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MAR 20 2009
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March 20, 2009

Mr. Mark Denton
Texas Historical Commission
1511 Colorado Street
Austin, Texas 78701

Re: Draft Report for Intensive Cultural Resources Survey

Jefferson County Drainage District No. 6
Bayou Din 34-Acre Survey
Beaumont, Jefferson County, Texas

TAC Permit No. 5197
HJN 090038 AR

Dear Mr. Denton:

Enclosed please find 1 copy of the draft report entitled *Intensive Cultural Resource Survey of the 34 Acres of Dredge Disposal Areas along Bayou Din, Beaumont, Jefferson County, Texas*, by Jeffrey D. Owens, describing the results of an archeological survey performed on behalf of Jefferson County Drainage District No. 6 (JCDD6). JCDD6 is proposing to conduct flood-control operations, including channel dredging and spoil deposition, along an approximately 1.4-kilometer- (km-) (0.9-mile- [mi-]) long segment of Bayou Din southwest of Beaumont in Jefferson County, Texas. Soils derived from the proposed dredging of Bayou Din would be deposited on the banks adjacent to the channel, covering an area of approximately 13.8 hectares (ha) (34.0 acres [ac]). The Area of Potential Effect (APE) of the proposed undertaking covers a total area of approximately 13.8 ha (34.0 ac).

The project is being sponsored by JCDD6, a political subdivision of the State of Texas; as such, the project would fall under the jurisdiction of the Antiquities Code of Texas. In addition, the proposed undertaking would be conducted using a grant from the Federal Emergency Management Agency (FEMA); as such, the project also falls under the jurisdiction of Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended. As the project represents a publicly sponsored undertaking with the potential to impact significant cultural resources, JCDD6 was required to provide for a cultural resource inventory of the project's APE and to assess the project's possible impacts on any significant cultural resources in the APE. To meet its responsibilities under applicable federal and state laws, JCDD6 contracted with Horizon Environmental Services, Inc. (Horizon), to obtain all necessary clearances for cultural resources.

On March 10, 2009, Horizon archeologists Reign Clark, project archeologist, and Jared Wiersema, archeological field technician, under the overall supervision of Jeffrey D. Owens, Principal Investigator, performed a cultural resource survey of the APE to locate any cultural resource properties that potentially would be impacted by the proposed construction project. The survey was conducted by Horizon under Texas Antiquities Permit No. 5197. The APE was traversed by Horizon's archeologists, the modern

ground surface was thoroughly inspected for cultural resources, and a total of 20 shovel tests were excavated during the survey, thereby exceeding the TSMASS for a project area of this size.

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. No new cultural resources were identified in the APE as a result of survey activities, and no previously recorded sites occur in the vicinity of the project area. Furthermore, no listed historic properties are present in the vicinity of the project area that would be adversely 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 listing on the NRHP according to 36 CFR 60.4 or for designation as SALs according to 13 TAC 26, and no further archeological work is recommended in connection with the proposed undertaking. It is recommended that the proposed project be cleared to proceed. However, in the unlikely event that any human remains or burial furniture are inadvertently discovered at any point during construction, use, or ongoing maintenance in the project area, even in previously surveyed areas, all work should cease immediately and the Texas Historical Commission (THC) should be notified of the discovery.

If you have any questions or require additional information, please feel free to contact me at (512) 328-2430 or at jesse_owens@horizon-esi.com.

Sincerely,

Jeffrey D. Owens
Archaeological Principal Investigator / Project Manager
Horizon Environmental Services, Inc.

NO HISTORIC
PROPERTIES AFFECTED
PROJECT MAY PROCEED
By Mark H Eaton
for F. Lawerence Oaks
State Historic Preservation Officer
Date 4-8-09
Track# 200906040

DRAFT REPORT
ACCEPTABLE
Please submit 20 final report copies
by Mark H Eaton
for F. Lawerence Oaks
State Historic Preservation Officer
Date 4-8-09
Track#

Intensive Cultural Resource Survey of 34 Acres of Dredge Disposal Areas along Bayou Din, Beaumont, Jefferson County, Texas

By:

Jeffrey D. Owens

Texas Antiquities Permit No. 5197
HJN 090038 AR

Prepared for:

Jefferson County Drainage District No. 6
Beaumont, Texas

Prepared by:

Horizon Environmental Services, Inc.
Austin, Texas

April 2009

Intensive Cultural Resource Survey of 34 Acres of Dredge Disposal Areas along Bayou Din, Beaumont, Jefferson County, Texas

By:

Jeffrey D. Owens

Prepared for:

Jefferson County Drainage District No. 6
6550 Walden Road
Beaumont, Texas 77720

Prepared by:

Horizon Environmental Services, Inc.
1507 South IH 35
Austin, Texas 78741

Jeffrey D. Owens, Principal Investigator
HJN 090038 AR

Texas Antiquities Permit No. 5197

April 2009

MANAGEMENT SUMMARY

Jefferson County Drainage District No. 6 (JCDD6) is proposing to conduct flood-control operations, including channel dredging and spoil deposition, along an approximately 1.4-kilometer- (km-) (0.9-mile- [mi-]) long segment of Bayou Din southwest of Beaumont in Jefferson County, Texas. Soils derived from the proposed dredging of Bayou Din would be deposited on the banks adjacent to the channel, covering an area of approximately 13.8 hectares (ha) (34.0 acres [ac]). The Area of Potential Effect (APE) of the proposed undertaking covers a total area of approximately 13.8 ha (34.0 ac).

