Volume 2018 Article 42

2018

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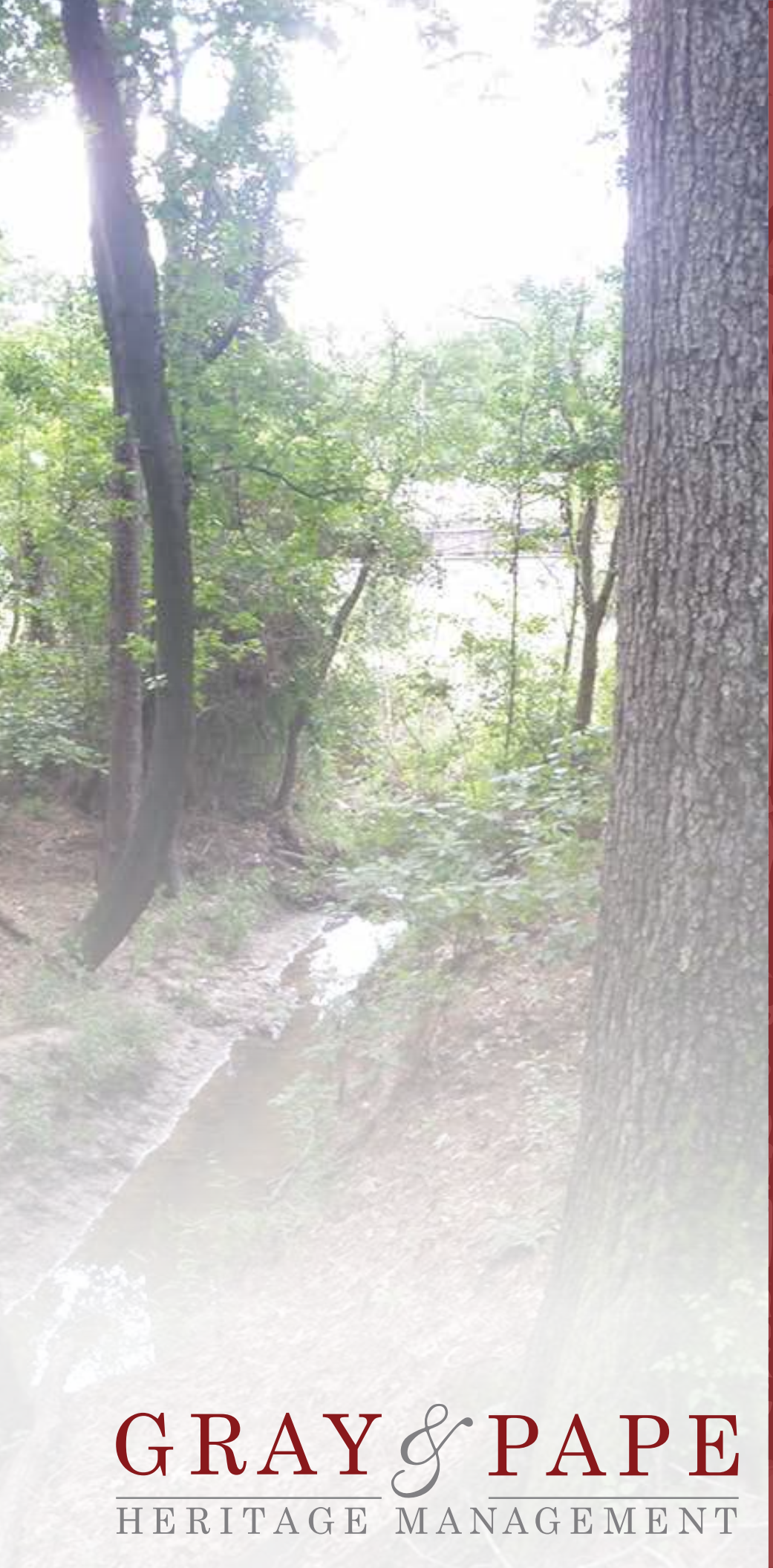

# *Archaeological Survey of 296 acres for the Houston 4 Project, Harris County, Texas*

**Lead Agency:**
United States Army Corps
of Engineers, Galveston District
Texas Antiquities Code Permit #7670

**Prepared for:**
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GRAY & PAPE
HERITAGE MANAGEMENT

16-72602.001

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Project No. 16-72602.001

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Lead Agency: United States Army Corps of Engineers, Galveston District
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# ABSTRACT

In June 2016, Gray & Pape, Inc. of Houston, Texas, at the request of Benchmark Ecological Services, Inc., conducted marine and terrestrial cultural resources surveys on property proposed for development in Harris County, Texas. The Lead Agency for this project has not yet been identified but is assumed to be the United States Army Corps of Engineers, Galveston District.

The goals of the survey were to establish whether or not previously unidentified buried archaeological resources were located within or immediately adjacent to the project's Area of Potential Effects and if so to provide management recommendations for such resources. The survey was undertaken in accordance with requirements set forth by Section 106 of the National Historic Preservation Act, specifically requirements set forth by 36 CFR 800. The procedures to be followed by the United States Army Corps of Engineers to fulfill the requirements set forth in the National Historic Preservation Act, other applicable historic preservation laws, and Presidential directives as they relate to the regulatory program of the United States Army Corps of Engineers (33 CFR Parts 320-334) are articulated in the Regulatory Program of the United States Army Corps of Engineers, Part 325 - Processing of Department of the Army Permits, Appendix C - Procedures for the Protection of Historic Properties. All fieldwork and reporting activities were completed with reference to State laws and guidelines (the Antiquities Code of Texas). Survey and site identification followed Texas Antiquities Code standards. Work was conducted on lands owned and controlled by the Port of Houston Authority, a political subdivisions of the state of Texas, and thus required a Texas Antiquities Code permit prior to survey. Work was completed under Texas Antiquities Permit Number 7670. The project also contains a marine component which is being investigated under a separate marine permit application and separate report.

The property boundary for this project is approximately 162 hectares (400 acres). However, approximately 42 hectares (104 acres) of that amount had been previously surveyed. Although the results of that survey are discussed in the current document, that portion of the project was excluded from the current investigation. Thus the current archaeological Area of Potential Effects amounts to 120 hectares (296 acres). Field investigation consisted of visual inspection and shovel testing within the Area of Potential Effects. Subsurface investigation here resulted in the excavation of 35 shovel tests, of which 34 were negative for archaeological deposits. Another 49 planned shovel tests were unexcavated due to a very low and wet landscape, which describes the majority of the project. The southern section of the project is also largely disturbed. Disturbances there included rip rap, heavy trash like cement fragments, tires, etc., existing pipelines, and existing cement or gravel laydown yards. One test contained a potentially human-modified stone flake but was found within a disturbed context and thus has a questionable provenance. No archaeological sites, standing structures, or other cultural resources were identified as a result of the survey.

Based on the largely negative results of the archaeological investigation, Gray & Pape recommends no further work and that the project be allowed to proceed as planned. As specified under the conditions of Texas Antiquities Code Permit Number 7670, all project associated records are curated at the Center of Archaeological Studies at Texas State University.

