WHITENTON group environmental consultants

11 November 2013

Alfred Dumaual
US Environmental Protection Agency Region 6
Air Permits Section (6PD-R)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

RE: Request for Concurrence – Finding of Will Not Adversely Affect Archaeological and Historic Resources
Equistar Chemicals, LP
Corpus Christi Complex, Nueces County, Texas

Mr. Dumaual:

On behalf of Equistar Chemicals, LP, Whitenton Group, Inc. (WGI) is requesting a review of the enclosed project information for the Olefins Unit Expansion Project in Nueces County, Texas. WGI is seeking concurrence on behalf of Equistar Chemicals, LP from the Texas Historical Commission (THC)/State Historic Preservation Officer (SHPO) and the United States (US) Environmental Protection Agency (EPA) that the construction and operation of the Olefins Unit expansion will not affect historic properties listed in the National Register of Historic Places (NRHP) or that meet the criteria for the NRHP in accordance with Section 106 guidance. The proposed project requires a Prevention of Significant Deterioration (PSD) air quality permit for greenhouse gas (GHG) emissions from the USEPA; and, therefore, is subject to regulation under Section 106 of the National Historic Preservation Act. The proposed project also requires a New Source Review and PSD review from the Texas Commission on Environmental Quality for non-GHG emissions.

The purpose of the project is to expand the existing Equistar Olefins Unit at Corpus Christi Complex. The proposed Equistar Olefins Unit expansion will increase the capacity of 15 existing cracking furnaces and revise the tubing configuration of 7 of those furnaces. The cracking furnaces convert less valuable saturated hydrocarbons into ethylene and propylene, highly desirable basic building blocks of the petrochemical

industry. The proposed project is located in Corpus Christi, Nueces County, Texas, approximately 2 miles south of the intersection of McKinzie Road and State Highway 407 (Leopard Street) (Figure 1-Appendix A).

Project location information:

USGS Quads	Latitude/Longitude
Annaville	27.810841, -97.592336

Construction of the proposed expansion of the Equistar Olefins Unit will take place within approximately 27.4 acres of the existing Corpus Christi Complex. The purpose of the project is to expand the existing Equistar Olefins Unit by adding additional capacity to 15 existing cracking furnaces and revising the tubing configuration of 7 of those furnaces. Additionally, all 15 furnaces will have new ultra-low NO_x burners added capable of burning higher hydrogen fuel gas for combustion heat. The capacity of 2 existing steam superheaters will also be increased, and they will be retrofitted with ultra-low NO_x burners capable of burning higher hydrogen fuel. Two fractionators and an acetylene converter will be added to the existing fractionation (distillation) section.

Construction of the proposed Equistar Olefins Unit Expansion Project, associated infrastructure, and auxiliary equipment will take place on Equistar property, within the existing Corpus Christi complex property boundary. The limits of the earth disturbance footprint will be referred to as the "Project Area." The Area of Potential Effect (APE) for the undertaking consists of the entire 27.4-acre Project Area. The Project Area is shown in Figures 1 and 2 of the enclosed Cultural Resources Assessment (Appendix B).

The total area of earth disturbance is approximately 27.4 acres. Approximately 0.68 acre of earth disturbance is proposed to occur in maintained open space within an isolated stand of mesquite trees on the east side of the existing facility. The remaining earth disturbance is to occur in areas historically impacted by development (asphalt, concrete, infrastructure, or caliche) of the existing facility. The linear facility associated with the proposed project consists of new electric lines that will be added to existing electric ducts and cable trays. Construction of the linear facility will be limited to the Project

Area. Photographs of the Project Area are included in Appendix C.

Earth disturbance activities will include the installation of cooling tower cells and columns. The estimated depths of disturbance are identified below.

Cooling tower cells:

- Concrete footings - Depth of 1 - 6 feet
- Pilings - Depth at 10 - 32 feet

Columns (2) to be placed within the existing plant footprint:

- Pilings - Depth at 10 - 32 feet

A Cultural Resources Assessment was conducted by Horizon Environmental Services, Inc. (Horizon) in February 2013. This review included an archival review of a 1-mile radius of the Project Area. No archeological sites, historic properties, or other cultural resources have been previously recorded within a 1.0-mile radius of the APE. Based on the results of the Cultural Resources Assessment, Horizon determined there is a low probability that intact cultural resources are present that would be eligible for listing on the NRHP and that an intensive cultural resources survey of the Project Area (27.4 acres) would not likely be required. The detailed results of the archival review are included in the enclosed document titled "Proposed Equistar Chemicals, L.P., Corpus Christi Complex Improvements Project, Corpus Christi, Nueces County, Texas Cultural Resources Assessment" (Appendix B).

Based on the results of the Cultural Resources Assessment, WGI is requesting concurrence on behalf of Equistar Chemicals, LP from the THC/SHPO and the EPA that the proposed plant expansion construction and operation will not adversely affect historic properties listed in the NRHP or that meet the criteria for the NRHP in accordance with Section 106 guidance. In the unlikely event that any cultural materials are inadvertently discovered at any point during construction or operation of the Project Area, all work at the location of the discovery should cease immediately, and the THC and the EPA should be notified of the discovery. Enclosed with this letter request are Figure 1 showing the project location, photographs of the proposed Project Area, and the

Cultural Resources Assessment report. Please call me at 512.353.3344 if you have any questions or need additional information.

Sincerely,

Jayme A. Shiner

Enclosures:

Appendix A - Figure 1 - Project Location

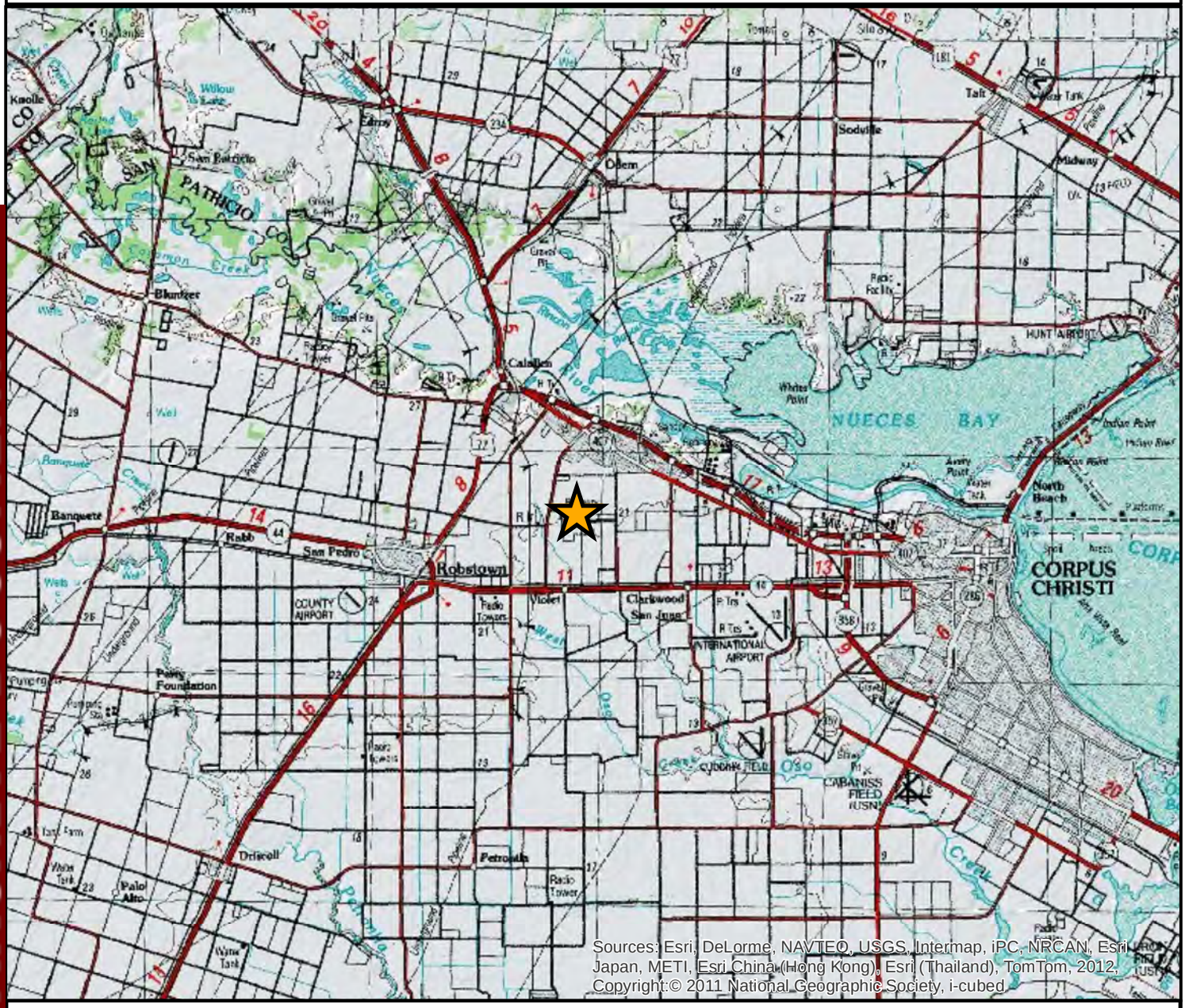
Appendix B - Proposed Equistar Chemicals, L.P., Corpus Christi Complex Improvements Project, Corpus Christi, Nueces County, Texas Cultural Resources Assessment

Appendix C - Photographic Log

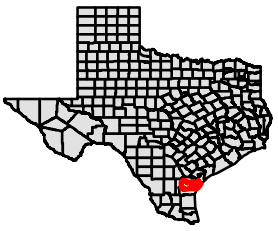
APPENDIX A

FIGURE 1 – PROJECT LOCATION

Figure 1
Project Location
Olefins Plant Expansion Project
Nueces County, Texas



Project Location



Background Resources: ESRI USA Roads Basemap	Surveyor(s): Scott Jecker CWB, PWS Bryan Whisenant	Project Number and Information: 1279 Equistar Chemicals, LP Corpus Christi Complex Biological Assessment	WHITENTON group environmental consultants 3413 Hunter Road San Marcos Texas 78666
GPS and Coordinate Type: Trimble Geo XH 6000 Series UTM NAD 1983 Zone 14 North	Map Created: 02/21/2013 by M. Pillion		Miles 0 4 8 N

APPENDIX B

CULTURAL RESOURCES ASSESSMENT

Proposed Equistar Chemicals, L.P., Corpus Christi Complex Improvements Project, Corpus Christi, Nueces County, Texas

Cultural Resources Assessment

Prepared for:

WHITENTON group environmental consultants

Whitenton Group, Inc.
3413 Hunter Road
San Marcos, Texas 78666

Prepared by:

Horizon™ Environmental Services, Inc.

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

HJN 110012 AR 13

March 2013

ABSTRACT

Horizon Environmental Services, Inc. (Horizon), has been contracted to provide a cultural resources assessment for the proposed expansion of Equistar Chemicals, L.P.'s (Equistar), existing Corpus Christi Complex (CCC) located at 1501 McKinzie Road, Corpus Christi, Texas, 78410, in Nueces County, Texas. Equistar owns and operates a petrochemical manufacturing facility at this location that consists of 2 chemical production units, including a butadiene unit and an olefins and aromatics unit (the latter is commonly referred to as the Olefins Plant), as well as a cogeneration facility. The Olefins Plant is authorized for new source review (NSR) purposes by Texas Commission on Environmental Quality (TCEQ) Permit No. 4682B/PSD-TX-761-M2, which was most recently renewed on February 10, 2012. The maintenance, startup, and shutdown (MSS) activities associated with the Olefins Plant are authorized by Permit No. 83864.

