Volume 2020 Article 128

2020

Intensive Cultural Resources Survey of the Proposed Galveston County Project, Texas City, Galveston County, Texas

Charles E. Bludau

Amy M. Goldenstein Jr.

Jesse O. Dalton

Kathryn St. Clair

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Texas Antiquities Permit No. 9449
H035-200102

Prepared for:

EDGE Engineering & Science
Houston, Texas

Prepared by:

Horizon Environmental Services, Inc.
Austin, Texas

Final
August 2020

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Prepared for:

EDGE Engineering & Science
16285 Park Ten Place, Suite 400
Houston, Texas 77084

Lead Federal Agency:

US Army Corps of Engineers
Galveston District

Prepared by:

Horizon Environmental Services, Inc.
1507 S. Interstate 35
Austin, Texas 78741

Amy M. Goldstein, Principal Investigator
H035-200102

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ABSTRACT

On behalf of Florida Gas Transmission Company, LLC (FGT), EDGE Engineering and Science, LLC (EDGE) has selected Horizon Environmental Services, Inc. (Horizon) to conduct a cultural resources survey and assessment for the proposed Galveston County Project. The project includes a proposed pipeline that will allow the delivery of natural gas to a new delivery point off the FGT mainline. The facilities to be installed include approximately 4.0 kilometers ([km] 2.5 miles) of 30.5-centimeter ([cm]12.0-inch) and 50.8-cm (20.0-inch) lateral piping as well as a measurement and regulation (M&R) station located at the southwest end of the new pipeline, referred to as the Attwater-Topaz M&R station. This portion of the proposed project is located approximately 2.9 km (1.8 miles) northwest of Texas City and crosses State Highway (SH) 146 in Galveston County, Texas. As part of the Galveston County Project, FGT will also be uprating a unit at their existing CS 4 compressor station in Matagorda County, Texas to maintain a sufficient delivery pressure to the proposed Attwater-Topaz M&R station.

In accordance with Section 7(b) of the Natural Gas Act, the project requires Prior Notice authorization to the Federal Energy Regulatory Commission (FERC), which will serve as the lead federal agency for the undertaking. Because the undertaking is regulated by FERC, the undertaking falls under the regulations of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. The Antiquities Code of Texas (ACT) governs proposed undertakings by political subdivisions of the State of Texas and/or projects located on publicly owned lands. Approximately 11.3 hectares (27.8 acres) of the project area are owned by the Gulf Coast Water Authority (GCWA). Since the GCWA is a public entity, this portion of the project falls under the jurisdiction of the ACT. Survey of the GCWA property was carried out under Antiquities Permit No. 9449.

Less than 0.1 hectare (0.2 acres) of additional temporary workspace (ATWS) falls within the State Highway (SH) 146 ROW, which is controlled by the Texas Department of Transportation (TxDOT). Since TxDOT is a State agency, survey of this area would also require an Antiquities Permit. However, this area has already been disturbed from road construction and underground utilities. Horizon therefore recommends no additional survey or shovel testing in this ATWS. Horizon sent a letter with this recommendation to the Texas Historical Commission (THC) on June 30, 2020.

Originally, FGT did not define the actual limits of the proposed right-of-way (ROW) for the project. Rather, they elected to wait until after the environmental assessments on larger overall parcels were complete in order to select a route with the least amount of environmental impacts.

As such, the cultural resources survey initially consisted of 100% survey of the entire 203.2 hectares (502.0 acres) that comprise the parcels traversed by the proposed pipeline. After FGT selected a proposed route, Horizon archeologists conducted additional fieldwork to ensure adequate survey coverage within the proposed ROW.

From May 12 to 15, and June 17, 2020, Horizon archeologists Charles E. Bludau, Jr. and Luis Gonzales performed an intensive cultural resources survey of the project area to locate any cultural resources that would potentially be impacted by the proposed undertaking. Horizon's archeologists traversed the project area on foot and thoroughly inspected the modern ground surface for aboriginal and historic-age cultural resources. The project area consists of an extensive, largely featureless coastal flat. An existing FGT pipeline corridor passes from northeast to southwest through the northern portion of the project area.

In addition to pedestrian walkover, the recently revised 2020 Texas State Minimum Archeological Survey Standards (TSMASS) require at least 50 shovel tests for the first 10.1 hectares (25.0 acres) of a project plus at least one shovel test for every 2.0 hectares (5.0 acres) over the original 10.1 hectares (25.0 acres). This equates to a minimum of 145 shovel tests within the original 203.2-hectare (502.0-acre) project area. Horizon excavated156 shovel tests within this area, thereby exceeding the TSMASS for a project area of this size. The TSMASS require a minimum of 16 shovel tests per mile for projects measuring 30.0 m (98.4 feet) or less in width; this equates to a minimum of 40 shovel tests within the proposed ROW. Horizon exceeded this minimum by excavating 46 shovel tests within the proposed ROW.

Shovel testing typically revealed shallow deposits of hydric, dark gray clay extending from the modern ground surface to depths ranging from 5.0 to 60.0 cm (2.0 to 23.6 inches) below surface, though most shovel tests were terminated at depths of 30.0 to 50.0 cm (11.8 to 19.7 inches) below surface. Shovel testing was capable of penetrating Holocene-age soils with the potential to contain subsurface archeological resources.

No archeological sites or historic-aged structures were recorded within the project area during the survey. A modern cattle corral, constructed with modern lumber, is present in the northeast corner of the project area, south of Skyline Drive. The corral does not appear on any historical topographic maps. It is first visible in a 1981 aerial image, which indicates the corral is not of historic age.

Based on the results of the survey-level investigations documented in this report, no significant cultural resources would be affected by the proposed undertaking. In accordance with 36 CFR 800.4, Horizon has made a reasonable and good faith effort to identify historic properties within the project area. No cultural resources were identified within the project area that meet the criteria for inclusion in the National Register of Historic Places (NRHP) under 36 CFR 60.4. Horizon recommends a finding of "no historic properties affected," and no further archeological work is recommended in connection with the proposed undertaking. However, human burials, both prehistoric and historic, are protected under the Texas Health and Safety Code. In the event that any human remains or burial objects are inadvertently discovered at any point during construction, use, or ongoing maintenance in the project area, even in previously surveyed areas, all work should cease immediately in the vicinity of the inadvertent discovery, and the THC should be notified immediately.

TABLE OF CONTENTS

Chapter		Page
	ABSTRACT	v
1.0	INTRODUCTION	1
2.0	ENVIRONMENTAL SETTING	11
	2.1 Physiography and Hydrology	11
	2.2 Geology and Geomorphology	11
	2.3 Climate	14
	2.4 Flora and Fauna	14
3.0	CULTURAL BACKGROUND	17
	3.1 PaleoIndian Period (ca. 10,000 to 5000 B.C.)	17
	3.2 Archaic Period (ca. 5000 B.C. to A.D. 100)	18
	3.4 Late Prehistoric Period (A.D. 600 to 1500)	20
	3.5 Protohistoric Period (A.D. 1500 TO 1600)	21
	3.6 Historic Period (ca. A.D. 1600 TO PRESENT)	22
4.0	BACKGROUND RESEARCH	25
5.0	SURVEY METHODOLOGY	29
6.0	RESULTS OF INVESTIGATIONS	35
	6.1 Results of Archeological Field Investigations	35
	6.2 Results of Visual Effects Analysis	41
7.0	SUMMARY AND RECOMMENDATIONS	43
	7.1 Conceptual Framework	43
	7.2 Summary of Results	43
	7.3 Management Recommendations	44
8.0	REFERENCES CITED	45

APPENDIX A: FGT Categorical Exclusion Agreement
APPENDIX B: Shovel Test Data
APPENDIX C: FGT Unanticipated Discoveries Plan

LIST OF FIGURES

Page

Figure 1-1. Vicinity Map of Project Area 2
Figure 1-2. Location of Project Area on USGS Topographic Quadrangle 3
Figure 1-3. Location of Project Area on Aerial Photograph 4
Figure 1-4. Location of CS 4 Compressor Station in relation to the Project Area 5
Figure 1-5. CS 4 Compressor Station on a topographic map 6
Figure 1-6. CS 4 Compressor Station on an aerial photograph 7
Figure 2-1. Soils Mapped within Project Area 13
Figure 4-1. Locations of Documented Cultural Resources within 1.0 Mile of Project Area 27
Figure 5-1. Shovel Tests Excavated within Northern Portion of Project Area 30
Figure 5-2. Shovel Tests Excavated within Southern Portion of Project Area 31
Figure 5-3. Shovel Tests Excavated within Southwestern Portion of Project Area 32
Figure 6-1. Overview of North-Central Portion of Project Area (Facing West) 36
Figure 6-2. View of Canal in Northern Portion of Project Area (Facing East) 36
Figure 6-3. Overview of Dirt Road on Eastern Portion of Project Area (Facing North) 37
Figure 6-4. View of Vegetation on Central Portion of Project Area (Facing South) 37
Figure 6-5. Overview of Southern Portion of Project Area (Facing South) 38
Figure 6-6. Overview of Pond on Central Portion of Project Area (Facing South) 38
Figure 6-7. Overview of Project Area North of Attwater Avenue (Facing West) 39
Figure 6-8. Overview of Project Area South of Attwater Avenue (Facing East) 39
Figure 6-9. View of Artificial Canal West of SH 146 (Facing West) 40
Figure 6-10. Modern Corral South of Skyline Drive within the Northeastern Portion of the Project Area (Facing North) 40
Figure 6-11. Existing buildings and infrastructure within the visual effects APE 42

LIST OF TABLES

Page

Table 2-1. Summary of Mapped Soils within Project Area 12
Table 4-1. Summary of Documented Cultural Resources within 1.0 Mile of Project Area 26

1.0 INTRODUCTION

On behalf of Florida Gas Transmission Company, LLC (FGT), EDGE Engineering and Science, LLC (EDGE) has selected Horizon Environmental Services, Inc. (Horizon) to conduct a cultural resources survey for the proposed Galveston County Project. The project includes a proposed pipeline that will allow the delivery of natural gas to a new delivery point off the FGT mainline. The facilities to be installed include approximately 4.0 kilometers ([km] 2.5 miles) of 30.5-centimeter ([cm]12.0-inch) and 50.8-cm (20.0-inch) lateral piping and a measurement and regulation (M&R) station at the southwest end of the new pipeline, referred to as the Attwater-Topaz M&R station. This portion of the proposed project is located approximately 2.9 km (1.8 miles) northwest of Texas City and crosses State Highway (SH) 146 in Galveston County, Texas (Figures 1-1 through 1-3). As part of the Galveston County Project, FGT will also be uprating a unit at their existing CS 4 compressor station in Matagorda County, Texas to maintain a sufficient delivery pressure to the proposed Attwater-Topaz M&R station (Figures 1-4 through 1-6).

In accordance with Section 7(b) of the Natural Gas Act, the project requires Prior Notice authorization to the Federal Energy Regulatory Commission (FERC), which will serve as the lead federal agency for the undertaking. Additionally, if the proposed pipeline crosses "waters of the United States" (WOTUS), the undertaking would require Nationwide Permits (NWPs) issued by the United States Army Corps of Engineers (USACE). Because the undertaking is regulated by FERC and could also require USACE permits, the undertaking falls under the regulations of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. Section 106 requires the lead federal agency on an undertaking to take into consideration the effects of its actions on cultural resources listed on or considered eligible for listing on the National Register of Historic Places (NRHP) and allow the State Historic Preservation Officer (SHPO) and other appropriate consulting parties or stakeholders the opportunity to comment.

The Antiquities Code of Texas (ACT) governs proposed undertakings by political subdivisions of the State of Texas and/or projects located on publicly owned lands. Approximately 11.3 hectares (27.8 acres) of the project area are owned by the Gulf Coast Water Authority (GCWA). Since GCWA is a public entity, this portion of the project falls under the jurisdiction of the ACT. As this portion of the proposed pipeline would be constructed on public property, the project sponsor is required to provide the Texas Historical Commission (THC) with an opportunity to review and comment on the project's potential to adversely affect historic properties listed as or considered eligible for listing as State Antiquities Landmarks (SALs).

