

US EPA ARCHIVE DOCUMENT

*An Intensive Cultural Resources Survey for the  
Proposed ExxonMobil Baytown Olefins  
Plant Ethylene Expansion Unit Project  
Harris County, Texas*

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**AN INTENSIVE CULTURAL RESOURCES SURVEY FOR THE  
PROPOSED EXXONMOBIL BAYTOWN OLEFINS PLANT  
ETHYLENE EXPANSION UNIT PROJECT  
HARRIS COUNTY, TEXAS**

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## Abstract

ExxonMobil Chemical Company (ExxonMobil) has submitted an application requesting authorization of greenhouse gas emissions to the U.S. Environmental Protection Agency Region 6 (EPA). Atkins North America, Inc. (Atkins) has been contracted by ExxonMobil to perform a cultural resources survey for the Baytown Olefins Plant Ethylene Expansion Unit Project.

In August and October 2012, Atkins conducted an intensive cultural resources survey of 10 hectares (25 acres) for the proposed BOP Ethylene Expansion Unit Project in eastern Harris County, Texas. The survey was performed at the request of ExxonMobil to identify the existence of any as yet unidentified cultural resources for the proposed BOP Expansion Project. The survey consisted of a surface inspection augmented by subsurface shovel testing and a historic-age nonarcheological resources survey of the proposed project footprint as this was defined as the area of potential effects. The visual area of potential effects (VAPE) extends 1.5 miles from the footprint. An intensive VAPE survey was conducted within 300 feet of the footprint and a windshield VAPE survey was conducted from 300 feet to 1.5 miles from the footprint to identify any historic (National Register of Historic Places [NRHP]-eligible) nonarcheological resources that could be indirectly affected by the proposed project.

During the initial phase of the surface inspection, concrete (Section A), decomposing pond silt (Section B), and construction fill (Section D) was identified at the ground surface. This, along with ongoing pipeline construction and installation activities within the project area precluded implementation of minimum survey standards as outlined by the Texas Historical Commission. Consequently, subsurface inspection efforts were focused on portions of the project area where penetrable and undisturbed soils were identified (Section C). All sections of the project area were visually inspected and a total of 5 shovel tests were excavated. No prehistoric or historic archeological sites were identified within the project area and no artifacts were observed, collected, or curated as a result. Subsequent to the historical-age resources survey, one potentially eligible NRHP historic-age nonarcheological resource was identified within the broader VAPE.

In light of the extensive amount of previous and on-going mechanical disturbances, presence of concrete, pond silt, construction fill, and impenetrable clay, and absence of cultural material within the proposed project area, Atkins recommends that cultural resources consultations be considered complete for the project presented in this report. Additionally, the proposed project does not appear to possess the potential to adversely impact historic nonarcheological resources. As a result, Atkins recommends that the proposed plant expansion of the ExxonMobil BOP activities be allowed to proceed without further consultation.

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## I. INTRODUCTION

ExxonMobil Chemical Company (ExxonMobil) has submitted an application requesting authorization of greenhouse gas emissions to the U.S. Environmental Protection Agency Region 6 (EPA). Atkins North America, Inc. (Atkins) has been contracted by ExxonMobil to perform a cultural resources survey for the Baytown Olefins Plant Ethylene Expansion Unit Project (Figure 1).

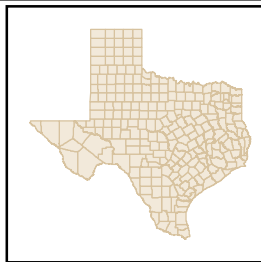
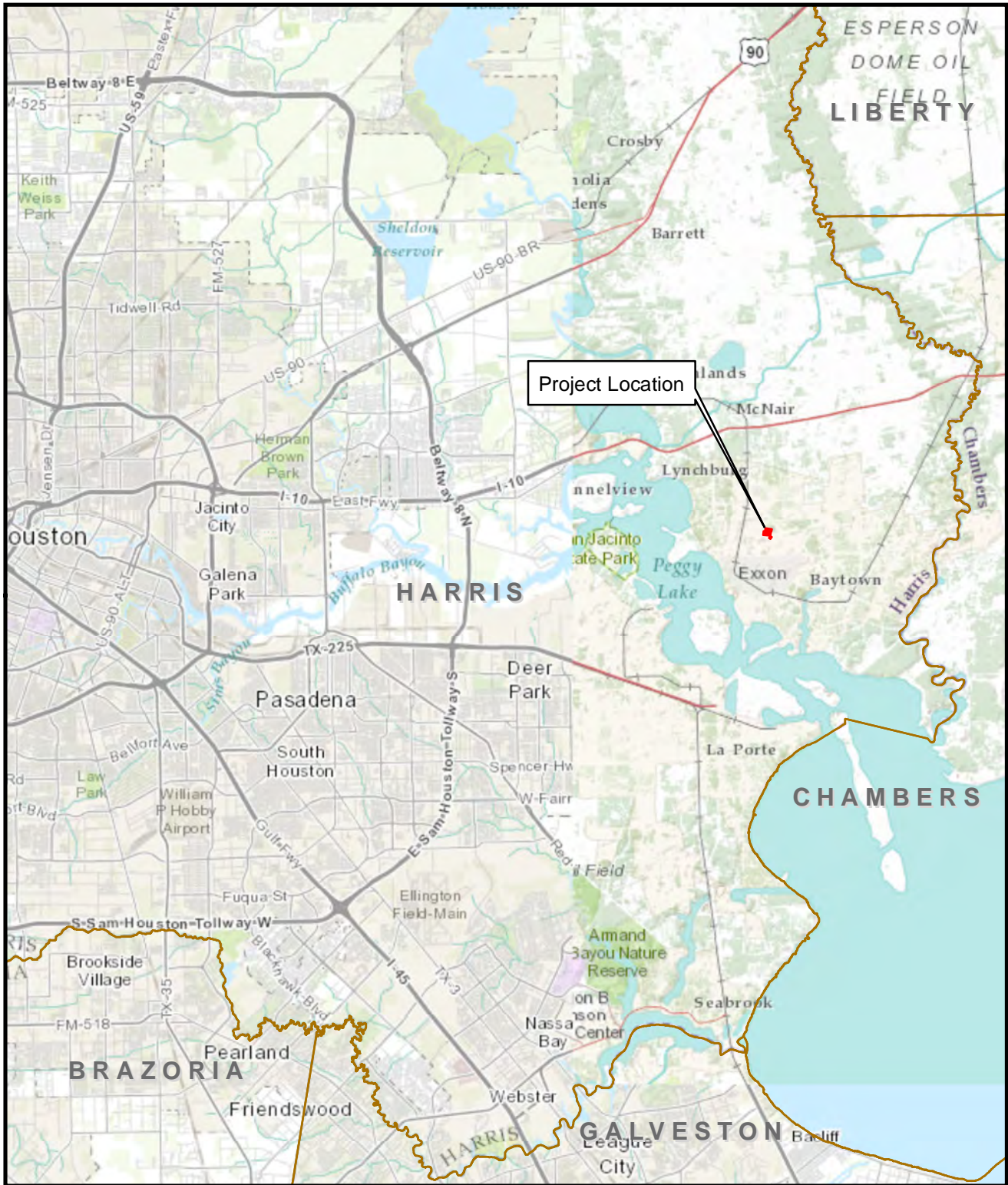
ExxonMobil Baytown is a petrochemical complex that consists of a refinery, chemical plant, and Olefins Plant (BOP). The proposed project will include expansion of the BOP Ethylene facility within the existing ExxonMobil complex. The project area is located within the USACE's Galveston District and can be found on the U.S. Geological Survey (USGS) 2012 Highland 7.5-minute series topographic quadrangle map.

In August and October 2012, Atkins conducted an intensive cultural resources survey of 10 hectares (ha) (25 acres) for the proposed BOP Ethylene Expansion Unit Project in eastern Harris County, Texas. The survey consisted of a surface inspection augmented by subsurface shovel testing and a historic-age nonarcheological resources survey of the proposed project footprint as this was defined as the area of potential effects. The visual area of potential effects (VAPE) extends 1.5 miles from the proposed project's footprint. An intensive VAPE survey was conducted within 300 feet of the footprint and a windshield VAPE survey was conducted from 300 feet to 1.5 miles from the footprint to identify any historic (National Register of Historic Places [NRHP]-eligible) nonarcheological resources that could be indirectly affected by the proposed project. All portions of the project area were visually inspected. The field investigation was conducted by Project Archeologist Karen Belvin and Historian Brandy Harris under the direction of Principal Investigator Dale Norton. Approximately 4 person-days of labor were expended during the surveys.

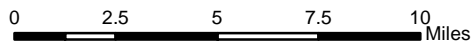
The proposed BOP Expansion Project is located in eastern Harris County, Texas and lies between the existing Olefins facility and State Highway (SH) 330 (Figure 2). The acreage for the proposed expansion project is 10 ha (25 acres). Of the total survey area, approximately 6 ha (16 acres) were subject to heavy mechanical disturbance for ExxonMobil plant development. Therefore, of the total 10 ha (25 acres) surveyed, 4 ha (9 acres) were shovel tested for a total of 5 shovel tests. No prehistoric or historic archeological sites were identified within the project area and no artifacts were observed, collected, or curated as a result.

The objectives of the survey were to (1) locate cultural resources within the survey area, (2) delineate the vertical and horizontal extent of any identified archeological sites, (3) assess the integrity of identified resources, and (4) provide a preliminary evaluation of each identified resource's potential eligibility for listing in the NRHP and/or designation as a State Archeological Landmark (SAL). The historic resources survey included a broader visual area of potential effects (VAPE) and sought to determine if proposed project activities would adversely affect any historic (NRHP-eligible or listed) resources as defined under Section 106.





Datum: NAD 1983  
 Projection: UTM  
 Zone: 15  
 Units: Meter



 Project Area

**ATKINS**

Figure 1  
 Project Vicinity Map  
 ExxonMobil Chemical Company  
 Baytown Olefins Plant Expansion Project

Highlands Quadrangle  
 Harris County, Texas

Prepared By: ATKINS/14923

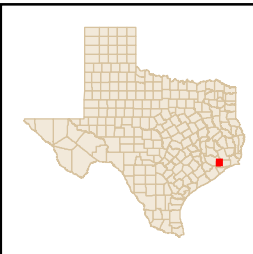
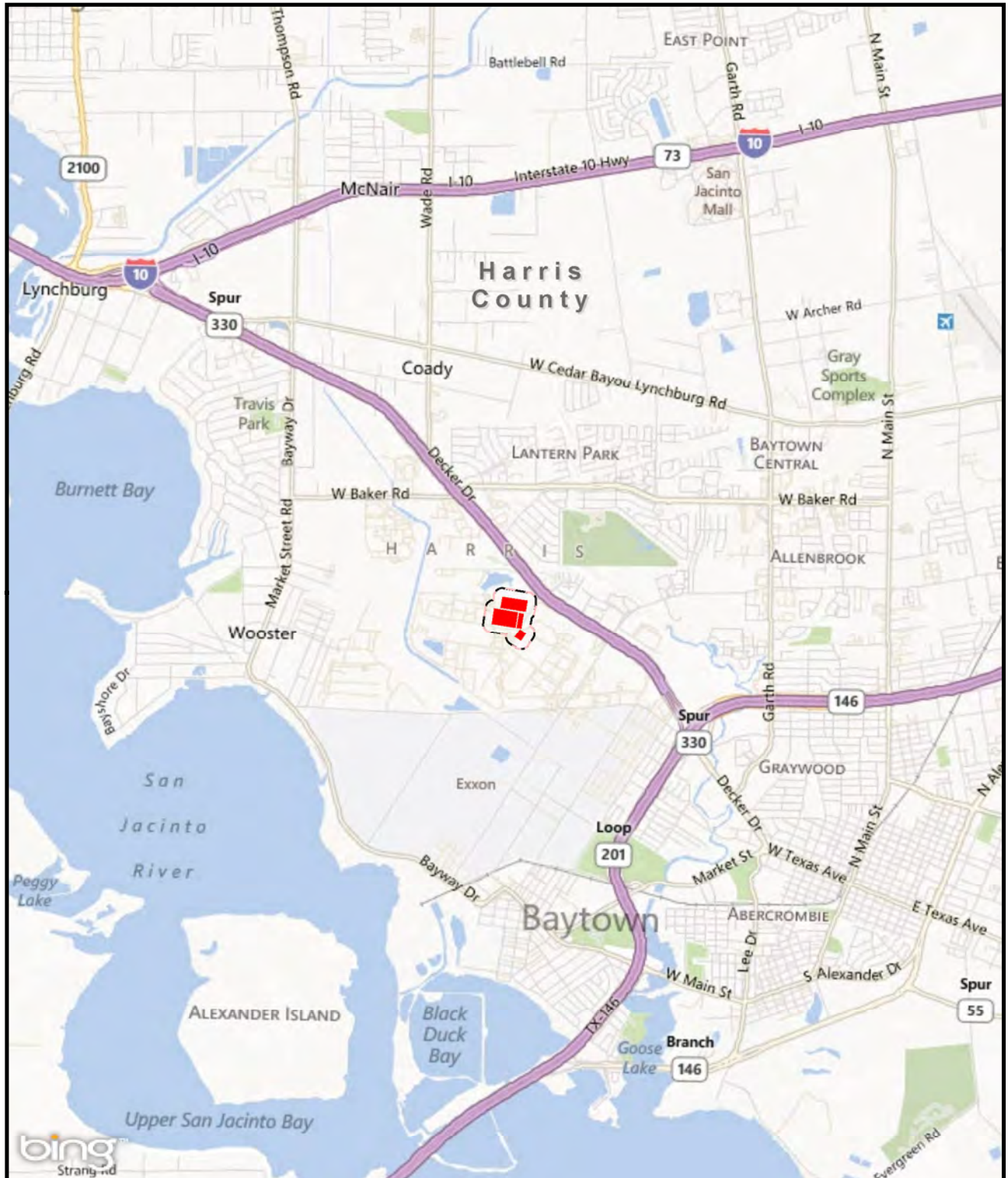
Scale: 1" = 5 Miles

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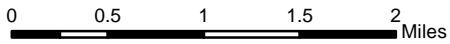
Date: Dec 12, 2012

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Datum: NAD 1983  
 Projection: UTM  
 Zone: 15  
 Units: Meter



 Project Area  
 300' APE

**ATKINS**

Figure 2  
 Project Location Map  
 ExxonMobil Chemical Company  
 Baytown Olefins Plant Expansion Project

Highlands Quadrangle  
 Harris County, Texas

Prepared By: ATKINS/14923	Scale: 1" = 1 Mile
Job No.: 100030414	Date: Dec 12, 2012
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The survey was performed at the request of ExxonMobil and was conducted in compliance with the National Historic Preservation Act of 1966 (Public Law [PL] 89-665 as amended); the Procedures of the Advisory Council on Historic Preservation (36 CFR 800); as well as the guidelines set forth by Texas Historical Commission and the Council of Texas Archeologists.

## II. NATURAL ENVIRONMENT

The proposed BOP Expansion Project area is located in eastern Harris County within the city of Baytown. It is situated northwest of Loop 201, between Bayway Drive and Decker Drive (SH 330). The environmental setting discussed below includes information on the physiography and geology, and soils, climate, and flora and fauna of the general project area.

### NATURAL ENVIRONMENT

#### Physiography

The project area lies within the Gulf Coastal Plain of Texas. This physiographic province ranges in character from a smooth depositional plain boarded by bays and barrier islands along the Gulf of Mexico, to rolling hills extending inland to the Balcones Fault Zone. The plain rises in elevation from sea level to approximately 197 ft (60 meters [m]) above mean sea level (amsl) within roughly 100 miles (161 kilometers [km]) of the Texas Gulf Coast. Narrow corridor valleys of small streams and broader valleys of larger streams break the generally flat relief of the Gulf Coastal Plain. Salt domes and fault scarps occasionally interrupt this relatively featureless topographic pattern. Some scattered salt domes express surface features as broad mounds with as much as 98 ft (30 m) of relief. Faults are common in the region, but express little or no surface relief (Bureau of Economic Geology 1996).

The landscape within this physiographic province is characterized as broad, nearly level, and gently sloping coastal prairie with poorly defined drainage patterns. Agricultural industry and urbanization within the Gulf coastal Plain have indelibly changed the landscape. Much of the plain, particularly within the project area, has been cleared for urban and petrochemical development, resulting in many of the natural drainages (e.g., Goose Creek and associated tributaries) having been altered by channelization and dredging (Fenneman 1938).

