ATTACHMENT 1

Environmental Assessment and Route Analysis for the 138 kV Stewart-West Bay Project in Galveston County, Texas

This page left blank intentionally

138 kV Stewart to West Bay Project

PREPARED FOR: CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC

PREPARED BY: POWER ENGINEERS, INC.
HOUSTON, TEXAS

This page left blank intentionally.

EXECUTIVE SUMMARY

CenterPoint Energy Houston Electric, LLC (CenterPoint Houston) proposes to rebuild a portion of an existing double-circuit 138 kilovolt (kV) electric transmission line located in Galveston County, Texas, also referred to as the 138 kV Stewart to West Bay Project (Project or Project Route). The rebuilt portions of existing Circuits 48 and 59 will continue to connect the existing CenterPoint Houston Stewart and West Bay Substations. The start of the Project is approximately 0.34 mile northwest of the intersection of San Luis Pass Road (Farm-to-Market Road [FM] 3005) and 13 Mile Road. The Project will extend approximately 11 miles to the West Bay Substation, which is located approximately 0.17 mile west of the intersection of San Luis Pass Road (FM 3005) and Catalina Drive. CenterPoint Houston retained POWER Engineers, Inc. (POWER) to prepare this Environmental Assessment and Route Analysis to support the Public Utility Commission of Texas (PUC) application for a Certificate of Convenience and Necessity for the proposed project.

POWER, with input from CenterPoint Houston, identified the study area boundaries utilizing the two endpoints, the portions of the existing 138 kV circuits proposed to be rebuilt, as well as potential paralleling features and constraints. CenterPoint Houston provided the project endpoints along the location of the existing 138 kV circuits. Data collection was conducted to identify the environmental and land use constraints within the study area that were pertinent to further evaluate if rebuilding the existing circuits within the existing roadway right-of-way was feasible. Data collection activities included a review of readily available data, coordination with federal and state regulatory agencies and local officials, and reconnaissance surveys from public viewpoints. CenterPoint Houston received input from local agencies and reconnaissance surveys as part of consideration of the project objectives.

The potential environmental and land use impacts for the Project Route were tabulated by POWER for the evaluation criteria. CenterPoint Houston provided the engineering review and estimated construction costs for the Project Route. POWER determined that the Project Route addresses the requirements of the Public Utility Regulatory Act (PURA) and the PUC Substantive Rules.

CenterPoint Houston provided input and review throughout the routing evaluation process and agreed that the Project Route addresses the requirements of the PURA and the PUC Substantive Rules.

TABLE OF CONTENTS

FIGURES:

TABLES:

APPENDICES:

ACRONYMS AND ABBREVIATIONS:

AM radio	Amplitude Modulation radio
amsl	above mean sea level
BEG	Bureau of Economic Geology
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practices
BP	Before Present
CCC	Coastal Coordination Council
CCN	Certificate of Convenience and Necessity
CenterPoint Houston	CenterPoint Energy Houston Electric, LLC
CFR	Code of Federal Regulations
CMP	Texas Coastal Management Program
CMZ	Coastal Management Zone
CNRA	Coastal Natural Resource Areas
CR	County Road
CWA	Clean Water Act
DoD	United States Department of Defense
EA	Environmental Assessment and Alternative Route Analysis
EMF	Electromagnetic Field
EOR	Element of Record
ESA	Endangered Species Act
ESSS	Ecologically Significant Stream Segment
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FM	Farm-to-Market Road
FM radio	Frequency Modulation radio
GIS	Geographic Information Systems
GLO	Texas General Land Office
HPA	high probability area
IPaC	Information for Planning and Consultation
ISD	Independent School District
kV	kilovolt
MBTA	Migratory Bird Treaty Act
NAIP	National Agriculture Imagery Program
NCED	National Conservation Easement Database
NEPA	National Environmental Policy Act
NESC	National Electrical Safety Code
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service

NRHP	National Register of Historic Places
NWI	National Wetland Inventory
NWP	Nationwide Permit
OTHM	Official Texas Historical Marker
PEM	Palustrine emergent
PFO	Palustrine forested
POWER	POWER Engineers, Inc.
ppt	parts per trillion
Project	138 kV Stewart to West Bay Project
PSS	Palustrine shrub-shrub
PUC	Public Utility Commission of Texas
PURA	Public Utility Regulatory Act
RHA	Rivers and Harbors Act of 1899
ROW	right-of-way
RRC	Railroad Commission of Texas
SAL	State Antiquities Landmark
SH	State Highway
SHPO	State Historic Preservation Office
Staff	PUC Staff
SWAP	State Wildlife Action Plan
SWPPP	Stormwater Pollution Prevention Plan
TAC	Texas Administrative Code
TARL	Texas Archeological Research Laboratory
TASA	Texas Archeological Site Atlas
TCEQ	Texas Commission on Environmental Quality
THC	Texas Historical Commission
THSA	Texas Historical Site Atlas
TLC	Texas Land Conservancy
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TPDES	Texas Pollution Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TWDB	Texas Water Development Board
TxDOT	Texas Department of Transportation
TXNDD	Texas Natural Diversity Database
TXSDC	Texas State Data Center
US	United States
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USCB	United States Census Bureau
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

US Hwy	United States Highway
WOTUS	Waters of the United States

This page left blank intentionally.

