA) Guidelines for Cultural Resources Management Reports.

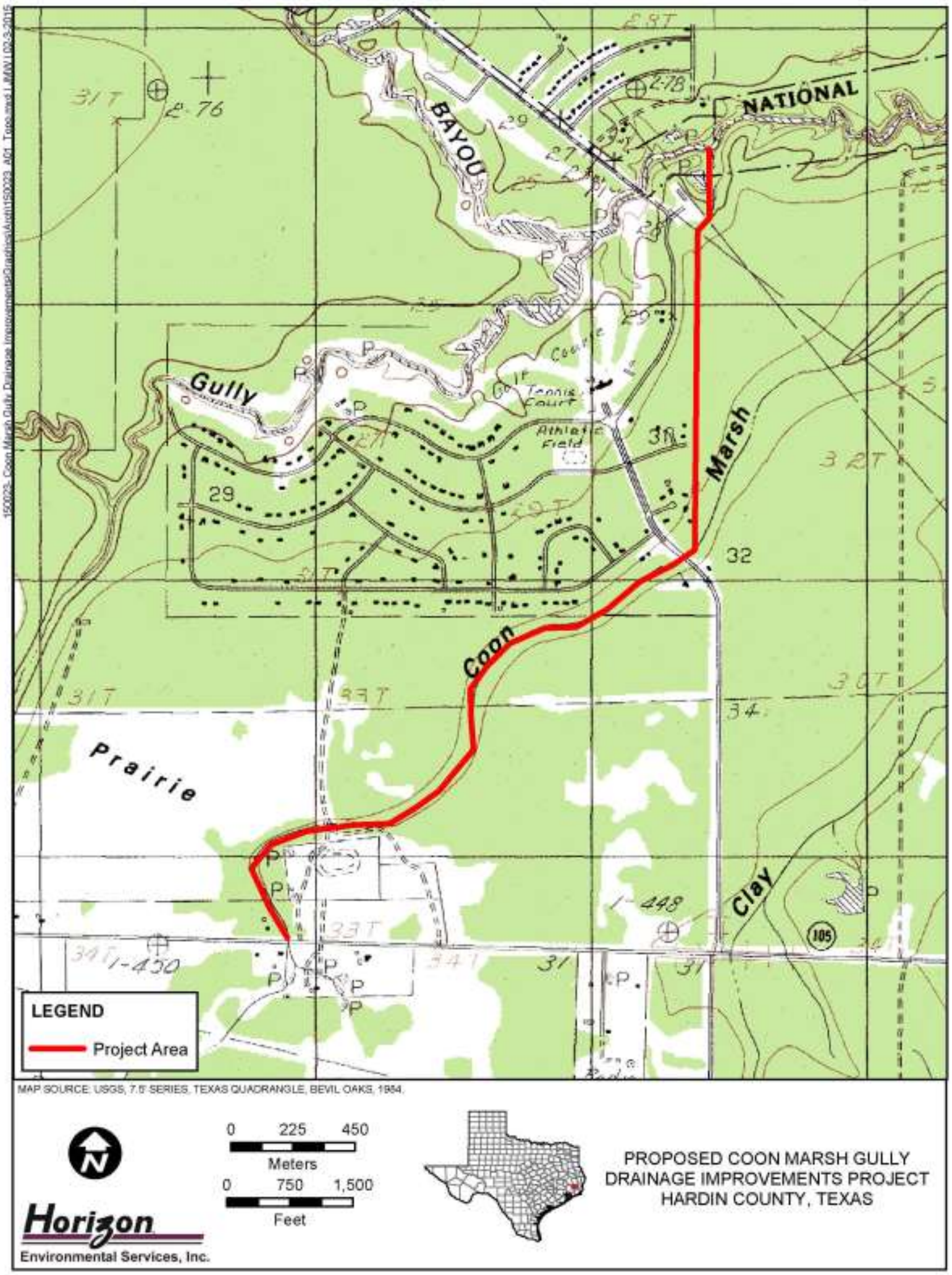

Figure 1. Location of APE on USGS Topographic Quadrangle

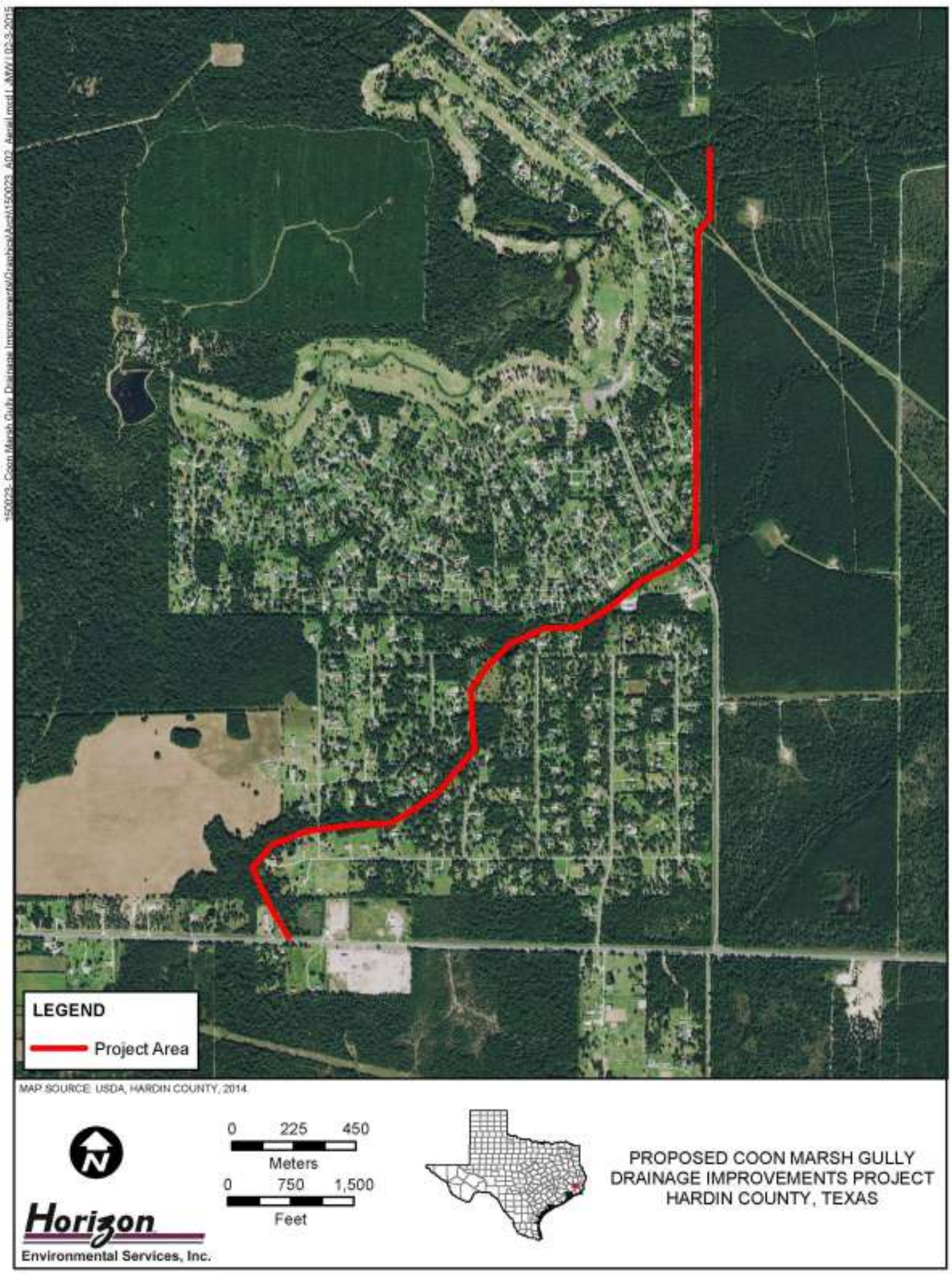

Figure 2. Location of APE on Aerial Photograph

Following this introductory chapter, Chapters 2.0 and 3.0 present the environmental and cultural backgrounds, respectively, of the APE. Chapter 4.0 describes the results of background archival research, and Chapter 5.0 discusses cultural resources survey methods. Chapter 6.0 presents the results of the cultural resources survey, and Chapter 7.0 presents cultural resources management recommendations for the project. Chapter 8.0 lists the references cited in the report, and Appendix A summarizes shovel test data.

2.0 ENVIRONMENTAL SETTING

2.1 PHYSIOGRAPHY AND HYDROLOGY

The APE is located in a rural residential subdivision in southeastern Hardin County, Texas. Hardin County is situated on the Gulf Coastal Plain in southeastern Texas, and the APE is located about 59.9 kilometers (37.2 miles) northwest of the Gulf of Mexico shoreline. The Gulf of Mexico represents a structural basin formed by lithosphere deformation. The Texas Coastal Plain, which extends as far north as the Ouachita uplift in southern Oklahoma and westward to the Balcones Escarpment, consists of seaward-dipping bodies of sedimentary rock, most of which are of terrigenous clastic origin, that reflect the gradual infilling of the basin from its margins (Abbott 2001). The region is underlain by rocks and unconsolidated sediments that are quite young in a geological sense, ranging from modern to Miocene in age. These consist predominantly of a series of fluviodeltaic bodies arranged in an offlapped sequence, with interdigitated and capping eolian, littoral, and estuarine facies making up a relatively minor component of the lithology. Major bounding disconformities between these formations are usually interpreted to represent depositional hiatuses that occurred during periods of sea level low stand. The oldest rocks in this fill are of Late Cretaceous age. As a result of the geometry of basin filling, successively younger rock units crop out in subparallel bands from the basin margin toward the modern coastline.