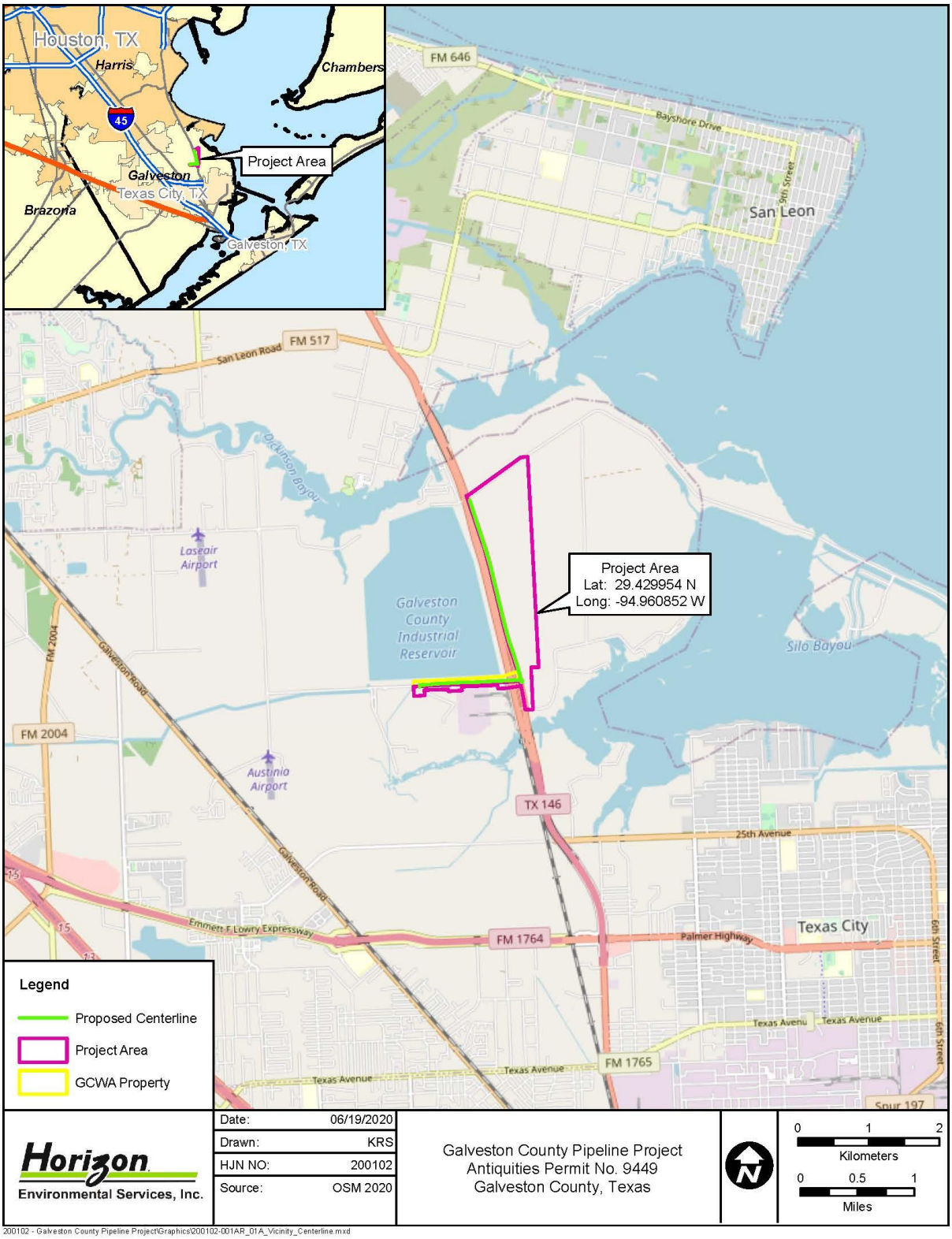

Figure 1-1. Vicinity Map of Project Area

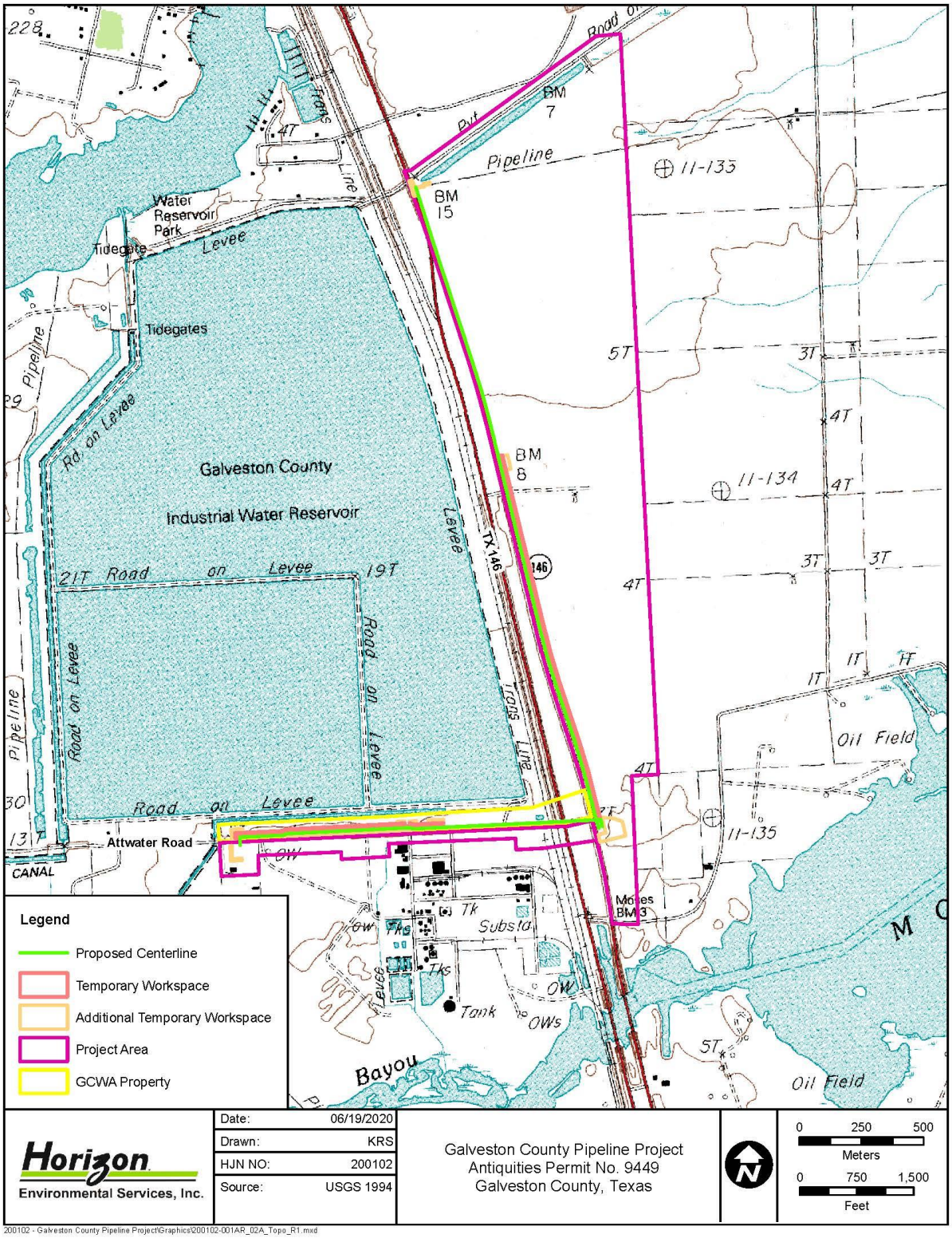

Figure 1-2. Location of Project Area on USGS Topographic Quadrangle

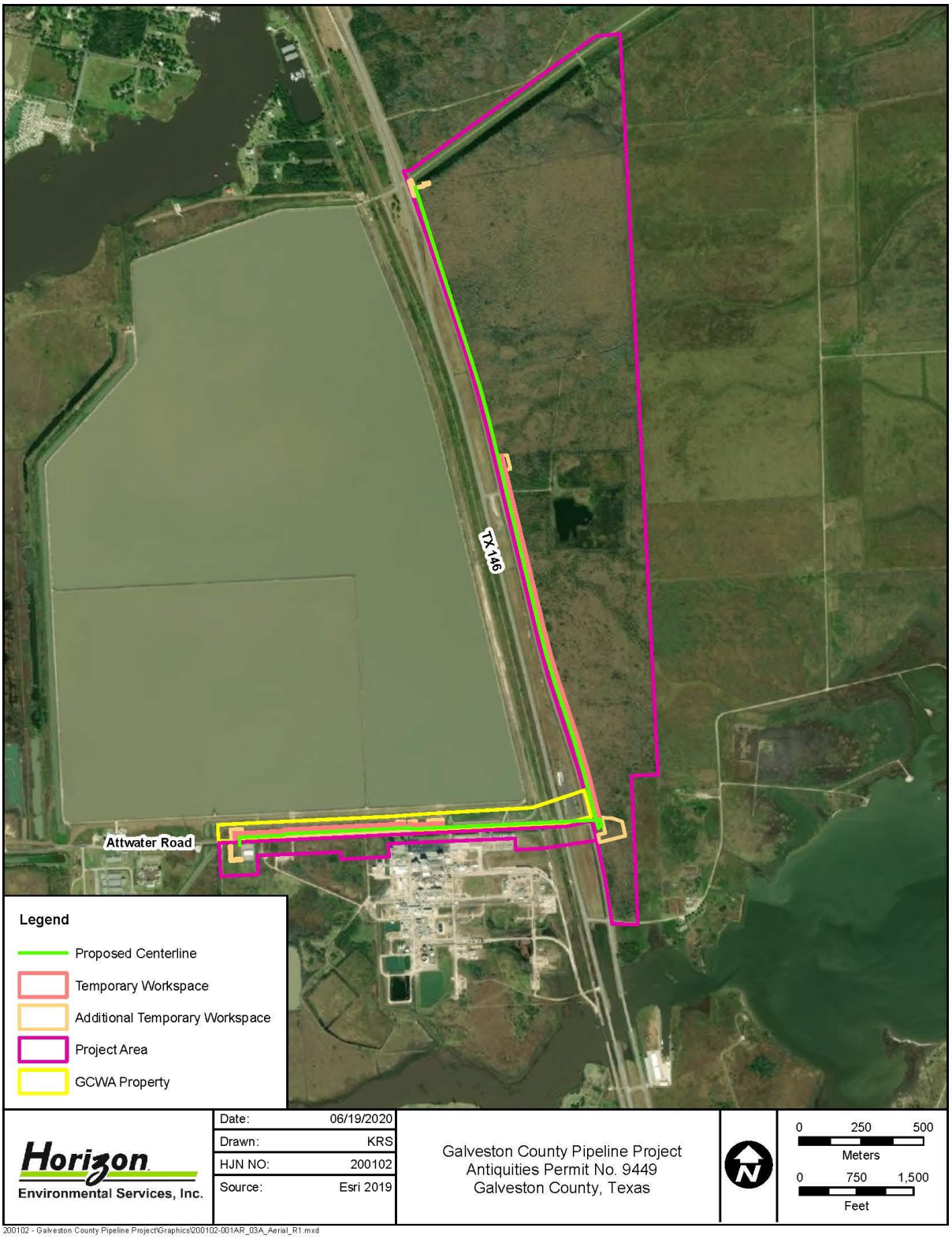

Figure 1-3. Location of Project Area on Aerial Photograph

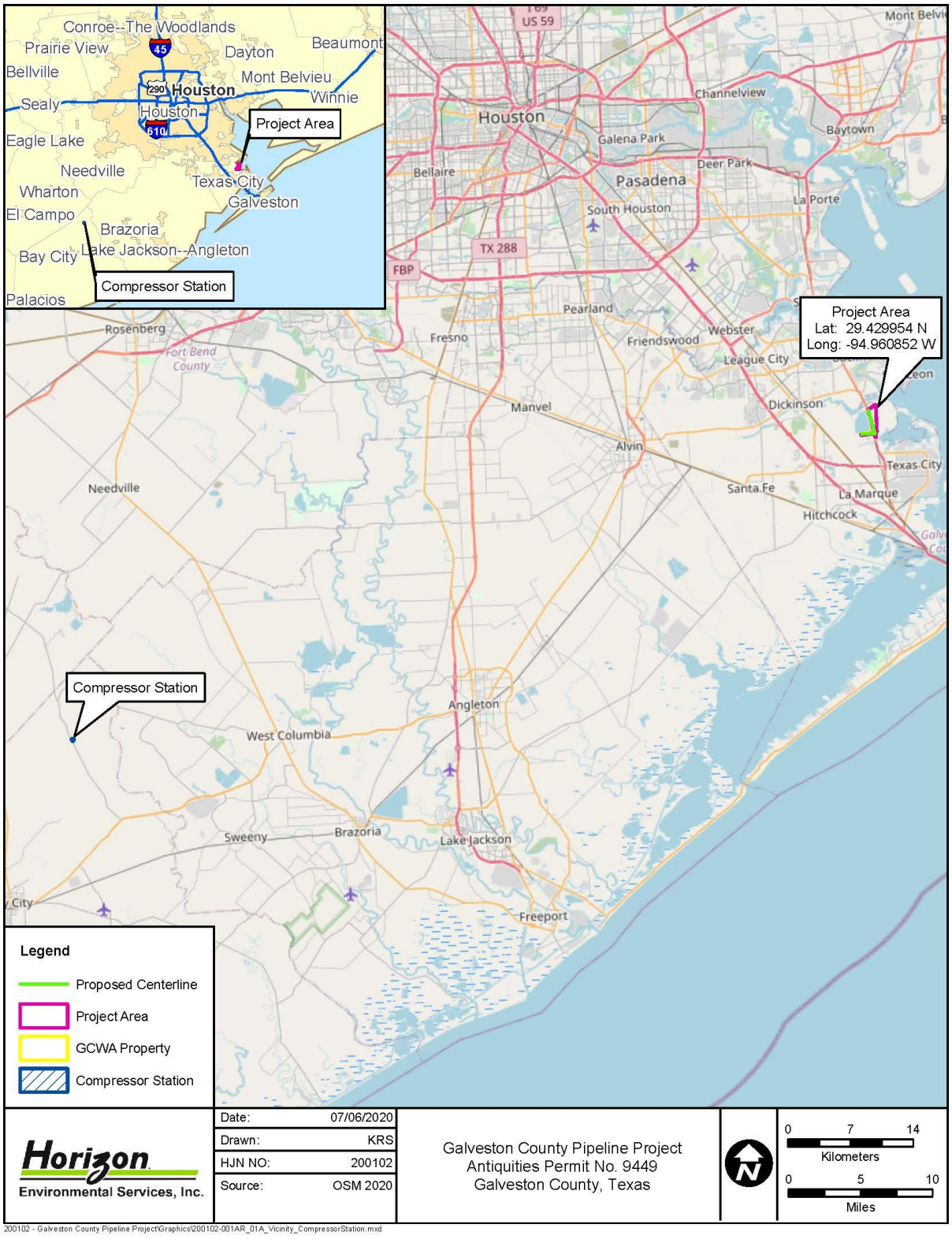

Figure 1-4. Location of CS 4 Compressor Station in relation to the Project Area

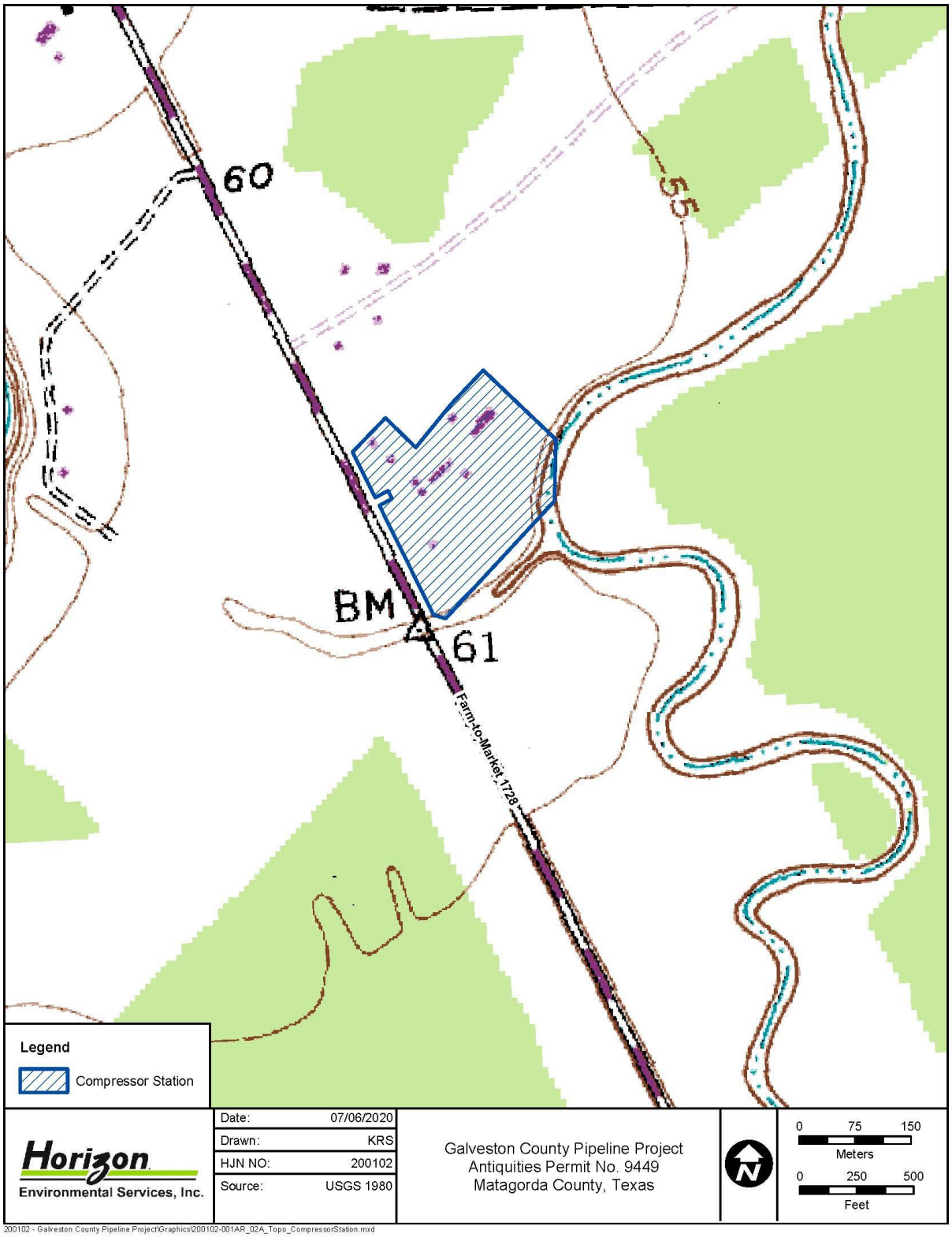

Figure 1-5. CS 4 Compressor Station on a topographic map

Figure 1-6. CS 4 Compressor Station on an aerial photograph

The ACT also requires an Antiquities Permit to conduct archeological survey on public land. Survey of the GCWA property was carried out under Antiquities Permit No. 9449. Project records associated with survey of GCWA property will be curated at the Texas Archeological Research Laboratory (TARL) in Austin.

Less than 0.1 hectare (0.2 acres) of additional temporary workspace (ATWS) falls within the State Highway (SH) 146 ROW, which is controlled by the Texas Department of Transportation (TxDOT). Since TxDOT is a State agency, survey of this area would also require an Antiquities Permit. However, this area has already been disturbed from road construction and underground utilities. Horizon therefore recommends no additional survey or shovel testing in this ATWS. Horizon sent a letter with this recommendation to the Texas Historical Commission (THC) on June 30, 2020.

Originally, FGT did not define the actual limits of the proposed right-of-way (ROW) for the project. Rather, they elected to wait until after the environmental assessments on larger overall parcels were complete in order to select a route with the least amount of environmental impacts. The project's initial survey area therefore included the 203.2 hectares (502.0 acres) that comprise the parcels that may be traversed by the proposed pipeline (see Figures 1-2 and 1-3). After FGT selected a proposed route, Horizon archeologists conducted additional fieldwork to ensure adequate survey coverage within the proposed ROW. The proposed ROW consists of a 9.1-meter- (30.0-foot-) wide permanent easement and 13.7-meter- (45.0-foot-) wide temporary workspace. Additional temporary workspaces (ATWS) exceed this width in some locations to accommodate horizontal directional drilling. The project's horizontal APE is defined as the proposed ROW and ATWS. The maximum proposed depth of subsurface disturbance within open-cut portions of the pipeline would likely be a maximum of 2.1 meters ([m] 7.0 feet) below surface. As such, the vertical APE within open-cut segments of the proposed undertaking would be no more than 2.1 m (7.0 feet). The APE for potential indirect, visual effects associated with the Attwater-Topaz M&R station is defined as the subject site and the parcels adjacent to the proposed M&R site.

Proposed modifications to the CS 4 compressor station in Matagorda County will take place within an existing, previously disturbed facility. This type of work falls under section 1-b of the categorical exclusion agreed upon by FGT and the THC (Appendix A). Therefore, cultural resources investigation of the CS 4 compressor station was not necessary.

From May 12 to 15, and June 17, 2020, Horizon archeologists Charles E. Bludau, Jr. and Luis Gonzales performed an intensive cultural resources survey of the project area to locate any cultural resources that would potentially be impacted by the proposed undertaking. Horizon's archeologists traversed the project area on foot and thoroughly inspected the modern ground surface for aboriginal and historic-age cultural resources. The project area consists of an extensive, largely featureless coastal flat. An existing FGT pipeline corridor passes from northeast to southwest through the northern portion of the project area.

No archeological sites or historic-aged structures were recorded within the project area during the survey. A modern cattle corral, constructed with modern lumber, is present in the northeast corner of the project area, south of Skyline Drive. The corral does not appear on any

historical topographic maps. It is first visible in a 1981 aerial image, which indicates the corral is not of historic age.

Following this introductory chapter, Chapters 2.0 and 3.0 present the environmental and cultural backgrounds of the project area, respectively. Chapter 4.0 describes the results of background research, and Chapter 5.0 discusses the cultural resources survey methodology. Chapter 6.0 presents the results of the cultural resources survey, and Chapter 7.0 presents cultural resources management recommendations for the project. Chapter 8.0 lists the references cited in the report. Appendix A is FGT's categorical exclusion agreement with the THC. Appendix B summarizes shovel test data, and Appendix C is an Unanticipated Discoveries Plan for the Galveston County Project.