Equistar is proposing to expand its Olefins Plant production by increasing maximum furnace firing rates and revising the tubing configuration in 7 ethane-cracking USC furnaces, which will trigger NSR requirements. Equistar's CCC is currently a major source of criteria pollutants, and proposed project carbon oxide equivalent (CO_2e) emission increases will exceed the 75,000 tons per year (tpy) significance level, which will require a Prevention of Significant Deterioration (PSD) permit for Greenhouse Gas (GHG) emissions issued by the US Environmental Protection Agency (EPA). As such, the undertaking falls under the regulations of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, which is invoked when federal funds are utilized or when federal permitting is required for a proposed project. The NHPA states that the Advisory Council for Historic Preservation (ACHP) and the Texas Historical Commission (THC), which serves as the State Historic Preservation Office (SHPO) for the state of Texas, must be afforded the opportunity to comment when any cultural resources potentially eligible for inclusion in the National Register of Historic Places (NRHP) are present in a project area affected by federal agency actions or covered under federal permits or funding.

In February 2013, Horizon conducted a cultural resources assessment of the proposed 27.4-acre area within the overall CCC in which improvements would be undertaken. For purposes of the cultural resources assessment, the Area of Potential Effect (APE) of the proposed project was established based on the direct impacts from construction and operation of proposed improvements, which consist of the cumulative 27.4-acre area within the overall

industrial facility in which improvements would be undertaken. Ground-disturbing activities would include the installation of cooling tower cells, a cooling water pipeline, and columns. Subsurface disturbances associated with the cooling tower cells would extend to depths of 1 to 6 feet for concrete footings and 10 to 32 feet for pilings; the cooling tower water line would be installed at depths of 6 to 10 feet; and columns would measure 10 to 32 feet in depth. Horizon also took into consideration whether or not the APE should extend beyond the construction and operation area as a result of potential indirect impacts. Regarding direct impacts, the proposed undertaking would involve only impacts associated with construction and process improvements within the existing industrial complex and would not result in an increase to the overall footprint of the existing plant. Regarding indirect impacts, the existing facility would remain an industrial process area with no changes to the overall size and height of the facility, and no archeological or historical sites are viewable from the existing facility; the noise levels generated via the project construction and operation would not exceed those associated with typical daily facility activities; and indirect effects of air pollutant emissions would not contribute to the existing geographical boundaries of the APE. As such, the APE was defined based only on direct impacts from construction and operation of proposed improvements and was not expanded due to indirect impacts resulting from noise, viewshed, or atmospheric effects.

The cultural resources assessment consisted of a desktop review of potential project impacts on historic properties or other culturally significant features or landscapes within the APE. No field investigations were undertaken as a part of the cultural resources assessment. Based on the results of desktop archival research, no archeological sites, cemeteries, historic properties or districts listed on the NRHP or designated as State Archeological Landmarks (SALs), historical markers, historic-age structures recorded during neighborhood surveys, or other cultural resources have been previously recorded on or within a 1.0-mile radius of the proposed project's APE. No prior cultural resources surveys have been conducted on or within 1.0 mile of the APE, and no portion of the APE has been previously surveyed for cultural resources.

The proposed project's APE is contained entirely within the existing CCC industrial facility. Based on the extent of existing disturbances within the proposed project site resulting from prior construction, use, and ongoing maintenance of the industrial plant; the physiographic setting away from extant water sources and alluvial environments; and the lack of previously recorded archeological sites, cemeteries, listed NRHP properties, or SALs on or in the immediate vicinity of the proposed project site, there is a low probability that intact cultural resources are present that would be eligible for listing on the NRHP. No known cultural resources were identified within the 27.4-acre APE, and there is a low probability that any unrecorded, intact cultural resources are present that would be eligible for listing on the NRHP. It is Horizon's opinion that the proposed project site does not require an intensive cultural resources survey, and no known archeological or historic properties that are listed on, eligible for, or potentially eligible for inclusion in the NRHP would be adversely affected. However, in the unlikely event that any human remains or burial objects are inadvertently discovered at any point during construction, use, or ongoing maintenance in the project area, all work should cease immediately in the vicinity of the inadvertent discovery and the THC should be notified of the discovery.

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1.0 INTRODUCTION

Horizon Environmental Services, Inc. (Horizon), has been contracted to provide a cultural resources assessment for the proposed expansion of Equistar Chemicals, L.P.'s (Equistar), existing Corpus Christi Complex (CCC) located at 1501 McKinzie Road, Corpus Christi, Texas, 78410, in Nueces County, Texas (Figures 1 and 2). Equistar owns and operates a petrochemical manufacturing facility at this location that consists of 2 chemical production units, including a butadiene unit and an olefins and aromatics unit (the latter is commonly referred to as the Olefins Plant), as well as a cogeneration facility. The Olefins Plant is authorized for new source review (NSR) purposes by Texas Commission on Environmental Quality (TCEQ) Permit No. 4682B/PSD-TX-761-M2, which was most recently renewed on February 10, 2012. The maintenance, startup, and shutdown (MSS) activities associated with the Olefins Plant are authorized by Permit No. 83864.

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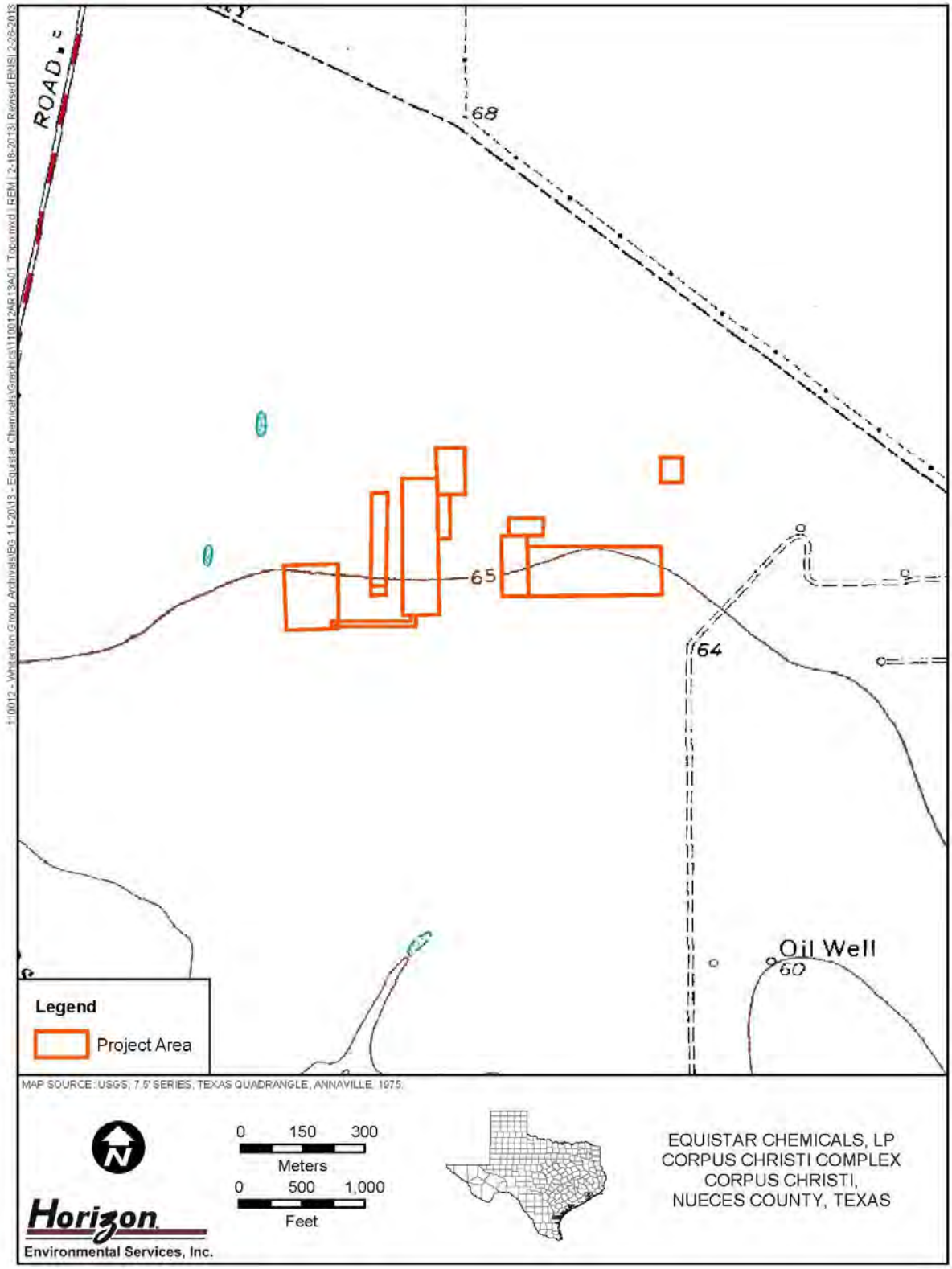

Figure 1. Location of Project Area on USGS Topographic Quadrangle Maps

Figure 2. Location of Project Area on Aerial Photograph

In February 2013, Horizon conducted a cultural resources assessment of the proposed 27.4-acre area within the overall CCC in which improvements would be undertaken. For purposes of the cultural resources assessment, the Area of Potential Effect (APE) of the proposed project was established based on the direct impacts from construction and operation of proposed improvements, which consist of the cumulative 27.4-acre area within the overall industrial facility in which improvements would be undertaken. Ground-disturbing activities would include the installation of cooling tower cells, a cooling water pipeline, and columns. Subsurface disturbances associated with the cooling tower cells would extend to depths of 1 to 6 feet for concrete footings and 10 to 32 feet for pilings; the cooling tower water line would be installed at depths of 6 to 10 feet; and columns would measure 10 to 32 feet in depth. Horizon also took into consideration whether or not the APE should extend beyond the construction and operation area as a result of potential indirect impacts. Regarding direct impacts, the proposed undertaking would involve only impacts associated with construction and process improvements within the existing industrial complex and would not result in an increase to the overall footprint of the existing plant. Regarding indirect impacts, the existing facility would remain an industrial process area with no changes to the overall size and height of the facility, and no archeological or historical sites are viewable from the existing facility; the noise levels generated via the project construction and operation would not exceed those associated with typical daily facility activities; and indirect effects of air pollutant emissions would not contribute to the existing geographical boundaries of the APE. As such, the APE was defined based only on direct impacts from construction and operation of proposed improvements and was not expanded due to indirect impacts resulting from noise, viewshed, or atmospheric effects.

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cultural resources survey, and no known archeological or historic properties that are listed on, eligible for, or potentially eligible for inclusion in the NRHP would be adversely affected.

This document presents the results of Horizon's cultural resources background review of the proposed project site. Following this introductory chapter, Chapters 2.0 and 3.0 present the environmental and cultural backgrounds of the project area, respectively. Chapter 4.0 presents the results of the background review, and Chapter 5.0 summarizes the results of the background review and presents management recommendations for the proposed undertaking. Chapter 6.0 lists the references cited in the document. Appendix A contains the resume of Jeffrey D. Owens, Horizon Senior Archeologist, who served as Principal Investigator for this project.

2.0 ENVIRONMENTAL SETTING

2.1 PHYSIOGRAPHY AND HYDROLOGY

The project area is located in Nueces County on the Gulf Coastal Plain in southeastern Texas. The Gulf of Mexico represents a structural basin formed by lithosphere deformation. The Texas Coastal Plain, which extends as far north as the Ouachita uplift in southern Oklahoma and westward to the Balcones Escarpment in central Texas, 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 Corpus Christi area is underlain by rocks and unconsolidated sediments that are quite young in a geological sense, ranging from modern to Miocene in age. These consist predominantly of a series of fluviodeltaic bodies arranged in an offlapped sequence, with interdigitated and capping eolian, littoral, and estuarine facies making up a relatively minor component of the lithology. Major bounding disconformities between these formations are usually interpreted to represent depositional hiatuses that occurred during periods of sea level low stand. The oldest rocks in this fill are of Late Cretaceous age. As a result of the geometry of basin filling, successively younger rock units crop out in subparallel bands from the basin margin toward the modern coastline.