The APE is situated within the channel, on the adjacent banks of Coon Marsh Gully and an artificial diversion canal that connects Coon Marsh Gully on the south to Pine Island Bayou on the north. Coon Marsh Gully flows generally northwestward into Pine Island Bayou, which forms the southern boundary of the Big Thicket National Preserve, and flows generally eastward into the Neches River, north of Beaumont. The Neches River, in turn, flows generally southeastward into Sabine Lake, an estuary of the Gulf of Mexico, near Port Arthur. Local topography within the APE ranges from approximately 6.1 to 9.1 meters (20.0 to 30.0 feet) above mean sea level (amsl), with a gradual slope down to the northeast toward Pine Island Bayou.

2.2 GEOLOGY AND GEOMORPHOLOGY

The APE is underlain by the Beaumont Formation (Shelby et al. 1968). The Beaumont, or Prairie, terrace is the youngest continuous coastwise terrace fronting the modern Gulf (Abbott 2001). The Beaumont Formation consists of clay, silt, and fine sand arranged in spatial patterns that reflect the distribution of fluvial (e.g., channel, point bar, levee, and backswamp) and mudflat/coastal marsh facies (Van Siclen 1985). Sandy deposits associated with littoral facies are also frequently considered part of the Beaumont. Many investigators (cf. DuBar et al. 1991; Fisk 1938, 1940) have correlated the Beaumont Terrace with the Sangamon Interglacial (ca. 130 to 75 thousand years ago [kya]), although age estimates range from Middle Wisconsinan (Alford and Holmes 1985) to 100 to 600 kya (Blum and Price 1994). While debate about the temporal affiliations of and correlations among the deposits that underlie the major coastline terraces remains active, they are of little direct geoarcheological relevance because virtually all investigators agree that these deposits considerably predate the earliest demonstrated dates of human occupation in North America.

The APE is underlain by 6 specific soil units (Table 1; Figure 3) (NRCS 2015). The vast majority of the APE (95%) is situated on a mosaic of loamy fluviomarine sediments of Pleistocene age. A small portion of the APE (5%), located within the channel and on the adjacent terraces of Pine Island Bayou at the northernmost end of the APE, is situated on loamy alluvium of Holocene age.

While aboriginal cultural resources are commonly encountered in deep alluvial sediments adjacent to major streams in Texas, the relative antiquity of the fluviodeltaic sediments that constitute the "upland" soils on the coastal plain, such as those that comprise the majority of the APE, suggests that any aboriginal cultural resources would be constrained to the modern ground surface, rather than in buried contexts, in erosional settings lacking integrity. Intact, buried archeological deposits may occur within alluvial sediments near major streams, such as the sediments mapped along Pine Island Bayou at the northernmost end of the APE. Historic-age cultural resources may occur in any physiographic setting; however, the Pinewood Estates residential subdivision, through which the APE passes, was constructed relatively recently in the 1980s, suggesting that the APE contains minimal potential for historic-era architectural and archeological resources.

2.3 CLIMATE

Evidence for climatic change from the Pleistocene to the present is most often obtained through studies of pollen and faunal sequences (Bryant and Holloway 1985; Collins 1995). While the paleoclimatic history of the coastal region remains unclear, Bryant and Holloway (1985) present a sequence of climatic change for nearby east-central Texas that includes 3 separate climatic periods—the Wisconsin Full Glacial Period (22,500 to 14,000 B.P.), the Late Glacial Period (14,000 to 10,000 B.P.), and the Post-Glacial Period (10,000 B.P. to present). Evidence from the Wisconsin Full Glacial Period suggests that the climate in east-central Texas was considerably cooler and more humid than at present. Pollen data indicate that the region was more heavily forested in deciduous woodlands than during later periods (Bryant and Holloway 1985). The Late Glacial Period was characterized by slow climatic deterioration and a slow warming and/or drying trend (Collins 1995). In east-central Texas, the deciduous woodlands were gradually replaced by grasslands and post oak savannas (Bryant and Holloway 1985). During the Post-Glacial Period, the east-central Texas environment appears to have been more stable. The deciduous forests had long since been replaced by prairies and post oak savannas. The drying and/or warming trend that began in the Late Glacial Period continued into the mid-

Table 1. Mapped Soils Located within APE

Soil Name	Soil Description	Typical Profile/Horizon (inches)
Camptown silt loam, 0 to 1% slopes (CamA)	Loamy fluviomarine deposits derived from igneous, metamorphic, and sedimentary rock on meanders	0-4: Silt loam (A) 4-24: Silt loam (Bg) 24-46: Silt loam (Btg/E) 46-80: Clay loam (Btg)
Evadale silt loam, 0 to 1% slopes (EvaA)	Loamy fluviomarine deposits derived from igneous, metamorphic, and sedimentary rock on flats	0-3: Silt loam (A) 3-7: Silt loam (Eg) 7-33: Silt loam (Btg/E) 33-80: Silty clay (Btg)
Evadale-Aldine complex, 0 to 1% slopes (EvdA)	Loamy fluviomarine deposits derived from igneous, metamorphic, and sedimentary rock on flats	<u>Evadale</u> 0-5: Silt loam (A) 5-16: Silt loam (Eg) 16-41: Silt loam (Btg/E) 41-80: Silty clay (Btg) <u>Aldine</u> 0-6: Silt loam (A1) 6-22: Silt loam (A2) 22-56: Silt loam (Bt/E) 56-80: Silty clay loam (Btg)
Evadale-Gist complex, 0 to 1% slopes (EvgA)	Loamy fluviomarine deposits derived from igneous, metamorphic, and sedimentary rock on flats	<u>Evadale</u> 0-3: Silt loam (A) 3-10: Silt loam (Eg) 10-42: Silt loam (Btg/E) 42-80: Silty clay (Btg) <u>Gist</u> 0-5: Very fine sandy loam (A1) 5-32: Very fine sandy loam (E) 32-45: Loam (Bt/E) 45-59: Loam (Bt) 59-80: Clay (Btg)
Spurger very fine sandy loam, 0 to 3% slopes (SpuB)	Loamy alluvium derived from igneous, metamorphic, and sedimentary rock on terraces	0-5: Very fine sandy loam (A) 5-11: Very fine sandy loam (E) 11-58: Clay (Bt) 58-80: Sandy clay loam (2BCt)
Vamont clay, 0 to 1% slopes (VamA)	Clayey fluviomarine deposits derived from igneous, metamorphic, and sedimentary rock on flats	0-4: Silty clay (A) 4-20: Clay (Bss) 20-60: Clay (Bssg1) 60-80: Clay (Bssg2)

Source: NRCS 2015

Holocene, at which point there appears to have been a brief amelioration to more mesic conditions lasting from roughly 6000 to 5000 B.P. Recent studies by Bryant and Holloway (1985) indicate that modern environmental conditions in east-central Texas were probably achieved by 1,500 years ago.

The modern climate of the upper Texas coast is classified as subtropical humid (Abbott 2001; Larkin and Bomar 1983), forming a transitional zone between the humid southeastern US and the semiarid to arid west. The climate reflects the influences of latitude, low elevation, and

Figure 3. Distribution of Soils Mapped within APE

proximity to the Gulf of Mexico, which combine with the urban heat islands formed by the tremendous concentrations of asphalt and concrete in the larger cities, such as Houston and Beaumont, to create a notorious modern climate that is oppressively warm and moist throughout much of the year. As a result of proximity to the Gulf and the abundance of surface water, humidity in the early morning can approach 100% even on cloudless summer days, and it often exceeds 50% even on the warmest afternoons. Largely as a consequence of the relatively high humidity characteristic of the region, temperature patterns exhibit a moderate annual range and a modest diurnal range that increases slightly with distance from the coast. Average monthly high temperature ranges from a low of 17 to 19°Celcius (°C) (59 to 63°Fahrenheit [°F]) in January to a high of 38 to 40°C (89 to 96°F) in August. Average monthly lows range from 4 to 9°C (38 to 47°F) in January to 25 to 29°C (72 to 79°F) in July and August. Annually, average low temperatures range from 15 to 21°C (56 to 65°F), and average high temperatures range from 27 to 29°C (75 to 79°F) (Abbott 2001; Larkin and Bomar 1983).

The region experiences 2 precipitation peaks throughout the year (Abbott 2001). The first occurs in the late spring (i.e., May to June) due to the passage of infrequent cold fronts that spawn chains of powerful frontal thunderstorms. The second occurs in the late summer to early autumn (i.e., August to September) due to the incidence of tropical storms and hurricanes from the Atlantic and, occasionally, Pacific oceans. In contrast, winter and early spring are relatively dry, and high summer rainfall is dominated by convectional thunderstorms that are relatively brief and localized, albeit frequently intense. Average annual precipitation varies from a low of approximately 100 centimeters (40 inches) to a high of more than 132 centimeters (52 inches). Average monthly precipitation varies from less than 5 to 8 centimeters (2 to 3 inches) in March to more than 19 centimeters (7.5 inches) occurring locally on the coast during September. Almost all of the measurable precipitation falls as rain—snowfall is extremely rare, occurring in measurable amounts in only 1 in 10 years.

