Intensive Archeological Survey

Celanese Methanol Project

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Table of Contents

Appendices

Figures

Executive Summary

Celanese Ltd. (Celanese) owns and operates an acetyl intermediates chemical plant Facility (Facility) located at 9502 Bayport Boulevard in Pasadena, Harris County, Texas. Celanese is a global technology and specialty materials company that engineers and manufactures a wide variety of products essential to everyday living. Celanese proposes to expand its Facility to include a new methanol unit which is referred to as the Celanese Methanol Project (Project).

Cardno ENTRIX was contracted by Celanese to perform a cultural resources assessment on an approximate 183 acre tract in the city of Pasadena, Texas (Survey Tract). The Survey Tract is located northwest of the intersection of Bay Area Boulevard and Bayport Boulevard in Pasadena, Harris County, Texas. The cultural resource survey of the Survey Tract was performed in support of a U.S. Environmental Protection Agency (EPA) Green House Gas (GHG) Permit Application and U.S. Army Corps of Engineers, Galveston District (COE) Individual Section 404 Permit Application. The purpose of the survey was to identify any cultural resources that might be affected by the Project.

The area of potential effect (APE) for the current Project is considered to be the limits of proposed ground disturbance, which is equivalent to the boundaries of the Survey Tract. Cardno ENTRIX conducted an intensive archeological survey of the Survey Tract between September 10 and 14, 2012. The fieldwork was performed by James Ambrosino, Ph.D., RPA, with the assistance of April Watson, M.A., RPA.

The entire Survey Tract was pedestrian surveyed. A total of 58 shovel tests were excavated and nine test locations with minimal ground cover were surface inspected. As a result of this work, no prehistoric or historic archaeological sites were identified. Two bricks possibly older than 50 years in age were identified on the surface within the southern portion of the Survey Tract. However, the brinks were likely introduced with imported materials during construction of the Facility and associated road between 1966 and 1969; thus, not representatives of a historic site.

Based on the results of this investigation, the proposed Project will not affect any sites or properties that have historical, cultural, or sacred significance, or that otherwise meet the minimum criteria for listing in the National Register of Historic Places (NRHP). No further archeological or historical work is recommended for this proposed Project.

1 Introduction

Cardno ENTRIX was contracted by Celanese to perform a cultural resources assessment on an approximate 183 acre tract (Survey Tract) in the city of Pasadena, Texas. The cultural resource survey of the Survey Tract was performed in support of the Project EPA GHG Permit Application and COE Galveston District Individual Section 404 Permit Application. The purpose of the survey was to identify any cultural resources that might be affected by the Project. All work was performed in accordance with:

> Section 106 of the National Historic Preservation Act of 1966 (PL 89-665) as amended,

> 36 CFR Part 800: Protection of Historic Properties,

> 33 CFR Part 325, Appendix C,

> Archaeological and Historic Preservation Act of 1974 (PL 93-291) as amended, and

> Antiquities Code of Texas (Texas Natural Resource Code, Title 9, Chapter 191).

The Survey Tract is located northwest of the intersection of Bay Area Boulevard and Bayport Boulevard in Pasadena, Harris County, Texas (Figure 1-1). It is part of a much larger parcel listed by the Harris County Appraisal District as number 100-515-000-0020 at the physical address of 9502 Bayport Boulevard. The Survey Tract is bounded on the west by a dirt and gravel road running along the east side of Big Island Slough; on the north by a buried pipeline corridor; to the east by the developed portion of the Celanese Facility; and along the south by an above-ground hydrogen pipeline. The Survey Tract lies within southeastern Harris County, between about 3.25 and 3.50 miles west of Galveston Bay. It is situated along the east side of Big Island Slough which is approximately 1.65 miles north-northeast of the confluence with Armand Bayou. The Survey Tract is found on the La Porte, TX 1995 and League City, TX 1995 USGS 7.5-minute topographic quadrangles (Figure 1-2).

Cardno ENTRIX conducted an intensive archeological survey of the Survey Tract between September 10 and 14, 2012. The fieldwork was performed by James Ambrosino, Ph.D., RPA, with the assistance of April Watson, M.A., RPA. The report was written by James Ambrosino. Resumes for these staff members are included in Appendix A.

