Part three of four

Identification of Historic Properties
within the Area of Potential Effects for
Tenaska Brownsville Partners'
Tenaska Brownsville Generating Station,
Cameron County, Texas

Attachment 2

Finding of No Adverse Effect to
Archeological and Historic Resources
Associated with the
Transmission Interconnect Line:
Brownsville, Cameron County, Texas

December 18, 2013
Project No. 0185680

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Attachment 2 - Finding of No Adverse Effect to
Archeological and Historic Resources
Associated with the Tenaska
Brownsville Generating Station
Transmission Interconnect Line:
Brownsville, Cameron County, Texas

Cultural Resources Assessment (CRA) –Tenaska Brownsville Generating Station – Transmission Interconnect Line

Tenaska Brownsville Partners, LLC
Cameron County, Texas

December 18, 2013

www.erm.com

Tenaska Brownsville Partners, LLC

Cultural Resources Assessment (CRA) – *Tenaska Brownsville Generating Station – Transmission Interconnect Line*

EPA Submission

December 18, 2013

Project No. 0185680
Cameron County, Texas

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ABSTRACT

Report Title: Tenaska Brownsville Partners, LLC – Cultural Resources Assessment: Transmission Interconnect Line

Report Date: December 18, 2013

Sponsor: Tenaska Brownsville Partners, LLC (Tenaska)

Agency: U.S. Environmental Protection Agency (EPA)

Permit Number: Texas Archeological Commission (TAC) Permit # 6694

Report Background: Environmental Resources Management (ERM) completed cultural resources investigations for a transmission interconnect line with Loma Alta Substation located in Cameron County, Texas related to the anticipated Tenaska Brownsville Generating Station Project and in support of a Greenhouse Gas (GHG) Prevention of Significant Deterioration (PSD) Permit Application for the generating station project. Coastal Environments, Inc., (CEI), under contract to ERM, assisted with the background research, Phase I intensive archeological survey, and metal detection survey of the Transmission Line Right-of-Way location. The GHG permit will be issued by the U.S. Environmental Protection Agency (EPA) under the PSD program of the Clean Air Act (CAA). Because the Tenaska Brownsville Generating Station Project will require a permit issued from the EPA, it and its connected actions are subject to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended.

The purposes of the information presented in this report are to:

- Identify historic properties (archeological and aboveground) located within the Area of Potential Effect (APE) for the Transmission Line Project; and
- Describe the effects of the Transmission Line Project on identified historic properties.

The information provided in this report is intended for utilization by the EPA in the agency's compliance with Section 106 of the NHPA pursuant to the issuance of the GHG PSD Permit. This current report has been prepared to support the Section 106 process as outlined in ERM's cultural resources report (Cultural Resources Assessment: Tenaska Brownsville Generating Station [ERM: August 6, 2013]), which is being submitted to support Tenaska's GHG permit application.

Tenaska is planning to build and operate a natural gas-fueled, combined cycle electric generating station with a nominal capacity of approximately 800 megawatts. Additionally, Tenaska proposes an alternative version with a nominal capacity of 400 megawatts. The generating station proposal includes up to two combustion turbines with supplementary fired heat recovery steam generators (HRSGs), one steam turbine generator, one cooling tower, auxiliary equipment, storm water retention structure(s), storm water outfall(s), one transmission interconnect line, access roads, and construction laydown area. This report discusses a transmission interconnect line extending from the generating station location to the Loma Alta Substation near the Port of Brownsville.

Identification of Historic Properties: The APE for this project was established as a 0.5 mile area extending out from either side of the Transmission Line center line. Archeology was investigated within the direct impact area which extended 50 feet out from both sides of the Transmission Line centerline within the APE. Aboveground resources were investigated for direct (within 50-feet of the centerline) and indirect impacts (within 0.5-mile of the centerline) within the APE. The APE of 0.5 miles was established following a meeting between Tenaska, ERM and the THC, where ERM was directed by THC to use Federal Communications Commission (FCC) standards for project height when determining the transmission line project's APE.

Prior to the survey, several historic-era resources were known to be in the project vicinity: the Palo Alto Battlefield National Historic Site National Historic Landmark (NHL), the Southern Pacific Railroad, Port Isabel and Rio Grande Valley Railroad, the Ranch Viejo Floodway, features associated with Cameron County Drainage District No. 1 (CCDD1), and unassociated irrigation and drainage ditches. The CCDD1 ditches were identified as potentially eligible in ERM's main CRA for the generating station (*ERM CRA: 2013*).

ERM's CRA - Additional Action #2: Transmission Interconnect Line reports the findings of the 11.7-mile project site/utility line ROW. The ROW extends from the 275-acre tract of undeveloped land (generating station) located near the intersection of FM 511 and Old Alice Road to the Loma Alta Substation located on Chemical Road just north of Hwy 48 near the Rancho Viejo Floodway. From the generating station, the ROW heads north for approximately 1 mile where it crosses Main Drainage Ditch No. 2 and then heads east, paralleling the ditch for approximately 5.4 miles. The line turns slightly northeast and parallels the ditch again on the northern side until turning south for approximately 1.7 miles. The line heads southeast for approximately 2.1 miles before turning south for another 1.5 miles before turning southeast to connect to the Loma Alta Substation.

The archeological investigation examined the direct impact area within the APE, which consists of a 100-foot (30 m) ROW. The surface inspection, shovel testing, and metal detection survey did not identify any significant archeological resources and only one isolated historic artifact was found.

The aboveground investigation did not identify any additional resources with the potential to be eligible for listing in the NRHP.

No additional historic properties with the potential to be eligible for listing in the NRHP were observed within the APE of the Transmission Line.

Coordination with Potential Stakeholders: ERM, on behalf of Tenaska, coordinated with the THC and the NPS in spring of 2013.

Assessment of Effects: No archeological historic properties were identified within the Transmission Line APE. Two (2) aboveground historic properties were identified within the APE: the Palo Alto Battlefield National Historic Landmark and the CCDD1, both of which are located within the indirect impact area. Application of the Criteria of Adverse Effect resulted in the finding that these resources will be affected by the transmission line, but not adversely.

Recommendations: ERM recommends that additional shovel testing be completed along a 0.6-mile segment of the Transmission Line survey area, north of Palo Alto Battlefield, due to accessibility challenges encountered in the vicinity. Although an attempt was made to completely inventory this area during the archeological inventory, the dense vegetation precluded some shovel test excavations. As this portion of the line is located north of the Palo Alto Battlefield National Historic Landmark boundary, there is a higher probability for cultural resources. Additionally, ERM recommends deeper testing by hand-augering at pole locations within paleochannels to identify buried paleosols. This work would be completed prior to the start of the transmission line construction and concluded in an addendum report.

Project Number: ERM Project No. 0185680

Project Location: Cameron County

Acres Surveyed: 11.7 linear miles by 100 feet (141.8 acres) Archeology
11.7 linear miles by 0.5 mile (3,744 acres) Aboveground

Identified Resources:

- 0 (Archeology)
- 6 (Aboveground)
  - Palo Alto Battlefield National Historic Site
  - Cameron County Drainage District No. 1
  - Southern Pacific Railroad
  - Port Isabel and Rio Grande Valley Railroad
  - Rancho Viejo Floodway
  - Irrigation and Drainage Ditches (Unassociated)

NRHP-Listed Properties:

- 0 (Archeology)
- 1 (Aboveground)
  - Palo Alto Battlefield National Historic Site

NRHP-Eligible Properties:

- 0 (Archeology)
- 1 (Aboveground)
  - Cameron County Drainage District No. 1 (potentially eligible)

NRHP-Ineligible Properties:

- 0 (Archeology)
- 4 (Aboveground)
  - Irrigation and Drainage Ditches (unassociated)
  - Southern Pacific Railroad
  - Port Isabel and Rio Grande Valley Railroad
  - Rancho Viejo Floodway

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Environmental Resources Management (ERM) completed a cultural resources assessment (CRA) for a transmission interconnect line with Loma Alta Substation located in Cameron County, Texas related to the anticipated Tenaska Brownsville Generating Station. In accordance with the Prevention of Significant Deterioration (PSD) provisions of the Clean Air Act and the implementing regulations at 40 CFR 52.21 as administered by the U.S. Environmental Protection Agency (EPA), Tenaska Brownsville Partners, LLC (Tenaska) submitted a Greenhouse Gas (GHG) PSD Permit Application for a electric generating station (the "Project") on February 15, 2013.

If the Project is issued a GHG PSD Permit by the EPA, the Project is subject to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. Tenaska plans to initiate construction of the Project, known as the Tenaska Brownsville Generating Station, in early 2015 and begin operation by mid-2017.

The purposes of the information presented in this report are to:

1) Identify historic properties (archeological and aboveground) located within the Transmission Interconnect Line (Transmission Line) Area of Potential Effects (APE); and
2) Describe the effects of the Transmission Line on identified historic properties.

The information provided in this report is intended for utilization by the EPA in the agency's compliance with Section 106 of the NHPA pursuant to the issuance of the GHG PSD Permit. This current report has been prepared to support the Section 106 process as outlined in ERM's completed cultural resources report (Cultural Resources Assessment (CRA): Tenaska Brownsville Generating Station [ERM: August 6, 2013]), which is being submitted to support Tenaska's GHG permit application.

Prior to the survey, several historic-era resources were known to be in the vicinity: the Palo Alto Battlefield National Historic Landmark (NHL), the Southern Pacific Railroad, Port Isabel and Rio Grande Valley Railroad, the Ranch Viejo Floodway, features associated with Cameron County Drainage District No. 1 (CCDD1), and unassociated irrigation and drainage ditches. The CCDD1 ditches were identified as potentially eligible in ERM's main CRA for the generating station (ERM CRA: 2013).

The archeological investigation examined the direct impact area of the APE, which includes the Transmission Line (identified as a 100-foot-wide ROW that connects the Tenaska Brownsville Generating Station with the Loma Alta Substation). By definition, the ROW typically extends 50-feet on both sides of the centerline of the transmission line; therefore ERM's archeological investigation examined ROW's boundaries. The surface inspection, shovel testing, and metal detection survey did not identify any archeological sites.

Aboveground investigations did not identify any additional resources with the potential to be eligible for listing on the NRHP.

For the Palo Alto Battlefield National Historic Landmark and the potentially eligible CCDD1, the application of the Criteria of Adverse Effect resulted in the finding that these historic resources will be affected by the construction of the transmission line, but not adversely.

ERM recommends that additional shovel testing be completed along a 0.6-mile segment of the Transmission Line survey area, north of Palo Alto Battlefield, due to accessibility challenges encountered in the vicinity. Although an attempt was made to completely inventory this area during the archeological inventory, the dense vegetation precluded some shovel test excavations. As this portion of the line is located north of the Palo Alto Battlefield National Historic Landmark boundary, there is a higher probability for cultural resources. Additionally, ERM recommends deeper testing by hand-auguring at pole locations within paleochannels to identify buried paleosols. This work would be completed prior to the start of the transmission line construction and concluded in an addendum report.

Tenaska understands that the EPA, as the lead federal agency and in consultation with relevant stakeholders, will make the final determinations regarding the effects of the project on historic properties.

1.0 INTRODUCTION

Tenaska Brownsville Partners, LLC (Tenaska) is proposing construction of a new natural gas-fueled power plant, the Tenaska Brownsville Generating Station, in south central Cameron County, Texas, outside of Brownsville. Tenaska has retained ERM to assist them in conducting investigations and preparing documentation expected to be required as part of the federal permitting process for the facility. Construction of the plant is projected to commence in early 2015 and the plant is to begin commercial operations in mid- 2017.

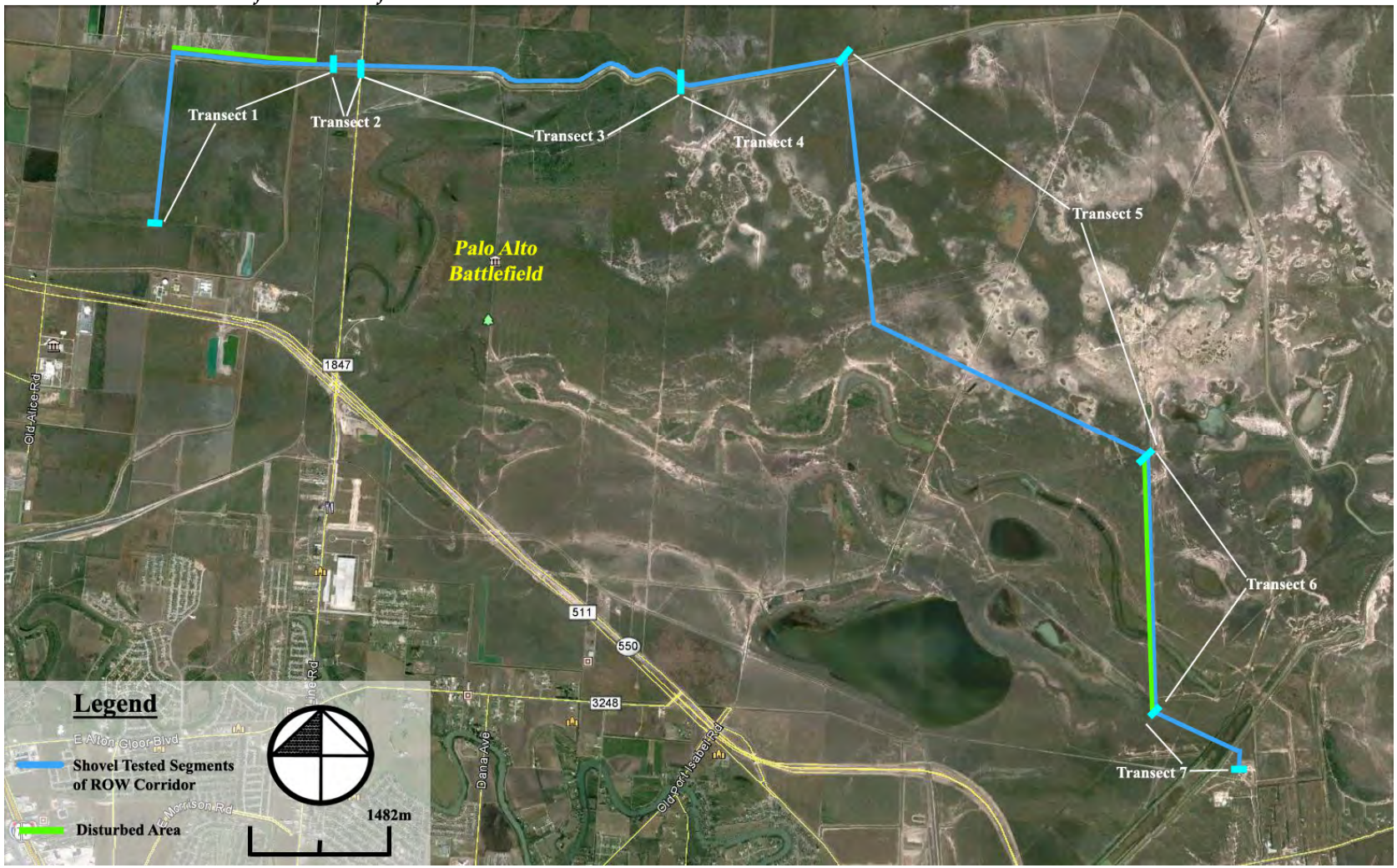
Tenaska is seeking a Greenhouse Gas (GHG) Permit under the Environmental Protection Agency's (EPA's) Prevention of Significant Deterioration (PSD) program of the Clean Air Act (CAA). Because the EPA is, as of the date of this report, the authority issuing GHG permit in the state of Texas, the requirements of Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, become part of the EPA's GHG permitting process. The EPA has requested that Tenaska undertake cultural resources investigations within the project's Area of Potential Effects (APE) to identify historic properties and to conduct preliminary coordination with expected stakeholders to the Section 106 process.

An investigation of the 275-acre power plant site was completed and the results are reported in Cultural Resources Assessment (CRA): Tenaska Brownsville Generating Station (ERM: August 6, 2013). However, the installation of the Transmission Interconnect Line from the generating station to the Loma Alta Substation requires the use of additional rights of way (ROWs) not considered in that CRA report.

The Transmission Interconnect Line (Transmission Line) is a connected action to the generating station undertaking. Section 106 of the NHPA requires the cultural investigation of this additional APE. Specifically, the Brownsville Public Utilities Board (BPUB) proposes to install a transmission line from the Tenaska Brownsville Generating Station, located west of the Palo Alto Battlefield NHL, trending roughly north, then east (north of the battlefield) and then roughly south and southeast (east of the battlefield) to where it will interconnect with the Loma Alta Substation, which is located west of the Port of Brownsville. The entire 11.7-mile long ROW (100-foot wide) was investigated for archeology and the entire APE (0.5-mile wide) was investigated for aboveground resources.

Figure 1-1 depicts the entire route of the Transmission Line survey area. Portions of the survey area within the direct impact area of the ROW were determined to be disturbed during the archeological investigations; however, the majority of the ROW was not disturbed.

FIGURE 1: Overview of the ROW for the Transmission Interconnect Line



The direct impact area of the APE, for the purposes of the archaeological and metal detection survey, is presumed to consist of the entire ROW (100-foot wide). A total of 78 towers (aka, "poles") will be constructed approximately every 250 meters (820 feet) along the route. The Transmission Interconnect Line will be a double circuit 345 kV line consisting of single-pole structures along the line and dead-end structures on the turns.

The indirect impact area of the APE was established as 0.5 miles from the ROW centerline. The reconnaissance-level aboveground survey of the APE consisted of a vehicular and pedestrian visual investigation.

The background research and fieldwork were completed between October 7 and 20, 2013. A series of discussions with Palo Alto Battlefield National Historical Park archeologist Rolando Garza before the Power Generating Station and Wastewater Discharge Utility Line surveys were conducted earlier this year and focused on the possibility of finding archeological sites and artifacts associated with the Battle of Palo Alto in the vicinity. These discussions, confirmed by background research as well as the data gathered for ERM's CRA (2013), indicated that no activities related to the battle, the Civil War, or other notable historic events were known to have occurred within the direct impact area. The one exception to this is that the Old Port Isabel Road was used by troops before the battle. Any possible evidence remaining would likely have been destroyed by maintenance and improvement to the current gravel road.

The review of the THC Archeological Sites Atlas and the NRHP database confirmed the presence of one (1) previously recorded historic property (the Palo Alto Battlefield National Historic Landmark) and four previously recorded archeological sites within a 1.5-mile (2.4 km) buffer of the ROW centerline.

Other historic-era resources located in the study area of the Transmission Line include the Port Isabel and Rio Grande Valley Railway and a connected "Old Railroad Grade" that are first depicted on the 1930 East Brownsville 7.5-minute quadrangle and a complex of historic-era ditches and irrigation control features including the Rancho Viejo Floodway and the CCDD1.

A total of approximately 11.7 miles were surveyed and no archaeological sites were encountered. A total of 328 shovel test probes (STPs) were excavated across all 7 transects for the length of the ROW. Thirty (30) meter (98-foot) transects were employed in higher probability areas. High probability for prehistoric sites was assigned to areas close to streams and paleochannels. Historic high probability areas were determined to be those areas close to the battlefield. All of the transects were subjected to metal detection survey to test for the presence of military artifacts associated with the Battle of Palo Alto or other historic events. Metal detection survey was attempted in all parts of the ROW but problems such as thick underbrush and highly ferrous soils impaired the survey of some transects and parts of other transects. No prehistoric artifacts were recovered and only one historic artifact was found on the surface of the ROW. No sites or

features were recorded during any part of the survey. This report summarizes the findings of cultural research and surveys to locate aboveground and archeological cultural resources within the Transmission Line APE.

1.1 SECTION 106 UNDERTAKING

The Antiquities Code of Texas of 1969 requires state agencies and political subdivisions of the state — including cities, counties, river authorities, municipal utility districts, and school districts — to notify the THC of ground-disturbing activity on public land. Since the majority of the 19-kilometer (11.84-mile) Transmission Line survey area fell within public land, specifically BPUB's ROW, a Texas Antiquities Permit was required from the TAC, a division under the THC's State Historic Preservation Officer (SHPO). The TAC Permit #6694 was issued on October 17, 2013.