2.4 FLORA AND FAUNA

Hardin County is situated near the southeastern edge of the Texan biotic province (Blair 1950), an intermediate zone between the forests of the Austroriparian and Carolinian provinces and the grasslands of the Kansan, Balconian, and Tamaulipan provinces. Some species reach the limits of their ecological range within the Texas province. McMahan et al. (1984) further define 4 broad communities that characterize that portion of the Texas biotic province that lies on the Gulf Coastal Plain: (1) coastal marsh/barrier island, (2) coastal prairie, (3) coastal gallery forest, and (4) pine-hardwood forest (cf. Abbott 2001:24-26).

The coastal marsh/barrier island category includes well-drained, sandy, coastal environments and saline and freshwater wetlands in the coastal zone (Abbott 2001:24). Marsh vegetation is typical of areas that are seasonally wet and have substrates composed primarily of sands and silts, clays, or organic decomposition products. Vegetation assemblages are strongly controlled by texture, salinity, frequency and duration of inundation, and depth of the seasonal water table. Sandy, relatively well-drained, freshwater environments are typically dominated by little bluestem, switchgrass, Florida paspalum, and brownseed paspalum. Wetter environments are often dominated by marshhay cordgrass, seashore saltgrass, saggitaria, bulrushes, smooth cordgrass, seashore paspalum, seashore dropseed, olney bulrush, saltmarsh bulrush, saltmarsh aster, longtom, sprangletop, burhead, arrowhead, coastal waterhyssop, needlegrass rush, and other sedges and rushes. Slightly higher, better-drained environments are characterized by such taxa as seashore saltgrass, seashore paspalum, gulfdune paspalum, shoregrass, gulf cordgrass, red lovegrass, bushy sea-oxey, and glasswort. A variety of fauna are characteristic of the shore zone. Important larger taxa include raccoon, nutria, alligators, turtles, swamp rabbit, and many birds, including ducks, geese, herons, and many smaller species. Aquatic taxa, including a wealth of fish and shellfish adapted to brackish to hypersaline conditions, are also important in the coastal zone.

The coastal prairie category consists primarily of grasses with minor amounts of forbs and woody plants in areas that are not saturated on a seasonal basis (Abbott 2001:24-26). This community is characteristic of upland areas and grades into the pine-hardwood forest to the north and east and into the coastal marsh/barrier island to the south. A wide variety of grasses are found in the prairie environments, but the principal taxa include big bluestem, little bluestem, indiangrass, eastern grama, switchgrass, brownseed paspalum, sideoats grama, silver bluestem, buffalograss, threeawn, and Texas wintergrass. Common forbs include Maximilian sunflower, Engelmann's daisy, blacksalmon, penstemon, dotted gayfeather, bundleflower, yellow neptunia, snoutbean, prairie clover, tickclover, wildbean, western indigo, paintbrush, bluebonnet, ragweed, croton, milkweed, vetch, verbena, and winecup. Woody plants occurring in the coastal prairie include mesquite, honey locust, huisache, eastern baccharis, sesbania, live oak, elm, hackberry, bumelia, and coralberry. The frequency of trees increases dramatically as the coastal prairie grades into the pine-hardwood forest, forming an open woodland environment with common stands of hardwood trees and occasional pines. The coastal prairie is home to a diverse fauna, including coyote, white-tailed deer, skunks, cottontail rabbit, many small rodents, amphibians, reptiles, and a variety of permanent and migratory birds. Bison and pronghorn were also present at various times in the past.

The coastal gallery forest consists of diverse, principally deciduous trees and associated understory in floodplains and streams that traverse the outer coastal plain (Abbott 2001:26). Important taxa include water oak, pecan, poplar, American elm, cedar elm, sugarberry, ash, loblolly pine, post oak, cherrybark oak, mulberry, swamp chestnut oak, willow oak, sweetgum, hawthorn, dogwood, hickory, bois d'arc, sassafras cypress, willow, cottonwood, and sumac. Shrubs and vines such as mustang grape, greenbrier, yaupon, coralberry, possumhaw, elderberry, honeysuckle, dewberry, and blackberry are common in the understory, as are grasses such as little bluestem, big bluestem, and indiangrass. The fauna of the gallery forest include white-tailed deer, opossum, raccoon, squirrel, turkey, a variety of small mammals and rodents, turtles, snakes, and many birds. Black bears were also present at various times in the past, and a number of fish and a few varieties of shellfish are present in the streams.

The pine-hardwood forest is characterized by a mix of coniferous and deciduous trees, including longleaf pine, shortleaf pine, loblolly pine, post oak, red oak, white oak, blackjack oak, willow oak, and live oak (Abbott 2001:26). Riparian environments often support larger deciduous trees like pecan, cottonwood, hickory, beech, and American elm. Understory vegetation varies from relatively open to quite dense, and consists of shrubs, vines, forbs, and young trees.

Common shrubs include acacia, yaupon, mayhaw, wild persimmon, myrtle, greenbrier, Virginia creeper, blackberry, dewberry, trumpet vine, gourd, and poison ivy. A variety of fauna is also present, including white-tailed deer, opossum, raccoon, squirrel, rabbit, mink, skunk, various small rodents, turtles, reptiles, and many different birds. Black bears were also present at times in the past, and bison and pronghorn were occasionally present in the transition zone to the coastal prairie environment.

3.0 CULTURAL BACKGROUND

The APE is located within the Southeast Texas Archeological Region, a 21-county area extending from the Colorado River on the west to the Sabine River on the east and measuring about 199.5 kilometers (124.0 miles) inland from the Gulf of Mexico coastline. Much of the archeological record in Southeast Texas represents an interface between the Southern Great Plains and the Southeastern Woodlands (Aten 1983, 1984; Patterson 1995; Story 1990). Further distinctions are often made between the inland and coastal margin subregions of Southeast Texas. These 2 subregions are somewhat culturally distinct, and the inland subregion has a much longer chronological record. The coastal margin of Southeast Texas comprises a zone about 25.7 kilometers (16.0 miles) inland from the coast that covers the area influenced by Gulf tidal flows on the salinity of streams, lakes, and bays. Considerable ecological variability characterizes this subregion, including woodlands, coastal prairie, lakes, wetlands, marine coastline, and barrier islands. The inland subregion also encompasses considerable ecological diversity, including mixed woodlands, coastal prairies, and dense piney woods.

The human inhabitants of Southeast Texas practiced a generally nomadic hunting and gathering lifestyle throughout all of prehistory. While many of the same labels are used to denote Southeast Texas cultural/chronological periods, the timeframe and cultural characteristics of Southeast Texas culture periods are often different than in neighboring regions. For instance, the Archaic and Late Prehistoric time periods are different in Central and Southeast Texas, and Central Texas lacks the Early Ceramic period that has been defined for Southeast Texas.

Mobility and settlement patterns do not appear to have changed markedly through time in Southeast Texas. Inland sites are usually found near a water source, usually exhibit evidence of reoccupation through time, have well-defined intrasite activity areas, tend not to be associated with satellite activity sites or separate base camps, and exhibit a range of subsistence-related activities. Inland sites also tend to contain modest pottery assemblages, fired clay balls (at some sites), abundant lithic material, and an absence of shell tools. Coastal sites tend to consist of multicomponent *Rangia* shell middens that contain oyster shell tools, large quantities of pottery (in later cultural components), numerous bone tools, and only a few lithic artifacts.

3.1 PALEOINDIAN PERIOD (10,000 TO 5000 B.C.)

The initial human occupations in the New World can now be confidently extended back before 10,000 B.C. (Dincauze 1984; Haynes et al. 1984; Kelly and Todd 1988; Lynch 1990;

Meltzer 1989). Evidence from Meadowcroft Rockshelter in Pennsylvania suggests that humans were present in Eastern North America as early as 14,000 to 16,000 years ago (Adovasio et al. 1990), while more recent discoveries at Monte Verde in Chile provide unequivocal evidence for human occupation in South America by at least 12,500 years ago (Dillehay 1989, 1997; Meltzer et al. 1997). Most archeologists presently discount claims of much earlier human occupation during the Pleistocene glacial period.

The earliest generalized evidence for human activities in Southeast Texas is represented by the PaleoIndian period (10,000 to 5000 B.C.) (Patterson 1995). This stage coincided with ameliorating climatic conditions following the close of the Pleistocene epoch that witnessed the extinction of herds of mammoth, horse, camel, and bison. Cultures representing various periods within this stage are characterized by series of distinctive, relatively large, often fluted, lanceolate projectile points. These points are frequently associated with spurred end-scrapers, gravers, and bone foreshafts.