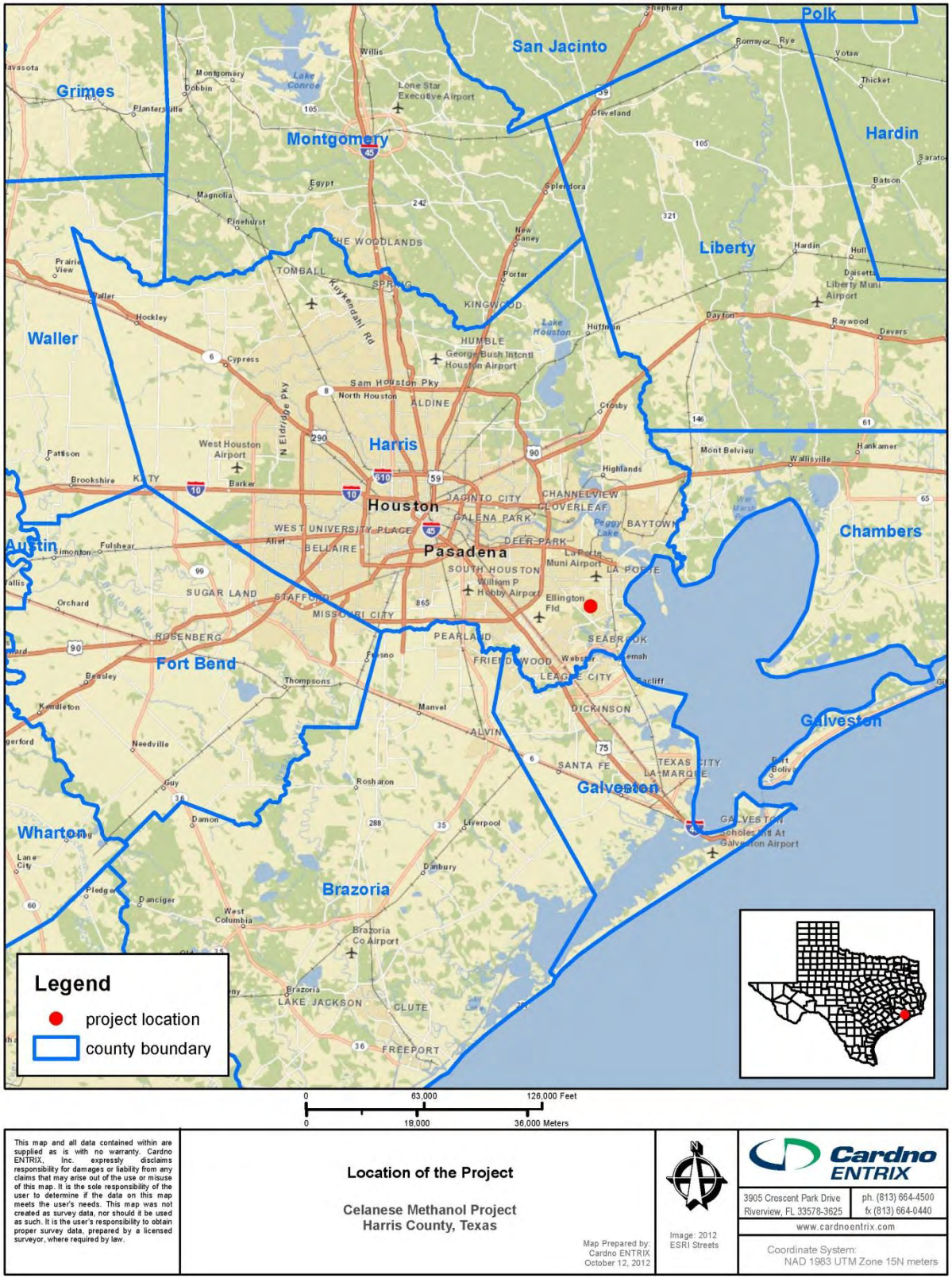

Figure 1-1 Location of Survey Tract within Harris County

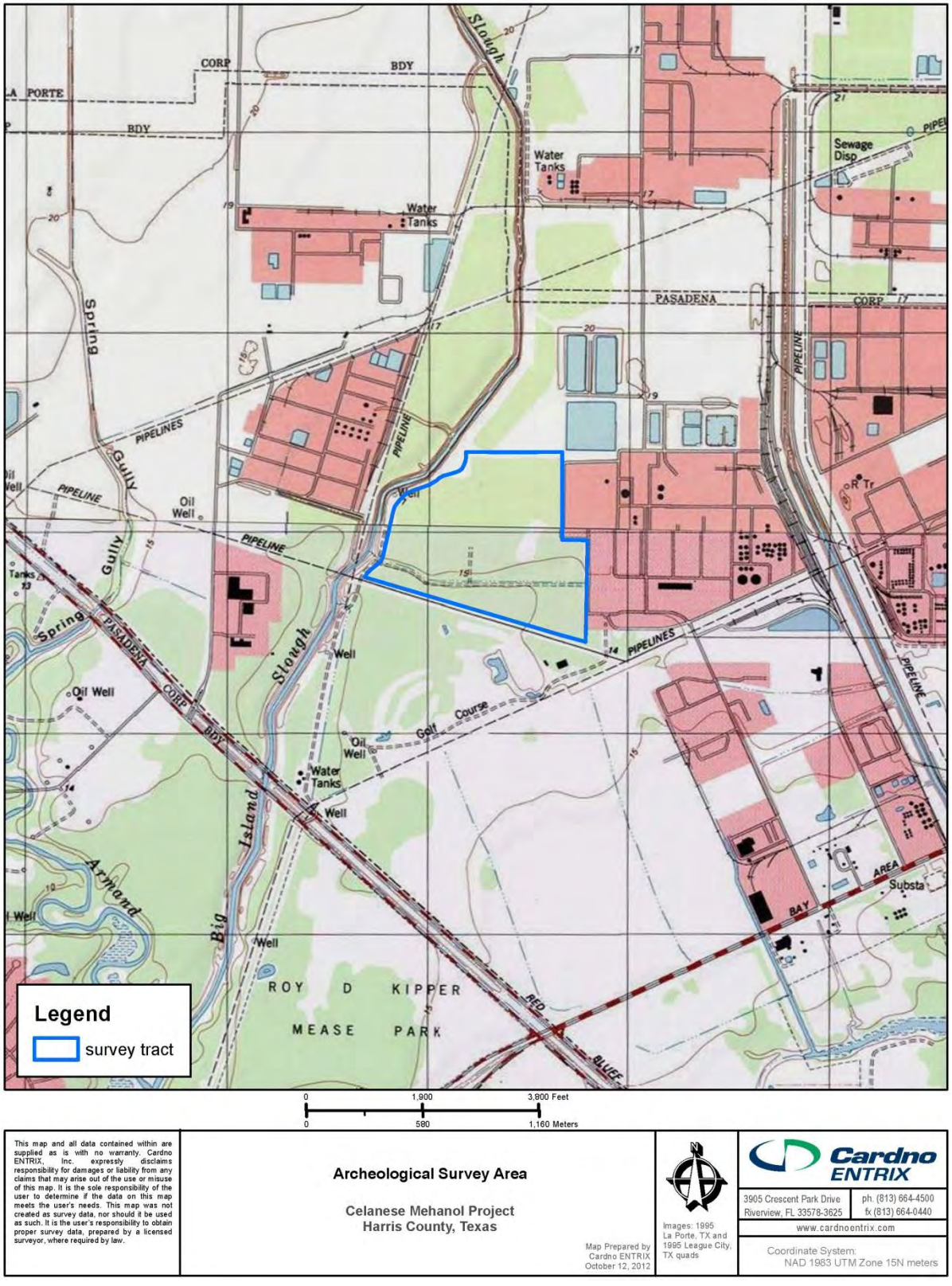

Figure 1-2 Location of the Survey Tract (topographic map)

2 Environmental Setting

2.1 Geography and Paleogeography

The Survey Tract lies within the Gulf Coastal Plains physiographic province, which forms most of east and south Texas. This is further divided into three subprovinces running parallel to the Gulf of Mexico. From the southeast to the northwest, this included the Coastal Prairies, the Interior Coastal Plans, and the Blackland Prairies. Beyond this are the Edwards Plateau within central Texas and the Grand Prairie farther north. The Survey Tract falls within the Coastal Prairies subprovince, which measures between 50 and 70 miles wide and consists of young deltaic sands, silts, and clays with very little slope. Elevations within this subprovince range from about 0 to 300 ft. above mean sea level (amsl) (Wermund 1996).

The Survey Tract is situated on a rather flat plain along the east side of Big Island Slough. Elevations within the Survey Tract range from a low of about 14 ft. amsl near the southeast corner to a high of about 17 ft. amsl across the northern portion of the property. Upper Galveston Bay lies between 3.25 and 3.50 miles to the east, and the Gulf of Mexico is approximately 27 miles away from the Survey Tract to the southeast.

Geologically, the Survey Tract falls within an area characterized as the Beaumont Formation. This geologic formation covers much of the Upper Texas Coast and is a mix of clays, silts, and sands laid down during the Pleistocene mostly along old meandering stream channels. The surface of the Beaumont Formation is somewhat featureless with pimple mounds evident in locations. Such low-relief pimple mounds were noted throughout the Survey Tract. Nearer the coast, the Beaumont Formation is overlapped by Holocene marsh and barrier island sediments. The Survey Tract lies within a portion of the Beaumont Formation that is characterized predominantly by clays and mud of low permeability and high shrink-swell potential (Aten 1983; Dillon 1982).

During the Late Pleistocene, the Galveston Bay area was essentially a wide meandering course of the Trinity-San Jacinto river system. Bathymetric studies have indicated that barrier island systems existed as much as 70 miles southeast of the current shoreline of Galveston Island between about 11,000 and 10,000 years before present (B.P.). At that time, the deltaic system within this portion of Texas included the combined: Trinity, San Jacinto, Sabine, Neches, and Calcasieu rivers. With the rise of sea levels during the initial part of the Holocene, Galveston Bay began to develop. By about 7500 B.P., the Trinity-San Jacinto river system had separated from the Sabine-Neches-Calcasieu system, and the shoreline was less than 10 miles beyond the current shoreline position. Between 7000 and 3500 B.P., sea levels continued to rise and the embayment process of Galveston Bay continued. Sea levels stabilized around 3500 B.P. when shorelines reached their most inland position, which may have been up to 15 miles inland from the current shoreline in the area of Sabine River northeast of Galveston Bay. After that time, depositional processes dominated and formed the current shoreline and barrier island system (Aten 1983; Rehkemper 1969).

2.2 Soils

Two distinct soil types are mapped within the Survey Tract, roughly dividing the area in half to either side of a north-south line. The eastern half of the Survey Tract is mapped as Beaumont clay (Ba), while the western half is mapped as Vamont clay, 0 to 1 percent slopes (VaA).

Beaumont clay is a nearly level, poorly drained soil found in broad, often irregular areas throughout the coastal prairie. Gilgai microrelief is often distinct in undisturbed areas characterized by this soil (Wheeler 1976:11). This is visible as a series of microknolls and microridges that formed due to the expansion of clay subsoil through the absorption of water introduced through shrink-swell cracks, root holes, and animal burrows (Gustavson 1975). Beaumont clay typically has a very firm, dark gray to gray clay surface layer about 21 inches thick. It then grades into a very firm, grayish brown clay subsoil mottled with olive

brown and strong brown. Native vegetation generally consists of grasses including andropogon, paspalum, and panicum, but pines and hardwoods have encroached in places (Wheeler 1976:11).

Vamont clay, 0 to 1 percent slopes, is a nearly level, somewhat poorly drained soil found in areas of the county ranging from 10 to hundreds of acres in size. Undisturbed areas are characterized by gilgai microrelief. The surface layer is about 8 inches thick and composed of firm, dark grayish brown clay. Below this is mottled yellowish brown and gray clay about 16 inches thick, which is classified as mixed A and C-horizon material. Very firm grayish brown clay with yellowish mottles underlies this. Native vegetation consists mostly of grasses including little bluestem, longleaf uniola, beaked panicum, and sedges; although, pines and hardwoods also grow (Wheeler 1976:22).

2.3 Vegetation

The Survey Tract was mostly characterized by very thick vegetation consisting of scattered mature trees, dense saplings, and dense but patchy vines. About 10 percent or less of the area consisted of open, grassy areas. The open, grassy spaces included two small rectangular areas, one in the center of the Survey Tract and one along the eastern edge that was surrounded by a chain-link fence. Other open, grassy areas consisted of pipeline corridors and roadways running along the margins and within the southern portion of the Survey Tract which are best shown on Figure 5-1. A dirt/gravel road and drainage ditch runs east to west, extending from the operating Facility boundaries through the southern half of the Survey Tract. The drainage ditch runs parallel to the road along the north side. This road was constructed with imported material during construction of the Facility in the late 1960s.

The majority of the Survey Tract is fairly low and has been delineated as potential jurisdictional wetlands (Cardno ENTRIX 2012). Upland portions are predominantly confined to open, grassy areas, although a small wooded area within the southeast corner of the Survey Tract was also characterized as upland.

The dominant tree species noted throughout the area included Chinese tallow (*Sapium sebiferum*), sweetgum (*Liquidambar styriciflua*), and willow oak (*Quercus phellos*). Cardno ENTRIX noted these species as mature trees and saplings, with Chinese tallow saplings being especially dense within specific areas. Also prevalent throughout the Survey Tract was yaupon holly (*Ilex vomitoria*), American beautyberry (*Callicarpa americana*), sawtooth blackberry (*Rubus argutus*), and muscadine (*Vitis rotundifolia*) (Cardno ENTRIX 2012). Sawtooth blackberry was especially overgrown and thick along a generally east-west trending line through the north-central portion of the Survey Tract. This often necessitated altering the course of pedestrian transects to work around practically impenetrable vegetation. Ground cover consisted of various herbaceous species throughout, although microdepressions within the wooded areas were often bare.

Figures 2-1 through 2-3 illustrate the vegetation and field conditions within the Survey Tract at the time of the cultural resource survey.

2.4 Climate

The climate of Harris County is generally mild with temperatures moderated by winds from the Gulf of Mexico. Weather data collected at the Houston National Weather Service Office between 1981 and 2010 indicates July and August are the hottest months with mean daily maximums of 90.7 degrees F, while January is the coldest month with mean daily minimum temperature of 43.4 degrees F. Temperatures drop to freezing only about 7 days per year and then usually only for a few hours per day. The close proximity to the Gulf and Galveston Bay also results in abundant rainfall and relatively frequent fog. Average annual rainfall between 1981 and 2010 was roughly 57 inches per year. June and September are typically the wettest months, while February through April are the driest months. Localized thunderstorms are the predominant source of rainfall resulting in highly variable daily rainfall amounts over different portions of the county. Destructive tropical storms occasionally pass through the area, but are relatively infrequent (National Climatic Data Center 2012; Wheeler 1976).

Figure 2-1 Photograph East-Central Portion of Survey Tract (facing west)

Figure 2-2 Photograph West-Central Portion of Survey Tract (facing northwest)

Figure 2-3 Photograph North-Central Portion of Survey Tract (facing south-southwest)

3 Historic Context

3.1 Prehistoric Background

The cultural sequence of southeast Texas has been subdivided into a number of broad temporal units or periods (Aten 1983; Patterson 1995; Ricklis 2004; Story 1990). These major periods include the Paleoindian, Archaic, and Ceramic periods, each of which are further divided into sub-periods. Within southeast Texas, these periods are based more on characteristic material remains (artifacts) rather than perceived developments in lifeways, such as patterns of subsistence and settlement or sociocultural organization. Throughout all periods, a general nomadic hunter-gatherer existence is evident within this and other portions of Texas (Patterson 1995:243).