In addition to conducting field surveys and documentary research, ERM coordinated with the THC to identify historic properties in the APE. Tenaska understands that a formal assessment of the effects of the Project on historic properties must reasonably account for connected actions, and that the Section 106 process cannot be concluded until those effects are assessed.

1.2 PROJECT DESCRIPTION

A complete description of the Tenaska Brownsville Generating Station has been provided in the ERM CRA (2013); please refer to that document for information specific to the generating station.

The Transmission Line is considered a connected action to the generating station project along with other possible connected actions including:

- Water Re-use Pipeline;
- Supplemental Water Supply Line;
- Sewer Interconnect Line;
- Water Discharge Line;
- Natural Gas Transmission Pipeline Line.

An interconnect sewer utility line will be constructed to provide connection to carry sanitary waste into the city systems. Non-contact storm water runoff from the site will drain into a drainage ditch via storm water outfall(s) located along the southern boundary of the property, which is owned and operated by Cameron County Drainage District No. 1 (CCDD1).

The utility wastewater pipeline was originally designated for discharge to the city sewer and wastewater system under terms of a pretreatment permit; however, recent adjustments to the facility plans now include the possibility of a

utility wastewater line running from the electric generating station to a outfall located on the Brownsville Ship Channel.

Potable water will be provided by the BPUB by an interconnect line from the vicinity of the Southmost Regional Water Authority (SRWA) Treatment Plant located immediately south of the site property.

Natural gas and water supply for the generating station will be provided through pipelines and facilities constructed, owned, and operated by the BPUB that serves other sites as well. A 24-inch diameter natural gas pipeline will originate from near Edinburg, Texas and extend southeasterly for approximately 58 miles, near the Project property, then to the Port of Brownsville. An interconnect line will be constructed within the property boundary of Project from this line to provide natural gas to the generating station.

The generating station will utilize reclaimed municipal treated effluent provided by the BPUB Robindale Wastewater Treatment Plant located approximately 6 miles southeast of the generating station project location. General alignment of the reuse pipeline indicates that it will be run northwesterly from the Robindale Plant up to the future industrial park area located along FM 511 near SRWA Treatment Plant. The Project estimates an average make-up water demand of 5-6 million gallons per day (MGD) with a peak demand of 8 MGD.

As previously described, the generating station project (ERM CRA: 2013) will have several interconnects including electrical transmission, wastewater, make-up water, and potable water. Although the layouts and designs for the interconnect lines are not finalized, each of the lines is located entirely within the Action Area [50 CFR 402.02] determined for the overall project.

1.3 SITE LOCATION AND HISTORY

The survey area is centrally located within Cameron County in south Texas, approximately seven miles north of Brownsville. The ROW essentially skirts around the Palo Alto Battlefield NHL. The closest part of the ROW to the battlefield is Transects 2 and 3 that run east-west along the north boundary of the larger battlefield area; however, the battlefield itself is well to the south (~825 meters) of this line. Several historic and prehistoric archaeological sites are present in the area, but none have been recorded along the ROW of the transmission line.

The entirety of the Transmission Line ROW is underlain by "Alluvium in Rio Grande" according to the Bureau of Economic Geology (According to the Natural Resources Conservation Service (NRCS) soils survey, the county is dominated by clay and clay loam soils, specifically Laredo silty clay loam, Raymondville clay loam, Harlingen clay, Sejita silty clay loam, Lomalta clay, Barradda clay and Olmito silty clay. Hydrological features stem primarily from various tributaries of the Rio Grande River. Land cover surrounding the Survey area is comprised predominantly by former agricultural croplands, shrubland,

and undeveloped lands. Heavy brush prevented survey around the Resaca that provides the northern and western boundaries of the Palo Alto Battlefield. The rest of the Transmission Line ROW was covered with Spartina and other ground cover that kept visibility below 30%throughout the majority of the APE. Based on review of historic aerial and topographic maps, the route has remained largely undeveloped but may have been used for agriculture including pasturage.

Known historic-era resources in the vicinity of the Transmission Line include:

- Cameron County Drainage District No. 1;
- Irrigation and Drainage Ditches (unassociated);
- Port of Brownsville;
- Southern Pacific Railroad;
- Port Isabel and Rio Grande Valley Railroad;
- Rancho Viejo Floodway; and
- Palo Alto Battlefield.

1.4 AREA OF POTENTIAL EFFECTS

As defined in 36 CFR §800.4(a)(1) and 36 CFR §800.16(d), the APE of an undertaking is "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." According to the Texas Historical Commission (THC) State Historic Preservation Officer's (SHPO) Section 106 Regulations Users Guide, the APE includes "all areas of construction, demolition, and ground disturbance (direct effects) and the broader surrounding area that might experience visual or other effects from the project (indirect effects)".

1.4.1 Direct Impact Area

The Transmission Line ROW is located within Cameron County, TX, and consists of an approximately 11.7-mile long transmission interconnect line containing 78 pole locations. Potential direct impacts during construction will be limited to the ROW, are of short duration, and are anticipated to be temporary. The utility poles and the transmission line (wires) will be the only permanent structures once the construction is completed.

Construction designs for the proposed transmission interconnect line have not been finalized at the time of this evaluation. It is anticipated that construction and placement of each utility pole will require ground disturbance of an area 10 to 16 feet in diameter. Each utility pole will require a single hole which will be either direct placement or placement in caissons to a depth of approximately 30 feet depending on engineering design. Utility pole heights will be on average of 140 feet high with some poles reaching 170 feet and they will be placed 500 to 700 feet apart.

The direct impact area within the 0.5 mile (0.80 km) APE consists of the actual ROW, which extends 50 feet (15 m) out from the centerline of the ROW in both directions (for a total of 100 feet [30 m]). The ROW extends from the 275-acre tract of undeveloped land located near the intersection of FM 511 and Old Alice Road where the power generating station will be constructed, to the Loma Alta substation located on Chemical Road just north of Hwy 48 near the Rancho Viejo Floodway. From the generating station property, the ROW heads north for approximately 1.0 mile where it crosses Main Drainage Ditch No. 2 and then heads east, paralleling the ditch for approximately 5.4 miles. The line turns slightly northeast and parallels the ditch again on the northern side until turning south for approximately 1.7 miles. The line heads southeast for approximately 2.1 miles before turning south for another 1.5 miles before turning southeast to connect to the Loma Alta Substation.

1.4.2 Indirect Impact Area

The aboveground investigation included a visual inspection of aboveground buildings, structures, objects, sites and districts within 0.5 mile from either side of the transmission line's centerline. Because the transmission line will include of 78 tower structures, and these towers are expected to have the greater impact on historic properties should they be present, ERM referred to the September 2004 Nationwide Programmatic Agreement for Review of Effects on Historic Properties for Certain Undertakings Approved by the Federal Communications Commission (FCC PA) in determining the study area for aboveground resources. The FCC PA stipulates a 0.5-mile Area of Potential Effects (APE) for cell towers 200 feet or less. Based upon discussions with BPUB, Tenaska understands that the transmission towers will be less than 200 feet in height.

1.5 GENERAL APPROACH

Cultural resources investigations conducted for compliance purposes are often divided into multiple phases to enable the consideration of information resulting from each phase in determining the need for and planning the next.

ERM's cultural resources investigations as summarized in this report consisted of a Phase I archeological survey within the direct impact area within the APE and a reconnaissance survey of aboveground resources within the full APE (direct and indirect). The Phase I archeological survey did not result in the identification of any archeological resources with the potential to be historic properties. However, there is a 0.6-mile portion of the transmission line ROW located north of the Palo Alto Battlefield where vegetation was very dense. ERM recommends that additional shovel testing be completed along this portion of the ROW. Additionally, ERM recommends deeper testing by hand-augering at pole locations within paleochannels to identify buried paleosols. This work would be completed prior to the start of the transmission line construction and concluded in an addendum report.

Finally, ERM determined that the aboveground investigations conducted in this study and the work performed in ERM's CRA (2013) was sufficient to identify potentially eligible aboveground resources in the APE. It is ERM's opinion that these efforts represent a sufficient, good faith effort to identify historic properties that may be affected by Tenaska's project.

Background research was conducted prior to, during, and after execution of field investigations, and included review of: the THC's Atlas online database, site files and library; other cultural resources reports for projects in the area; NRHP data layers and other online inventories; historic maps; selected scholarly research; and desktop reference materials. One historic property was identified adjacent to the Survey area prior to conducting the cultural resources surveys: the Palo Alto Battlefield National Historic Site, an NHL also listed in the NRHP and historically significant as the site of the first battle of the U.S.-Mexican War on May 8, 1846.

The boundaries of the Palo Alto National Historical Park were designated in 1991 and amended in 2008 include approximately 1,352.9 hectares (3,343 acres) of public and private lands. This large parcel borders the east side of Paredes Line Road for approximately two miles. The Battlefield is partially owned and operated by the NPS.

The archeological survey and metal detection survey were completed between October 20 and October 31, 2013. The aboveground survey was conducted between October 21 and October 22, 2013. These efforts are in compliance with the Secretary of the Interior's (SOI's) Standards and Guidelines for Archeology and Architectural History (48 FR 44716).

As is discussed in Section 1.3 of this CRA the surface geology of the Transmission Line APE is defined as Alluvium in Rio Grande (USDI 2013). The inter-distributary fine sediment and sands that make up the formation were deposited by the Rio Grande during the Holocene Epoch. The depth of these deposits allow for the possibility of deeply buried archaeological sites.

Seven (7) different soil series are mapped in the organic, saline, fine sediments of the survey area. These soils series are distinct but texturally and structurally they are very similar. The distinctions between the soil series have developed as an indirect result of the dynamics of alluvial deposition and they reflect the fine environmental changes that accompany the various surfaces of the current landscape. Because the parent material was deposited as distinct landforms they have different histories of surface water and water table interactions. All of the soils are very hard, very firm, and very sticky and have significant components of humus, and sodium and other salts. Eolian deposits are part of the parent material and all the soils have formed in Holocene deposits. Shrink-swell cracks frequently exceeded a meter in depth in the Benito and Chargo soils. Animal burrows are common and locally the soils have a strong organic component. Fiddler crabs and their burrows are very common at the direct APE (SSS NRCS USDA 2013).

The Lomalta Series forms on level to slight depressions, typically, marshy surfaces. The A horizon is usually 0-12 centimeters (0-5 inches) thick and composed of gray to dark gray clay. This soil has a moderate fine and medium angular and subangular blocky structure. It is saline, strongly effervescent, and moderately alkaline. A gradual, smooth boundary separates the A horizon from the first B horizon. The first B horizon is gleyed due to frequent longterm saturation. The soil is a saline, gray clay (5Y 6/1) and displays a weak course prismatic structure that parts to medium blocky. This horizon is 12-36 centimeters (5-15 inches) thick and terminates in a gradual, smooth boundary. The next B horizon (Bssgz1 and 2) has two parts. Both are 10YR 5/1 clay, display a medium wedge structure, and have prominent slickensides. Both are also saline, strongly effervescent, and moderately alkaline. They are separated by a gradual, smooth boundary. In addition to these descriptors, the lower part includes 5 percent (by volume) salt masses and crystals. A gradual wavy boundary separates this 20-69 centimeters (8-27 inches) thick horizon from the next B horizon. The next B horizon is composed of a lighter and browner gray (2.5YR 6/2) clay loam 0-12 centimeters (0-8 inches) thick. Included in this horizon are yellowish brown concentrations of iron and gray sediment-filled land-crab krotovinas. Below a gradual, smooth boundary is a very pale gray (10YR 7/3), silt loam C horizon (SSS NRCS USDA 2013b).

Chargo series soils form on stream terraces and typically have an Ap horizon 0-13 centimeters (0-5 inches) thick. This horizon is a mix of loose gray aeolian sediment and dark grayish brown silty clay that create a massive and cloddy structured gray (10YR 5/1) silty clay. Below an abrupt, smooth boundary is a

two part Az horizon totaling 10-40 centimeters (4-16 inches) thick. The upper part is dark grayish brown (10YR 4/2) silty clay and the lower part is grayish brown (10YR 5/2) and has the same texture. Both parts have moderate fine and medium subangular structure with a few wedge shaped peds. Like all the soils at the Direct APE this horizon is very hard, very firm, and very sticky. Threads and masses of salt are common. This horizon is strongly effervescent, moderately alkaline, and saline. Below a gradual wavy boundary are a Bz followed by a Bkz horizon. The Bz horizon is slightly browner (10YR 5/3) than the lowest part of the A horizon but otherwise share composition and structure. It is typically 13-40 centimeters (5-19 inches) thick. A gradual boundary separates the Bz and the Bkz horizon. The Bkz horizon is light brownish gray (10YR 6/2) silty clay and displays a weak, fine, angular blocky structure. This horizon is 8-30 centimeters (3-12 inches) thick and displays a weak, fine angular blocky structure and common masses and concretions of calcium carbonate. Below a clear, wavy boundary are two C horizons. The Cz horizon is 10-40 centimeters (4-10 inches) thick and very pale brown (10YR7/3), massive, silt loam that is violently effervescent. The final horizon is a Ckz composed of massive, light brown (7.5 6/4) silty clay with common masses and concretions of calcium carbonate (SSS NRCS USDA 2013b).

Benito series soils form on level terraces at higher elevations than overflow would typically reach. All of the horizons are saline and all but the top A horizon have accumulation of salts more soluble than gypsum. The profile has three A horizons that total 50-87 centimeters (20-34 inches) thick. The top 1.9-4.7 centimeters (5-12 inches) constitute an Az horizon comprised of gray (N 6/0) clay with a weak, fine granular and subangular blocky structure. Below a gradual smooth boundary is an Anz horizon that is light grayish brown (10YR 6/2) with a fine angular blocky structure. This horizon is 102-152 centimeters (40-60 inches) thick and is very hard, very firm, very sticky and very plastic. Salt threads are common and it is strongly effervescent and saline A diffuse, gradual boundary separates the Anz from the ACnz horizon. The ACnz horizon is a pale brown silt loam that is 13-38 centimeters (5-15 inches) thick. Iron concentrations and depletions are common and many calcium carbonate concretions and soft masses are present. Land crab krotovinas are common. An abrupt, smooth boundary separates this horizon from the lower 2CKnz horizon. The 2CKnz horizon is pale brown (10YR 6/3) silt loam and has inclusions similar to the ACnz horizon. This horizon is also burrowed by land crabs (SSS NRCS USDA 2013b).

Laredo soils form on sloping tributary drainages or Holocene stream terraces. The Laredo series consists of very deep, well-drained, moderately permeable soils that formed in calcareous, silty alluvium derived from mixed sources. Slope ranges from 0 to 3 percent. Its Taxonomic Class is fine, silty, mixed, superactive, and contains hyperthermic torrifluventic haplustolls. Typical pedon described is Laredo silty clay loam on east-facing linear 0 to 1percent slopes, in cropland at an elevation of 12 meters (40 feet). The Ap horizon is 0-20 centimeters (0-8 inches) thick. The soil found here is dark grayish brown (10YR 4/2) silty clay loam. Its structure is weak, fine, subangular blocky to moderate, very fine, and angular.

Its composition is hard, friable, sticky and plastic. Also, it is strongly effervescent, moderately alkaline, and has a smooth abrupt boundary 10-31 centimeters (4-12 inches) thick, separating it from the A horizon below. The A horizon is 20-46 centimeters (8-18 inches) thick, and contains dark grayish brown (10YR 4/2) silt loam. Its structure is moderate, very fine, and granular to fine, subangular blocky. Its composition is hard, friable, sticky, and plastic with few fine pores. It is strongly effervescent, moderately alkaline, and has a clear wavy boundary 20-41 centimeters (8-16 inches) thick, separating it from the Bw horizon below. The Bw horizon is 46-104 centimeters (18-41 inches) thick, and contains light brownish gray (10YR 6/2) silt loam. It has a weak, fine, medium sub angular blocky structure. Its composition is slightly hard, friable, sticky, and plastic, with many fine pores. The horizon contains few insect tunnels and root channels filled with slightly darker material from the horizons above. Also, it contains 2 percent films and threads of calcium carbonate. It is violently effervescent, moderately alkaline, and has a clear wavy boundary of 41-91 centimeters (16-36 inches) thick separating it from the Bk/Ck horizon below. The Bk/Ck horizon is 104-125 centimeters (41-49 inches) thick. It contains 80 percent light brownish gray (10YR6/2) silty clay loam, with a thin stratum of silt loam (20 percent). Its composition is massive, slightly hard, friable, sticky, and plastic, with many fine pores. Also, there are 4 percent masses and concretions of calcium carbonate. The horizon is violently effervescent, moderately alkaline, and separated from the C horizon below by a clear wavy boundary 10-25 centimeters (4-10 inches) thick. The C horizon is 125-203 centimeters (49-80 inches) thick and contains light gray (10YR 7/2) silt loam with a thin strata of silty clay loam and very fine sandy loam. Its composition is massive, slightly hard, friable, violently effervescent, and moderately alkaline (SSS NRCS USDA 2013b).

Sejita series soils are found in channels of streams and drainages. They form in stratified alluvial and marine sediments and have been modified by deposits of eolian silt and clay blown from nearby tidal flats. It is taxonomically classified as fine, silty, mixed, active, and contains hyperthermic typic aquisalids. The typical pedon described is rangeland sejita silt loam. The Anz horizon is 0-5 centimeters (0-2 inches) thick and contains light brownish gray (10YR 6/2) silt loam. Its structure is weak, fine, and subangular blocky. Its composition is slightly hard, friable, sticky, and plastic and also contains common salt threads. The horizon is strongly saline, strongly effervescent, and strongly alkaline. It is separated from the horizon below by a clear wavy boundary 3-13 centimeters (1-5 inches) thick. The Bynz horizon is 5-17 centimeters (2-7 inches) thick, and contains a light gray (10YR 7/2) silty clay loam, and common medium distinct gray (10YR 6/2) streaks. Its structure is weak, course, angular, and blocky, and its composition is hard, friable, sticky, and plastic. Within this horizon are few gypsum crystals, few iron-manganese concretions, and common salt threads. The horizon is strongly saline, strongly effervescent, and strongly alkaline. It is separated from the horizon below by a gradual wavy boundary 8-25 centimeters (3-10 inches) thick. The second Bynz horizon is 18-50 centimeters (7-20 inches) thick, and contains light gray (10YR 7/2) silty clay loam, and a few gray (10YR 6/1) streaks. It has a weak, coarse prismatic structure, and the horizon is massive, hard,

friable, sticky, and plastic. It also contains few gypsum crystals, and common masses and threads of salt. The horizon is strongly saline, strongly effervescent, and strongly alkaline. It is separated from the Cynz horizon below by a diffuse wavy boundary 25-43 centimeters (10-17 inches) thick. The final horizon is Cynz, which is 50-152 centimeters (20-60 inches) thick. It contains a very pale brown (10YR 7/3) stratified silt loam, silty clay loam, and clay loam. It has a massive, hard, friable, sticky, and plastic structure. It also contains common to medium distinct dark gray (10YR 4/1), and strong brown (7.5 YR 5/6) masses of iron accumulation. Also, within the horizon are few gypsum crystals and few black concretions, and it is strongly saline, strongly effervescent, and strongly alkaline (SSS NRCS USDA 2013b).