PaleoIndian groups are often inferred to have been organized into egalitarian bands consisting of a few dozen individuals that practiced a fully nomadic subsistence and settlement pattern. Due to poor preservation of floral materials, subsistence patterns in Southeast Texas are known primarily through the study of faunal remains. Subsistence focused on the exploitation of small animals, fish, and shellfish, even during the PaleoIndian period. There is little evidence in this region for hunting of extinct megafauna, as has been documented elsewhere in North America; rather, a broad-based subsistence pattern appears to have been practiced during all prehistoric time periods.

In Southeast Texas, the PaleoIndian stage is divided into 2 periods based on recognizable differences in projectile point styles (Patterson 1995). These include the Early PaleoIndian period (10,000 to 8000 B.C.), which is recognized based on large, fluted projectile points (i.e., Clovis, Folsom, Dalton, San Patrice, and Big Sandy), and the Late PaleoIndian period (8000 to 5000 B.C.), which is characterized by unfluted lanceolate points (i.e., Plainview, Scottsbluff, Meserve, and Angostura).

3.2 ARCHAIC PERIOD (5000 B.C. TO A.D. 100)

The onset of the Hypsithermal drying trend signaled the beginning of the Archaic stage (5000 B.C. to A.D. 100) (Patterson 1995). This climatic trend marked the beginning of a significant reorientation of lifestyle throughout most of North America, but this change was far less pronounced in Southeast Texas. Elsewhere, the changing climatic conditions and corresponding decrease in the big game populations forced people to rely more heavily upon a diversified resource base composed of smaller game and wild plants. In Southeast Texas, however, this hunting and gathering pattern is characteristic of most of prehistory. The appearance of a more diversified tool kit, the development of an expanded groundstone assemblage, and a general decrease in the size of projectile points are hallmarks of this cultural stage. Material culture shows greater diversity during this broad cultural period, especially in the application of groundstone technology.

Traditionally, the Archaic period is subdivided into Early, Middle, and Late subperiods. In Southeast Texas, the Early Archaic period (5000 to 3000 B.C.) is marked by the presence of Bell, Carrollton, Morrill, Trinity, Wells, and miscellaneous Early Stemmed projectile points. The Bell point is the only type in this period that is closely associated with the Southern Plains. Many of the latter point types continue into the Middle Archaic period (3000 to 1500 B.C.), and several new types appear, including Bulverde, Lange, Pedernales, Williams, Travis, and probably the Gary-Kent series. The Late Archaic period (1500 B.C. to A.D. 100) is characterized by Gary, Kent, Darl, Yarbrough, Ensor, Ellis, Fairland, Palmillas, and Marcos points.

In the western part of inland Southeast Texas, a Late Archaic mortuary tradition developed in the lower Brazos and Colorado river valleys and in the intervening area (Hall 1981; Patterson 1995). Organized burial practices actually started during the Middle Archaic period but reached full development in the Late Archaic with the use of exotic grave goods such as boatstones and bannerstones (probably used as atlatl weights), stone gorgets, corner-tang knives, stingray spines, shark teeth, and marine shell beads and pendants. Other burial practices included the systematic orientation of burial direction, body position, use of red ochre, and use of locally made grave goods, such as longbone implements and bone pins. Most burials are found in extended supine position, though some extended prone and bundle burials are also known. Burial direction is usually consistent within single sites but varies from site to site. Patterson et al. (1993) report that at least 11 sites are associated with this mortuary tradition in Austin, Fort Bend, and Wharton counties.

3.3 EARLY CERAMIC PERIOD (A.D. 100 TO 600)

The use of pottery did not start uniformly throughout Southeast Texas. Pottery manufacture appears to have diffused into this region from adjacent regions, primarily from the east along the coastal margin. Aten (1983:297) argues that pottery was being manufactured on the coastal margin of the Texas-Louisiana border by about 70 B.C., in the Galveston Bay area by about A.D. 100, in the western part of the coastal margin by about A.D. 300, and in the Conroe-Livingston inland area by about A.D. 500. The practice of pottery manufacture appears to have progressed first along the coastal margin and then moved inland (Patterson 1995). Southeastern Texas ceramic chronologies are best known in the Galveston Bay area, where Aten (1983) established a detailed chronological sequence.

The earliest ceramic periods in the Galveston Bay and neighboring Sabine Lake areas appear to be approximately contemporaneous with the earliest ceramic periods of the lower Mississippi Valley (Aten 1984). Early assemblages contain substantial quantities of Tchefuncte ceramics. In the Sabine Lake region, grog-tempered varieties of Baytown Plain and Marksville Stamped are common, while grog-tempered ceramics do not occur in the Galveston Bay area, 128.7 kilometers (80.0 miles) to the wes, until several hundred years later. With the principal exception of a few Tchefuncte ceramic types, other southern Louisiana ceramics are not found on the Gulf coast west of the Sabine Lake area.

Goose Creek sandy-paste pottery was used throughout Southeast Texas and somewhat farther north in the Early Ceramic, Late Prehistoric, and the early part of the Historic periods (Aten 1984; Patterson 1995; Pertulla et al. 1995). The Goose Creek series is the primary utility ware throughout the prehistoric sequence in Southeast Texas, though it gives way to Baytown Plain for about 200 years during the transition between the Late Prehistoric and Historic periods before once again becoming predominant into the Historic period (Aten 1984). A minor variety, Goose Creek Stamped, occurs only in the Early Ceramic period (Aten 1983). Three other minor pottery types—Tchefuncte (Plain and Stamped), Mandeville, and O'Neal Plain *variety Conway* (Aten 1983)—were used only during the Early Ceramic period. The Mandeville and Tchefuncte types are characterized by contorted paste and poor coil wedging. Mandeville has sandy paste (like Goose Creek), while Tchefuncte paste has relatively little sand. Given their technological similarities, Mandeville and Tchefuncte may represent different clay sources rather than distinct pottery types (Patterson 1995). The bone-tempered pottery that characterizes ceramic assemblages elsewhere in Texas is not common in Southeast Texas.

3.4 LATE PREHISTORIC PERIOD (A.D. 600 TO 1500)

The onset of the Late Prehistoric period (A.D. 600 to 1500) (Patterson 1995) is defined by the appearance of the bow and arrow. Elsewhere in Texas, pottery also appears during the latter part of the Late Prehistoric period, but, as already discussed, ceramics appear earlier in Southeast Texas. Along the coastal margin of Southeast Texas, use of the atlatl (i.e., spearthrower) and spear was generally discontinued during the Late Prehistoric period, though they continued to be used in the inland subregion along with the bow and arrow through the Late Prehistoric period (Ensor and Carlson 1991; Keller and Weir 1979; Patterson 1980, 1995; Wheat 1953). In fact, Patterson (1995:254) proposes that use of the bow and arrow started in Southeast Texas as early as the end of the Middle Archaic period, using unifacial arrow points that consisted of marginally retouched flakes. In contrast, Prewitt (1981) argues for a generalized date of adoption of the bow-and-arrow hunting system at about the same time (ca. A.D. 600) in Central and Southeast Texas. In Southeast Texas, unifacial arrow points appear to be associated with a small prismatic blade technology. Bifacial arrow point types include Alba, Catahoula, Perdiz, and Scallorn. A serial sequence for these point types has not been established in Southeast Texas, though Scallorn points appear to predate Perdiz points throughout the rest of Texas.

Grog- (i.e., crushed-sherd-) tempered pottery was used in the Late Prehistoric and Protohistoric periods in Southeast Texas. The grog-tempered varieties include San Jacinto Plain and Baytown Plain *variety Phoenix Lake*. San Jacinto pottery contains a relatively small proportion of small-sized temper, while Baytown Plain has larger amounts of sherd pieces that are often visible on vessel surfaces. As previously mentioned, sandy-paste Goose Creek pottery remained in use throughout the Late Prehistoric period. Rockport Plain and Asphalt Coated pottery from the Central Texas Coast (Ricklis 1995) are found at a few sites in Southeast Texas during the Late Prehistoric and Protohistoric periods.

3.5 PROTOHISTORIC PERIOD (A.D. 1500 TO 1700)

For the most part, Protohistoric and early Historic Indian sites in Southeast Texas have not been articulated with the ethnographic record (Story 1990:258). Similarly, reconciling the ethnographic record to prehistoric Indian groups in this region is problematic. Late Prehistoric and Historic population movements further complicate this issue. Aten (1983) has reconstructed the territories of native groups present in this region in the early 18th century, including the Akokisa, Atakapa, Bidai, Coco (possibly Karankawa), and Tonkawa. The presence of the Tonkawa in Southeast Texas may be due to their rapid expansion from Central Texas in the 17th and 18th centuries (Newcomb 1993:27). The Karankawa Indians are thought to have occupied the coastal margin of this region as far east as Galveston Island and the corresponding mainland (Aten 1983). Judging by the scarcity of Rockport pottery on sites east of the San Bernard River, the ethnic association of the Karankawa Indians with the Coco tribe may be in doubt.

Protohistoric and Historic Indian sites may not be systematically recognized as such because few aboriginal artifact types changed from the Late Prehistoric to the Historic periods (Patterson 1995). Only a few non-European artifact types are useful in identifying Historic Indian sites, including Bulbar Stemmed and Guerrero arrow points and possibly Fresno and Cuney points after A.D. 1500 (Hudgins 1986). Historic period Indian sites are usually identified by the presence of glass and metal artifacts, gunflints, and European types of pottery.