1.0 DESCRIPTION OF THE PROPOSED PROJECT

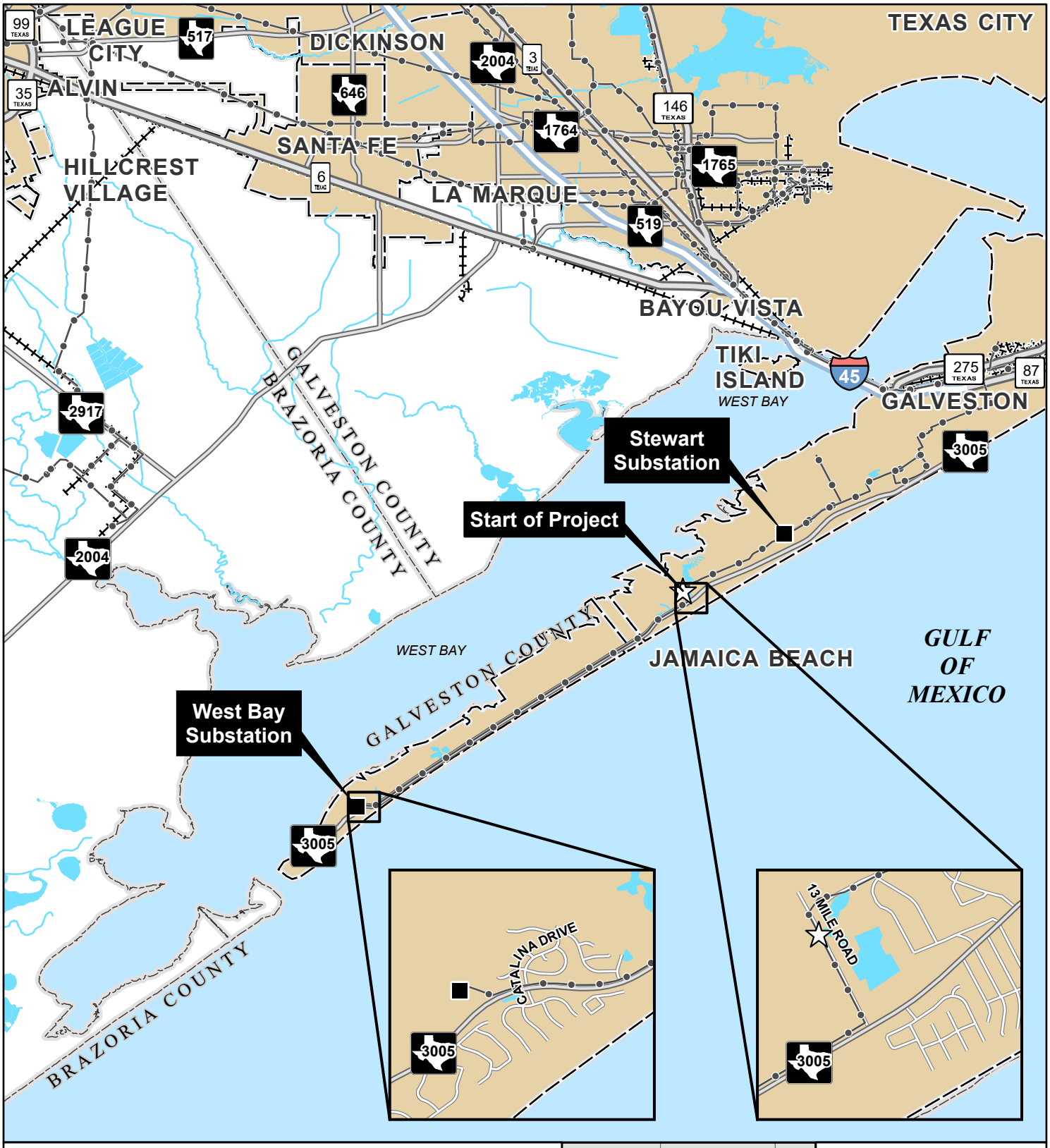
1.1 SCOPE OF THE PROJECT

CenterPoint Energy Houston Electric, LLC (CenterPoint Houston) proposes to rebuild a portion of a double-circuit 138 kilovolt (kV) electric transmission line located in Galveston County, Texas, also referred to as the 138 kV Stewart to West Bay Project (Project or Project Route). The rebuilt portions of existing Circuits 48 and 59 will continue to connect the existing CenterPoint Houston Stewart and West Bay Substations. The rebuilt double-circuit transmission line is anticipated to remain within the existing roadway right-of-way (ROW) for the majority of its length. The start of the Project is approximately 0.34 mile northwest of the intersection of San Luis Pass Road (Farm-to-Market Road [FM] 3005) and 13 Mile Road. The Project will extend approximately 11 miles to the West Bay Substation, which is located approximately 0.17 mile west of the intersection of San Luis Pass Road (FM 3005) and Catalina Drive. See Figure 1-1 for a map of the Project vicinity.