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# 1.0 INTRODUCTION

In May 2016, Benchmark Ecological Services, Inc. (Benchmark) of Katy, Texas, on behalf of Contanda, LLC., contracted with Gray & Pape, Inc. (Gray & Pape), of Houston, Texas, to perform marine and terrestrial cultural resources surveys of property proposed for development in Harris County, Texas.

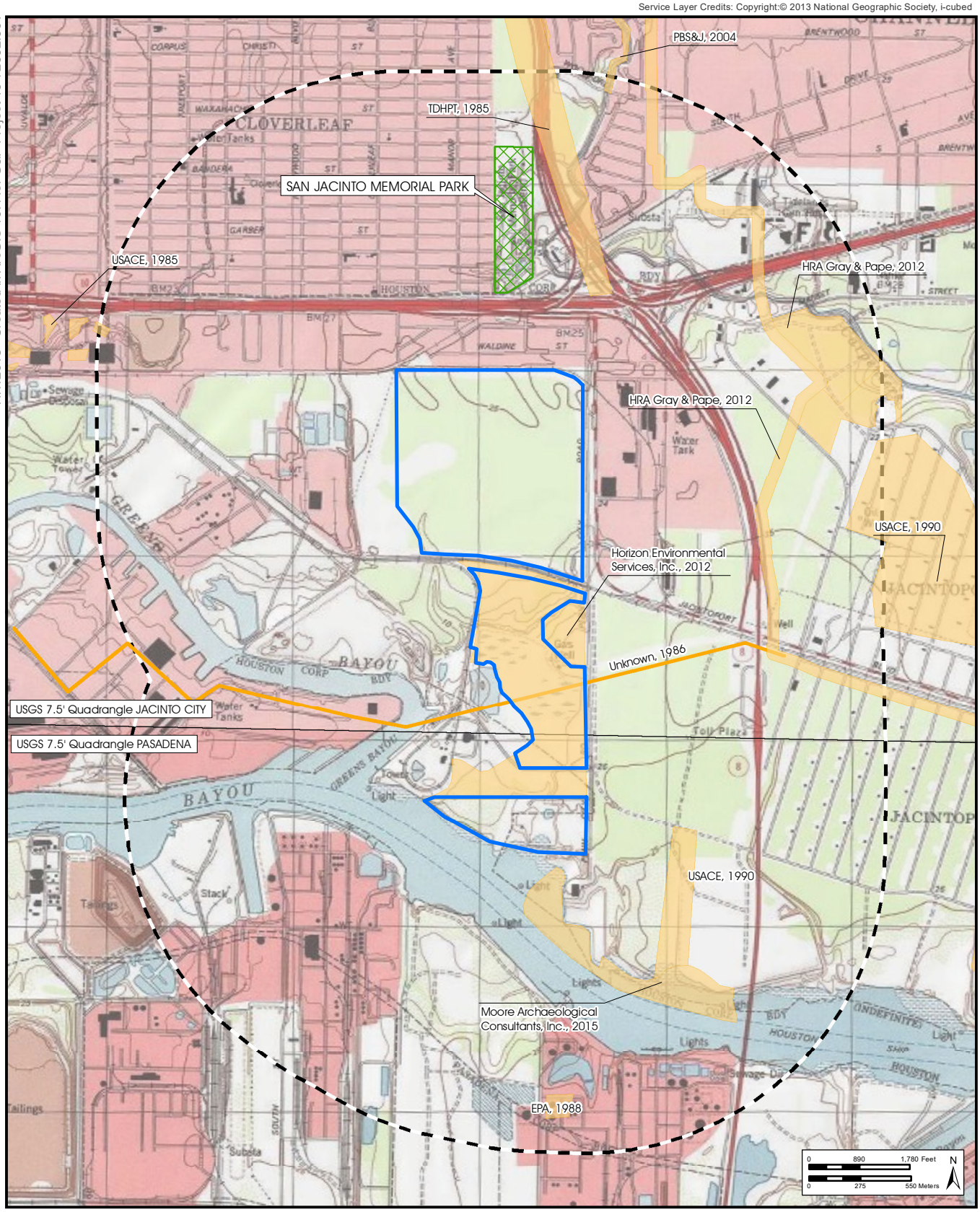
The Lead Federal Agency for this project has been identified as the United States Army Corps of Engineers (USACE), Galveston District. The procedures to be followed by the USACE to fulfill the requirements set forth in the National Historic Preservation Act (NHPA), other applicable historic preservation laws, and Presidential directives as they relate to the regulatory program of the USACE (33 CFR Parts 320-334) are articulated in the Regulatory Program of the USACE, Part 325 - Processing of Department of the Army Permits, Appendix C - Procedures for the Protection of Historic Properties. All fieldwork and reporting activities were completed with reference to State laws and guidelines. Survey and site identification followed Texas standards.

The goal of this study was to assist Benchmark, the Texas Historical Commission (THC), and the USACE in determining whether or not the project would affect any previously identified archaeological sites as defined by Section 106 of the NHPA of 1966, 36 CFR Part 800: Protection of Historic Properties (Advisory Council for Historic Preservation [ACHP] 2004, as amended), to determine if project construction would affect any previously identified cultural resources, and to establish whether or not previously unidentified buried archaeological resources were located within the project's Area of Potential Effects (APE)/Permit Area, and if so to provide management recommendations for these resources (United States Department of the Interior, National Park Service [USDI, NPS] 1983). Further, the project is located on lands owned and controlled by the Port of Houston Authority, a political subdivisions of the state of Texas, and thus required a Texas Antiquities Code permit prior to survey. Work was completed under Texas Antiquities Permit #7670. The project also contains a marine component which is being investigated under a separate marine permit application and separate report. All fieldwork and reporting activities were completed with reference to state (the Antiquities Code of Texas) and federal (NHPA) guidelines.

## 1.1 Project Overview

The project is defined as all property within an approximately 162-hectare (400-acre) tract proposed for development. The project can be located on the Jacinto City and Pasadena, Texas, United States Geological Survey (USGS) 7.5-minute topographic quadrangle maps (Figure 1-1). The project area is located near the confluence of Buffalo Bayou and Greens Bayou, south of I-10 (East Texas Freeway) and west of Penn City Road.

Project plans have not yet been developed but the property is planned to be used as a storage terminal. Planned construction on the project would likely include bulkheads, mooring dolphins, pilings, etc. While the boundary for this project is approximately 162 hectares (400 acres), approximately 42 hectares (104 acres) of that amount had been previously surveyed in 2012. Based on the overlap of that survey, its recent time frame, and negative findings it is recommended that that area not require survey again. Thus the current survey area amounts to 120 hectares (296 acres). The APE for direct effects is limited to the area of potential ground disturbance and any property, or any portion thereof, which will be physically altered or destroyed by the undertaking. The APE for direct effects is the 120-hectare (296-acre) project area. The amount of above ground construction has not yet been determined, thus for the purposes of this project

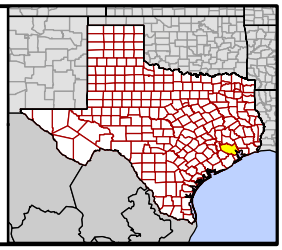



Project area location in Harris County, Texas.