The project area is situated in a coastal upland setting southwest of Corpus Christi. Local topography is relatively flat, and drainage is generally to the south, primarily via overland sheet flow, toward Oso Creek. Oso Creek flows generally southeastward to discharge into Corpus Christi Bay approximately 29 kilometers (km) (18 miles [mi]) southeast of the project area. No natural drainages or water bodies are present within or in the immediate vicinity of the proposed project's APE. Elevations across the 3 segments of the APE are relatively flat, averaging approximately 20 meters (m) (65 feet [ft]) above mean sea level (amsl).

2.2 GEOLOGY AND GEOMORPHOLOGY

The project area is underlain by the Beaumont Formation (Groat 1975). The Beaumont, or Prairie, terrace is the youngest continuous coastwise terrace fronting the modern Gulf (Abbott 2001). The Beaumont Formation consists of clay, silt, and fine sand arranged in spatial patterns that reflect the distribution of fluvial (e.g., channel, point bar, levee, and backswamp) and mudflat/coastal marsh facies (Van Siclen 1985). Sandy deposits associated with littoral facies are also frequently considered part of the Beaumont. Many investigators (cf. DuBar et al. 1991;

Fisk 1938, 1940) have correlated the Beaumont terrace with the Sangamon Interglacial (ca. 130 to 75 thousand years ago [kya]), although age estimates range from Middle Wisconsinan (Alford and Holmes 1985) to 100 to 600 kya (Blum and Price 1994). While debate about the temporal affiliations of and correlations among the deposits that underlie the major coastline terraces remains active, they are of little direct geoarcheological relevance because virtually all investigators agree that these deposits considerably predate the earliest demonstrated dates of human occupation in North America.

The project area is situated on a mosaic of 4 specific coastal upland soil units (NRCS 2013) (Table 1; Figure 3). These 4 soil types consist of loamy and clayey fluviomarine deposits found on coastal flats that were deposited during the early to late Pleistocene epoch. No Holocene-age sediments or alluvial sediments are mapped within the proposed project's APE.

2.3 CLIMATE

Evidence for climatic change from the Pleistocene to the present is most often obtained through studies of pollen and faunal sequences (Bryant and Holloway 1985; Collins 1995). Bryant and Holloway (1985) present a sequence of climatic change for nearby east-central Texas from the Wisconsin Full Glacial period (22,500 to 14,000 B.P.) through the Late Glacial period (14,000 to 10,000 B.P.) to the Post-Glacial period (10,000 B.P. to present). Evidence from the Wisconsin Full Glacial period suggests that the climate in east-central Texas was considerably cooler and more humid than at present. Pollen data indicate that the region was more heavily forested in deciduous woodlands than during later periods (Bryant and Holloway 1985). The Late Glacial period was characterized by slow climatic deterioration and a slow warming and/or drying trend (Collins 1995). In east-central Texas, the deciduous woodlands

Table 1. Mapped Soils Located within Project Area

Soil Name	Soil Description	Typical Profile
Edroy clay (Ba)	Clayey over loamy fluviomarine deposits of late Pleistocene age on open depressions	0-18 in: Clay 18-34 in: Clay 34-60 in: Clay loam 40-70 in: Clay 70-80 in: Sandy clay loam
Raymondville complex, 0 to 1% slopes (CcA)	Loamy fluviomarine deposits of late Pleistocene age on coastal flats	0-8 in: Clay loam 8-40 in: Clay 40-60 in: Clay
Orella fine sandy loam (Of)	Loamy fluviomarine deposits of early Pleistocene age on coastal flats	0-6 in: Fine sandy loam 6-40 in: Sandy clay loam 40-62 in: Sandy clay loam
Victoria clay, 0 to 1% slopes (VcA)	Clayey fluviomarine deposits of late Pleistocene age on coastal flats	0-6 in: Clay 6-37 in: Clay 37-50 in: Clay 50-80 in: Clay

in: Inches

Source: NRCS 2013

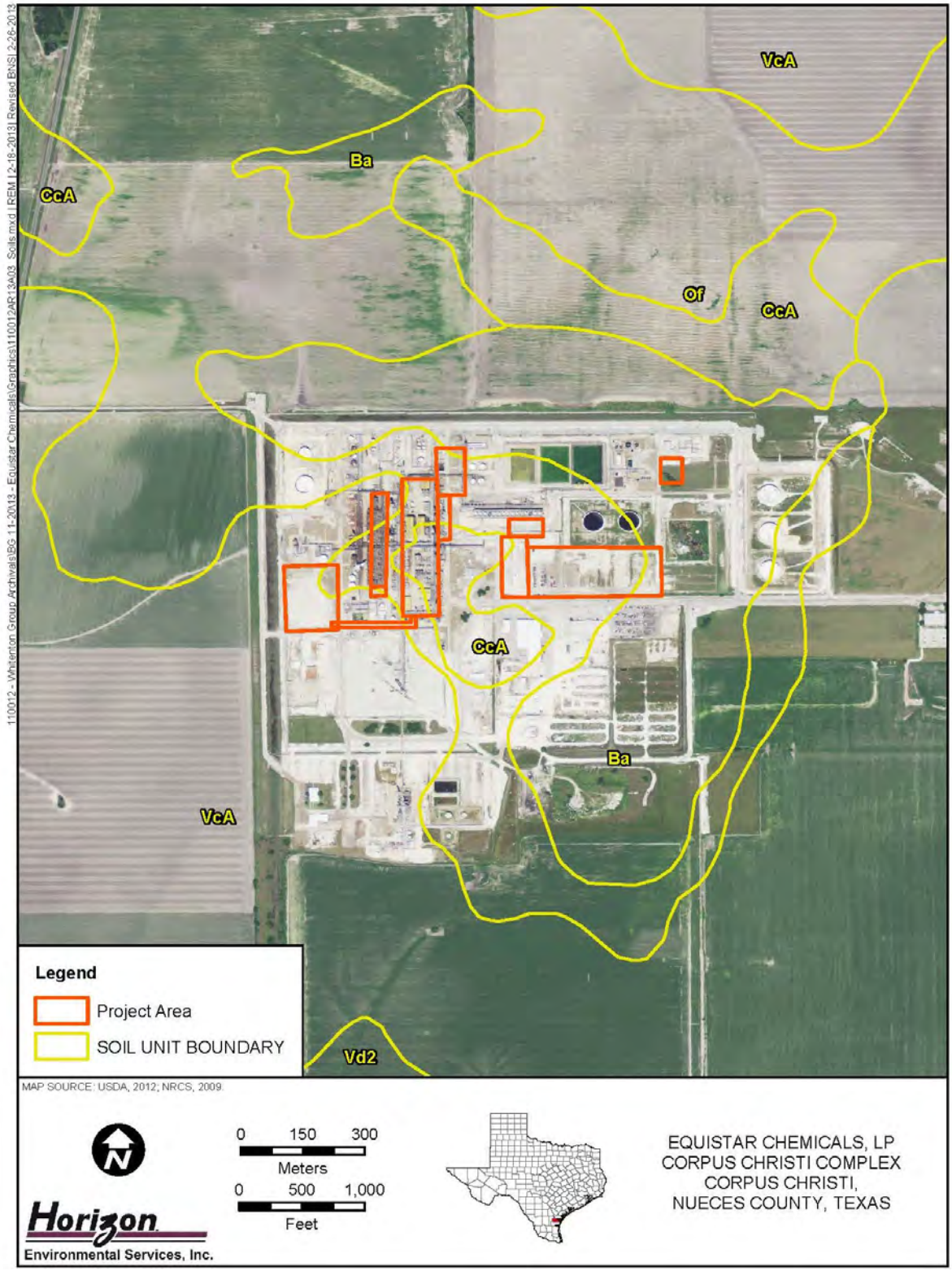

Figure 3. Distribution of Mapped Soils in Project Area

were gradually replaced by grasslands and post oak savannas (Bryant and Holloway 1985). During the Post-Glacial period, the east-central Texas environment appears to have been more stable. The deciduous forests had long since been replaced by prairies and post oak savannas. The drying and/or warming trend that began in the Late Glacial period continued into the mid-Holocene, at which point there appears to have been a brief amelioration to more mesic conditions lasting from roughly 6000 to 5000 B.P. Recent studies by Bryant and Holloway (1985) indicate that modern environmental conditions in east-central Texas were probably achieved by 1,500 years ago.

The modern climate is typically dry to subhumid with long, hot summers and short, mild winters. The climate is influenced primarily by tropical maritime air masses from the Gulf of Mexico, but it is modified by polar air masses. Tropical maritime air masses predominate throughout spring, summer, and fall. Modified polar air masses are dominant in winter and provide a continental climate characterized by considerable variations in temperature.

In winter, the average temperature is 52 degrees Fahrenheit (°F); however, during winter the temperature tends to fluctuate greatly as air masses move in and out of the area. These air masses can produce light rain and drizzle, and conditions can become cloudy. Spring is relatively dry, with some thunderstorms and cool spells. Summer temperatures are high, with the daily maximum temperature often reaching or exceeding 90°F. Fall is warm, dry, and pleasant, with increasing cold spells.

The average precipitation within the region is 33 inches. The majority of this precipitation occurs as rain that falls between April and September. The growing season is approximately 265 days long.

2.4 FLORA AND FAUNA

The project site is located in the Tamaulipan Biotic Province (Blair 1950) and the South Texas Plains vegetational region (Gould 1975). The upland areas support a rich tapestry of south Texas chaparral. The vegetation of the undeveloped and uncleared areas can be characterized as brush country, with variably dense scrub ranging in height from 1 to 3 m (4 to 10 ft). Mesquite and associated thorny shrubs, such as catclaw acacia, huisache, blackbrush, granjeno, whitebrush, prickly pear, and Spanish dagger are common locally. Understory vegetation is characteristically sparse. Along major drainages, live oak, Texas ebony, Texas sugarberry, cedar elm, and retama occur. Little bluestem, bristlegrass, paspalums, windmill grass, and buffelgrass are dominant grasses.

The Tamaulipan/Mezquital ecoregion of southern Texas and northeastern Mexico has unique plant and animal communities containing tree- and brush-covered dunes, wind tidal flats, and dense native brushland. Although there are large acreages of cultivated land on the South Texas Plains, most of the area is still rangeland. Land holdings predominantly are large cattle ranches. Deer and other wildlife species are common. This area originally supported a grassland- or savannah-type climax vegetation. Long continued grazing and other factors have altered the plant communities to such a degree that ranchmen of the region now face a severe brush problem (Gould 1975).

3.0 CULTURAL BACKGROUND

The prehistory of South Texas can essentially be divided into 3 major periods—(1) PaleoIndian (9200 to 6000 BC); (2) Archaic, which has been subdivided into the Early Archaic (ca. 6000 to 2500 BC), Middle Archaic (ca. 2500 to 400 BC), and Late Archaic (ca. 400 BC to AD 800); and (3) Late Prehistoric (AD 800 to 1600). These prehistoric periods are principally defined by the presence of particular diagnostic projectile points, but they are intended to designate general cultural patterns based on ecology, technology, and subsistence strategies (Black 1989:48-57; Suhm et al. 1954).