2.0 ENVIRONMENTAL SETTING

2.1 PHYSIOGRAPHY AND HYDROLOGY

The project area is located in northeastern Galveston County, Texas, approximately 7.2 km (4.5 miles) northwest of Texas City, Texas. Galveston County is situated on the Texas Coastal Plain, which extends as far north as the Ouachita uplift in southern Oklahoma and westward to the Balcones Escarpment in Central Texas. The Texas Coastal Plain consists of seaward-dipping bodies of sedimentary rock, most of which are of terrigenous clastic origin, that reflect the gradual infilling of the basin from its margins (Abbott 2001). The project area is located on a coastal flat about 5.6 km (3.5 miles) west of Galveston Bay, an inlet of the Gulf of Mexico. Dickinson Bayou is adjacent to the project area's northern boundary, while Moses Bayou is adjacent to its southern boundary. Moses Bayou drains into Moses Lake, which empties into Galveston Bay through a narrow opening at Miller Point. The Galveston County Industrial Water Reservoir is immediately north and west of the project area. Topographically, the project area is generally flat, with elevations ranging from 1.2 to 2.7 m (4.0 to 9.0 feet) above mean sea level (amsl).

2.2 GEOLOGY AND GEOMORPHOLOGY

Geologically, the project area is underlain by the Beaumont Formation (USGS 2020). The Beaumont, or Prairie, terrace is the youngest continuous coastwise terrace fronting the modern Gulf (Abbott 2001). The Beaumont Formation consists of clay, silt, and fine sand arranged in spatial patterns that reflect the distribution of fluvial (e.g., channel, point bar, levee, and backswamp) and mudflat/coastal marsh facies (Van Siclen 1985). Sandy deposits associated with littoral facies are also frequently considered part of the Beaumont Formation. Many investigators (cf. DuBar et al. 1991; Fisk 1938, 1940) have correlated the Beaumont terrace with the Sangamon Interglacial stage (ca. 130 to 75 thousand years ago [kya]), although age estimates range from Middle Wisconsinan (Alford and Holmes 1985) to 100 to 600 kya (Blum and Price 1994). While debate about the temporal affiliations of and correlations among the deposits that underlie the major coastline terraces remain active, they are of little direct geoarcheological relevance, because virtually all investigators agree that these deposits considerably predate the earliest demonstrated dates of human occupation in North America.

Seven different soil series are mapped within the project area (Table 2-1; Figure 2-1) (NRCS 2020). These soils typically consist of Pleistocene-age clayey alluvium and fluviomarine

deposits. According to Abbott, (2001:21-23), these soils are considered to have a low geoarchaeological potential for containing buried cultural deposits. In southeast Texas, aboriginal archeological sites are commonly encountered in upland settings and adjacent to major streams and rivers. Based on the physiographic setting of the project area on a coastal flat situated north of Moses Bayou and in close proximity to Moses Lake, an inlet of the Gulf of Mexico, it is Horizon's opinion that there exists at least moderate potential for undocumented prehistoric archeological resources within the project boundaries.

Table 2-1. Summary of Mapped Soils within Project Area

NRCS Soil Code	Soil Name	Parent Material	Typical Profile (inches)
Ba	Bacliff clay, 0 to 1% slopes, rarely flooded	Clayey fluviomarine deposits of Late Pleistocene age derived from igneous, metamorphic and sedimentary rock on coastal flats	0-9: Clay (A) 9-35: Clay (Bg) 35-48: Clay (Bssg1) 48-80: Clay (Bssg2)
Be	Bernard clay loam, 0 to 1% slopes	Clayey fluviomarine deposits derived from igneous, metamorphic and sedimentary rock on coastal flats	0-6: Clay loam (Ap) 6-31: Clay (Bt) 31-50: Clay (Btk1) 50-80: Clay (Btk2)
Fr	Francitas clay loam, 0 to 1% slopes, rarely flooded	Clayey fluviomarine deposits derived from igneous, metamorphic and sedimentary rock	0- 16: Clay loam (A 16- 38: Clay (Bss) 38-69: Clay (Bkss1) 69- 80: Clay (Bkss2)
LetA	Leton loam, 0 to 1% slopes, occasionally flooded, frequently ponded	Loamy fluviomarine deposits derived from igneous, metamorphic and sedimentary rock	0- 6: Loam (A) 6- 15: Loam (E) 15-29: Loam (Btg/E) 29-80: Clay loam (Btg)
KeA	Kemah silt loam, 0 to 1% slopes, rarely flooded	Loamy fluviomarine deposits of late Pleistocene age	0-15: Silt loam (H1) 15-38: Clay (H2) 38-60: Sandy clay loam (H3)
LaA	Lake Charles clay, 0 to 1% slopes	Clayey fluviomarine deposits derived from igneous, metamorphic and sedimentary rock on backswamps	0-11: Clay (A) 11-53: Clay (Bss) 53-69: Clay (Bkss1) 69-80: Clay (Bkss2)
Ve	Verland silty clay loam, rarely flooded	Loamy fluviomarine deposits derived from igneous, metamorphic and sedimentary rock on meander scrolls	0-6: Silty clay loam (H1) 6-30: Clay (H2) 30-60: Clay (H3)