GRAY & PAPE HERITAGE MANAGEMENT

Figure 1-1

- Project Boundary
- Study Radius (.8-km/.5-mi.)
- Previously Recorded Area Survey
- Previously Recorded Linear Survey
- Previously Recorded Cemetery Boundary
- USGS Quadrangle Boundary



the APE for visual effects was limited to the project area and areas immediately adjacent. Both the Direct and Visual APEs were based on project maps and information provided by the client.

## 1.2 Report Organization

This report is organized into seven numbered chapters. Chapter 1.0 provides an overview of the surveyed areas. Chapter 2.0 presents an overview of the environmental setting and geomorphology of the surveyed areas. Chapter 3.0 presents a discussion of the cultural context associated with surveyed areas. Chapter 4.0 presents the research design and methods developed for this investigation. The results of this investigation are presented in Chapter 5.0. Chapter 6.0 presents the investigation summary and provides recommendations based on the results of field survey. A list of literary references cited in the body of the report is provided in Chapter 7.0.

## 1.3 Personnel

Tony Scott served as the Project Manager and Principal Investigator. Fieldwork was completed by Crew Chief Stephanie Bush and Field Technicians Charles William Fee and Jeremiah Hull. The content of this report was prepared by Tony Scott with contributions by Stephanie Bush. Report graphics were prepared by Tony Scott and the report was edited and produced by Jessica Bludau.

## 1.4 Acknowledgements

Gray & Pape would like to convey a special thank you to Brett Soutar of Benchmark, Michael Long of Contanda, LLC., and Erik Eriksson of the Port of Houston Authority for their much-appreciated guidance, support, and assistance.

# 2.0 ENVIRONMENTAL CONTEXT

## 2.1 Physiography and Geomorphology

The project area is located within the Coastal Prairies of the Gulf Coastal Plains Province of Southeast Texas. The Coastal Prairies exhibit nearly flat terrain that is underlain by nearly flat strata of deltaic sands and muds (University of Texas-Bureau of Economic Geology [UT-BEG] 2010). These sediments include a combination of fill and spoil, alluvium and the Beaumont Formation. Fill and spoil along the northern bank of Buffalo Bayou is comprised of dredged sediments of Holocene age. The alluvium along the east bank of Greens Bayou is comprised of clay, silt, sand and organic matter deposited by fluvial land formation. The Beaumont Formation of the adjacent floodplain is comprised predominately of clay and silt with low permeability and low drainage. These sediments form interdistributary muds, abandoned channel-fill muds and overbank fluvial muds (UT-BEG 2010).

## 2.2 Natural Environment

The project area is seated between the Brazos and Trinity Rivers within the Trinity River drainage basin. The Trinity River flows 681 kilometers (423 miles) southeast from the confluence of the Elm and West forks in the interior lowlands near Dallas to Trinity Bay which drains into the Gulf of Mexico. Greens Bayou, approaching the western boundary of the APE, flows 68 kilometers (42 miles) southeast from northwestern Harris County near Jersey Village to Buffalo Bayou in Southeastern Harris County near Pasadena. Buffalo Bayou, which comprises the southern boundary of the APE, flows 105 kilometers (65 miles) east from the juncture of Willow Fork and Cane Branch in northern Fort Bend County to the San Jacinto River in Lynchburg that flows into Galveston Bay.

## 2.3 Climate

The project area belongs to the humid subtropical climate zone characterized by hot summers and mild to cool winters without any regular dry season. On average, annual precipitation for the Houston Port area is 128.6 centimeters (50.63 inches) distributed relatively evenly throughout the year. Average annual temperature is 70.7 °Fahrenheit (F) with an annual maximum temperature of 79.5 °F and an annual minimum temperature of 61.9 °F. Summer peaks average at 92.6 °F and winter troughs average at 46.0 °F (National Oceanic and Atmospheric Administration [NOAA] 2016).

## 2.4 Flora and Fauna

The project area inhabits the Gulf Coast Prairies and Marshes ecoregion. This ecoregion extends from the Sabine River to the Rio Grande along the Gulf Coast and transitions inland to the South Texas Plains along the lower coast, to the Post Oak Savannah along the central coast and to the East Texas Piney Woods along the upper coast. It is characterized by inland tallgrass prairies, riverine woodlands and coastal sedges, rushes and salt grass marshes. Common grasses include big bluestem, little bluestem, gulf muhly and indian yellow grass. Common trees include live oak, yaupon, sweetgum and bald cypress. The region is home to many resident and migratory birds and several species of furbearers and reptiles (Texas Parks and Wildlife [TPWD] 2016).

## 2.5 Soils

Approximately seven soil series are mapped within the project area. These include Bacliff clay, Bacliff-Urban land complex, Ijam clay, Verland silty clay loam, Verland-Urban land complex, Sorter silt loam, and Texla silt loam (Table 2-1) (Soil Survey Staff, National

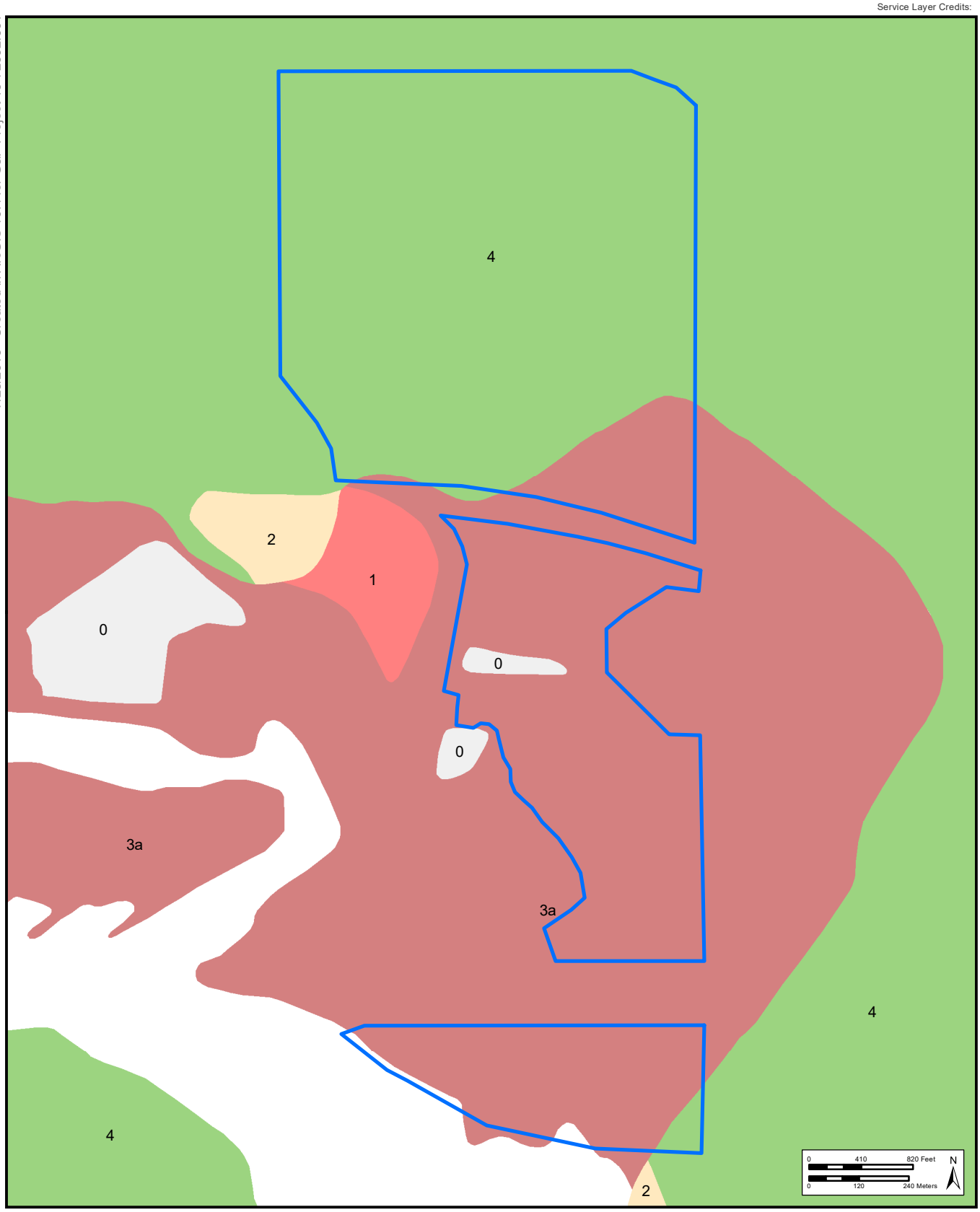
Table 2-1. Soils Mapped within the Project Area and Archaeological APE.