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1.0 INTRODUCTION

Jefferson County Drainage District No. 6 (JCDD6) is proposing to conduct flood-control operations, including channel dredging and spoil deposition, along an approximately 1.4-kilometer- (km-) (0.9-mile- [mi-]) long segment of Bayou Din southwest of Beaumont in Jefferson County, Texas (Figure 1). Soils derived from the proposed dredging of Bayou Din would be deposited on the banks adjacent to the channel, covering an area of approximately 13.8 hectares (ha) (34.0 acres [ac]). The Area of Potential Effect (APE) of the proposed undertaking covers a total area of approximately 13.8 ha (34.0 ac).

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This report presents the results of the cultural resource survey. Following this introductory chapter, Chapters 2.0 and 3.0 present the environmental and cultural backgrounds of the project area, respectively. Chapter 4.0 describes the research objectives, results of archival research, and cultural resource survey methods implemented during the survey. Chapter 5.0 presents the results of the survey, and Chapter 6.0 presents cultural resource management recommendations for the project. Chapter 7.0 lists the references cited in the report, and Appendix A presents data collected from shovel tests excavated during the survey.

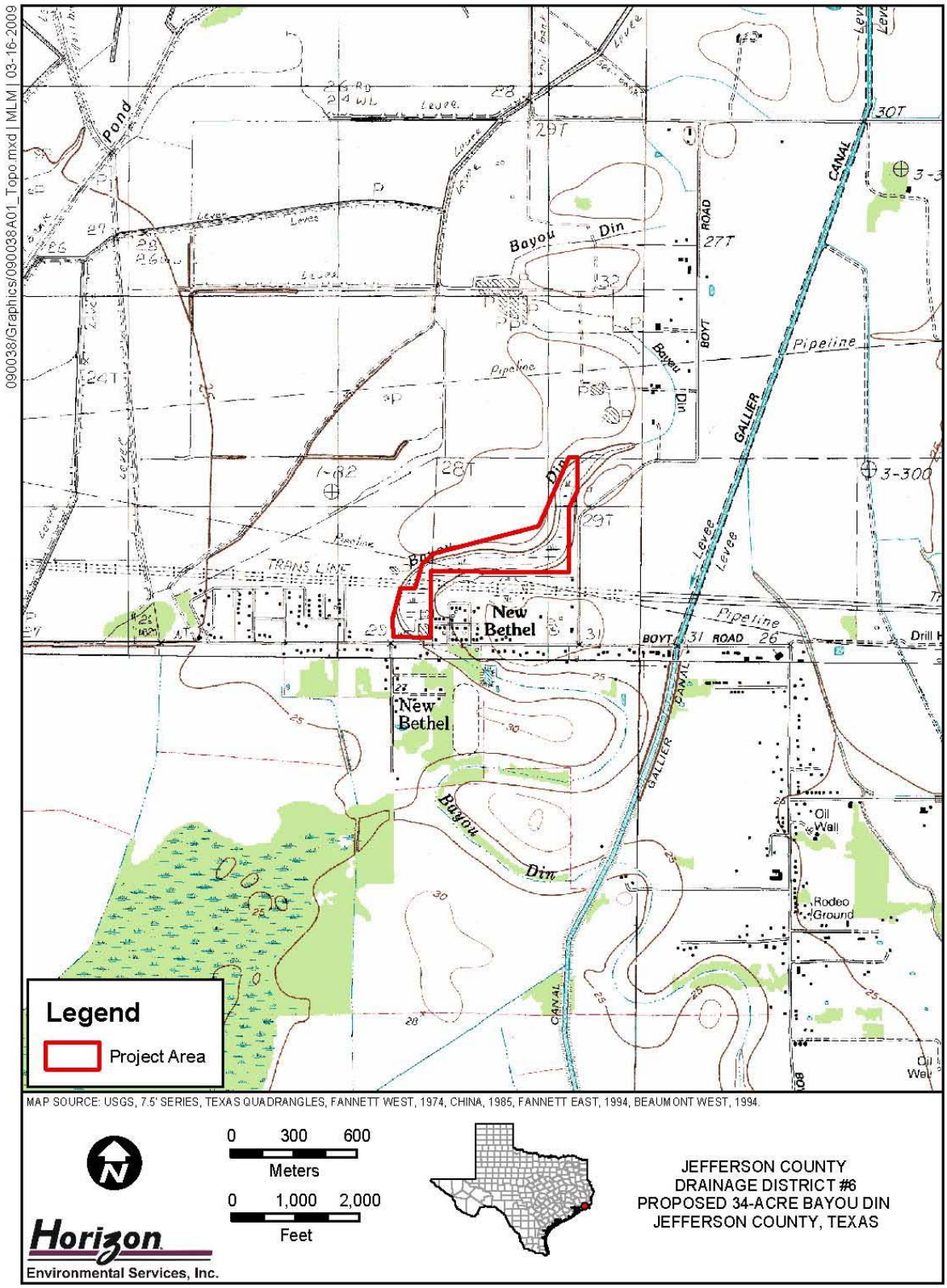

Figure 1. Location of Project Area

2.0 ENVIRONMENTAL SETTING

2.1 PHYSIOGRAPHY AND HYDROLOGY

The project area is located just north of the community of New Bethel, southwest of the city of Beaumont, in northwestern Jefferson County, Texas. Jefferson County is situated on the Gulf Coastal Plain in southeastern Texas, and the project area is located about 36 km (22 mi) 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 Houston area 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 project area is situated on low, clayey terraces adjacent to Bayou Din, a meandering bayou that forms part of a system of bayous that discharges into a network of marshy inlets in the vicinity of Port Arthur, Texas. Within the project area, Bayou Din forms a large, ponded wetland area with poor drainage. In the vicinity of the project area, Bayou Din meanders extensively eastward and westward but flows generally south-southeastward to its confluence with Hillebrandt Bayou, which in turn discharges into Taylor Bayou. Taylor Bayou flows past Big Hill Reservoir and discharges into Sabine Lake, an inlet of the Gulf of Mexico, approximately 36 km (22 mi) southeast of the project area. Local topography is extremely flat, and elevations across the project area average approximately 9 meters (m) (28 feet [ft]) above mean sea level (amsl) with minimal topographic relief.

2.2 GEOLOGY AND GEOMORPHOLOGY

The project area is underlain by the Beaumont Formation (Crout et al. 1965; Fisher 1982; 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.

Specifically, the project area is underlain by Leton loam, ponded, 0 to 1% slopes (LwA) (Crout et al. 1965). This soil unit consists of loamy fluviomarine deposits of Late Pleistocene age found on open depressions on flats and coastal plains.

While aboriginal cultural resources are commonly encountered in deep alluvial sediments adjacent to major streams in Texas, the relative antiquity of the fluviodeltaic clayey sediments that constitute the soils on the coastal plain, such as those that comprise the current project area, suggests that any 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, though no alluvial sediments are mapped within the current project area, and the only streams in the vicinity of the APE are channelized canals. Historic-age cultural resources may occur in any physiographic setting, though they are comparatively rare in the frequently flooded, marshy environs of Southeast Texas.