Source: NRCS 2020

NRCS = Natural Resources Conservation Service

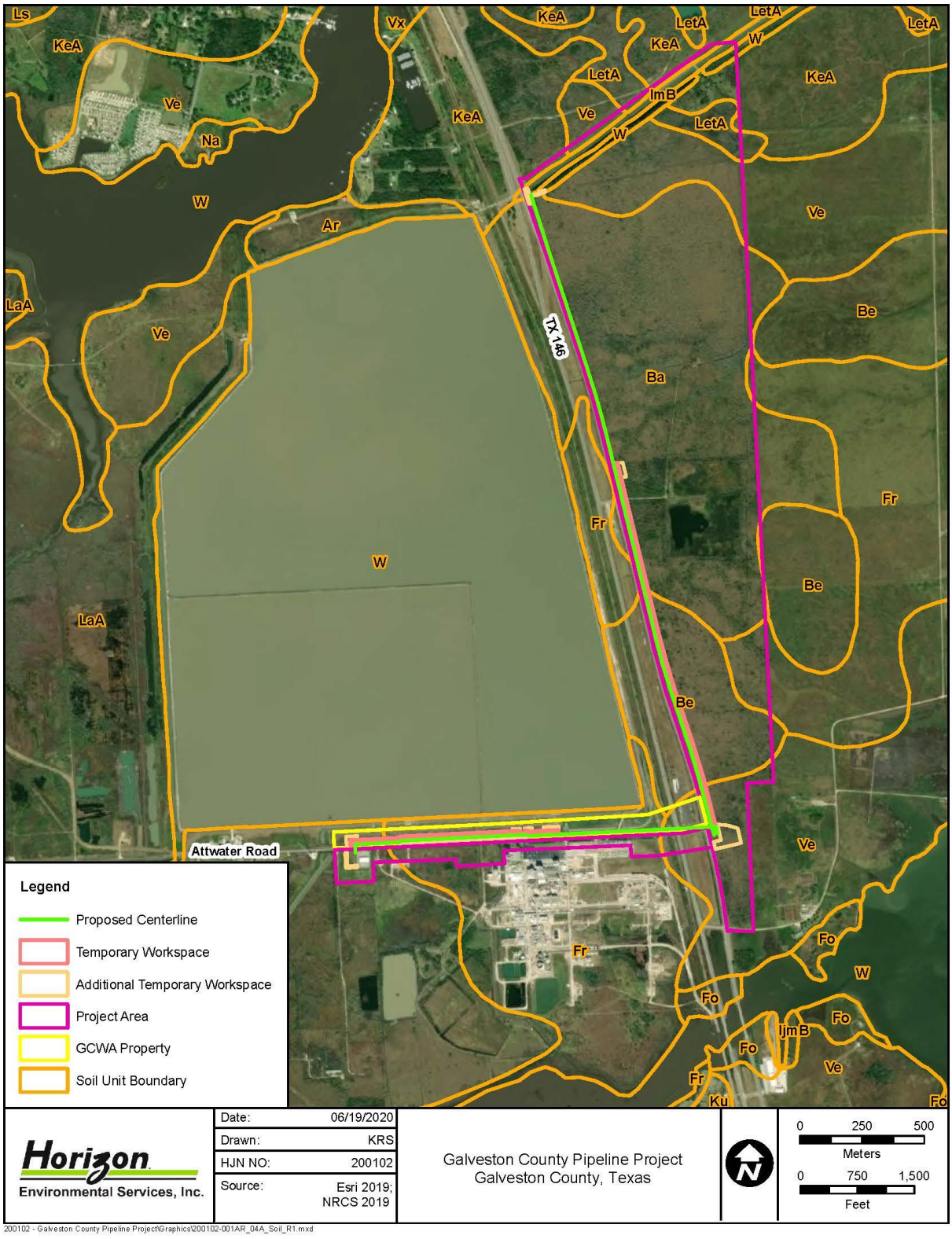

Figure 2-1. Soils Mapped within Project Area

2.3 CLIMATE

The modern climate of the upper Texas coast, including the region surrounding Houston, is classified as subtropical humid (Abbott 2001; Larkin and Bomar 1983), forming a transitional zone between the humid southeastern US and the semiarid to arid west. The climate reflects the influences of latitude, low elevation, and proximity to the Gulf of Mexico, which combine with the urban heat island formed by the tremendous concentration of asphalt and concrete to give the Houston area a notorious modern climate that is oppressively warm and moist throughout much of the year. As a result of proximity to the Gulf and the abundance of surface water, humidity in the early morning can approach 100% even on cloudless summer days, and it often exceeds 50% even on the warmest afternoons. Largely as a consequence of the relatively high humidity characteristic of the region, temperature patterns exhibit a moderate annual range and a modest diurnal range that increases slightly with distance from the coast. Average monthly high temperature ranges from a low of 17 to 19°Celsius ([C] 59 to 63°Fahrenheit [°F]) in January to a high of 38 to 40°C (89 to 96°F) in August. Average monthly lows range from 4 to 9°C (38 to 47°F) in January to 25 to 29°C (72 to 79°F) in July and August. Annually, average low temperatures range from 15 to 21°C (56 to 65°F), and average high temperatures range from 27 to 29°C (75 to 79°F) (Abbott 2001; Larkin and Bomar 1983).

The Houston region experiences 2 precipitation peaks throughout the year (Abbott 2001; Wheeler 1976). The first occurs in the late spring (i.e., May to June) due to the passage of infrequent cold fronts that spawn chains of powerful frontal thunderstorms. The second occurs in the late summer to early autumn (i.e., August to September) due to the incidence of tropical storms and hurricanes from the Atlantic and, occasionally, Pacific oceans. In contrast, winter and early spring are relatively dry, and high summer rainfall is dominated by convectional thunderstorms that are relatively brief and localized, albeit frequently intense. Average annual precipitation varies from a low of approximately 101.6 cm (40.0 inches) to a high of more than 132.1 cm (52.0 inches). Average monthly precipitation varies from less than 5.1 to 7.0 cm (2.0 to 3.0 inches) in March to more than 19.1 cm (7.5 inches) occurring locally on the coast during September. Almost all of the measurable precipitation falls as rain—snowfall is extremely rare, occurring in measurable amounts in only 1 in 10 years.

2.4 FLORA AND FAUNA

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

The coastal marsh/barrier island category includes well-drained, sandy, coastal environments and saline and freshwater wetlands in the coastal zone (Abbott 2001:24). Marsh vegetation is typical of areas that are seasonally wet and have substrates composed primarily of

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

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

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

The pine-hardwood forest is characterized by a mix of coniferous and deciduous trees, including longleaf pine, shortleaf pine, loblolly pine, post oak, red oak, white oak, blackjack oak, willow oak, and live oak (Abbott 2001:26). Riparian environments often support larger deciduous trees like pecan, cottonwood, hickory, beech, and American elm. Understory vegetation varies from relatively open to quite dense, and consists of shrubs, vines, forbs, and young trees. Common shrubs include acacia, yaupon, mayhaw, wild persimmon, myrtle, greenbrier, Virginia creeper, blackberry, dewberry, trumpet vine, gourd, and poison ivy. A variety of fauna are also present, including white-tailed deer, opossum, raccoon, squirrel, rabbit, mink, skunk, various small rodents, turtles, reptiles, and many different birds. Black bear was also present at times in the past, and bison and pronghorn were occasionally present in the transition zone to the coastal prairie environment.

3.0 CULTURAL BACKGROUND

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

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

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

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

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

Meltzer 1989). Evidence from Meadowcroft Rockshelter in Pennsylvania suggests that humans were present in Eastern North America as early as 14,000 to 16,000 years ago (Adovasio et al. 1990), while more recent discoveries at Monte Verde in Chile provide unequivocal evidence for human occupation in South America by at least 12,500 years ago (Dillehay 1989, 1997; Meltzer et al. 1997). Most archeologists have historically discounted claims of much earlier human occupation during the Pleistocene glacial period. However, recent investigations of the Buttermilk Creek Complex in Bell County, Texas, have raised the possibility that a pre-Clovis culture may have been present in North America as early as 15,500 years ago (Waters et al. 2018).

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

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

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

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

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

Traditionally, the Archaic period is subdivided into Early, Middle, and Late subperiods. In Southeast Texas, the Early Archaic period (5000 to 3000 B.C.) is marked by the presence of Bell, Carrollton, Morrill, Trinity, Wells, and miscellaneous Early Stemmed projectile points. The Bell point is the only type in this period that is closely associated with the Southern Plains. Many of the latter point types continue into the Middle Archaic period (3000 to 1500 B.C.) and several new types appear, including Bulverde, Lange, Pedernales, Williams, Travis, and probably the Gary-Kent series. The Late Archaic period (1,500 B.C. to A.D. 100) is characterized by Gary, Kent, Darl, Yarbrough, Ensor, Ellis, Fairland, Palmillas, and Marcos points (Ricklis 2003).

In the western part of inland Southeast Texas, a Late Archaic mortuary tradition developed in the lower Brazos and Colorado river valleys and in the intervening area (Hall 1981; Patterson 1995). Organized burial practices actually started during the Middle Archaic period but reached full development in the Late Archaic with the use of exotic grave goods such as boatstones and bannerstones (probably used as atlatl weights), stone gorgets, corner-tang knives, stingray spines, shark teeth, and marine shell beads and pendants. Other burial practices included the systematic orientation of burial direction, body position, use of red ochre, and use of locally made grave goods, such as longbone implements and bone pins. Most burials are found in extended supine position, though some extended prone and bundle burials are also known. Burial direction is usually consistent within single sites but varies from site to site. Patterson et al. (1993) report that at least 11 sites are associated with this mortuary tradition in Austin, Fort Bend, and Wharton counties. One notable Late Archaic mortuary site is the Ernest Witte site (41AU36), where two distinct cemeteries have yielded more than 206 bodies were interred with an array of lithics, shell artifacts, and pedants (Ricklis 2003). Additionally, the Crestmont site in Wharton County, the Albert George site in Fort Bend County, and the Morhiss site in Victoria County all have led researchers to hypothesize that these Late Archaic cultures were beginning to systematically and communally inter their dead as a response to surges in population growth (Ricklis 2003). This population growth may have been brought on by the climatic changes in the early Holocene, such as an increase of floodplains from regional streams that indirectly provided locales with an abundance of food and other resources (Ricklis 2003).

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

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

The earliest ceramic periods in the Galveston Bay and neighboring Sabine Lake areas appear to be approximately contemporaneous with the earliest ceramic periods of the lower Mississippi Valley (Aten 1984). Early assemblages contain substantial quantities of Tchefuncte

ceramics. In the Sabine Lake region, grog-tempered varieties of Baytown Plain and Marksville Stamped are common, while grog-tempered ceramics do not occur in the Galveston Bay area 129 km (80 miles) to the west until several hundred years later. With the principal exception of a few Tchefuncte ceramic types, other southern Louisiana ceramics are not found on the Gulf coast west of the Sabine Lake area.

The distinctive Woodland period archeological manifestation known as the Mossy Grove Culture/Tradition occupies the inland coastal plain and coastal margins that extend from the Brazos River Delta upwards to the Sabine River Delta (Ellis 2013). The Mossy Grove culture first appears in the archeological record around 2,500 years ago and consists of a sandy-paste ceramic technology similar to several styles of the Lower Mississippi River Valley cultures, such as Coles Creek and Fourche Maline (Ellis 2013). However, in contrast to the latter two cultures, Mossy Grove ceramics include rounded bottoms, floated surfaces, thinner walls, and, overall, these wares typically demonstrate lower frequencies of decoration. Important Woodland components that contain Mossy Grove assemblages have been found at Jonas Short (41PK8), Crawford (41PK69), and site 41PK21; the latter site contains both Gary and Kent projectile points as well as evidence of Marksville Stamped ceramic sherds (Ellis 2013), hinting at regional trading patterns and an economic affinity of Mossy Grove with Lower Mississippi Valley cultures.

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

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

The onset of the Late Prehistoric period (A.D. 600 to 1500) (Patterson 1995) is defined by the appearance of the bow and arrow. Elsewhere in Texas, pottery also appears during the latter part of the Late Prehistoric period, but, as already discussed, ceramics appear earlier in Southeast Texas. Along the coastal margin of Southeast Texas, use of the atlatl (i.e., spearthrower) and spear was generally discontinued during the Late Prehistoric period, though they continued to be used in the inland subregion along with the bow and arrow through the Late Prehistoric period (Ensor and Carlson 1991; Keller and Weir 1979; Patterson 1980, 1995; Wheat 1953). In fact, Patterson (1995:254) proposes that use of the bow and arrow started in Southeast Texas as early as the end of the Middle Archaic period, using unifacial arrow points that consisted of marginally

retouched flakes. In contrast, Prewitt (1981) argues for a generalized date of adoption of the bow-and-arrow hunting system at about the same time (ca. A.D. 600) in Central and Southeast Texas. In Southeast Texas, unifacial arrow points appear to be associated with a small prismatic blade technology. Bifacial arrow point types include Alba, Catahoula, Perdiz, and Scallorn. A serial sequence for these point types has not been established in Southeast Texas, though Scallorn points appear to predate Perdiz points throughout the rest of Texas.

Grog- (i.e., crushed-sherd-) tempered pottery was used in the Late Prehistoric and Protohistoric periods in Southeast Texas. The grog-tempered varieties include San Jacinto Plain and Baytown Plain variety Phoenix Lake. San Jacinto pottery contains a relatively small proportion of small-sized temper, while Baytown Plain has larger amounts of sherd pieces that are often visible on vessel surfaces. As previously mentioned, sandy-paste Goose Creek pottery remained in use throughout the Late Prehistoric period. Rockport Plain and Asphalt Coated pottery from the Central Texas Coast (Ricklis 1995) are found at a few sites in Southeast Texas during the Late Prehistoric and Protohistoric periods. Notable Late Prehistoric sites include the McGloin Bluff site (41SP11), where a large sample of Rockport ceramic sherds were found (approximately 28,275), and the Anaqua site (41JK8), where a plain sandy-paste Goose Creek sherds were found with Scallorn arrow points, the point most often associated with the Rockport phase (Ricklis 2013). The presence of Rockport Phase ware at certain Spanish missions has linked this archeological ceramic culture with the historic Karankawa Indians of the South Texas Coast.

3.5 PROTOHISTORIC PERIOD (A.D. 1500 TO 1600)

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

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

3.6 HISTORIC PERIOD (CA. A.D. 1600 TO PRESENT)

By 1519, Spain had claimed much of the Texas Coast, stretching across the southeast Texas coastal and interior landscape that included what are present-day Galveston and Harris counties. Between the Neches and Trinity Rivers lived a small tribe of Native Americans who were called the Orcoquisac by the Spaniards; anthropologist John R. Swanton believes these people were akin to the Atakapan speakers who occupied western Louisiana and southeast inner-coastal Texas woodlands (Swanton 1911; Newcomb 1961). Little is known about the Texas sect of Atakapans, whose name is a Choctaw word for "man-eaters" (Newcomb 1961). Their language was likely under the Tunican stock, but scant data are available about their linguistic origins (Swanton 1911). According to Newcomb, the Akokisas (Orcoquisac in Spanish) settled on the lower Trinity and San Jacinto rivers, as well as on the eastern shores of Galveston Bay; to the north lived a lesser known group, the Patiris, and, to their north, the Bidais (Newcomb 1961; Swanton 1911). Altogether, their population estimates are around 3,500 people (Newcomb 1961). The Galveston Bay focus likely practiced a hunter-gatherer subsistence strategy, for the salt water flooding in the region would be cumbersome to any agricultural practices (Newcomb 1961).