| Map Unit Symbol | Map Unit Name | Acres | Percent of Project |
|---|---|---|---|
| BacA | Bacliff clay, 0 to 1 percent slopes | 10.4 | 2.6 |
| BadA | Bacliff-Urban land complex, 0 to 1 percent slopes | 0.3 | 0.1 |
| IjmB | Ijam clay, 0 to 2 percent slopes, frequently flooded, tidal | 91.8 | 23.0 |
| Md | Verland silty clay loam | 229.0 | 57.3 |
| Mu | Verland-Urban land complex | 0.2 | 0.0 |
| SolA | Sorter silt loam, 0 to 1 percent slopes | 11.6 | 2.9 |
| TelB | Texla silt loam, 0 to 2 percent slopes | 46.6 | 11.7 |
| W | Water | 9.4 | 2.4 |

Cooperative Soil Survey, Web Soil Survey [SSS NCSS WSS] 2016). While the current project does not involve the Texas Department of Transportation (TxDOT), a review of TxDOT's Potential Archeological Liability Map (PALM) indicates the project intersects PALM Unit 3a (No Surface Survey Recommended, Deep Reconnaissance Recommended only if Severe Deep Impacts are Anticipated) and PALM Unit 4 (No Survey Recommended) (Figure 2-1).

## 2.6 Land Use

Today, much of the Gulf Coast Prairies and Marshes have been converted to use by industry, agriculture and urbanization. Such land uses have resulted in fragmentation and massive habitat loss to many native plants and animals and the preservation status of the ecoregion is considered critical/endangered. Wild fires are a necessary component of this ecoregion that have been hindered and prevented by human intervention. As a result, species of thorn scrub such as mesquite and acacia have grown and spread in areas previously dominated by grasses. Controlled fires have been employed to reduce these plant populations and to help restore the native prairie grasses (World Wildlife Fund 2016).




Project area overlaid on the TxDOT Harris County PALM.

GRAY & PAPE HERITAGE MANAGEMENT

Figure 2-1

Project
Map Unit
0 - Water. No Survey
1 - Surface Survey Recommended, Deep Reconnaissance Recommended if Deep Impacts are Anticipated.
2 - Surface Survey Recommended, No Deep Reconnaissance Recommended.
2a - Surface Survey of Mounds Only; No Deep Reconnaissance Recommended.
3 - No Surface Survey Recommended, Deep Reconnaissance Recommended if Deep Impacts are Anticipated.
3a - No Surface Survey Recommended, Deep Reconnaissance Recommended only if Severe Deep Impacts are Anticipated.
4 - No Survey

# 3.0 CULTURAL CONTEXT

Between the San Bernard River and Sabine Lake, most prehistoric sites near the coast consist of shell middens found in estuaries or exposed in cutbanks along streams (Aten 1983; Patterson 1985). Inland sites are more similar to generalized open campsites. In both areas, sites are found near stream channels. Historic sites tend to reflect farm or homesteads, generally dating to the mid-nineteenth century and are typically found on terraces or uplands.

## 3.1 Prehistoric Context

The cultural context of the upper coastal region is described by Aten (1983), Story (1990), and Perttula (2004). This information is merged with the archaeological data here to give a complete picture of life on the Upper Texas Coast. Along the Upper Texas Coast, the Paleoindian period (termed the Early Cultures by Story) begins around 12,000 Before Present (B.P.) and ends near 9,000 to 8,000 B.P. (Aten 1983; Story 1990). The population during this stage was highly mobile in response to the movement of food sources. Isolated artifacts include Clovis, Angostura, Scottsbluff, Meserve, Plainview, and Golondrina point types (Aten 1983).

The Archaic Cultures took place from 7,000 B.P. until approximately 1,300 B.P. (Story 1990; Perttula 2004). Like the Paleoindian cultures, Archaic societies were primarily composed of small, hunter-gatherer bands. During this time period, the climate began to resemble current conditions. Temperatures continued to rise and the glaciers continued to melt, increasing alluvial activity and altering the landscape of southeast Texas. Sea levels rose to their current levels, submerging shorelines and river deltas (Story 1990). The Archaic Culture period is distinguished from the Paleoindian period primarily by the toolset. In general, tools were not as finely made but were often more task specific and expedient. In addition, the quality of raw material used for tool making declined, possibly due to an increase in population density causing a decrease in group mobility (Story 1990).

The final cultural period that Story (1990) identifies, the Late Cultures, occurred from 1,200 B.P. until about 200 B.P., when European settlers all but wiped out the indigenous population. This time period corresponds to Perttula's (2004) Late Prehistoric period. The vast majority of prehistoric sites in southeast Texas come from this time period. Technology, once again, represents the biggest changes in culture. It was during this time that the bow and arrow came into use, approximately 1,300 to 1,500 years ago (Story 1990). Another major indicator of the Late Culture period is the widespread use of ceramics. Archaeological evidence from this period shows that sites were generally utilized for short visits at regular times during the year and that similar activities were undertaken each year at individual sites (Story 1990). Most sites reflect this pattern of a short period of use over many years, but a few sites could represent a more permanent residence or "base camp." Though it is not known why Inland groups did not exploit coastal resources, Story (1990) provides two possibilities. The first is that it was simply too far to travel from the northern reaches of the inland range all the way to the coast and abundant inland resources made a journey of this length unnecessary. The second is that the coastal groups denied them access. This theory would suggest firm tribal groups with distinct regional boundaries; however, there is little archaeological evidence to support this. Ricklis (2004:201-202) notes that further development of models of prehistoric settlement and subsistence as well as more detailed chronologies for the region are needed and notes that their development is contingent on the "discovery and extensive excavation of sealed site components that

represent occupation episodes and/or recurrent occupations during discrete time periods" (Ricklis 2004:201). It is also generally agreed that Prehistoric subsistence is poorly understood throughout the Holocene because of the lack of well-preserved botanical materials, particularly inland (Patterson 1995).