3.6 Historic Period (ca. A.D. 1700 to Present)

The first European incursion into what is now known as Texas occurred in 1519, when Álvarez de Pineda explored the northern shores of the Gulf of Mexico. In 1528, Álvar Núñez Cabeza de Vaca crossed South Texas after being shipwrecked along the Texas Coast near Galveston Bay; however, European settlement did not seriously disrupt native ways of life until after 1700. The first half of the 18th century was the period in which the fur trade and mission system, as well as the first effects of epidemic diseases, began to seriously disrupt the native culture and social systems. This process is clearly discernable at the Mitchell Ridge site, where the burial data suggest population declines and group mergers (Ricklis 1994), as well as increased participation on the part of the Native American population in the fur trade. By the time heavy settlement of Texas began in the early 1800s by Anglo-Americans, the indigenous Indian population was greatly diminished. The Alabama/Coushatta Indians who currently reside in Southeast Texas are migrants who were displaced from the east in the late 18th to early 19th centuries (Newcomb 1961).

East Texas Indians began to visit the Sour Lake area of Hardin County long before the region became a part of the Atascosito District of Spanish and Mexican Texas[1]. Empresario Lorenzo de Zavala received the territory as part of his colonization grant of 1829 but made little headway in persuading potential immigrants to settle there. Although a small community called Providence developed around 1830 a few miles north of the site of present Kountze, further efforts at colonization did not begin until 1834 and 1835. During those years, the Mexican government made more than 50 land grants within the future Hardin County. Additional towns developed to serve the rural population and to attract weary travelers. Before the end of 1835, Stephen Jackson had founded a settlement at Sour Lake; by 1850, it was recognized as a health resort. Concord (now Loeb), a port town on Pine Island Bayou, developed soon after the Sour Lake

[1] The following historical summary of Hardin County has been adapted from TSHA (2015).

settlement began. Saratoga, another health resort with medicinal springs, was also settled before the Civil War.

After the revolution of 1836, the area was split between the jurisdictions of Liberty and Jefferson counties. By 1858, the region's population had increased sufficiently to warrant establishment of its own county government. In response, the state legislature established Hardin County, drawing territory from both the parent counties, early in that year. Legislators specified that the county's name honor the Hardin family of Liberty and instructed that the county seat, to be located within 5 miles of the center, also bear that name. After the election of Hampton J. Herrington as chief justice (i.e., county judge), the first session of the county court convened outdoors under an enormous dogwood tree. A log courthouse was completed in 1859 and followed later by a frame structure. Hardin remained the county seat until the mid-1880s. In 1881, the Sabine and East Texas Railroad bypassed that community in favor of its own newly established town, Kountze, 2 miles east of Hardin. Agitation soon developed for removal of county government to the new site. In the resulting election, a majority of voters favored Hardin, but a courthouse fire in August 1886 reopened the issue. A second vote settled the matter permanently in favor of Kountze. After meeting in other structures, county officers accepted the 1904 offer of town founders Herman and Augustus Kountze of land for a courthouse site. The resulting domed courthouse was replaced by a $1.5 million, 3-story, split-level structure in 1959.

Life in antebellum Texas was difficult for Hardin County settlers, many of whom had come from the lower South. No manufacturing took place in the county at that time. Farmers raised corn, sweet potatoes, hogs, milk cows, other cattle, sheep, and horses to produce a self-sufficient subsistence economy rather than a cash-crop agricultural one. Although 14% of the county's 1353 inhabitants were slaves in 1860, cotton was never an important factor in the local economy. Slavery was not a point of debate in county elections; both slaveholders and respected non-slaveholders were chosen for local positions of power between 1858 and 1865. However, the district sided with hard-line Southerners over questions of national concern. Residents strongly favored Southern Democrat John C. Breckinridge over the Southern Unionist John Bell in 1860, and 73% of the voters favored secession the following year. Though a number of county men joined the Confederate Army, a minority hid in the Big Thicket until the end of the war.

Like other Texas counties, Hardin County experienced outside political interference during Reconstruction. Provisional governor Andrew J. Hamilton and military governor J.J. Reynolds both appointed local non-slaveowners of Southern birth to administer county affairs in 1865 and 1869. However, residents chose former slaveholders as leaders when allowed to vote in regular elections. The county may have attempted to disfranchise blacks at an early date, for the moderate Hamilton received 100% of the vote in the gubernatorial race against Republican Edmund J. Davis in 1869. However, a 32% vote for the Republican Party in the presidential election of 1872 probably indicates that African Americans exercised some political power by that time.

The 1870s brought a period of growth and change that lasted until the Great Depression. Only the practice of subsistence agriculture remained somewhat constant. Although the number of farms increased more than 250% between 1870 and 1929, individual farmers continued to raise the same kinds of crops and livestock previously relied upon to supply the basic necessities of life. Livestock raising, considered more profitable than agriculture as early as 1867, increased in importance at the end of the period. Limited manufacturing began by 1870, only to disappear until the newly developed lumber industry slowly stimulated the industrial economy after 1880. As early as 1878, loggers floated timber cut from the county's hardwood, longleaf, and loblolly pine forests down local streams to the Neches River and Beaumont. By 1881, at least 2 lumber-processing mills were operating in the county.

The lumber business provided the incentive needed to bring railroad transportation to Hardin County. The Sabine and East Texas Railroad arrived in 1881. It entered the county at its southeastern corner, then extended through the north-central section before crossing the county line. The Gulf, Beaumont, and Kansas City came in 1894. This road, part of the Atchison, Topeka, and Santa Fe (AT&SF) system, runs through the eastern part of the county. The Gulf, Colorado, and Santa Fe, also a component of the AT&SF, crossed northern Hardin County from west to east in 1901 to 1902. The Beaumont, Sour Lake, and Western, the last railroad to arrive, was built east to west through southern Hardin County between 1904 and 1908. The arrival of the railroads stimulated the lumber industry to further growth. Although the original boom slowed after 1887, the lumber business remained the only important industry in Hardin County until after 1900. In 1925, 5 large processing plants produced a total of 840 million board feet of lumber. Oil production joined lumber as a significant industry after 1901 and has remained important. Although 2 companies established small refineries at Sour Lake in 1896 and 1898, the real development of the Hardin County oil industry began with the discovery of oil at Saratoga (1901) and Batson (1903) and the successful development of the Sour Lake oil field, also in 1903. In that year, the Sour Lake field alone produced 7 million barrels. By 1904, a pipeline system connected the 3 fields to Beaumont. The Texas Company (now Texaco) struck its first productive well at Sour Lake.

Changes in transportation and industry brought change to Hardin County. The population more than doubled between 1870 (1460 inhabitants) and 1900 (5049), then grew by 157% between 1900 and 1930 (to 13,936). The newcomers brought different modes of living that sometimes made long-standing residents uncomfortable. By 1887, small numbers of Germans, French, Irish, Italians, and Mexican Americans had also settled within the county, adding their customs to the cultural mix. During this 60-year period, the black population grew from a low of 13% in 1880 to a high of 20% in 1910. The increase in population led to the development of an embryonic school system. In 1870, 6 schools were scattered throughout the county. By 1887, the county claimed a more organized system that maintained 2 school buildings, employed 22 teachers, and admitted 690 pupils that year. However, an average of only 427 students attended class regularly, and the school term lasted only 52 days. Yet, in 1900, only 7% of adult males of voting age were illiterate. By 1920, the percentage had risen to 12.9%. Further change came with the arrival of electricity and the automobile. Electrical power reached the towns first, beginning at Silsbee in 1909. By 1925, Saratoga, Kountze, Sour Lake, and Batson were also electrified, each powered by its own generating plant. Many of these facilities were later absorbed by the Gulf States Utilities Company, which still served a part of Hardin County in the 1980s, when the Sam Houston Electrical Co-op, begun in 1939, powered the rest of the county. Rural electrical service developed more slowly; as late as 1946, buildings in the Batson Prairie area were without power. By the 1920s, the presence of the automobile was reinforcing the area's need for good roads, though the need was met slowly. Only 9% of the population registered cars or trucks in 1923 (2115 vehicles), and, in 1925, the county had only 40.7 miles of road completed or in progress, including 1 through highway. Serious efforts at road development lay in the future.

Hardin County residents reacted politically to the changes of the 1870 to 1930 era on 2 levels. On local issues, the lumber and petroleum companies often sided against the general populace, creating a division that lasted well into the latter half of the 20th century. Farmers gave 20% of the county's vote to the People's (Populist) party in the national election of 1892. Otherwise, the county usually gave large majorities to the Democratic Party until the 1970s.

The Great Depression reinforced Hardin County's condition as a rural, basically underdeveloped region. Although the overall population grew only 14%, from 13,936 in 1930 to 15,875 in 1940, the number of farms almost doubled, perhaps indicating an increased reliance on the land. Yet the farmers were less self-sufficient than their predecessors. The total number of cattle on farms fell 51% between 1930 and 1940, and the number of milk cows had decreased sharply by 1950. Manufacturing fell from 27 establishments in 1920 to 15 in 1930 and 10 in 1940. The unemployment rate increased accordingly. In 1935, 694 persons were on relief, and in 1940, 10% of the local workforce was seeking employment. Another 7% held emergency jobs sponsored by the federal government. In spite of economic hardships, the lumber industry remained a significant factor in the Hardin County economy. Six of the 10 industrial companies in business in 1940 were lumber or timber concerns, while 3 large plants employed more than 100 persons each.