3.1 PALEOINDIAN PERIOD (CA. 9200–6000 BC)

Evidence of PaleoIndian occupations in South Texas (9200 to 6000 BC) usually consists of surface finds found most frequently in the Nueces-Guadalupe and Rio Grande plains. Only 2 stratified PaleoIndian sites have been excavated in the region: Buckner Ranch (Sellards 1940) and Berger Bluff (Brown 1987). Both sites were deeply buried in alluvial terraces. Diagnostic projectile point styles of the PaleoIndian period include Clovis (Meltzer 1986), Folsom (Largent et al. 1991), Golondrina, Scottsbluff, and Angostura (Black 1989:48-49). Finely flaked end scrapers fashioned on blades and bifacially worked Clear Fork tools are also diagnostic of the PaleoIndian period. PaleoIndian peoples have traditionally been characterized as terminal Pleistocene big-game hunters, but these highly mobile hunter-gatherers probably exploited a rich diversity of wild plant and animal foods. Investigations at Baker Cave, for instance, indicate that a diverse array of fish, snakes, and rodents was exploited by the PaleoIndian occupants (Hester 1983). PaleoIndian populations were probably organized into small groups that ranged over great distances across periglacial plains and marginally forested areas to acquire different food sources throughout the year (Black 1989:48).

3.2 ARCHAIC PERIOD (CA. 6000 BC–AD 800)

The major distinction of the Early Archaic period (6000 to 2500 BC) is the replacement of earlier lanceolate-shaped projectile points by stemmed and corner-notched types. These styles include Bell, Andice, Early Triangular, and Early Expanding Stemmed points such as Bandy, Martindale, Uvalde, and related forms (Turner and Hester 1999). Other diagnostic artifacts include Clear Fork tools and large, thin, triangular bifaces with concave bases. The beginning of the Early Archaic period marks the onset of the modern Holocene era, during which the periglacial climate of the late Pleistocene began to grow warmer. Available evidence from the

Gulf Coastal Plain suggests that population densities remained low through the beginning of the Archaic period in South Texas, reflecting a continuation of the highly mobile adaptations of the PaleoIndian period.

The Middle Archaic period (2500 to 400 BC) in South Texas is defined by the presence of Pedernales, Langtry, Kinney, Bulverde, and Tortugas projectile point styles (Bell 1958; Turner and Hester 1999). Distally beveled tools are also common during this period, and ground stone tools, such as tubular grinding stones and manos, appear for the first time (Black 1989:49). Site densities in South Texas increase markedly during the Middle Archaic, possibly reflecting a decrease in group mobility and/or an increase in territoriality among groups (Black 1989:51). A heavier reliance on vegetal foods may be indicated by the introduction of ground stone technology and the appearance of large burned rock middens throughout Central Texas.

Late Archaic (400 BC to AD 800) occupations in South Texas are defined by small corner- and side-notched dart points, including Ensor, Frio, Marcos, Fairland, and Ellis types (Bell 1958, 1960; Turner and Hester 1999). Site densities continue to increase throughout the Late Archaic period, possibly indicating that population densities continued to rise. Cultural deposits on Late Archaic sites also tend to be deeper than during preceding periods, suggesting that occupations were either more extended in duration or that reoccupation of the same locations was more frequent (Black 1989:51). Cemeteries appear during this period, possibly indicating higher levels of social organization and increasing territoriality (Black 1989:51). During the Late Archaic, the exploitation of different ecological niches continued to intensify, becoming increasingly oriented toward the exploitation of seasonal food sources. This kind of adaptation is best illustrated by the frequent occurrence of shell middens along the coast and burned rock middens farther inland. Data collected from inland sites indicate that the economy was based primarily on vegetal resources supplemented with the hunting of small game such as rodents and rabbits (Black 1989:51).

3.3 LATE PREHISTORIC PERIOD (CA. AD 800–1600)

The onset of the Late Prehistoric period (AD 800 to 1600) is defined by the appearance of pottery and the bow and arrow. The small dart points of the Late Archaic period were largely replaced by arrow points (Black 1989:52). The Late Prehistoric period in South Texas has been divided into 2 distinct time horizons, the Austin (AD 800 to 1350) and Toyah (AD 1350 to 1600) phases (Black 1986). The Austin phase is characterized by the presence of Scallorn arrow points, while the Toyah phase is defined by the presence of Perdiz arrow points. Faunal resources became increasingly important during this period, especially large mammals such as bison and deer. Lithic tool kits seem to have been manufactured for the processing of large mammals (Black 1989:51-57). Late Prehistoric sites are relatively common throughout South Texas, which might be interpreted as the result of population increases. The movement of bison from Central to South Texas may coincide with a movement of peoples and/or technology from both the Austin and Toyah phases of Central Texas (Black 1989:51-57).

3.4 HISTORIC PERIOD (CA. AD 1600–PRESENT)

The first European incursion into what is now known as Texas was in 1519, when Álvarez de Pineda explored the northern shores of the Gulf of Mexico. In 1528, Cabeza de Vaca crossed South Texas after being shipwrecked along the Texas Coast near Galveston Bay. However, European settlement did not seriously disrupt native ways of life until after 1700. The first half of the 18th century was the period in which the fur trade and mission system, as well as the first effects of epidemic diseases, began to seriously disrupt the native culture and social systems. This process is clearly discernable at the Mitchell Ridge site, where burial data suggest population declines and group mergers (Ricklis 1994) as well as increased participation on the part of the Native American population in the fur trade. By the time that heavy settlement of Texas began in the early 1800s by Anglo-Americans, the indigenous Indian population was greatly diminished.

The earliest Europeans to reach the area of the future Nueces County may have been the party of Alonzo Álvarez de Pineda, who reputedly reached Corpus Christi Bay on the feast of Corpus Christi, 1519.[1] Conclusive evidence is lacking, however, because the records of his expedition are lost. Nine years later, Álvar Núñez Cabeza de Vaca and his crew were shipwrecked on the Texas coast. Although Cabeza de Vaca's exact route is unknown, historians believe that some members of his party skirted Corpus Christi Bay. The Spanish, however, largely ignored Texas until the French, under René Robert Cavelier, Sieur de La Salle, established a colony in the region in 1685. Spanish authorities dispatched an expedition to the region in 1689 under Alonso De León, the governor of Coahuila. Corpus Christi Bay, however, remained unknown and unexplored until 1747, when Joaquín Prudencio de Orobio y Basterra, captain of the presidio at La Bahía, led an expedition down the Nueces River to its mouth, where he arrived on February 26. After his return, José de Escandón, governor and captain general of Nuevo Santander, proposed to found a settlement called Villa de Vedoya at the mouth of the Nueces. Indians living in the area were to be served by a mission named Nuestra Señora del Soto. In the summer of 1749, 50 families accompanied by a squadron of soldiers and 2 priests set out, but because of drought and poor provisions they never reached their goal. Several other attempts were made to found a colony at the mouth of the Nueces, but not until the 1760s, when ranchers from Camargo, Nuevo Santander (now Tamaulipas), pushed northward in search of new grazing lands, did the first Spanish settlers reach the area. The first settlement was founded by Blas María de la Garza Falcón, captain of Camargo, who in 1766 established a ranch called Santa Petronila on Petronila Creek. In 1787, Manuel de Escandón, the son of José de Escandón, proposed another settlement at the mouth of the Nueces, but the project never advanced beyond the planning stages. In the late 1780s and early 1790s, Spanish authorities also considered moving Nuestra Señora del Refugio Mission to the mouth of the Nueces, but abandoned the idea because of continuing friction with the Lipan Apaches. At the end of the 18th century, ranchers from the Rio Grande valley began applying for and receiving land grants in the lower Nueces valley. By 1794, a large ranch belonging to Juan Barrera and known as Rancho de Santa Gertrudis was in operation on the north side of Corpus

[1] The following historical summary is adapted from TSHA (2013).

Christi Bay. Between 1800 and the end of Spanish dominion, much of what is now Nueces County was granted to ranching families, most of whom were related by marriage. In 1812, after an Indian uprising, the colonists abandoned the area and sought refuge in the Rio Grande valley. The colonists returned, but repeated skirmishes with the Indians continued until about 1824, when peace was made with the Comanches and Lipans. After Mexican independence, the region became part of Tamaulipas. During the period from 1829 to 1836, most of the land in the lower Nueces valley that had not been granted under Spanish rule was deeded to individuals by the Tamaulipan government.

In 1830, new attempts were made to establish colonies in the area. Gen. Manuel de Mier y Terán proposed founding 2 towns near the mouth of the Nueces. One settlement was to be located at the site of present-day Corpus Christi, but it was never realized. The other settlement, however, a military post known as Fort Lipantitlán, was established in 1831 in the northwestern part of the future county at the point where the road from Matamoros to Goliad crossed the river. During the remaining years of Mexican rule, no other towns were established on the west bank of the Nueces; however, in the 1820s, 2 Irish colonies were founded on the east side of the river under contracts issued to James Power and James Hewetson by the state of Coahuila and Texas. In 1828, John McMullen and James McGloin obtained a grant to settle a tract of land along the east side of the Nueces 10 leagues west of the coast. Later, some of these colonists and their descendents moved west of the river.

During the 1830s, 2 further unsuccessful attempts were made to establish colonies at the mouth of the Nueces. German nobleman Baron Johan von Raiknitz attempted to found a German settlement on the west bank of the Nueces, but the ship carrying the colonists was prevented from landing by the French during the so-called ~~P~~Pastry War" between France and Mexico. A second ship transporting colonists from Germany was shipwrecked. Around the same time, abolitionist Benjamin Lundy proposed to established a colony for freed slaves, but the plans were abandoned after the outbreak of the Texas Revolution. During the revolution, Texans under Ira Westover captured the Indian village of Lipantitlán, which was later occupied by Francis W. Johnson and the New Orleans Greys. After the revolution, the area south and west of the Nueces River was a no-man's-land. Texas claimed the territory, but Mexico said it was part of Tamaulipas. Neither exercised effective control. Both Texan and Mexican raiding parties made periodic forays into the region between 1838 and 1841. Mexican Federalist forces twice sought sanctuary at Fort Lipantitlán in the late 1830s, and, in 1838, Gen. Antonio Canales organized his army for the Republic of the Rio Grande nearby.

During this period, both Mexican and Texan merchants engaged in illegal trading in the Nueces valley. Among the most prominent of these was Henry Lawrence Kinney, who established a trading post and fort on Corpus Christi Bay in 1839. The land belonged to Capt. Enrique Villareal, a rancher from Matamoros, who had obtained it in 1832. Villareal led a force of 300 men to confront Kinney in 1841. Kinney, however, managed to negotiate an agreement and purchase the land from him. The small settlement soon became the focus of trade in the area. Repeated attacks by Mexican bands forced Kinney to abandon the post in 1842, but he returned a short time later and reestablished his trading business. A post office opened in 1842 with William P. Aubrey as its postmaster. The population of the small settlement, now known as

Corpus Christi, boomed briefly when Gen. Zachary Taylor's army arrived there in September 1845, but it quickly shrank again after the Mexican War.

Nueces County, including the entire area south of Bexar County west to the Rio Grande and east to the Gulf of Mexico, was formed from San Patricio County in 1846 and organized the same year. Corpus Christi, which was incorporated in 1846, became the county seat. The population of the county, however, remained small. Although large numbers of fortune seekers passed through Corpus Christi to join wagon trains heading west during the California gold rush of 1849, few settlers put down roots. Continuous Indian attacks and the relative isolation of the region kept away most would-be settlers. The first census of the county in 1850 showed a population of 689. Between 1850 and 1861, the Nueces County area was further divided to form several new counties.