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-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 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; Crout et al. 1965). 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 cm centimeters (cm) (40 inches [in]) to a high of more than 132 cm (52 in). Average monthly precipitation varies from less than 5 to 8 cm (2 to 3 in) in March to more than 19 cm (7.5 in) 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

Jefferson 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, Engelman 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 project area 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 200 km (124 mi) 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 km (16 mi) 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 (1,500 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 129 km (80 mi) to the west 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).

The French and Spanish disputed ownership of the future county during the 18th century[1]. Spanish claims were based on the 1528 expedition of Álvar Núñez Cabeza de Vaca, and French involvement began with La Salle in 1685. By 1730, French fur traders had

[1] The following historical summary of Jefferson County has been compiled from Block (1973, 1976, 1980, 1987), East (1961), and Pray (1936), as summarized in Handbook (2008).

crossed the lower Sabine to trade with the Orcoquizas on the Trinity River; however, the area that became Jefferson County was rarely visited by EuroAmerican traders because it was bounded on the east by unfordable rivers and bayous and on the north by the Big Thicket. To prevent French penetration, the Spanish established the San Agustín de Ahumada Presidio and Nuestra Señora de la Luz Mission near the mouth of the Trinity in 1756. In 1777, Antonio Gil Ibarbo conducted an expedition to investigate the English presence in Spanish territory, and, in 1785, José de Evia camped at Sabine Pass and mapped Sabine Lake and the Sabine and Neches rivers. By 1803, when the US acquired Louisiana, the area of Jefferson County was under Spanish control as part of the Atascosito District. In conjunction with filibustering efforts to discourage Spanish shipping after 1816, the area provided a path for slave smuggling between Louisiana, Point Bolivar, Jefferson County, and the Sabine River until the 1830s. The pirate Jean Laffite maintained a slave barracks on the Sabine River 16 km (10 mi) north of the present site of Orange to house black slaves in transit. In 1821, filibustering efforts ceased when the Treaty of Córdova ended Spanish ownership in the region and made it part of Mexico. Anglo-American colonization subsequently met both hostility and encouragement from the Mexican government, as settlement efforts brought new families to the area from 1821 to 1836. The first settlement within the confines of the present county, established at Tevis Bluff in 1824, became the City of Beaumont. The area that became Jefferson County was included in the Mexican Department of Nacogdoches as part of the Liberty Municipality in Lorenzo de Zavala's *empresario* grant of 1831. It later became part of the Jefferson Municipality. The Cow Bayou settlement in this municipality, organized in 1835 and later known as Old Jefferson, became the first county seat and the focal point of future growth in the county. Local volunteers took part in the Texas Revolution, and other residents provided troop support.