#### Geology

The project area overlies the Pleistocene-aged Beaumont Formation, the youngest continuous coastwise terrace fronting the modern Gulf Coast (Fischer et al. 1972). The origins of this formation are mainly fluvial and deltaic although some areas may have originated as coastal marsh and lagoonal deposits (Wheeler 1976). The Beaumont Formation can be divided into three stratigraphic subdivisions, the first consisting of clay and mud deposits, the second consisting of clayey sand and silt deposits, and the last consisting of fine-grained sand (Abbott 2001). The stratigraphic subdivision of the project area is that of clay and mud deposits.

## Soils

Sheet 97 of the *Soil Survey of Harris County, Texas* (Wheeler 1976), depicts the soils of the project area. The soils are mapped as the Beaumont Clay, which is listed by Abbott (2001) as having a low geoarcheological potential. A brief description of this series is provided below.

### **Beaumont Series**

The Beaumont Series (Ba) consists of deep, acid, nearly level, clayey soils on upland prairies and are formed in thick beds of alkaline marine clay and are poorly drained. The soils exhibit gilgai microrelief, in which the microknolls are 6 to 12 inches higher than the microdepressions. When dry, Beaumont soils tend to exhibit deep, wide cracks that extend to the surface. During the rainy season, the cracks quickly fill with water, creating flooding due to very slow runoff, low permeability, very slow internal drainage, and high available water capacity. Primary uses of Beaumont soils are rice cultivation and pasture with regional urban development (Wheeler 1976).

The entire project area lies within the Beaumont Clay mapping unit. Abbott (2001) rates the geoarcheological of Beaumont soils as low. He notes that the soils “are the product of prolonged pedogenesis and the sediments are too old to contain archeological materials in good context.”

## Climate

The modern climate of the project area is humid and subtropical. Temperature is regulated by prevailing south-southeasterly Gulf breezes (Arbingast et al. 1976). Summers are generally hot with temperature rising to over 100 degrees Fahrenheit, most often during July and August. Winters are mild, with January typically the coldest month. Monthly rainfall is evenly distributed throughout the year and averages between 30 and 60 inches annually. Gulf-generated thunderstorms and tropical storms occasionally pass through Harris County and can cause severe damage (Larkin and Bomar 1983).

## Flora and Fauna

The climate and vegetation of the upper Texas coast reflect the latitude, low elevation, and influence of proximity to the Gulf of Mexico. The region is bound on the west by the San Jacinto River, on the east by the Trinity River, and on the north by an arbitrary line that closely approximates the southern extent of Caddo settlement (Ensor 1987, 1991). In general, four broad communities of vegetation can be identified near the Houston area: Coastal Marsh/Barrier Island, Coastal Prairie, Coastal Gallery Forest, and Pine-Hardwood Forest (McMahan et al. 1984).

Coastal Marsh/Barrier Island communities include well-drained sandy coastal environments and saline and freshwater wetlands near the coast. Salinity, frequency and inundation durations, and depth of the seasonal water table control the character of vegetation assemblages in these areas



(Abbott 2001:24). Well-drained freshwater environments are dominated by bluestem (*Schizachyrium* spp. and *Andropogon* spp.), switchgrass (*Panicum virgatum*), and *Paspalum* spp. Marshhay cordgrass (*Spartina patens*), seashore saltgrass (*Distichlis spicata*), bulrushes (*Scirpus* spp.), saltmarsh aster (*Aster subulatus*), and other sedges and grasses dominate wetter areas. Higher areas are dominated by some of the above-mentioned vegetation and gulfdune paspalum (*Paspalum monostyachyum*), bushy sea-oxeye (*Borrchia frutescens*), and glasswort (*Salicornia* spp.) (Abbott 2001; White and Paine 1992).

The most common mammal on the barrier islands is the hispid cotton rat (*Sigmodon hispidus*), a significant source of meat for aboriginal inhabitants of Galveston Island (Ricklis 1994). White-tailed deer (*Odocoileus virginianus*), raccoons (*Procyon lotor*), and opossum (*Didelphis virginiana*) are also common to the coastal marsh/barrier island communities, although white-tailed deer are no longer present on Galveston Island. Reptilian species include the ornate box turtle (*Terrapene ornata*), kingsnakes (*Lampropeltis* spp.), eastern hognose (*Heterodon platirhinos*), western diamondback rattlesnake (*Crotalus atrox*), and cottonmouth (*Agkistrodon piscivorus*).

Coastal Prairies are nearly topographically flat, characterized by clayey soils, and generally only a few meters above sea level. The Coastal Prairie consists primarily of grasses with minor amounts of forbs and wooded plants, and is characteristic of upland areas that are not saturated on a seasonal basis (Abbott 2001). Principal taxa include little bluestem (*Schizachyrium scoparium*), indiagrasses (*Sorghastrum* spp.), eastern gamagrass (*Tripsacum dactyloides*), switchgrass, brownseed paspalum (*Paspalum plicatulum*), silver bluestem (*Bothriochloa saccharoides*) buffalograss (*Buchloe dactyloides*), threeawn (*Aristida* spp.), and Texas wintergrass (*Stipa leucotricha*). Sunflower (*Helianthus* spp.), Engleman daisy (*Englemannia pinnatifida*), bluebonnets (*Lupinus texensis*), ragweed (*Ambrosia* spp.), croton (*Croton* spp.), verbena (*Verbena* spp.), and winecup (*Callirhoe* spp.) are common forbs. Woody plants include mesquite (*Prosopis* spp.), huisache (*Acacia farnesiana*), eastern baccharis (*Baccharis halimifolia*), rattlebush (*Sesbania drummondii*), live oak (*Quercus virginiana*), elm (*Ulmus* spp.), hackberry (*Celtis pallida*), bumelia (*Sideroxylon lanuginosum*), and coralberry (*Symphoricarpos orbiculatus*) (Abbott 2001). As the Coastal Prairie grades into the Pine-Hardwood forest, the frequency of trees increases.

The upland coastal prairies provide habitats for a number of mammals, including white-tailed deer, eastern cottontail (*Sylvilagus floridanus*), jackrabbit (*Lepus californicus*), gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), raccoon, eastern spotted skunk (*Spilogale putorius*), striped skunk (*Mephitis mephitis*), opossum, and bobcat (*Lynx rufus*) (Abbott 2001; Shew et al. 1981). During historic times, bison (*Bos bison*), black bear (*Ursus americanus*), and gray wolf (*Canis lupis*) were present on the coastal prairies and woods in the Galveston Bay region, some of which were known ethnographically to be hunted by native peoples (Folmer 1940).

The Coastal Gallery Forest consists of diverse trees and understory occupying the floodplains of streams along the outer coastal plain (Abbott 2001) A variety of oaks (*Quercus* spp.), elms (*Ulmus*

spp.), and pines (*Pinus* spp.), as well mulberry (*Morus rubra*), ash (*Fraxinus* spp.), sweetgum (*Liquidambar styraciflua*), hawthorn (*Crataegus* spp.), dogwood (*Cornus* spp.), hickory (*Carya* spp.), bois d'arc (*Maclura pomifera*), willow (*Salix* spp.), cottonwood (*Populus deltoides*), and sumacs (*Rhus* spp.) are included in these areas. The understory commonly includes mustang grape (*Vitis mustangensis*), greenbriar (*Smilax* spp.), yaupon (*Ilex vomitoria*), coralberry (*Symphoricarpos orbiculatus*), possumhaw (*Ilex decidua*), elderberry (*Sambucus canadensis*), and dewberry (*Rubus trivialis*), as well as little bluestem, big bluestem (*Andropogon gerardii*) and indiagrass grasses. Frequently flooded areas support stands of dwarf palmetto (*Sabal minor*), and bald cypress (*Taxodium distichum*) trees are common in relict stream channels and swamps (Vines 1977).

White-tailed deer are abundant in the floodplain environment, as well as gray and fox squirrels (*Sciurus* spp.), raccoons, opossum, swamp rabbits (*Sylvilagus aquaticus*), and muskrats (*Ondatra zibethicus*). Beaver (*Castor canadensis*) and river otters (*Lutra canadensis*) were once common to these areas. In addition to a number of snakes and turtles, alligators (*Alligator mississippiensis*) are common in riverine and floodplain environments. Upstream of brackish waters, bowfin (*Amis calva*), shiners (*Lythrurus umbratilis*, *Cyprinella venusta*, *Notemigonus crysoleucas*), yellow bullhead (*Ameiurus natalis*), largemouth bass (*Micropterus salmoides*), and sunfish (*Lepomis* spp.) are found in rivers and larger streams (Ricklis 1994).

### III. CULTURAL SETTING

The project area is located in the Southeast Texas Archeological Study Region of the Eastern Planning Region as delineated by the THC (Kenmotsu and Perttula 1993) and, more specifically, the Trinity-San Jacinto Coastal Basin within the West Gulf Coastal Plain physiographic province (USACE 2006). This region encompasses the northeastern portion of the Coastal culture area as defined by Story et al. (1990), and the western portion of the Upper Texas Coast as defined by Campbell (2003). Archeological evidence assimilated for this region presents a long and prosperous occupation by indigenous groups over an extended period of time.

This cultural history of this region exhibits a four-phase chronological sequence: Paleoindian, Archaic, Late Prehistoric, and Historic. Exploitative techniques appropriate to micro environmental variation produced a variety of site types within each of these broad phases. The Archaic sequence is further subdivided into early, middle, and late phases to emphasize environmental changes that occurred between approximately 8000 B.C. and A.D 400 (Aten 1983b). This chronology is believed to reflect changes in subsistence as defined by the material remains and settlement patterns of the people occupying this portion of Texas throughout each sequence of occupation.

#### CULTURAL SEQUENCE

##### Prehistory of the Vicinity

###### *Early Paleoindian Period (10,000–8000 B.C.)*

The earliest generally accepted culture of the Americas, the Paleoindian, appears to have extended over most of nonglaciaded North America by the end of the Pleistocene epoch. It has been hypothesized that, in Texas, the Pleistocene coastline extended as much as 25 miles (40 km) into the present Gulf of Mexico and that rivers cut deep canyons into sediments deposited during previous periods of glaciation (Aten 1983a). Culturally, this period is referred to as the time of the “Big Game Hunting” tradition, due to a presumed heavy reliance upon now-extinct species of Pleistocene megafauna as a food source. Coastal Paleoindian populations undoubtedly utilized a wide range of faunal and floral resources dictated by the local environment, as the occasional well-preserved site in Texas testifies (Collins 1998).

Occupation of the Texas Gulf Coast during the terminal Pleistocene is evidenced by the recovery of several types of well-made, lanceolate, parallel-flaked projectile points from surface settings or mixed archaeological contexts. Types that have been recovered include Scottsbluff, Clovis, Plainview, Angostura, and possibly San Patrice. The occasional presence of these projectile point types along the coastal plain appears to reflect activities that would typically have occurred in areas where the environment is characterized by a mixture of deciduous and pine woodlands. According to Aten (1983b), this type of habitat typically supports low-density human populations. Subsistence



activities during this period would have resulted in small archaeological sites, reflecting a limited range of hunting and gathering activities at each locale. Site 41JF50, for example, presents the existence of Paleoindian remains that have been recovered along McFaddin Beach, from which deposition has occurred from an eroding site offshore (Long 1977; Turner and Tanner 1994).

With the close of the Pleistocene came a period of climatic warming and a rise in sea level as surface water was gradually released from glaciers and polar ice. Paleoindian cultural developments in the Gulf Coastal Plain region, as in most areas of North America, appear to have been intimately related to these gradual but vast changes in the world climate and local environmental conditions. Because of these and later Holocene climatic regimes, most archaeological sites from this period in the Gulf Coastal Plain are buried by alluvium, found in eroded upland areas, or located offshore beneath millennia of silts. Thus, environmental changes that brought about the extinction or dislocation of Rancholabrean megafauna precipitated a shift away from Paleoindian adaptations toward a broad-based subsistence orientation termed Archaic (Aten 1983a; Willey and Phillips 1958).

#### ***Archaic Period (8000 B.C.–A.D. 400)***

Cultural developments appear to have progressed somewhat beyond those of Paleoindian sequence with the onset of the Holocene epoch during the Archaic Period. Changes in the world climate caused sea levels to rise, inland prairies to expand, and regional weather patterns to become more variable (Aten 1979). Generally termed the Archaic, this next sequence of cultural development in the New World has been further subdivided based on changes observed in the archeological record that appear to coincide with episodic shifts in the Holocene climate and environment. It is commonly thought that human lifestyles and subsistence strategies maintained patterns developed during the previous Paleoindian period, but with some notable differences.

Aten (1983a) suggests that Early Archaic groups, like their Paleoindian predecessors, probably continued to migrate seasonally in small bands and rely on a generalized projectile point technology to facilitate their hunting and gathering of a variety of faunal and vegetal species. Despite a paucity of intact Archaic components at sites in the upper Texas Gulf Coast region, it has been observed that Archaic lithic technologies appear to show an increased diversity of functional types and styles over those associated with the Paleoindian sequence. However, the level of craftsmanship and the use of fine exotic materials appear to have declined. In addition, the greater array of Archaic projectile point styles begins to reflect a greater degree of regional cultural variation. Story et al. (1990) surmise that human populations of the Archaic sequence may have become more concentrated with individual bands covering less territory on their seasonal rounds.

Differentiation between Early, Middle, and Late Archaic culture sites in the upper Texas Gulf Coastal region, without the benefit of sufficient associated cultural features and artifacts from which strong chronological dates and sequences can be derived, has been based largely on observation and comparison of projectile point styles associated with more-intact archeological contexts elsewhere

in Texas and North America. The assumption has been that similar point styles are probably related chronologically despite sometimes-vast geographical distances. According to this reasoning, Early Archaic point types are usually considered to include Andice, Baird, Bell, and Wells, whereas Bulverde, Carrollton, and Trinity points are usually attributed to the Middle Archaic. Based on a greater database for defining the Late Archaic, point types considered diagnostic of this cultural sequence typically include Gary, Kent, Yarbrough, Ellis, Palmillas, and Refugio (Patterson 1983).

#### ***Late Prehistoric (A.D. 400–1519)***

The Late Prehistoric sequence, or Ceramic period, cultures experienced a relatively static environment. This period began with the adoption of ceramics and lasted until interaction between European and aboriginal populations became firmly established. Aten (1983a) has divided the Late Prehistoric sequence in the Galveston Bay area into six chronological periods based on ceramic seriation: Clear Lake, Mayes Island, Turtle Bay, Round Lake, Old River, and Orcoquisac.

The addition of Perdiz and Scallorn arrow points to the inventory marks the beginning of the Late Ceramic period. Ceramics of the earlier period may include Goose Creek Plain, O'Neal Plain variety conway, Mandeville Plain, Tchefuncte plain, Goose Creek variety unspecified, and Tchefuncte Stamped. In the Late Ceramic period, the ceramic inventory may include San Jacinto Incised and Baytown Plain varieties, as well as Phoenix Lake and San Jacinto (Aten 1983a). It should be noted that several varieties of Goose Creek Plain and Goose Creek Incised, including Red-Filmed and the occurrence of bone tempering appear throughout the duration of the Ceramic period.

#### **History of the Vicinity**

##### ***Historic Period (A.D. 1519–1900)***

###### *Regional Native Occupation*

As Europeans immigrated to the upper Texas Gulf Coast, they encountered two major indigenous groups, the Atakapa and the Karankawa. These coastal groups occupied separate territories within the Galveston Bay region. The Atakapa spoke a language belonging to the Tunica family and displayed lifeways closely related to the natives of southwestern Louisiana. The Karankawan groups spoke a language of the Coahuilitecan family, which resembled the indigenous groups of south Texas and Mexico (Aten 1983a).

Despite the differences in language and cultural derivation, the Atakapa and Karankawa maintained similar cultural patterns (Newcomb 1983). Both groups were nomadic, although the Atakapa maintained seasonal, semi-permanent villages in the interior during winter. The Atakapa subsisted primarily on shellfish, bird eggs, wild plants, deer, and bear. The Karankawa favored shellfish, turtles, marine and land plants, alligator, deer, bison, bear and peccary. Conical huts and skin tents

served as shelter for the Atakapa, while the Karankawa traveled with portable ba-ak (cane and grass mat) structures.