The Latina Series forms in loamy marine and deltaic sediments, on nearly level low coastal terraces. The Az-horizon is usually 10 centimeters (0-4 inches) thick, and is composed of very dark gray sandy clay loam (10YR 3/1). It has a medium coarse subangular blocky and granular structure. This horizon is very hard, massive, friable, sticky, and plastic. Also, it contains a clear wavy boundary separating it from the horizon below, and is moderately alkaline and is strongly saline. The Bnz1 horizon is 10-23 centimeters (4-9 inches) thick, and consists of very dark gray (10YR 3/1) and dark gray (10YR 4/1) sandy clay loam. It has a prismatic structure parting to moderate fine and medium blocky, and is very hard, friable, sticky and plastic. Within the horizon are thin patchy clay films, few fine pores, and black organic stains on surfaces of peds. It is moderately alkaline and strongly saline, with a clear wavy boundary separating it from the horizon below. The Bnz2 horizon is 23-40 centimeters (9-16 inches) thick, and consists of a light brownish gray (10YR 6/2) sandy clay loam. It has a moderate fine and medium angular blocky structure, and is very hard, friable, sticky, and plastic. It also contains few fine pores, few patchy clay films, few fine faint yellowish brown masses of iron accumulation, and common threads of salt. Finally, it is slightly effervescent, moderately alkaline, and separated from the horizon below with a gradual wavy boundary. The Bknz level is 40-76 centimeters (16-30 inches) thick, and consists of light brownish gray (10YR 6/2) sandy clay loam. It has a weak coarse angular blocky structure, and is very hard, friable, sticky, and plastic. Within the soil are few fine pores, few faint yellowish brown masses if iron accumulation, and common threads and nests of salt. Lastly, it contains 4% masses of calcium carbonate, has strongly saline and effervescent properties, is moderately alkaline, and is separated from the horizon below with a gradual wavy boundary. The BCknz level is 76-160 centimeters (30-63 inches) thick, consists of a dark grayish brown (2.5Y 4/2) sandy clay loam, and has a weak coarse subangular blocky structure. The soil appears massive when moist, and is hard, friable, slightly sticky, and slightly plastic. It also contains common medium distinct strong brown and reddish brown masses of iron accumulation, as well as many masses and few concretions of calcium carbonate. Lastly, it has strongly saline, violently effervescent, and moderately alkaline properties (SSS NRCS USDA 2013).

The Point Isabel series soils formed in calcareous loamy and clayey eolian deposits, and are found on vegetated dunes. The A1 horizon is 0-20 centimeters

(0-9 inches) thick and consists of light brownish gray (10YR 6/2) clay loam. It has a weak fine granular and subangular blocky structure, is slightly hard and friable, and has strongly effervescent and moderately alkaline properties. The A2 horizon is separated by a smooth clear boundary, and is 20-30 centimeters (9-12 inches) thick. The soil is dark grayish brown (10YR 4/2) and has a moderate fine subangular blocky structure. It is hard and firm, and has strongly effervescent and moderately alkaline properties. The Bkn1 horizon is separated from the A2 horizon by a clear wavy boundary, and is 30-48 centimeters (19-22 inches) thick. It has a moderate coarse prismatic structure parting to moderate fine angular blocky, and is hard and firm. It also contains common films and threads of calcium carbonate, and has strongly effervescent and moderately alkaline properties. Separated from the horizon above by an abrupt wavy boundary is the Bkn2 horizon. It is 48-56 centimeters (19-22 inches) thick, consisting of grayish brown (10YR 5/2) clay loam. It has a coarse prismatic structure parting to moderate fine angular blocky. It has a hard and firm consistency, and contains common films and threads of calcium carbonate. Also, it displays strongly effervescent and moderately alkaline properties. The Bkn3 horizon is separated from the previous horizon by an abrupt wavy boundary. The soil is light brownish gray (10YR 6/2) clay, and has a moderate fine and medium angular blocky structure. The consistency is hard, firm, and contains few films and threads of calcium carbonate, as well as having strongly effervescent and moderately alkaline properties. Below Bkn3, separated by an abrupt wavy boundary, is the Bknb1 horizon. The soil is gray (10YR 5/1) clay with a moderate fine subangular blocky structure, and a hard firm consistency. It contains few films and threads of calcium carbonate, and has strongly effervescent and moderately alkaline properties. The final horizon, Bknb2, is separated from Bknb1 by a clear wavy boundary. It is 107-203 centimeters (42-65 inches) thick, and is composed of light gray (10YR 7/2) clay. It has a moderate fine and medium angular blocky structure, and a hard, firm consistency. It also contains common threads and films of calcium carbonate, and has strongly effervescent and alkaline properties (SSS NRCS USDA 2013).

3.0 CULTURAL RESOURCES INVESTIGATIONS

Cultural resources investigations were conducted to determine if historic properties, defined as those listed in or eligible for listing in the NRHP, are present in the APE. For a property to be eligible for listing in the NRHP, it must possess historical significance under at least one of the NRHP Criteria – A, B, C, or D – and retain integrity, often described as the physical characteristics of the property that convey the historical significance. The NRHP Criteria as defined in 36 C.F.R. §60.4 include properties:

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or

B. that are associated with the lives of persons significant in our past; or

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

D. that have yielded or may be likely to yield, information important in prehistory or history.

Integrity may be defined as the authenticity of a property's historic identity, demonstrated by the survival of physical characteristics that existed during the historic property's period of significance. The seven aspects of integrity are:

- Location: the place where the historic property was constructed or the place where the historic event occurred;
- Design: the combination of elements that create the form, plan, space, structure, and style of a property;
- Setting: the physical environment of a historic property;
- Materials: the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property;
- Workmanship: the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory;
- Feeling: a property's expression of the aesthetic or historic sense of a particular period of time; and
- Association: the direct link between an important historic event or person and a historic property.

As explained in the NPS National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation, "The evaluation of integrity is sometimes a subjective judgment, but it must always be grounded in an understanding of a property's physical features and how they relate to its significance. To retain historic integrity a property will always possess several, and usually most, of these aspects. The retention of specific aspects of integrity is

paramount for a property to convey its significance. Determining which of these aspects are most important to a particular property requires knowing why, where, and when the property is significant"(NPS 1990).

3.1 SITE FILE AND LITERATURE REVIEW

ERM conducted background research including a site file search, a review of literature, and a review of historic maps to determine if any known cultural resources (including properties listed on the NRHP, archeological sites, structures, historical markers, historical districts, and cemeteries) existed within the Transmission Line's direct APE or within a 1.5-mile (2.4 km) distance from the ROW centerline. A review of previous archeological projects within this radius was also conducted. Inventories of projects, sites and markers, cemeteries and previous surveys have been assembled. The following repositories were consulted:

- The THC SHPO – Archeological Sites Atlas
- Texas General Land Office (GLO)
- The University of Texas (Austin) Briscoe Center Map Collection
- The University of Texas (Arlington) Special Collections Library
- Texas State Historical Association Archives
- Texas State Archeological Landmarks
- National Park Service – National Register of Historic Places (NRHP) Properties
- Texas State Library and Archives Commission Collection – Texas Heritage Online
- U.S. Library of Congress
- USGS 7.5-minute series, Topographic, Historic Quadrangle Maps
- Handbook of Texas Online

A total of five (5) archeological sites (including the National Register District/National Historic Landmark [NHL Palo Alto Battlefield]) are located within the 1.5-mile (2.4 km) file search area (Table 3-1). Additionally, at least 21 cultural resources investigations have been conducted within 1.5 miles (2.4 km) of the transmission line (Table 3-2; Maps are located in Appendix A).

Other potentially extant historic-era resources located in the APE include the Port Isabel and Rio Grande Valley Railway and a connected "Old Railroad Grade" that are first depicted on the 1930 East Brownsville 7.5-minute quadrangle and a complex of historic-era ditches and irrigation control features including the Rancho Viejo Floodway.

TABLE 3-1: Archeological Sites within 1.5 miles (2.4 km) of the Survey Area

Site No.	Date Recorded	Site Type	Site Description	Age	NR Eligibility
41CF90	1970	Historic-era	Trash scatter	Unknown (WWI ammo noted)	Unknown
41CF92	1970, 1981	Historic-era	Palo Alto Battlefield	1846	Eligible (NR District/NHL)
41CF143	1994	Prehistoric	Possible Open Camp	Unknown Aboriginal	Unknown
41CF146	1992	Prehistoric	Possible Open Camp	Unknown Aboriginal	Unknown
41CF159	1996	Prehistoric	Possible Open Camp	Unknown Aboriginal	Not Eligible (within ROW of documenting project)

TABLE 3-2: Cultural Resources Investigations within 1.5 miles (2.4 km) of the Survey Area

Texas Atlas Polygon ID No.	Report Date	Agency	Consultant	Project Type	Principal Investigator	Report Authors	Report Title	TAC Permit No.
441	1974	Unknown	Unknown	Boat Survey	Unknown	Unknown	Unknown	Unknown
442	1981	COE-VD	Unknown	Survey	Unknown	Unknown	Unknown	Unknown
588	1981	EPA	Unknown	Survey	Unknown	Unknown	Unknown	Unknown
609	1993	FMHA	Unknown	Survey	Unknown	Unknown	Unknown	Unknown
1170	1990	SDHPT	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
1172	1974	GAL CE	Unknown	Boat Survey	Unknown	Unknown	Unknown	Unknown
1174	1981	GAL CE	Unknown	Survey	Unknown	Unknown	Unknown	Unknown
1284	1993	TxDOT	Unknown	Survey	Unknown	Unknown	Unknown	Unknown
8735	1998	TWDB	Unknown	Survey	Unknown	Unknown	Unknown	Unknown
10557/10780/ 12713/12952	2003	Southmost Regional Water Authority	SWCA, Inc.	Recon & Survey	Brett A. Houk	Brett A. Houk and Kerri S. Barile	An Archeological Survey of the Southmost Regional Water Authority Project, Cameron County, Texas	2900
10998/12234	2004	TxDOT	Hicks and Co.	Archival and Survey	Rachel Feit	Bryan King and Rahel Feit	Archeological Survey of the Proposed Texas Historic Battlefield Trails Southern Pacific Linear Park, Brownsville, Texas	3553
11458	2005	NPS	NPS	Survey	Rolando Garza	Rolando Garza	NPS Letter Report.	Unknown
11648	2006	TxDot	SWCA, Inc.	Survey and Archival	Kevin Miller	Mindy L. Bonine	Archeological and Historic Archival Background Research and Cultural Resource Survey for the Proposed Farm-to-Market 511 Road Expansion Project, Brownsville, Cameron County, Texas	3637

Texas Atlas Polygon ID No.	Report Date	Agency	Consultant	Project Type	Principal Investigator	Report Authors	Report Title	TAC Permit No.
11685	2005	FEMA	Horizon	Survey	Russell Brownlow	Russell Brownlow and Reign Clark	An Intensive Cultural Resources Survey of the Proposed Valero 24-Mile Harlingen to Brownsville Refined Products Pipeline Right-of-Way, Cameron County, Texas	Unknown
11854	2005	FERC	Horizon	Survey	Russell Brownlow	Russell Brownlow and Michael Mudd	Valero Horizontal Directional Drill Locations	Unknown
12147	2005	TxDOT	Coastal Environments, Inc.	Survey	R. Weinsten	Richard A. Weinstein, Pollyanna A. Held, Robert A. Ricklis	Cultural Resources Survey and Preliminary Site Assessment within Six Right of Way Areas, State Highway SH 48, Port Isabel to Brownsville, Cameron County	3601
13513	2004	COE-VD/Border Patrol/DHS	COE-VD	Survey	Nicole Minnichbach	Nicole Minnichbach	COE Letter Report.	Unknown
15254	2008	NPS	NPS	Survey	Rolando Garza	Rolando Garza	NPS Interim Report.	Unknown
15255	2008	NPS	NPS	Survey	Rolando Garza	Rolando Garza	Unknown	Unknown
16059	2009	TxDOT	SWCA, Inc.	Survey	Kevin Miller	Mindy Bonine, C.T. Hartnet, A. Peyton	Intensive Cultural Resource and Metal Detector Survey of Portions of the Proposed Farm-to-Market 511 Road Expansion Project, Brownsville, Cameron County, Texas	4938

Texas Atlas Polygon ID No.	Report Date	Agency	Consultant	Project Type	Principal Investigator	Report Authors	Report Title	TAC Permit No.
16060	2006	TxDOT	SWCA, Inc.	Survey	Kevin Miller	Mindy Bonine, L.A. Acuna, K. Lawrence	Unknown	Unknown

3.2 ARCHEOLOGICAL INVESTIGATIONS

Archival research combined with accurate field recordings and documentation become integral components that build the foundations for all cultural resources investigations. The efforts outlined below are in compliance with the Secretary of the Interior's Standards and Guideline: Standards for Identification (as well as the Secretary's Professional Qualification Standards for Archeologists and Historians 36 CFR Part 61) as prepared under the authority of Sections 101(f) (g), and (h), and Section 110 of the NHPA (48 Federal Register 44716: September 29, 1983). Moreover, documentation generally results in both greater factual knowledge about the specific property and its values, and a broader understanding of the property in its historical context. In addition to increasing factual knowledge about a property and its significance in one historical context, documentation may also serve to link the property to or define its importance in other known or yet-to-be defined historic contexts.

3.2.1 Field Methods

The archeological field investigation associated with the current undertaking was designed to identify and assess all sites, historic-aged and prehistoric, within the APE (Figure 1-1). Surface and subsurface (buried) archeological resources and structural ruins fall within the purview of this investigation. In addition to site identification, the investigation also must provide sufficient data to determine whether or not additional investigations will be required to evaluate fully the potential eligibility of any newly defined site location for inclusion in the NRHP or as a State Archeological Landmark (SAL).

The majority of the direct impact area was undisturbed. However, two areas were partially or completely disturbed. A portion of the APE follows a pipeline ROW that was disturbed for a 1.6-mile (2.5 km) stretch and a portion of the APE follows a disturbed ditch levee for an approximate 0.9-mile (1.4 km) stretch. Archeological survey of the APE consisted of surface inspection and shovel testing at 98- and 197-foot (30- to 60-m) intervals along a single transect in the ROW. High probability areas were primarily the floodplains of streams or paleochannels and were subject to 98-foot (30-m) spaced shovel tests along a single transect. Low probability areas were tested with shovel tests spaced 197 feet (60 m) apart. Although there was a single transect, surveyors were instructed to place the STPs in the part of the ROW that appeared least disturbed. Some shovel test locations were obviously disturbed and only a surface inspection was performed.

The survey was divided into seven (7) continuous linear segments for ease of discussion (Figure 1-1). These arbitrary segments are identified as Transects 1-7 from the western to eastern terminus. Transect 1 connects to the generating station and goes north adjacent to a power line ROW until it intersects a canal and turns east. Transect 2 starts at this point and immediately crosses onto the other side of the canal. It continues east and terminates at Paredes Line Road (FM 1847). Transect 3 picks up on the eastern side of Paredes Line Road and

continues east along a canal. Transect 3 terminates at an intersecting canal at Pole Location 30. The remaining east-west section is designated Transect 4. Transect 5 continues from the end of Transect 4 (at Pole Location 37) and runs southward to Pole Location 49. At this point (Pole Location 49), the transmission line ROW turns to a 115.6-degree heading (southeast) and crosses Old Port Isabel Road. This section of Transect 5 terminates at a pipeline ROW near Pole Location 63. From here the ROW turns south and Transect 6 begins. Transect 6 runs south along this highly disturbed ROW and terminates at Pole Location 73 where the transmission line turns southeast again and Transect 7 begins. Transect 7 comprises the remainder of the ROW to where it terminates at Loma Alta Substation.

All shovel tests were excavated by hand and were 40 to 50 cm in diameter and they ranged up to 65 cm deep (but were generally about 40 cm deep in the dense clay). Two twenty-centimeter arbitrary levels were screened and hand-sorted separately from each shovel test. Notes were taken describing levels in terms of soil horizons, color, texture, soil structure, and presence of artifacts. Additional notes were taken describing vegetation and general environment.

The metal detection survey employed Fisher model F2, with a 10-inch coil. According to the owner's manual (2013), these metal detectors are self-calibrating and effective to 25 centimeters below the surface. Surveyors attempted to use sweeping 1-meter arcs of the metal detector; however, dense brush was encountered in those areas that were not disturbed, and in most parts of the APE surveyors were typically limited to sweeping areas less than 2 square. The coil was kept within 10 centimeters of the surface within these areas. All hits were excavated but modern trash was not collected or recorded. Surveyors were careful to maintain a 20-meter buffer from other metal detectors and avoided other metals such as the steel toes of boots, shovels, and other equipment.

3.2.2 Results of Archeological Investigations

The primary purpose of this investigation was to determine whether any previously unidentified and intact archeological were present within the direct APE by conducting an intensive archeological survey and metal detection survey and provide recommendations based on the research and survey activities. No archeological sites were recorded during the survey.

The length of the seven (7) transects totaled about 11.7 miles and a total of 328 shovel tests were excavated (Figures 2-8). Observation points consisting of surface inspections and shovel testing were executed at 98-foot (30 m) intervals for high probability areas and 197-foot (60 m) intervals in low probability areas. Some shovel tests were not dug due to inaccessibility or disturbance. Transect 6 was located along a pipeline ROW and was disturbed to an unknown depth. Due to this heavy disturbance and for safety reasons, no shovel tests were excavated; due to the presence of subsurface utilities it was determined that this area would not be tested. However, a pedestrian recon was completed to observe any artifacts located on the surface of the disturbance. Additionally, a

0.9-mile (1.4 km) segment of Transect 1 that started at the first western turn was located within the disturbance of the canal levee and no shovel tests or metal detection were performed in this segment (Figure 3-7). Surveyors could not safely and adequately access a 0.60-mile (1 km) segment within Transect 3 due to intensely thick thorny brush and cacti; additional work is recommended for this area (see Section 3.2.5). In the vast majority of shovel tests, natural soil profiles matching NCRS soil maps were encountered.

The THC minimum standards for linear projects require 16 shovel tests for every 1-mile (1.6-km) of a 100-foot (30 m) wide survey area that is not disturbed and has no more than 30 percent ground visibility. Therefore, only 189 shovel tests were required by THC minimum standards. The current survey exceeded the number of shovel tests required by minimum standards by about 60 percent. There were no positive shovel tests on any transects; one historic ceramic sherd was found on the surface of the ROW (IF01) but it was found in an active water run-off area and likely was in a secondary depositional context.

An approximate 0.9-mile (1.4 km) section of Transect 1 coincided with the top of the canal levee and no shovel tests were completed on this section (Figure 3-1). Fifty-eight shovel tests were excavated on the remaining part. Transect 2 is 0.2 miles (0.33 km) long and 11 shovel tests were excavated (Figure 3-2). Transect 2 crosses an abandoned gun range built after 1995 (Google 2013). Spent projectiles and cartridges were found in the upper few centimeters of several shovel tests. These finds were quickly recognized as modern. Transect 3 is located directly north of the Palo Alto Battlefield (Figures 3 and 4). It crosses a large meandering paleochannel that extends through the Palo Alto battlefield south of the Transmission Line survey area. However, much of this area was inaccessible due to the thick thorny brush and cacti (see Section 3.2.5 below). A total of 47 shovel tests were excavated along Transect 3.

Transect 4 consists of the eastern-most 1.14 miles (1.83 km) of the east-west section (Figure 3-4). Two small high probability areas are within this transect and a total of 37 shovel tests were excavated. Seven high probability areas are included in Transect 5 (Figure 3-5 and 3-6). A total of 146 shovel tests were dug along the 3.83-mile (6.2 km) transect. Transect 6 was located within a heavily disturbed pipeline ROW and no shovel tests were excavated. The last transect terminates at the Loma Alta Substation (Figure 3-7) and eighteen of nineteen planned shovel tests were completed.