Jefferson County, formed in 1836 and organized in 1837, was one of the original counties in the Republic of Texas. It was named for the municipality that preceded it, which was in turn named for Thomas Jefferson. The county's boundaries, as delineated on 21 December 1837, included all of the future Orange County, a part of what later became Hardin County, and the extreme eastern part of the future Chambers County. The first county seat, Jefferson, or Old Jefferson, on the east bank of Cow Bayou, was replaced by Beaumont in 1838 and had disappeared by 1845, when the site of Orange was surveyed. Orange was first called Jefferson or New Jefferson. In 1836, Claiborne West, a signer of the Texas Declaration of Independence, served as first postmaster and merchant at Old Jefferson. Another chief town was Sabine Pass, laid out in 1839 with the backing of Sam Houston and Philip A. Sublett. Early settlers, primarily from the lower South, were joined by Cajuns in the 1840s and by immigrants from the North and from Europe in the 1850s. The area became an ethnic conglomerate. The Cajuns settled near Taylor Bayou, and the Germans settled in the center of the county.

By the 1840s, shingle manufacture and timber exports supplemented a domestic economy based on spinning, leatherwork, and soap and candle making. Shipbuilding, which grew from the lumber industry before 1850, took place next to the lumber mills in Sabine Pass and Beaumont. Steam-driven industry developed in 1846, and the first steam sawmill in Beaumont was established in 1856. Jefferson County's land was better suited to livestock raising than to a cotton-based plantation economy. By 1820, Louisiana cattlemen drove herds across the Sabine and Neches to graze on Gulf Coast saltgrasses, and a system of roads and

ferries running from east to west across the county was slowly put in place to support movement of the herds. In the antebellum period, some cattlemen settled permanently and pursued their livelihood alongside small farmers. Leather shops and tanneries developed in Beaumont in the 1840s, and shoe shops, saddleries, and exporters of hides and tallow followed in the 1850s. Cotton-buying and ginning began by 1850 and increased with the arrival of the Eastern Texas Railroad, though production in 1859 was only 84 bales and not much of the potential agricultural land had been improved. Stephen L. Smith, the county's most diversified planter in the 1840s, raised corn, sweet potatoes, and rice. Early rice agriculture, the forerunner of the county's largest farm enterprise, produced 1,000 pounds in 1859. The Texas and New Orleans Railroad from Houston to Orange and the Eastern Texas Railroad from Sabine Pass to Beaumont were completed by 1861, but insufficient rail transportation and high freight rates limited antebellum growth. Sabine Pass became a boomtown, stimulated by the Morgan Lines, which established operations there before the Civil War. Four firms at Sabine shipped 20,000 bales of cotton annually, and 300 vessels cleared the Sabine customhouse in 1859. Though the county was prosperous in the 1850s, and resolution of the (Orange County) Regulator-Moderator War in Jefferson County courts stabilized growth in that decade, Beaumont had only 4 commission and forwarding houses, 4 dry-goods stores, 2 groceries, 2 hotels, and a population of 400 by 1858.

During the Civil War, Jefferson County residents voted 256 for and 15 against secession. The county court voted to garrison a fort at Sabine Pass, Beaumont became a concentration point for Confederate troops, a cantonment was established at Spindletop Springs, and the county courthouse served as a hospital. Among the county's several volunteer groups, the Sabine Pass Guard was organized at Sabine Pass in April 1861 under the Texas legislative act of 1858 that authorized the state militia. Beginning in 1862, federal troops burned cavalry barracks near Sabine Pass, along with a railroad depot, sawmills, a planing mill, a sash and door factory, and the palatial homes of D.R. Wingate and John Stamps. They also shelled Sabine City, then suffering an epidemic of yellow fever. The Confederates reoccupied Sabine Pass in January 1863, and the battle of Sabine Pass in September of that year ended federal efforts to penetrate the interior via the Sabine. The war caused considerable losses, and farm acreage and value declined, cotton exports fell, and the number of cattle in the county dropped from 51,600 in 1862 to 40,000 in 1865.

Recovery from the war was slow. Jefferson County exports in 1867 of cotton, cattle, beef hides, lumber, cypress shingles, and lumber products, including resin and turpentine, constituted only about 1/4 of their prewar total. Sugar production between 1860 and 1880 was limited, and significant agriculture did not develop again until after 1890. By 1876, however, the county was once again a lumber and shipping center, as loggers used the Neches and Sabine rivers to float logs to mills at Orange and Beaumont, where mills manufactured 82 million shingles and 75 million board feet of timber by 1880. Exports, including pine for cross-ties and bridges, made these towns major lumber centers by 1900. Four canal systems for irrigating rice were built between 1898 and 1902, including the Port Arthur Rice and Irrigation Company, McFaddin Canal Company, Jefferson County Irrigation Company (later renamed Beaumont Irrigation Company), and Treadaway Canal Company (later renamed Neches Canal Company). By 1904, 50,000 ac were under cultivation as mule power replaced ox teams.

After 1880, rail transportation increased significantly. The Texas and New Orleans (now the Southern Pacific Transportation Company) built from Houston to Orange in 1860, abandoned its Orange County track in 1863 and the line in 1867, and then rebuilt in 1876. This railroad was linked to the Louisiana and Western, and through service was provided to New Orleans in 1881. By 1881, service had also been reestablished by the East Texas Railway, which was renamed the Sabine and East Texas and later became part of the Texas and New Orleans. The Gulf, Beaumont and Kansas City Railway, constructed between 1893 and 1896, ran at first neither to the Gulf nor to Kansas City, but only from Kirbyville to Beaumont. The Gulf and Interstate developed in 1895, and the Beaumont, Sour Lake, and Western Railway between 1903 and 1904. Port Arthur, founded in 1895 by Arthur Edward Stilwell, was linked in 1895 by the Kansas City Southern to Beaumont. Service to Kansas City finally came in 1897, when the Sabine River bridge was completed. The Sabine-Neches or Port Arthur Ship Canal was excavated in 1897 and 1898 from Sabine Pass to Port Arthur. It opened in 1899 and was gradually extended to the mouths of the Neches and Sabine Rivers. The first oceangoing vessel to call at Beaumont and Orange was the *Nicaragua*, which arrived in 1906. River depths were increased to around 8 m (25 ft) by 1920, by which time the Gulf Intracoastal Waterway had crossed the southern part of the county. Interurban service from Nederland to Beaumont and Port Arthur linked those communities in 1913, and, by 1916, completion of the channel to Beaumont from Port Arthur and the mouth of the Neches had further increased lumber exports.