The Paleoindian Period in Texas generally dates from approximately 9200 to 6000 B.C., and represents the first well-accepted occurrence of humans in the western hemisphere (Turner and Hester 1999). Paleoindian populations were generally highly adaptive and mobile hunter-gatherers whose recent ancestors were Upper Paleolithic Siberians who migrated across the present Bering Strait during the Late Pleistocene, when sea levels were approximately 60 meters lower than present levels. During the Late Glacial era, when initial human colonization of the eastern United States (U.S.) is postulated, climatic changes followed the receding of the continental ice sheets, and there was a widespread extinction of megafauna.

Within Texas, the Paleoindian Period is usually divided into early and late subperiods, although various authors differ slightly as to the timing of the split and constituent stone tool forms of the two subperiods (Ensor 1990; Patterson 1995; Ricklis 2004; Story 1990; Turner and Hester 1999). The Early Paleoindian Period is generally associated with fluted lanceolate spear points including Clovis and Folsom. Unfluted lanceolate forms including Plainview and San Patrice were first produced around 8200 B.C., which some researchers see as the start of the Late Paleoindian Period. Early side-notched forms such as Big Sandy as well as the wide stemmed Scottsbluff form co-occur with these unfluted lanceolate points. The problem within Southeast Texas is that all Paleoindian finds were either noted as isolated surface finds or mixed with later Archaic occupations. No discrete Paleoindian components have been reported within the area thus limiting the archeological interpretations that can be made (Ricklis 2004).

The Archaic Period dates from about 6000 B.C. to A.D. 100 and consists of three parts: Early (6000 to 3000 B.C.), Middle (3000 to 1500 B.C.), and Late (1500 B.C. to A.D. 100). The distinction between each period is based primarily on stylistic changes in projectile points. The Archaic is associated with the Holocene geologic epoch. After the demise of some types of Pleistocene fauna, human subsistence strategies became more diverse and included new plant, animal, and aquatic species. These changes are seen in the way stone tools changed through time. Smaller side-notched spear points or knives and points with bifurcated bases replaced the large multifunctional lanceolate-shaped spear points used during the Paleoindian period. These smaller tools, often referred to as dart points, were designed to be thrown or launched with a spear thrower (atlatl), or hafted to handles and used as knives (Patternson 1995; Ricklis 2004).

Although several Early Archaic sites are known from the inland Southeast Texas region, it is not until the Middle Archaic that we have good evidence of intensive use of the coastal region (Aten 1983; Ricklis 2004). This evidence comes in the form of several Middle and Late Archaic shell middens around Clear Lake, along the Trinity River delta, and around Galveston Bay. These tend to be made up of brackish water shellfish, mostly Common Rangia and oyster. Analysis of food remains at the Eagle Ridge site along the Trinity River delta indicated that in addition to shellfish, white-tailed deer and various species of estuarine fish provided a significant portion of the diet during both the Middle and Late Archaic periods (Ricklis 2004).

Available site component data suggests that the greatest prehistoric population levels within Southeast Texas may have occurred between the Late Archaic and the subsequent Early Ceramic period. Patterson (1995) suggests this may have to do with a variety of factors including a more productive climate, increased hunting efficiency, adaptation to a wider range of food resources, and/or migration into

the region. Ricklis (2004) notes that the apparently high population levels correspond with the stabilization of modern sea levels and formation of current estuaries within the region.

The Early Ceramic period, which dates from about A.D. 100 to 700, is essentially a continuation of the Late Archaic lifeway with the addition of ceramics. Patterson (1995) notes that stone tool assemblages are more or less identical during the Late Archaic and Early Ceramic periods. Early Ceramic components are also typically found directly overlapping Archaic components suggesting fundamental similarities regarding settlement and subsistence patterns (Ricklis 2004). Aten (1983) has suggested that ceramics represent a diffusion of material culture from the east along the Gulf of Mexico. The earliest ceramics within the Upper Texas Coast, dating to about 70 B.C., are found at the eastern end of the region around Sabine Lake and are very similar to Tchefuncte ceramics from Louisiana. They reach the Galveston Bay area around A.D. 100 and areas farther west along the coast in the following few centuries.

The Late Ceramic period, often referred to as the Late Prehistoric period, begins about A.D. 700 in the Galveston Bay area and is distinguished by the introduction of bow and arrow technology. This is evidenced by the appearance of tiny stemmed and barbed or notched point forms, noticeably smaller than previously known dart points. Patterson (1995) notes four major arrow point types within Southeast Texas including Alba, Catahoula, Perdiz, and Scallorn. Although the Late Ceramic period is traditionally seen as ending approximately A.D. 1500 with the initial arrival of Europeans, the general way of life remained unchanged until the advent of Spanish missions in the eighteenth century (Hester and Turner 2012).

At the time of European contact, the Native American group occupying the Galveston Bay area and immediately inland locations was the Akokisa. During the mid-eighteenth century, the Akokisa were said to occupy the area from the mouth of the Neches River west to the area midway between the Trinity and Brazos rivers. They were bordered to the northeast by the Atakapa and to the southwest along the coast by a linguistically related group of tribes collectively referred to as the Karankawa (Aten 1983).

3.2 Historic Background

Early European exploration of the Texas coast included the expedition of Alonso Álvarez de Pineda in 1519. Pineda was the first to fully map the Gulf of Mexico including the Texas coast. There is no indication that Pineda landed in Texas, however. In 1528, the expedition of Pánfilo de Narváez wrecked near Galveston Island. Of the surviving members of the expedition, the most famous is Álvar Núñez Cabeza de Vaca who remained in the area of Galveston Bay for four years and traded among the native population (Freeman 1990).

The next European attempt to colonize the northwest Gulf Coast was by the French explorer René Robert Cavelier, Sieur de la Salle. Attempting to reach the Mississippi River, he overshot his mark and landed instead in Matagorda Bay along the central Texas coast. He established Fort St. Louis there in 1685. The fort, which was eventually destroyed by a native group in 1689, was perceived as a threat to Spain and served to renew Spanish interest in Texas (Freeman 1990).

Starting in the late seventeenth century and continuing into the eighteenth century, several Spanish missions were established throughout Texas. The missions, while seeking to religiously convert native populations, also served important political ends by attempting to turn potential enemies into Spanish subjects who would support the crown through allegiance and labor (Milanich 1995). The Spanish, in their initial attempts to settle Texas in the 1690s and by doing so check French expansion, relied heavily on missionaries, but with little success. By the mid-eighteenth century, the establishment of military presidios became the predominant method to control the native groups of the Texas frontier (Weber 1992). In the Galveston Bay area, the Spanish mission and presidio complex of El Orcoquisac was established near the mouth of the Trinity River in 1756 but was eventually abandoned in 1771 (Henson 2012).

When Mexico gained its independence from Spain in 1821, Texas became part of an independent nation. As a way to colonize this sparsely populated part of its new nation, Mexico opened Texas to immigration from the U.S. Stephen F. Austin was authorized as empresario or colonization agent, and Anglo-

Americans began settling in large numbers due to the draw of cheap land. Officially organized as the Mexican state of Coahuila y Tejas in 1824, it was the large influx of Anglo-Americans that made Texas unique within Mexico and likely ripe to break away. The Texas Revolution began in October 1835 at the Battle of Gonzales on the Guadalupe River and ended in April 1836 with the capture of Mexican president Santa Anna at the Battle of San Jacinto in Harris County (Campbell 2003).

Between 1836 and 1845, Texas existed as an independent republic, although Mexico still considered it part of its territory. In 1845, Texas was annexed by the U.S. and made a U.S. state on the same day as annexation. Following the Mexican-American War, which happened in the wake of the annexation, the southern border was finally fixed at the Rio Grande. Following annexation, the influx of immigrants from the southern U.S. increased. Additionally, large numbers of immigrants from Europe, especially Germany, arrived in the 1840s and 1850s. The character of the state was still very much like neighboring southern states, and slavery was endorsed in the state constitution (Campbell 2003).

In February 1861, Texas seceded from the Union and officially joined the Confederate States of America the following month. During the Civil War, most Texans in the Confederate Army served in areas west of the Mississippi, but several regiments served in major battles fought east of the Mississippi. While no major battles occurred on Texas soil, the Texas coast was a significant focus of Union blockades starting in 1862 since it was an important supply state. Following the end of the war, reconstruction began with the arrival of occupying Union troops at Galveston Bay and at Marshall in Harrison County, the latter having been the center of the Confederate Trans-Mississippi command (Campbell 2003).

The late nineteenth century saw the expansion of ranches into the Indian frontier of West Texas and the rise of cattle ranching as big business. During this time, however, the majority of the Texas populace earned a living through farming, much like people throughout the South. The latter decades of the nineteenth century also saw significant urban growth in cities such as Dallas, Fort Worth, San Antonio, Galveston, and Houston. The arrival of the railroad also spurred industry within the state, especially milling, lumbering, and mining (Campbell 2003).

Industry and commercial development in Texas came to the forefront in the early twentieth century due to oil. Although crude oil was known to exist in the state and was actually drilled immediately post-Civil War, the first significant commercial production did not begin until 1894 in Corsicana just south of Dallas. Several other oil strikes were made throughout Texas in the first decade of the twentieth century, setting the stage for additional industrial development in the decades to follow (Campbell 2003).