Hard times in Hardin County lasted well past the end of World War II. In 1950, at least 20% of local families had incomes below $2000, and 48% of the houses lacked running water. The black population of 3079 had only barely surpassed its 1920 level, while the total population numbered only 19,535. Industry was beginning to recover, yet the 32 manufacturing establishments operating in 1954 employed 16% fewer employees than had the 27 companies in business in 1920. Nevertheless, manufacturing accounted for at least 50% of the jobs in Hardin County in 1950. The depression also delayed road construction, which was equally slow in recovering momentum. In 1936, only US Highway (US) 69 had been completed, running from southeast to northwest across the county. By 1945, US 96 was surfaced from Beaumont to Silsbee. A network of state highways and farm roads gradually developed between 1945 and 1957. These included State Highway (SH) 105, running northwest to southeast; SH 326, running north to south; and SH 327, running eastward from Kountze.

Between 1960 and 1980, Hardin County saw changes equal in importance to those caused by railroads and industry during the boom of 1870 to 1930. The population grew 65%, from 24,629 in 1960 to 29,996 in 1970 and 40,721 in 1980. Of the 1980 total, 23% were of Irish, 13% of German, and 11% of French descent. However, the black population grew by only 3% between 1960 and 1980. In response to the general population increase and better times, the number of housing units within the county increased by 50% between 1970 and 1980. Agriculture changed drastically. The number of farms fell to 331 in 1982, while average farm value increased from $22,476 in 1959 to $204,798 in 1982. The importance of farm animals fell; cattle were the only livestock raised in significant numbers after 1959. The production of corn also fell significantly; the 1982 harvest was only 1133 bushels. Instead, soybeans, hay, and fruits were considered primary crops. Oil production and lumber remained important parts of the manufacturing establishment; however, by 1980, the retail trade was challenging their dominance of the county economy. Educational levels of Hardin County residents rose dramatically during the period. In 1950, only 17% of males and 18% of females over 24 years of age had completed high school, but the figures had risen to 38% and 36%, respectively, in 1970. By 1980, 56.6% of the total residents over 24 years of age had finished high school. In 1982, the county supported 5 school districts, employed 583 teachers, and had an average daily student attendance of 9,237. Citizens were also much more mobile than they had been at any other time in the county's past. In 1974, 12,704 vehicles were registered in the county. The number had risen to 38,862, almost 1 vehicle for every resident, by 1982. Local politics remained volatile, with business interests that paid 85% of the county's taxes often siding against the rest of the community on a variety of issues. The county's Democratic political predilections continued through the election of 1992, the only exceptions being majorities for American party presidential candidate George Wallace in 1968 and Republican candidates in 1972 and 1984.

In 1990, Hardin County had a population of 41,320. More than 85% of the county was forested, and timber remained the most important agricultural product. The Big Thicket National Preserve provided recreational opportunities for county residents and tourists.

4.0 ARCHIVAL RESEARCH

The cultural resources survey described in this report was undertaken with 3 primary research goals in mind:

1. To locate and record cultural resources occurring within the designated APE
2. To provide a preliminary assessment of the significance of these resources regarding their potential for inclusion in the National Register of Historic Places (NRHP) and for designation as State Antiquities Landmarks (SAL)
3. To make recommendations for the treatment of these resources based on their NRHP and SAL assessments

The first of these goals was accomplished by means of a review of documentation on file at the THC's online *Texas Archeological Sites Atlas*, the National Park Service's (NPS) online *National Register Information System* (NRIS), the Texas Archeological Research Laboratory (TARL), and the Texas State Historical Association's (TSHA) *The Handbook of Texas Online*, as well as a program of intensive pedestrian survey of the APE. As no cultural resources were encountered as a result of the survey, the second and third goals were not brought into play.

Prior to initiating fieldwork, Horizon personnel reviewed existing archives for information on previously recorded cultural resources sites and previous archeological investigations conducted within a 1.6-kilometer (1.0-mile) radius of the APE. Based on this archival research, no previously recorded archeological sites, cemeteries, or historic properties listed on the NRHP have been recorded within the APE or within 1.6 kilometers (1.0 miles) of the APE (NPS 2015; THC 2015). No prior cultural resources surveys have been conducted within or in the vicinity of the APE.

5.0 SURVEY METHODOLOGY

On February 12, 2015, Horizon archeological technicians Briana Nicole Smith and Jared Wiersema, under the overall direction of Jeffrey D. Owens, Principal Investigator, performed an intensive cultural resources survey of the APE to locate any cultural properties that potentially would be impacted by the proposed undertaking. The APE consists of existing drainages that wind through the Pinewood Estates residential subdivision; as such, residential backyards front against both banks of the creeks. In some areas, vegetation along the creek banks was relatively open, though in most areas it consisted of exceedingly dense thickets of oak, cedar, and hackberry trees with a dense groundcover of tall grasses, shrubs, and greenbrier. Both channels contained numerous “choke points” where accumulated vegetation formed natural dams, producing alternating wet and dry areas within the channels. Some modifications from residential landscaping were evident in some areas, though most of the Coon Marsh Gully channel was relatively intact aside from some evident stream bank erosion. A few small portions of the Coon Marsh Gully channel had been contoured via residential landscaping or at the crossings of utility ROWs, and the diversion channel between Coon Marsh Gully and Pine Island Bayou is an artificial drainage feature. Representative photographs of the APE are presented in Figures 4 to 9.

In addition to pedestrian walkover, the Texas State Minimum Archeological Survey Standards (TSMASS) require excavation of a minimum of 16 subsurface probes per mile per 30.5-meter (100.0-foot) width of linear ROW. Thus, the TSMASS would require a minimum of 40 shovel tests within the combined 4.0-kilometer- (2.5-mile-) long ROWs of Coon Marsh Gully and the artificial diversion canal. Horizon excavated a total of 39 shovel tests during the survey (Figure 10). While the TSMASS requirements were missed by 1 shovel test, shovel testing was able to fully penetrate Holocene-age sediments within the APE with the potential to contain subsurface archeological deposits; as such, it is Horizon’s opinion that the pedestrian walkover with surface inspection and shovel testing was adequate to evaluate the cultural resources potential of the APE.

Shovel tests measured 30.0 centimeters (11.8 inches) in diameter and were excavated to a target depth of 1.0 meters (3.3 feet) below surface, to the top of pre-Holocene deposits, or to the maximum depth practicable. In practice, while a few shovel tests reached the 1.0 meters (3.3 feet) in depth, most were terminated at depths of 25.0 to 70.0 centimeters (9.8 to 27.6 inches), typically in the range of 40.0 to 50.0 centimeters (15.7 to 19.7 inches) below surface, due to the presence of dense, pre-Holocene clayey sediments. All sediments were screened through 6.35-millimeter (0.25-inch) hardware cloth. The Universal Transverse Mercator (UTM) coordinates of

Figure 4. Typical View of Artificial Diversion Canal (Facing Southwest)

Figure 5. Confluence of Artificial Diversion Canal and Coon Marsh Gully (Facing North)

Figure 6. Typical View of Coon Marsh Gully near Northern End of APE (Facing South)

Figure 7. Contoured Portion of Coon Marsh Gully at Pipeline Crossing (Facing Northwest)

Figure 8. Typical View of Coon Marsh Gully near Mid-Point End of APE (Facing West)

Figure 9. View of Natural Vegetation "Dam" within Coon Marsh Gully (Facing East)