Between 1900 and 1910, the population grew from 14,329 to 38,182. A major influx followed the Spindletop oilfield's opening in 1901, and the growth in the decade came almost exclusively from the white population of Hardin, Tyler, Jasper, and Newton counties. Significant Cajun French movement to Jefferson County began in 1910 when the boll weevil destroyed cotton crops in parishes adjacent to Lafayette, Louisiana. Also, a small influx of Mexicans reached Jefferson County beginning in 1917 and 1918 as refinery workers were drafted in World War I. By 1920, the county's population reached 73,120, nearly double the 1910 figure.

Spindletop transformed Beaumont into a major industrial center. Refineries, including the Texas Company refinery of Joseph S. Cullinan and Arnold Schlaet (1902) and the Gulf Oil Corporation (now Chevron) refinery were built at Port Arthur, Port Neches, and Beaumont. During World War I, shipbuilding increased, and the Magnolia Petroleum Company (now ExxonMobil) refinery on the Neches at Beaumont played an active role as a supplier for the war. Between 1955 and 1960, the Texaco and Gulf refineries employed 5,000 to 6,000 workers, and, by World War II, the Gulf refinery was the 14th largest refinery in the world. Farm tenancy, which increased significantly in Jefferson County in the first decade of the 20th century, declined briefly, but increased so much during the Great Depression that owners and tenant farmers achieved almost equal numbers. By 1930, the average farm size had fallen to roughly 250 ac. In the 1930s, however, despite the hardships experienced in many areas, Jefferson County was one among several Texas counties that continued to prosper. The county shipped 29,022,201 tons of materials through Beaumont, Sabine Pass, and Port Arthur in 1934 and in the next year produced 1,304,495 barrels of crude petroleum, crops valued at $1,866,873, and livestock valued at $1,511,061. In 1930, the county had 141 manufacturing establishments with products valued at more than $297 million. In 1938, the county produced clay and shells and raised 2.2 million bushels of rice on 40,000 ac of irrigated land as well as 1,000 bales of cotton,

corn, other feed crops, figs, and truck crops. Livestock totals included 100,000 beef cattle as well as dairy cattle, hogs, poultry, sheep, and goats. In foreign and coastal trade, Beaumont and Port Arthur shipped oil, cotton, lumber, and other products. Industries included oil refining, ship building, rice milling, food processing, and the manufacture of machinery, chemicals, garments, and crates. The Rainbow Bridge over the Neches River from Port Arthur to Orange was completed in 1938; with a vertical clearance of 54 m (176 ft) over the water, it was the South's tallest highway bridge.

In the 1940s, 26% of Jefferson County's farmers were tenant farmers. Because of the importance of the rice and beef crops, the Texas Rice Improvement Association, Texas A&M College, and the US Department of Agriculture established an experiment station for the improvement of rice and pasture cultivation as a joint project at Pine Island. The world's largest synthetic rubber plant, Neches Butane Products Company (now Texaco Chemical), was built at Port Neches in 1942. By 1949, the county had become highly industrialized and urbanized, with 6 oil refineries producing total daily capacities of more than half a million barrels, 3 rice mills, 11 tank farms, and 14 producing oilfields. New industry arrived as plants were established for the production of chemicals and petrochemicals. During World War II, the growth of shipbuilding in the Sabine-Neches Waterway brought in such firms as Bethlehem Steel, Gulfport, Weaver, Burton, and Jones and Laughlin. In the 1950s, the Spindletop field was still active, Gulf Oil laid pipelines, oilmen developed a new field at Hillebrandt Bayou, and sulfur mining began. The nickname applied to Orange, Port Arthur, and Beaumont, the "Golden Triangle," symbolized the close relationship that had grown up among the cities. Gulf State Utilities Company supplied electric power for much of Southeast Texas and southern Louisiana. In 1956, roughly 26 million tons of materials were shipped from the county's inland ports, including rice, cotton, rubber products, steel, sugar, flour, oil, and oil products. In 1960, the economy continued to be based on significant agricultural production but was dominated by Beaumont and Port Arthur, which together had become a commercial banking center and major chemical and petroleum products manufacturer. Port Neches was the site of Atlantic, Gulf, and Texaco refineries. By the 1970s, rice and cattle were the chief agricultural products, soybeans had been introduced, and residents were employed in the petrochemical, shipbuilding, and rubber industries.