It is possible that Cabeza De Vaca and/or members of the Narvaez expedition may have encountered the Atakapan communities as early as 1528, and it is also possible that the Atakapans were encountered in La Salle's excursions in 1684. However, the first confirmed documented European account of the Atakapans was written by French naval officer Simars de Bellisle in 1719 (Newcomb 1961). The Atakapans in southeast Texas continued to trade deerskins and bison skins with the encroaching French settlers to the east in Louisiana throughout the 1730s and 1740s, until the Spanish Crown sent Captain Joaquin de Orobio Bazterra to investigate alleged French settlements in 1745 or 1746 (Newcomb 1961; Henson 2010). During this incursion, Capt. Bazterra visited several Orcoquisac villages along Spring Creek, a tributary to the San Jacinto River; during his visit, he found no identifiable roads or maps, nor any indications of French presence or structures (Newcomb 1961; Henson 2010).

The indigenous people collectively known as the Karankawas lived from the mouth of the Brazos to Baffin Bay; this included the areas settled by the new colonists at Fort Bend (Newcomb 1961; Ott 2010). The Karankawas comprised nomadic groups of hunter-gatherers and fishers that were ethnically tied to both a common linguistic stock and an identifiable archeological culture (Ricklis 2013). They manufactured a distinct style of ceramics, called Rockport ware, and were highly skilled at basketry (Newcomb 1961). Rockport ware typically contains a sandy paste and is speculated to have a stylistic relationship to the Upper Texas coast ceramic style, Goose Creek, where it may have originated, or at least culturally diffused from, in prehistoric times (Ricklis 2013). Throughout the seventeenth to nineteenth centuries, the Spanish documented at least five subgroups in their official state documents; from north to south, they list the Cocos, the Carancaguases, the Cujanes, the Coapites, and the Copanes (Ricklis 2013). In 1528, members of Narvaez's expedition documented the Karankawas as the occupants of Malhado, or the Isle of Misfortune (otherwise known as *Isla de Culebras*), and Cabeza de Vaca lived among the Upper coast Cocos (Karankawas) for several years after being shipwrecked (Lipscomb 2010). During de Vaca's tenure with the Upper Coast Cocos, otherwise known as the Capoque, his account

documents that they inexorably traded asphaltum, shark's teeth, marine shells, and smoked fish with the interior natives in exchange for maize, hides, flint, and red ochre (Himmel 2016). After living with the Capoque tribe for approximately 18 months, de Vaca moved to the mainland woods opposite of Galveston island in present-day Brazoria County (Foster 2008). There he encountered the Charruco, another hunter/gatherer tribe, with whom he lived and traded extensively until 1533 (Foster 2008). By the turn of the eighteenth century, the Cocos were trading with both the Spanish and the French for European trade goods (Himmel 2016). By 1850, the Karankawas, decimated by disease, disenfranchised by the mission system, and hunted down by Texas colonists, were pushed all the way south to Mexico and no longer occupied the areas now known as Brazoria, Fort Bend, and Galveston counties (Ott 2010; Himmel 2016). As documented in 1891, the Karankawas were completely extinct.

On his ill-fated expedition of 1865, Rene Robert Cavelier, Sieur de La Salle, first named the area of present-day Galveston in honor of King Louis XIV (San Louis); however, no Europeans would settle in the area until the early nineteenth century. The Spanish mariner and Royal Navy commander Jose Antonio de Evia named Galveston Bay after Viceroy Bernardo de Galvez in 1783, while embarked on a mission for the Crown to document and chart the inlets of the Gulf of Mexico (Holmes 2010). Members of the Gutierrez-Magee expedition, a filibustering campaign during the Mexican Revolution, landed at Bolivar Point in 1815. Galveston Bay was a fulcrum for privateer and pirate activity until an earthwork fort was constructed by Francisco Xavier Mina and his fleet as they planned an invasion into Royalist Mexico (Kleiner 2010). By 1817, the island would house over 1,000 inhabitants, most of whom were settled in a community named Campeche at the present site of Sealy Hospital.

Anglo-American settlement in Galveston began in 1822, after a group of 80 colonists landed the schooner *Revenge* on the mainland. By 1827, the island had been settled as well (Kleiner 2010). At the suggestion of Stephen F. Austin, the Mexican government recognized the bay's strategic position and officially established a seaport, customhouse, and garrison (Kleiner 2010). Frictions between Mexican authorities and Texians began to arise, which culminated in the surrendering of the area to the Texians. The Texians built fortifications that housed the nascent Texas Navy and its fleet and were later known as Fort Travis (Kleiner 2010). Galveston County was carved out by 1838, and by the mid-nineteenth century, Galveston Bay became an integral seaport serving the incipient agriculture and plantation economies of southeast Texas. Staple crops such as cotton, sugar, pecans, and cattle were shipped through its many wharves and industrial sectors. Improvements to infrastructure were solidified by the advent of The Galveston, Houston and Henderson Railroad in 1853, as well as the Gulf Intracoastal Waterway, which connected Oyster Creek, West Bay, and the Brazos River. The first bridge that connected the mainland to the island was completed in 1859. By 1860, the population of Galveston County was 8,229.

Because Galveston Bay served as a major hub for the import of African slaves, it is unsurprising that the majority of the county's residents voted to leave the union during the 1861 Ordinance to Secession (Timmons 1973). Federalist troops captured Galveston Island in 1862 during their blockade campaign, only to be recaptured by Confederates during the Battle of Galveston of 1864. During the Reconstruction period, a large number of Federal troops were

positioned in Galveston, and the Freedman's Bureau established a headquarters on the island. During the late nineteenth century, a number of schools were chartered, including Galveston Medical College. By 1880, the county had 24,121 citizens, and Galveston was the largest populated city in Texas and was known as the "New York of the Gulf" due to its commercial and agricultural industries of imports and exports (Kleiner 2010).

The Hurricane of 1900 devastated the area, killing thousands of people and destroying homes and businesses, but the city was quick to regain its importance as a port of entry. Several thousand immigrants flowed through the new custom house and quarantine station built on Pelican Island, which at the time was comparable to Angel or Ellis Island (Kleiner 2010). In 1912, an interurban railroad was chartered for commuting passengers, and the area saw a boom of prosperity with the widening of the Houston Ship Channel and subsequent railroad extensions from the Southern Pacific, Santa Fe, Missouri-Kansas-Texas, International-Great Northern, and Gulf and Interstate rail lines (Kleiner 2010).

Like most counties in Texas, Galveston County did not escape the economic throes caused by the Great Depression. Many farms, banks, and businesses failed during this time, but the businesses geared towards wartime production drew thousands of workers needing jobs by the onset of World War II. These industries included shipbuilding, iron working, and petroleum/petrochemicals. Galveston Bay was once again fortified during this time to thwart any attacks, and the population of Mexican immigrants grew as the need for farm laborers almost doubled. During the postwar years, Galveston began to decline due to limited water supplies as its previous industries waned. However, by the 1960s, the petroleum and petrochemical manufacturing industries hit their stride with the formation of companies like Union Carbide, Wah Chang, Monsanto, Amoco Chemical, Marathon Oil, and Texas City Refining (Kleiner 2010). Galveston also gained prominence in the commercial fishing industry as Gulf shrimping began to generate millions of dollars and jobs throughout the 1970s. The Lyndon B. Johnson Space Center was incorporated in 1960, the Texas Maritime Academy was chartered in 1962, and Galveston College opened its doors in 1967.

In 2018, the population of Galveston was 337,890. Main commercial industries include tin smelting, oil refining, metal fabrication, and chemical production. Galveston's main agricultural exports are rice, hay, watermelons, and pecans. Institutions of higher learning include the Texas A&M College of Marine Science and Maritime Research as well as the University of Texas Medical Branch, and the Galveston Independent School District serves the public. The Galveston Arts Center, pristine beaches, Schlitterbahn, Moody Gardens, and significant nineteenth-century architecture attract over five million tourists annually.

4.0 BACKGROUND RESEARCH

Prior to initiating fieldwork, Horizon personnel reviewed the THC's online *Texas Archeological Sites Atlas* (TASA), the National Park Service's (NPS) online *National Register Information System* (NRIS), the Texas Archeological Research Laboratory's (TARL) files, the Texas Department of Transportation's (TxDOT) *Historic Bridges of Texas* and *Historic Districts & Properties of Texas* online databases, and the Texas Freedom Colonies Atlas (TFCA) for information on previously recorded cultural resources sites and previous archeological investigations conducted within a 1.6-km (1.0-mile) radius of the project area (NPS 2020; TFCA 2020; THC 2020; TSHA 2020; TxDOT 2020a, 2020b).

Based on this research, no previously recorded archeological sites, cemeteries, historic structures, or Freedom Colonies overlap the project area. Two prior archeological surveys overlap the project area where it is intersected by SH 146. Michael Baker Associates, under TAC Permit 3770, surveyed the northbound ROW of SH 146 in 2005, but did not record any archeological sites near the project area. In 2013, under TAC Permit 6446, HRA Gray & Pape surveyed the proposed ROW of a pipeline adjacent to the southbound ROW of SH 146; no archeological sites were recorded near the project area (THC 2020). Eleven previously recorded archeological sites and two shipwrecks fall within 1.6 km (1.0 mile) of the project area. These documented cultural resources and their distances from the project area are summarized in Table 4-1 and Figure 4-1 below.

Examination of historical US Geological Survey (USGS) topographic maps dating from 1929 to the present and aerial photographs dating from 1955 to the present indicate no standing structures of historic age within the project area.

Table 4-1. Summary of Documented Cultural Resources within 1.0 Mile of Project Area

Site No./Name	Site Type	NRHP/SAL Eligibility[1]	Distance/Direction from Project Area	Potential to be Impacted by Project?
Archeological Sites				
41GV37	Mussel shell midden (undetermined prehistoric)	Undetermined	Site Location Omitted	No
41GV38	Mussel shell midden (undetermined prehistoric)	Undetermined	Site Location Omitted	No
41GV39	Aboriginal lithic, ceramic, and faunal bone scatter (Late Prehistoric)	Undetermined	Site Location Omitted	No
41GV83	Mussel shell midden (undetermined prehistoric)	Undetermined	Site Location Omitted	No
41GV84	Mussel shell midden (undetermined prehistoric)	Undetermined	Site Location Omitted	No
41GV85	Mussel shell midden (undetermined prehistoric)	Undetermined	Site Location Omitted	No
41GV86	Mussel shell midden (undetermined prehistoric)	Undetermined	Site Location Omitted	No
41GV87	Mussel shell midden (undetermined prehistoric)	Undetermined	Site Location Omitted	No
41GV88	Mussel shell midden (undetermined prehistoric)	Undetermined	Site Location Omitted	No
41GV89	Multicomponent mussel shell midden	Undetermined	Site Location Omitted	No
41GV141	Multicomponent mussel shell midden	Undetermined	Site Location Omitted	No
Shipwrecks				
THC Shipwreck Number 1189	Unknown, lost 1969	Undetermined	0.7 miles northwest	No
THC Shipwreck Number 1190	Unknown, lost 1970	Undetermined	0.8 miles northwest	No

[1] *Undetermined* = Eligibility not assessed or no information available

SENSITIVE ARCHEOLOGICAL SITE LOCATION INFORMATION OMITTED

Figure 4-1. Locations of Documented Cultural Resources within 1.0 Mile of Project Area

5.0 SURVEY METHODOLOGY

From May 12 to 15 and June 17, 2020, Horizon archeologists Charles E. Bludau, Jr. and Luis Gonzales performed an intensive cultural resources survey of the project area. Horizon's archeologists traversed the project area on foot and thoroughly inspected the modern ground surface for aboriginal and historic-age cultural resources. In addition to pedestrian walkover, for area projects, the recently revised 2020 TSMASS require at least 50 shovel tests for the first 10.1 hectares (25.0 acres) of a project plus at least one shovel test for every 2.0 hectares (5.0 acres) over the original 10.1 hectares (25.0 acres). This equates to a minimum of 145 shovel tests within the original 203.2-hectare (502.0-acre) project area. Horizon exceeded the TSMASS by excavating 156 shovel tests within this area. The TSMASS require a minimum of 16 shovel tests per mile for linear projects measuring 30.0 m (98.4 feet) or less in width; this equates to a minimum of 40 shovel tests within the proposed ROW. Horizon exceeded this minimum by excavating 46 shovel tests within the proposed ROW. Shovel tests were also placed within ATWS that extended beyond the proposed ROW. Altogether, Horizon archeologists excavated 202 shovel tests within the project area (Figures 5-1 through 5-3).

All shovel tests measured approximately 30.0 cm (12.0 inches) in diameter and were to be excavated to at least 80.0 cm (31.5 inches) below surface; to sterile, pre-Holocene subsoil; or to a restrictive feature such as bedrock or the water table, whichever was encountered first. All excavated matrices were screened through quarter-inch hardware mesh. During the first stage of fieldwork, shovel tests were generally placed in 200.0-m (656.2-foot) staggered transects across the project area. In areas with higher probability of finding prehistoric aboriginal subsurface artifacts, such as near water sources, shovel tests were placed at closer intervals. After the proposed route was selected, additional shovel tests were excavated within the proposed ROW so that shovel tests were approximately 100.0 m (328.1 feet) apart. The Universal Transverse Mercator (UTM) coordinates for all shovel test locations were recorded using the Collector for ArcGIS smart phone application.