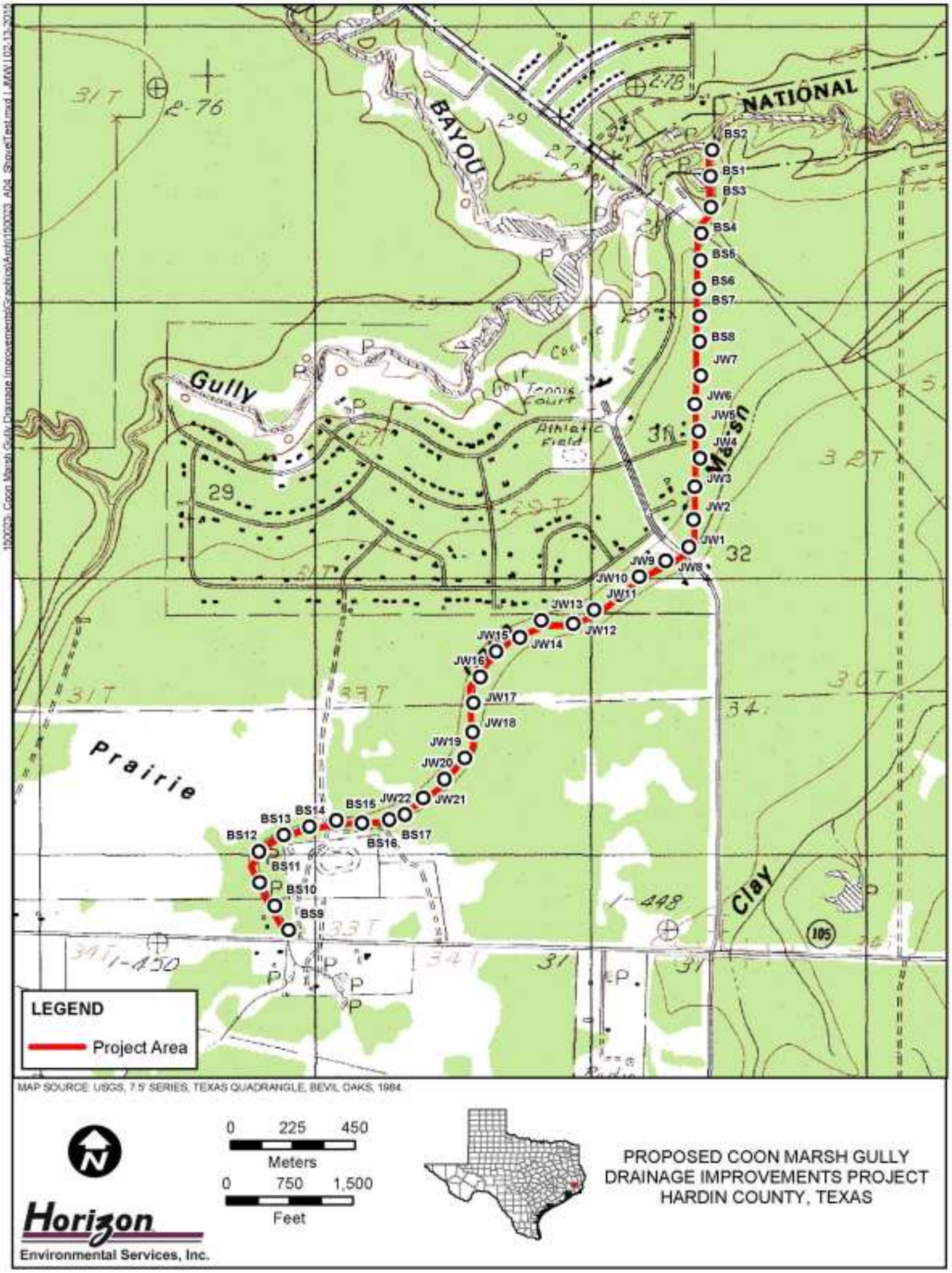

Figure 10. Locations of Shovel Tests Excavated within APE

all shovel tests were determined using hand-held Garmin ForeTrex Global Positioning System (GPS) devices based on the North American Datum of 1983 (NAD 83). Specific shovel test data for all 39 shovel tests excavated within the APE are summarized in Appendix A.

During the survey, field notes were maintained on terrain, vegetation, soils, landforms, survey methods, and shovel test results. Digital photographs were taken, and a photographic log was maintained. Horizon employed a non-collection policy for cultural resources. Diagnostic artifacts (e.g., projectile points, ceramics, historic materials with maker's marks) and non-diagnostic artifacts (e.g., lithic debitage, burned rock, historic glass, and metal scrap) were to be described, sketched, and/or photo-documented in the field and replaced in the same location in which they were found. As no cultural materials were observed during the survey, the collection policy was not brought into play.

The survey methods employed during the survey represented a "reasonable and good-faith effort" to locate significant archeological sites within the APE, as defined in 36 Code of Federal Regulations (CFR) 800.3.

6.0 RESULTS OF INVESTIGATIONS

Horizon was selected by Future Link on behalf of Hardin County to conduct a cultural resources inventory survey and assessment of the proposed Coon Marsh Gully Drainage Improvements Project in south-central Hardin County, Texas. The proposed undertaking would involve channel improvements along an approximately 2.6-kilometer- (1.6-mile-) long segment of Coon Marsh Gully and an approximately 1.4-kilometer- (0.9-mile-) long artificial diversion channel that wind through the Pinewood Estates residential subdivision between State Highway (SH) 105 on the south and Pine Island Bayou on the north. For purposes of the cultural resources survey, it is assumed that all channel improvements, temporary construction easements, and work areas would be constrained to a linear ROW measuring no more than approximately 30.5 meters (100.0 feet) in width, or 15.2 meters (50.0 feet) on either side of the centerlines of the channels. Thus, the APE is assumed to consist of a linear ROW measuring approximately 4.0 kilometers (2.5 miles) in length by 30.5 meters (100.0 feet) in width, covering an area of approximately 12.4 hectares (30.6 acres).

On February 12, 2015, Horizon archeological technicians Briana Nicole Smith and Jared Wiersema, under the overall direction of Jeffrey D. Owens, Principal Investigator, performed an intensive cultural resources survey of the APE to locate any cultural properties that potentially would be impacted by the proposed undertaking. Horizon's archeologists traversed the APE and thoroughly inspected the modern ground surface for aboriginal and historic-age cultural resources. The APE consists of existing drainages that wind through the Pinewood Estates residential subdivision; as such, residential backyards front against both banks of the creeks. In some areas, vegetation along the creek banks was relatively open, though in most areas it consisted of exceedingly dense thickets of oak, cedar, and hackberry trees with a dense ground cover of tall grasses, shrubs, and greenbrier. Both channels contained numerous "choke points" where accumulated vegetation formed natural dams, producing alternating wet and dry areas within the channels. Some modifications from residential landscaping were evident in some areas, though most of the Coon Marsh Gully channel was relatively intact aside from some evident stream bank erosion. The diversion channel between Coon Marsh Gully and Pine Island Bayou is an artificial drainage feature.

In addition to pedestrian walkover, the TSMASS require excavation of a minimum of 16 subsurface probes per mile per 30.5-meter (100.0-foot) width of linear ROW. Thus, the TSMASS would require a minimum of 40 shovel tests within the combined 4.0-kilometer- (2.5-mile-) long ROWs of Coon Marsh Gully and the artificial diversion canal. Horizon excavated a total of 39 shovel tests during the survey. While the TSMASS requirements were missed by 1 shovel test, shovel testing was able to fully penetrate Holocene-age sediments within the APE with the potential to contain subsurface archeological deposits; as such, it is Horizon's opinion that the pedestrian walkover with surface inspection and shovel testing was adequate to evaluate the cultural resources potential of the APE.

No cultural resources, historic or prehistoric, were identified within the APE as a result of the survey.

7.0 SUMMARY AND RECOMMENDATIONS

7.1 CONCEPTUAL FRAMEWORK

The archeological investigations documented in this report were undertaken with 3 primary management goals in mind:

- Locate all historic and prehistoric archeological resources that occur within the designated survey area.
- Evaluate the significance of these resources regarding their potential for inclusion in the NRHP and for designation as SALs.
- Formulate recommendations for the treatment of these resources based on their NRHP and SAL evaluations.

At the survey level of investigation, the principal research objective is to inventory the cultural resources within the APE and to make preliminary determinations of whether or not the resources meet 1 or more of the pre-defined eligibility criteria set forth in the state and/or federal codes, as appropriate. Usually, management decisions regarding archeological properties are a function of the potential importance of the sites in addressing defined research needs, though historic-age sites may also be evaluated in terms of their association with important historic events and/or personages. Under the NHPA and the Antiquities Code of Texas, archeological resources are evaluated according to criteria established to determine the significance of archeological resources for inclusion in the NRHP and for designation as SALs, respectively.

Analyses of the limited data obtained at the survey level are rarely sufficient to contribute in a meaningful manner to defined research issues. The objective is rather to determine which archeological sites could be most profitably investigated further in pursuance of regional, methodological, or theoretical research questions. Therefore, adequate information on site function, context, and chronological placement from archeological and, if appropriate, historical perspectives is essential for archeological evaluations. Because research questions vary as a function of geography and temporal period, determination of the site context and chronological placement of cultural properties is a particularly important objective during the inventory process.

7.2 ELIGIBILITY CRITERIA FOR INCLUSION IN THE NATIONAL REGISTER OF HISTORIC PLACES

Determinations of eligibility for inclusion in the NRHP are based on the criteria presented in 36 CFR §60.4(a-d). The 4 criteria of eligibility are applied following the identification of relevant historical themes and related research questions:

> The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
>
> a. [T]hat are associated with events that have made a significant contribution to the broad patterns of our history; or,
>
> b. [T]hat are associated with the lives of persons significant in our past; or,
>
> c. [T]hat embody the distinctive characteristics of a type, period, or method of construction, or that represent a significant and distinguishable entity whose components may lack individual distinction; or,
>
> d. [T]hat have yielded, or may be likely to yield, information important in prehistory or history.

The first step in the evaluation process is to define the significance of the property by identifying the particular aspect of history or prehistory to be addressed and the reasons why information on that topic is important. The second step is to define the kinds of evidence or the data requirements that the property must exhibit to provide significant information. These data requirements in turn indicate the kind of integrity that the site must possess to be significant. This concept of integrity relates both to the contextual integrity of such entities as structures, districts, or archeological deposits and to the applicability of the potential database to pertinent research questions. Without such integrity, the significance of a resource is very limited.