Technology for both the Atakapa and Karankawa included pottery, basketry, manos and mutates (milling stones), the bow and arrow, dugout canoes, and drums. Some of the more significant differences between the two include the use of traps, wooden bowls and utensils, grass fiber textiles and traps by the Atakapa versus the use of dogs (a fox-like or coyote-like breed), cane weirs, bone tools, and whistles and tambourines by the Karankawan.

Similarities among both groups included burial practices, clothing and physical adornment. The Atakapa mirrored the Karankawan in that both buried their dead beneath mounds constructed primarily of shell. Both wore breechcloths and skirts made from animal skins and decorated themselves with piercings and tattoos. Although these two groups were fierce warriors, neither group was prepared for the introduction of European diseases. By the late eighteenth century, both groups were in serious decline (Newcomb 1983).

#### ***European Contact and Anglo-American Settlement***

The European presence in the Galveston Bay area began with Spanish explorations lead by Alonso Álvarez de Piñeda and Alvar Nuñez Cabeza de Vaca in the early sixteenth century. The Spanish Crown, in its quest to observe and record the character and economic potential of the North American continent, sanctioned the explorers. Exploration of the Americas by Spain was precipitated by greater colonial expansion efforts undertaken by Western European powers throughout the sixteenth century. Subsequent to Piñeda's initial maritime effort to map the Gulf Coast, the earliest exploration of the Texas Gulf Coast region was accomplished by Alvar Nuñez Cabeza de Vaca. Both Álvarez de Piñeda and Cabeza de Vaca were shipwrecked in 1528 along with other members of the expeditions (Weddle 1985). Much historical speculation has occurred whether the island of Malhado, upon which Cabeza de Vaca's party was shipwrecked, is the current Galveston Island or nearby San Luis Island. In either case, Cabeza de Vaca lived in the Galveston area for several years among the Karankawas as a doctor, slave, and merchant. He and his companions would eventually reach Mexico City in 1536 before finally returning to Spain. His account of the journey, published in 1542, is the first book relating to Texas (Campbell 2003).

Cabeza de Vaca's account served as the basis for continued exploration of the Gulf region, whereby Hernando de Soto (1539) and Luis de Moscoso Alvarado (1542) further documented the Texas Gulf Coast. By 1561, having expanded beyond its ability to supplement and control, Spain faced increasing difficulties in maintaining its colonies in Florida. The relatively poor economic prospects for these colonies and increased competition from other colonial powers quelled Spanish interest in further colonization efforts. As a result, the Texas Gulf Coast remained relatively uninhabited by Europeans for the next two centuries until the threat of increased exploration by the French stimulated the Spanish government to establish more permanent settlements (Weddle 1985).

Commissioned by the French government, René Robert Cavelier, Sieur de la Salle, established Fort St. Louis along the Gulf Coast in 1685. This fort is believed to have been located southwest of the proposed project area (Weddle 1991). As a consequence of Sieur de la Salle efforts, disease, starvation, and intermittent attacks by regional indigenous groups led to the ruin of Fort St. Louis. In an attempt to reestablish a stronghold and to Christianize the indigenous people of the region, Spain would construct a mission in 1722, near the abandoned Fort St. Louis by the name of Nuestra Señora del Espíritu Santo de Zúñiga (La Bahía del Espíritu Santo de Zúñiga). Resistant to Spanish influence, however, the indigenous people forced the relocation of the mission to a site near the Guadalupe River, which would later be relocated a second time in 1754 to Goliad, Texas. It was during this time that the Franciscan missionaries laid the foundation for the livestock industry of Texas. The Franciscan stock formed the nucleus from which vast herds of wild cattle and mustangs roamed throughout Texas (Tyler 1996).

French attempts to establish permanent trading posts on Galveston Bay were ultimately unsuccessful, but individual traders continued to navigate the San Jacinto and Trinity Rivers through the 1750s. Anchoring their sailing vessels in the upper bay, the traders would transport their goods upstream by canoe to trade with the local Orcoquisa, Bedai, and Atakapa tribes (Henson 1986). This practice came to an end in 1754 when an Orcoquisac chief betrayed a French trader to Spanish agents, which ultimately led to establishment of a Spanish *presidio* in the area to prevent further French encroachment. Spain abandoned this *presidio* in 1771, in part because France had lost the Seven Years War in 1763 and, with it, any territorial claims. Spain then had sovereign control of the area all the way to the Mississippi River.

Whereas Álvarez de Piñeda and Cabeza de Vaca crafted maps of the greater Gulf Coast, in an attempt to reestablish Sieur de la Salle's former trading post and fortress on Matagorda Bay, Jean Baptiste Bénard de la Harpe (1721) completed the earliest detailed map of Galveston Bay. Following Bénard de la Harpe's efforts, Spain's defense of the region, then called Nuevo Santander, was to be achieved by establishing a series of missions and associated *presidios* across much of western central and eastern Texas. Mission Nuestra Señora de la Luz and its companion, *Presidio San Agustín de Ahumada*, composed the Spanish ecclesiastical outposts in the Galveston Bay area. This mission, also known as Mission Orcoquisac after a principal Indian village, was founded in 1756. It met with considerable resistance from the local tribes and much like Mission Nuestra Señora del Espíritu Santo de Zúñiga, was ordered to relocate several times before the mission and its *presidio* were abandoned in 1771 and officially decommissioned in 1772 (Tyler 1996).

Coupled with the United State's purchase of the Louisiana Territory from France in 1803, the long-running dispute over control of Texas shifted to include Spain, with both countries having claim to land between the Rio Grande and Neches Rivers. Increasing dissent against Spain's imperial control over New Spain gave rise to a series of revolutionary movements seeking to establish new, independent nations in Mexico and Texas. Despite Spain's efforts in establishing two military outposts, Atascosita and Salcedo, east of Galveston Bay, Mexican and Texan revolutionaries

displaced the Spanish at Salcedo in 1811, with the Gutierrez-McGee expedition effectively taking control of the Trinity River the following year (Richner and Bagot 1978).

Prior to Mexico winning its independence from Spain (1821), the territory of Texas encompassed what is known today as Colorado, Kansas, Oklahoma, New Mexico, and Utah. As a wealth of abundant resources, this frontier remained an area of constant dispute between Spain, Mexico, and the United States. The ongoing dispute over control would eventually leave the territory without a sufficient political and military presence, attracting both entrepreneurs and fugitives wishing to immigrate from Europe and adjacent southern states along the Atlantic coast.

The earliest Anglo-Americans arriving in the Trinity-San Jacinto River basin came as a part of early colonization efforts of Stephen F. Austin. Originally, Moses Austin negotiated a contract with the Spanish government in 1820 to bring settlers to Texas in exchange for land. Upon their arrival, the colonists would receive grants of land in proportion to their family status and time of arrival in the colony. Following Mexico's independence and the death of his father Moses (1821), Stephen F. Austin took on the responsibility of fulfilling his father's contract as an empresario. Although Austin's colony included the Colorado and Brazos River watersheds to the west, many of the colonists who initially arrived in Galveston (1822) chose to remain in the area. William Scott, Nathaniel Lynch, James Strange, Christian Smith, and John Iiams were a few of the first settlers to settle their families in the Bay Town area (Henson 1986).

#### ***Historic Land Use***

The community of Bay Town lies immediately northeast of the project area. The community was originally settled in 1824 by William Scott, one of Stephen F. Austin's Old Three Hundred settlers, who received a land grant equaling two leagues and one labor of land (over 9,000 acres) that covered most of present day Baytown. He established a gristmill, cotton gin, and boat landing on the east bank of Scott's Bay (San Jacinto Bay) near his home known as Point Pleasant. As new settlers filtered into the area, the small settlement grew to include a small store and sawmill and was eventually renamed Baytown (Kleiner 2012).

Despite the establishment of a shipyard at the mouth of Goose Creek in 1850, the area remained largely undeveloped and isolated into the twentieth century. It would not be until 1908 when oil was discovered in Tabbs Bay that the area would experience exponential growth. Subsequent to the 1908 discovery, the American Petroleum Company began drilling in 1916 along the shores of Goose Creek producing the first successful offshore drilling operation in Texas (Young 2012).

The Goose Creek Oilfield changed the community overnight as men sought to obtain leases, drill new wells, and construct housing for oil field workers and their families (Brenham 2012). Coupled with the discovery of oil in Goose Creek, Tabbs Bay, and Black Duck Bay, oil prices during WWI encouraged further petrochemical development of the Baytown area, including the founding of the Humble Oil and Refining Company (Exxon Company, U.S.A.). Exxon Company U.S.A. would later



purchase 2,200 acres of the William Scott survey for construction of an integrated petroleum and petrochemical complex, which eventually became home to the ExxonMobil BOP in 1979. Subsequent changes to Exxon Chemical U.S.A. include a 1999 merger between Exxon and Mobil Oil to form what today is the Exxon Mobil Corporation (ExxonMobil) (Henson 1986).

## **PREVIOUS CULTURAL RESOURCES INVESTIGATIONS**

### **Records Review**

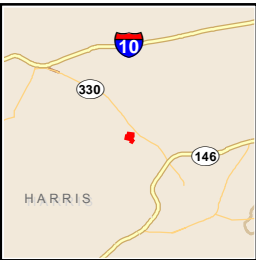
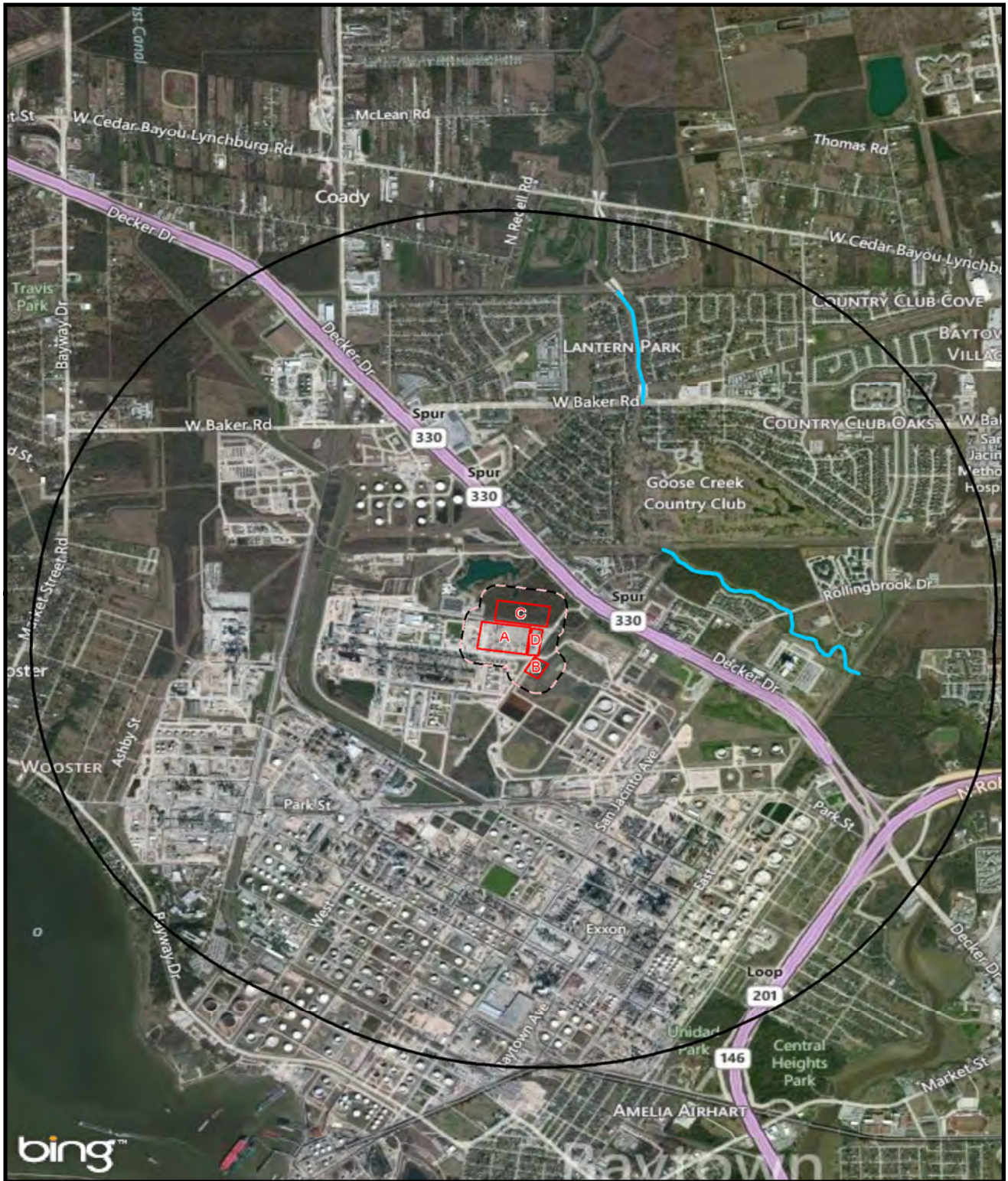
Prior to commencement of fieldwork, Atkins archeologists reviewed the files and maps at the Texas Archeological Research Laboratory (TARL) at The University of Texas at Austin, the THC's on-line Restricted Archeological Sites Atlas, and the National Park Service NRHP database and GIS Spatial Data, as well as the National Historic Landmarks Program. In addition, reports on previous cultural resource investigations in the area were consulted. The records review revealed that no previous cultural resources investigations have been conducted within the project area and that no previously recorded archeological sites or historic properties listed in the NRHP or eligible for listing were located within the survey area for this project. One previously recorded historic site GC-01 (Field ID) and two Official Texas Historical Markers (OTHMs) (Humble Oil and Refining Company and Point Pleasant Plantation of William Scott) were identified within 1.5 mile of the proposed project.

### **Previous Investigations**

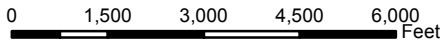
Over the past three decades, multiple cultural resource management studies have been conducted within Harris County, many of which included archeological survey, testing, and mitigation projects. From these studies, cultural reviews of previous research along the Upper Texas Coast have been presented by Aten (1983), Fields et al. (1983), and Stoke (1985). In addition, Moore et al. (1989) and Patterson (1995) both compiled extensive bibliographies for the archeology of the region.

As the Chairman of the Department of Anthropology at The University of Texas, J.E. Pearce carried out some of the earliest professional investigations in this region under the sponsorship of the Bureau of American Ethnology. In addition, between 1918 and 1932, Pearce also led or directed numerous reconnaissance and excavation projects throughout southeast Texas (Pearce 1932).

A single cultural resources investigation was conducted within 1.5 km (1 mile) of the proposed project (Figure 3). In 1996, on behalf of the Harris County Flood Control District, Moore Archeological Consulting conducted a cultural resources investigation of two sections along Goose Creek. Section one is 0.3 mile and Section 2 is 0.8 mile from the project area. One historic site (GC-01) was identified in Section 2 and was determined ineligible for SAL status or for listing in the NRHP, and no further work was recommended (Moore 1996).



Datum: NAD 1983  
 Projection: UTM  
 Zone: 15  
 Units: Meter



- Project Area/APE
- 300' Intensive Survey VAPE
- 1.5 Mile Windshield Survey VAPE
- Previous Cultural Resource Survey

**ATKINS**

Figure 3  
 Previous Projects Map  
 ExxonMobil Chemical Company  
 Baytown Olefins Plant Expansion Project

Highlands Quadrangle  
 Harris County, Texas

Prepared By: ATKINS/14923

Scale: 1" = 3,000'

Job No.: 100030414

Date: Dec 14, 2012

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## IV. SURVEY METHODS AND RESULTS

### FIELD INVESTIGATION METHODS

The records review revealed that no cultural resources surveys had been conducted and that there were no previously recorded archeological or historic sites within or immediately adjacent to the BOP Expansion project area. Therefore, an intensive cultural resources survey was employed to cover 100 percent of the proposed project area. While the original scope of work called for shovel testing at 30-m intervals, this strategy proved impractical for the following reasons (Figure 4).