FIGURE 3-1: Transect 1 Results of Survey Showing Shovel Test Locations and Disturbed Area

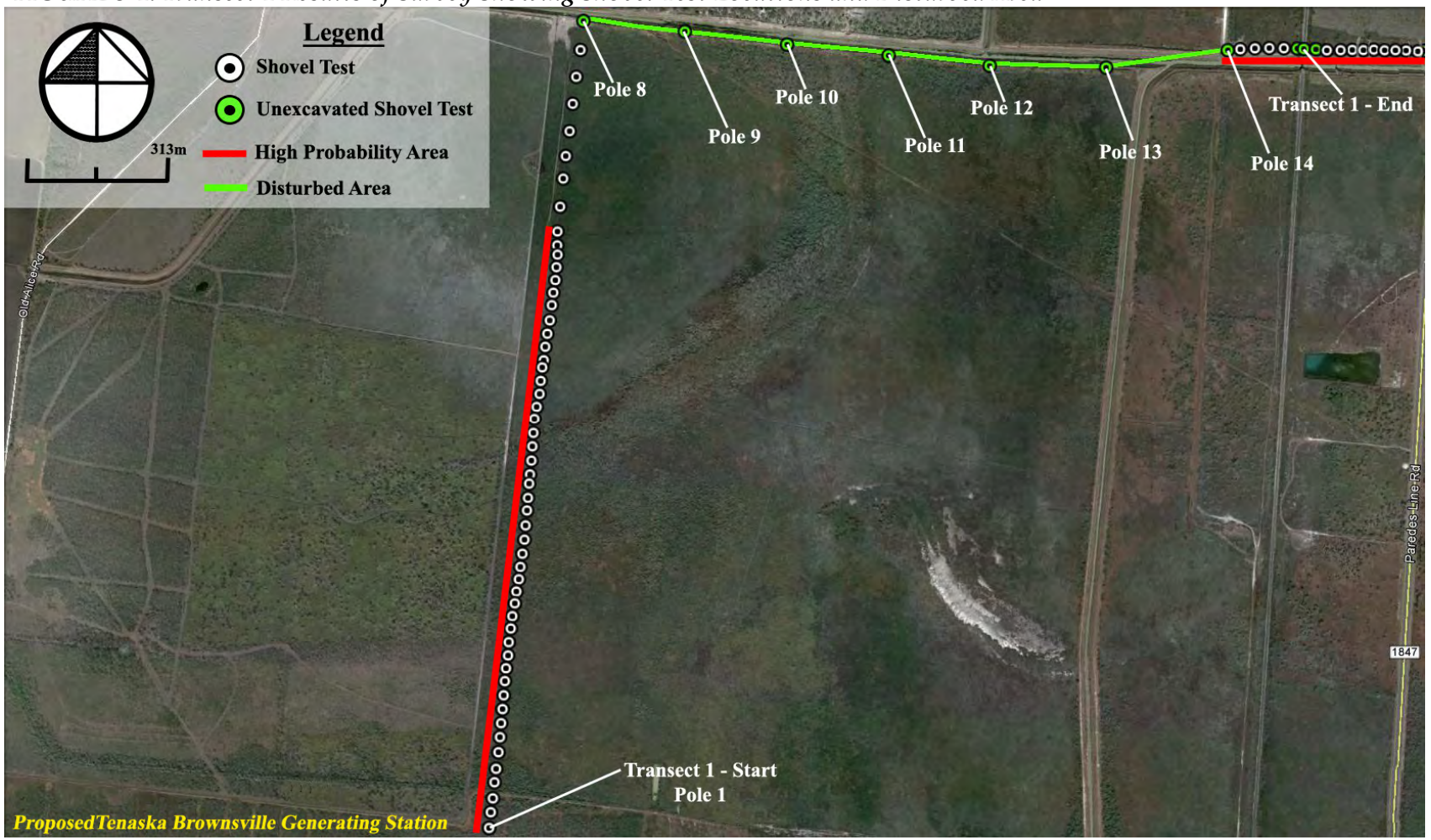


FIGURE 3-2: Transect 2 and western part of Transect 3, Results of Survey Showing Shovel Test and Unexcavated Shovel Test Locations

FIGURE 3-3: Transect 3 and western part of Transect 4, Results of Survey Showing Shovel Test and Unexcavated Shovel Test Locations

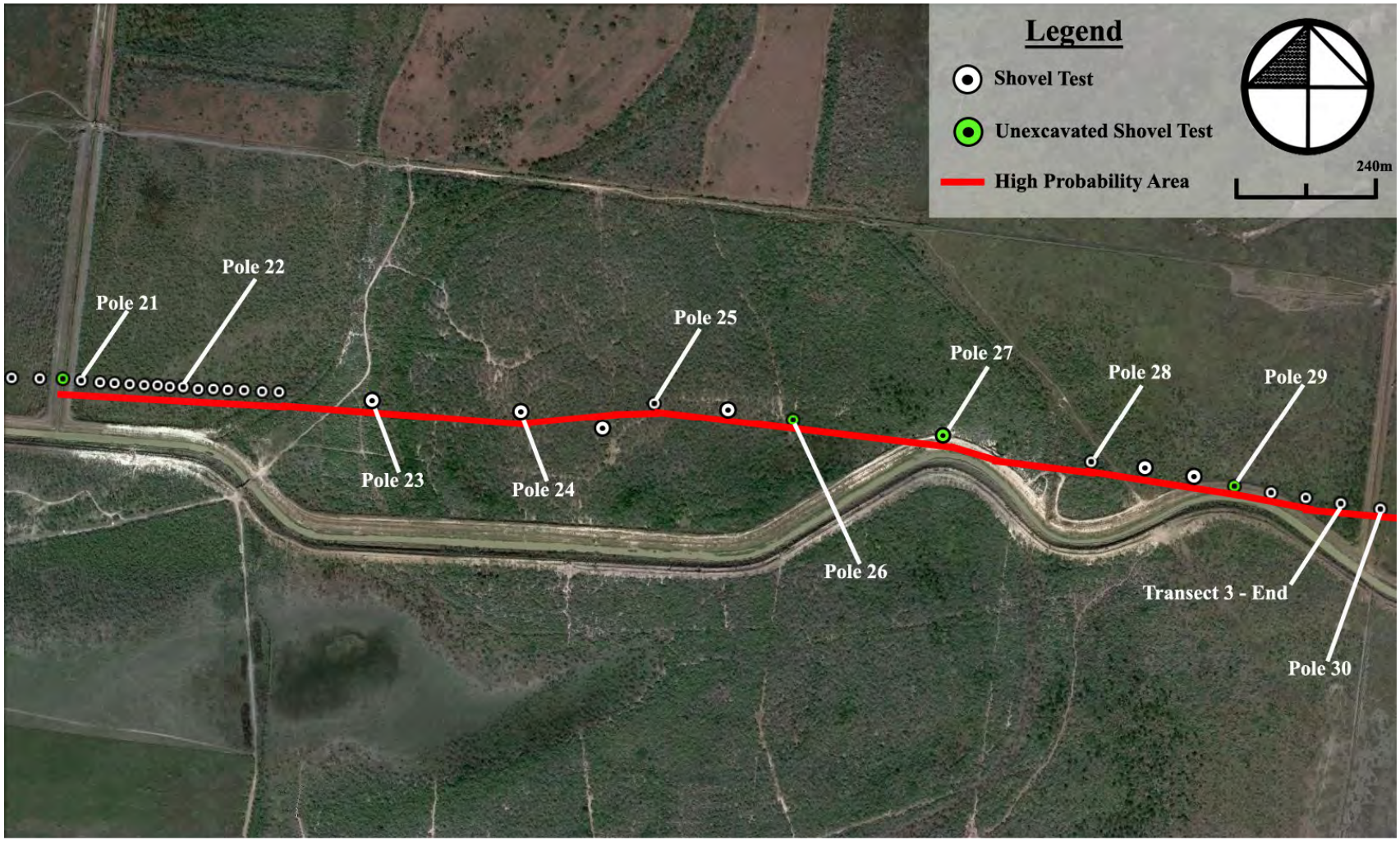
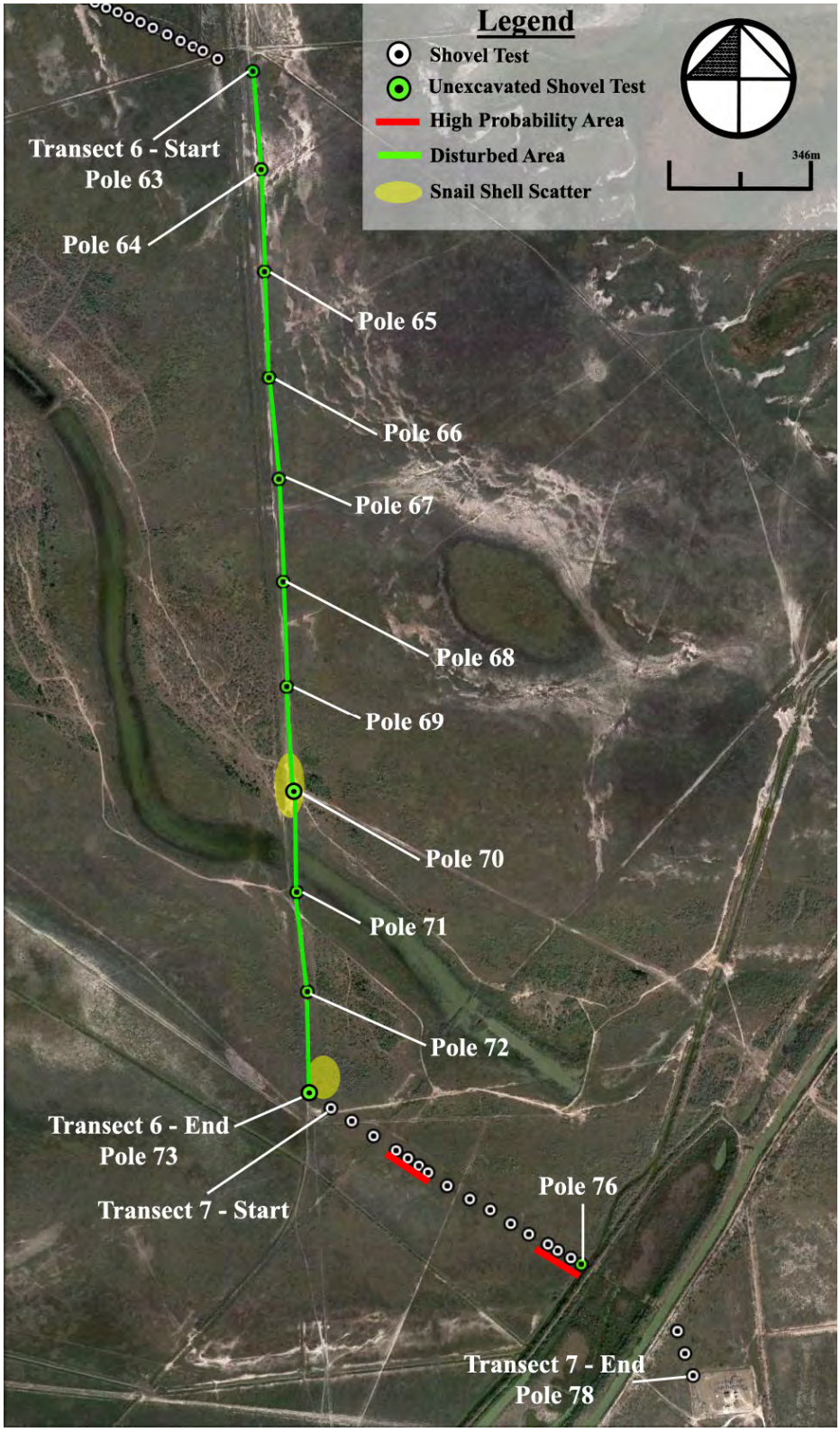


FIGURE 3-4: Transect 4, Results of Survey Showing Shovel Test and Unexcavated Shovel Test Locations

FIGURE 3-6: Southern part of Transect 5, Results of Survey Showing Shovel Test and Unexcavated Shovel Test Locations

FIGURE 3-7: Transects 6 and 7, Results of Survey Showing Shovel Test and Unexcavated Shovel Test Locations



Below are examples of typical shovel test profiles recorded during the survey. Appendix B is the photo log and images from the seven (7) transects are included and labeled. A complete log of shovel tests including location, depth, and result are included as Appendix C.

Typical Shovel Test Profiles

Transect 1, Shovel Test 20

Level 1: 0-20cmbs Clay Loam, dark grayish brown (10YR4/2), platy, parting to crumb structure

Level 2: 20-40cmbs Silty Clay, dark grayish brown (10YR4/2), fine subangular blocky parting to crumb structure, soft masses of $CaCO_3$ and fine snail shell frags from 30-40cmbs

Transect 2, Shovel Test 7

Surface: 0-1cmbs Humus
Level 1: 1-40cmbs Clay, dark gray (10YR4/1), angular, blocky structure with slickensides, common $CaCO_3$ nodules, few fine shell frags

Level 2: 40-50cmbs Clay, gray, angular, blocky structure with slickensides

Transect 3, Shovel Test 34

Level 1: 0-20cmbs Silty Clay, brown (10YR3/2), massive (recent deposit)

Level 2: 20-40cmbs Clay Loam, dark yellowish brown, common $CaCO_3$

Transect 4, Shovel Test 24

Level 1: 0-8cmbs Clay Loam, dark grayish brown (10YR4/2), subangular blocky parting to crumb structure

Level 2: 8-40cmbs Silty Clay, dark grayish brown (10YR4/2), subangular blocky parting to crumb structure

3.2.3 Metal Detection Survey

All seven (7) transects were attempted to be surveyed with metal detectors. The metal detector survey resulted in finding no historic-aged artifacts. The plan to complete a metal detector survey of 100 percent of the survey area is intended to offset the possibility that a smaller sample may be insufficient due to unfavorable conditions. A number of variables reduced the potential effectiveness of the

metal detector survey. These conditions that impeded complete metal detector survey of the survey area included highly ferrous soils that forced operators to use settings that could leave smaller iron artifacts undetected and thick ground cover that often prevented the operator from placing the coil the optimum distance from the ground.

3.2.4 Artifacts

No prehistoric or historic-aged artifacts were recovered from any of the shovel tests or the metal detection survey. One possibly historic-era ceramic sherd (IF01) was found on the surface of the ROW between Pole Locations 22 and 23 (T3 STP 34 was placed adjacent to IF01 location). It was found in an alluvial run-off area and was likely in a secondary depositional context. It was a White-Improved Earthenware sherd from an indeterminate-type vessel with a hand-painted floral design.

Two areas containing snail shells were observed along the disturbed Transect 6 corridor (see Figure 3-7, above). The shells were observed eroding out of disturbed cut banks; however, visual inspection did not reveal any culturally modified material in these areas.

3.2.5 Evaluation of Archeological Resources

ERM conducted an archeological survey and a metal detection survey of approximately 11.7-miles of the transmission line ROW. No archeological features or sites were found and only a single possibly historic-era ceramic sherd was recovered from the surface of the ROW. Similar to the survey of the power plant project (main CRA report) and the wastewater discharge utility line (Attachment 1 of main CRA report) there were no prehistoric sites found in the APE (ERM CRA: 2013, CRA Addendum: 2013). As discussed in the previous reports, the most likely reason that no sites were found during the survey is that the very active depositional environment has built this delta with glacial and Rio Grande storm sediments from the last ca. 14,000 years. It is possible that this area has been swampy and subject to flooding by tropical storms for thousands of years and any evidence of occupation, therefore, has been washed away.

Because no archeological sites were identified within the direct impact area, construction of the Transmission Line ROW is unlikely to have an adverse effect on archeological historic properties. However, due to access constraints along a 0.60-mile (1 km) long portion of Transect 3, additional work is recommended in this area. Additionally, ERM recommends deeper testing by hand-augering at pole locations within paleochannels to identify buried paleosols. This work would be completed prior to the start of the transmission line construction and concluded in an addendum report.

3.3 ABOVEGROUND INVESTIGATIONS

3.3.1 Field Methods

An ERM Architectural Historian meeting the Secretary of the Interior's Professional Qualification Standards conducted the aboveground resource reconnaissance survey on October 22, 2013. The aboveground survey area included the transmission line, consisting of 78 transmission towers, and a corridor extending 0.5 miles out from the line.

The majority of the study area is located in undeveloped areas not accessible by paved roads, and the terrain was muddy and heavily vegetated with thick grasses and mesquite. ERM accessed the survey area on foot and by a four wheel-drive utility vehicle operated by a BPUB employee. Approximately 75% of the survey area, including Pole Locations 1 through 33 and 49 through 78, was directly accessed in this manner. Two sections of the study area were not accessible. An approximately 2.5-mile segment adjacent to the northeast corner of the Palo Alto Battlefield National Historic Site National Historic Landmark (NHL), including Pole Locations 34 through 48, was inaccessible due to the presence of drainage ditches and standing water. An approximately 780-foot segment crossing the Rancho Viejo Floodway, between Pole Locations 76 and 77 was also inaccessible by land.

ERM also investigated the study area on foot in several locations accessible by paved public roads, including: Lemon Drive and Old Alice Road north of CCDD1 Ditch No. 2; Paredes Line Road, where it crosses CCDD1 Ditch No. 2; and the Del Mar Heights neighborhood north of CCDD1 Ditch No. 2 and east of CCDD1 Ditch No. 10.

Survey efforts were focused on identifying and documenting readily identifiable cultural resources with the potential to be eligible for listing in the National Register of Historic Places (NRHP), and gaining an understanding of the physical and developmental character of the area for the purpose of informing the cultural resources work. While on site ERM visually scanned the study area to identify buildings, structures, and landscape features of interest (i.e., those with the potential to be eligible for listing in the NRHP). Aerial photography of the survey area was taken into the field and notations were made regarding the study area and resources of interest. Digital photographs were taken with a GPS-enabled camera to document the general character of the study area and resources of interest.

Prior to the survey, several historic properties were known to be located within the study area: the Palo Alto Battlefield National Historic Site NHL; and extant irrigation and drainage ditches associated with Cameron County Drainage District No. 1 (CCDD1). The portions of the study area where the transmission line will run adjacent to the boundaries of the NHL were documented more closely to enable consideration of effects, as were the points where the line will cross the CCDD1 ditches.

3.3.2 Results of the Aboveground Investigation

Aboveground survey and background research resulted in the identification of six aboveground resources or categories of resources of interest within the study area:

- Palo Alto Battlefield National Historic Site NHL;
- Cameron County Drainage District No. 1;
- Southern Pacific Railroad;
- Port Isabel and Rio Grande Valley Railroad;
- Rancho Viejo Floodway; and
- Irrigation and drainage ditches (unassociated).

Three of these – the NHL, the CCDD1, and the Southern Pacific Railroad – were identified and evaluated as NRHP-listed, NRHP-eligible, and NRHP-ineligible, respectively, in ERM's Cultural Resources Assessment: Tenaska Brownsville Generating Station (ERM CRA 2013). The Port Isabel and Rio Grande Valley Railroad and the Rancho Viejo Floodway were identified and evaluated as NRHP-ineligible in ERM's December 18, 2013 Cultural Resources Assessment Addendum: Wastewater Discharge Utility Line (Attachment 1, ERM 2013).

This survey, therefore, focused on examining the portions of the two eligible properties located within the study area to aid in the assessment of effects.

3.3.3 Evaluation of Aboveground Resources

Palo Alto Battlefield National Historic Site National Historic Landmark

Pole Locations 16 through 49 of the transmission line are located within 1,000 feet of the Palo Alto Battlefield National Historic Site NHL (see Appendix A for Figures). Designated in 1960, the NHL consists of approximately 6,600 acres, including most of the 3,434-acre Palo Alto Battlefield National Historical Park established by legislative act in 1991. A full background on the battlefield is presented in ERM's CRA (2013).

Cameron County Drainage District No. 1

Ditches associated with the CCDD1 are located throughout the study area and are crossed by the transmission line at several points along the route. The first county-managed drainage district in the Cameron County, CCDD1 was established in 1905 to improve soils in the area for rice cultivation following authorization by the Texas Legislature in that year (Knight 2009). A discussion of the CCDD1 is provided ERM's CRA (2013) for the generating station.

Consistent with this CRA, ERM recommends that the CCDD1 be treated as eligible for listing in the NRHP.

Southern Pacific Railroad

The transmission line crosses the Southern Pacific Railroad between Pole Locations 14 and 15. Constructed in 1927, the Southern Pacific Line ran 28 miles from Brownsville to Harlingen (Keillor n.d.). This segment of the Southern Pacific Railroad is discussed and evaluated in ERM's CRA (2013) for the generating station. Consistent with the CRA, ERM recommends this segment of the Southern Pacific Railroad as ineligible for listing in the NRHP.

Port Isabel and Rio Grande Valley Railroad

The segment of the transmission line between Pole Locations 63 and 73 runs along the berm of the former Port Isabel and Rio Grande Valley Railroad. The Port Isabel and Rio Grande Valley Railroad began in 1872, and the segment that falls within the study area was discontinued in 1940 (Young, n.d.). This resource is discussed and evaluated in ERM's Attachment 1 (2013) for the wastewater discharge utility line. Consistent with Attachment 1, ERM recommends this resource as ineligible for listing in the NRHP.