3.2.1 Harris County

Harris County was originally called Harrisburg County and was established by the Republic of Texas on December 22, 1836. It originally encompassed the town of Harrisburg, the eastern part of modern Houston, along with Galveston Island. The modern boundaries of the county were established in 1838, and the name was officially changed to Harris County the following year. Harris County is named for John R. Harris, one of the original Anglo-American pioneers who settled the area in the 1820s in response to Stephen F. Austin's empresario grants (Henson 2012).

The early settlers of the county were U.S. southerners, many of whom brought along black slaves. By the 1840s, a number of German and French immigrants settled within the county as well, mostly within the areas north and west of Houston. Early settlement was at first predominantly along waterways, but after the Civil War a main focus was along railways. Several railroads, some of the earliest in the state, were established in the Houston area in the years immediately prior to and after the Civil War (Henson 2012).

Harris County became an industrial power with the development of the Houston Ship Channel starting in 1911. Following improvement of the waterway and development of the Port of Houston, various industries, notably oil refineries began locating along Buffalo Bayou and the San Jacinto River. This resulted in a surge of population to the area, making Harris the most populous county in Texas by 1930 (Henson 2012).

4 Archival Research

4.1 Land Use History

4.1.1 Early Land Ownership

The Texas General Land Office provides access to the Original Texas Land Survey via an online GIS application. This data was searched to determine the earliest recorded ownership of the Survey Tract. The area including both the Survey Tract and the rest of the Celanese Facility was first deeded to George B. McKinstry on November 24, 1830. The area of the deed amounted to one league, which is equivalent to approximately 4,428 acres.

George B. McKinstry was a trader and civil servant who was born in Ireland and arrived in Texas, likely via Georgia, in 1829. He was appointed as the first postmaster of Brazoria in Brazoria County just south of Harris County in 1830. He was involved in the Anahuac Disturbance of 1832, which was one of the events that precipitated the Texas Revolution. In 1836, McKinstry was appointed the first chief justice of Brazoria County by President Sam Houston. Stephen F. Austin died at McKinstry's home in Columbia, Brazoria County in December 1836. George B. McKinstry died December 1837 in Brazoria and was buried in Columbia (Cutrer 2012).

McKinstry lived in Brazoria and Columbia, and all of his civil servant positions were in Brazoria County. While he was the grantee of land in Harris County including the Survey Tract, there is no evidence that he ever established a home on that land.

4.1.2 Property Appraiser Records

Harris County Appraisal District online records were searched for information on more recent ownership of the Survey Tract. These records dated back to the 2006 tax year. Between 2006 and present 2012 (date of this report), the Survey Tract has been owned by Celanese.

4.2 Historic Aerials and Maps

The use of historic aerial photography allows us to look at both the presence of historic structures within a project area and changes over time to the environmental setting. A series of aerial photographs from 1953 to 2004 was available online (Nationwide Environmental Title Research, LLC [NETR] 2011). Aerial images from additional years between 1953 and 1989 were available through the EarthExplorer online GIS application maintained by the USGS (http://earthexplorer/usgs.gov).

Aerial images from 1953, 1957, and 1962 all show most of the Survey Tract to have been wooded except for portions along the eastern edge. The pipeline corridor marking the southern boundary was in existence by 1953, and the northern half of Big Island Slough had been canalized by this early date. The 1964 aerial image shows the entire stretch of Big Island Slough within the vicinity of the Survey Tract to have been canalized including widening of the northern section and a maintained corridor cleared to either side.

Sometime between 1966 and 1969, the east-west road through the southern portion of the Survey Tract was built. This road was likely built in 1967, which according to information provided by Celanese employees was when construction of the existing Celanese Facility commenced. The 1969 aerial image shows the Celanese Facility to the east of the Survey Tract. None of the historic aerials depict any buildings within the Survey Tract.

Historic USGS topographic quadrangles are also often useful in understanding the development of a particular project area. In addition to topography, such maps show cultural features including structure locations, roads, railways, and pipelines. Several previous editions of the La Porte, Texas topographic quadrangle were available for study including 1916, 1944, 1955, and 1967 maps. Previous editions of the League City, Texas topographic quadrangle available included 1943, 1955, and 1969 maps.

The 1916 quad, which was available only for the northern half of the Survey Tract, shows that the northern section of Big Island Slough was canalized by this time (Figure 4-1). Additionally, a north-south running canal was in existence approximately 0.3 miles east of the Survey Tract. The quads from 1943 and 1944 show no additional development beyond what was present in 1916, but they do indicate the extent of the wooded area. The first pipelines, including one along the southern boundary and one just west of the Survey Tract, appear on the 1955 quads. The 1969 League City quad shows that the southern section of Big Island Slough had recently been canalized, and the road running east-west through the southern part of the Survey Tract had been built. Portions of the new Celanese Facility are also depicted in the 1969 photorevision on the League City quad. No structures are indicated within the Survey Tract on any of these historic quads.

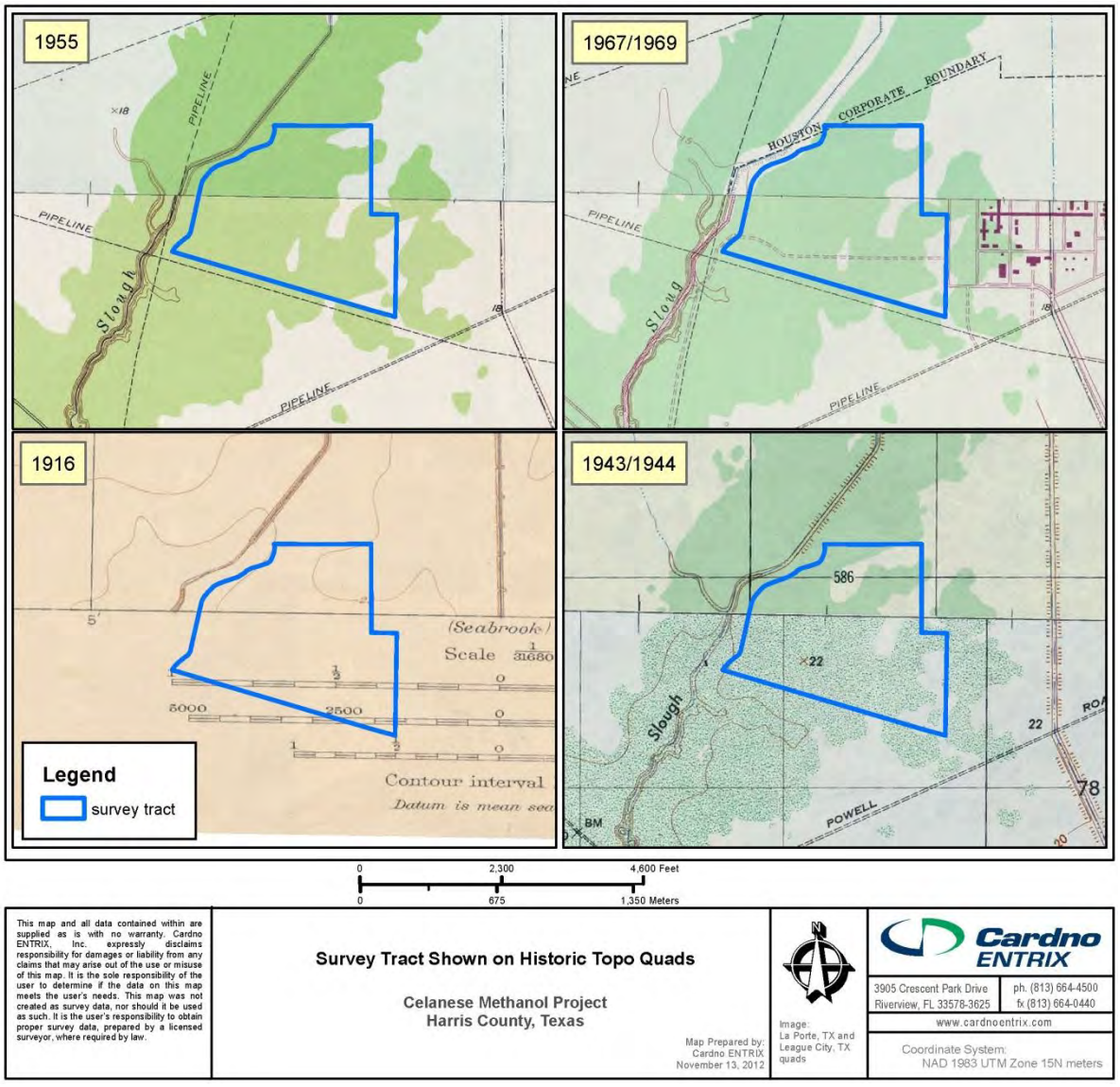

Figure 4-1 Survey Tract on Historic USGS Topographic Quadrangles

4.3 Previously Recorded Resources

A review of the Texas Archeological Sites Atlas was made of the Survey Tract and within a 1-mile radius of the tract. This review revealed one previously recorded archeological site and one National Register district located within 1 mile of the Survey Tract.

Archeological site 41HR149 was recorded in 1970 by members of the Houston Archeological Society. The site was recorded as a possible prehistoric shell midden. It was identified eroding from the west bank of Big Island Slough, about 0.3 miles southwest of the southwest corner of the Survey Tract. The site recorder noted that 33 clam shell fragments and one piece of bone were found within a thin layer, but no artifacts were seen. The site is currently listed as undetermined for eligibility by the recorder for placement on the NRHP; therefore, it may potentially be eligible, however, the SHPO has not made a determination of eligibility for the site. The site was recorded at a location near an industrial plant that (according to historical aerial photographs) was constructed sometime after 1978. Due to industrialization of the area, site 41HR149 may no longer exist. If the site does remain in place, a stand of trees along Big Island Slough would serve as a visual buffer between the site and the proposed Project. Thus no impacts would occur from construction of the proposed Project.