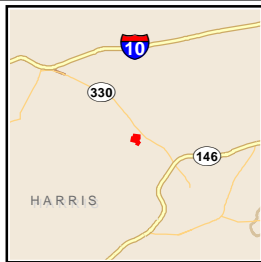
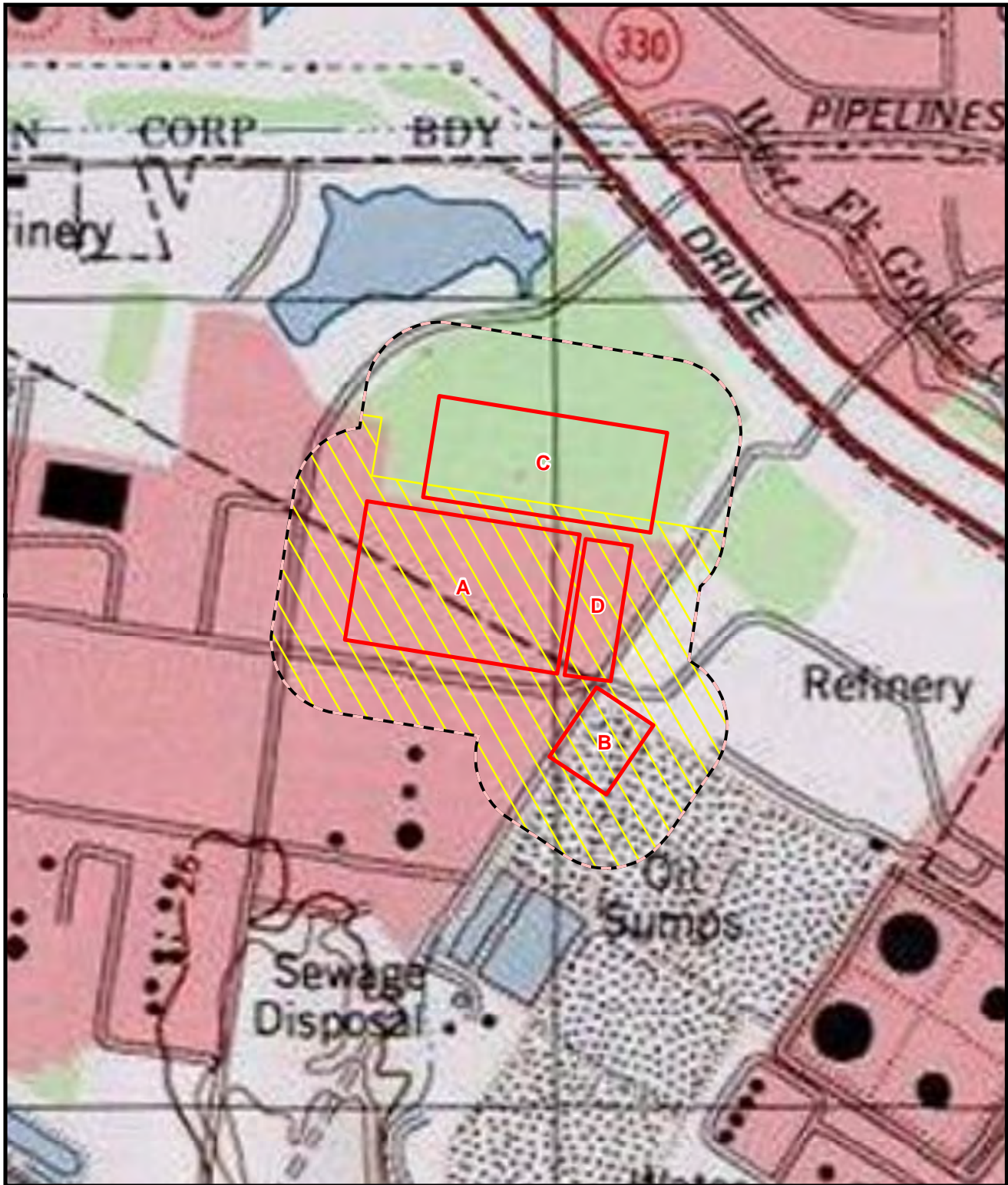
The most prohibitive factors include the presence of construction fill across Sections A and D and pond silts in Section B. Plant construction and silt drying activities have stripped the Beaumont clays that naturally occur near the surface, eliminating natural stratus within these sections (Appendix A, Photographs 1–6). Subsequent deposition of construction fill now serves as a foundation for temporary workspaces and plant parking (Appendix A, Photograph 7). Secondly, the mantle of dense clay and standing water within Section C (Appendix A, Photograph 8) restricted shovel testing to the northwest corner and along the southern periphery (Figure 5). The clay was exposed at the surface and was also visible in canals, eroded gullies and around drainage improvements and utility easements (Appendix A, Photographs 9–10).

In light of the impediments to systematic shovel testing, Atkins' archeologist photo-documented and described the mechanical disturbances, as well as the level of pond silt within the project areas that had greatly reduced the probability of locating intact subsurface cultural materials. Additionally, Atkins archeologist placed shovel tests every 2 acres within the Section C where no obvious fill was present and where subsurface inspection was feasible.

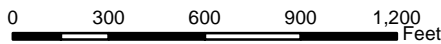
### SURFACE INSPECTION

In August and October 2012, Project Archeologist Karen Belvin and Historian Brandy Harris conducted an intensive cultural resources survey of 10 ha (25 acres) within the BOP in eastern Harris County, Texas. As a comparison, topographic maps from the mid- to late twentieth century indicate approximately 6 ha (16 acres) of the proposed project area (Sections A, B, and D) to be mechanically disturbed as a result of plant development. Visual inspection of Section B also revealed the landscape at this location to be several feet higher in elevation than the surrounding landscape, as a result of pond silt deposition. Numerous Plant development activities were also noted within the project area. Access roads enter BOP off Decker Drive allowing access to the refinery/chemical plant. Also, erosion of natural strata dominated portions of the project area periphery where pipeline and utility construction and associated canal maintenance was most recent (see Figure 5). During the surface inspection, no cultural materials were identified within the project area and no artifacts were observed, collected, or curated as a result.





Datum: NAD 1983  
 Projection: UTM  
 Zone: 15  
 Units: Meter



- Project Area
- 300' APE
- Mechanically Disturbed Area

**ATKINS**

Figure 4  
 Mechanically Disturbed Area  
 ExxonMobil Chemical Company  
 Baytown Olefins Plant Expansion Project

Highlands Quadrangle  
 Harris County, Texas

Prepared By: ATKINS/14923

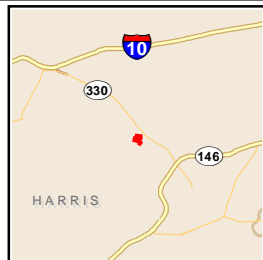
Scale: 1" = 600'

Job No.: 100030414

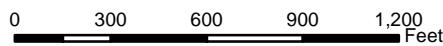
Date: Dec 12, 2012

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Datum: NAD 1983  
 Projection: UTM  
 Zone: 15  
 Units: Meter



- Project Area
- 300' APE
- Shovel Test Location

**ATKINS**

Figure 5  
 Subsurface Inspection Map  
 ExxonMobil Chemical Company  
 Baytown Olefins Plant Expansion Project

Highlands Quadrangle  
 Harris County, Texas

Prepared By: ATKINS/14923

Scale: 1" = 600'

Job No.: 100030414

Date: Dec 12, 2012

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## **SUBSURFACE INSPECTION**

Five shovel tests were excavated within the project area (see Figure 5). Each shovel test was approximately 30 centimeters (cm) (11.9 inches) in diameter and was excavated by natural strata, or in intervals not exceeding 10 cm (4 inch) in depth. All shovel tests were excavated to a depth of 100 cm (39.4 inches), or until impenetrable clay was encountered. All soil was sifted through 0.64-millimeter (¼-inch) hardware screen except when the matrix was dominated by dense clay. Clayey matrix was sorted by hand and visually inspected. The location, depth, and profile information of each shovel test was recorded by a Global Positioning System (Trimble) and plotted on a 2012 USGS Highland 7-5 minute series topographic quadrangle map (see Figure 5). Soil characteristics such as strata, thickness, texture, color and the presence or absence of any cultural deposits were documented on field shovel test forms. All shovel tests were backfilled upon completion. During the subsurface inspection, no previously unrecorded prehistoric or historic archeological sites were identified or assessed and, therefore, no artifacts were observed, collected, or curated as a result of this effort.

## **FIELD INVESTIGATIONS RESULTS**

All portions of the project area were visually inspected, though not all portions were shovel tested. Previous mechanical disturbances restricted shovel testing to portions of the project area where no previous construction was present and where subsurface inspection was feasible. All other areas of the survey area were judged too disturbed by previous construction or erosion to warrant systematic shovel testing. Additionally, the northeast portion of Section C was considered to have a low probability for containing buried cultural materials because it is seasonally inundated and low-lying. Therefore, no shovel tests were conducted in this portion of Section C. However, five shovel tests were excavated in Section C of the project area, most of which typically terminated prior to 40 cm (16 inches) below surface. Shovel tests in disturbed soils, such as those on artificial landforms or along man-made canals and drainages were attempted, but generally terminated at a shallow depth of 31 cm (12 inches). All 5 shovel tests were culturally sterile. During the field investigation efforts, no previously unrecorded prehistoric or historic archeological sites were identified and no artifacts were observed, collected, or curated as a result.

## V. HISTORIC-AGE NONARCHEOLOGICAL RESOURCES

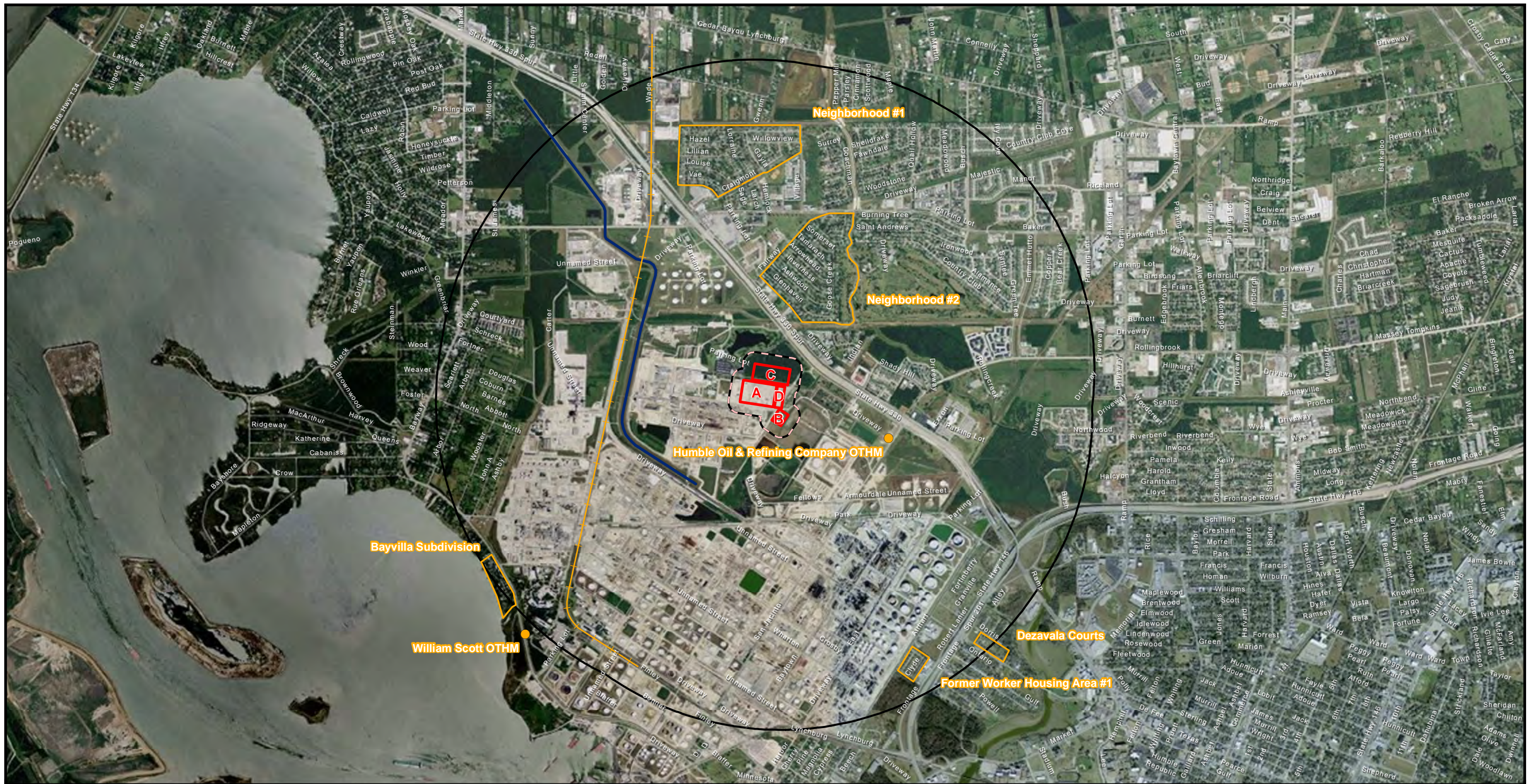
### HISTORIC-AGE NONARCHEOLOGICAL RESOURCES SURVEY METHODS

As per coordination with the EPA, a historian meeting the Secretary of the Interior Standards for History and Architectural History conducted a survey to assess potential impacts to historic (NRHP-eligible or -listed) resources from the proposed BOP Expansion Project. Prior to initiation of the survey, the historian conducted a records review to identify any previously designated historic resources within a 1.5 mile radius of the proposed project footprint. This review included consultation of the THC's Historic Sites Atlas, the NRHP, and the list of Recorded Texas Historic Landmarks (RTHLs), the list of SALs, and all OTHMs. The historian identified two THC subject markers within the broader 1.5 mile study area (Figure 6). The first commemorates the former location of the Point Pleasant Plantation owned by William Scott (Appendix B and Figure 7). The location of the marker was confirmed during the field survey on a parcel extending into the visual area of potential effect (VAPE) The second marker refers to the Humble Oil and Refining Company and commemorates the history of the petrochemical industry in the vicinity of the Olefins plant location (see Appendix B and Figure 8). The marker is located at the main entrance to the existing refinery/chemical plant along Decker Drive.

Upon completion of the records review, the project historian conducted an intensive survey of the proposed project's footprint and a VAPE extending 300 ft from direct impact areas. This effort included photographic documentation of the current setting of the project vicinity (see Figure 7). Additionally, the historian conducted a windshield survey of accessible areas of the project vicinity within a 1.5 mile radius of the project area to identify any previously unrecorded historic resources, and if present, to assess potential indirect effects to the properties by the proposed project. The project historian recorded no historic-age resources within the project footprint or within the 300-ft APE. There is one potentially NRHP-eligible historic-age nonarcheological resource located along the periphery of the 1.5 mile survey corridor (see Appendix B and Figure 6).

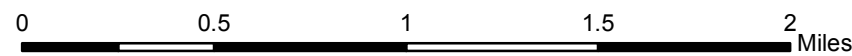
No other individual resources or groups of resources appeared to qualify for NRHP inclusion based on the results of the windshield survey. Assessments of the resources and potential effects from the project under Section 106 are included in the Historic Resources Results Section. All NRHP eligibility assessments were based on integrity observations of resources from the public right of way and contextual research available from secondary sources. No archival research was conducted for this project.