### 3.1.1 The San Jacinto District and Harris County History

Harris County was formed as Harrisburg County on December 22, 1836. The county was renamed Harris in December 1839 to honor John Richardson Harris, an early pioneer who had established Harrisburg in 1826, the first town site in the county. Harrisburg was established at the confluence of Buffalo Bayou and Brays Bayou and by the 1830s had become the major port of entry for the region and a transportation hub. Roads ran northwest to the Brazos communities of San Felipe and Washington, east to the ferry landing that crossed the San Jacinto, and west paralleling Brays Bayou to the Oyster Creek Community near present day Stafford in Fort Bend County.

Under Mexican rule, the area surrounding Harrisburg was known as the San Jacinto District. The district stretched east from Lynchburg on the San Jacinto River, west to the location of present day Richmond, and from Clear Creek in the south to Spring Creek in the north. Harrisburg County encompassed this same territory with the addition of Galveston Island. The modern boundaries of Harris County were established in 1838 (Henson 2016).

The lands that would become Harris County comprised the southeastern border of Austin's Colony. In July of 1824, 29 titles were granted to lands in future Harris County, with an additional 23 grants made between 1828 and 1833. These original grants concentrated mainly on the watercourses of the region (Henson 2016). The early settlers in the region were mostly from the southern U.S. who brought with them their African slaves. In the 1840s, large numbers of German and French immigrants settled in Harris County. The Hispanic presence in the region was relatively sparse prior to an influx of immigrants following the Mexican Revolution reflecting the ephemeral nature of Spanish and Mexican colonization.

The founding of the city of Houston by Augustus and John Allen was announced in a newspaper advertisement in August 1836. The brothers managed to convince the delegates of the first Texas Congress to establish the yet-to-be-built Houston as the first, albeit temporary (1837-1840), capital of Texas. In 1837, Houston also became the seat of Harrisburg County. The town was laid out on a grid plan with streets running parallel and perpendicular to Buffalo Bayou near the confluence of White Oak Bayou. The town grew rapidly from 12 inhabitants and one log cabin in January 1837 to 1500 people and 100 houses four months later (Henson 2016).

Initially, the city was not segregated and slaves lived scattered throughout the city's neighborhoods. There was a separate social structure for the whites and subordinate blacks which, continued beyond the Civil War and Emancipation. Schools, churches, and businesses continued to be segregated and by the end of the nineteenth century residential segregation was also present. Separate white, black, and later on Hispanic neighborhoods divided the city.

The immigrants that came to the area following the Civil War founded settlements along the rail lines that bisected the county. The Houston communities of Pasadena, Deer Park, Houston Heights, Bellaire, Webster, La Porte, South Houston, and Genoa developed in this manner and were eventually annexed into the city of Houston. By the 1930s, Harris County was the largest county and Houston was the largest city in Texas.

By the mid-nineteenth century, Houston and Harris County had become a center of commerce. Products were imported into the Texas hinterland through Houston after being offloaded from ocean going ships in Galveston. Exports included agricultural products such as cotton, corn, and cow hides. The town became a railroad hub with six railways spreading from 80.5 to 160.9 kilometers (50 to 100 miles) to the northwest, east, west, south, and southeast. In 1873, Houston joined the national rail network when the Houston and Texas Central reached Denison (Henson 2016).

The expansion of Buffalo Bayou was essential to the commercial life of Houston and a number of private ventures were undertaken over the years to widen and deepen the channel. The Army Corps of Engineers took control of the project in 1881, eventually creating the 15.2-meter (50-foot) deep Houston Ship Channel from Galveston Bay to a turning basin above Brays Bayou. Additional public works projects included the creation of the Lake Houston reservoir in 1954 to reduce the dependence on subsurface water, the use of which had caused up to 3 meters (9 feet) of subsidence surrounding the confluence of Buffalo Bayou and the San Jacinto River. In 1935, the Harris County Flood Control District was established and infrastructures such as the Addicks and Barker dams in western Harris County were constructed. Since this time, channelization projects completed along Houston area bayous have disturbed any archaeological sites in their path. However, isolated and undisturbed areas along these watercourses may still contain intact deposits (Abbott 2001:101).

The discovery of oil at Spindletop made Houston an important center for the petroleum industry. The Ship Channel's inland location made it safe from Gulf storms and refineries began lining the banks in 1918. By 1929, 40 oil companies had offices in Houston. The outbreak of World War II created a demand for products made of petrochemicals. The city would go on to become one of the two largest petrochemical concentrations in the United States (Henson 2016).

# 4.0 FIELD METHODOLOGY

Gray & Pape designed the current archaeological investigation to identify and record the presence of cultural resources, including prehistoric and historic archaeological sites and aboveground historic period resources, within the project area.

## 4.1 Site File and Literature Review

Background review and literature research were conducted prior to fieldwork mobilization. The background literature search included a review of previously conducted cultural resource surveys in the vicinity of the proposed project area, and of any historic document pertaining to the history of the area. Site file research was performed in order to identify all previously recorded archaeological sites within a 1.6-kilometer (1-mile) study radius of the project area (Figure 1-1), and any recorded historic structures eligible for the National Register of Historic Places (NRHP) listing located adjacent to the project area. Site file research was done by consulting online research archives maintained by the THC.

Historic topographic and aerial maps were reviewed in order to identify any historic structures that might be located close to or within the project area. Historic maps of Texas and Texas counties were reviewed in order to better understand the history of the region and to identify any potential historic trails and important historic sites located or crossing the project area. In addition, Texas General Land Office (TxGLO) files and maps were consulted to identify past land owners of the tracts comprising the property area. Historic topographic maps and aerial photographs were reviewed to identify potential residential and other structures located within the project area. TxDOT's PALM model was referred to as well.

## 4.2 Field Methods

The archaeological investigations associated with the current undertaking were designed to define all sites, prehistoric and historic, within the defined boundaries for the project. In addition to site identification, the investigations also must provide sufficient data to determine whether or not additional investigations will be required to evaluate fully the potential eligibility of any newly defined site location for inclusion on the NRHP or as a State Antiquities Landmark.

### 4.2.1 Intensive Pedestrian Survey

Archaeological methods utilized during the survey consisted of shovel testing, photo-documentation, and pedestrian reconnaissance. Horizontal control was maintained by the use of a Global Positioning System (GPS) data collector. All actions performed, the general observations of the surveyor, and the results of survey actions were recorded on a shovel test form. These forms included information on provenience, survey method, and cultural materials identified.

Per state standards, shovel tests were attempted at an average interval of one shovel test for every 1.2 hectares (3 acres). The interval and number of tests was increased in areas that exhibited a higher potential for containing intact cultural resources, such as those that are adjacent to waterways or are suggestive of high potential based on background research or field observation. This testing interval was increased or decreased in sections of the property as required by variations in topography and degree of prior disturbance, or as needed for site delineation.