The Armand Bayou Archeological District is a National Register district that was listed on the NRHP on December 12, 1978. The district measures nearly 45,000 acres in size and runs along Armand Bayou south into Mud Lake, just north of Clear Lake. The northern extent of the Armand Bayou Archeological District lies due west of the Survey Tract and at its closest point is about 0.7 miles away. The district was originally recorded as having 12 contributing sites, each of which lie greater than 1 mile from the Survey Tract. The district is significant for both its prehistoric and nineteenth-century historic occupations. The Armand Bayou Archeological District is heavily wooded; therefore its 12 contributing sites would not be visible from the proposed Project area. Thus no impacts would occur from construction of the proposed Project.

5 Research Design

5.1 Objectives

The objective of this cultural resource identification survey was to locate and evaluate any historic properties located within the Project APE, which for this Project is defined as the boundaries of the Survey Tract. Prehistoric and historic archaeological sites, structures, land forms, cemeteries, landscapes, traditional cultural properties, and linear resources (historic roads, railroads, and canals), were among the types of historic properties looked for during this investigation.

The first part of the research strategy was to compile background, or archival, information about the Survey Tract. State and local agency records and the "gray" literature were searched for relevant data. This information was used to generate a site predictive model for the Survey Tract to guide the field investigations. Previous survey work in the general vicinity and within the region was consulted to provide an overview of the types of resources that might be encountered, and to give insight into the methods used by other researchers. The Texas Archeological Sites Atlas was searched for any previously recorded archaeological or historical resources within or adjacent to the Survey Tract that would merit special consideration. The Survey Tract was mapped on a USGS 7.5' topographic quadrangle to indicate slope and distance to water, important factors in developing a site predictive model. Soil data and environmental surveys were used to characterize the environmental setting of the Survey Tract, and identify areas more suitable for prehistoric or historic settlement. Both primary and secondary resources were used to develop a historic context of the Survey Tract and surrounding region.

5.2 Expected Results

Throughout southeast Texas, the larger prehistoric sites tend to be located in proximity to important water sources including along the coast and inland along major rivers and creeks. These areas are often where two or more different environmental settings interface. Such locations gave the early inhabitants access to a variety of resources in one place. Distance to potable water is a key factor in predicting site location. Rivers, creeks, and lake shores were favored locations. Sites found in upland settings farther from water tend to be small lithic scatters or campsites. Within the Galveston Bay area, shell middens are commonly found along shorelines and riverbanks in estuarine settings. Such sites tend to date between the Middle Archaic and Late Ceramic periods, with Paleoindian and Early Archaic sites presumably having been inundated following rising sea levels and now located on the continental shelf. Although the Survey Tract is located along the east side of Big Island Slough, prior to the canalization of this waterway it was only a minor stream. The Survey Tract is located greater than 3 miles away from the Galveston Bay estuary and over 1 mile away from known sites along Armand Bayou. For these reasons, the probability of prehistoric archeological sites within the Survey Tract is low.

Distance to water is not as significant of an indicator when it comes to historic sites, but major rivers were still important during early historic times since they formed the major transportation corridors to the interior. Although the Survey Tract is known to be part of a larger 1830 land grant to George B. McKinstry, this historical figure is known to have made his home in Brazoria County to the south. There is no historical evidence that he ever built a home on this grant in Harris County. Also, map research indicated no structures to have existed within the Survey Tract since 1916, and only very recent development within the area. Thus, the probability of encountering historic archeological sites within the Survey Tract is also low.

5.3 Procedures to Deal with Unexpected Discoveries

Although the Survey Tract was subjected to an intensive archaeological survey, the possibility remains that prehistoric or historic archaeological materials or sites could be encountered. If any suspicious materials, prehistoric or historic artifacts, or suspected bones or other indications of human remains are

encountered during subsurface excavation then all work in that area should be stopped and moved to another area until the location can be inspected. Artifacts could include prehistoric pottery, concentrations of shell, bone, and dark soil stains that feel "greasy." This area may also contain human burials, either by themselves or in small groupings. Should any of these be identified during ground disturbing activities, all digging should be **STOPPED** at said location. No digging should be conducted to "confirm" suspicions. And the hole should not be filled. The area should be secured and a consult with the Archeology Division of the Texas Historical Commission (THC) should be notified. Representatives of Cardno ENTRIX can assist in consulting with the THC and in the identification and preliminary assessment of the materials. In the case of human remains, Cardno ENTRIX archeologists can assist with the filing of a Notice of Existence of Cemetery with the county clerk and other requirements of Chapter 711 of the Texas Health and Safety Code.

5.4 Field Methods

Cardno ENTRIX conducted an intensive archeological survey of the Survey Tract on September 10 through 14, 2012. The fieldwork was performed by James Ambrosino, Ph.D., RPA, and April Watson, RPA, and was performed to meet the guidelines for archeological surveys set forth by the THC and the Council of Texas Archeologists.

The current archeological survey included the excavation of a regular series of shovel tests along pedestrian transects throughout the entire Survey Tract. For areas measuring between 101 and 200 acres in size like this one, the THC recommends placing no less than 1 test per 3 acres. During this survey, there were a total of 67 test locations, which amounted to 1 test per 2.7 acres. Removing recently disturbed locations from the survey area including roadways, pipeline corridors, and the fenced area along the eastern side which contained modern debris and gravel on the surface, results in a testing frequency that is closer to 1 test per 2.2 acres. These tests were placed more or less along a 90-m grid throughout the Survey Tract.

Of the 67 total test locations, 58 represent shovel tests (STs) excavated according to the above methodology (Figure 5-1). The other nine test locations fell within areas that had between 60 and 100 percent surface visibility and were only surface inspected. Most of these areas corresponded to wetland depressions, but one was located along a dry drainage ditch/firebreak. Within these particular locations, a wide surface area, generally about 20 m diameter, was carefully surface inspected for artifacts or historic features. The fenced clearing along the eastern side was not shovel tested because it contained modern debris and gravel on the surface throughout. The entire Survey Tract was subjected to pedestrian surface inspection for prehistoric and historic artifacts and features.

Shovel tests measured 30 cm (12 in.) diameter and were dug at least into subsurface horizons. The spoil was screened through ¼-in. (0.64-cm) hardware cloth mesh except where thick clays and clay loams were encountered. In these cases, which accounted for roughly 80 percent of the shovel tests, the soil was carefully hand troweled to search for artifacts. Over most of the area, ground cover ranged from 75 to 100 percent. Ground cover of about 0 to 40 percent was noted within limited wetland areas and within disturbed ditches or firebreaks.

The Universal Transverse Mercator (UTM) coordinates of all shovel tests and surface inspection areas were recorded using a hand-held Global Positioning System (GPS) device with Wide Area Augmentation System (WAAS) correction enabled and set to North American Datum (NAD) 83 datum. Digital color pictures were taken of relevant features and to illustrate the Survey Tract setting. All field measurements were taken in metric units. All fieldwork was documented on standardized field forms.

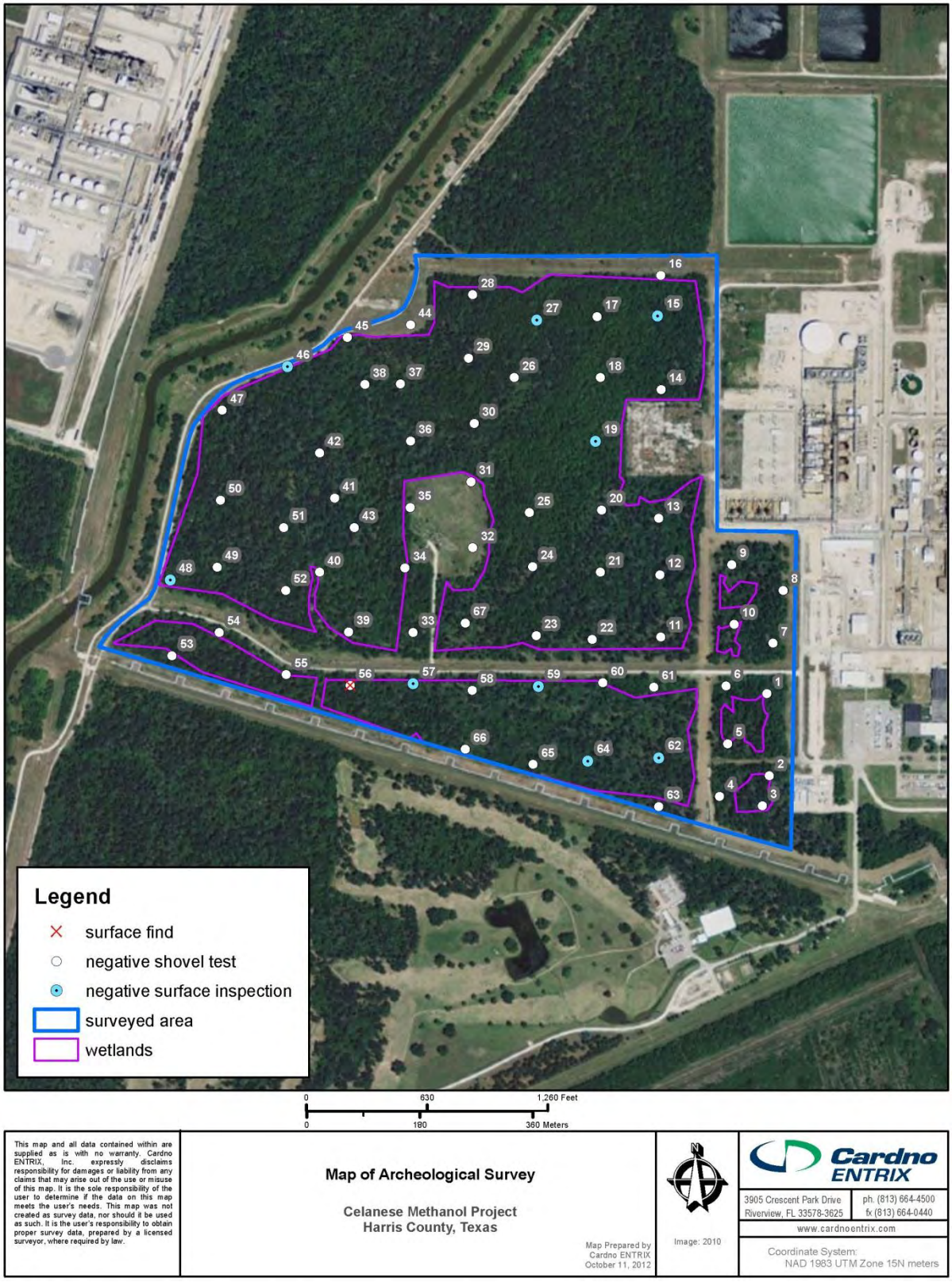

Figure 5-1 Intensive Archeological Survey Tract Data

5.5 Laboratory Methods

No laboratory methods were used, since no prehistoric or historic cultural materials were recovered during this investigation.