Rancho Viejo Floodway

The transmission line crosses over the Rancho Viejo Floodway between Pole Locations 76 and 77. The 27 mile-long Rancho Viejo Floodway was completed by 1940 as part of the large-scale multi-county Lower Rio Grande Flood Control Project (LRGFCP), and was subsequently abandoned in 1950 (Plimpton and Blackwell 2012). A discussion and evaluation of the Rancho Viejo Floodway is provided in ERM's Attachment 1 (2013) for the wastewater discharge utility line. Consistent with Attachment 1, ERM recommends this resource as ineligible for listing in the NRHP.

Irrigation and Drainage Ditches (Unassociated)

Other irrigation and drainage ditches are located throughout the study area. Some of these are present on maps as early as 1928. It is presumed that these ditches reflect irrigation and drainage measures constructed for agricultural purposes for both individual farms and larger agricultural ventures, and most of the ditches observed in the study area are still surrounded by open land. These ditches are not currently associated with a recognized planned system, such as the Cameron County Irrigation District No. 6, and were not observed to be associated with more localized collections of resources (i.e., ranch, orchard, etc.) with the potential to be eligible for listing in the NRHP. Accordingly, ERM recommends that unassociated ditches be treated as ineligible for listing in the NRHP.

4.0 EFFECTS OF THE PROJECT ON HISTORIC PROPERTIES

The Section 106 implementing regulations state that "an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association."

A major consideration in assessing the effects of the transmission line on the Palo Alto Battlefield National Historic Site NHL and the CCDD1 is the presence of existing transmission lines throughout the project area, as well as numerous other tower and pole structures including telephone lines, communications towers, radio towers, and highway and roadway lighting. The beginning (Pole Locations 1 through 8) and end (Pole Locations 49 through 78) segments of the transmission line, or 46% of the total route, is to be located immediately adjacent to an existing utility line. Another 40% of the transmission line is located within 0.5 mile of an existing utility line. Only 14% of the transmission line (i.e., Pole Locations 33 through 44) will be located where there are no existing aboveground utility lines within a half mile. Specific analysis of the transmission line on identified historic properties in the study area is presented below.

Cameron County Drainage District No. 1

The transmission line will run immediately adjacent to or within approximately 700 feet of CCDD1 Ditch No. 2 between Pole Locations 8 and 37, or approximately 37% of its length. The line will cross over CCDD1 ditches in five locations:

- between Pole Locations 13 and 14 (over Ditch No. 2);
- between Pole Locations 20 and 21 (over Ditch Los Fresnos S.E.);
- between Pole Locations 33 and 34 (over Ditch No. 10);
- between Pole Locations 37 and 38 (over Ditch No. 2); and
- between Pole Locations 76 and 77 (over Ditch No. 1).

Crossover points will consist of power lines spanning the ditches between the specified pole locations. Additionally, the transmission line will run within 0.5 miles of the CCDD1 Olmito Branch and Ditch No. 3.

These activities would potentially fall under the following Adverse Effect Criteria outlined in the Section 106 implementing regulations:

- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance (Adverse Effect Criterion iv, 36 CFR §800.5[a][2][iv]); and
- Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features (Adverse Effect Criterion v, 36 CFR §800.5[a][2][v]).

The transmission line will not change the character of the property's use, but it will affect the features within the property's setting that contribute to its historic significance. The action will result in the introduction of visual and audible elements that affect and relate to two primary aspects of integrity: setting and feeling. The action will affect the setting of the CCDD1, and in the case where the transmission line is immediately adjacent or crosses over a ditch, feeling as well. Once completed, the transmission line will be an additional feature visible and audible from the CCDD1 district and from the individual contributing resources (e.g., ditches) within the district.

As discussed in more detail in the CRA (ERM 2013), irrigation and drainage systems in south Texas are utilitarian works of engineering that were designed for function rather than aesthetics. As such, the aspects of integrity that are expected to be most important to convey historical significance are design, location, and association. These aspects of integrity, and the aspects of materials and workmanship, will not be affected by the transmission line.

Setting and feeling also contribute to the NRHP integrity of these resources. Lila Knight's A Field Guide to Irrigation in the Lower Rio Grande Valley, a historic context and NRHP evaluation guide prepared in 2009 for the Texas Department of Transportation (TxDOT) Environmental Affairs Division discusses the link between setting and the historical significance of irrigation features, specifically the rural context of agricultural fields, noting that "modern intrusions" such as suburbanization compromise the pastoral setting of irrigations systems (Knight 2009).

The CCDD1 is no longer located within an agricultural setting, as substantial suburban growth has occurred in the area since the mid-20th century, radically altering the project area by reducing the amount of land remaining in agricultural use, particularly in the last 20 years. Many of the large tracts of formerly agricultural land in the immediate vicinity of the transmission line is currently vacant and/or for sale in anticipation of further development. While most of the transmission line will run through open, undeveloped land, none of the survey area was observed to be actively cultivated agricultural land, and only one area was observed to be in active use for livestock grazing (i.e., in the vicinity of Pole Locations 49 through 54). As noted above, the ditches of the CCDD1 are crossed by numerous utility lines as well as paved multi-lane roads with modern construction, lighting, signage, etc. These changes have compromised the setting and feeling of the CCDD1.

Transformers along high-voltage transmission lines may emit sound energy in the form of a buzzing or humming noise as a result of electrical discharge known as corona. This sound energy may become more pronounced depending upon voltage and weather conditions (e.g., humidity). BPUB has confirmed that the transmission interconnect line will be designed to comply with applicable national, state, and local standards, and that the noise level along the transmission line will be below the outdoor levels accepted by the EPA. Sound emitted from the transmission lines is expected to be minimally audible if at all

from the ground outside of the utility right-of-way. Along the western half of the transmission line corridor, the effects of the sound energy emitted from the line will be significantly diminished by the noise from traffic along Highway 550/FM 511 and Paredes Line Road.

In consideration of the existing intrusions to the setting and feeling of the CCDD1 in the study area, and given the nature of the ditches as utilitarian works of engineering now disassociated from their agricultural function, ERM finds that the transmission line will not adversely affect the CCDD1.

Palo Alto Battlefield National Historic Site National Historic Landmark

As presented in more detail in the CRA (ERM 2013), the Palo Alto Battlefield is associated with two distinct management entities: the Palo Alto Battlefield National Historic Site National Historic Landmark, designated in 1960 and consisting of 6,600 acres; and the Palo Alto Battlefield National Historical Park, established in 1992 and consisting of 3,434 acres. The NHPA requires the consideration of historic properties, defined as those that are listed in or eligible for listing in the NRHP: therefore, effects on the 6,600-acre NHL (rather than the 3,434-acre park) are assessed here.

The transmission line runs adjacent to but entirely outside of the boundaries of the NHL between Pole Locations 16 and 49. The "southerly right-of-way" of CCDD1 Ditch No. 2 delineates the north boundary of the NHL, although it should be noted that Ditch No. 2 is identified as a contributing feature in the cultural landscape inventory prepared in 2010 (NPS 2010). The transmission line will run within approximately 700 feet of CCDD1 Ditch No. 2 between Pole Locations 16 (at Paredes Line Road) and 37, at the northeast corner of the NHL. The transmission line is located entirely on the north side of Ditch No. 2 for this stretch, crossing over Ditch No. 2 to the east of the east boundary of the NHL. At this point, the transmission line begins to move away from the NHL east boundary between Pole Locations 37 and 49, where it turns sharply in a southeasterly direction towards the Old Port Isabel Road. At Old Port Isabel Road, the NHL is well outside of the 0.5-mile study area.

The transmission line as defined in Section 1.1 will not have direct effects on the NHL, and the special provisions for NHLs in the NHPA, which state that "Prior to the approval of any Federal undertaking which may directly and adversely affect any National Historic Landmark, the head of the responsible Federal agency shall, to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to such landmark," are understood not to apply.

Indirect effects from the Transmission Line have the potential to fall into two categories of the Adverse Effect Criteria outlined in the Section 106 implementing regulations:

- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance (Adverse Effect Criterion iv, 36 CFR §800.5[a][2][iv]); and
- Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features (Adverse Effect Criterion v, 36 CFR §800.5[a][2][v]).

The transmission line will not change the character of the property's use, but it will affect the features within the property's setting that contribute to its historic significance. The action will result in the introduction of visual, and possibly audible elements, that affect and relate to two primary aspects of integrity: setting and feeling. The transmission line will affect the setting and feeling of the NHL along the north boundary and the northern portion of the east boundary. Once completed, the transmission line will be an additional feature, visible and possibly audible, from the NHL that is inconsistent with the period of significance (1846-1916), as defined in the National Park Service Cultural Landscape Inventory: Palo Alto Battlefield Landscape, Palo Alto Battlefield National Historical Park report on file at the THC (NPS 2010).

Review of the CLI reveals that the core area of activity associated with the Battle of Palo Alto, including the battle itself, is located to the east of the Palo Alto Resaca, the Visitor's Center and the overlook. Accordingly, interpretation at the Park, public access, and circulation are focused in this area. The CLI identifies landscape characteristics, including the "open, relatively flat topography" and "relatively flat terrain with subtle changes in elevation," as well as "expansive views of and within the core battlefield" as contributing to the historical significance of the Palo Alto National Historical Park.

Although the battlefield landscape remains open and flat, with "less dense overstory vegetation in the core battlefield area that provides open views," the transmission line will be minimally visible from this area, if at all (NPS 2010). This is evident from the limited, almost imperceptible visibility of the existing high-voltage transmission line from the overlook as observed by ERM during the winter (January 2013): the overlook viewing platform is elevated above the battlefield, and the existing line is closer to the battlefield than the transmission line (i.e., from Pole Location 28 through 49, where the two lines will be co-located).

The segment of the transmission line from Paredes Line Road (Pole Location 16) to its intersection with the existing high-voltage line at Pole Location 28 will be closer to the battlefield core interpretation area: however, this is also an area of the Park that is characterized by "dense overstory vegetation" associated with the Palo Alto Resaca and cultivated by the National Park Service (NPS) to help screen the battlefield from Paredes Line Road and development beyond (NPS 2010). The transmission line between Pole Locations 16 and 28 is expected to be minimally visible from the core battlefield area.

Although the north boundary is of lesser importance in conveying the historical significance of the NHL owing to its distance from the core battlefield and the associated absence of activity there, it is worth noting the presence of the Palo Alto Resaca, along the east banks of which the American troops approached the battlefield prior to engagement (NPS 2010). The NPS acknowledges in their Guidelines for Identifying, Evaluating, and Registering America's Historic Battlefields (Andrus 1992) that routes of approach and withdrawal from the core area are important to the study and understanding of battles. However, in determining boundaries, NPS guidance states that "boundaries should not be drawn to include the portion of the route taken to the battlefield where there were no encounters. Although the route may be important in understanding the tactics of the overall campaign, it is not necessary to defining the particular battlefield" (Andrus 1992).

In this area the transmission line skirts the north bank of Ditch No. 2: however, effects from this transmission line will be reduced by the presence of the existing high-voltage transmission line, which crosses Ditch No. 2 at this point, cutting across the northeast corner of the Park and extending for approximately 2 miles within the boundaries of the NHL. Rather than being located in parallel alignment with the existing transmission line through the Park and the NHL, the transmission line was redesigned to be located completely outside the NHL along its north and east boundaries.

The presence of the existing high-voltage transmission line along the north boundary of the NHL and within the northeast portion of the NHL has been discussed above. Additionally, existing utility lines are present along Paredes Line Road adjacent to and outside of the west NHL boundary, and parallel to and within the south NHL boundary. As noted above, the light poles along Highway 550/FM 511 along the southwest boundary of the NHL are also visible within the core battlefield area.

As discussed above, sound emitted from the transmission lines is expected to be minimally audible if at all from the ground outside of the utility ROW. Within the core battlefield area of the NHL, and along the south and west boundaries, the effects of the sound energy emitted from the transmission line will be significantly diminished by the noise from traffic along Highway 550 and Paredes Line Road.

In consideration of the minimal visual and audible effects of the transmission line to the core battlefield area, as well as the existing intrusions to the setting and feeling of the NHL in the study area, ERM finds that the transmission line will not adversely affect the NHL.

TABLE 4-1: NRHP Eligibility Recommendations for Aboveground Resources of Interest within the Study Area

Resource Name	Date of Origin	Resource Type	NRHP Eligibility Recommendation	Effects
Palo Alto Battlefield National Historic Site	1846	District	Listed	No Adverse Effects
Cameron County Drainage District No. 1	1905	District	Potentially Eligible	No Adverse Effects
Southern Pacific Railroad	1927	Structure	Not Eligible	N/A
Port Isabel and Rio Grande Valley Railroad	1872	Structure	Not Eligible	N/A
Rancho Viejo Floodway	1940	Structure	Not Eligible	N/A
Irrigation and Drainage Ditches (Unassociated)	Various	Structures	Not Eligible	N/A

5.0 REFERENCES

5.1 PRINCIPAL INVESTIGATORS

Albee, Carrie. ERM: Architectural Historian; Senior Project Manager: Northern Division, Washington, DC.

McClure-Cannon, Tara. ERM: Archeologist, RPA; Cultural Resources Consultant – Impact and Assessment Planning (IAP) Group: Southwest Division, Houston, TX.

Nash, Sean. CEI: Archeologist, RPA: Corpus Christi, TX.

5.2 REFERENCE DOCUMENTS

Google Earth
2013 Online Resource.

Keillor, James A.
n.d. "A Brief History of Los Fresnos." Electronic document, http://www.losfresnoschamber.com/pdf/Keillor.pdf, accessed November 4, 2013.

Knight, Lila
2009 A Field Guide to Irrigation in the Lower Rio Grande Valley. Historical Studies Report No. 2009-01. Texas Department of Transportation, Environmental Affairs Division, Historical Studies Branch. Electronic document, http://ftp.dot.state.tx.us/pub/txdot-info/env/ifg_3.pdf, accessed July 26, 2013.

National Park Service (NPS)
2013 American Battlefield Protection Program. Electronic document, http://www.nps.gov/hps/abpp/, accessed July 26, 2013.

2010 National Park Service Cultural Landscape Inventory: Palo Alto Battlefield Landscape, Palo Alto Battlefield National Historical Park. Report on file at the Texas Historical Commission.

1990 National Register Bulletin [# 15]: How to Apply the National Register Criteria for Evaluation. Revised 1991, 1995, 1997. Revised for Internet 1995.

Plimpton, Kathryn and Chad Blackwell
2012 Historic Context for the U.S. International Boundary and Water Commission Lower Rio Grande Flood Control Project , prepared by HDR Environmental, Operations and Construction, Inc., for the U.S. Army Corps of Engineers, Galveston District, Office of Border Patrol, Customs and Border Protection, U.S. Department of Homeland Security.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture (SSS NRCS USDA)
2013a Web Soil Survey. Electronic document, http://websoilssurvey.nrcs.usda.gov/, accessed May 9, 2013.

2013b Official Soil Series Descriptions. Electronic document, http://soils.usda.gov/technical/classification/osd/index.html, accessed May 9, 2013.

Texas Historical Commission (THC)
2013 Texas Archeological Sites Atlas Electronic database: http://nueces.thc.state.tx.us/

nd Texas Historical Commission Request for SHPO Consultation: Projects Subject to Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas. Electronic document, http://www.thc.state.tx.us/public/upload/forms/SHPO_Consultation_ Form-Ver0811.pdf, accessed July 26, 2013.

United States Department of the Interior (USDI)
2013 U.S. Geological Survey (USGS). Electronic document, http://mrdata.usgs.gov/geology/state/sgmc- unit.php?unit.php?unit=TXQac;0 , accessed May 2, 2013

United States Environmental Protection Agency (EPA)
1988 Workbook for Plume Visual Impact Screening and Analysis, EPA-450/4-88- 015.

United States Secretary of the Interior (SOI)
1983 Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines [As Amended and Annotated]. Electronic document, http://www.cr.nps.gov/local-law/arch_stnds_0.htm, accessed July 26, 2013.

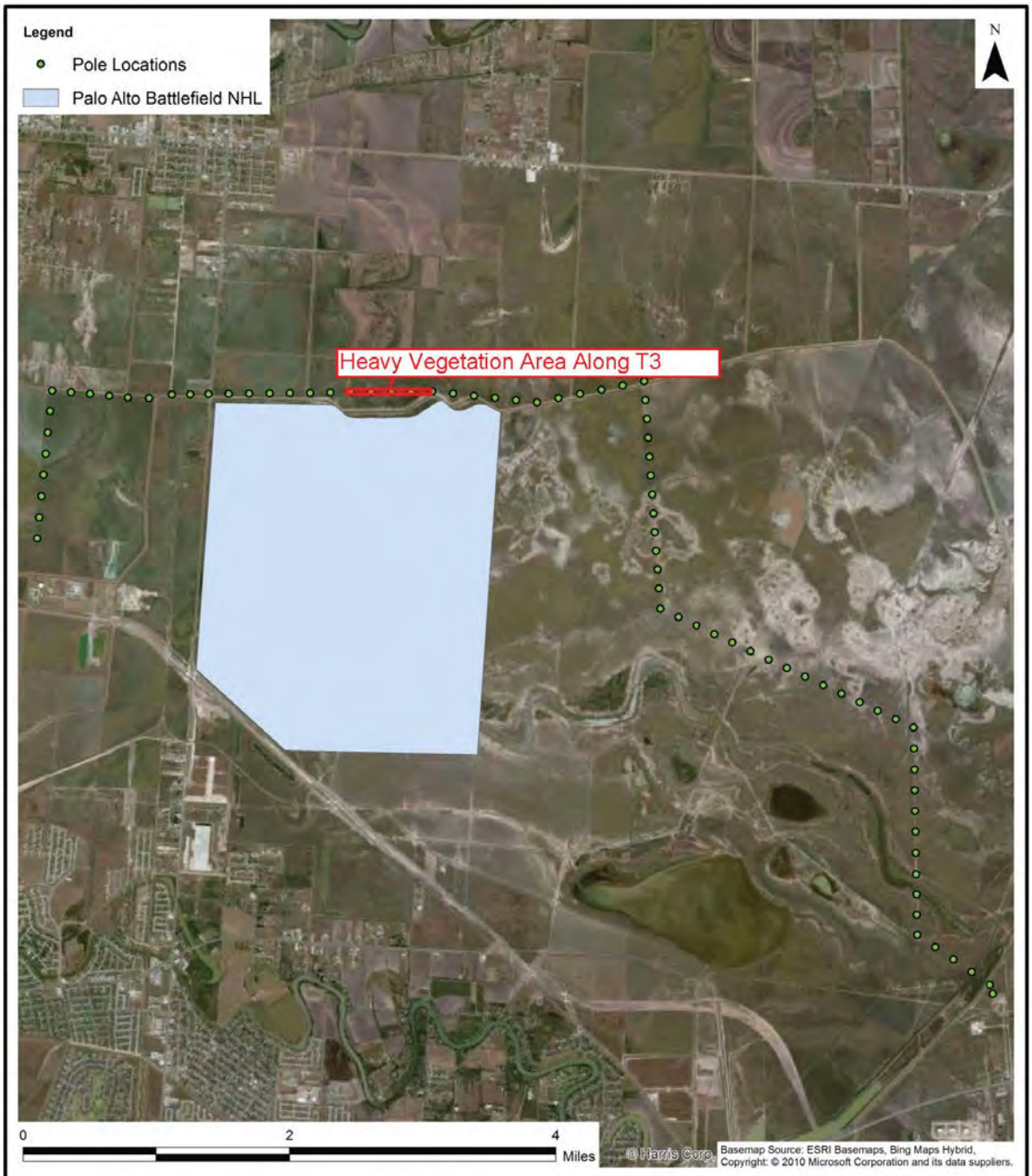
Young, Nancy Beck
Nd. "Port Isabel And Rio Grande Valley Railroad," Handbook of Texas Online http://www.tshaonline.org/handbook/online/articles/eqp16, accessed September 04, 2013. Published by the Texas State Historical Association.