Kinney, who continued to promote Corpus Christi, organized a major fair in the town in 1852, reportedly the first state fair in Texas. Despite extensive preparations, however, it proved to be a failure. Two years later, yellow fever decimated the population. Nonetheless, the early 1850s saw the construction of a county courthouse and jail and the beginnings of regular county government.

The mainstay of the local economy in late antebellum Texas remained ranching. Between the Texas Revolution and the late 1840s, the area's ranches had been virtually abandoned. After the Mexican War, the land grants of Mexican ranchers in the region were gradually acquired by Anglos who reestablished the cattle and horse industries. Tax rolls in 1848 reported only 647 cattle and 19 horses. By 1860, however, records showed 56,454 cattle and 8,554 horses and mules worth an estimated $489,520. Farming was not extensive and was only for subsistence.

During the early years of the Civil War, Corpus Christi was an important center for Confederate commerce. In 1859, no fewer than 45 small vessels carried trade between Corpus Christi and Indianola. Small boats sailing inside the barrier islands transported goods from the Brazos River to the Rio Grande, while inland cotton was moved along the Cotton Road through Banquete to Matamoros and the mills of England. In an effort to halt the trade, Union forces seized control of Mustang Island in the fall of 1863. Corpus Christi was twice bombarded by federal gunboats, but the overland trade continued without interruption until the end of the war.

Although Nueces County escaped the destruction that devastated other parts of the South, the war years were difficult for the county's citizens, who were thwarted by the lack of markets and the wild fluctuations in Confederate currency, as well as by concern for combatants. After the war, Nueces County residents experienced a protracted period of lawlessness and violence. Although the black population before the war had been very small and no Ku Klux Klan chapter was organized in the county during Reconstruction, political violence was commonplace, as Republicans and former Confederates struggled for control. Turmoil continued along the Mexican border, and cattle rustling and raids by bandits were frequent problems. In the end, however, because of its relatively small population, Nueces County was spared much of the fighting that other Texas counties experienced, and order was generally restored by the early 1870s.

The war and its aftermath also had a less serious effect on the county's economy than was the case in much of Texas. Land prices fell significantly, from 50 cents per acre in 1860 to 28 cents per acre in 1869. The boom in the cattle industry in the early 1870s helped Nueces County to overcome the postwar economic depression. In 1871, local tax rolls showed 218,969 cattle worth more than $942,000, more than 4 times the number from 1860. The cattle were shipped to market by 2 main routes—by water to New Orleans and Havana, or overland to Kansas, where they were shipped by rail to the East. During the early 1870s, some 10 meat-packing plants operated in Nueces County, but most were closed by the middle of the decade because the cattle drives proved to be more profitable.

Mustangs and other horses also contributed to the county's new prosperity; in 1871, there were 34,077 horses and mules in the county. The greatest competition to the cattle industry came from sheep ranching. Before the ranges were fenced, Nueces County was an important center for wool production. During the late antebellum period, the number of sheep had been relatively small, with some 35,000 reported in 1860. By 1871, 363,835 sheep were counted, and by 1876 the number of sheep topped 650,000. In 1875 and 1876, the assessed value of sheep in the county actually exceeded that of cattle. Falling wool prices in the 1880s, however, and the advent of fencing eventually caused the sheep industry to decline. For a number of years between the mid-1870s and early 1880s, Nueces County led all Texas counties in the number of sheep and cattle.

During the latter half of the 19th and the early 20th centuries, the population of Nueces County grew markedly, particularly in the decade after the turn of the century. In 1860, the county had only 2,906 residents, but the number increased rapidly in the post-Civil War years, to 3,975 in 1870, 7,673 in 1880, 8,093 in 1890, 10,439 in 1900, and 21,955 in 1910. Much of the population was centered in and around Corpus Christi, which gradually emerged as the commercial hub of the region. As the city grew in importance as a shipping center, efforts were made to improve access to the ocean. In 1874, the main sea channel was dredged to a depth of 8 feet to allow large steamers to navigate. During the mid-1870s, construction also began on the county's first railroad, a narrow-gauge line from Corpus Christi to Laredo. After its completion in 1881, a second line was begun, the San Antonio and Aransas Pass, which was completed in 1886 and extended from Corpus Christi to San Antonio.

The mid-1880s also witnessed the beginnings of cash-crop agriculture in Nueces County. During the late 1870s and early 1880s, livestock raising in some areas of the county began to be supplanted by more traditional farming, particularly of cotton and vegetables. The growth of such farms began the breakup of the huge expanses of pastureland in the county and spelled the beginning of the end of the old cattle-ranching life. In 1889, 1,010 bales of cotton were produced; by 1910, the figure had grown to 8,566, and by 1930 Nueces County was among the leading cotton-producing counties in the state, with 148,442 bales.

Although cotton was the dominant crop during the early decades of the 20th century, Nueces County farmers also produced large quantities of vegetables, including cabbage, onions, spinach, carrots, cucumbers, and turnips. The transition to cash-crop farming brought dramatic changes in land tenure. While large ranchers had predominated during the antebellum and early postwar period, by the turn of the century the land was increasingly worked by tenant

farmers. In 1910, when agriculture was still developing in the county, only 35.3% of farmers were tenants, below the statewide average of 52.6%. By 1925, however, 76.4% of all Nueces County farmers were tenants. The majority of the leaseholders were Anglos, but much of the labor was performed by Mexican Americans who were poorly paid and frequently lived in poverty.

During the 1920s, agricultural mechanization began in the county. Tractors and other machines appeared in increasing numbers, and by the eve of World War II Nueces County farms were among the most mechanized in the state. The onset of the Great Depression, falling cotton prices, and the arrival of the boll weevil brought new hardships for county farmers. Many were forced to move to the cities. The total number of farms in the county fell from a high of 1,969 in 1930 to 1,306 in 1950. Cotton production, which had peaked during the mid-1920s at more than 100,000 bales per year, fell markedly during the 1930s and early 1940s. In 1945, only 46,000 bales were ginned. Cotton farming rebounded in the late 1940s, and in 1949 production once again topped the 100,000-bale mark. Since that time cotton production has declined, though it remains a significant part of the county's agricultural receipts. Truck farming flourished in the 1950s, but was afterward increasingly replaced by sorghum, which in the 1980s and 1990s was the county's largest crop. The decline in cotton and truck farming in the post-World War II era also forced many tenant farmers to leave the land or to hire out as agricultural workers. In the 1980s, the economic base of the county outside of the Corpus Christi area was still overwhelmingly agricultural. In 1982, 85% of the county was in farms and ranches, with 77% of the land under cultivation and 1% irrigated. Nueces County ranked 29th in the state in agricultural receipts, with some 87% coming from crops.

Another important sector of the Nueces County economy in the 20th century has been oil and natural gas. In 1922, natural gas was discovered in Nueces County, and a few years later several major oilfields were developed. Gas-recycling plants and carbon black plants, as well as oil refineries, are located in the county. Total oil production in the county from 1930 to January 1, 1989, was 533,831,701 barrels. Soda and salts of several varieties are produced from raw materials chiefly from Duval County. Other industries include a Celanese chemical plant and copper and lead refineries.

In 1926, the port of Corpus Christi was opened. The legislature made the port a state project by allocating the taxes from 7 adjacent counties for the construction of breakwaters, jetties, and other ancillary improvements. The channel from the Gulf of Mexico to the turning basin is a part of the Gulf Intracoastal Waterway, which connects the port with cities of the Mississippi valley as well as with foreign markets and makes it potentially one of the chief ports in America. In 1935, the depth of the channel was increased to 35 feet so that large ships could be accommodated. The 1930s and 1940s also brought improvements in the transportation network of the county. By 1940, most of the major roads in the county were paved, and US Highway (US) 77 and State Highways (SH) 44 and 286 had given farmers better access to markets.

The military importance of the area has been recognized since the time of the Mexican War, when Fort Marcy, the first federal post activated on Texas soil, was established. At one time, Nueces County had 5 federal forts; Corpus Christi was a supply depot until 1857. On

March 12, 1941, with the establishment of the Naval Air Station in Corpus Christi, the town became the home of the so-called "University of the Air."

Since World War I, Nueces County has shown a remarkable growth in population, increasing from 22,807 residents in 1920 to 165,471 in 1950 and to 237,544 in 1970. In 1991, the reported population of the county was 296,527. Hispanics were about 50.5% of the population, non-Hispanic whites 44.1%, and African Americans 4.4%. The largest towns were Corpus Christi, Robstown, Port Aransas, and North San Pedro. During the early 1980s, the county had 13 school districts with 60 elementary, 20 middle, and 15 high schools, as well as 6 special-education schools.

4.0 ARCHIVAL RESEARCH

In February 2013, Horizon conducted a cultural resources desktop review of the proposed 27.4-acre APE. The background review examined an area extending 1.0 mile from the boundaries of the proposed construction areas within the overall CCC site. Background archival research conducted via the Internet at the THC's online *Texas Archeological Sites Atlas* (Atlas) restricted-access database and the National Park Service's (NPS) NRHP Google Earth map layer indicated the presence of no previously recorded archeological sites, cemeteries, historic properties or districts listed on the NRHP or designated as SALs, historical markers, historic-age structures recorded during neighborhood surveys, or other cultural resources on or within a 1.0-mile radius of the existing CCC facility (THC 2013; NPS 2013).

Prehistoric archeological sites are commonly found in upland areas and on alluvial terraces near stream and river channels in South Texas. Equistar's CCC facility is located on a broad upland coastal flat, and no extant water bodies or stream channels are present within or adjacent to the project area. Soils mapped within the project site consist of clayey and loamy fluviomarine sediments that were deposited during the early to late Pleistocene epoch, prior to the earliest human habitation of North America, and no Holocene-age sediments or alluvial environments occur within the project area that would have the potential to contain buried, intact archeological deposits. Typically, cultural resources associated with Beaumont Formation sediments, such as those mapped within the project area, are constrained to surficial contexts and lack integrity due to erosion, historic-age farming activities, residential and industrial development, and other sources of disturbance.

In regard to historic-era resources, the lack of visible structures in proximity to the project site on topographic and aerial maps of the project area suggests a low potential for historic-era architectural or archeological resources within the limits of the proposed project site.

No prior cultural resources surveys have been conducted on or within 1.0 mile of the APE, and no portion of the APE has been previously surveyed for cultural resources.

The proposed project's APE is contained entirely within the existing CCC industrial facility. Based on the extent of existing disturbances within the proposed project site resulting from prior construction, use, and ongoing maintenance of the industrial plant; the physiographic setting away from extant water sources and alluvial environments; and the lack of previously recorded archeological sites, cemeteries, listed NRHP properties, or SALs on or in the

immediate vicinity of the proposed project site, there is a low probability that intact cultural resources are present that would be eligible for listing on the NRHP. No known cultural resources were identified within the 27.4-acre APE, and there is a low probability that any unrecorded, intact cultural resources are present that would be eligible for listing on the NRHP. It is Horizon's opinion that the proposed project site does not require an intensive cultural resources survey, and no known archeological or historic properties that are listed on, eligible for, or potentially eligible for inclusion in the NRHP would be adversely affected.

5.0 SUMMARY AND RECOMMENDATIONS

5.1 ELIGIBILITY CRITERIA FOR INCLUSION IN THE NATIONAL REGISTER OF HISTORIC PLACES

Determinations of eligibility for inclusion in the NRHP are based on the criteria presented in 36 CFR §60.4(a-d). The 4 criteria of eligibility are applied following the identification of relevant historical themes and related research questions:

> The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
>
> a. [T]hat are associated with events that have made a significant contribution to the broad patterns of our history; or,
>
> b. [T]hat are associated with the lives of persons significant in our past; or,
>
> c. [T]hat embody the distinctive characteristics of a type, period, or method of construction, or that represent a significant and distinguishable entity whose components may lack individual distinction; or,
>
> d. [T]hat have yielded, or may be likely to yield, information important in prehistory or history.