Copies of the field notes, maps, and other paperwork generated during the course of this survey along with digital photographic image files will be stored at Cardno ENTRIX under file number 72388001.00.

5.6 Criteria for NRHP Eligibility

Cultural resources are evaluated for potential NRHP eligibility based on several criteria (National Register of Historic Places 1998:2). "The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting materials, workmanship, feeling, and association."

To be considered significant, the historic property must meet one or more of the four National Register of Historic Places criteria *in addition* to possessing integrity:

> Be associated with events that have made a significant contribution to the broad patterns of our history; or

> Be associated with the lives of persons significant in our past; or

> Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

> Have yielded, or may be likely to yield, information important in prehistory or history.

Criterion D is most commonly applied to archaeological sites, while A, B, and C are most often used to evaluate buildings and structures (National Register of Historic Places 1998).

6 Survey Findings

A total of 58 shovel tests were excavated and 9 test locations with minimal ground cover were surface inspected during the current survey (see Figure 5-1). Generally, the soil noted within the shovel tests consisted of firm to very firm clay throughout. Most of the shovel tests east of the central clearing were characterized by a surface layer of brown to grayish brown clay above a subsurface zone of gray clay with reddish brown mottles. The surface layer was typically between 10 and 20 cm thick but in a couple shovel tests was up to 35 cm thick. In as much as 20 percent of the shovel tests within the eastern half of Survey Tract, the surface layer was completely absent. This may be the result of recent disturbance.

The shovel tests excavated west of the central clearing tended to have a thin surface layer of gray to brownish gray clay followed by a subsurface layer of gray clay with yellow mottles. The surface layer within these tests tended to be only about 5 to 10 cm thick and was absent in places. Shovel testing within the central clearing showed the soils to be somewhat thicker within this area. For example, ST 32 contained three soil zones. The first was a dark brown clay about 10 cm thick below which was 30 cm of orange-brown clay with limestone gravel throughout. Finally, below this we encountered very firm gray clay with reddish brown mottling similar to the subsurface zone noted in adjacent wooded areas.

No historic or prehistoric cultural materials were recovered from the shovel tests excavated within the Survey Tract. Clay skeet disc fragments from two of the shovel tests (ST 31 and ST 32) were identified within the centrally located open, grassy area. These were only possible cultural materials identified from subsurface contexts within shovel tests. Upon further investigation, the clay sheet disc fragments had florescent orange paint adhering to most pieces, which indicated these materials are modern.

Two bricks possibly older than 50 years in age were identified on the ground surface; ST 56 was excavated near this location (Figure 6-1). Cardno ENTRIX did not encounter any subsurface artifacts within ST 56 or in any of the other nearby shovel tests. During a thorough examination of the ground surface within the vicinity, no additional artifacts or any indications of structural remains were identified. Both bricks, which were identified within 2 m of each other, were buff colored fire bricks stamped with “A. P. GREEN / LONESTAR” (Figure 6-2). The A.P. Green Fire Brick Company began in 1910 when Allen Percival Green purchased Mexico Brick and Fire Clay in Mexico, Missouri. The company was incorporated in 1915. During the 1930s, A.P. Green expanded both domestically and internationally (Moore and Trout 2012). The Lonestar brand of fire bricks was likely produced at their plant in Sulphur Springs, Texas (Langston 2012).

The two bricks were found on the surface within a possible wetland about 10 to 15 m south of the existing road running east-west throughout the southern portion of the Survey Tract. No physical evidence of any structures was identified within the Survey Tract. Research of historic maps and aerial photographs confirmed development of road but did not identify the presence of any previous structures within the Survey Tract. Given the location near the existing road along with the lack of additional bricks or other historic artifacts or features within the Survey Tract, the bricks appear to be out of context and likely brought to the site the late 1960s when the road was constructed with imported material. For these reasons, the bricks were not recorded as an archeological site.

Figure 6-1 Photograph Bricks South of East-West Road

Figure 6-2 Photograph Brick with "A. P. GREEN / LONESTAR" Stamp

7 Summary and Recommendations

In September 2012, Cardno ENTRIX performed an intensive archeological survey of the 183-acre Survey Tract for Celanese. The entire Survey Tract was pedestrian surveyed. A total of 67 test locations were inspected, including 58 excavated shovel tests and 9 surface test locations with minimal ground cover. As a result of this work, no prehistoric or historic archaeological sites were identified. Two bricks possibly older than 50 years in age were identified on the ground surface within the southern portion of the Survey Tract; however, they are believed to have been introduced between 1966 and 1969 during construction of the east-west road with imported material; thus, are not considered representatives of a historic site.

Based on the results of this investigation, the proposed Celanese Methanol Project will not affect any sites or properties that have historical, cultural, or sacred significance, or that otherwise meet the minimum criteria for listing in the NRHP. No further archeological or historical work is recommended for this proposed Project.

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Celanese Methanol Project

APPENDIX A

STAFF RESUMES

James N. Ambrosino, PhD

Current Position
Project Archaeologist

Discipline Areas
> Cultural Resource Management
> Section 106 NHPA
> Prehistoric & Historic Archaeology
> Preparation of Research Designs
> ICRMP Preparation
> GIS Mapping & Analysis
> Statistical Analysis
> Total Station Mapping
> Southeast US, Mesoamerica, Caribbean

Years' Experience
23 Years

Joined Cardno
2012

Education
> PhD, Anthropology, Southern Methodist University, 2007
> MA, Anthropology, University of Iowa, 1990
> BS, Statistics, University of Delaware, 1988

Certifications
> Florida Department of Transportation PD&E Training, 2008
> National Guard Bureau ICRMP Training, 2007
> Section 106 Review, ACHP and University of Nevada, Reno, 2003
> First Aid/CPR/AED, 2012

Summary of Experience

Dr. James N. Ambrosino is a Registered Professional Archaeologist with more than 23 years of experience in conducting archaeological surveys throughout the United States (Alabama, Florida, Georgia, Iowa, Minnesota, Mississippi, New Mexico, North Carolina, Pennsylvania, South Carolina, Tennessee, Texas, and Virginia), Mexico, and the Caribbean. Dr. Ambrosino serves as project archaeologist and principal investigator for projects in Florida and elsewhere throughout the southeastern United States. His duties include archaeological work, preparation of reports, preparation of bids, and GIS and statistical analysis of archaeological data.

Dr. Ambrosino has extensive experience on a variety of archaeological projects, including cultural resource inventories, reconnaissance surveys, large and small-scale cultural resource assessment surveys, site testing, and archaeological mitigation. He has been principal investigator on over 250 cultural resource projects for military, pipeline, telecommunication, transportation, and development clients. He also has updated and developed cultural resource management plans for various agencies.

Dr. Ambrosino has experience directing both small and large-scale cultural resource investigations. His dissertation work involved large-scale excavation within a Maya city in Yucatan, Mexico, where he directed crews as large as 80 Spanish and Yucatec Mayan-speaking workers. Dr. Ambrosino has conducted and overseen all aspects of cultural resource projects ranging in size up to 10,000-acre surveys. He also has extensive experience with GIS analysis and statistical analysis of archaeological data, as well as site mapping using electronic total stations, ceramic analysis, and macroscopic lithic analysis. Dr. Ambrosino has developed and taught training seminars concerning cultural resource regulations and practices designed for engineering, environmental, and housing professionals. Additionally, he has provided training for archaeological technicians in field methodology, on various computer packages including GIS, and in the use of surveying equipment.

Significant Projects

Energy Projects

Project Archaeologist – Virginia Southside Expansion Project Third Party Environmental Assessment, Virginia

Cardno ENTRIX was contracted to perform third party review and develop an Environmental Assessment for the Federal Energy Regulation Commission of a Transco natural gas pipeline expansion in southern Virginia. Dr. Ambrosino is serving as the cultural resources specialist for the project, reviewing cultural resources impacts and documentation, and authoring relevant sections of the EA document.

Principal Investigator – Phase I Cultural Resource Identification Survey, Williams Gas Pipeline Smart Pig Project, Buckingham and Fluvanna Counties, Virginia

This was a Phase I archaeological survey of two work areas and two access roads on both sides of the upper James River within central Virginia prior to proposed facility modifications. The archaeological survey involved the excavation of close-spaced shovel tests within the project area, which measured approximately 2.4 acres in size. Dr. Ambrosino performed and oversaw all fieldwork, laboratory analysis, and historical research for the project and was lead author on the report of the investigations.

Principal Investigator – Phase II Archaeological Testing of 31DV720, Mid-South Pipeline,

Affiliations

- Register of Professional Archaeologists
- Society for American Archaeology
- Florida Anthropological Society
- Lambda Alpha, National Anthropology Honors Society

Davidson County, North Carolina
This project involved archaeological testing of a mid-nineteenth to twentieth century farmstead with several standing and ruined structures along a proposed access road for a natural gas pipeline expansion project. Dr. Ambrosino performed and oversaw all fieldwork and laboratory analysis for the project and was lead author on the report of the investigations.