Project Maps

Appendix A

December 18, 2013
Project No. 0185680

Environmental Resources Management
CityCentre Four
840 West Sam Houston Parkway North, Suite 600
Houston, Texas 77024-3920
281-600-1000



Environmental Resources Management

DESIGN:	T Cannon	DRAWN:	T Cannon	CHKD.:	T Cannon
DATE:	12/10/2013	SCALE:	AS SHOWN	REVISION:	0
FILE:					

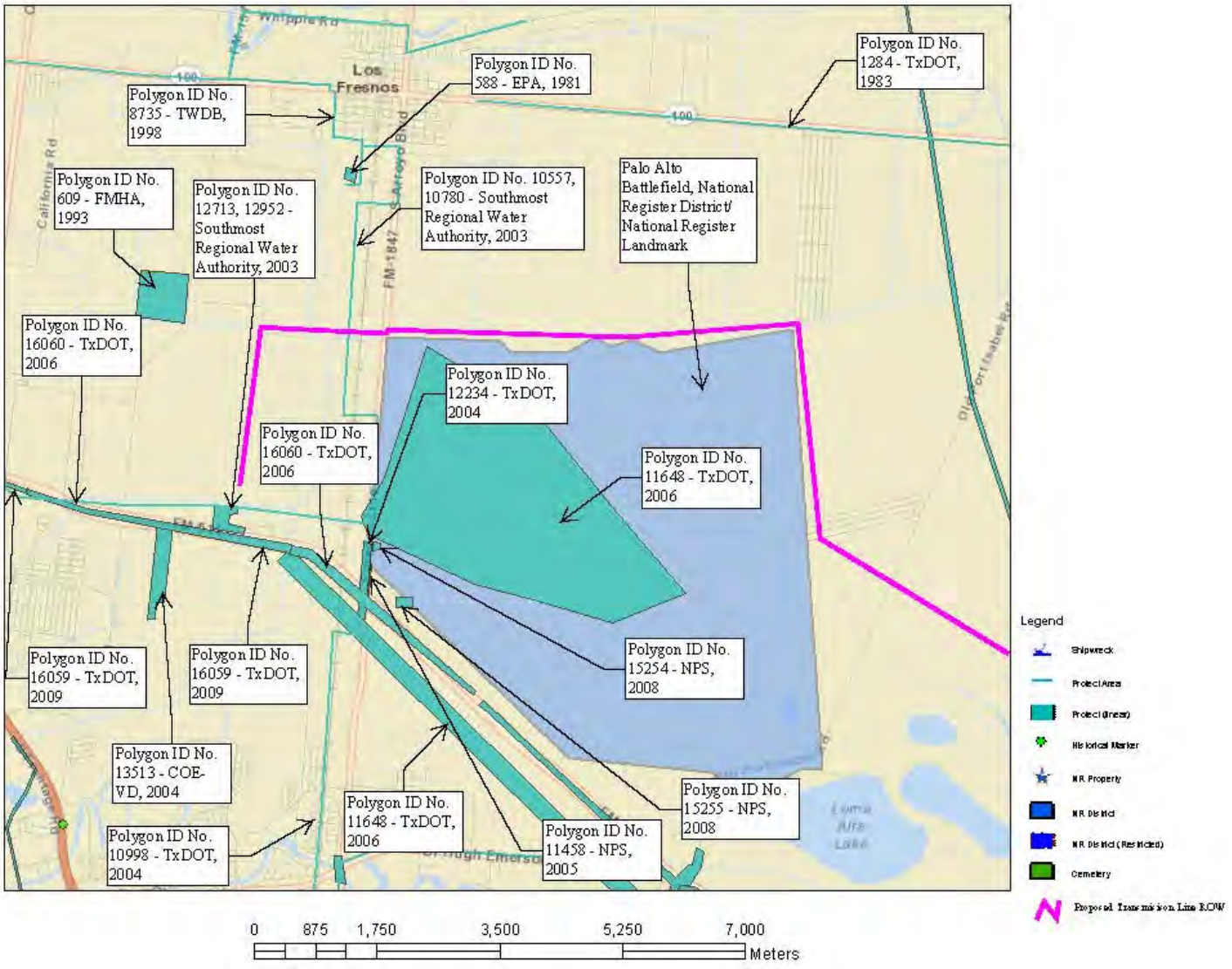
Tenaska Brownsville Generating Station Project: Transmission Interconnect Line

Cultural Resources Assessment

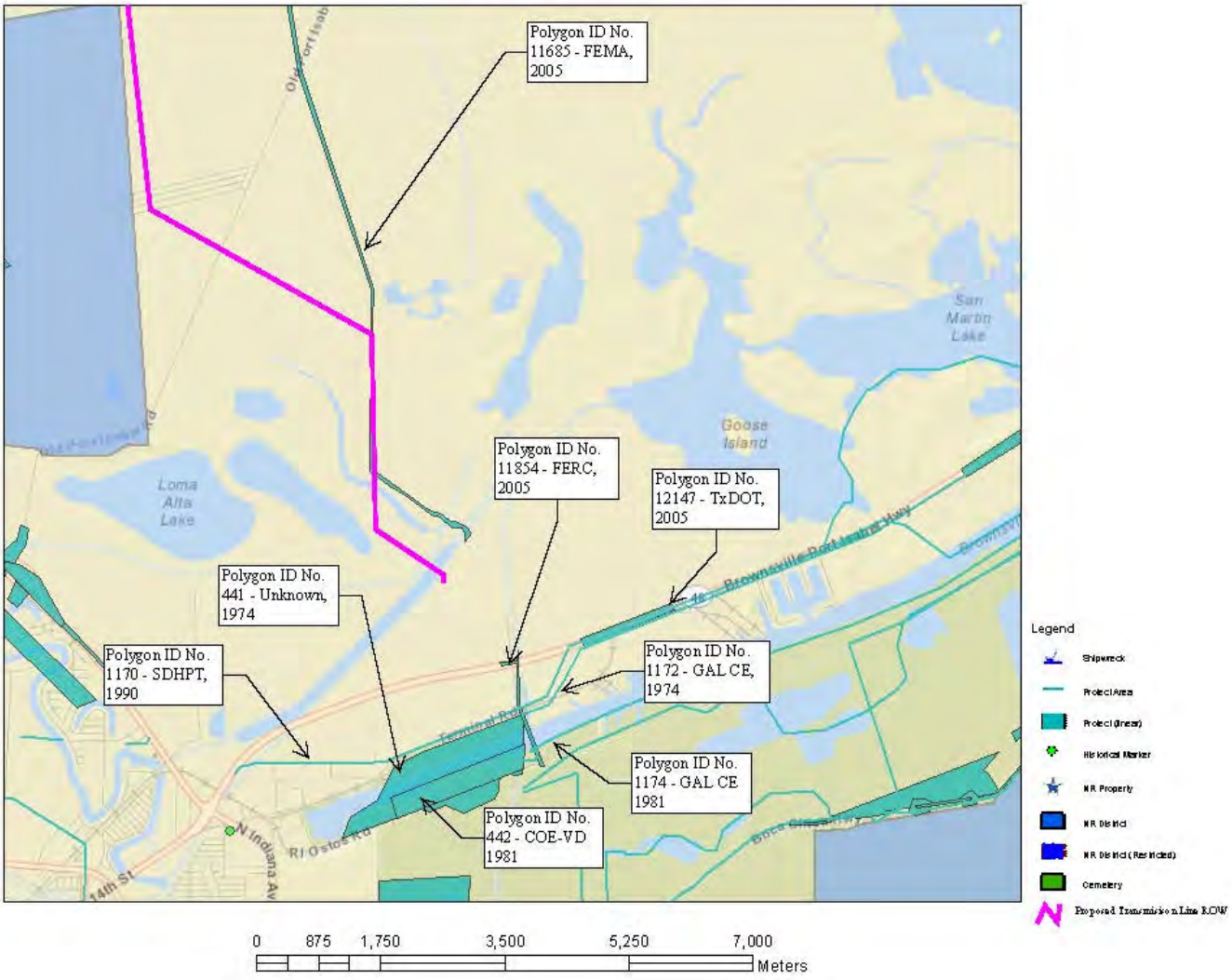
Cameron County, TX

ERM

Transmission Line Western Portion



Transmission Line Eastern Portion



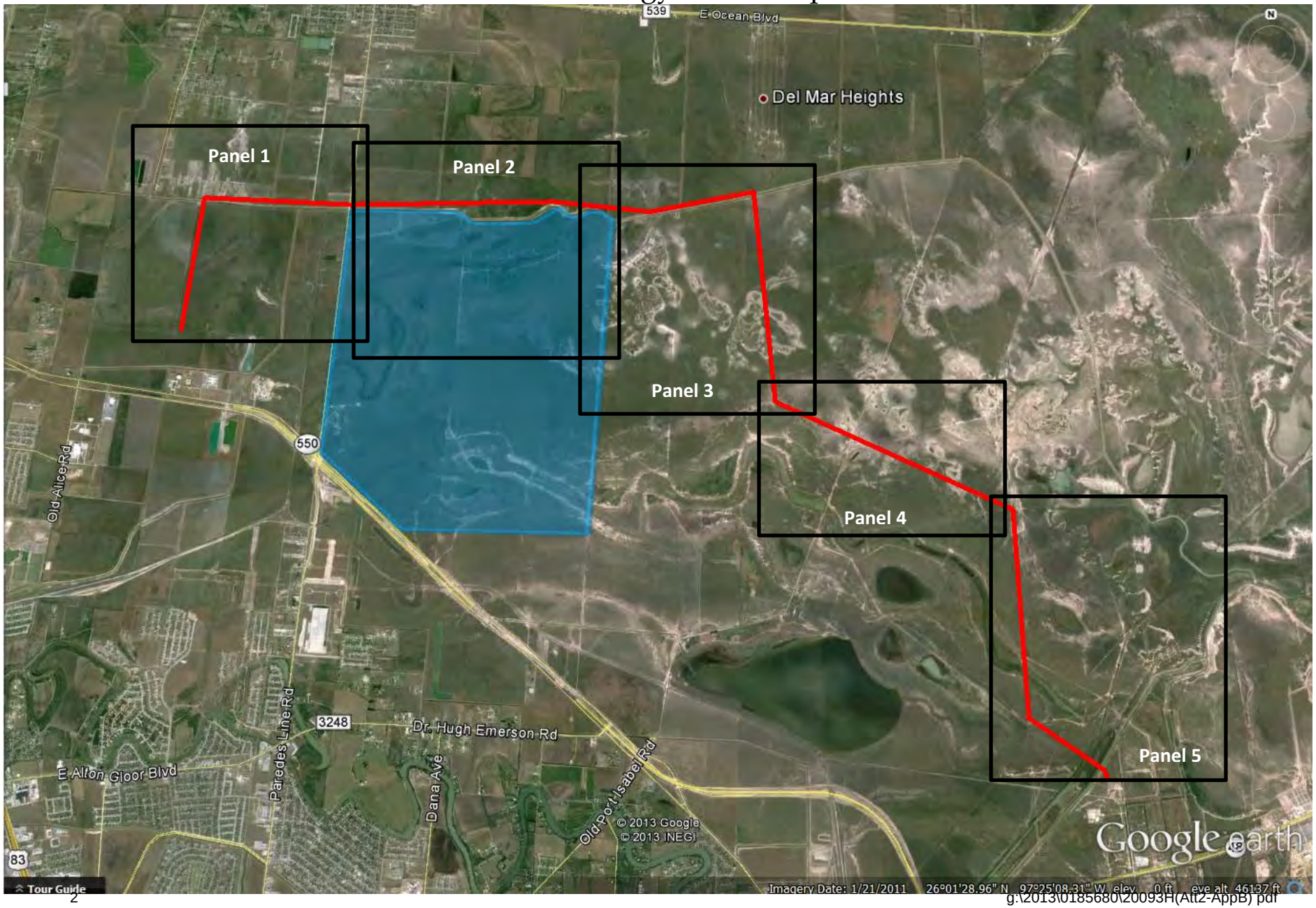
Photograph Log

Appendix B

December 18, 2013
Project No. 0185680

Environmental Resources Management
CityCentre Four
840 West Sam Houston Parkway North, Suite 600
Houston, Texas 77024-3920
281-600-1000

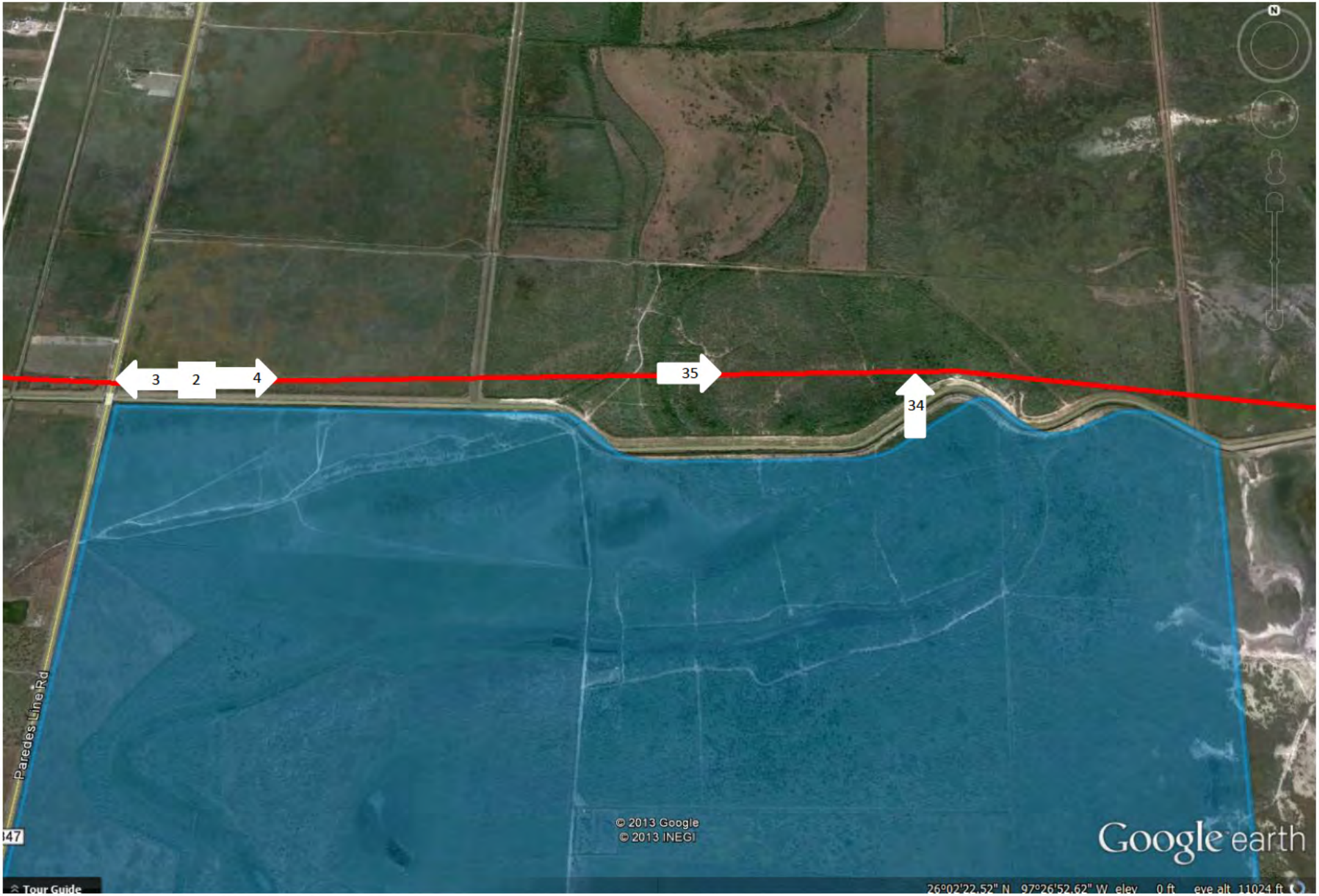
Transmission Interconnect Line –Additional Action #2:
Brownsville Generating Station:
Cameron County, Texas
Archeology Photo Map



Panel 1


321
11
8
9
10
1
Paredes Line Rd
1847
© 2013 Google
© 2013 INEGI
Google earth
Tour Guide
26°01'50.17" N 97°28'54.66" W elev 0 ft eye alt 7773 ft

Panel 2


3
2
4
35
34
Paredes Line Rd
© 2013 Google
© 2013 INEGI
Google earth
Tour Guide
26°02'22.52" N 97°26'52.62" W elev 0 ft eye alt 11024 ft

Panel 3


España Ave
5
6
7
12
13
Old Port Isabel Rd
© 2013 Google
© 2013 INEGI
Google earth
Tour Guide
Imagery Date: 1/21/2011 26°02'00.11" N 97°24'49.67" W elev 0 ft eye alt 11024 ft

Panel 4


14
15
16
17
18
19
Old Port Isabel Rd
© 2013 Google
© 2013 INEGI
Google earth
Tour Guide
Imagery Date: 1/21/2011 26°01'17.91" N 97°24'31.73" W elev 0 ft eye alt 11024 ft

Panel 5


22
20
21
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26
28
27
29
31
32
30
33
Old Port Isabel Rd
oma Alta Lake
© 2013 Google
© 2013 INEGI
Google earth
Tour Guide
Imagery Date: 1/21/2011
97°23'13.36" W elev 0 ft eye alt 13804 ft

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 1	**Date: 10/21/13**
Direction Photo Taken: W	
Description: Overview of Transect 2, taken just west of Parades Line Road	

Photo No. 2	**Date: 10/22/13**
Direction Photo Taken: Detail	
Description: STP 10 of Transect 3	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 3	**Date: 10/22/13**
Direction Photo Taken: W	
Description: Transect 3 looking west from STP 10	

Photo No. 4	**Date: 10/22/13**
Direction Photo Taken: E	
Description: Transect 3 looking east from STP 10	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 5	**Date: 10/24/13**
Direction Photo Taken: E	
Description: Western End of Transect 4	

Photo No. 6	**Date: 10/24/13**
Direction Photo Taken: W	
Description: Western End of Transect 4	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 7	**Date:** 10/24/13

Direction Photo Taken: Detail

Description: Transect 4 STP 13

Photo No. 8	**Date:** 10/24/13

Direction Photo Taken: S

Description: Northern end of Transect 1 Segment 2

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 9	**Date: 10/24/13**
Direction Photo Taken: N	
Description: Northern end of Transect 1 Segment 2	

Photo No. 10	**Date: 10/28/13**
Direction Photo Taken: W	
Description: Transect 1 Segment 3, located entirely within disturbed levee context. Photo taken at eastern end of Segment 3 near where the line crosses the canal.	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 11	**Date: 10/28/13**
Direction Photo Taken: E	
Description: Transect 1 Segment 3, located on a levee. At western end of Segment 3.	