The first step in the evaluation process is to define the significance of the property by identifying the particular aspect of history or prehistory to be addressed and the reasons why information on that topic is important. The second step is to define the kinds of evidence or the data requirements that the property must exhibit to provide significant information. These data requirements in turn indicate the kind of integrity that the site must possess to be significant. This concept of integrity relates both to the contextual integrity of such entities as structures, districts, or archeological deposits and to the applicability of the potential database to pertinent research questions. Without such integrity, the significance of a resource is very limited.

For an archeological resource to be eligible for inclusion in the NRHP, it must meet legal standards of eligibility that are determined by 3 requirements: (1) properties must possess significance, (2) the significance must satisfy at least 1 of the 4 criteria for eligibility listed above, and (3) significance should be derived from an understanding of historic context. As discussed here, historic context refers to the organization of information concerning prehistory and history

according to various periods of development in various times and at various places. Thus, the significance of a property can best be understood through knowledge of historic development and the relationship of the resource to other, similar properties within a particular period of development. Most prehistoric sites are usually only eligible for inclusion in the NRHP under Criterion D, which considers their potential to contribute data important to an understanding of prehistory. All 4 criteria employed for determining NRHP eligibility potentially can be brought to bear for historic sites.

Criterion A—Events

To be considered for listing under Criterion A, a property must be associated with 1 or more events important in the defined historic context. Criterion A recognizes resources associated with single events, such as the founding of a town, or with a pattern of events, repeated activities, or historic trends, such as the gradual rise of a port city's prominence in trade and commerce. The event or trends, however, must clearly be important within the associated context of settlement, in the case of the town, or development of a maritime economy, in the case of the port city. Moreover, the property must have an important association with the event or historic trends, and it must retain historic integrity.

Criterion B—Persons

Criterion B applies to resources associated with individuals whose specific contributions to history can be identified and documented. Persons –significant in our past" refers to individuals whose activities are demonstrably important within a local, state, or national historic context. The criterion is generally restricted to those resources that illustrate (rather than commemorate) a person's important achievements.

Criterion C—Design or Construction

This criterion applies to resources significant for their physical design or construction, including such elements as architecture, landscape architecture, engineering, and artwork. To be eligible under this criterion, a property must meet *at least one* of the following requirements—embody distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic value; or represent a significant and distinguishable entity whose components may lack individual distinction.

Criterion D—Information Potential

Certain important research questions about human history can only be answered by the actual physical material of cultural resources. Criterion D encompasses the resources that have the potential to answer, in whole or in part, those types of research questions. The most common type of property nominated under this Criterion is the archeological site (or a district composed of archeological sites). Buildings, objects, and structures (or districts composed of these property types), however, can also be eligible for their information potential. Criterion D has 2 requirements, which must *both* be met for a property to qualify—the property must have, or have had, information to contribute to our understanding of human history or prehistory, and the information must be considered important.

5.2 SUMMARY AND RECOMMENDATIONS

In February 2013, Horizon conducted a cultural resources assessment of the proposed 27.4-acre area within the overall CCC in which improvements would be undertaken. The background review examined an area extending 1.0 mile from the boundaries of the APE. Based on this archival background research, no archeological sites, cemeteries, historic properties or districts listed on the NRHP or designated as SALs, historical markers, or other cultural resources have been previously recorded on or within a 1.0-mile radius of Equistar's existing CCC facility. No prior cultural resources surveys have been conducted on or within 1.0 mile of the APE, and no portion of the APE has been previously surveyed for cultural resources.

The proposed project's APE is contained entirely within the existing CCC industrial facility. Based on the extent of existing disturbances within the proposed project site resulting from prior construction, use, and ongoing maintenance of the industrial plant; the physiographic setting away from extant water sources and alluvial environments; and the lack of previously recorded archeological sites, cemeteries, listed NRHP properties, or SALs on or in the immediate vicinity of the proposed project site, there is a low probability that intact cultural resources are present that would be eligible for listing on the NRHP. No known cultural resources were identified within the 27.4-acre APE, and there is a low probability that any unrecorded, intact cultural resources are present that would be eligible for listing on the NRHP. It is Horizon's opinion that the proposed project site does not require an intensive cultural resources survey, and no known archeological or historic properties that are listed on, eligible for, or potentially eligible for inclusion in the NRHP would be adversely affected. However, in the unlikely event that any human remains or burial objects are inadvertently discovered at any point during construction, use, or ongoing maintenance in the project area, all work should cease immediately in the vicinity of the inadvertent discovery and the THC should be notified of the discovery.

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Suhm, D.A., A.D. Krieger, and E.B. Jelks

1954 An Introductory Handbook of Texas Archeology. *Bulletin of the Texas Archeological Society*, No. 25.

(THC) Texas Historical Commission

2013 *Texas Archeological Sites Atlas Restricted Database*. <http://www.pedernales.thc.state.tx.us/>. Accessed February 20, 2013.

(THSA) Texas State Historical Association

2013 Nueces County. The Handbook of Texas Online. <http://www.tshaonline.org/handbook/online/articles/hcn05>. Accessed February 20, 2013.

Turner, E.S., and T.R. Hester

1999 *A Field Guide to Stone Artifacts of Texas Indians*. Third Revised Edition. Gulf Publishing Company, Houston.

Van Siclen, D.C.

1985 Pleistocene Meander-Belt Ridge Patterns in the Vicinity of Houston, Texas. *Transactions of the Gulf Coast Association of Geological Societies* 35:525-532.

(USDA) US Department of Agriculture

2012 Digital orthophoto, Nueces County, Texas. National Agriculture Imagery Program, Farm Service Agency, Aerial Photography Field Office.

(USGS) US Geological Survey

1975 7.5-minute series topographic maps, Annaville, Texas, quadrangle.

APPENDIX A:

Principal Investigator's Resume

Horizon Environmental Services, Inc.

Jeffrey D. Owens, M.A., R.P.A.

Archeological Principal Investigator/Project Manager

EXPERTISE

- Prehistoric Archeology
- Historic Archeology

RESEARCH AREAS

- Eastern North America (esp. Midwest, Southeast)
- Great Plains
- American Southwest

AREAS OF EXPERTISE

- Project Management
- Archival and Historical Research
- Archeological Survey, Testing, and Data Recovery
- National Register of Historic Places (NRHP) Evaluations
- Section 106 of the National Historic Preservation Act (NHPA)
- Antiquities Code of Texas (ACT)
- Native American Graves Protection and Repatriation Act (NAGPRA)
- Lithic and Ceramic Analysis
- Technical Writing and Editing
- Quality Assurance/ Quality Control

EDUCATION

- A.B.D., Anthropology, Southern Methodist University, 1997
- M.A., Anthropology, New York University, 1995
- B.A., Anthropology, New York University, 1991

Mr. Owens is an accomplished cultural resources professional with more than 23 years of experience in archeological fieldwork, research and analysis, and cultural resources management (CRM). He is an adept principal investigator and project manager, proficient at managing suites of turnkey, fast-turnaround projects as well as long-term, multidisciplinary research projects. He is fully versed in historic and environmental preservation laws, assessing the National Register of Historic Places (NRHP) eligibility of cultural resources, and developing management plans for historic properties that ensure compliance with applicable federal, state, and local laws while ensuring projects meet construction schedules and adhere to budgetary constraints.

Mr. Owens has planned, implemented, and successfully completed cultural resources survey, testing, and data recovery projects in Arizona, Arkansas, Illinois, Louisiana, Mississippi, Missouri, New Jersey, New Mexico, New York, Oklahoma, Pennsylvania, and Texas. He has completed hundreds of projects for a broad range of clients in the public and private sectors, including oil and gas exploration, development, and transportation; ethanol and petrochemical production; coastal and inland residential, commercial, and industrial land development; solid waste landfills; dredging activities; municipal planning; reservoir development; coastal port and channel improvements; transportation infrastructure; water and wastewater transportation and treatment; electricity generation and transportation; military reservations; and university research.

Mr. Owens also regularly contributes cultural resources oversight to the preparation of environmental regulatory documents, including Environmental Assessments (EA), Environmental Impact Statements (EIS), Biological Assessments (BA), and Categorical Exclusions (CE) for National Environmental Policy Act (NEPA) compliance projects.

Mr. Owens' project management style incorporates innovative leadership skills, resourcefulness, versatility, swift adaptability, and attention to the bottom line. His success is due in part to his thorough familiarity with federal, state, and local historic preservation laws and long-standing personal relationships with regulatory agency reviewers.

CERTIFICATIONS/QUALIFICATIONS

- Meets all Secretary of the Interior's standards for performing cultural resources investigations
- Permittable to perform cultural resource investigations on federal and state projects
- Listed on qualified cultural resource consultant lists in numerous states
- Pre-certified by TxDOT for Service 2.10.1 (Archeological Surveys, Documentation, Excavations, Testing, Reports, and Data Recovery Plans) and Service 2.11.1 (Historical and Archival Research)

PROFESSIONAL AFFILIATIONS

- Register of Professional Archaeologists (RPA)
- Council of Texas Archeologists (CTA)
- Texas Archeological Society (TAS)

PROFESSIONAL EXPERIENCE

Archaeological Principal Investigator/Project Manager Jan 2005 Present
Horizon Environmental Services, Inc.
1507 South IH-35
Austin, Texas 78741
(512) 328-2430

Project Archaeologist/Managing Editor Mar 2002 – Jan 2005
TRC Environmental Corporation
505 East Huntland Drive, Suite 250
Austin, Texas 78752
(512) 454-8716

Senior Editor Oct 1999 – Aug 2001
Consulting Partners (now part of Beeline Learning Solutions)
14911 Quorum Drive, Suite 120
Dallas, Texas 75254
(972) 813-0465

Project Archaeologist Aug 1997 – Oct 1999
Geo-Marine, Inc.
2201 K Avenue, Suite A2
Plano, Texas 75074
(972) 423-5480

Departmental/Teaching Assistant Sep 1995 – Jun 1997
Southern Methodist University
Department of Anthropology
3225 Daniel Avenue, Room 208
Dallas, Texas 75205
(214) 768-2684

Project Archaeologist Oct 1994 – Sep 1995
Soil Systems, Inc. (now part of PaleoWest)
1121 North 2nd Street
Phoenix, Arizona 85004
(602) 261-7253

Archeological Field Technician Jun 1994 – Oct 1994
John Milner Associates, Inc. Nov 1993 – Dec 1993
535 North Church Street
West Chester, Pennsylvania 19380
(610) 436-9000

Departmental Assistant Aug 1991 – Jun 1994
New York University
Department of Anthropology
25 Waverly Place, Rufus D. Smith Hall
New York, New York 10003
(212) 998-8550

Field Technician Dec 1993
Institute for Long Island Archaeology
State University of New York – Stonybrook
Department of Anthropology
Circle Road, Social & Behavioral Sciences Buildings, 5th Floor
Stonybrook, New York 11794
(631) 632-7620

Crew Chief Sep 1993 – Nov 1993
Greenhouse Consultants, Inc.
32 Park Place
Newark, New Jersey 07102
(973) 623-9091

Research Associate May 1993 – Sep 1993
AquaTerra Environmental Services Corporation
(now AquaTerra Environmental Solutions, Inc.)
[New York office no longer in business]
New York, New York

Crew Chief Jun 1992 – Jul 1992
New York University Jun 1990 – Jul 1990
Department of Anthropology
25 Waverly Place, Rufus D. Smith Hall
New York, New York 10003
(212) 998-8550