During the survey, field notes were maintained on terrain, vegetation, soils, landforms, survey methods, and shovel test results. Digital photographs were taken, and a photographic log was maintained. Horizon employed a non-collection policy for cultural resources. Diagnostic artifacts (e.g., projectile points, ceramics, historic materials with maker's marks) and nondiagnostic artifacts (e.g., lithic debitage, burned rock, historic glass, and metal scrap) were to be described, sketched, and/or photographed in the field and replaced where they were found. Project records associated with survey of GCWA property will be curated at TARL.

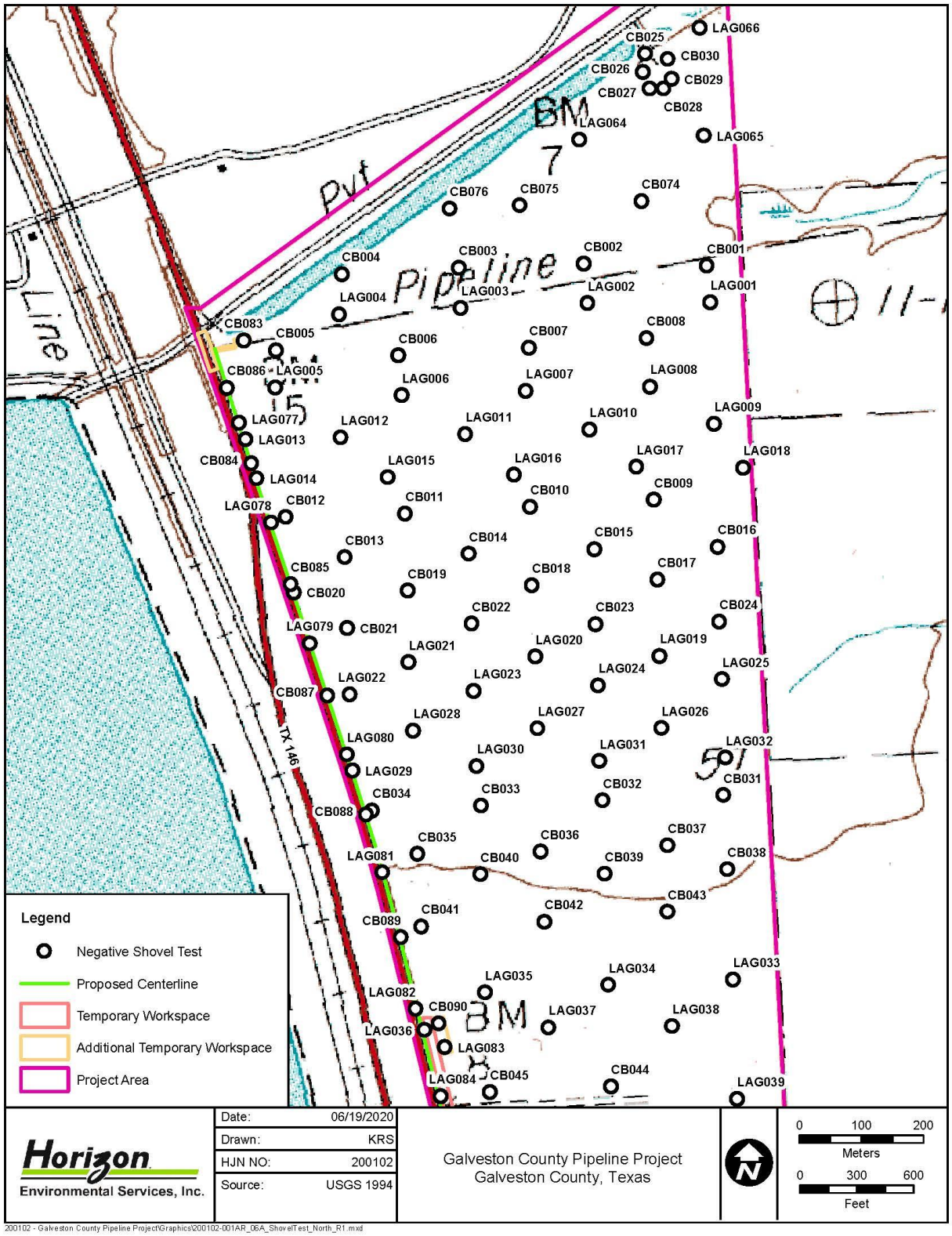

Figure 5-1. Shovel Tests Excavated within Northern Portion of Project Area

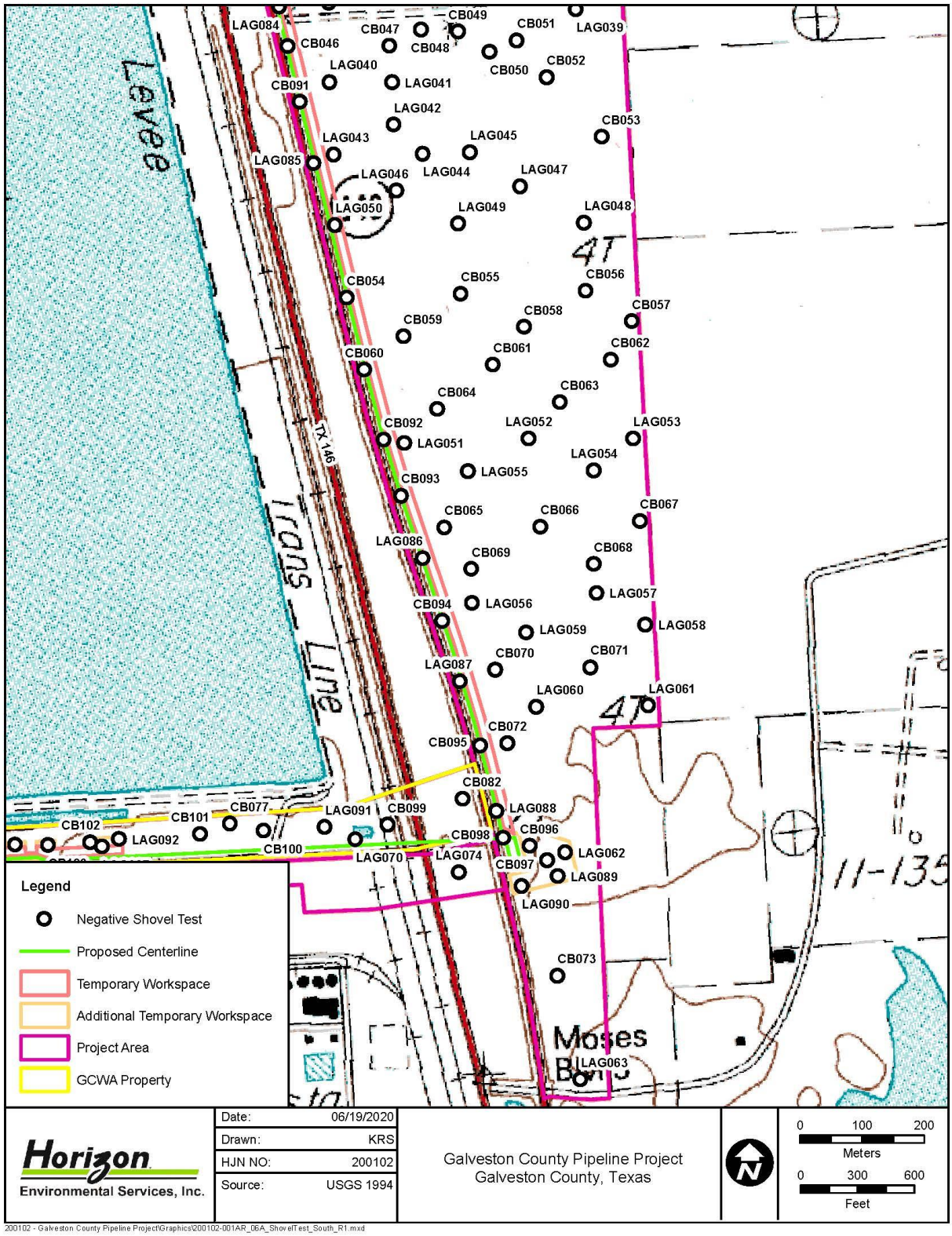

Figure 5-2. Shovel Tests Excavated within Southern Portion of Project Area

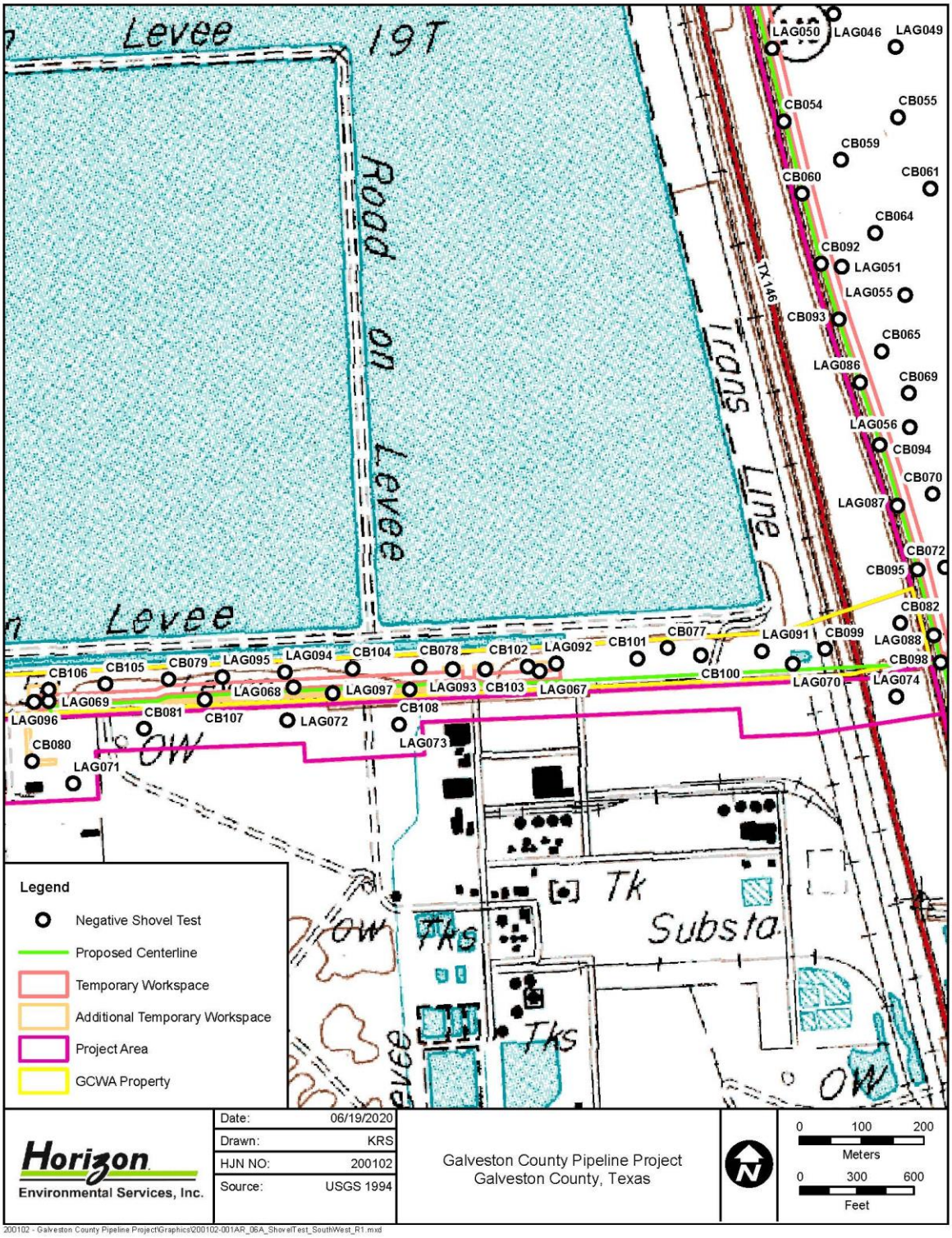

Figure 5-3. Shovel Tests Excavated within Southwestern Portion of Project Area

In addition to field survey, a desktop study was conducted to assess potential indirect, visual effects that could result from the construction of the Attwater-Topaz M&R station. This study included consulting the THC's Texas Historical Sites Atlas, TxDOT's *Historic Bridges of Texas* and *Historic Districts & Properties of Texas* online databases, and recent aerial images of the proposed M&R station and its surrounding area.

6.0 RESULTS OF INVESTIGATIONS

6.1 RESULTS OF ARCHEOLOGICAL FIELD INVESTIGATIONS

At the time of the cultural resources survey, the project area consisted of open coastal flats heavily inundated with water from recent and perennial rain events on its northern portion, as well as permanent and ephemeral wetlands. Some areas were overgrown with heavily wooded vegetation that included several hardwood and softwood species, such as live oak, yaupon, birch, and palmetto (see Figures 6-1 through 6-6). The ground surface within the project area west of SH 146 has been heavily modified by parking lots, modern industrial facilities, and artificial drainages and canals (Figures 6-7 through 6-9). Ground surface visibility varied between poor (20%) and moderate (50%). Shovel testing typically revealed shallow deposits of hydric dark gray clay and clay loam extending from the modern ground surface to depths ranging from 5.0 to 100.0 cm (2.0 to 39.4 inches) below surface, though most shovel tests were terminated at depths of 30.0 to 50.0 cm (11.8 to 19.7 inches) below surface.

It is Horizon's opinion that these shovel tests were capable of penetrating Holocene-age soils with the potential to contain subsurface archeological resources. At the time of the cultural resources survey, portions of the project area were inundated with ankle-deep water from perennial flooding, and shovel tests often encountered the water table within 5.0 to 30.0 cm (1.9 to 11.8 inches) below the surface (cmbs). Summary data for all 202 shovel tests excavated during the survey are presented in Appendix A.