Photo No. 12	**Date: 10/28/13**
Direction Photo Taken: N	
Description: Transect 5 Segment 1 from Pole Location 38	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 13	**Date: 11/28/13**
Direction Photo Taken: S	
Description: Transect 5 Segment 1 from Pole Location 38	

Photo No. 14	**Date: 10/30/13**
Direction Photo Taken: N	
Description: Transect 5 Segment 2 from Pole 49	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 15	**Date: 10/30/13**
Direction Photo Taken: SE	
Description: Transect 5 Segment 2 from Pole 49	

Photo No. 16	**Date: 10/30/13**
Direction Photo Taken: NW	
Description: Transect 5 Segment 2 taken from east of Pole 54	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 17	**Date: 10/30/13**
Direction Photo Taken: SE	
Description: Transect 5 Segment 2 taken from east of Pole 54	

Photo No. 18	**Date: 10/30/13**
Direction Photo Taken: SE	
Description: Transect 5 Segment 2 taken east of Pole 58	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 19	**Date: 10/30/13**
Direction Photo Taken: NW	
Description: Transect 5 Segment 2 taken east of Pole 58	

Photo No. 20	**Date: 10/31/13**
Direction Photo Taken: NW	
Description: End of Transect 5 Segment 2 at a ditch	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 21	**Date: 10/31/13**
Direction Photo Taken: SE	
Description: End of Transect 5 Segment 2 at a ditch, looking toward Pole 63	

Photo No. 22	**Date: 10/31/13**
Direction Photo Taken: S	
Description: From Pole Location 63, looking south along disturbed section of project. Start of pedestrian recon area.	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 23	**Date: 10/31/13**
Direction Photo Taken: S	
Description: Pedestrian Recon in Disturbed Corridor	

Photo No. 24	**Date: 10/31/13**
Direction Photo Taken: S	
Description: Pedestrian Recon in Disturbed Corridor	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 25	**Date: 10/31/13**
Direction Photo Taken: SW	
Description: Pipeline markers and monitoring station in disturbed portion of project area	

Photo No. 26	**Date: 10/31/13**
Direction Photo Taken: S	
Description: Pipeline Station in ROW near Pole 73	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 27	**Date: 10/31/13**
Direction Photo Taken: SE	
Description: Transect 7, taken east of Pole 73	

Photo No. 28	**Date: 10/31/13**
Direction Photo Taken: NW	
Description: Transect 7, taken east of Pole 73	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 29	**Date: 10/31/13**
Direction Photo Taken: ESE	
Description: Transect 7 at Rancho Viejo Floodway Canal near Pole 76	

Photo No. 30	**Date: 10/31/13**
Direction Photo Taken: NW	
Description: Transect 7, east of Rancho Viejo Floodway Canal	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 31	**Date: 10/31/13**
Direction Photo Taken: SE	
Description: Transect 7, east of Rancho Viejo Floodway Canal	

Photo No. 32	**Date: 10/31/13**
Direction Photo Taken: S	
Description: End of Transect 7 at Sub-station	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

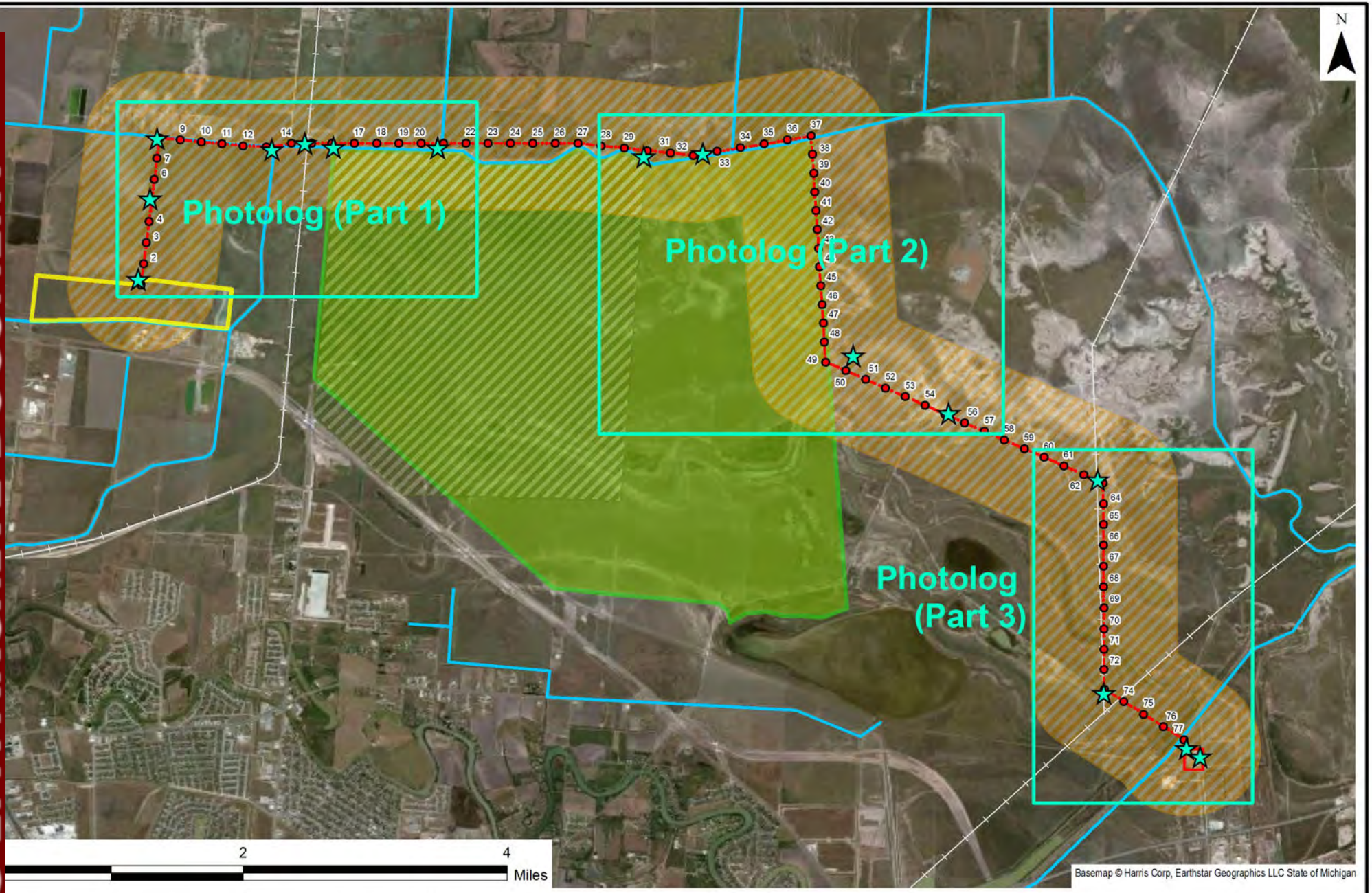
Photo No. 33	**Date: 10/31/13**
Direction Photo Taken: N	
Description: End of Transect 7 taken from Sub-station	

Photo No. 34	**Date: 10/22/13**
Direction Photo Taken: N	
Description: Dense Vegetation between Poles 23 and 29. Photo taken from top of levee to the south of vegetation. Vegetation is taller than levee (10+ foot tall levee).	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 35	**Date: 10/22/13**
Direction Photo Taken: E	
Description: Dense Vegetation between Poles 23 and 29.	



Environmental Resources Management

N:	C Albee	DRAWN:	W Campbell	CHKD.:	C Albee
	12/13/2013	SCALE:	AS SHOWN	REVISION:	2

FILE: C:\Wade_ArcGIS\Projects\Tenaska\Tenaska_PhotoLog_Overview_AbovegroundSurvey_8x11_20131213.mxd

Photograph Log Overview
Aboveground Resources Survey

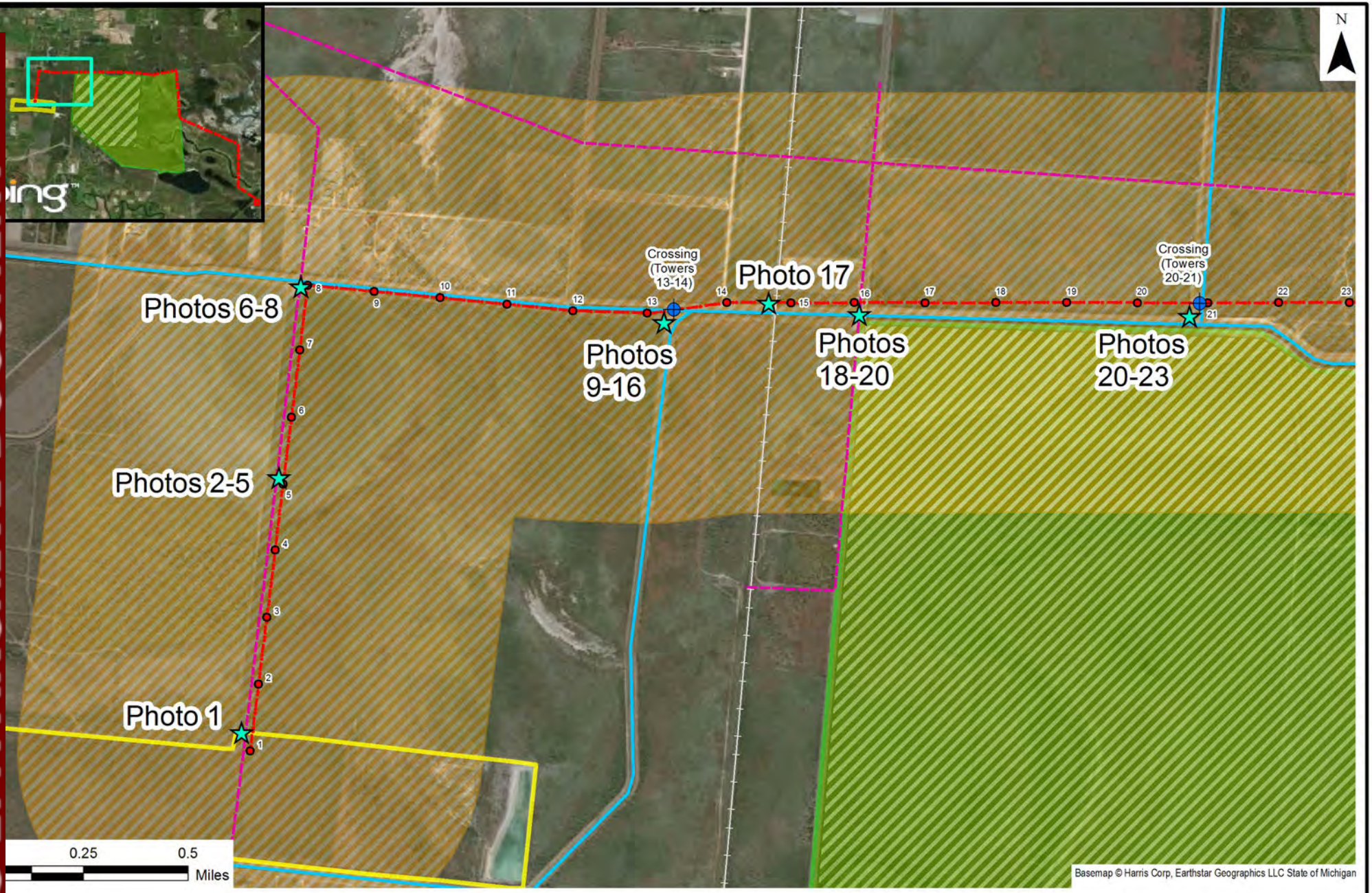
Tenaska Brownsville Generating Station:
Transmission Interconnect Line with Loma Alta
Assessment of Effects

Tenaska Brownsville Partners, LLC
Cameron County, TX

Legend

- Photograph Log Points
- Proposed Transmission Line Towers
- Proposed Transmission Line
- Loma Alta Substation
- Cameron Co. Drainage Dist. No.1
- Generating Station Site
- 1/2 Mile Survey Area
- Palo Alto Battlfield National Historical Park
- Palo Alto Battlefield National Historic Site NHL

ERM



Environmental Resources Management

N:	C Albee	DRAWN:	W Campbell	CHKD.:	C Albee
	12/13/2013	SCALE:	AS SHOWN	REVISION:	2

FILE: C:\Wade_ArcGIS\Projects\Tenaska\Tenaska_PhotoLog_Sq1_AbovegroundSurvey_8x11_20131213.mxd

Photograph Log (Part 1)
Aboveground Resources Survey

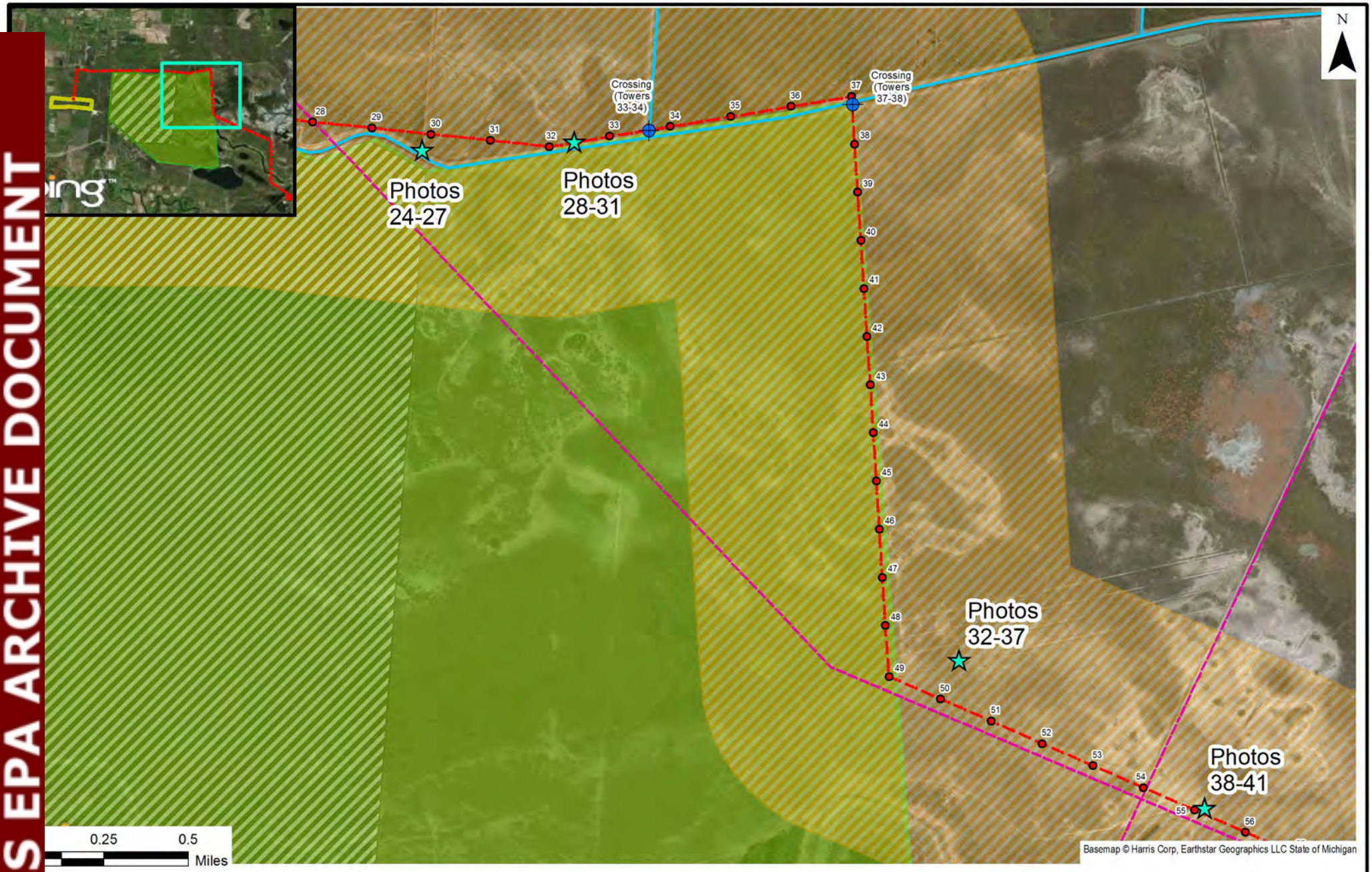
Tenaska Brownsville Generating Station: Transmission Interconnect Line with Loma Alta Assessment of Effects

Tenaska Brownsville Partners, LLC
Cameron County, TX

Legend

- Photograph Log Points
- Ditch Crossing Points
- Proposed Transmission Line Towers
- Proposed Transmission Line
- Existing Utility Lines
- Cameron Co. Drainage Dist. No.1
- Generating Station Site
- 1/2 Mile Survey Area
- Palo Alto Battlfield National Historical Park
- Palo Alto Battlefield National Historic Site NHL

ERM



Environmental Resources Management

N:	C Albee	DRAWN:	W Campbell	CHKD.:	C Albee
	12/13/2013	SCALE:	AS SHOWN	REVISION:	2

FILE: C:\Wade_ArcGIS\Projects\Tenaska\Tenaska_PhotoLog_Sq2_AbovegroundSurvey_8x11_20131213.mxd

Photograph Log (Part 2)
Aboveground Resources Survey

Tenaska Brownsville Generating Station: Transmission Interconnect Line with Loma Alta Assessment of Effects

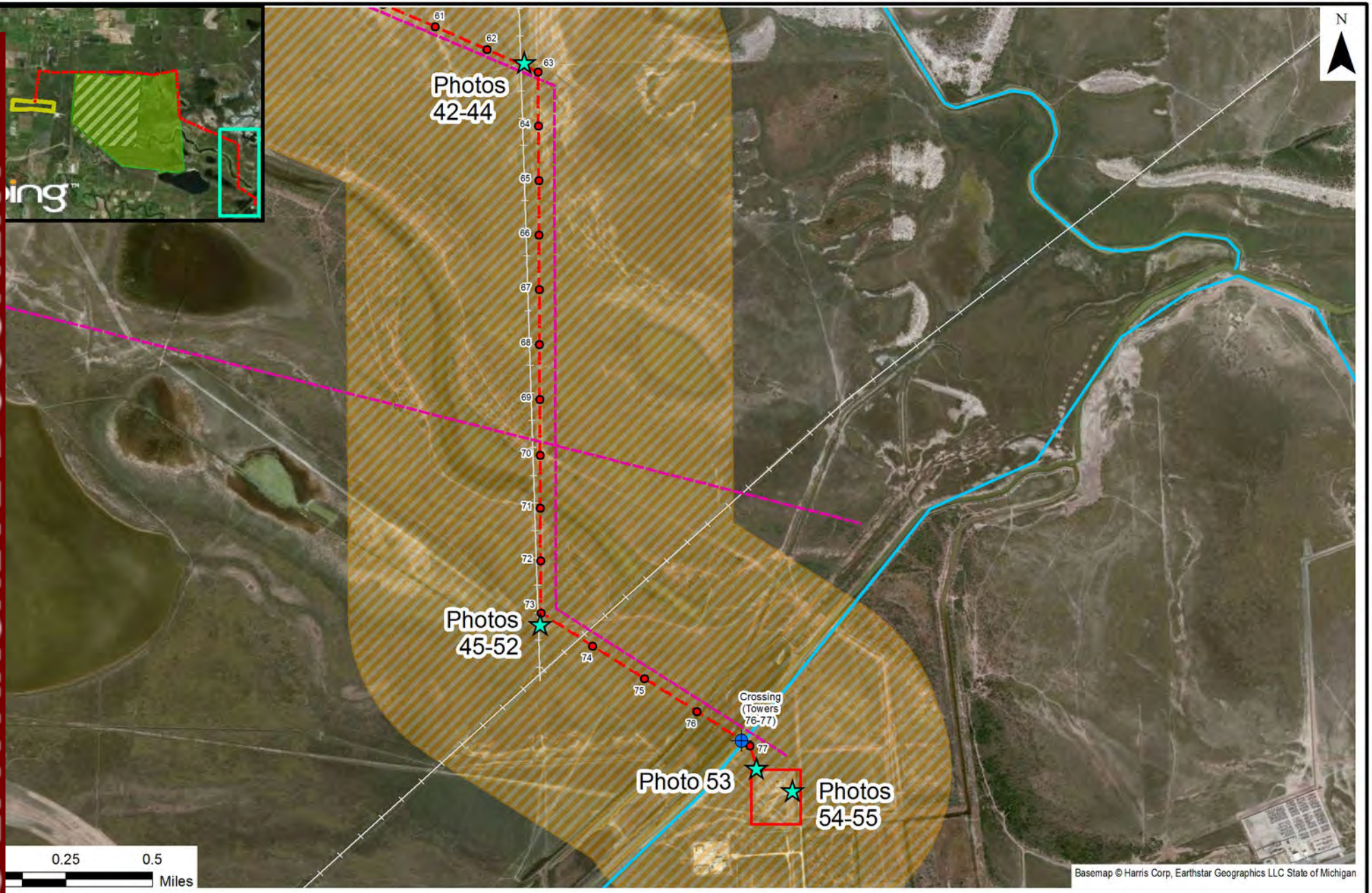
Tenaska Brownsville Partners, LLC

Cameron County, TX

Legend

- Photograph Log Points
- Ditch Crossing Points
- Proposed Transmission Line Towers
- Proposed Transmission Line
- Existing Utility Lines
- Cameron Co. Drainage Dist. No.1
- 1/2 Mile Survey Area
- Palo Alto Battlfield National Historical Park
- Palo Alto Battlefield National Historic Site NHL

ERM



Environmental Resources Management

N:	C Albee	DRAWN:	W Campbell	CHKD.:	C Albee
	12/13/2013	SCALE:	AS SHOWN	REVISION:	2

FILE: C:\Wade_ArcGIS\Projects\Tenaska\Tenaska_PhotoLog_Sq3_AbovegroundSurvey_8x11_20131213.mxd

Photograph Log (Part 3)
Aboveground Resources Survey

Tenaska Brownsville Generating Station: Transmission Interconnect Line with Loma Alta Assessment of Effects