Datum: NAD 1983  
 Projection: UTM  
 Zone: 15  
 Units: Meter

- Project Area/APE
- 300' Intensive Survey VAPE
- 1.5 Mile Windshield Survey VAPE
- Official Texas Historical Marker
- +— Historic-age Railroad Siding
- San Jacinto River Authority Canal
- Historic-age Neighborhood



**ATKINS**

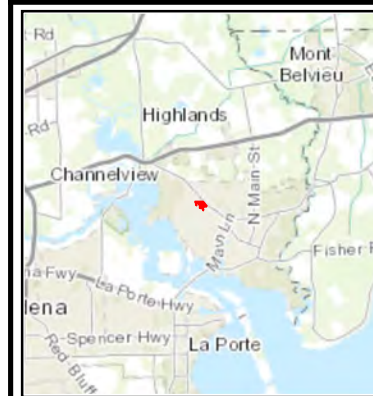
**Figure 6**  
 Historic-age Nonarcheological Resources Area of Potential Effects and Resource Location Map  
 ExxonMobil Chemical Company  
 Baytown Olefins Plant Expansion Project

Highlands Quadrangle  
 Harris County, Texas

Prepared By: ATKINS/14923	Scale: 1" = 0.5 miles
Job No.: 100030414	Date: Dec 17, 2012

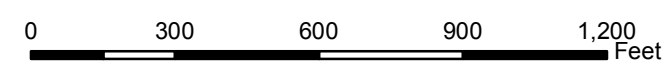
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Datum: NAD 1983  
 Projection: UTM  
 Zone: 15  
 Units: Meter

- Project Area/APE
- 300' Intensive Survey VAPE
- 1 Photo Location
- ➔ Camera Facing Direction



**ATKINS**

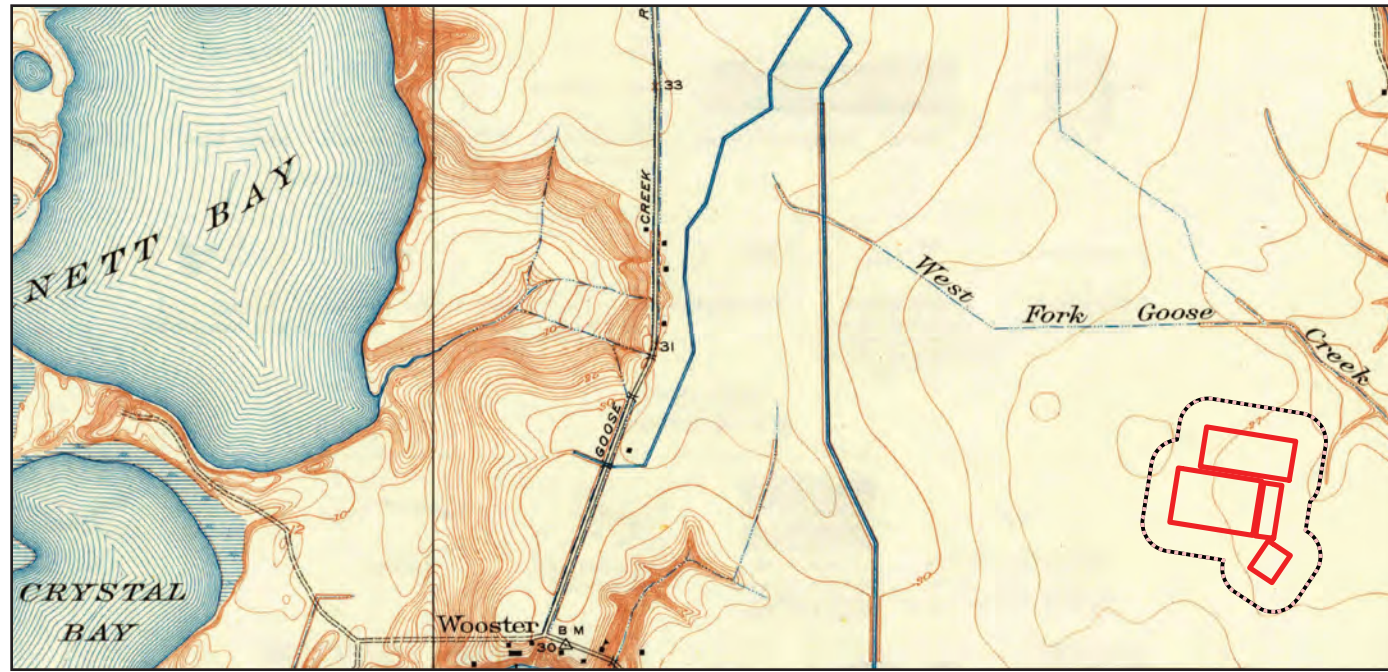
**Figure 7**  
**Setting Photograph Location Map**  
**ExxonMobil Chemical Company**  
**Baytown Olefins Plant Expansion Project**

Highlands Quadrangle  
 Harris County, Texas

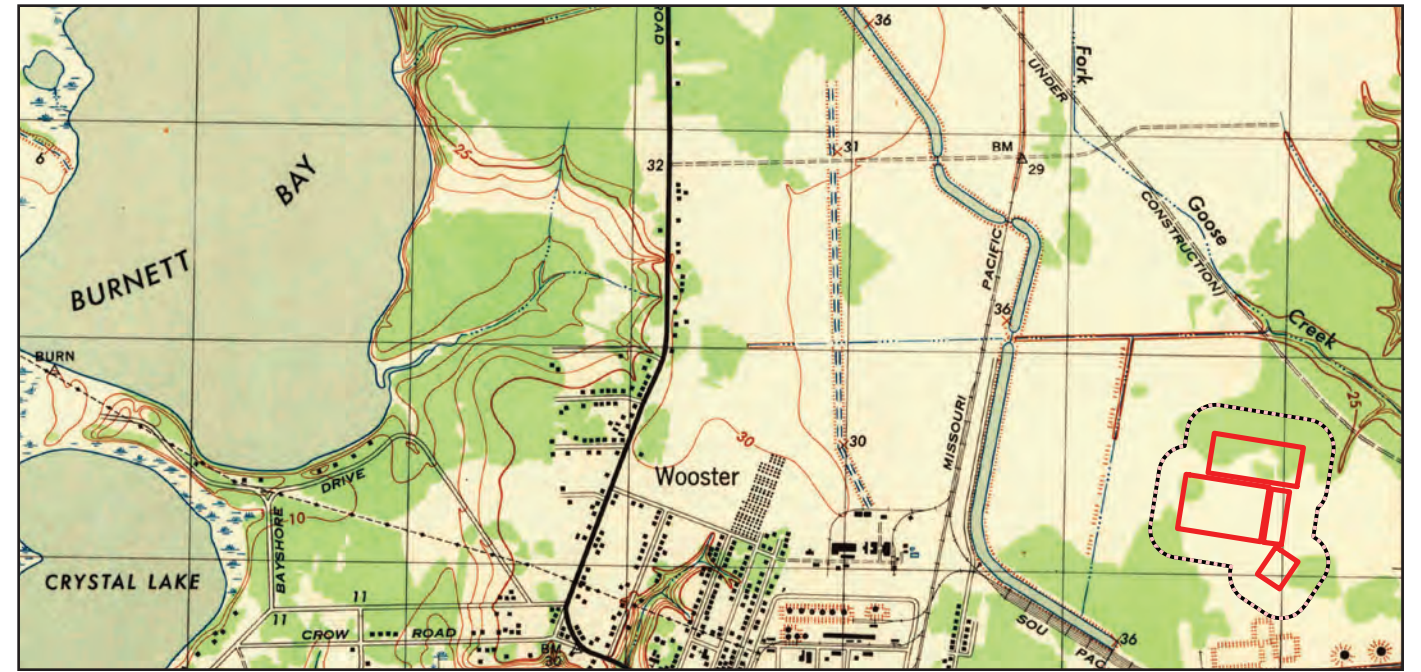
Prepared By: ATKINS/14923	Scale: 1" = 400'
Job No.: 100030414	Date: Dec 14, 2012

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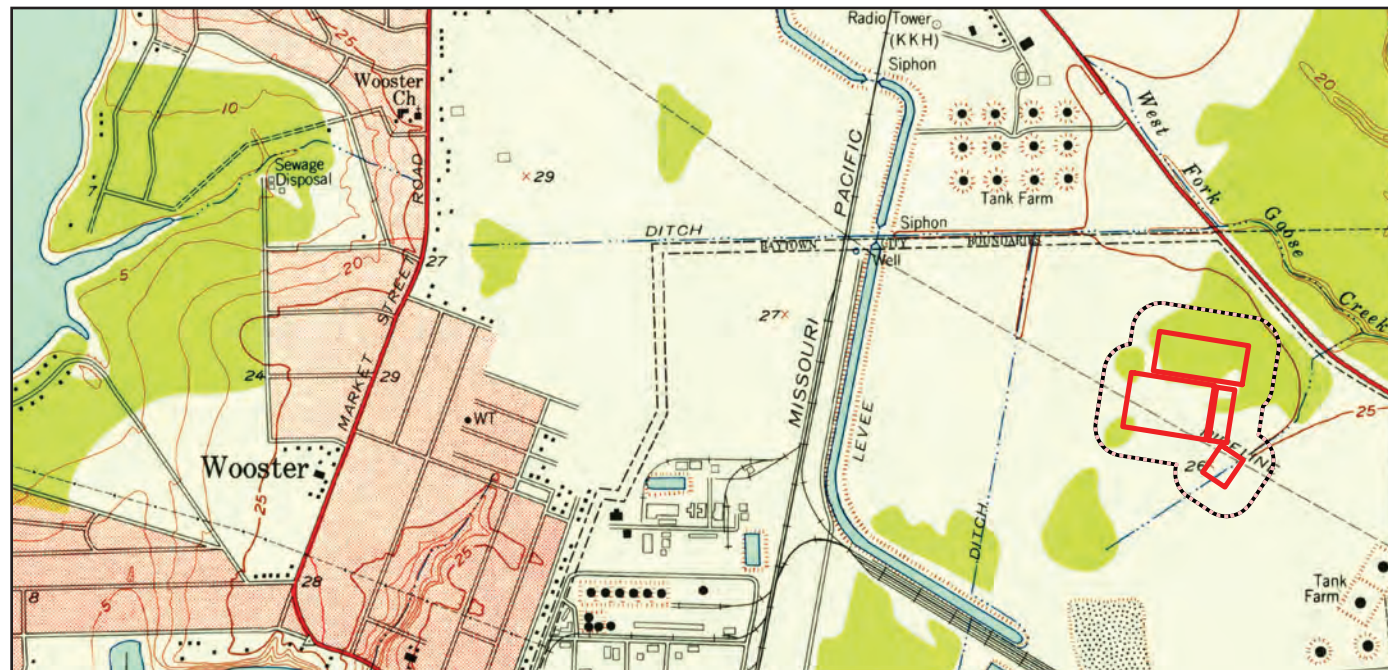




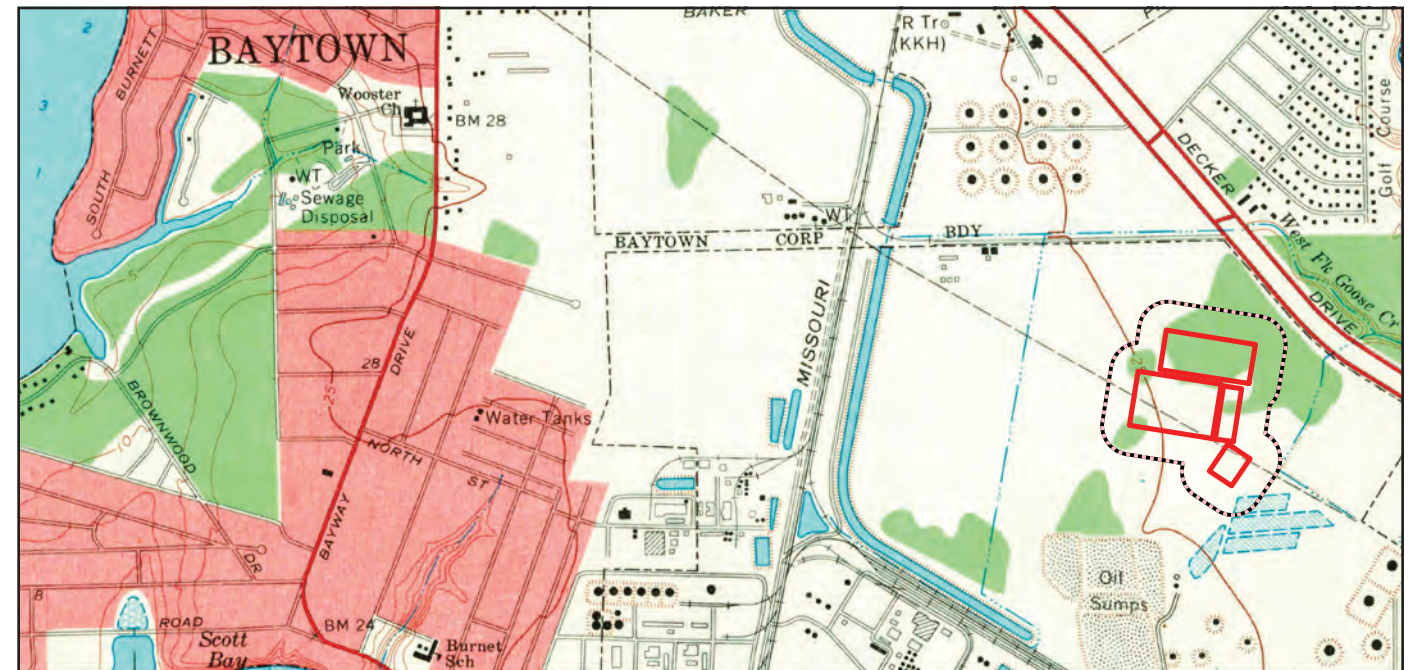
1920



1944

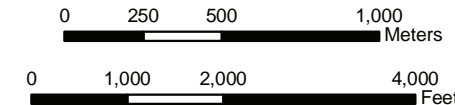


1955



1967

- Project Area/APE
- 300' Intensive Survey VAPE



**ATKINS**

Figure 8

Historic Representations of the Project Vicinity:  
 1920, 1944, 1955, and 1967  
 ExxonMobil Baytown Olefins  
 Plant Expansion Project

Source: USGS 7.5' 1920 Burnett Bay and 1955 and 1967 Highlands, Texas Quadrangles; USACE 7.5' 1944 Burnett Bay, Texas Quadrangle

L:\Projects\He1\CLIENTS\EXXON\100030414 Baytown\cad\Figure 8\_Historic Representations

Drafted by: C. Wallace



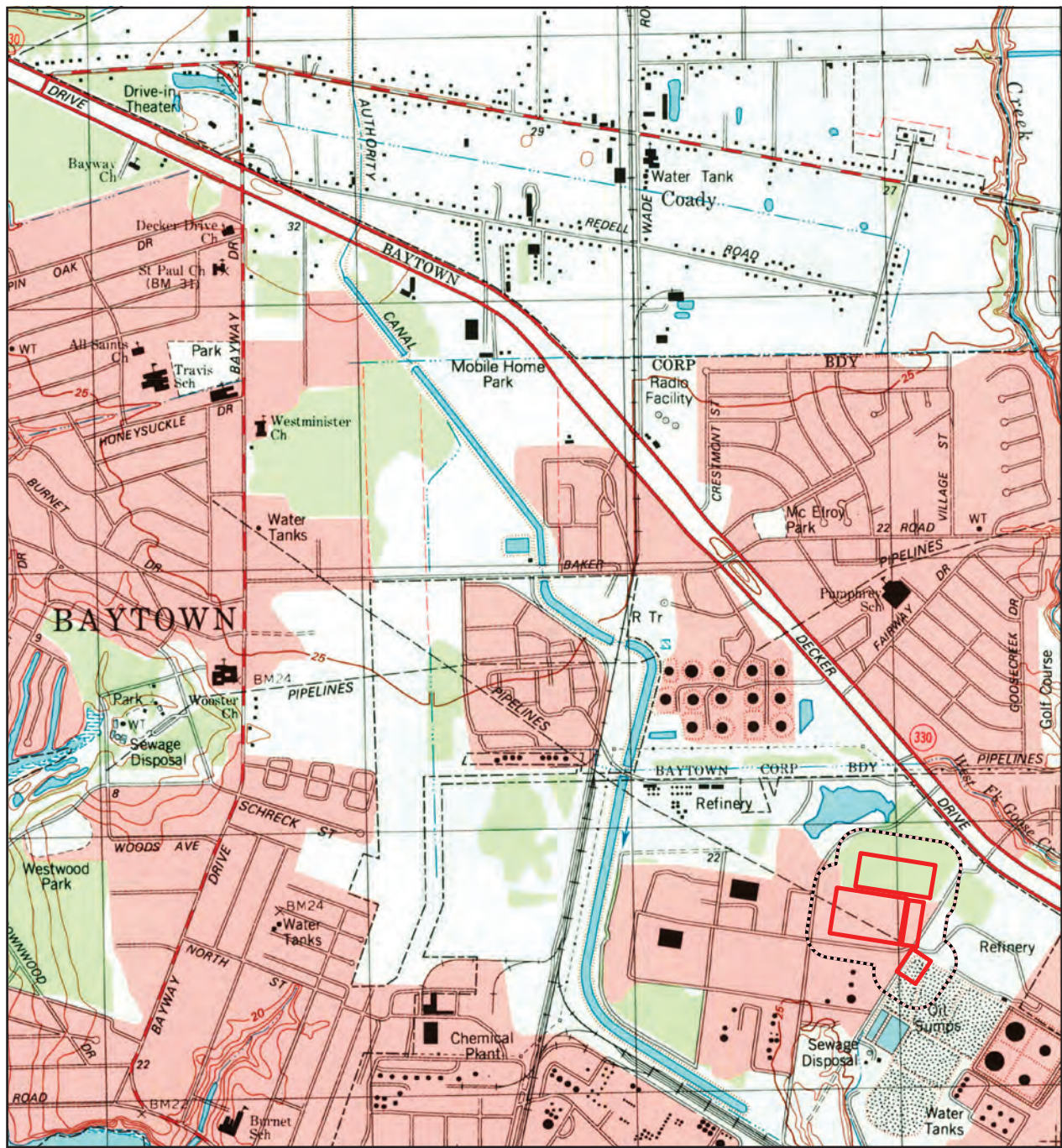
## GENERAL PROJECT AREA DESCRIPTION: BUILT ENVIRONMENT

The study area, including the proposed project area and a VAPE extending 1.5 miles from the project area's boundaries, contains extensive industrial, commercial, and residential development dating from the 1920s through the present (see Figure 8 and Figure 9). Most of the development occurred post-1967 in association with the postwar suburban development boom that occurred throughout communities in the Houston area during the mid- to late twentieth century (see Figure 6). Small areas at the northern, northwestern, and southeastern periphery of the survey area remain undeveloped, though there is little to no evidence of agricultural land use in these areas. Historic-age resources located within the project vicinity include a historic-age tank farm, two 1960s-era neighborhoods on the north side of SH 330 that are outside of the viewshed of the proposed project area, and another neighborhood of 1960s-era resources with more recent infill located to its northwest closer to the bay (see Appendix B, page B-5). The third neighborhood is on the periphery of the VAPE and well outside of the viewshed of the proposed project.