Shovel tests were excavated to a maximum depth of between approximately 50 centimeters (20 inches) and 1 meter (3 feet), or until culturally sterile subsoil is reached or soils

become saturated with ground water. All shovel tests measured approximately 30 centimeters by 30 centimeters (1 foot by 1 foot). Vertical control was maintained by excavating each shovel test in 10-centimeter (4-inch) levels within natural soil stratigraphy. Each shovel test was profiled and the walls and floor of each shovel test were inspected for color or texture change that might offer evidence of cultural features. Soils were screened through 0.65-centimeter (¼-inch) galvanized wire mesh and descriptions of soil texture and color followed standard terminology and the Munsell (2005) soil color charts. Additional observations of soils were recorded on standardized shovel test forms for each excavation.

### 4.2.2 Site Definition

No new or previously recorded sites were identified during survey. If they had been preliminary assessments concerning resource integrity and preliminary recommendations for NRHP eligibility status would have been made. All sites would have been photographed and mapped with a minimum of six shovel tests excavated to delineate site boundaries.

No standing structures were identified during survey. Had any standing structures located immediately adjacent to the survey corridor and appearing to be 50 years or older been identified they would have been photographed during the survey, and their locations plotted on field maps with Global GPS points collected.

## 4.3 Laboratory Analysis

Non-diagnostic artifacts were not collected during the intensive pedestrian survey of the project; instead, attributes describing these materials and their archaeological context were recorded in the field. Thus no laboratory analysis has been completed or was required for the project.

## 4.4 Curation

As specified under the conditions of Texas Antiquities Code Permit Number 7670, all project associated records are curated at the Center of Archaeological Studies (CAS) at Texas State University.

# 5.0 RESULTS OF INVESTIGATIONS

The four primary goals of Gray & Pape's investigation of the project area and its APE were as follows: 1) identification of previously identified cultural resources or listed NRHP properties located within a 1.6-kilometer (1-mile) radius of the project area; 2) identification of previous cultural resource investigations conducted in or near the project area; 3) identification of previously unidentified and intact cultural resources within the project area through an intensive pedestrian survey; and 4) provide management recommendations based on the results of background research and survey activities.

## 5.1 Result of Site File and Literature Review

Site file and literature research was conducted prior to fieldwork mobilization. The background literature search included a review of previously conducted cultural resource surveys in the vicinity of the proposed project area, and of any historic document pertaining to the history of the area.

### 5.1.1 Previously Recorded Surveys

Research activities were initiated in May 2016. Background research revealed that 13 previous cultural resources surveys have been conducted within 1.6 kilometers (1 mile) of the project area (Figure 1-1; Table 5-1). There is no information available for the majority of the earlier surveys performed by the federal agencies including those undertaken by or for the USACE, Environmental Protection Agency (EPA), and the Texas Department of Highways and Public Transportation (TDHPT), later renamed as TxDOT. The site file research revealed that two previous archaeological surveys intersect the current project and one marine survey was

Table 5-1. Previously Recorded Area and Linear Surveys Within 1.6 Kilometers of the Proposed Project Area, Harris, Texas.

| Investigator, Date | Sponsor | Permit No. | Report Author |
|---|---|---|---|
| ECOMM,2006 | TxDOT | 3978 | Treierweilier, Nicholas and Richard S. Jones |
| EPA, 1988 | - | | - |
| Horizon Environmental Services, Inc., 2012* | Port of Houston Authority | 6131 | Owens, Jeffrey D. |
| HRA Gray & Pape, 2012 | USACE | | Bludau, Charles E., Jr. |
| HRA Gray & Pape, 2012 | USACE | | Bruner, David |
| HRA Gray & Pape, 2014 | USACE | 6806 | Bludau, Charles E., Jr. |
| Moore Archeological Consultants, Inc., 2015** | USACE | 7300 | Pearson, Charles E.; Bryan Haley; Allan R. Saltus |
| PBS&J, 2004 | - | 3548 | Porter, Nancy |
| TDHPT, 1985 | - | | - |
| USACE, 1985 | - | | - |
| USACE, 1990 | - | | - |
| USACE, 1990 | - | | - |
| Unknown, 1986* | - | | - |

-Indicates no information available.
*Indicates an overlap with the current project.
**Indicates a marine survey nearly adjacent to the current project.

conducted very near to the southern extent of the current APE. No information is available for the earliest of the overlapping surveys, a linear survey reportedly conducted in 1986.

In 2012, Horizon Environmental Services, Inc. (Horizon) conducted a survey on approximately 66 hectares (162 acres) of property proposed for the expansion of the existing Penn City Coal Facility. The survey overlaps the entire central portion of the current project. The survey recorded a total of 19 shovel tests and reported that approximately 75 percent of the project consisted of marshy wetlands or was disturbed by the existing Penn City Terminal facility. Shovel testing in the remaining 25 percent of the project area produced negative results. No further work was recommended for the project (Owens 2015).

In 2015, Moore Archeological Consultants, Inc. (MAC), conducted a marine survey covering approximately 29 hectares (72 acres) of water surface for a proposed docking facility to be constructed on the north shore of Buffalo Bayou. The survey recorded a number of magnetic anomalies, of which two were found to be composed of shipwrecks. The shipwrecks were assigned archaeological site trinomials 41HR1168 and 41HR1169. Neither site was recommended as eligible for listing on the NRHP (Pearson et al. 2015).

### 5.1.2 Previously Recorded Archaeological Sites

The site file research revealed that no previously recorded archaeological sites, cemeteries, Historic Markers, or National Register-listed properties have been identified within the current project area. Additional site file research revealed that four archaeological sites (two of which are shipwrecks), two additional shipwrecks and one cemetery have been recorded within a 1.6-kilometer (1-mile) study radius of the project area boundary (Table 5-2).

Site 41HR140 consists of the remnants of a prehistoric shell midden. The earliest site record available dates to 1973 and alludes to a previous recordation of the site sometime in the 1960s (McGuff and Thomas 1973). No information regarding its eligibility is available other than the statement that the site was in poor condition when recorded in 1973. An attempt to revisit the site in 1990 did not locate it (Moore 1990). Site 41HR140 consists of the remnants of a prehistoric shell midden. The earliest site record available dates to 1973 and alludes to a previous recordation of the site sometime in the 1960s (McGuff and Thomas 1973). No information regarding its eligibility is available other than the statement that the site was in poor condition when recorded in 1973. An attempt to revisit the site in 1990 did not locate it (Moore 1990).

Table 5 2. Previously Recorded National Register of Historic Places within 1.6 Kilometers (1 Mile) of the Proposed Project Area, Harris, Texas.

| Name / Number | Type | Temporal Affiliation | NRHP Status/Recommendations |
|---|---|---|---|
| 41HR140 | Shell Midden | Late Prehistoric | Undetermined |
| 41HR424 | Historic, Military | Historic; World War II era | Not Eligible |
| 41HR1168 | Shipwreck | Modern (1901-present) | Not Eligible |
| 41HR1169 | Shipwreck | Modern (1901-present) | Not Eligible |
| Unknown 1363 | Debris | Pre-1955 | Not Eligible |
| Unknown 2433 | Shipwreck | Pre-1955 | Not Eligible |
| San Jacinto Memorial Park / HR-C115 | Cemetery | - | - |

-Indicates no information available.