In the 1980s, the county was one of the most densely populated in the state. Ninety-four percent of its roughly 250,900 residents lived in urban areas. Manufacturing establishments made products valued at more than $2 billion in a single year, and a total of 5,318 business establishments operated countywide. In the early 1990s, Lamar University and Lamar University-Port Arthur provided higher education in Jefferson County. A new county jail and a new state prison, the Mark Stiles Unit, opened, and a new unit of the federal prison system was under construction. The South Texas State Fair was held annually in October. Duck hunting and saltwater fishing attracted sportsmen to the area. Tourists visited a restored boomtown at Spindletop in Gladys City, a monument commemorating Richard Dowling's Confederate victory during the Civil War in Sabine Pass Battleground State Historical Park, and the Tex Ritter park and memorial in Nederland. Annual events include the Heritage Festival at Nederland in March, the Neches River Festival in Beaumont in April, the Beaumont Jazz Festival in July, Spindletop

Boom Days in Beaumont in September, the South Texas Fair in Beaumont in October, and the Saltwater Anglers Fishing Tourney in Port Arthur in May.

4.0 RESEARCH OBJECTIVES AND METHODOLOGY

The cultural resource 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 project area
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 Texas State Archeological Landmarks (SALs)
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 on 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), the General Land Office (GLO), and the Texas State Historical Association's and the General Libraries at The University of Texas at Austin's *Handbook of Texas Online*, as well as a program of intensive survey of the project area. No cultural resources were documented as a result of this survey, so the second and third of these goals were not pursued. The rest of this chapter presents the methodological background for the current investigations and the specific survey methods used in the field.

4.1 ARCHIVAL RESEARCH

Prior to conducting the archeological fieldwork, Horizon personnel reviewed existing archival documentation to acquire information on (1) previous cultural resource investigations conducted in the vicinity of the project area, and (2) any previously documented cultural resource properties in or near the survey corridor. Archival research conducted on the THC's online *Texas Archeological Sites Atlas* indicated that no previously recorded archeological sites have been recorded in the vicinity of the APE. No previous cultural resource surveys have been conducted in the vicinity of the project area, and the APE has not been previously surveyed for cultural resources.

4.2 SURVEY METHODS

On March 10, 2009, Horizon archeologists Reign Clark, project archeologist, and Jared Wiersema, archeological field technician, under the overall supervision of Jeffrey D. Owens, Principal Investigator, performed a cultural resource survey of the APE to locate any cultural resource properties that potentially would be impacted by the proposed construction project. The survey consisted of pedestrian walkover of the APE with systematic shovel testing. Field conditions were generally favorable at the time of the survey—the winter sky was slightly overcast, but visibility was good. Approximately half of the APE is covered by large, ponded wetlands; the other half is situated predominantly in open pastureland with limited areas of mixed deciduous hardwood forest near the north end of the project area (Figures 2 to 5). Visibility of the modern ground surface was generally fair, though vegetative ground cover reduced visibility to below 30% in many areas. An existing 2-track road ran along the edge of Bayou Din across much of the APE, though artificial disturbances otherwise appear to be relatively limited and the project area appears to be largely intact.

The project area is situated in a low, flat, fluviodeltaic environment on the terraces of Bayou Din, a meandering bayou that flows generally south-southeastward, on mature, Pleistocene-age clayey sediments of the Beaumont Formation that possess minimal potential to contain intact archeological deposits. No deep alluvial sediments were encountered that would have the potential to contain deeply buried, intact archeological deposits. Any cultural materials that may occur within the APE therefore would be expected to occur on or near the modern ground surface in deflated, erosional contexts and likely would lack integrity.

In general, intensive cultural resource survey activities entail a pedestrian walkover with surface inspection as well as excavation of subsurface probes, such as shovel tests and/or backhoe trenches. The APE was traversed on foot by Horizon archeologists in parallel transects, and the modern ground surface was thoroughly inspected for aboriginal and historic-age cultural resources. The Texas State Minimum Archeological Survey Standards (TSMASS) for cultural resource surveys state that, for block-area projects, a minimum of 1 subsurface probe per 2 acres is required in a project area of this size unless field conditions warrant excavation of more probes (e.g., due to the presence of culturally sensitive areas) or less probes (e.g., due to extensive prior disturbances or cultural low-probability areas). In the event that a probe yields evidence of subsurface cultural deposits, additional probes may be necessary to determine the horizontal and vertical extent of the subsurface deposits associated with the cultural resource. Thus, a minimum of 17 subsurface probes would be required within the 13.8-ha (34.0-ac) APE. Horizon excavated a total of 20 shovel tests during the survey, thereby exceeding the TSMASS requirements for a project area of this size (Figure 6). In general, shovel tests measured approximately 30 cm (12 in) in diameter and were excavated to a target depth of 1.0 m (3.3 ft) below ground surface, to the top of pre-Holocene deposits, or to the maximum depth practicable, and all sediments were screened through 6.35-millimeter (mm) (0.25-in) hardware cloth. In practice, most shovel tests were terminated at depths of 10 to 40 cm below surface (cmbs) due to the presence of dense, Pleistocene-age black clay sediments on and near the modern ground surface. Specific shovel test data are summarized in Appendix A.