The dominant land use pattern within the VAPE is industrial and includes the extensive Olefins refinery/chemical plant that extends from the bay to SH 330 (see Figure 6). Access to and photography of the main plant facilities was restricted; however, review of historic maps and aerial photographs indicates that the portion of the plant within the 300-foot APE was not constructed until post-1967 (USACE 1944; USGS 1920, 1955, 1967) (see Figure 8). The tank farm to the north of the project area was constructed between 1944 and 1955, but the original section of the plant constructed by Humble Oil was located well south of the study area. As late as 1955, the area comprising the current project area was still used for agricultural purposes (USGS 1955) (see Figure 8).

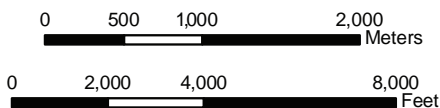
The historian documented remnants of former plant employee housing to the west and east of its historic boundary (see Appendix B, pages B-8 and B-9); however, most of the former dwellings are no longer extant and those that remain in use do not date from the period of significance for early industrial development in the area (pre-1945) or possess particular design merit. To the north-northeast of the refinery, land use becomes predominately residential with associated commercial and institutional resources. The older neighborhoods were under construction in 1967 according to historic maps and are adjacent to SH 330. Closer to the northeastern boundary of the VAPE, most of the neighborhoods are not historic-age, dating from the 1970s to the present. Other features of this portion of the VAPE include a large undeveloped parcel adjacent to Goose Creek, the nonhistoric-age ExxonMobil office, and several recently constructed apartment complexes.





— Project Area/APE

- - - 300' Intensive Survey VAPE



**ATKINS**

Figure 9

Modern Development in the APE  
ExxonMobil Baytown Olefins  
Plant Expansion Project

Source: 1995 USGS 7.5' Highlands, Texas Quadrangle

The oldest resources within the VAPE are those furthest from the proposed project area and include a mix of early twentieth century (post-1920) dwellings with post-1960 infill, vacant lots, and trailer homes along Crosby-Lynchburg Road and Redell Road. There is a similar character of building stock along Bayway Drive in the southwest boundary of the VAPE. The most intact of these earlier neighborhoods is Bayvilla (see Figure 6 and Appendix B, page B-1), though it too contains a mix of 1930s to 1950s homes with different stylistic influences interspersed with modern infill and vacant lots. This neighborhood includes a resource recommended for NRHP inclusion, but does not appear to qualify for NRHP designation as a historic district.

## **HISTORIC-AGE NONARCHEOLOGICAL RESOURCE SURVEY RESULTS AND RECOMMENDATIONS**

The project historian did not record any historic-age (50-years-of-age or older) resources within the proposed project's footprint or extended 300-ft APE. The larger 1.5-mile VAPE accessed via windshield survey included one resource that may qualify for NRHP inclusion based on its architectural merit (Criterion C). There were no other resources or combinations of resources that appeared to be NRHP eligible within the study area, and none of the historic-age neighborhoods appear to retain sufficient integrity or design merit to qualify for NRHP inclusion as historic districts. The individual resource recommended for NRHP inclusion (Resource 01) and the historic-age neighborhoods closest to the project area are discussed individually below. Appendix B includes representative streetscapes of the 1960s-era neighborhoods, as well as additional photographs of select resources of marginal significance identified within the VAPE.

### **The Bayvilla Neighborhood**

The Bayvilla Neighborhood is a small, limited access subdivision located along Bayvilla Street between the Bay Way Drive and the San Jacinto River (see Figure 6). The neighborhood was not constructed as part of a planned effort, but rather developed piecemeal between the 1930s and 1950s. It does not exhibit characteristics such as uniform lot sizes, similar stylistic influences, or building forms and construction dates that would qualify it for consideration as a historic district under NRHP Criterion C nor does it maintain any known historic associations that would qualify it for NRHP inclusion under Criteria A or B. Recent infill and several vacant lots further detract from the neighborhood's overall integrity of design, materials, workmanship, feeling, and setting; however, there is one individual resource within the neighborhood that may qualify for NRHP inclusion under Criterion C.

Resource 01 (#5 Bayvilla) is a large, side-gabled Tudor-style dwelling constructed circa 1945 (see Appendix B, page B-1). The dwelling has two prominent cross gables with false half-timbering that dominate the main façade and is clad in stucco veneer. It appears to retain its integrity of design, materials, workmanship, feeling, and association and includes many of the character-defining features of the Tudor style, including steeply pitched cross gables, decorative half-timbering, tall,



narrow windows clustered in multiple groups, and decorative chimney pots. Due to its integrity and representation of key characteristics of the Tudor style, the resource is recommended for NRHP inclusion under Criterion C at the local level of significance. Despite its integrity, the resource is located immediately across the street from the expansive Olefins refinery/chemical plant (see Figure 6). The proposed project area is thus not visible from the resource, nor will the expansion of the industrial facilities impact any of the character-defining features that qualify the resource for NRHP inclusion. As a result, no further consideration of the resource is recommended in connection with the current project.

### **Additional Historic-Age Neighborhoods**

The project historian identified two additional historic-age or partially historic-age neighborhoods within the central portion of the VAPE closest to the project vicinity (see Figure 6). The street grid for both appears on the 1967 quadrangle; however, both contain dwellings that are not of historic-age. Additionally, the neighborhoods do not possess particular design distinction that would exemplify them as outstanding examples of the post-war subdivision development that was ubiquitous in the greater Houston area during the period nor do they maintain any known historic associations. As a result, they do not appear to qualify for NRHP inclusion under Criteria A, B, or C.

The first neighborhood (Neighborhood #1) is generally bounded by SH 330 (Decker Drive), Craigmont Street, and Crestmont Street and includes a mix of vernacular dwellings with Minimal Traditional and Ranch style influences generally oriented on similar-sized lots along curvilinear streets (see Appendix B, page B-2). This neighborhood is a typical post-war development common throughout the greater Houston area. Baytown and surrounding communities experienced an industrial boom related to petrochemical processing in the 1960s that continued through the 1980s. Numerous similar neighborhoods emerged in the Gulf Coast area, and the subject neighborhood is not an outstanding example of its type. Additionally, the associated dwellings lack architectural significance, do not represent excellent examples of Vernacular regionalism or Minimal Traditional/Ranch styles, and many have undergone various phases of addition and alteration detracting from their integrity of design, materials, workmanship, and feeling. Overall, the neighborhood lacks significant planned aesthetic detailing such as vegetation, grading, and small-scale elements, and does not maintain any known historic associations. As a result, it is not recommended for NRHP eligibility under Criteria A, B, or C.

The second neighborhood (Neighborhood #2) is somewhat larger and includes a mix of mid-1960s, 1970s, and 1980s dwellings. It is bounded on the south by Glenhaven Drive, on the east by Goose Creek Drive and a public golf course, and on the north by Interlachen Drive (see Appendix B, pages B-3–B-5). As with Neighborhood #1, individual buildings were not recorded throughout the entire subdivision, but the project historian did look for larger street design patterns and consistency of age, material, and style of housing stock, overall historic integrity, and unifying development patterns. As a result of these efforts, the project historian concluded that the extant

resources do not form a cohesive, historic-age neighborhood. Though residential development appears to have been planned, over twenty-five percent of the dwellings within the neighborhood are not historic-age. The older houses tend to be located near the golf course and Goose Creek Road, while newer houses characterize the western half of the neighborhood nearest the project area. Additionally, the residential streets themselves are characterized by a variety of architectural styles, construction dates, and building materials. Several of the dwellings that are historic-age have obvious alterations. Because of the high percentage of nonhistoric-age structures associated with the neighborhood, as well as the lack of integrity maintained by the remnant historic-age resources, the subdivision does not meet the eligibility criteria for NRHP inclusion as a historic district under Criteria A, B, or C, and none of the recorded dwellings appears to be eligible on an individual basis under the same criteria.

### **Other Historic-age Nonarcheological Resources**

The project historian also documented a portion of an historic-age railroad grade within the expanded 1.5 mile VAPE (see Appendix B, page B-6). Though historically significant for its contributions to economic and community development in the region under NRHP Criterion A, the portion within the expanded VAPE was not constructed until after 1920 in response to industrial development in the area. As a result, it does not date to the period of significance for early settlement in the area (pre-1900) nor does it retain integrity of materials due to replacement of key elements such as ties and grading or integrity of setting due to the proliferation of nonhistoric-age resources around it during the late twentieth century. Alterations to the resource and its construction after the period of significance for railroad related development suggest it does not merit NRHP listing under Criterion A, B, or C, and thus warrants no further consideration under Section 106.

The project historian also recorded a portion of a historic-age canal within the VAPE (see Appendix B, page B-7). The segment within the VAPE extends from the intersection of SH 330 to Fellows Drive on the current Olefins Refinery Property. Two smaller irrigation canals appear in its general vicinity on the 1920 Burnett Bay Quadrangle, and it had achieved its modern form within a raised levee by 1944. In that year, it was referred to as the Industrial Water Supply Canal and supplied water to the plant along the bay. The canal was incorporated into the San Jacinto River Authority system by 1955, and ExxonMobil has been the canal's primary customer since its acquisition by the water authority. Other customers include two Municipal Utility Districts and local farmers (Unknown 2012). Despite the resource's historic associations with industrial development in the region under NRHP Criterion A, recent construction at the plant resulted in large sections of the canal being infilled and/or put into pipe. Additionally, it is served by several nonhistoric-age drainage features associated with recent periods of plant expansion, including one adjacent to the proposed project's footprint. As a result, the resource lacks integrity of design, materials, workmanship, feeling, and setting. As a resource needs both integrity and significance to qualify for

NRHP inclusion, the canal is not recommended for historic designation under Criteria A, B, or C, and no further consideration of it is anticipated in association with the current project.

As referenced in the records review summary, the project historian also recorded two OTHMs on parcels within the larger VAPE (see Appendix B, pages B-7 and B-8). The first commemorates the former location of the Point Pleasant Plantation established by William Scott as one of Stephen F. Austin's original 300 settlers and is located adjacent to the Bayway Drive entrance to the ExxonMobil Refinery. The second commemorates the founding the original Humble Oil and Refining Company in the vicinity of the current Olefins Plant and is located at the main entrance to the refinery on Rollingbrook Drive near its intersection with Decker Drive(see Figure 6). The markers were erected in 1990 and 1989, respectively, and are thus not of historic age. As they do not meet the age criterion for NRHP inclusion under Criteria A, B, or C, consideration of indirect effects to them as a result of the project is not required. Additionally, there are no plans to remove or relocate the markers in connection with the current project. As a result, no further consideration of impacts to the historic markers is recommended in association with the proposed project.

The project historian also recorded remnants of historic-age worker housing associated with the ExxonMobil Plant facility. Historically, there were several worker occupied neighborhoods to both the east and west of the plant; however, only two groupings were still extant at the time of the survey (see Appendix B, pages B-8 and B-9). Both were constructed circa 1960 (NETR Online 1957, 1964). The first grouping (Former Worker Housing Area #1) is located immediately east of the plant between the facility and SH 146 (see Figure 6). It includes a complex of abandoned duplexes along two perpendicular streets. All of the dwellings are vernacular in design with Minimal Traditional influences, and all are similar in form. The dwellings are cross-gabled and clad in brick veneer. All of the doors and windows are covered, but the original fenestration pattern included two entrances on the primary façade (see Appendix B, pages B-8 and B-9). In addition to lacking individual design merit, the resources do not maintain any known historic associations that would qualify them for NRHP designation under Criteria A, B, or C. They are located well outside of the viewshed of the proposed improvements, and no further consideration of the resources is recommended in association with the current project.

The second complex is similar in form to the first; however, it is still occupied. The property is now a public housing facility known as Dezavala Courts (see Appendix B, page B-9). The associated resources have replacement doors and windows, detracting from their integrity of materials and feeling. Additionally, they lack individual design merit, negating their NRHP eligibility under Criterion C, and they do not possess any known historic associations that would qualify them for NRHP inclusion under Criterion A or B. As with the complex of former worker housing along Clyde Road (Former Worker Housing Area #1), these resources are located at the periphery of the 1.5 mile VAPE well outside of the potential viewshed of the proposed project and in an area historically characterized by industrial land use.

## VI. CONCLUSIONS AND RECOMMENDATIONS

During the intensive cultural resources survey of the proposed BOP Expansion Project area, no previously unrecorded archeological or historic archeological sites were identified and assessed. The survey revealed that the entire south (Section A) and southeast (Section B) portions of the project area have been subject to extensive artificial disturbance in the form of excavation and fill deposition, installation of pipelines and utilities, and construction of parking lots, man-made canals and drainage improvements. Owing to the type and breadth of disturbances in Sections A and B, the Beaumont topsoil appears to have been either completely removed or severely truncated. In addition, natural erosion processes resulting from previous plant development activities have profoundly disturbed a large majority of the project area to the south and southwest. Since cultural deposits in this soil type would be expected on or near the surface, they would have been removed during the mechanical disturbances that caused the truncation.

Based on the negative results of the cultural survey, it is recommended that archeological resource consultation and field investigations be considered complete and that the proposed BOP Expansion Project be allowed to proceed. However, if during the course of the proposed expansion any cultural resources are encountered, the project should cease at that location until a qualified professional archeologist or historian can assess the findings and the THC and the EPA are notified.

With regard to its built environment, the area is characterized by nonhistoric-age development including oil and gas processing facilities, nonhistoric-age residential complexes and subdivisions, and other nonhistoric-age resources such as convenience stores and outbuildings. Within the VAPE, there could be historic resources that qualify for NRHP inclusion under Criteria A or B, however, expansion of the plant facilities would not adversely affect any character-defining features of these property types, such as their design, materials, workmanship, feeling, or association. In addition, investigation of the larger VAPE resulted in the documentation of one potentially significant historic-age nonarcheological resource that may qualify for NRHP-inclusion based on its architectural merit under Criterion C. Even so, the proposed project area is not visible from the resource, nor will the proposed expansion of plant facilities impact any of the character-defining features that qualify the resource for NRHP inclusion.

Additionally, the historian did not observe any potential historic districts or intact landscapes that could be affected by the proposed project. As the proposed project will not directly or otherwise adversely affect any historic (NRHP-eligible) resources, no further consideration of potential impacts to historic-age nonarcheological resources is recommended in connection with the current project.

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**Appendix A**

**Project Area Photographs**

Appendix A: Project Area Photographs



Photograph 1: Overview of Section A. Photo from northwest corner, facing southeast.



Photograph 2: Section A. Photo from southwest corner, facing northeast.





Photograph 3: Overview of Section A and D. Photo from southeast corner, facing northwest.



Photograph 4: Overview of Section D. Photo from northeast corner, facing southwest.



Photograph 5: Overview of Section B. Photo from bend in access road, facing southwest.