Principal Investigator – Phase II Archaeological Testing of 1DS95, Mid-South Pipeline, Dallas County, Alabama
This project involved archaeological testing of a large site with prehistoric Archaic and Woodland as well as nineteenth century historic components. The work was done prior to construction of a compressor station for a natural gas pipeline expansion project. Dr. Ambrosino performed and oversaw all fieldwork and laboratory analysis for the project and was lead author on the report of the investigations. The fieldwork included formal test unit excavation as well as large scale mechanical excavation of grader strips.

Principal Investigator – Phase III Data Recovery at 1AU364, Momentum Pipeline, Autauga County, Alabama
This project involved archaeological data recovery to mitigate adverse effects of a natural gas pipeline expansion project on a significant prehistoric archaeological site. Dr. Ambrosino developed the research design for the archaeological investigation, oversaw all fieldwork and laboratory work, and authored the report of the investigation. Dr. Ambrosino performed specialized lithic and ceramic analysis for this project.

Principal Investigator – Ground Penetrating Radar Survey of Two Cemeteries along the Momentum Pipeline, Alabama
This project included GPR survey within and around two historic cemeteries to determine if any graves might be impacted by nearby work associated with a natural gas pipeline expansion project. Dr. Ambrosino oversaw the GPR survey performed by a subconsultant and performed ground truthing of anomalies. Dr. Ambrosino also performed historical research into the cemeteries and authored the report.

Environmental Projects

Principal Investigator – Phase I Cultural Resources Survey of the Nicodemus Slough Water Management Project, Glades County, Florida
This was a cultural resource assessment survey of a proposed 22-mile earthen berm corridor and archaeological reconnaissance survey of approximately 6,000 acres for a water management public private partnership project. The project was located within a large cattle ranch west of Lake Okeechobee and north of the Everglades. Dr. Ambrosino directed all fieldwork for the project and authored the report of investigations. Dr. Ambrosino also participated in various consultation efforts related to the project involving the Florida SHPO, Army Corps of Engineers, Seminole Tribe of Florida, and South Florida Water Management District.

Government Projects

Project Manager – Phase I Survey of the Upper Tampa Bay Trail Phase IV Project Corridor, Hillsborough County, Florida
This was a cultural resource assessment survey of a 4.3-mile corridor for a proposed recreational trail. The project was performed for the Hillsborough County Parks, Recreation and Conservation Department and the Intermodal Systems Development section of the Florida Department of Transportation. The corridor traversed a mix of county and state owned lands and required a state-issued archaeological research permit. Dr. Ambrosino was in charge of client contacts, oversaw all field and laboratory work, and authored the report of investigations.

Co-Principal Investigator and Mapping Specialist – Total Station Mapping and Archaeological Testing of the Historic Transportation Network of Fort Dade, Egmont Key, Florida

This project was performed for the U.S. Fish and Wildlife Service and was done to aid in their stewardship of the historic brick roadway system constructed between 1904 and 1909. Dr. Ambrosino performed the total station mapping of the transportation network including 1.7 km of brick roadways, 1.7 km of concrete roadways, 1.3 km of concrete sidewalks, and various entryways, ramps, and building pads. Individual areas of missing and slumped bricks and previous repair patches were mapped. Dr. Ambrosino produced detailed CAD maps and was lead author on the final report of the investigations.

Principal Investigator – Phase I Survey and Phase II Testing at the LL Middle School Project Area, Hillsborough County, Florida

This was a multi-stage project including initial cultural resource assessment survey and subsequent testing of potentially eligible archaeological sites prior to construction of a middle school by the Hillsborough County School District. Dr. Ambrosino performed and oversaw all field and laboratory work associated with both stages of the project and was lead author on all reports.

Industrial/Commercial Development

Project Archaeologist – Haile Gold Mine Third Party Environmental Impact Statement, Lancaster County, South Carolina

The Army Corps of Engineers is assessing the impacts of reactivating the existing Haile Gold Mine near Kershaw, South Carolina, for the development of gold resources, to expand the area for open pit mining, and to construct associated facilities. Dr. Ambrosino is serving as a consulting archaeologist on the project, reviewing cultural resources impacts, assisting with sections of the EIS document, and performing third party review of cultural resource survey reports. He is also participating in various consultation efforts related to the project.

Principal Investigator – Phase I Survey of the Celanese Methanol Project, Harris County, Texas

This project involved an intensive archaeological survey of a 183-acre tract near Houston, Texas, prior to expansion of a chemical plant facility. The survey was performed in support of a US EPA Green House Gas Permit Application and US Army Corps of Engineers 404 Permit Application. Dr. Ambrosino performed and oversaw all field work associated with the project and authored the report of the investigation.

Principal Investigator – Phase I Survey and Phase II Testing of South Pasture Mine Infill Parcels, Hardee County, Florida

This was a multi-stage project including cultural resource assessment survey and subsequent testing of potentially eligible archaeological sites prior to expansion of phosphate mining activities by CF Industries. Dr. Ambrosino performed and oversaw all field and laboratory work associated with both stages of the project and was lead author on all reports.

Principal Investigator – Phase II Testing of the Arrow Site and the Pizo 113 Site in Hillsborough and Manatee Counties, Florida

This project involved Phase II testing at two prehistoric sites located within proposed phosphate mining areas for Mosaic Fertilizer. Dr. Ambrosino oversaw all archaeological work for this project and authored the reports. He also operated the total station and produced the finished CAD maps for the project.

Principal Investigator – Phase III Data Recovery at 8DA5918, a Black Earth Midden in the Everglades, Miami-Dade County, Florida

This site was a prehistoric midden located on a tree island that was expected to be

impacted by proposed limestone mining activities. The work included an initial feasibility study intended to recover information about the condition of the midden to develop a mitigation plan. The data recovery phase included the excavation of ten 1-x-2-m units, some of which were adjacent to each other. The site was found to be predominantly an Archaic midden with later Woodland intrusions at the summit, including two human burials. Dr. Ambrosino served as mapping specialist for the project and oversaw laboratory analysis of materials as well as report writing. This included synthesizing the results of a detailed faunal analysis performed by a subconsultant into the interpretation of the site. Dr. Ambrosino also participated in consultation meetings related to this project between the US Army Corps of Engineers and the Seminole and Miccosukee Tribes.

Military

GIS Analyst – Cultural Resource Summary of Fort Benning, Georgia
Dr. Ambrosino performed GIS analysis of previously recorded site data on Fort Benning and tested predictive models of site location. This project involved the summary of data collected over a decade or more by several cultural resource consultants.

Principal Investigator – Integrated Cultural Resources Management Plan Update for Installations of the Florida Army National Guard
This project involved updating an existing ICRMP for 65 installations statewide maintained by the Florida Army National Guard. Major document revisions to the previous ICRMP were necessary to place it within a format that was adopted by the National Guard Bureau for state National Guards nationwide. As part of the ICRMP process, Dr. Ambrosino assisted in the facilitation of a consultation meeting between the National Guard and interested Native American Tribes. Dr. Ambrosino authored the updated ICRMP and served as presenter and participant during the consultation meeting.

Principal Investigator – Phase I Survey and Phase II Testing of Navy Family Housing Public/Private Venture, Florida and Mississippi
This was a multi-stage, multi-year project including cultural background studies, cultural resource assessment surveys, and archaeological testing of potentially eligible sites performed prior to privatization of family housing, which was planned at various naval activities in the continental U.S. The work was performed on NAS Jacksonville, NAS Key West, NAS Pensacola, NAS Whiting Field, NAVSTA Mayport, and NAVSTA Panama City in Florida, and NAS Meridian, NAVSTA Pascagoula, and NCBC Gulfport in Mississippi. Dr. Ambrosino was tasked with general project management related to fieldwork and report preparation over the course of the project.

Private

Project Manager and Principal Investigator – Topographic Mapping and Site Testing of 8SO51 (Old Oak Site), Sarasota County, Florida
This project was performed for local landowners of adjacent properties that encompass most of a large prehistoric shell mound site along Sarasota Bay. Dr. Ambrosino was contracted to produce a topographic map and tie in previous archaeological excavation units to a newly established grid using an electronic total station. Additionally, he performed limited testing to determine the extent of the subsurface deposit across the site

Residential Development

Project Manager and Principal Investigator –Phase II Testing of 8PA165, 8PA168, and 8PA2682 within the Evans Properties Pasadena Hills Parcel, Pasco County, Florida
This project involved archaeological testing of three prehistoric lithic sites within an orange grove prior to rezoning for residential development. Dr. Ambrosino managed all aspects of the project, including client relations and overseeing all field and laboratory work. He also

was lead author on all reports produced for this project.

Principal Investigator – Phase I Survey and Phase II Testing of Two Sites within the Southern Oaks DRI Project Area, Sumter County, Florida
This was a multi-stage project including cultural resource assessment survey and subsequent testing of potentially eligible archaeological sites prior as part of a Development of Regional Impact study. Dr. Ambrosino oversaw all field and laboratory work associated with both stages of the project and was the primary contact for the client throughout the project. As part of this project, Dr. Ambrosino developed a unique testing procedure in consultation with the Florida SHPO tailored towards the unusually widespread archaeological lithic scatters located within the area.

Principal Investigator – Phase III Data Recovery at Site 8IR45 (Head Cove Midden), Indian River County, Florida
This project involved archaeological data recovery within a shell and bone midden located on a small residential lot to mitigate adverse effects of planned development. Dr. Ambrosino produced a topographic map of the site, oversaw the field investigation, and produced the final report of investigations. As part of the project, he managed subconsultants and synthesized results of their analyses into the report.