Site 41HR424 consists of the World War II-era San Jacinto Ordnance Depot (SJOD). Starting in December 1941, the construction of the SJOD functioned as a stopping point for munitions so they could be received, inspected, reconditioned, and stored before they were shipped out to continue their journey to their final destinations (Lockwood et al. 1941). This site consisted of standard military construction concrete roads, concrete road culverts, earth sheltered bunkers, earthen berms in the shape of a "U", an administration building, a fire station, a small utility building, loading docks, brick buildings, and a residence, a garage, and servant quarters that were probably for the SJOD's commander (Moore 1990). A small neighborhood of dispersed homes is depicted on the 1920 USGS quad map in the same location but neither the homes nor the roads connecting them are shown on the 1944 map. The SJOD was no longer used after 1959, and the USACE assumed responsibility for the facility. In October 1964, the land and facilities of the SJOD were sold to the Houston Channel Industrial Corporation (Moore 1990).

The site also contained a small cemetery with burial markers indicating it was used in the mid-nineteenth century (Anderson and Wallace 2007; Foster et al. 2007). The cemetery was located on the southeastern portion of the southern half of the recorded site boundaries. A barbed wire fence enclosed the cemetery. The West family owned the land where the cemetery is located "from 1853 until after the turn of the twentieth century" (Foster et al. 2007:37). Previous investigation of the cemetery concluded that there is a possibility of there being as many as 16 burials at the location but only a few can be confirmed (Foster et al. 2007). Foster et al. (2007) states it contained "…four grave markers believed to mark three graves, eight unmarked depressions suggestive of graves, and a concentrated scatter of bricks" (Foster et al. 2007:27). The two grave markers that were found are believed to belong to two young children, Lydia K. West and C.J. Puckett. It is believed that the fence was erected around the cemetery at the time the SJOD was built.

Previous investigations of the site resulted in no discovery of prehistoric cultural materials. Structures associated with the site were not recommended for listing on the NRHP due to the lack of integrity and uniqueness (Bludau 2014; Moore 1990; Anderson and Wallace 2007; Foster et al. 2007). The site is currently listed as not eligible for listing on the NRHP (THC Online Historic Sites Atlas 2016).

Sites 41HR1168 and 41HR1169 are both recorded as shipwrecks. 41HR1168 is recorded as barge, presumably constructed in the first half of the twentieth century, and sunk around 1962. It appears as if this barge was purposefully built as a floating dock of some sort or had been converted to this use before it sank (Pearson et al. 2015). Site 41HR1169 is recorded as an intact sill-sided deck barge constructed sometime in the first half of the twentieth century and purposefully scuttled sometime in the late 1980s or early 1990s (Pearson et al. 2015). Both resources were concluded to be not eligible for listing on the NRHP. Of the two remaining shipwrecks, Number 1363 is recorded as debris (Pearson et al. 2015). No information was available for Number 2433.

San Jacinto Memorial Park Cemetery (HR-C115) is located north of the project to the north of Interstate 10. The cemetery dates to around the 1940s and is reported to contain approximately 12,406 burials (Find-A-Grave 2016).

## 5.2 Results of Field Investigations

The primary purpose of field investigations was to determine whether any previously unidentified, intact, and significant cultural resources were present within the project's area APE and to provide management recommendations based on the results of research and survey activities. The project area was divided into two survey areas and are

referred to in this chapter of the report as the Northern and Southern Sections. The subsurface testing strategy, as outlined in Chapter 4.0 (Field Methods), was implemented across the entire project area. Field survey was conducted from June 15 to June 21, 2016, and required 96 person hours to complete. As a result, a total of 35 shovel tests were excavated during the field survey, one of which was positive for cultural materials.

### 5.2.1 The Northern Section

The Northern Section of the project area consisted of approximately 100 hectares (248 acres) bordered by railroad tracks on the north and south, Penn City Road on the east, and ISK facility on the west. Although plans for this area have not been finalized, a storage facility is currently being proposed for this portion of the project area. According to historic aerial imagery, the Northern Section of the project area appeared to be relatively unchanged, consisting of low lying wooded, wetland areas (Figure 5-1).

Figure 5-1. Example of the low, flat, inundated areas located within the Northern Section of the project APE. View is to the south.

A small drainage is located in the southwestern portion of the Northern Section (Figure 5-2). The ground surface at the drainage margin is higher near the southern edge of the APE but becomes lower as it continues into the property and eventually flattens into the surrounding inundated areas.

Figure 5-2. Drainage located within the southwestern portion of the Northern Section of project APE. View is to the east.

At the time of the field survey, the vast majority of the northern area was inundated, and no shovel tests could be excavated in these areas. Due to the standing water, the area was inspected by a pedestrian survey and a total of 29 shovel tests were excavated in dry areas. Another 34 tests were unexcavated due to inundation (Figure 5-3). Of the excavated shovel tests, 15 of these were excavated to an average depth of 80 to 100 centimeters (31 to 39.4 inches). Another 10 were excavated to an average depth of 30 to 45 centimeters (12 to 18 inches) and terminated when water was encountered.

The general soil description of the Northern Section is exemplified by Shovel Tests B5 consisting of three strata, and C6 consisting of two strata in those encountering water (Figure 5-4). Consistently in all shovel tests the upper stratum consisted of a moist, very dark gray (10YR 3/1) sandy loam with a depth of 10 to 20 centimeters (4 to 8 inches) below surface. The second stratum consist of a moist grayish brown (10YR 5/2) to yellowish brown (10YR 5/4) fine sand to a depth of 30 to 40 centimeters (12 to 16 inches) below surface.

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Cultural resources survey results within
the Northern Section of the project APE.

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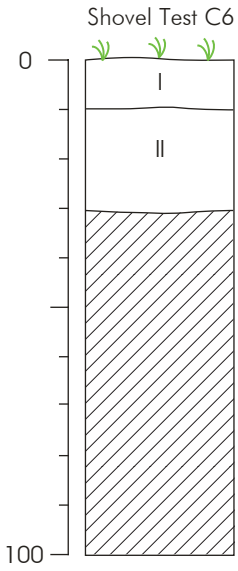
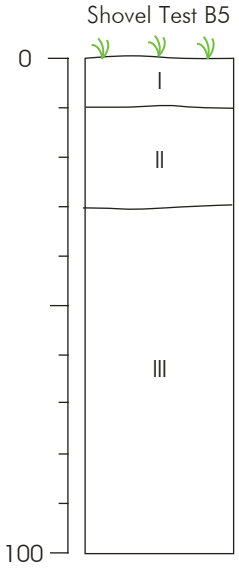
Figure 5-3




I (0-10 cmbs) 10YR 3/1 Very dark gray sandy loam;

II (10-30 cmbs) 10YR 5/2 Grayish brown to 10YR 5/4 yellowish brown find sand.

Unexcavated




I (0-10 cmbs) 10YR 3/1 Very dark gray sandy loam;

II (10-30 cmbs) 10YR 5/2 Grayish brown to 10YR 5/4 yellowish brown find sand;

III (30-100 cmbs) 10YR 5/4 yellowish brown sandy clay heavily mottled with 7.5YR5/1 very dark gray and 5YR4/6 yellowish red clay.



Representative shovel test profiles from within the Northern Section of the project APE.