Photograph 6: Section B. Drying pond silts. Photo from access road, facing northeast.





Photograph 7: Section A. Photo of trench profile, facing northwest.



Photograph 8: Section A and C. Photo from southwest corner of Section C, facing east.





Photograph 9: Section C. Clay exposure along easement. Facing east.



Photograph 10: Section C. Clay exposure near KB-3. Facing northeast.



**Appendix B**

**Historic-age Nonarcheological Resources Photographs**

Potentially NRHP-Eligible Resource within the Bayvilla Neighborhood



Resource 01 (5 Bay Villa): Camera facing southwest



Resource 01 (5 Bay Villa): Detail view facing southwest



**Representative Streetscapes of 1960s Neighborhoods in the VAPE**



Neighborhood #1: north side of Shirley Road, camera facing northeast



Neighborhood #1: south side of Shirley Road, camera facing southeast





Neighborhood #1: North side of Lorraine from intersection with Lillian facing southeast



Neighborhood #2: North side of Lorraine from intersection with Lillian facing north





Neighborhood #2: View of Glenhaven showing recent infill, camera facing northwest



Neighborhood #2: South side of Glenhaven, camera facing west





Neighborhood #2: North side of Ashwood from Mustang, camera facing northwest



Neighborhood #2: North side of Ashwood from Mustang, camera facing northeast



**Other Historic-Age Resources**



View of historic-age Missouri Pacific Railroad Grade, camera facing west



View of levee associated with historic-age canal on plant property from the public ROW, camera facing south





View of canal from intersection with Dicker Road, camera facing south



Detail view of William Scott subject marker, camera facing north





Representative view of former worker housing along Clyde Street, camera facing east



Setting view of former worker housing neighborhood along Clyde Street, camera facing northeast



Setting view of former worker housing along Dorris Street (Dezavala Courts), camera facing northeast



**Setting Views from Project Perimeter**



Setting View #1: View from main entrance towards SH 330, camera facing northeast



Setting View #2: View from main entrance, camera facing north





Setting View #3: View from northern project area boundary showing historic-age tank farm, camera facing north



Setting View #4: View of setting to the northwest of the project area, camera facing west



Setting View #5: View from the southern boundary of the project area towards refinery, camera facing south



Setting View #6: View from the southern boundary of the project area, camera facing southwest





Setting View #7: View from eastern boundary of project area, camera facing east



**Appendix C**

**Résumé for Dale Norton**



## Dale C. Norton

Group Manager  
Atkins

### Education

B.A., Anthropology, Southwest  
Texas State University, 1998  
M.A., Anthropology, University of  
Southern Mississippi, 2004

### Professional Memberships

Society for American Archaeology

Mr. Norton works as a group manager for Atkins. In this capacity, he is responsible for managing the Houston Cultural Resources Program. In addition, he manages projects overseeing their field investigations, report preparation, and agency review coordination in Texas, Louisiana, Mississippi, Missouri and Oklahoma.

In addition to his archeological experience, extensive training and practical experience in both bioarcheology and forensic anthropology have provided him with the skills and knowledge necessary to conduct investigations of skeletonized human remains. Mr. Norton wrote his thesis while at the University of Southern Mississippi entitled *Intersite Relationship of the Widows Creek (1JA305) and Williams Landing (1JA306) Sites: A Holistic Evaluation Utilizing Diet, Health, Genetic, Cultural and Demographic Data*.

### Cultural Resources Survey Experience

#### **2012 Front Range Pipeline Project in Colorado, Oklahoma and Texas.**

Currently Mr. Norton is serving as the manager for cultural resources for the approximately 400 mile Front Range Pipeline Project. He is overseeing all cultural resource permitting at the federal and state level. This also entails managing all field crews and ensuring that all state and federal laws are adhered to during field investigations.

#### **2011 Cuero Lateral Pipeline Project in Dewitt and Jackson Counties, Texas.**

Mr. Norton served as the Principal Investigator for this 52-mile pipeline located in south central Texas. In this role, he developed and implemented field methodologies, worked effectively with the pipeline engineers and project managers. In particular, he provided guidance to the pipeline engineers with respect to avoiding a potentially NRHP eligible sites encountered within the proposed project. This entailed consultations with the Texas Historical Commission and the Galveston USACE District. The sites were avoided, concurrence was provided by both agencies.

**2011 EOG Marshall and Milton Eagle Ford Gas Pipeline Project in Dewitt, Karnes, Gonzales and Lavaca Counties, Texas** The Project consisted of approximately 73 miles of new 16-inch-diameter and 36-inch-diameter natural gas pipeline. As Principal Investigator, Mr. Norton ensured that all fieldwork was conducted in a timely and safe manner and that all reports for particular required permits were produced such that Enterprise was able to commence construction on time.

**2011 Eagle Ford Shale Crude Pipeline Project 24-inch crude oil pipeline in Gonzales, DeWitt, Lavaca, Colorado, and Austin Counties, Texas.** The project consisted of approximately 91 miles of new pipeline. Mr. Norton served as Principal Investigator on this project, which entailed being in constant contact with crews regarding survey methodologies in varying conditions and environments, coordination of field efforts, creating and maintaining a budget and report preparation. This particular project consisted of multiple preconstruction notifications with the USACE Galveston District, which has



involved consultations with both the USACE archeologists and Texas Historical Commission reviewers.

**2010 White Kitchens Line 5-10, Section 4 Pipeline Project in Frio and LaSalle Counties, Texas.** This project consisted of 21 miles of 16-inch natural gas pipeline. Mr. Norton served as Principal Investigator for the project. As such, he provided guidance on field methodologies, scheduled field crews, provided weekly status reports for the client and project manager, worked effectively with pipeline engineers in the field and ensured that budgetary and scheduling aspects were dealt with appropriately. A total of 14 archeological sites were documented. Several sites were found to be potentially eligible for the NRHP and PBS&J archeologist worked closely with project engineers to avoid impacts to these areas allowing the project to proceed on schedule.

**2010 Eagle Ford Mainline West Pipeline Project in Webb and LaSalle Counties, Texas.** Mr. Norton served as PBS&J's Principal Investigator on this project that spanned approximately 54.4 kilometers (33.8 miles). Mr. Norton oversaw field crews and advised crew chiefs on varying shovel testing methodologies as varying terrain was encountered. A total 9 cultural resources sites were recorded. In addition, Mr. Norton assisted in preparing a report documenting the survey in time for the client to begin construction on schedule.

**2009 College Station College Station Switchyard Brazos County, Texas** This project consisted of a intensive archeological survey for a proposed 400 by 400 foot switchback facility for Entergy Services, Inc. Mr. Norton served as the Principal Investigator.

**2009 Branson to Aurora Pipeline Project, Sendero, Barry, Stone, Taney and Lawrence Counties, Missouri.** This project consists of approximately 30 miles (48 kilometers) of 8-inch natural gas pipeline. Mr. Norton is serving as Principal Investigator for the project. He provides direction on field methodologies, schedules field crews and provides status reports for the client and project manager. A total of five cultural resources sites have been assessed during the project. Three sites have been found potentially eligible for the NRHP. Mr. Norton is working with the Missouri Department of Natural Resources regarding the project and the sites ensuring that the requirements of both the state and the client are met in a timely and satisfactory manner.

**2009 Upper Leggett Gathering System Pipeline Project, Knudson, Polk County, Texas.** This project consisted of approximately 19.31 kilometers (12 miles) of proposed 8-inch pipeline. Mr. Norton served as Principal Investigator for the project. In this role, he developed and provided guidance on field methodologies, scheduled field crews, worked effectively with pipeline engineers and ensured that budgetary and scheduling aspects were dealt with properly.

**2009 Davis A-39 #1 Pipeline Project, Knudson, Polk County, Texas.** This project consisted of approximately 2.4 kilometers (1.5 miles) of proposed 8-inch pipeline. Mr. Norton served as Principal Investigator and survey crew for the project. In this role, he developed and implemented field methodologies, worked effectively with the pipeline engineer. In particular, he provided guidance to the pipeline engineer with respect to avoiding a potentially NRHP eligible site encountered within the proposed project. The site was avoided and construction began on time.

**2009 Grizzly Bear Lateral Pipeline Project, Knudson, Polk County, Texas.**

This project consisted of approximately 2.4 kilometers (1.5 miles) of proposed 8-inch pipeline. Mr. Norton served as Principal Investigator for the project. In this role, he developed and provided guidance on field methodologies, scheduled field crews and worked effectively with pipeline engineers.

**2008 Sims Bayou Extension Project, USACE Galveston District, Harris County, Texas.** This project consisted of intensive terrestrial survey for an approximately 20 acre site for the extension of Sims Bayou. Mr. Norton served as the PI for the project. His roles included coordination with the USACE Galveston cultural resources division and provided guidance on field methodologies and scheduled field crews. The area was culturally sensitive due to the proximity of the historic Blue Ridge State Prison Farm. Additional intensive historic background reviews were conducted to ensure that no associated cultural resources would be impacted by the proposed project.

**2008 Texas Independent Pipeline, Energy Transfer Fuels, LP, Ellis, Navarro, Henderson, Anderson, Cherokee and Rusk Counties, Texas.** Mr. Norton served as PBS&J's Principal Investigator on this project that spanned approximately 230.54 kilometers (143.28 miles). Mr. Norton oversaw field crews and advised crew chiefs on varying shovel testing methodologies as varying terrain was encountered. A total of 27 cultural resources sites were recorded. Mr. Norton effectively worked with the client to avoid five sites recommended as potentially eligible for the National Register of Historic Places by shifting the proposed pipeline route. In addition, Mr. Norton assisted in preparing a report documenting the survey in time for the client to begin construction on schedule.

**2008 Vastar Well #7 Hardin County, Texas** This project consisted of intensive archaeological survey for archaeological investigations were conducted within a project area consisting of a 2.06 acres (300 feet x 300 feet) well pad and an access road measuring approximately 1,000 feet in length. A total of 2.74 acres were surveyed during this project. Mr. Norton served as the Principal Investigator for the project.

**2008 Marshfield to Lebanon Pipeline Project, Sendero, Laclede and Webster Counties Missouri.** This project consisted of 32.08 miles (51.62 kilometers) of 8-inch natural gas pipeline. Mr. Norton served as Principal Investigator for the project. He provided direction on field methodologies, scheduled field crews, provided status reports for the client and project manager, worked effectively with pipeline engineers in the field and ensured that budgetary and scheduling aspects were dealt with correctly. A total of 24 cultural resources sites were assessed during the project. Mr. Norton coordinated extensively with the Missouri Department of Natural Resources regarding the project and the sites ensuring that the requirements of both the state and the client were met in a timely and satisfactory manner.

**2008 Siesta Key Development in Matagorda County, Texas.** Mr. Norton worked as PBS&J's Principal Investigator for this proposed project by a private developer. The survey was for a proposed 55-acre housing development near Matagorda, Texas. This project involved intensive survey with transect navigation using GPS equipment. During survey site 41MG123 was revisited and determined to be potentially eligible. Additional testing was requested by



the THC. Mr. Norton developed and implemented a SOW involving several mechanical trenches and test units being excavated to determine the site's eligibility.

**2008 Cedar Bayou Navigation Channel Improvement Project, USACE Galveston District, Chambers and Harris Counties, Texas.** This project consisted of a remote sensing survey, terrestrial survey for two mitigation areas and the relocation of five recorded sites for the Cedar Bayou Navigation Channel Improvement Project. Mr. Norton served as the PI for the terrestrial portion of the project. His roles included coordination with the USACE Galveston cultural resources division and provided guidance on field methodologies and scheduled field crews. He also oversaw the documentation of the site revisits and survey for the mitigation areas.

**2008 Wesley AME Church, Harris County, Texas.** Mr. Norton worked as PBS&J's Principal Investigator for this proposed project by a private developer. The survey was for an approximately 32 acre plot of land in Houston, Texas.

**2008 Indian Springs, Enterprise Operating Products, L.P. in Polk County, Texas.** This project consisted of 6.9 miles (11.1 kilometers) of 10-inch natural gas pipeline. Mr. Norton served as Principal Investigator for the project. As such, he provided guidance on field methodologies, scheduled field crews, and ensured that project logistics and dilemmas were addressed. The intensive cultural resources survey was completed and an USACE permit was granted allowing the client to begin construction on time.

**2008 Grimes to Katy, Energy Transfer Company Katy Pipeline, Ltd. in Grimes County, Texas.** This project consisted of 54 miles (87 kilometers) of 36-inch natural gas pipeline. Mr. Norton served as Principal Investigator for the project. As such, he provided guidance on field methodologies, scheduled field crews, provided weekly status reports for the client and project manager and ensured that budgetary and scheduling aspects were dealt with appropriately. In addition, several locations along the proposed route were in deep soils that required exploratory trenching, which involved coordination between the client and the US Corps of Engineers, Galveston District. The intensive cultural resources survey was completed and a permit was granted allowing the client to begin construction on time.

**2007 Virginia Point Pipeline Maintenance Project, Houston Pipeline, L.P., Galveston County, Texas.** This project involved monitoring construction activities associated with the repair of 100 feet (30.48 meters) of natural gas pipeline near Galveston, Texas. Mr. Norton served as the project manager and coordinated with the THC to address the sensitivity of the area; especially as it relates to the Civil War era Fort Hebert. Houston Pipeline, L.P. successfully made repairs and the associated activities had no adverse affect to Fort Hebert or any related cultural resources.

**2007 Oak Grove Pipeline Project, Kinder Morgan, Falls and Robertson Counties Texas.** This project consisted of 20.63 miles (33.19 kilometers) of 30-inch natural gas pipeline. Mr. Norton served as Principal Investigator for the project. As such, he provided guidance on field methodologies, scheduled field crews, provided weekly status reports for the client and project manager, worked effectively with pipeline engineers in the field and ensured that budgetary and scheduling aspects were dealt with appropriately. During this project Mr.

Norton coordinated with the THC and successfully developed an avoidance plan for a possible gravesite that satisfied both the THC and Kinder Morgan.

**2007 IH 45: FM1764 to the Causeway Bridge CSJ: 0500-04-104, 105; & 01-107, TxDOT, Harris County, Texas.** This project consisted of exploratory trenching near Tiki Island for the proposed widening of IH 45. Mr. Norton served as the Principal Investigator for the project. His roles included coordination with TxDOT officials for the field effort, oversight of field investigations and documentation and permitting.

**2007 Farrar to Texoma Energy Transfer Company Katy Pipeline, Ltd. in Limestone, Freestone, Leon, Houston, Trinity Polk, and Tyler Counties, Texas.** This project consisted of 136 miles (219 kilometers) of 42-inch natural gas pipeline. Mr. Norton served as Principal Investigator for the project. In addition to his roles regarding project logistics and overseeing the cultural resources financial aspects, he worked exhaustively to ensure that state and federal cultural resource laws were adhered to by the client. As such, several sites potentially eligible for the National Registry for Historic Places were located during the survey, which resulted in Mr. Norton working closely with pipeline engineers to move the proposed line so that these sites were not impacted. In addition, several locations along the proposed route were in deep soils that required trenching, which involved coordination between the client and the US Corps of Engineers, Galveston District. The intensive cultural resources survey was completed and a permit was granted allowing the client to begin construction on time.

**2007 Sherman Pipeline Project, Enterprise, Erath, Hood, Parker Wise Counties, Texas in the South Section and Wise, Denton, Collin and Grayson Counties, Texas in the North Section.** This project consisted of 70 miles (112.63 kilometers) of 36-inch natural gas pipeline in the South Section and 92 miles (148.03 kilometers) of 36-inch natural gas pipeline in the North section. Mr. Norton served as Principal Investigator for the project. In particular, he provided guidance on field methodologies, assisted in scheduling field crews for work and worked effectively with the client and ensured that budgetary and scheduling aspects were dealt with appropriately.

**2007 HPL 24-inch Trunkline Lateral Project, Katy Pipeline, Ltd. in Tyler and Hardin Counties, Texas.** This project consisted of approximately 31.4 kilometers (19.5 miles) of proposed pipeline. Mr. Norton served as Principal Investigator for the project.

**2007 Interconnect with Wagner and Brown Project, Natural Gas Pipeline Company of America in Carter County, Oklahoma.** This particular project consisted of survey for a connecting pipeline. Due to the many previously recorded sites found deeply buried in the area, trenching was required for this project. Mr. Norton served as project coordinator for this effort. This entailed assisting with planning, mapping, and logistics for field crews.