Archaeological Consultant Nov 1991 – Dec 1991
TAMS Consultants, Inc.
300 Broadacres Drive
Bloomfield, New Jersey 07003
(973) 338-6680

TECHNICAL PUBLICATIONS

n.d. *Intensive Cultural Resources Survey of the Proposed 545-Acre Kansas City Southern Railroad Wylie Intermodal Facility, Wylie, Collin County, Texas*. HJN 130042. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Proposed Equistar Chemicals, L.P., Corpus Christi Complex Expansion Project, Corpus Christi, Nueces County, Texas—Cultural Resources Assessment*. HJN 110012.13. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Intensive Cultural Resources Survey of the Proposed 78-Acre La Paloma Energy Center Tract, Harlingen, Cameron County, Texas*. HJN 080122.31. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Proposed Clinker Production Increase at the CEMEX Construction Materials South, LLC, Balcones Cement Plant, Comal County, Texas—Cultural Resources Review*. HJN 080122.39. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Intensive Cultural Resources Survey of the Proposed 77-Acre Pinecrest Energy Center Tract, Lufkin, Angelina County, Texas*. HJN 080122.40. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Proposed Guadalupe Generating Station Expansion Project, Marion, Guadalupe County, Texas—Cultural Resources Review*. HJN 130016. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Intensive Cultural Resources Survey of the Proposed 181-Acre Enterprise Mont Belvieu Complex Propane Dehydrogenation Unit Project, Chambers County, Texas*. HJN 110012.12. Horizon Environmental Services, Inc., Austin, Texas.

n.d. *Intensive Cultural Resources Survey of a Proposed 20-Acre Expansion Tract Adjacent to an Existing PL Propylene, LLC, Facility, Houston, Harris County, Texas*. HJN 080122.30. Horizon Environmental Services, Inc., Austin, Texas.

2013 *Intensive Cultural Resources Survey of a USACE Jurisdictional Area on a Proposed 4.6-Acre HEB Grocery Store Expansion Tract, Georgetown, Williamson County, Texas*. HJN 120085. Horizon Environmental Services, Inc., Austin, Texas.

2013 *Cultural Resources Investigations along the Proposed Lone Star Competitive Renewable Energy Zone (CREZ) 345-kV Transmission Line Right-of-Way in North-Central Texas*, Vols. I and II (with Jennifer L. Cochran, Russell K. Brownlow, and Raymundo Chapa). HJN 100137. Horizon Environmental Services, Inc., Austin, Texas.

2013 *Intensive Cultural Resources Survey of the San Antonio River Outfall Project, San Antonio, Bexar County, Texas*. HJN 120150. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Archeological Survey for the Proposed Brushy Creek Regional Trail Gap Project, Round Rock, Williamson County, Texas*. HJN 080151. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Archeological Survey for the Proposed San Gabriel River Trail Extension Project, Georgetown, Williamson County, Texas*. HJN 120057. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey of the 1,102-Acre Creekside Park West Tract, Harris County, Texas* (with Raymundo Chapa). HJN 100142. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey of Two 0.9-Acre HDD Locations on the Trinity River, Madison and Houston Counties, Texas*. HJN 120009.14. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey of a USACE Jurisdictional Area on the Proposed 18.5-Acre Esperanza Crossing Tract, Austin, Travis County, Texas*. HJN 120052. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey, One USACE Jurisdictional Area, Existing East Red Segment 1 Pipeline Maintenance Activities, Clay County, Missouri*. HJN 120075. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey, Two USACE Jurisdictional Area Dig Sites (#253 and #261) on the Existing Eskridge to Kearney Pipeline Maintenance Activities, Clay County, Missouri*. HJN 120075. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey for the Penn City Coal Expansion Project, Houston, Harris County, Texas*. HJN 110097. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey for the Lake Anahuac East Levee Project, Anahuac, Chambers County, Texas* (with Sally Victor). HJN 120004. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey, One USACE Jurisdictional Area on the Existing Eskridge to Kearney Pipeline Right-of-Way, Platte County, Missouri*. HJN 120075. Horizon Environmental Services, Inc., Austin, Texas.

2012 *Intensive Cultural Resources Survey of the Proposed 0.6-Mile-Long Rattler Road Extension Project, San Marcos, Hays County, Texas*. HJN 120036. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive Cultural Resources Survey of 6 Jurisdictional Stream Crossings for the City of Hamshire Water System Improvements Project, Hamshire, Jefferson County, Texas*. HJN 110070. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Cultural Resources Investigations on the Proposed Waller Creekside Apartments Tract, Austin, Travis County, Texas*. HJN 110116. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive Cultural Resources Survey of the Woodland Oaks Wastewater Treatment Plant Proposed 1.3-Acre Expansion Tract, Houston, Harris County, Texas*. HJN 100024. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive Archeological Survey of the Farm-to-Market Road 1660 Realignment Project, Hutto, Williamson County, Texas*. HJN 090047. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive Archeological Survey of a 3.7-Acre Tract in San Marcos, Hays County, Texas*. HJN 110124. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive Cultural Resources Survey of USACE Jurisdictional Areas on the Proposed Whispering Pines Par 3 Golf Course Tract, Trinity County, Texas*. HJN 110031. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Archeological Avoidance Plan for the Proposed Washburn 3D Seismic Survey Project, Houston, Harris County, Texas*. HJN 110122. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive Cultural Resources Survey of the Orange County Sewer and Natural Gas Infrastructure Improvements Project, Orange County, Texas*. HJN 110121. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive cultural Resources Survey for the McInnish Park Water System Improvements Project, Carrollton, Dallas County, Texas*. HJN 110135. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Intensive Cultural Resources Survey for the City of Liberty Wastewater System Improvement Project, Liberty County, Texas*. HJN 110005. Horizon Environmental Services, Inc., Austin, Texas.

2011 *Cultural Resource Investigations to Offset Mechanical Impacts to the Clear Creek Golf Course Site (41CV413), Fort Hood, Texas* (with J. Michael Quigg, Christopher Lintz, Grant D. Smith, and David DeMar). TRC Technical Report No. 02353. ARM Series, Research Report No. 60. TRC Environmental Corporation, Austin, Texas.

2011 *Archeological Avoidance Plan for the Proposed North Clinton Dome 3D Seismic Survey Project, Houston, Harris County, Texas*. HJN 110011. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Cultural Resources Survey Activities for the Shelby East 3D Seismic Survey Project, Areas 1 and 2, Sabine National Forest, San Augustine and Shelby Counties, Texas*. HJN 090017. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Cultural Resources Survey Activities for the Shelby East 3D Seismic Survey Project, Areas 1 and 2, Sabine National Forest, San Augustine and Shelby Counties, Texas. Addendum #1—Access Routes*. HJN 090017. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of the 10.6-Acre Helbig Road Tract, Beaumont, Jefferson County, Texas*. HJN 100099. Horizon Environmental Services, Inc., Austin, Texas

2010 *Intensive Cultural Resources Survey of the 44-Acre Creekside Park, Section 18, Tract, The Woodlands, Harris County, Texas*. HJN 100079. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of the 66-Acre Royal Shores Tract, Kingwood, Harris County, Texas*. HJN 100005. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of the Proposed 74 Ranch Pittman 1-H Well Pad, Campbellton, Atascosa County, Texas*. HJN 100093.001. Horizon Environmental Services, Inc., Austin, Texas

2010 *Intensive Cultural Resources Survey of the Proposed 74 Ranch Axis 1-H Well Pad, Campbellton, Atascosa County, Texas*. HJN 100093.002. Horizon Environmental Services, Inc., Austin, Texas

2010 *An Intensive Cultural Resources Survey of a Proposed HDD Location Under an Abandoned Tram Road in Nacogdoches County, Texas*. HJN 100019. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey for the Green Valley Special Utility District's Water Supply Improvement Project, Guadalupe County, Texas*. HJN 090102. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive and Reconnaissance Survey of the Proposed Lake Halbert Water Treatment Plant Expansion Project, Corsicana, Navarro County, Texas*. HJN 100015. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of a Proposed 2.9-Mile-Long Force Main Right-of-Way, Houston, Harris County, Texas*. HJN 100051. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of a 13.9-Acre Tract for the Proposed Fort Bend County MUD No. 116 Wastewater Treatment Plant Project, Richmond, Fort Bend County, Texas*. HJN 100047. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of a Proposed 3,100-Foot-Long Erosion-Control Bulkhead on the T-BAR-O Ranch, Llano County, Texas*. HJN 100075. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of the 21.6-Acre Kalentari Tract, San Marcos, Hays County, Texas*. HJN 100055. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resource Survey of a 14.8-Acre Tract on Williams Gully in Houston, Harris County, Texas*. HJN 090127. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Cultural Resources Survey of the Proposed Crossroad Exhibit Hall Expansion, Fort Griffin State Historic Site, Shackelford County, Texas*. HJN 090019. Horizon Environmental Services, Inc., Austin, Texas.

2010 *Intensive Phase I Cultural Resources Survey of 3.5 Miles of M2 LGS, LLC's, Proposed Natural Gas Pipeline Right-of-Way on the Mansfield Battlefield, DeSoto Parish, Louisiana*. HJN 090055.025. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Intensive Archeological Survey of the US Highway 69 Expressway and Reliever Route, Jacksonville, Cherokee County, Texas*. HJN 080173. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Intensive Cultural Resource Survey of the Proposed 5.4-Acre Floral Gardens Senior Living Apartments Tract, Houston, Harris County, Texas*. HJN 090129. Horizon Environmental Services, Inc. Austin, Texas.

2009 *Intensive Cultural Resource Survey, PEC Marshall Ford to Buttercup Substations Transmission Line Rebuild Project, Travis and Williamson County, Texas*. HJN 090096. Horizon Environmental Services, Inc. Austin, Texas.

2009 *Intensive Cultural Resources Survey of the Possum Kingdom Lake Hike and Bike Trail, Phase III, Palo Pinto County, Texas*. HJN 090053. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Intensive Cultural Resource Survey of the Proposed 2.2-Acre Junker-Spencer Well No. 69, Fannett, Jefferson County, Texas*. HJN 090079. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Cultural Resource Survey of the Proposed 60-Acre Harrison Ranch Park, Dripping Springs, Hays County, Texas*. HJN 090080. Horizon Environmental Services, Inc. Austin, Texas.

2009 *Intensive Cultural Resource Survey of the Tyrrell Park Storm Water Detention Pond Project, Beaumont, Jefferson County, Texas*. HJN 090042. Horizon Environmental Services, Inc. Austin, Texas.

2009 *Intensive Cultural Resource Survey of 7 Miles of Proposed Dredge Disposal Areas along Green Pond Gully, Beaumont, Jefferson County, Texas*. HJN 090041. Horizon Environmental Services, Inc. Austin, Texas.

2009 *Intensive Cultural Resource Survey of for the Lumberton Lift Station Rehabilitation Project, Loeb, Hardin County, Texas*. HJN 080008. Horizon Environmental Services, Inc. Austin, Texas.

2009 *An Intensive Cultural Resources Survey of the Port of Houston Authority's 43-Acre Acryl Tract, Seabrook, Harris County, Texas*. HJN 080163. Horizon Environmental Services, Inc. Austin, Texas.

2009 *Intensive Cultural Resource Survey of 34 Acres of Dredge Disposal Areas along Bayou Din, Beaumont, Jefferson County, Texas*. HJN 090038. Horizon Environmental Services, Inc. Austin, Texas.