No archeological sites or historic-aged structures were observed within the project area during the survey. A modern cattle corral, constructed with modern lumber, is present in the northeast corner of the project area, south of Skyline Drive (Figure 6-10). The corral does not appear on any topographic maps. It is first visible in a 1981 aerial image; as such the corral is not of historic age.

Figure 6-1. Overview of North-Central Portion of Project Area (Facing West)

Figure 6-2. View of Canal in Northern Portion of Project Area (Facing East)

Figure 6-3. Overview of Dirt Road on Eastern Portion of Project Area (Facing North)

Figure 6-4. View of Vegetation on Central Portion of Project Area (Facing South)

Figure 6-5. Overview of Southern Portion of Project Area (Facing South)

Figure 6-6. Overview of Pond on Central Portion of Project Area (Facing South)

Figure 6-7. Overview of Project Area North of Attwater Avenue (Facing West)

Figure 6-8. Overview of Project Area South of Attwater Avenue (Facing East)

Figure 6-9. View of Artificial Canal West of SH 146 (Facing West)

Figure 6-10. Modern Corral South of Skyline Drive within the Northeastern Portion of the Project Area (Facing North)

6.2 RESULTS OF VISUAL EFFECTS ANALYSIS

The APE for visual effects is defined as the geographic area in which the Undertaking has the potential to introduce visual elements that diminish or alter the setting, including the landscape, where the setting is a character-defining feature of a Historic Property that makes it eligible for listing on the NRHP. The proposed Attwater-Topaz M&R station would be no more than 6.1 m (20.0 feet) in height and located within an existing industrial land-use area. The APE for potential indirect, visual effects is therefore defined as the subject site and the parcels adjacent to the proposed M&R station.

The visual APE is characterized by industrial facilities, existing pipeline infrastructure, and the state correctional facility (Figure 6-11). The M&R station would be located adjacent to an existing two-story state office building (Texas Department of Corrections) and to a Galveston County Criminal Justice Center (constructed in 2006). Approximately 450 m (1,500 feet) to the east is a large oil and gas processing facility complex, with SH 46 east of the complex. The Galveston County Industrial Reservoir occupies the land to the north of the proposed site.

According to the THC's Texas Historical Sites Atlas and TxDOT's TxDOT's *Historic Bridges of Texas* and *Historic Districts & Properties of Texas* online databases, there are no properties listed or considered eligible for listing on the NRHP within the visual effects APE. Further, there are no Recorded Texas Historic Landmarks, Official Texas Historical Markers, or SALs within the visual effects APE. There are no known properties or resources within the visual effects APE that have characteristics of historically significant structures, objects, buildings, or landscapes. The construction of a M&R station within this industrial land-use area is consistent with the existing infrastructure and does not impose an element of character with the surrounding landscape. Therefore, it is recommended that the proposed Attwater-Topaz M&R station would have no indirect or visual effects on historic resources.

Figure 6-11. Existing buildings and infrastructure within the visual effects APE

7.0 SUMMARY AND RECOMMENDATIONS

7.1 CONCEPTUAL FRAMEWORK

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

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

At the survey level of investigation, the principal research objective was to inventory the cultural resources within the project area and to make preliminary determinations of whether the resources meet one or more of the pre-defined eligibility criteria set forth in the state and/or federal codes, as appropriate. Determinations of eligibility for inclusion in the NRHP are based on the criteria presented in 36 CFR §60.4(a-d). The criteria for determining the eligibility of a prehistoric or historic cultural property for designation as a SAL are presented in Chapter 191, Subchapter D, Section 191.092 of the ACT.

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

7.2 SUMMARY OF RESULTS

From May 12 to 15 and June 17, 2020, Horizon archeologists Charles E. Bludau, Jr. and Luis Gonzales completed a cultural resources survey of the Galveston County Pipeline Project's

203.2-hectare (502.0-acre) project area. They thoroughly inspected the modern ground surface and excavated 202 shovel tests within the project area. The project area consisted of open, fallow, coastal flats heavily inundated with water from recent and perennial rain events in the northern portion, as well as permanent and ephemeral wetlands. Some areas were overgrown with heavily wooded vegetation. The ground surface within the project area west of State Highway 146 has been heavily modified by parking lots, modern industrial facilities, and artificial drainages and canals.

No archeological sites or historical structures were observed within the project area. A corral within the northeastern corner of the project area proved to be modern based on review of historical topographic maps and aerial images.

7.3 MANAGEMENT RECOMMENDATIONS

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

All project records associated with survey of the GCWA property (completed under Antiquities Permit No. 9449) will be curated at TARL.

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APPENDIX A:

FGT Categorical Exclusion Agreement

APPENDIX B:

Shovel Test Data

Table B-1. Shovel Test Summary Data

ST No.	UTM Coordinates[1]		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
CB01	309909	3259739	0-25+	Dark gray clay w/ iron staining	None
CB02	309712	3259752	0-25+	Dark gray clay w/ iron staining	None
CB03	309511	3259756	0-35+	Dark gray clay w/ iron staining	None
CB04	309322	3259756	0-35+	Dark gray clay w/ iron staining	None
CB05	309210	3259639	0-35+	Dark gray clay w/ iron staining	None
CB06	309407	3259621	0-35+	Dark gray clay w/ iron staining	None
CB07	309617	3259622	0-35+	Dark gray clay w/ iron staining	None
CB08	309807	3259628	0-35+	Dark gray clay w/ iron staining	None
CB09	309805	3259368	0-20+	Dark gray clay w/ iron staining	None
CB10	309605	3259367	0-60+	Dark gray clay w/ iron staining	None
CB11	309404	3259366	0-60+	Dark gray clay w/ iron staining	None
CB12	309212	3259370	0-60+	Dark gray clay w/ iron staining	None
CB13	309304	3259301	0-60+	Dark gray clay w/ iron staining	None
CB14	309503	3259296	0-60+	Dark gray clay w/ iron staining	None
CB15	309705	3259293	0-60+	Dark gray clay w/ iron staining	None
CB16	309903	3259287	0-35+	Dark gray clay w/ iron staining	None
CB17	309804	3259239	0-25+	Dark gray clay w/ iron staining	None
CB18	309602	3259240	0-60+	Dark gray clay w/ iron staining	None
CB19	309402	3259242	0-60+	Dark gray clay w/ iron staining	None
CB20	309219	3259249	0-60+	Dark gray clay w/ iron staining	None
CB21	309302	3259187	0-60+	Dark gray clay w/ iron staining	None
CB22	309502	3259184	0-60+	Dark gray clay w/ iron staining	None
CB23	309701	3259173	0-60+	Dark gray clay w/ iron staining	None
CB24	309900	3259167	0-60+	Dark gray clay w/ iron staining	None
CB25	309828	3260084	0-60+	Light gray clay w/ iron staining	None
CB26	309822	3260055	0-5+	Compact gravel	None
CB27	309832	3260028	0-5+	Compact gravel	None
CB28	309854	3260026	0-25 25-50+	Dark gray sandy loam Dark gray clay w/ iron staining	None None
CB29	309868	3260042	0-25 25-50+	Dark gray sandy loam Dark gray clay w/ iron staining	None None
CB30	309864	3260074	0-50+	Dark gray clay w/ iron staining	None
CB31	309892	3258888	0-35+	Gray, black, orangish-red clay	None

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

ST No.	UTM Coordinates[1]		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
CB32	309698	3258889	0-40+	Dark gray and black clay w/ iron staining	None
CB33	309502	3258891	0-40+	Dark gray and black clay w/ iron staining	None
CB34	309327	3258892	0-40+	Dark gray and black clay w/ iron staining	None
CB35	309396	3258819	0-40+	Dark gray and black clay w/ iron staining	None
CB36	309594	3258812	0-40+	Dark gray and black clay w/ iron staining	None
CB37	309798	3258812	0-40+	Dark gray and black clay w/ iron staining	None
CB38	309892	3258768	0-40+	Dark gray and black clay w/ iron staining	None
CB39	309694	3258771	0-40+	Dark gray and black clay w/ iron staining	None
CB40	309495	3258781	0-40+	Dark gray and black clay w/ iron staining	None
CB41	309396	3258702	0-40+	Dark gray and black clay w/ iron staining	None
CB42	309594	3258699	0-40+	Dark gray and black clay w/ iron staining	None
CB43	309792	3258705	0-40+	Dark gray and black clay w/ iron staining	None
CB44	309687	3258430	0-40+	Dark gray and black clay w/ iron staining	None
CB45	309493	3258431	0-40+	Dark gray and black clay w/ iron staining	None
CB46	309423	3258364	0-40+	Dark gray and black clay w/ iron staining	None
CB47	309587	3258356	0-35+	Dark gray and pale brown clay w/ calcium carbonate	None
CB48	309638	3258380	0-35+	Red and pale brown clay w/ calcium carbonate	None
CB49	309698	3258374	0-35+	Red and pale brown clay w/ calcium carbonate	None
CB50	309746	3258338	0-60+	Dark gray and pale brown clay w/ calcium carbonate	None
CB51	309791	3258355	0-60+	Dark gray and pale brown clay w/ calcium carbonate	None
CB52	309836	3258293	0-60+	Dark gray and pale brown clay w/ calcium carbonate	None
CB53	309919	3258193	0-60+	Dark gray and pale brown clay w/ calcium carbonate	None
CB54	309497	3257956	0-60+	Dark gray and pale brown clay w/ calcium carbonate	None
CB55	309680	3257953	0-60+	Dark gray and pale brown clay w/ calcium carbonate	None
CB56	309881	3257947	0-60+	Dark gray and pale brown clay w/ calcium carbonate	None
CB57	309953	3257894	0-60+	Dark gray and pale brown clay w/ calcium carbonate	None

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

ST No.	UTM Coordinates[1]		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
CB59	309585	3257889	0-60+	Dark gray and pale brown clay w/ calcium carbonate	None
CB60	309519	3257839	0-30 30-60+	Light gray clay loam Dark gray clay	None None
CB61	309726	3257836	0-45+	Dark gray clay w/ iron staining	None
CB62	309916	3257834	0-50+	Dark gray clay w/ iron staining	None
CB63	309830	3257770	0-50+	Dark gray clay w/ iron staining	None
CB64	309633	3257769	0-50+	Dark gray clay w/ iron staining	None
CB65	309635	3257579	0-30 30-60+	Dark gray clay w/ iron staining	None None
CB66	309789	3257572	0-45+	Dark gray clay w/ iron staining	None
CB67	309949	3257573	0-45+	Dark gray clay w/ iron staining	None
CB68	309871	3257508	0-45+	Dark gray clay w/ iron staining	None
CB69	309674	3257510	0-45+	Dark gray clay w/ iron staining	None
CB70	309704	3257346	0-45+	Dark gray clay w/ iron staining	None
CB71	309857	3257342	0-45+	Dark gray clay w/ iron staining	None
CB72	309718	3257228	0-45+	Dark gray clay w/ iron staining	None
CB73	309779	3256850	0-45+	Dark gray clay w/ iron staining	None
CB74	309810	3259848	0-45+	Dark gray clay w/ iron staining	None
CB75	309614	3259851	0-45+	Dark gray clay w/ iron staining	None
CB76	309501	3259852	0-45+	Dark gray clay w/ iron staining	None
CB77	309266	3257121	0-40+	Dark gray, red, black, pale brown clay	None
CB78	308867	3257111	0-40+	Dark gray, red, black, pale brown clay	None
CB79	308464	3257112	0-40+	Dark gray, red, black, pale brown clay	None
CB80	308238	3256992	0-40+	Dark gray and pale brown clay	None
CB81	308421	3257035	0-40+	Dark gray and pale brown clay	None
CB82	309642	3257142	0-5+	Dark gray clay w/ gravel	None
CB83	309160	3259657	0-30+	Dark gray clay w/ iron staining	None
CB84	309161	3259460	0-30+	Dark gray clay w/ iron staining	None
CB85	309215	3259262	0-30+	Dark gray clay w/ iron staining	None
CB86	309128	3259583	0-30+	Dark gray clay w/ iron staining	None
CB87	309265	3259081	0-30+	Dark gray clay w/ iron staining	None
CB88	309317	3258886	0-30+	Dark gray clay w/ iron staining	None

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

ST No.	UTM Coordinates[1]		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
CB89	309363	3258686	0-30+	Dark gray clay w/ iron staining	None
CB90	309416	3258545	0-30+	Dark gray clay w/ iron staining	None
CB91	309438	3258274	0-30+	Dark gray clay w/ iron staining	None
CB92	309545	3257725	0-30+	Dark gray clay w/ iron staining	None
CB93	309568	3257634	0-30+	Gray clay w/ iron staining	None
CB94	309623	3257429	0-30+	Gray clay w/ iron staining	None
CB95	309674	3257226	0-30+	Gray clay w/ iron staining	None
CB96	309745	3257061	0-30+	Gray clay w/ iron staining	None
CB97	309772	3257037	0-30+	Gray clay w/ iron staining	None
CB98	309703	3257076	0-30+	Gray clay w/ iron staining	None
CB99	309519	3257107	0-30+	Black, pale brown, gray and orange clay	None
CB100	309320	3257107	0-30+	Black, pale brown, gray and orange clay	None
CB101	309217	3257107	0-30+	Black, pale brown, gray and orange clay	None
CB102	309041	3257103	0-30+	Black, pale brown, gray and orange clay	None
CB103	308972	3257102	0-30+	Black, pale brown, gray and orange clay	None
CB104	308760	3257114	0-30+	Black, pale brown, gray and orange clay	None
CB105	308362	3257110	0-30+	Dark gray and orange clay	None
CB106	308271	3257106	0-30+	Black, pale brown, gray and orange clay	None
CB107	308520	3257077	0-30+	Black, pale brown, gray and orange clay	None
CB108	308850	3257076	0-30+	Black, pale brown, gray and orange clay	None
LAG01	309912	3259680	0-30+	Dark gray clay w/ iron staining	None
LAG02	309715	3259689	0-30+	Dark gray clay w/ iron staining	None
LAG03	309511	3259691	0-30+	Dark gray clay w/ iron staining	None
LAG04	309315	3259691	0-30+	Dark gray clay w/ iron staining	None
LAG05	309206	3259579	0-30+	Dark gray clay w/ iron staining	None
LAG06	309408	3259556	0-30+	Dark gray clay w/ iron staining	None
LAG07	309608	3259553	0-30+	Dark gray clay w/ iron staining	None
LAG08	309808	3259550	0-30+	Dark gray clay w/ iron staining	None
LAG09	309908	3259484	0-30+	Dark gray clay w/ iron staining	None
LAG10	309707	3259486	0-30+	Dark gray clay w/ iron staining	None
LAG11	309508	3259489	0-30+	Dark gray clay w/ iron staining	None
LAG12	309307	3259494	0-30+	Dark gray clay w/ iron staining	None