Tenaska Brownsville Partners, LLC
Cameron County, TX

Legend

- Photograph Log Points
- Ditch Crossing Points
- Proposed Transmission Line Towers
- Proposed Transmission Line
- Existing Utility Lines
- Cameron Co. Drainage Dist. No.1
- Loma Alta Substation
- 1/2 Mile Survey Area
- Palo Alto Battlfield National Historical Park
- Palo Alto Battlefield National Historic Site NHL

ERM

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 1	**Date:** 10/22/13
Direction: Looking North	
Description: Vicinity of proposed transmission tower 1, north of generating station site (note existing utility line at right)	

Photo No. 2	**Date:** 10/22/13
Direction: Looking South	
Description: Vicinity of proposed transmission tower 5, north of generating station site	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 3 **Date:** 10/22/13 **Direction:** Looking West **Description:** Vicinity of proposed transmission tower 5, north of generating station site	
Photo No. 4 **Date:** 10/22/13 **Direction:** Looking North **Description:** Vicinity of proposed transmission tower 5, north of generating station site	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 5 **Date:** 10/22/13 **Direction:** Looking East **Description:** Vicinity of proposed transmission tower 5, north of generating station site (view towards Paredes Line Road and Palo Alto Battlefield National Historic Site NHL)	
Photo No. 6 **Date:** 10/22/13 **Direction:** Looking West **Description:** Vicinity of proposed transmission tower 8, adjacent to Cameron County Drainage District No. 1 Ditch No. 2 (right)	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 7 **Date:** 10/22/13 **Direction:** Looking Northwest **Description:** Vicinity of proposed transmission tower 8, adjacent to Cameron County Drainage District No. 1 Ditch No. 2 (note radio tower and residential neighborhood in background)	
Photo No. 8 **Date:** 10/22/13 **Direction:** Looking East **Description:** Vicinity of proposed transmission tower 8, adjacent to Cameron County Drainage District No. 1 Ditch No. 2 (left)	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 9 **Date:** 10/22/13 **Direction:** Looking South **Description:** Vicinity of proposed transmission tower 13, view toward Cameron County Drainage District No. 1 Ditch No. 3	
Photo No. 10 **Date:** 10/22/13 **Direction:** Looking Southwest **Description:** Vicinity of proposed transmission tower 13	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 11 **Date:** 10/22/13 **Direction:** Looking West **Description:** Vicinity of proposed transmission tower 13	
Photo No. 12 **Date:** 10/22/13 **Direction:** Looking Northwest **Description:** Vicinity of proposed transmission tower 13, view across Cameron County Drainage District No. 1 Ditch No. 2	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 13 **Date:** 10/22/13 **Direction:** Looking North **Description:** Vicinity of proposed transmission tower 13, view across Cameron County Drainage District No. 1 Ditch No. 2	
Photo No. 14 **Date:** 10/22/13 **Direction:** Looking Northeast **Description:** Vicinity of proposed transmission tower 13, view across Cameron County Drainage District No. 1 Ditch No. 2 (note existing transmission line in the background)	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 15 **Date:** 10/22/13 **Direction:** Looking East **Description:** Vicinity of proposed transmission tower 13, view across Cameron County Drainage District No. 1 Ditch No. 2 (note existing transmission line in the background)	
Photo No. 16 **Date:** 10/22/13 **Direction:** Looking Southeast **Description:** Vicinity of proposed transmission tower 13, view across Cameron County Drainage District No. 1 Ditch No. 2 (existing utility lines along Paredes Line Road can just be seen on the horizon)	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 17	**Date:** 10/22/13
Direction: Looking Southeast	
Description: Vicinity of proposed transmission tower 15, view of Cameron County Drainage District No. 1 Ditch No. 2, showing Southern Pacific Railroad crossing	

Photo No. 18	**Date:** 10/22/13
Direction: Looking West	
Description: View from Paredes Line Road, in the vicinity of proposed transmission tower 16, down Cameron County Drainage District No. 1 Ditch No. 2	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 19	**Date:** 10/22/13

Direction: Looking South

Description:

Paredes Line Road, in the vicinity of proposed transmission tower 16, adjacent to Cameron County Drainage District No. 1 Ditch No. 2 (Palo Alto Battlefield National Historic Site NHL left of road)

Photo No. 20	**Date:** 10/22/13

Direction: Looking East

Description:

View from Paredes Line Road, in the vicinity of proposed transmission tower 16, adjacent to Cameron County Drainage District No. 1 Ditch No. 2 (Palo Alto Battlefield National Historic Site NHL on right bank)

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 21 **Date:** 10/22/13 **Direction:** Looking Southwest **Description:** Vicinity of proposed transmission tower 21, view across Cameron County Drainage District No. 1 Ditch No. 2 (Palo Alto Battlefield National Historic Site NHL on left bank)	
Photo No. 22 **Date:** 10/22/13 **Direction:** Looking Southeast **Description:** Vicinity of proposed transmission tower 21, view across Cameron County Drainage District No. 1 Ditch No. 2 (Palo Alto Battlefield National Historic Site NHL on far bank)	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 23 **Date:** 10/22/13 **Direction:** Looking Northeast **Description:** Vicinity of proposed transmission tower 21, view across Cameron County Drainage District No. 1 Ditch Los Fresnos S.E. (note existing transmission line in the distance)	
Photo No. 24 **Date:** 10/22/13 **Direction:** Looking Southeast **Description:** Vicinity of proposed transmission tower 30, view across Cameron County Drainage District No. 1 Ditch No. 2 (Palo Alto Battlefield National Historic Site NHL on right bank)	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 25	**Date:** 10/22/13
Direction: Looking Southeast	
Description: Vicinity of proposed transmission tower 30, view across Cameron County Drainage District No. 1 Ditch No. 2, with Palo Alto Battlefield National Historic Site NHL on far side (note existing transmission line in the distance)	

Photo No. 26	**Date:** 10/22/13
Direction: Looking Southwest	
Description: Vicinity of proposed transmission tower 30, view across Cameron County Drainage District No. 1 Ditch No. 2 (Palo Alto Battlefield National Historic Site NHL on far side)	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 27 **Date:** 10/22/13 **Direction:** Looking Southwest **Description:** Vicinity of proposed transmission tower 30, view across Cameron County Drainage District No. 1 Ditch No. 2, with Palo Alto Battlefield National Historic Site NHL on left bank (note existing transmission line in the distance)	
Photo No. 28 **Date:** 10/22/13 **Direction:** Looking East **Description:** Vicinity of proposed transmission tower 32, view across Cameron County Drainage District No. 1 Ditch No. 2 (Palo Alto Battlefield National Historic Site NHL on right bank)	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 29 **Date:** 10/22/13 **Direction:** Looking South **Description:** Vicinity of proposed transmission tower 32, view across Cameron County Drainage District No. 1 Ditch No. 2 (Palo Alto Battlefield National Historic Site NHL on opposite side)	
Photo No. 30 **Date:** 10/22/13 **Direction:** Looking Southwest **Description:** Vicinity of proposed transmission tower 32, view across Cameron County Drainage District No. 1 Ditch No. 2 (Palo Alto Battlefield National Historic Site NHL on left bank)	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 31 **Date:** 10/22/13 **Direction:** Looking West **Description:** Vicinity of proposed transmission tower 32, adjacent to Cameron County Drainage District No. 1 Ditch No. 2	
Photo No. 32 **Date:** 10/22/13 **Direction:** Looking West **Description:** View towards the Palo Alto Battlefield National Historic Site NHL, vicinity of proposed transmission tower 50, showing existing transmission line	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 33 **Date:** 10/22/13 **Direction:** Looking Northwest **Description:** View towards the Palo Alto Battlefield National Historic Site NHL, vicinity of proposed transmission tower 50, showing existing transmission line	
Photo No. 34 **Date:** 10/22/13 **Direction:** Looking North **Description:** Vicinity of proposed transmission tower 50	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 35 **Date:** 10/22/13 **Direction:** Looking East **Description:** Vicinity of proposed transmission tower 50	
Photo No. 36 **Date:** 10/22/13 **Direction:** Looking Southeast **Description:** Vicinity of proposed transmission tower 50 (note existing transmission line on the horizon)	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 37 **Date:** 10/22/13 **Direction:** Looking South **Description:** Vicinity of proposed transmission tower 50 (note existing transmission line in the background)	
Photo No. 38 **Date:** 10/22/13 **Direction:** Looking West **Description:** Vicinity of proposed transmission tower 55 (note existing utility line along Old Port Isabel Road in the background)	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 39 **Date:** 10/22/13 **Direction:** Looking Northwest **Description:** Vicinity of proposed transmission tower 55, showing existing transmission line overhead (note existing utility line along Old Port Isabel Road in the background)	
Photo No. 40 **Date:** 10/22/13 **Direction:** Looking North **Description:** Vicinity of proposed transmission tower 55 (note existing utility line along Old Port Isabel Road just visible on the horizon)	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 41 **Date:** 10/22/13 **Direction:** Looking Southeast **Description:** Vicinity of proposed transmission tower 55, showing existing transmission line overhead	
Photo No. 42 **Date:** 10/22/13 **Direction:** Looking Northwest **Description:** Vicinity of proposed transmission tower 63, showing existing transmission line overhead	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 43 **Date:** 10/22/13 **Direction:** Looking East **Description:** Vicinity of proposed transmission tower 63, showing existing transmission line overhead	
Photo No. 44 **Date:** 10/22/13 **Direction:** Looking South **Description:** Vicinity of proposed transmission tower 63, showing existing transmission line overhead and in the distance	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 45	**Date:** 10/22/13
Direction: Looking Northeast	
Description: Vicinity of proposed transmission tower 73, showing existing transmission line	

Photo No. 46	**Date:** 10/22/13
Direction: Looking East	
Description: Vicinity of proposed transmission tower 73, showing existing transmission line and natural gas pipeline meter reading station	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 47 **Date:** 10/22/13 **Direction:** Looking Southeast **Description:** Vicinity of proposed transmission tower 73	
Photo No. 48 **Date:** 10/22/13 **Direction:** Looking South **Description:** Vicinity of proposed transmission tower 73	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 49 **Date:** 10/22/13 **Direction:** Looking Southwest **Description:** Vicinity of proposed transmission tower 73	
Photo No. 50 **Date:** 10/22/13 **Direction:** Looking West **Description:** Vicinity of proposed transmission tower 73	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 51 **Date:** 10/22/13 **Direction:** Looking Northwest **Description:** Vicinity of proposed transmission tower 73	
Photo No. 52 **Date:** 10/22/13 **Direction:** Looking North **Description:** Vicinity of proposed transmission tower 73	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 53 **Date:** 10/22/13 **Direction:** Looking East **Description:** Vicinity of proposed transmission tower 78, showing the Loma Alta Substation	
Photo No. 54 **Date:** 10/22/13 **Direction:** Looking Northwest **Description:** View of Loma Alta Substation	

PHOTOGRAPH LOG

Client Name: Tenaska	**Site Location:** Transmission Interconnect Line – Additional Action #2: Brownsville Electric Generating Station: Cameron County, Texas	**Project No.** 0185680

Photo No. 55	**Date:** 10/22/13
Direction: Looking Southwest	
Description: Transmission lines leading into Loma Alta Substation	

Shovel Test Log

Appendix C

December 18, 2013
Project No. 0185680

Environmental Resources Management
CityCentre Four
840 West Sam Houston Parkway North, Suite 600
Houston, Texas 77024-3920
281-600-1000

Appendix C: Tenaska – Additional Action #2: Brownsville Electric Generating Station Transmission Line ROW				
Shovel Test Log				
Transect	**Shovel Test**	**Result**	**Depth** (cm below surface)	**Artifacts**
Transect 1	1	Negative	40	0
	2	Negative	40	0
	3	Negative	40	0
	4	Negative	40	0
	5	Negative	40	0
	6	Negative	40	0
	7	Negative	40	0
	8	Negative	40	0
	9	Negative	40	0
	10	Negative	40	0
	11	Negative	40	0
	12	Negative	40	0
	13	Negative	40	0
	14	Negative	40	0
	15	Negative	40	0
	16	Negative	40	0
	17	Negative	40	0
	18	Negative	40	0
	19	Negative	40	0
	20	Negative	40	0
	21	Negative	40	0
	22	Negative	40	0
	23	Negative	40	0
	24	Negative	40	0
	25	Negative	50	0
	26	Negative	40	0
	27	Negative	65	0
	28	Negative	50	0
	29	Negative	50	0
	30	Negative	40	0
	31	Negative	48	0
	32	Negative	50	0
	33	Negative	45	0
	34	Negative	45	0
	35	Negative	40	0
	36	Negative	40	0
	37	Negative	40	0
	38	Negative	40	0

	39	Negative	40	0
	40	Negative	40	0
	41	Negative	40	0
	42	Negative	40	0
	43	Negative	40	0
	44	Negative	40	0
	45	Negative	40	0
	46	Negative	40	0
	47	Negative	40	0
	48	Negative	40	0
	49	Negative	40	0
	50	Negative	40	0
	51	Negative	40	0
	52	Negative	40	0
	53	Negative	40	0
	54	Negative	40	0
	55	Negative	40	0
	56	Negative	40	0
	57	Negative	40	0
	58	Negative	40	0
Transect 2	1	Unexcavated		
	2	Negative	40	0
	3	Negative	40	0
	4	Negative	40	0
	5	Negative	40	0
	6	Negative	40	0
	7	Negative	40	0
	8	Negative	40	0
	9	Negative	40	0
	10	Negative	40	0
	11	Unexcavated		
Transect 3	1	Negative	50	0
	2	Negative	45	0
	3	Negative	40	0
	4	Negative	40	0
	5	Negative	40	0
	6	Negative	40	0
	7	Negative	40	0
	8	Negative	40	0
	9	Negative	40	0
	10	Negative	40	0
	11	Negative	40	0
	12	Negative	40	0

	13	Negative	40	0
	14	Negative	40	0
	15	Negative	40	0
	16	Negative	45	0
	17	Negative	45	0
	18	Negative	40	0
	19	Negative	40	0
	20	Negative	unexcavated	0
	21	Negative	40	0
	22	Negative	40	0
	23	Negative	40	0
	24	Negative	40	0
	25	Negative	50	0
	26	Negative	40	0
	27	Negative	40	0
	28	Negative	40	0
	29	Negative	45	0
	30	Negative	40	0
	31	Negative	40	0
	32	Negative	40	0
	33	Negative	40	0
	34	Negative	40	0
	35	Negative	unexcavated	0
	36	Negative	unexcavated	0
	37	Negative	40	0
	38	Negative	40	0
	39	Negative	40	0
	40	Negative	40	0
	41	Negative	40	0
	42	Negative	40	0
	43	Negative	40	0
	44	Negative	40	0
	45	Negative	40	0
	46	Negative	40	0
	47	Negative	40	0
Transect 4	1	Negative	40	0
	2	Negative	40	0
	3	Negative	40	0
	4	Negative	40	0
	5	Negative	40	0
	6	Negative	40	0
	7	Negative	40	0
	8	Negative	40	0
	9	Negative	40	0

	10	Negative	40	0
	11	Negative	40	0
	12	Negative	40	0
	13	Negative	40	0
	14	Negative	unexcavated	0
	15	Negative	40	0
	16	Negative	40	0
	17	Negative	40	0
	18	Negative	40	0
	19	Negative	40	0
	20	Negative	40	0
	21	Negative	40	0
	22	Negative	40	0
	23	Negative	40	0
	24	Negative	35	0
	25	Negative	40	0
	26	Negative	35	0
	27	Negative	40	0
	28	Negative	40	0
	29	Negative	40	0
	30	Negative	40	0
	31	Negative	40	0
	32	Negative	40	0
	33	Negative	40	0
	34	Negative	40	0
	35	Negative	40	0
	36	Negative	40	0
	37	Negative	40	0
Transect 5	1	Negative	40	0
	2	Negative	40	0
	3	Negative	40	0
	4	Negative	40	0
	5	Negative	40	0
	6	Negative	40	0
	7	Negative	40	0
	8	Negative	40	0
	9	Negative	40	0
	10	Negative	40	0
	11	Negative	40	0
	12	Negative	40	0
	13	Negative	40	0
	14	Negative	40	0
	15	Negative	40	0
	16	Negative	40	0

17	Negative	40	0
18	Negative	40	0
19	Negative	40	0
20	Negative	40	0
21	Negative	40	0
22	Negative	40	0
23	Negative	40	0
24	Negative	40	0
25	Negative	40	0
26	Negative	40	0
27	Negative	40	0
28	Negative	40	0
29	Negative	40	0
30	Negative	40	0
31	Negative	40	0
32	Negative	40	0
33	Negative	40	0
34	Negative	40	0
35	Negative	40	0
36	Negative	40	0
37	Negative	40	0
38	Negative	40	0
39	Negative	40	0
40	Negative	40	0
41	Negative	40	0
42	Negative	40	0
43	Negative	40	0
44	Negative	40	0
45	Negative	40	0
46	Negative	40	0
47	Negative	40	0
48	Negative	40	0
49	Negative	40	0
50	Negative	40	0
51	Negative	40	0
52	Negative	40	0
53	Negative	40	0
54	Negative	40	0
55	Negative	40	0
56	Negative	40	0
57	Negative	40	0
58	Negative	40	0
59	Negative	40	0
60	Negative	40	0
61	Negative	40	0

62	Negative	40	0
63	Negative	40	0
64	Negative	40	0
65	Negative	40	0
66	Negative	40	0
67	Negative	40	0
68	Negative	40	0
69	Negative	40	0
70	Negative	40	0
71	Negative	40	0
72	Negative	40	0
73	Negative	40	0
74	Negative	40	0
75	Negative	40	0
76	Negative	40	0
77	Negative	40	0
78	Negative	40	0
79	Negative	40	0
80	Negative	40	0
81	Negative	40	0
82	Negative	40	0
83	Negative	40	0
84	Negative	40	0
85	Negative	40	0
86	Negative	40	0
87	Negative	40	0
88	Negative	40	0
89	Negative	40	0
90	Negative	40	0
91	Negative	40	0
92	Negative	40	0
93	Negative	40	0
94	Negative	40	0
95	Negative	40	0
96	Negative	40	0
97	Negative	40	0
98	Negative	40	0
99	Negative	40	0
100	Negative	unexcavated	0
101	Negative	40	0
102	Negative	40	0
103	Negative	40	0
104	Negative	40	0
105	Negative	40	0
106	Negative	40	0

107	Negative	40	0
108	Negative	40	0
109	Negative	40	0
110	Negative	40	0
111	Negative	40	0
112	Negative	40	0
113	Negative	40	0
114	Negative	40	0
115	Negative	40	0
116	Negative	40	0
117	Negative	40	0
118	Negative	40	0
119	Negative	40	0
120	Negative	40	0
121	Negative	40	0
122	Negative	40	0
123	Negative	40	0
124	Negative	40	0
125	Negative	40	0
126	Negative	40	0
127	Negative	40	0
128	Negative	40	0
129	Negative	40	0
130	Negative	40	0
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132	Negative	40	0
133	Negative	40	0
134	Negative	40	0
135	Negative	40	0
136	Negative	40	0
137	Negative	40	0
138	Negative	40	0
139	Negative	40	0
140	Negative	40	0
141	Negative	40	0
142	Negative	40	0
143	Negative	40	0
144	Negative	40	0
145	Negative	40	0
146	Negative	40	0
147	Negative	40	0
148	Negative	40	0
149	Negative	40	0
150	Negative	40	0
151	Negative	40	0

	152	Negative	40	0
	153	Negative	40	0
	154	Negative	40	0
	155	Negative	40	0
	156	Negative	40	0
Transect 6		Negative	unexcavated	0
Transect 7	1	Negative	40	0
	2	Negative	40	0
	3	Negative	40	0
	4	Negative	40	0
	5	Negative	40	0
	6	Negative	40	0
	7	Negative	40	0
	8	Negative	40	0
	9	Negative	40	0
	10	Negative	40	0
	11	Negative	40	0
	12	Negative	40	0
	13	Negative	40	0
	14	Negative	40	0
	15	Negative	40	0
	16	Negative	unexcavated	0
	17	Negative	40	0
	18	Negative	40	0
	19	Negative	40	0

328 total shovel tests