For an archeological resource to be eligible for inclusion in the NRHP, it must meet legal standards of eligibility that are determined by 3 requirements: (1) properties must possess significance, (2) the significance must satisfy at least 1 of the 4 criteria for eligibility listed above, and (3) significance should be derived from an understanding of historic context. As discussed here, historic context refers to the organization of information concerning prehistory and history according to various periods of development in various times and at various places. Thus, the significance of a property can best be understood through knowledge of historic development and the relationship of the resource to other, similar properties within a particular period of development. Most prehistoric sites are usually only eligible for inclusion in the NRHP under Criterion D, which considers their potential to contribute data important to an understanding of prehistory. All 4 criteria employed for determining NRHP eligibility potentially can be brought to bear for historic sites.

7.3 ELIGIBILITY CRITERIA FOR LISTING AS A STATE ANTIQUITIES LANDMARK

The criteria for determining the eligibility of a prehistoric or historic cultural property for designation as an SAL are presented in Chapter 191, Subchapter D, Section 191.092 of the Antiquities Code of Texas, which states that SALs include:

> Sites, objects, buildings, artifacts, implements, and locations of historical, archeological, scientific, or educational interest including those pertaining to prehistoric and historical American Indians or aboriginal campsites, dwellings, and habitation sites, their artifacts and implements of culture, as well as archeological sites of every character that are located in, on, or under the surface of any land belonging to the State of Texas or to any county, city, or political subdivision of the state are state antiquities landmarks and are eligible for designation.

For the purposes of assessing the eligibility of a historic property for designation as an SAL, a historic site, structure, or building has historical interest if the site, structure, or building:

1. [W]as the site of an event that has significance in the history of the United States or the State of Texas;
2. [W]as significantly associated with the life of a famous person;
3. [W]as significantly associated with an event that symbolizes an important principle or ideal;
4. [R]epresents a distinctive architectural type and has value as an example of a period, style, or construction technique; or,
5. [I]s important as part of the heritage of a religious organization, ethic group, or local society.

The Antiquities Code of Texas establishes the THC as the legal custodian of all cultural resources, historic and prehistoric, within the public domain of the State of Texas. Under Part II of Title 13 of the Texas Administrative Code (13 TAC 26), the THC may designate a historic structure as an SAL if it (1) is publicly or privately owned and listed on the NRHP and (2) meets one of the following 6 eligibility criteria:

A. Is associated with events that have made a significant contribution to the broad patterns of our history;

B. Is associated with the lives of persons significant in our past;

C. Is important to a particular cultural or ethnic group;

D. Is the work of a significant architect, master builder, or craftsman;

E. Embodies the distinctive characteristics of a type, period, or method of construction, possesses high aesthetic value, or represents a significant and distinguishable entity whose components may lack individual distinctions; or

F. Has yielded or may be likely to yield information important to the understanding of Texas culture or history.

7.4 Summary of Inventory Results

Horizon archeological technicians Briana Nicole Smith and Jared Wiersema, under the overall direction of Jeffrey D. Owens, Principal Investigator, performed an intensive cultural resources survey of the APE to locate any cultural properties that potentially would be impacted by the proposed undertaking. The APE was traversed by Horizon's archeologists, the modern ground surface was thoroughly inspected for cultural resources, and a total of 39 shovel tests were excavated within the APE. While the TSMASS requirements were missed by 1 shovel test, shovel testing was able to fully penetrate Holocene-age sediments within the APE with the potential to contain subsurface archeological deposits; as such, it is Horizon's opinion that the pedestrian walkover with surface inspection and shovel testing was adequate to evaluate the cultural resources potential of the APE.

No cultural resources, historic or prehistoric, were identified within the APE as a result of the survey.

7.5 Management Recommendations

Based on the results of the survey-level investigations documented in this report, no potentially significant cultural resources would be affected by the proposed undertaking. In accordance with 36 CFR 800.4, Horizon has made a reasonable and good-faith effort to identify archeological historic properties within the APE. No cultural resources were identified that meet the criteria for inclusion in the NRHP according to 36 CFR 60.4 or for designation as a SAL according to 13 TAC 26, and no further archeological work is recommended in connection with the proposed undertaking. However, it should be noted that human burials, both prehistoric and historic-era, are protected under the Texas Health and Safety Code. In the event that any human remains or burial objects are inadvertently discovered at any point during construction, use, or ongoing maintenance in the APE, even in previously surveyed areas, all work should cease immediately at the location of the inadvertent discovery until a qualified archeologist can assess the find, and the THC should be notified immediately.

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APPENDIX A:

Shovel Test Data

Table A-1. Shovel Test Summary Data

ST No.	UTM Coordinates[1] Easting	UTM Coordinates[1] Northing	Depth (cmbs)	Soils	Artifacts
BS1	373419	3337662	0-50+	Mottled brown and dark yellowish-brown wet silty clay	None
BS2	373425	3337756	0-35+	Mottled brown, grayish-brown, and dark yellowish-brown clay	None
BS3	373421	3337551	0-30+	Mottled very dark brown, grayish-brown, and dark yellowish-brown dense clay	None
BS4	373387	3337455	0-25+	Mottled very dark brown, grayish-brown, and dark yellowish-brown dense clay	None
BS5	373382	3337357	0-25	Mottled dark yellowish-brown, grayish-brown, and yellowish-red clay with light gray silt mottles	None
			25-30+	Mottled dark yellowish-brown, gray, and yellowish-red clay	None
BS6	373379	3337255	0-35+	Mottled dark yellowish-brown, grayish-brown, and yellowish-red clay	None
BS7	373380	3337155	0-50+	Mottled light gray and yellowish-red wet silty clay	None
BS8	373379	3337063	0-40+	Mottled light gray, yellowish-brown, and yellowish-red silty clay	None
BS9	371889	3334931	0-35+	Mottled gray and yellowish-red wet silty clay	None
BS10	371839	3335019	0-40	Gray silty clay loam	None
			40-60+	Mottled gray and yellowish-red wet silty clay	None
BS11	371785	3335104	0-45	Gray silty clay loam	None
			45-50+	Mottled gray and yellowish-red wet silty clay	None
BS12	371782	3335217	0-50	Gray silty clay loam	None
			50-55+	Mottled gray and yellowish-red wet silty clay	None
BS13	371872	3335276	0-30	Gray silty clay loam	None
			30+	Mottled gray and yellowish-red wet silty clay	None
BS14	371966	3335307	0-50	Gray silty clay loam	None
			50-55+	Mottled gray and yellowish-red wet silty clay	None
BS15	372064	3335329	0-40	Mottled light gray and yellowish-red silty clay loam	None

Table A-1. Shovel Test Summary Data (cont.)

ST No.	UTM Coordinates[1]		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
			40-45+	Mottled light gray and yellowish-red silty clay	None
BS16	372156	3335320	0-30	Mottled gray and yellowish-red silty clay loam	None
			30-40+	Mottled gray and yellowish-red silty clay	None
BS17	372255	3335333	0-30	Mottled gray and yellowish-red silty clay loam	None
			30-40+	Mottled gray and yellowish-red silty clay	None
JW1	373341	3336320	0-40	Grayish-brown silty loam	None
			40+	Grayish-brown silty clay	None
JW2	373357	3336418	0-35+	Grayish-red mottled clay	None
JW3	373362	3336538	0-25	Reddish-brown sandy loam	None
			25+	Reddish-brown sandy clay	None
JW4	373382	3336641	0-40	Reddish-brown sandy loam	None
			40+	Reddish-brown sandy clay	None
JW5	373377	3336738	0-35+	Grayish-red mottled clay	None
JW6	373362	3336836	0-30	Pale brown silty loam	None
			30-40+	Grayish-brown silty loam	None
JW7	373385	3336940	0-30	Pale brown silty loam	None
			30-40+	Reddish brown sandy clay	None
JW8	373257	3336269	0-100	Grayish-brown silty loam	None
JW9	373161	3336211	0-60	Grayish-brown silty loam	None
			60+	Grayish-brown silty clay	None
JW10	373088	3336147	0-100	Grayish-brown silty loam	None
JW11	372998	3336091	0-60	Grayish-brown silty loam	None
			60+	Grayish-brown silty clay	None
JW12	372921	3336040	0-60	Grayish-brown silty loam	None
			60+	Grayish-brown silty clay	None
JW13	372806	3336052	0-60	Grayish-brown silty loam	None
			60+	Grayish-brown silty clay	None
JW14	372727	3335992	0-25+	Grayish-brown clay	None
JW15	372643	3335940	0-25+	Grayish-brown clay	None
JW16	372585	3335848	0-70+	Grayish-brown silty loam	None

Table A-1. Shovel Test Summary Data (cont.)

ST No.	UTM Coordinates[1]		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
JW17	372560	3335755	0-25+	Reddish-brown sandy clay	None
JW18	372557	3335649	0-60	Grayish-brown silty loam	None
			60+	Grayish-brown silty clay	None
JW19	372528	3335554	0-30+	Grayish-brown silty clay	None
JW20	372455	3335479	0-60+	Grayish-brown silty clay	None
JW21	372377	3335410	0-60+	Grayish-brown silty clay	None
JW22	372311	3335351	0-40	Grayish-brown silty loam	None
			40+	Grayish-brown clay	None

[1] All UTM coordinates are located in Zone 15 and utilize the North American Datum of 1983 (NAD 83)
cmbs = Centimeters below surface
ST = Shovel test
UTM = Universal Transverse Mercator