Figure 2. Overview of Southern Portion of APE (Facing North)

Figure 3. Small Upland Area near North End of APE (Facing North)

Figure 4. View of 2-Track Road along Edge of Bayou Din (Facing East)

Figure 5. Typical View of Large Pond along Bayou Din (Facing North)

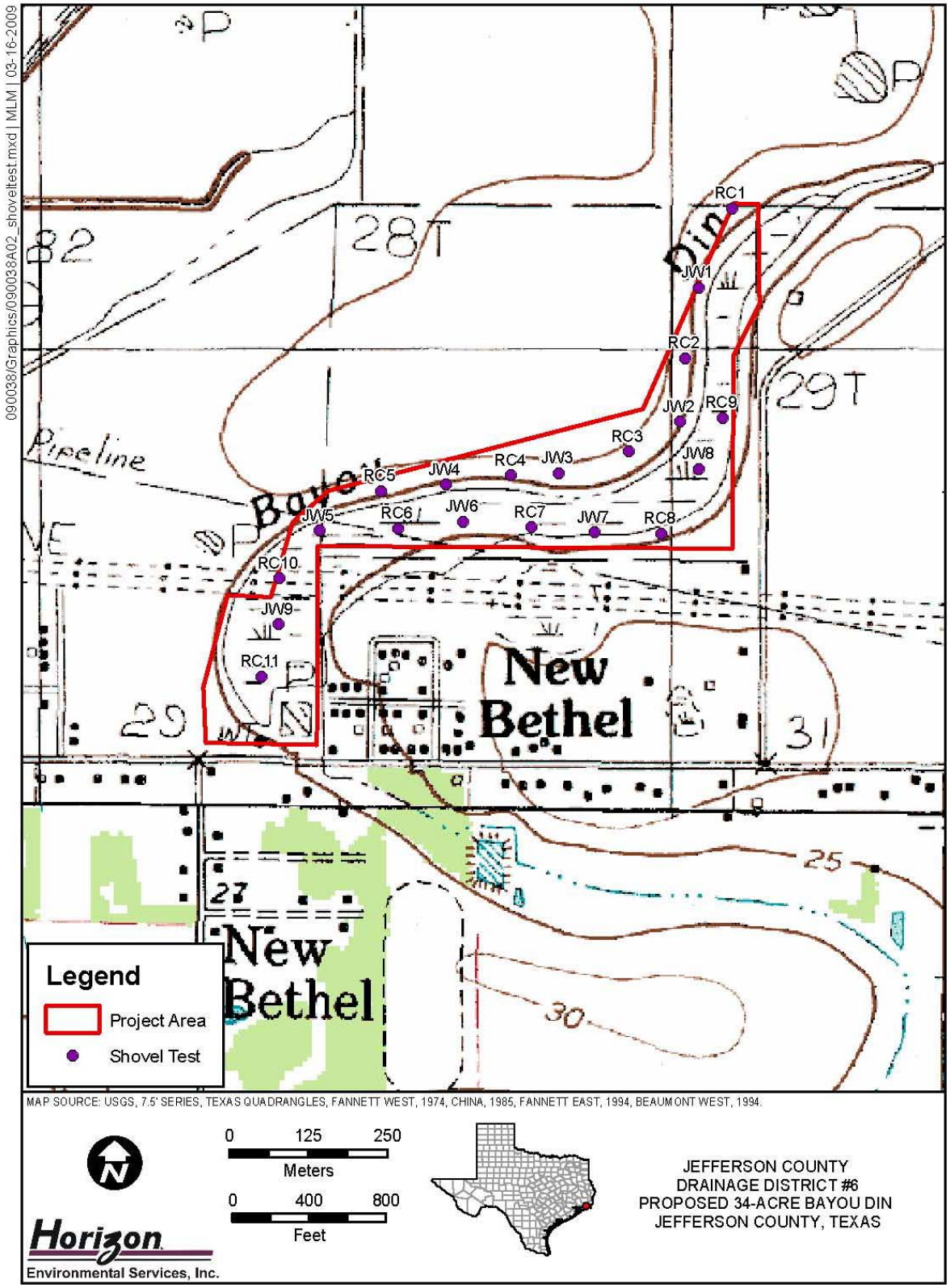

Figure 6. Location of Shovel Tests in Project Area

In addition to shovel testing, the TSMASS require backhoe trenching in stream terraces and other areas with the potential to contain buried cultural materials at depths below those that shovel tests are capable of reaching (approximately 80 to 100 cmbs or more in sandy sediments or 40 to 60 cmbs in clayey sediments). It was determined during the pedestrian survey that deep Holocene-age alluvial sediments that would require backhoe trenching were not present within the APE. Consequently, backhoe trenching was not conducted within the APE during the survey, and the pedestrian walkover with shovel testing is considered to constitute an adequate survey technique for assessing the potential of the project area to contain cultural resources.

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 resources were observed during the survey, the collections policy was not brought into play.

The Universal Transverse Mercator (UTM) coordinates of all subsurface probes, including shovel tests and backhoe trenches, were determined using hand-held Garmin ForeTrex Global Positioning System (GPS) devices based on the North American Datum of 1983 (NAD 83).

The survey methods employed during the survey represented a "reasonable and good-faith effort" to locate significant archeological sites within the project areas as defined in 36 Code of Federal Regulations (CFR) 800.3. The TSMASS requirements for subsurface probes were exceeded for a project area of this size.