**2007 Houstonia Pipeline Replacement Project, Panhandle Eastern Pipe Line Company, LP in Cooper County, Missouri.** Mr. Norton served as Principal Investigator for the cultural resources survey for this project. His duties included a file review at the Missouri State Historic Preservation Office (MOSHPO), coordination with MOSHPO regarding survey methodologies, coordination of the field effort, creating and maintaining a budget and report preparation. In Mr.



Norton's consultation with the MOSHPO it was determined that trenching in the recent Holocene soils on the Lamine River was required in addition to methodical shovel testing. All work was completed to MOSPHO and FERC standards and MOSPHO concurred with the findings allowing the client to begin construction on time.

**2007 I-10/White Oak Bayou Flood Mitigation Ponds, Texas Department of Transportation in Harris County, Texas.** Mr. Norton served as PBS&J's Project Archeologist for this proposed Texas Department of Transportation (TxDOT) project. The project included intensive archeological survey for one proposed detention pond situated next to White Oak Bayou near downtown Houston, Texas.

**2007 Mary Wagner Road at Hostetter Creek Bridge Replacement Project, Texas Department of Transportation in Montgomery County, Texas.** This project consisted of an intensive cultural resources survey for a proposed bridge replacement. Mr. Norton served as the project archeologist, which entailed coordinating the field effort and ensuring that all field notes and forms were completed correctly. He also assisted in the report preparation.

**2007 100-1, 2 and 3 Mainline Pipeline Replacement Project, El Paso Gas Company in Harris County, Texas.** Mr. Norton served as the PBS&J's project manager for this effort. This project consisted of survey for the replacement of approximately 182.88 meters (600 feet) of pipeline.

**2007 Wilson Storage to Channel 30-inch Pipeline Project, Enterprise Texas Pipeline, LLC in Wharton, Matagorda and Brazoria Counties, Texas.** This project consisted of survey for approximately 25.5 kilometers (15.83 miles) of new pipeline. Mr. Norton served as PBS&J's Principal Investigator for the project which entailed advising crews on survey methodologies, coordination of the field efforts, creating and maintaining a budget and report preparation.

**2007 Maypearl to Malone Pipeline Project, Energy Transfer Company in Ellis and Hill Counties, Texas.** This project consisted of survey for approximately 32.5 kilometers (20.2 miles) of new pipeline. Mr. Norton served as PBS&J's Principal Investigator for the project which entailed advising crews on survey methodologies, coordination of the field efforts, creating and maintaining a budget and report preparation.

**2007 Crighton Road Expansion Project in Montgomery County, Texas.** For this project, Mr. Norton served as PBS&J's project archeologist. The project entailed a proposed widening and bridge replacement over Stewarts Creek just south of Conroe, Texas. The cultural survey was provided for both the City of Conroe and TxDOT. This project involved an intensive archeological survey. In addition, trenching was provided. All work conducted for this project adhered to the Potential Archeological Liability Map (PALM) developed by TxDOT.

**2007 Southeast Expansion Project Third Party FERC Review, Gulf South Pipeline Company, LP in Choctaw County Alabama and Simpson, Smith, Jasper and Clarke Counties, Mississippi.** Mr. Norton was tasked with the third-party review the cultural resources portion of Gulf South's FERC filing. This review entailed the examination of the document to ensure that state and FERC guidelines were followed and that the data were represented properly. These comments were submitted to FERC to provide comments and data request

to Gulf South Pipeline Company, LP.

**2007 State Highway 87 Reconnaissance Survey, Texas Department of Transportation in Galveston, Jefferson and Chambers Counties, Texas.** Mr. Norton served as the project archeologist for this reconnaissance effort. His duties included conducting background research of previously recorded sites and surveys conducted in the area, conducting a pedestrian survey with limited judgmental shovel testing and making recommendations on the potential for buried archeological sites and future survey methods.

**2007 Fletcher Street at Sandy Creek Bridge Replacement Project, Texas Department of Transportation in Jasper County, Texas.** This project consisted of an intensive cultural resources survey for a proposed bridge replacement. Mr. Norton served as PBS&J's project archeologist, which entailed coordinating the field effort and ensuring that all field notes and forms were completed correctly. He also assisted in the report preparation.

**2007 Mullins-Reynolds Road at Bessie's Creek Bridge Replacement Project, Texas Department of Transportation in Fort Bend County, Texas.** This project consisted of an intensive cultural resources survey for a proposed bridge replacement. Mr. Norton served as PBS&J's project archeologist, which entailed coordinating the field effort and ensuring that all field notes and forms were completed correctly. He also assisted in the report preparation.

**2007 Louisburg 200 Line Hydrostatic Test Project, Panhandle Eastern Pipe Line Company, LP in Cass County, Missouri.** Mr. Norton served as Principal Investigator for the cultural resources survey for a proposed hydrostatic test of an existing pipeline. His duties included a file review at the Missouri State Historic Preservation Office (MOSHPO), coordination with MOSHPO regarding survey methodologies, coordination of the field effort, creating and maintaining a budget and report preparation.

**2007 County Road 323 at Walnut Run Creek Bridge Replacement Project, Texas Department of Transportation in Jasper County, Texas.** This project consisted of an intensive cultural resources survey for a proposed bridge replacement. Mr. Norton served as PBS&J's project archeologist, which entailed coordinating the field effort and ensuring that all field notes and forms were completed correctly. He also assisted in the report preparation.

**2006 FM 1464 from Clodine-Reddick Drive to South of Pecan Drive, Texas Department of Transportation in Fort Bend County, Texas.** Mr. Norton served as PBS&J's project archeologist and was responsible for the coordination of the field effort, mapping and report preparation. This project consisted of an intensive cultural resources survey for the rehabilitation of approximately 5.16 kilometers (3.21 miles) of FM 1464.

**2006 Cheniere Sabine Pass Pipeline in Cameron Parish, Louisiana (Reroutes).** Mr. Norton worked as PBS&J's project archeologist for this project. With guidance from Mr. Norton, PBS&J archeologists conducted an intensive archeological survey for areas where Cheniere decided to deviate from the originally permitted alignment. Mr. Norton worked closely with the project's engineers in the field to maximize efficiency of survey and construction planning.



**2006 A Class III Inventory of Proposed Alabama-Coushatta Gas Wells #1, #2 and #3, The Meridian Resource and Exploration, LLC in Polk County, Texas.** Mr. Norton served as an archeological technician on this project. In this capacity he conducted shovel tests, assisted in logistical issues and maintained field notes. He also compiled the data and prepared the document for the intensive cultural resources survey.

**2006 CR 101 Ramp Construction, Texas Department of Transportation in Brazoria County, Texas.** As PBS&J's project archeologist, Mr. Norton was responsible coordinating with both the TxDOT and a private developer, McGuyer Homebuilders, Inc. Under the guidance of Mr. Norton, PBS&J provided intensive archeological survey with trenching. Methodology adhered to TxDOT's PALM recommendations.

**2006 Cypress Lake Crossing Development in Harris County, Texas.** Mr. Norton worked as PBS&J's Principal Investigator for this proposed project by a private developer. The survey was for a proposed 620-acre housing development near Tomball, Texas. This project involved intensive survey with transect navigation through extremely dense vegetation using GPS equipment. The survey also resulted in the documentation of an early 20<sup>th</sup> century farmstead.

**2006 Halls Bayou Reconnaissance Project, Harris County Flood Control in Harris County, Texas.** As PBS&J's project archeologist on this project, Mr. Norton was responsible for a reconnaissance survey for the Harris County Flood Control District (HCFCD) for proposed flood management. Specifically, he made recommendations on locations along the bayou that should undergo intensive archeological survey.

**2006 Texoma to Carthage Energy Transfer Company Katy Pipeline, Ltd. in Rusk and Panola Counties, Texas.** Mr. Norton assisted with the Texoma to Carthage Pipeline Project, which consisted of approximately 51 kilometers (31.5 miles) of new 42-inch natural gas pipeline, through report preparation and assisting with field crews' navigation and logistics.

**2006 Reed to Cleburne Energy Transfer Fuels, LP, Pipeline in Freestone, Navarro, Hill, and Johnson Counties, Texas.** Mr. Norton served as PBS&J's project coordinator and assisted with planning, mapping, and logistics for field crews. He also assisted in report preparation. The proposed project consisted of approximately 135 kilometers (84 miles) of new 42-inch natural gas pipeline.

**2006 Centralia Line 200 natural Gas Pipeline Project Panhandle Eastern Pipe Line Company, LP (PEPL) in Audrain, Ralls, and Pike Counties, Missouri.** Mr. Norton served as Principal Investigator for the cultural resources survey for a proposed hydrostatic test of an existing pipeline. During the file review at the MOSHPO Mr. Norton discovered that a portion of the proposed workspace existed within prehistoric archeological site 23PI74 that had previously undergone national registry testing. In consultation with MOSHPO staff, Mr. Norton completed modified testing on the portion of the site existing within the client's proposed workspace and satisfied state requirements for documenting this portion of the site. Concurrence on PBS&J's findings was given by MOSHPO and the client was able to begin work on time.

**2005 Bethel to Texoma Energy Transfer Company Katy Pipeline, Ltd. Pipeline in Anderson, Cherokee, and Rusk Counties, Texas.** Mr. Norton

served as PBS&J's project coordinator and assisted with planning, mapping, and logistics for field crews. He also assisted in report preparation. The project consisted of approximately 122.28 kilometers (76.0 miles) of new 42-inch pipeline.

**2005 Bethel to Farrar Energy Transfer Fuels, LP, Pipeline in Anderson, Freestone and Limestone Counties, Texas.** Mr. Norton served as PBS&J's project coordinator and assisted with planning, mapping, and logistics for field crews. He also assisted in report preparation. The proposed project consisted of approximately 36 kilometers (22.4 miles) of new 42-inch natural gas pipeline.

**2005 Reed to Farrar Energy Transfer Fuels, LP, Pipeline in Anderson, Cherokee, and Rusk Counties, Texas.** Mr. Norton served as PBS&J's project archeologist on this project that spanned approximately 122.28 kilometers (76.0 miles). Mr. Norton led several field crews and advised crew chiefs on varying shovel testing methodologies as they applied to varying terrain.

**2005 Bethel to Reed Energy Transfer Fuels, LP, Pipeline in Anderson and Freestone Counties, Texas.** Mr. Norton served as PBS&J's project archeologist on this project that spanned approximately 37.49 kilometers (23.3 miles). Mr. Norton led several field crews and advised crew chiefs on varying shovel testing methodologies as they applied to varying terrain. Mr. Norton effectively worked with the client to avoid two sites recommended as potentially eligible for the National Register of Historic Places by altering the proposed pipeline route and avoided impacts to another site during construction. In addition, Mr. Norton assisted in preparing a report documenting the survey in time for the client to begin construction on schedule.

**2005 Cheniere Creole Trail Pipeline Project, Cheniere Creole Trail Pipeline Company, Cameron, Calcasieu, Beauregard, Allen, Jefferson Davis, and Acadia Parishes, Louisiana.** As PBS&J's project archeologist, Mr. Norton provided a variety of roles on the 466.7 kilometer (290 mile) long project. He scheduled and supervised a staff of up to twelve individuals, ensured that all Federal Energy Regulatory Commission and Louisiana Division of Archeology standards were followed, created a weekly status update for the client, worked closely with pipeline field engineers and land agents, assisted the client in protecting potentially eligible archeological sites and ensured that the project was completed within budget and on time.

**2005 Creole Trail LNG Terminal Project, Cheniere Creole Trail Pipeline Company, Cameron Parish, Louisiana.** As PBS&J's project archeologist, Mr. Norton assisted in the logistical planning during the project, which entailed scheduling a back hoe for trenching at a previously known site location and creating a methodology for surveying the marsh habitat effectively.

**2005 Proposed Kosse Lignite Mine, Texas Utilities Mining Company, Limestone and Robertson County, Texas.** Mr. Norton was a crew chief for an intensive cultural resources survey for a proposed area of lignite mine location. His duties included ensuring paperwork was properly completed and that work assigned to the crew was completed in a timely fashion.

**2005 Lampasas-Buchanan Dam Transmission Line Replacement Project Burnet and Lampasas Counties, Texas.** Mr. Norton served as a crew chief for the intensive cultural resources survey of the proposed rebuilding of an electric

transmission line for the Lower Colorado River Authority (LCRA). Specifically, he led field logistics and was in constant communication with LCRA representatives during the survey regarding landowner access and alignment issues.

**2005 Callahan Divide Wild Rand Wind Turbine, Abilene, Texas.** Mr. Norton was PBS&J's project archeologist for this project and led an intensive cultural resources survey of proposed turbine loci for wind farms on the Callahan Divide Wind Ranch. Specifically, he was responsible in navigating rugged terrain to document any cultural resources encountered within a proposed wind turbine location.

**2004 Sam Houston Electric Cooperative Wolf Creek-Dorrell, Walker and San Jacinto Counties, Texas.** Mr. Norton served as an archeological technician during the intensive cultural resources survey for the proposed 138-kV transmission line right-of-way (ROW). In this capacity he conducted shovel tests, assisted in logistical issues and maintained field notes.

**2004 Proposed CGU Well Sites and Access Roads, Chevron USA, Inc. in Panola County, Texas.** Mr. Norton assisted in the field effort as an archeological technician for surveying several proposed well pad locations and access roads. In this capacity he conducted shovel tests, assisted in logistical issues and maintained field notes.

**2004 Site 22RA660, Rankin County, Mississippi.** Mr. Norton was a crew member for this project, which included National Register of Historic Places eligibility testing. He also assisted in the analyses of artifacts, compiled these data and synthesized it into a comprehensive report.

**2004 Sites 22GN680 and 22GN685, Greene County, Mississippi.** Mr. Norton artifact analyses of the lithic debitage and stone tools recovered in the data recovery investigations of these sites. He gathered metric data and identified various stone and ceramic artifacts.

Prior to joining PBS&J, Mr. Norton worked as an artifact curator and archeology technician for the US Forest Service on the Chickasawhay Ranger District of the De Soto National Forest in Laurel, Mississippi. He also worked as an archeology technician at Aquarena Springs in San Marcos, Texas, as part of field school for Texas State University at San Marcos. While attending Texas State University, Mr. Norton additionally worked as an archeology technician at the Center for Archeological Studies in San Marcos and at the Blackman Eddy Site in the Cayo District of Belize.

#### **Bioarcheology and Forensic Experience**

Prior to joining PBS&J, Mr. Norton worked as a medicolegal death investigator and pathology technician for the Travis County Medical Examiner's Office in Austin, Texas. He also worked as a bioarcheology technician for data recovery investigation of a Late Prehistoric Caddoan cemetery in northeast Texas.

He worked as a laboratory manager for the Human Skeletal Identification Laboratory in San Marcos, Texas. In this capacity, Mr. Norton assisted in forensic casework and took part in directing the investigation of prehistoric Mayan human skeletal remains.



## Dale C. Norton

Group Manager

Mr. Norton worked as an assistant instructor teaching the fundamentals of human skeletal identification and recovery for a course presented to the Roseburg Police Department.

Mr. Norton worked as a laboratory assistant at the Biological Anthropology Laboratory at the University of Southern Mississippi. In this capacity, he aided in the investigation and documentation of prehistoric Mayan human skeletal remains and assisted in forensic casework.

### **Professional Development**

1994-1998: Forensic Anthropology, Anatomy and Physiology, Vertebrate Anatomy and Mammology: Texas State University, San Marcos.

2001-2004: Physical Anthropology Seminar, Human Variation, Bioarcheology, Archeology Seminar, Prehistory of Southeastern Indians: The University of Southern Mississippi, Hattiesburg.

1999: Medicolegal Death Investigator Course School: St. Louis University, Missouri.

Medicolegal Investigation of Death Seminar: The University of Southern Mississippi.

### **Other Selected Publications and Reports**

M.A. Thesis: *Intersite Relationship of the Widows Creek (1JA305) and Williams Landing (1JA306) Sites: A Holistic Evaluation Utilizing Diet, Health, Genetic, Cultural and Demographic Data*. Department of Anthropology, University of Southern Mississippi, Hattiesburg, 2004.

Mississippi Academy of Sciences: *Decomposition Patterns in South Mississippi*, Summer, 2004.

Midwestern Bioarcheology and Forensic Anthropology Association: *Melanin in Teeth?* 2002.