Telecommunications

Dr. Ambrosino has served as Principal Investigator on cultural resource assessments of numerous cellular tower locations throughout Florida and in Georgia, North Carolina, and the U.S. Virgin Islands. These projects involved archaeological survey of areas of direct effects and assessments of effects on historic viewsheds of proposed cellular towers.

Transportation

Principal Investigator – Phase I Survey of the FEC Amtrak Passenger Rail Study Project Area, Florida
This project was performed for Florida Department of Transportation, District 4. It involved conversion of an existing historic rail line to accommodate high speed passenger rail service between Jacksonville and West Palm Beach. The project included assessment of the historic rail line including bridges, archaeological and historical survey of proposed sidings, and an assessment of potential visual, sonic, and vibration effects on historic properties near road crossings. Dr. Ambrosino performed the assessment of indirect effects at road crossings, oversaw production of reports, and attended onsite client meetings over the course of the project.

Principal Investigator – Phase I Survey of the West Bay Parkway (CR 388) Project between SR 77 and SR 79, Bay County, Florida
This project involved an initial cultural resource background study and subsequent archaeological and historical survey of approximately 12-miles of route alternatives for a new highway. The project was performed for Florida Department of Transportation, District 3. Dr. Ambrosino oversaw all field and laboratory work associated with both stages of the project and was lead author on the reports.

Principal Investigator – Phase I Survey of State Road A1A and Phase II Testing of Chobie Midden (8IR985), Indian River County, Florida

This was a multi-stage project including cultural resource assessment survey and subsequent testing of a potentially eligible archaeological site prior to construction of a bicycle path along SR A1A on barrier islands of the central east coast of Florida. Dr. Ambrosino oversaw the field and laboratory work for the project and produced the reports of the investigations.

Thesis and Dissertation

> Ambrosino, James N. 2007. Warfare and Destruction in the Maya Lowlands: Pattern and Process in the Archaeological Record of Yaxuna, Yucatan, Mexico. Ph.D. dissertation. Southern Methodist University.

> Ambrosino, James N. 1990. Classic Maya Inscriptions: An Epigraphic Approach to Political Organization. Master's thesis. University of Iowa.

Published Papers and Monographs

> Stanton, Travis W., David A. Freidel, Charles K. Suhler, Traci Ardren, James N. Ambrosino, Justine M. Shaw, and Sharon Bennett. 2010. Archaeological Investigations at Yaxunà, 1986-1996: Results of the Selz Foundation Yaxuna Project. BAR International Series. British Archaeological Reports, Oxford.

> Ambrosino, James N. 2003. The Function of a Maya Palace at Yaxuna: A Contextual Approach. In Maya Palaces and Elite Residences: An Interdisciplinary Approach, edited by Jessica Joyce Christie, pp. 253-273. University of Texas Press, Austin.

> Ambrosino, James N., Traci Ardren, and Travis W. Stanton. 2003. The History of Warfare at Yaxuna. In Warfare and Conflict in Ancient Mesoamerica, edited by M. Kathryn Brown and Travis W. Stanton, pp. 109-124. Altamira Press, Walnut Creek, CA.

> Ambrosino, James N. 2002. The Ritual Destruction of Buildings in the Maya Lowlands: Evidence from Yaxuna, Yucatan, Mexico. In Memorias del Tercer Congreso Internacional de Mayistas, vol. I, edited by Ana Luisa Izquierdo, pp. 361-373. Centro de Estudios Mayas, Instituto de Investigaciones Filológicas, Universidad Autónoma de México, México, D.F.

> Ambrosino, James N., Traci Ardren, and Kam Manahan. 2001. Fortificaciones defensivas en Yaxuná, Yucatán. In Yucatán a través de los siglos: Memorias del 49º Congreso Internacional de Americanistas, Quito, Ecuador, 1997, edited by Ruth Gubler and Patricia Martel, pp. 49-66. Universidad Autónoma de Yucatán, Mérida, México.

> Ambrosino, James N. 1995. Inter-societal Contact and the Rise of the State: A Brief Note from Work in Progress. In Alternative Pathways to Early State, edited by Nikolay N. Kradin and Valeri A. Lynsha, pp. 54-59. Dal'nauka, Vladivostok, Russia.

April A. Watson, RPA

Current Position
Staff Archaeologist

Discipline Areas
> Prehistoric archaeology
> Human osteology
> Geographic Information Systems
> Remote sensing of the environment

Years' Experience
4

Joined Cardno
2012

Education
> MA, Anthropology, Florida Atlantic University, 2011
> BA, Anthropology, Florida Gulf Coast University, 2003
> AA, Edison Community College, 2001

Affiliations
> Register of Professional Archaeologists
> Forensic Archaeological Recovery
> Archaeological Institute of America
> Florida Anthropological Society

US EPA ARCHIVE DOCUMENT

Summary of Experience

Ms. Watson is an archaeologist focusing on prehistoric human adaptations and interactions with the environment, cultural resource management, and the use of GIS in both the academic and CRM arena

Significant Projects

Florida History LLC Boca Raton, Florida

Archaeological Monitor for Site 1 Impoundment. Subcontractor Army Corp of Engineers. Primary duties include daily monitoring of ongoing construction activities. Assisting prime consultant with questions regarding archaeological issues. Providing recommendations for archaeological sites.

Florida Atlantic University Boca Raton, Florida

Department of Anthropology at Florida Atlantic University – Teaching Assistant. Prepared weekly lectures for Culture and Society and Introduction to Anthropology courses for up to 175 students. Extensive use of Blackboard as a teaching tool. Developed and proctored quizzes and exams. Assessed students' oral presentations as well as biweekly written assignments. Planned and assessed research papers on anthropological topics.

FPAN – Southeast Fort Lauderdale, Florida

Received summer internship to develop four archaeology lesson plans for use in summer camps. Developed lesson plans tied to Florida Sunshine State Standards.

New South Associates Naples, Florida

Performed Phase I survey of Picayune Strand national park as a part of the Everglades wetland restoration program. Worked as a subcontractor for the Army Corp of Engineers. Excavated 40x40cm shovel tests, screening with handheld ¼" screens, to recover artifacts, identify ecofacts, and to establish boundaries of known archaeological sites.

Panamerican Consultants Tampa, Florida

CRM Field Technician, participated in Phase I & II surveys, architectural surveys and historic resource impact studies throughout the state of Florida. Excavated metric test units 30x30cm shovel tests, screening with 1/4" screens, to recover artifacts, identify ecofacts and obtain information about soil stratigraphy. As a lab technician, sorted, analyzed and prepared artifacts for curation, as well as participated in curation of files and artifacts for ongoing and past sites.

University of Maine Farmington, Maine

Scientific Technician, performed excavations and shovel test surveys in three locations in Vermont under the direction of Field Directors from the Department of Archaeology at the University of Maine. Excavated 150x150cm units, 50x50cm shovel tests, and remote sensing to recover artifacts and ensure compliance with Vermont State Section 205 laws.

Florida Gulf Coast University Fort Myers, Florida

Archaeological Field Technician, under Professor Corbett Torrence, M.A.. This includes various periods of paid and volunteer labor, performed as a trainee and student at Florida Gulf Coast University and the Department of Environmental Science. Excavated 1x1m

units, 50x50cm shovel test surveys, some use of TotalStation laser survey device, as well as extensive mapping and soil profiling. At the Pineland site, on Pine Island, Florida, excavated 1x1m units in a contiguous grid within the larger historical and archaeological context. Performed laboratory analysis of shell tools and marine faunal remains, as well as curation of artifacts and materials.

Florida Gulf Coast University Fort Myers, Florida

Excavated portions of Galt Island, a shell mound called Boat Mound, in 1x1m units, supervised by FGCU Professor of Archaeology Corbett Torrence, M.A.. Laboratory experience in artifact and shell analysis. Site was located in Pine Island Sound.

Publications

> Brown, Clifford T., Larry Liebovitch, April Watson, and Urszula Strawinska. 2012. Changing Inequality in Ancient Maya Society. First author with paper presented in the symposium “Bruce H. Dahlin Memorial Session Part 1: Ancient Maya Economies” held at the 76th Annual Meeting of the Society for American Archaeology in Memphis, TN on Friday, April 20th, 2012.

> Brown, Clifford T., April Watson, Ashley Gravlin-Beman, and Larry S. Liebovitch 2012 Poor Mayapán, in The Ancient Maya of Mexico: Reinterpreting the Past of the Northern Maya Lowlands, edited by Geoffrey Braswell. London: Equinox Publishing. In press.

> Strawinska, Urszula, Larry S. Liebovitch, April Watson, and Clifford T. Brown (2012). The Evolution of Inequality in Ancient Maya Society. Submitted to PLoS ONE. Under review.

> Brown, Clifford, April Watson, Ursula Strawiska, and Larry S. Liebovitch. 2011 La Evolución de la Desigualdad Económica en la Sociedad Maya Antigua, Invited paper presented at the III Congreso Internacional de Cultura Maya: Civilización, Colapso, Crisis, y Coyuntura, held in Mérida, Yucatán, México, March 14th, 2011.

> Brown, Clifford, April Watson and Larry S. Liebovitch. 2010 La Auto-Organización de la Civilización, Invited keynote address presented at the “Primer Congreso Mexicano de Ciencias de la Complejidad” held at the Universidad Autónoma de México on October 4th through 6th, 2010, in México, D.F.

> Brown, Clifford, April Watson, Ashley Gravlin-Bemin, and Larry S. Liebovitch. 2010 Wealth and Society at Mayapán, first author with Paper presented in the symposium “The Ancient Maya of Yucatán: Papers in Honor of E. Wyllys Andrews V, Part I” held at the 75 Annual Meeting of the Society for American Archaeology in St. Louis, Mo. on Saturday, April 17th, 2010.

> Watson, April 2011 Predicting Archaeological Site Location in Cuba. Master’s Thesis, Department of Anthropology, Florida Atlantic University, Boca Raton.