5.0 RESULTS OF INVESTIGATIONS

JCDD6 is proposing to conduct flood-control operations, including channel dredging and spoil deposition, along an approximately 1.4-km- (0.9-mi-) long segment of Bayou Din southwest of Beaumont in Jefferson County, Texas. Soils derived from the proposed dredging of Bayou Din would be deposited on the banks adjacent to the channel, covering an area of approximately 13.8 ha (34.0 ac). The APE of the proposed undertaking covers a total area of approximately 13.8 ha (34.0 ac).

The project is being sponsored by JCDD6, a political subdivision of the State of Texas; as such, the project would fall under the jurisdiction of the Antiquities Code of Texas. In addition, the proposed undertaking would be conducted using a grant from FEMA; as such, the project also falls under the jurisdiction of Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended. As the project represents a publicly sponsored undertaking with the potential to impact significant cultural resources, JCDD6 was required to provide for a cultural resource inventory of the project's APE and to assess the project's possible impacts on any significant cultural resources in the APE. To meet its responsibilities under applicable federal and state laws, JCDD6 contracted with Horizon to obtain all necessary clearances for cultural resources.

On March 10, 2009, Horizon archeologists Reign Clark, project archeologist, and Jared Wiersema, archeological field technician, under the overall supervision of Jeffrey D. Owens, Principal Investigator, performed a cultural resource survey of the APE to locate any cultural resource properties that potentially would be impacted by the proposed construction project. The survey was conducted by Horizon under Texas Antiquities Permit No. 5197. The APE was traversed by Horizon's archeologists, the modern ground surface was thoroughly inspected for cultural resources, and a total of 20 shovel tests were excavated during the survey, thereby exceeding the TSMASS for a project area of this size.

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

6.0 SUMMARY AND RECOMMENDATIONS

6.1 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 one 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.

6.2 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 the Code of Federal Regulations (CFR) 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.

6.3 ELIGIBILITY CRITERIA FOR LISTING AS A STATE ARCHEOLOGICAL 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 archeological landmarks and are eligible for designation.

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 Section 26.8 of Part 2 of Title 13 of the Texas Administrative Code (13 TAC 26), the THC may designate an archeological site as an SAL if the site meets one or more of the following criteria:

1. [T]he site has the potential to contribute to a better understanding of the prehistory and/or history of Texas by the addition of new and important information;
2. [T]he site's archeological deposits and the artifacts within the site are preserved and intact, thereby supporting the research potential or preservation interests of the site;
3. [T]he site possesses unique or rare attributes concerning Texas prehistory and/or history;
4. [T]he study of the site offers the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; or,
5. [T]he high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is needed to ensure maximum legal protection, or alternatively further investigations are needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

6.4 SUMMARY OF INVENTORY RESULTS

The APE was traversed by Horizon's archeologists, the modern ground surface was thoroughly inspected for cultural resources, and a total of 20 shovel tests were excavated during the survey, thereby exceeding the TSMASS requirements for a project area of this size. No cultural resources, historic or prehistoric, were identified within the APE as a result of the survey.

6.5 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. No new cultural resources were identified in the APE as a result of survey activities, no previously recorded sites occur in the vicinity of the project area. Furthermore, no listed historic properties

are present in the vicinity of the project area that would be adversely 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 listing on the NRHP according to 36 CFR 60.4 or for designation as SALs according to 13 TAC 26, and no further archeological work is recommended in connection with the proposed undertaking. It is recommended that the proposed project be cleared to proceed. However, in the unlikely event that any human remains or burial furniture are inadvertently discovered at any point during construction, use, or ongoing maintenance in the project area, even in previously surveyed areas, all work should cease immediately and the THC should be notified of the discovery.

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APPENDIX A:

Shovel Test Data

Table A-1. Shovel Test Summary Data

ST No.	UTM Coordinates[1]		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
JW-1	379026	3320299	0-20	Dark brown clay (wet)	None
JW-2	378996	3320086	0-10	Dark brown clay (wet)	None
JW-3	378804	3320004	0-10	Brown clay (very wet)	None
JW-4	378625	3319986	0-10	Brown clay (very wet)	None
JW-5	378425	3319913	0-25	Brown clay (very wet)	None
JW-6	378653	3319927	0-25	Brown clay (very wet)	None
JW-7	378861	3319910	0-25	Brown clay (very wet)	None
JW-8	379027	3320011	0-25	Brown clay (very wet)	None
JW-9	378360	3319764	0-15	Dark brown clay	None
RC-1	379079	3320425	0-30	Dark brown sand	None
			30-100	Medium brown sandy loam	
RC-2	379005	3320187	0-50	Black sandy loam	None
			50-60	Dark brown clay (wet)	
RC-3	378915	3320039	0-20	Black sandy loam	None
			20-40	Black clay	
RC-4	378729	3320001	0-30	Dark brown sandy loam	None
			30-40	Dark brown clay	
RC-5	378522	3319976	0-30	Black clay (wet)	None
RC-6	378550	3319916	0-30	Black clay (wet)	None
RC-7	378761	3319918	0-30	Black clay (wet)	None
RC-8	378967	3319908	0-30	Black clay (wet)	None
RC-9	379064	3320092	0-30	Black clay (wet)	None
RC-10	378361	3319837	0-20	Mottled black and brown sandy clay	None
RC-11	378333	3319682	0-20	Black 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