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Figure 5-4

Finally, in those shovel tests that did not encounter water a third stratum was observed. his includes tests near the unnamed drainage located in the southwest corner of the Northern Section. Stratum 3 consisted of a moist, hydric, yellowish brown (10YR5/4) sandy clay heavily mottled with very dark gray (7.5YR5/1) and yellowish red (5YR4/6) clay (Figure 5-4).

The only exception to the general soil profile is Shovel Tests H5 and H6, both consisting of three strata. Within these two shovel tests Stratum 1 consisted of 10 centimeters (4 inches) of moist, loose, very dark gray (10YR3/1) sandy loam. Although like the other shovel tests Stratum 2 consisted of a moist, yellowish brown (10YR5/4), fine sand. Unlike the others, Stratum 2 was twice as thick extending to a depth of 70 to 80 centimeters (28 to 31 inches) below surface. Finally, like the other shovel tests, the third stratum consisted of a moist, hydric, yellowish brown (10YR5/4) sandy clay heavily mottled with very dark gray (7.5YR5/1) and yellowish red (5YR4/6) clay. Although these two shovel test strata were comprised of the same soil descriptions these were the only two that exhibited a deep Stratum 2. No cultural materials were recovered during excavations of the Northern Section.

### 5.2.2 The Southern Section

The Southern Section of the survey area consists of approximately 19 hectares (48 acres) and is bordered to the north by railroad tracks, to the east by Penn City Road, and to the south and west by Buffalo Bayou. The APE is located along the relatively low, flat, banks of and crushed concrete roadways, current hard packed dirt roadways, buried pipeline corridors, and a series of berms and push piles consisting of discarded tires, wood and large concrete chunks (Figure 5-5). In addition, two large sections are currently being utilized as storage areas/pipe yards (Figure 5-6). Buffalo Bayou. The majority of the southern section of the project has been highly disturbed. The many disturbances within the southern section of the survey area include previous shell

Figure 5-5. Modern trash and concrete located within the Southern Section of the project APE. View is to the west.

Figure 5-6. Existing pipe yard located within the Southern Section of the project APE. View is to the east.

Although heavy disturbance was encountered throughout the survey of the Southern Section, six shovel tests were excavated to an average depth of 80 centimeters (31 inches) in areas believed to have the least disturbance. Another 15 shovel tests were unexcavated due to inundation or disturbance (Figure 5-7). All shovel tests excavated within the Southern Section of the APE identified only two soil strata, as exemplified by Shovel Test A2 (Figure 5-8). Stratum 1 consisted of a moist, very dark gray (10YR3/1) sandy loam with a depth of 10

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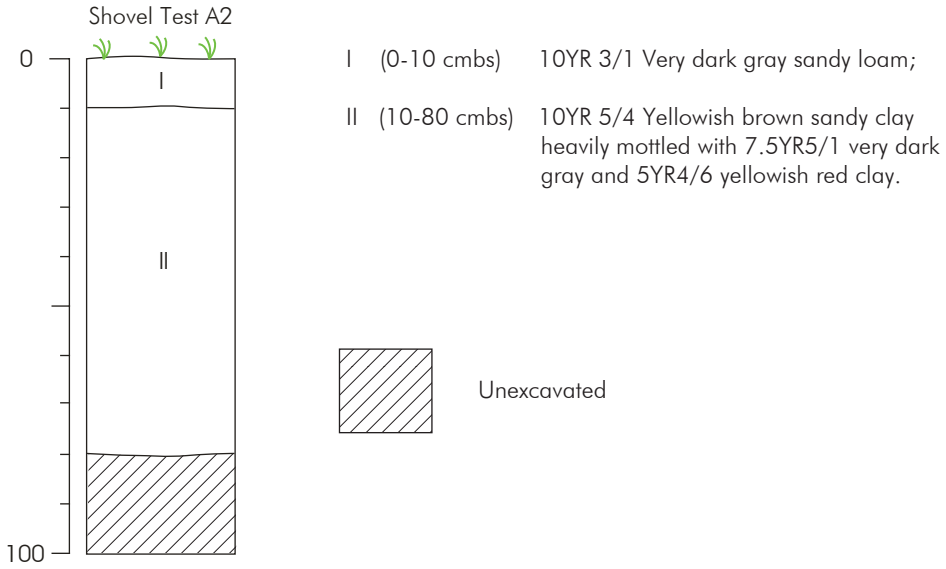
Cultural resources survey results within
the Southern Section of the project APE.




Representative shovel test profiles from within the Southern Section of the project APE

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Figure 5-8

centimeters (4 inches) below surface. The second stratum began at a depth of 10 centimeters (4 inches) below surface and consist of a moist, hydric, yellowish brown (10YR5/4) sandy clay heavily mottled with very dark gray (7.5YR5/1) and yellowish red (5YR4/6) clay (Figure 5-8). The only cultural material identified during the survey was a small chert flake (5 by 12 millimeters [0.19 by 0.5 inches]) identified in Shovel Test B2. This small flake was recovered at a depth of 3 centimeters (1.1 inches) in what was identified as a push pile covered in muscadine vines, and green briars (Figure 5-9). Because of the disturbed context of the find, and the large area of disturbance surrounding the positive shovel test, no delineation tests were capable or are recommended.

Figure 5-9. Dense, brush-covered push pile at the location of positive Shovel Test B2. View is to the west.

# 6.0 CONCLUSIONS AND RECOMMENDATIONS

This report presents the results of an intensive pedestrian cultural resources survey of the Houston 4 Project in Harris County, Texas. All fieldwork and reporting activities were conducted with reference to state and federal guidelines. The archaeological APE amounts to approximately 120 hectares (296 acres). Work was conducted on lands owned and controlled by the Port of Houston Authority, a political subdivisions of the state of Texas, and thus required a Texas Antiquities Code permit prior to survey. Work was completed under Texas Antiquities Permit Number 7670.

Prior to fieldwork, initial investigation consisted of a background literature and site files search to identify the presence of previously recorded sites in close proximity to the project area. In addition, a review of historic aerial imagery and topographic maps was performed along the entirety of the project length in an effort to assess the potential of unrecorded intact buried cultural deposits or historic-age standing structures. A review of the Texas Online Archeological Sites Atlas indicated that no previously recorded cultural resource had been identified within the project APE.

Field investigation consisted of visual inspection and shovel testing within the APE. During this investigation, a total of a total of 35 shovel tests were excavated. Another 49 shovel tests were unexcavated due to a very low and wet landscape, which describes the majority of the project. Further, approximately 75 percent or more of the Southern Section of the APE was disturbed. Disturbances there included rip rap, heavy trash like cement fragments, tires, etc., existing pipelines, and existing cement or gravel laydown yards.

One shovel test contained a potentially human-modified stone flake but was found within a disturbed context and thus has a questionable provenance. No archaeological sites, standing structures, or other cultural resources were identified as a result of the survey.

Based on the largely negative results of the archaeological investigation, Gray & Pape recommends no further work and that the project be allowed to proceed as planned. As specified under the conditions of Texas Antiquities Code Permit Number 7670, all project associated records are curated at CAS.

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# APPENDIX A

# SHOVEL TEST LOG

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