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

ST No.	UTM Coordinates[1]		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
LAG13	309154	3259498	0-30+	Dark gray clay w/ iron staining	None
LAG14	309169	3259435	0-30+	Dark gray clay w/ iron staining	None
LAG15	309379	3259426	0-30+	Dark gray clay w/ iron staining	None
LAG16	309582	3259420	0-30+	Dark gray clay w/ iron staining	None
LAG17	309779	3259422	0-30+	Dark gray clay w/ iron staining	None
LAG18	309951	3259412	0-30+	Dark gray clay w/ iron staining	None
LAG19	309801	3259117	0-30+	Dark gray clay w/ iron staining	None
LAG20	309601	3259126	0-30+	Dark gray clay w/ iron staining	None
LAG21	309398	3259127	0-30+	Dark gray clay w/ iron staining	None
LAG22	309300	3259080	0-30+	Dark gray clay w/ iron staining	None
LAG23	309500	3259076	0-30+	Dark gray clay w/ iron staining	None
LAG24	309700	3259074	0-30+	Dark gray clay w/ iron staining	None
LAG25	309899	3259074	0-30+	Dark gray clay w/ iron staining	None
LAG26	309798	3259000	0-30+	Dark gray clay w/ iron staining	None
LAG27	309599	3259010	0-30+	Dark gray clay w/ iron staining	None
LAG28	309399	3259017	0-30+	Dark gray clay w/ iron staining	None
LAG29	309298	3258958	0-30+	Dark gray clay w/ iron staining	None
LAG30	309498	3258955	0-30+	Dark gray clay w/ iron staining	None
LAG31	309695	3258953	0-30+	Dark gray clay w/ iron staining	None
LAG32	309898	3258948	0-30+	Dark gray clay w/ iron staining	None
LAG33	309892	3258591	0-30+	Dark gray clay w/ iron staining	None
LAG34	309691	3258593	0-30+	Dark gray clay w/ iron staining	None
LAG35	309493	3258591	0-30+	Dark gray clay w/ iron staining	None
LAG36	309393	3258536	0-30+	Dark gray clay w/ iron staining	None
LAG37	309592	3258529	0-30+	Dark gray clay w/ iron staining	None
LAG38	309791	3258521	0-30+	Dark gray clay w/ iron staining	None
LAG39	309889	3258400	0-30+	Dark gray clay w/ iron staining	None
LAG40	309488	3258303	0-30+	Dark gray clay w/ iron staining	None
LAG41	309588	3258298	0-30+	Dark gray clay w/ iron staining and gravel	None
LAG42	309587	3258229	0-30+	Dark gray clay w/ iron staining and gravel	None
LAG43	309488	3258186	0-30+	Dark gray clay w/ iron staining and gravel	None

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

ST No.	UTM Coordinates[1]		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
LAG44	309631	3258180	0-30+	Dark gray clay w/ iron staining and gravel	None
LAG45	309707	3258179	0-30+	Dark gray clay w/ iron staining and gravel	None
LAG46	309585	3258123	0-30+	Dark gray clay w/ iron staining	None
LAG47	309784	3258120	0-30+	Dark gray clay w/ iron staining	None
LAG48	309884	3258056	0-30+	Dark gray clay w/ iron staining	None
LAG49	309682	3258066	0-30+	Dark gray clay w/ iron staining	None
LAG50	309484	3258073	0-30+	Dark brown and black clay	None
LAG51	309577	3257718	0-30+	Dark brown and black clay	None
LAG52	309777	3257715	0-30+	Dark brown and black clay	None
LAG53	309945	3257706	0-30+	Dark brown and black clay	None
LAG54	309879	3257658	0-30+	Dark brown and black clay	None
LAG55	309677	3257667	0-30+	Dark brown and black clay	None
LAG56	309673	3257455	0-30+	Dark brown and black clay	None
LAG57	309874	3257461	0-30+	Dark brown and black clay	None
LAG58	309949	3257406	0-30+	Dark gray clay w/ iron staining	None
LAG59	309758	3257404	0-30+	Dark gray clay w/ iron staining	None
LAG60	309767	3257283	0-30+	Dark gray clay w/ iron staining	None
LAG61	309947	3257276	0-30+	Dark gray clay w/ iron staining	None
LAG62	309802	3257048	0-30+	Dark gray clay w/ iron staining	None
LAG63	309808	3256682	0-30+	Dark gray clay w/ iron staining	None
LAG64	309715	3259951	0-30+	Dark gray clay w/ iron staining	None
LAG65	309915	3259948	0-30+	Dark gray clay w/ iron staining	None
LAG66	309917	3260122	0-30+	Dark gray clay w/ iron staining	None
LAG67	309059	3257095	0-30+	Gray clay mottled w/ orange, red and black clay	None
LAG68	308663	3257089	0-30+	Gray clay mottled w/ orange, red and black clay	None
LAG69	308270	3257087	0-30+	Gray clay mottled w/ orange, red and black clay	None
LAG70	309466	3257085	0-30+	Gray clay mottled w/ orange, red and black clay	None
LAG71	308302	3256953	0-30+	Dark gray clay w/ iron staining	None
LAG72	308651	3257037	0-30+	Dark gray clay w/ iron staining	None
LAG73	308830	3257021	0-30+	Dark gray and brown clay	None

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

ST No.	UTM Coordinates[1]		Depth (cmbs)	Soils	Artifacts
	Easting	Northing			
LAG74	309629	3257024	0-30+	Dark gray and brown clay	None
LAG77	309145	3259526	0-40+	Dark gray clay w/ iron staining	None
LAG78	309188	3259362	0-40+	Dark gray clay w/ iron staining	None
LAG79	309240	3259165	0-40+	Dark gray clay w/ calcium	None
LAG80	309291	3258989	0-40+	Dark gray clay w/ calcium	None
LAG81	309336	3258792	0-40+	Dark gray clay w/ iron staining	None
LAG82	309380	3258571	0-30+	Dark gray clay w/ iron staining	None
LAG83	309424	3258507	0-30+	Dark gray clay w/ iron staining	None
LAG84	309412	3258428	0-30+	Dark gray clay w/ iron staining	None
LAG85	309455	3258174	0-30+	Dark gray clay w/ iron staining	None
LAG86	309598	3257531	0-30+	Dark gray clay w/ iron staining	None
LAG87	309647	3257331	0-30+	Dark gray clay w/ iron staining	None
LAG88	309094	3257119	0-30+	Dark gray clay w/ iron staining	None
LAG89	309788	3259010	0-30+	Dark gray clay w/ iron staining	None
LAG90	309729	3256997	0-30+	Dark gray clay w/ iron staining	None
LAG91	309418	3257108	0-30+	Dark gray, orange and yellow clay	None
LAG92	309087	3257106	0-30+	Dark gray, orange and yellow clay	None
LAG93	308920	3257105	0-30+	Reddish-brown and black clay	None
LAG94	308052	3257114	0-30+	Reddish-brown and black clay	None
LAG95	308550	3257112	0-30+	Reddish-brown and black clay	None
LAG96	308247	3257088	0-30+	Reddish-brown and black clay	None
LAG97	308726	3257077	0-30+	Reddish-brown and black clay	None

[1] All UTM coordinates are located in Zone 15 and utilize the North American Datum of 1983 (NAD 83).

cmbs = Centimeters below surface

ST = Shovel test

UTM = Universal Transverse Mercator

APPENDIX C:

FGT Unanticipated Discoveries Plan

FLORIDA GAS TRANSMISSION COMPANY, LLC

Galveston County Project

Unanticipated Discoveries Plan Cultural Resources and Human Remains

Florida Gas Transmission Company

An Energy Transfer/Kinder Morgan Affiliate

1.0 INTRODUCTION

This document describes the procedures for dealing with unanticipated discoveries during the course of Galveston County Project (Project) construction. It is intended to:

- Maintain compliance with applicable Federal and State laws and regulations during construction of the Project;
- Describe to regulatory and review agencies the procedure the Project or its representative will follow to prepare for and deal with unanticipated discoveries; and,
- Provide direction and guidance to Project personnel as to the proper procedure to be followed should an unanticipated discovery occur.

2.0 PROCEDURES FOR THE DISCOVERY OF CULTURAL RESOURCES

In the event that any member of the construction work force believes that a cultural resource discovery is encountered the following plan will be implemented:

1. All work within 100 feet of the discovery will immediately stop and the Environmental Inspector (EI) and Construction Manager (CM) will be notified. The area of work stoppage will be adequate to provide for the security, protection, and integrity of the materials. A cultural resource can be prehistoric or historic and could consist of, but not be limited to, for example:
    - An accumulation of shell, burned rocks, or other subsistence related materials;
    - An area of charcoal or very dark soil with artifacts;
    - Stone tools, arrowheads, or dense concentrations of stone artifacts;
    - A cluster of bones in association with shell, charcoal, burned rocks, or stone artifacts; and
    - A historic structure or assemblage of historic materials older than 50 years.
2. If the EI and/or CM believes that the discovery is a cultural resource, the EI will take appropriate steps to protect the discovery site. This will include flagging the immediate area of discovery and stop work or exclusion zone, as well as notifying the Environmental Project Manager and/or Company Representative. Work in the immediate area will not resume until treatment of the discovery has been completed.
3. FGT or its representative will arrange for the discovery to be evaluated by a qualified archaeologist in accordance with applicable regulations. The archaeologist will evaluate the remains and provide recommendations for how to manage the resource under the appropriate State's Historic Preservation Plan.
4. If the discovery is determined to be a cultural resource and within an area of federal jurisdiction, the appropriate federal agency will be consulted. If the discovery is determined to have the potential for eligibility, the archaeologist and FGT will also consult with the Texas Historical Commission (THC) on how best to avoid, minimize, or otherwise mitigate further impacts. Treatment measures may include mapping, photography, sample collection, or excavation activity.
5. The archaeologist will implement the appropriate treatment measure(s) and provide a report on its methods and results as required. The investigation and technical report will be performed in compliance with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 CFR 44734--44737); the Advisory Council on Historic Preservation (ACHP) publication "Treatment of Archaeological Properties" (ACHP 1980); and follow the guidelines set forth by the applicable State(s) Historic Preservation Office (SHPO).

3.0 PROCEDURES FOR THE DISCOVERY OF HUMAN REMAINS

In the event that human remains are encountered during either construction or maintenance activities, the following plan outlines the specific procedures to be followed. These procedures meet or exceed the Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects set forth by the National Historic Preservation Act (Public Law [PL] 89-665), its implementing regulations, "Protection of Historic and Cultural Properties" (36 CFR Part 800); the Native American Grave and Repatriation Act (43 CFR Part 10); Procedures for the Protection of Historic Properties (33 CFR 325 Appendix C); the Archaeological and Historic Preservation Act; and Consultation and Coordination with Indian Tribal Governments (EO 13175).

All activity that might disturb the remains shall cease and may not resume until authorized by appropriate law enforcement officials or the THC. Any human remains, burial sites, or burial related materials that are discovered during construction will at all times be treated with dignity and respect. If any member of the construction work force believes that human remains are encountered the following plan will be implemented:

1. Any activity that may disturb the unmarked burial site, human skeletal remains, or burial artifacts associated with the site will immediately cease on discovery. The site will be carefully covered and secured for protection from degradation by weather or unauthorized individuals.
2. The EI and CM will be notified and responsible for taking appropriate steps to protect the discovery. This will include fencing off the immediate area of discovery and flagging the area as an exclusion zone. No activity may resume until authorized by the agency authority governing the disposition of the human remains.
3. The EI will notify the Project Environmental Manager, who will contact the Project archeologist, specific county law enforcement agency and the Medical Examiner of the jurisdiction where the site or remains are located. The THC will also be contacted to assist with identifying the remains.
4. If local law enforcement finds that the unmarked burial site is over 50 years old and that there is no need for a legal inquiry by their office or for a criminal investigation, and if no direct relations to any Native American tribe are found, then the SHPO will have jurisdiction of the site, human skeletal remains, and the burial artifacts.
5. If the unmarked burial site, human skeletal remains, or funerary objects can be shown to have ethnic affinity with a living Native American tribe, the Environmental Project Manager will notify the appropriate federal agency with jurisdiction and/or SHPO to assist in determining the tribe(s), if any, who may have historic ties to the region and represent descendants of any Native American remains. If direct relations to a Native American tribe are verified, the tribe will have control of the disposition of the human skeletal remains.

5.0 PROJECT CONTACTS

Environmental Inspector
Contact: TBD Prior to Construction
Telephone
Email:
Address:

Construction Manager

Contact: TBD Prior to Construction
Telephone:
Email:
Address:

Project Manager

Contact: TBD Prior to Construction
Telephone:
Email:
Address:

Project Environmental Manager

Contact: Michael Aubele
Telephone: (o) 1.713-989-7186 (c) 1.713.985.9914
Email: Michael.Aubele@energyTransfer.com
Address: 1300 Main Street, Houston, TX 77002