2009 *Intensive Cultural Resources Survey of the 2.8-Acre Harris County MUD No. 148 Wastewater Treatment Plant No. 2, Harris County, Texas*. HJN 090048. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Intensive Cultural Resources Survey of the Round Rock ISD 181-Acre Pearson/ England Tract, Round Rock, Williamson County, Texas*. HJN 090027. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Intensive Cultural Resources Survey of the Round Rock ISD 12.8-Acre Stone Oak School Tract, Round Rock, Williamson County, Texas*. HJN 090006. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Intensive Cultural Resources Survey of the 136-Acre Sweetwater Ranch Tract, Travis County, Texas*. HJN 090005. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Intensive Cultural Resources Survey of the Elm Fork Relief Interceptor Segment EF-3 Project, Dallas and Farmers Branch, Dallas County, Texas*. HJN 080185. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Intensive Cultural Resources Survey of Oak Branch Drive at US Highway 290 and Nutty Brown Road, Hays County, Texas*. HJN 080166. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Intensive Cultural Resources Survey of the Bachelor Creek Interceptor Project, Terrell, Kaufman County, Texas*. HJN 080132. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Intensive Cultural Resources Survey of the Washington Street Improvements Project, Sherman, Grayson County, Texas*. HJN 080179. Horizon Environmental Services, Inc., Austin, Texas.

2009 *Intensive Cultural Resources Survey of the Canyon Creek Drive Extension Project, Sherman, Grayson County, Texas*. HJN 080178. Horizon Environmental Services, Inc., Austin, Texas.

2008 *Archeological Surveys and Impact Evaluations in the Texas Department of Transportation's Abilene, Brownwood, Fort Worth, and Waco Districts, 2006-2008*. HJN 080104. Texas Department of Transportation, Environmental Affairs Division, Archeological Studies Program, Report No. 112. Horizon Environmental Services, Inc., Austin, Texas.

2008 *Intensive Cultural Resources Survey of the Wells Ranch Carrizo Groundwater Project, Bexar, Gonzales, and Guadalupe Counties, Texas*. HJN 070157. Horizon Environmental Services, Inc., Austin, Texas.

2008 *Intensive Cultural Resource Survey of the Westwood Water Supply Corporation Water System Improvements Project, Jasper County, Texas*. HJN 080060. Horizon Environmental Services, Inc., Austin, Texas.

2008 *Intensive Cultural Resources Survey of 1,118 Feet of the Bethune Gathering System Pipeline Right-of-Way, Sam Rayburn Reservoir, Nacogdoches County, Texas*. HJN 060042. Horizon Environmental Services, Inc., Austin, Texas.

2008 *Intensive Cultural Resources Survey of 15 Earthen Levee Segments on White's Ranch, Jefferson and Chambers Counties, Texas*. HJN 070196. Horizon Environmental Services, Inc., Austin, Texas.

2008 *Intensive Cultural Resources Survey of the 107-Acre Juno Lake No. 1 Reservoir Project, Trinity and Polk Counties, Texas*. HJN 080034. Horizon Environmental Services, Inc., Austin, Texas.

2008 *Intensive Cultural Resources Survey of a 0.9-Acre Tract Between Broadway and Garfield Streets, Del Rio, Val Verde County, Texas*. HJN 080091. Horizon Environmental Services, Inc., Austin, Texas.

2008 *Intensive Cultural Resource Survey of the Green Acres Storm Water System Project, Fannett, Jefferson County, Texas*. HJN 080068. Horizon Environmental Services, Inc., Austin, Texas.

2008 *Intensive Cultural Resources Survey of USACE Jurisdictional Areas on the Sunchase Tract, Austin, Travis, and Bastrop Counties, Texas*. HJN 080079. Horizon Environmental Services, Inc., Austin, Texas.

2008 *Intensive Cultural Resources Survey of 2 USACE Jurisdictional Areas on the 70-Acre Regal Oaks Tract, Travis County, Texas*. HJN 080041. Horizon Environmental Services, Inc., Austin, Texas.

2008 *Intensive Cultural Resources Survey of the Proposed 10-Acre Mitchell Island Development, The Woodlands, Montgomery County, Texas* (with Russell K. Brownlow). HJN 070193. Horizon Environmental Services, Inc., Austin, Texas.

2008 *The Varga Site: A Multicomponent, Stratified Campsite in the Canyonlands of Edwards County, Texas, Volume I* (with J.M. Quigg, P.M. Matchen, G. Smith, R.A. Ricklis, M.C. Cody, and C.D. Frederick). TRC Technical Report No. 35319. TRC Environmental Corporation, Austin, Texas.

2008 *Phase I Cultural Resource Investigations for the Deer Park LPG Terminal Project in Chambers and Harris Counties, Texas* (with Price Laird, Larissa Thomas, and Paul Matchen). TRC Environmental Corporation, Austin, Texas.

2007 *Intensive Cultural Resources Survey of 5 USACE Jurisdictional Waterway Impact Areas on the 418-Acre Watersedge Tract, Travis County, Texas*. HJN 070011. Horizon Environmental Services, Inc., Austin, Texas.

2007 *Intensive Cultural Resources Survey of the North Brushy Creek Interceptor Extension, Phase 1, Cedar Park, Williamson County, Texas*. HJN 060258. Horizon Environmental Services, Inc., Austin, Texas.

2007 *Cultural Resources Survey of 2.4 Miles of Proposed Pipeline Reroutes, Dripping Springs Wastewater Treatment System, Dripping Springs, Hays County, Texas*. HJN 050073.002. Horizon Environmental Services, Inc., Austin, Texas.

2007 *Intensive Cultural Resources Survey of the Loop 4 Extension Project, Buda, Hays County, Texas*. HJN 070071. Horizon Environmental Services, Inc., Austin, Texas.

2007 *Intensive Cultural Resources Survey of 3,550 Feet of Jurisdictional Waterways on the 112-Acre Brushy Creek Business Park Tract, Williamson County, Texas*. HJN 050006. Horizon Environmental Services, Inc., Austin, Texas.

2007 *Intensive and Reconnaissance Cultural Resources Survey of the Bexar Metropolitan Water District's Trinity Aquifer Water Supply Project, Bexar County, Texas*. HJN 070012. Horizon Environmental Services, Inc., Austin, Texas.

2007 *Intensive Cultural Resources Survey of the 65.5-Acre Southeast Metropolitan Park Expansion and 2.3-Mile Raw Water Pipeline Right-of-Way, Austin, Travis County, Texas*. HJN 070062. Horizon Environmental Services, Inc., Austin, Texas.

2007 *Intensive Cultural Resources Survey of Section 404 Jurisdictional Waterways on the 260-Acre Winding Creek Tract, Williamson County, Texas*. HJN 070032. Horizon Environmental Services, Inc., Austin, Texas.

2007 *An Intensive Cultural Resources Survey and Subsequent NRHP Eligibility Testing of the USACE Jurisdictional Areas within the Proposed 4.5-Mile Townsen Road Right-of-Way,*

Montgomery and Harris Counties, Texas (with Abigail Peyton and Russell K. Brownlow). HJN 050161. Horizon Environmental Services, Inc., Austin, Texas.

2007 *Intensive Cultural Resources Survey of 2.0 Miles of the Proposed Grande Avenue Extension Project, New Copeland Road to SH 110, Tyler, Smith County, Texas*. HJN 070066. Horizon Environmental Services, Inc., Austin, Texas.

2007 *Intensive and Reconnaissance Cultural Resources Survey of the City of Meridian 14.8-Mile Treated Water Delivery System, Bosque County, Texas*. HJN 050182. Horizon Environmental Services, Inc., Austin, Texas.

2007 *An Intensive Cultural Resource Survey of the USACE Jurisdictional Areas within the Proposed 6-Mile Loco Bayou Pipeline Right-of-Way, Angelina and Nacogdoches Counties, Texas* (with Pollyanna Held and Russell K. Brownlow). HJN 060053. Horizon Environmental Services, Inc., Austin, Texas.

2007 *Intensive Cultural Resources Survey of the Possum Kingdom Lake Hike and Bike Trail, Phase II, Palo Pinto County, Texas*. HJN 070148. Horizon Environmental Services, Inc., Austin, Texas.

2006 *Archeological Surveys in the Texas Department of Transportation's Abilene, Brownwood, Fort Worth, and Waco Districts, 2006*. HJN 060170. Texas Department of Transportation, Environmental Affairs Division, Archeological Studies Program, Report No. 90. Horizon Environmental Services, Inc., Austin, Texas.

2006 *Intensive Archeological Survey of 5.6 Miles of US 290 from US 183 to Gilleland Creek, Travis County, Texas*. HJN 040029.006. Horizon Environmental Services, Inc., Austin, Texas.

2006 *Intensive Archeological Survey of Farm-to-Market Road 1460 from Old Settler's Boulevard to Quail Valley Cove, Georgetown, Williamson County, Texas*. HJN 040029.006. Horizon Environmental Services, Inc., Austin, Texas.

2006 *An Intensive Cultural Resources Survey of the Sun 6-Inch-Diameter Pipeline Reroute, Orange County, Texas* (with Abigail Peyton and Russell K. Brownlow). HJN 060123. Horizon Environmental Services, Inc., Austin, Texas.

2006 *Intensive Archeological Survey of 3.9 Acres of New Right-of-Way at the Intersection of FM 3405 and Ronald Reagan Boulevard, Williamson County, Texas*. HJN 060194. Horizon Environmental Services, Inc., Austin, Texas.

2006 *Interim Report: Phase Ia Cultural Resource Inventory Survey, Lake Columbia Water Supply Project, Cherokee and Smith Counties, Texas* (with Terri Myers, Charles D. Frederick, Reign Clark, Abigail Peyton, and A. Elizabeth Butman). HJN 050082. Horizon Environmental Services, Inc., Austin, Texas.

2006 *Intensive Cultural Resources Survey of Two Road Easements in Buescher State Park, Bastrop County, Texas* (with Reign Clark and Marie Archambeault). HJN 060178. Horizon Environmental Services, Inc., Austin, Texas.

2006 *Cultural Resource Survey of 3.1 Miles of the US Highway 69 Expressway and Reliever Route, Jacksonville, Cherokee County, Texas* (with contributions by Abigail Weinstein). HJN 050093. Horizon Environmental Services, Inc., Austin, Texas.

2006 *Intensive Cultural Resource Survey of 58.2 Acres of Langham Creek for the Langham Creek Flood Bypass Project, Harris County, Texas* (with Abigail Peyton). HJN 060160. Horizon Environmental Services, Inc., Austin, Texas.

2006 *Cultural Resource Survey of 6,600 Feet of Langham Creek for the Langham Creek Flood Bypass Project, Harris County, Texas*. HJN 060001. Horizon Environmental Services, Inc., Austin, Texas.

2006 *Intensive Cultural Resources Survey of the La Nana Bayou Detention Ponds, Nacogdoches County, Texas* (with Marie J. Archambeault). HJN 060068. Horizon Environmental Services, Inc., Austin, Texas.

2006 *Cultural Resource Survey of the City of Jarrell Wastewater Treatment System, Williamson County, Texas*. HJN 050130. Horizon Environmental Services, Inc., Austin, Texas.

2005 *Cultural Resource Survey of the Farm-to-Market Road 2001 Extension Project, Buda, Hays County, Texas*. HJN 050140. Horizon Environmental Services, Inc., Austin, Texas.

2005 *Cultural Resource Survey of the 46-Acre Arbor Walk Property, Austin, Travis County, Texas*. HJN 040109. Horizon Environmental Services, Inc., Austin, Texas.

2005 *Cultural Resource Survey of Reunion Ranch, a 550-Acre Property in Hays County, Texas*. HJN 040065. Horizon Environmental Services, Inc., Austin, Texas.

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