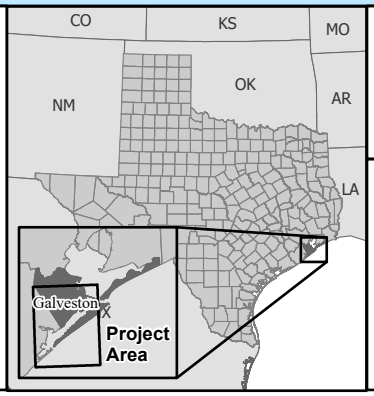
CenterPoint Houston retained POWER Engineers, Inc. (POWER) to prepare this Environmental Assessment and Route Analysis (EA) to support the application for a Certificate of Convenience and Necessity (CCN) for the Project. This EA discusses a single route, the Project Route, and the environmental and land use constraints identified within the study area, documents routing methodologies and public involvement, and provides an evaluation of the Project Route. This document provides information in compliance with the requirements of Section 37.056(c)(4)(A)-(D) of the Public Utility Regulatory Act (PURA), the Public Utility Commission of Texas (PUC) CCN application form, and 16 Texas Administrative Code (TAC) § 22.52 and § 25.101. The EA may also be used to support any additional local, state, or federal permitting activities that may be required for construction of the Project.

To assist POWER with the evaluation of the Project, CenterPoint Houston provided POWER with the Project endpoints, information regarding the need for the Project, and CenterPoint Houston's construction practices and ROW requirements. CenterPoint Houston also provided information regarding engineering and design requirements, as well as estimated cost information associated with the Project Route.

This page left blank intentionally.



Start of Project
Existing Substation
Existing Transmission Line
Interstate Highway
State Highway
Farm-to-Market Road
Railroad
River / Stream
Waterbody
City Limit
County Boundary



CENTERPOINT ENERGY
138 KV STEWART TO WEST BAY PROJECT
FIGURE 1-1
PROJECT VICINITY

0 3 6
Miles

CenterPoint Energy
POWER ENGINEERS
Date: 3/12/2025

This page left blank intentionally.

1.2 AGENCY ACTIONS

Numerous federal, state, and local regulatory agencies have rules and regulations regarding the routing process and potential impact assessment associated with the construction of high voltage electrical transmission lines. This section describes the major regulatory agencies and issues that are involved in planning and permitting of transmission lines within the state of Texas. POWER solicited Project scoping comments from various regulatory agencies during the development of the EA. Records of correspondence are provided in Appendix A.

1.2.1 Public Utility Commission of Texas

The PUC regulates the routing of transmission lines in Texas under Section 37.056(c)(4)(A)-(D) of PURA. The PUC regulatory rules and guidelines for routing transmission lines include:

- 16 TAC § 25.101(b)(3)(B)
- 16 TAC § 22.52(a)
- Policy of prudent avoidance
- CCN application requirements

This EA has been prepared by POWER in support of CenterPoint Houston's CCN application for this Project to be filed at the PUC for approval.

1.2.2 United States Army Corps of Engineers

The United States Army Corps of Engineers (USACE) has been directed by Congress to administer Section 10 of the Rivers and Harbors Act (RHA) of 1899 (33 United States Code [U.S.C.] §403) and Section 404 of the Clean Water Act (CWA) (33 U.S.C. §1344). Under Section 10 of the RHA, the USACE regulates all work or structures in or affecting the course, condition, or capacity of navigable waters of the United States (WOTUS). The intent of this law is to protect the navigable capacity of waters important to interstate commerce. Under Section 404 of the CWA, the USACE regulates the discharge of dredge and fill material into WOTUS, including associated wetlands. The purpose of Section 404 is to protect the WOTUS from indiscriminate discharge and to minimize the potential adverse impacts and degradation of the WOTUS and aquatic ecosystems.

Although the USACE – Galveston District does not publish a list of designated Section 10 (navigable) surface waters, based on POWER's extensive permitting experience with the USACE – Galveston District, no Section 10 surface waters are anticipated to occur within the study area. A review of the National

Wetland Inventory (NWI) maps indicated numerous emergent, scrub/shrub, and estuarine/marine wetlands, which may be considered jurisdictional by the USACE, occur throughout the study area.

Upon PUC approval of the Project Route, additional coordination, jurisdictional wetland verifications, and permitting with the USACE – Galveston District for a Section 404 Permit may be required if the approved route is to be constructed within potential jurisdictional areas. If the approved route is constructed within jurisdictional areas, the construction of the Project may meet the conditions of Nationwide Permit (NWP) No. 57 - Electric Utility Line and Telecommunications Activities. NWP 57 authorizes activities for the construction, maintenance, repair, and removal of electric utility lines, telecommunication lines, and associated facilities (i.e., substations, foundations, and access roads) in WOTUS, provided the activity does not result in the loss of greater than 0.5 acre of WOTUS and the general and regional conditions of the permit are met.

1.2.3 United States Fish and Wildlife Service

The United States Fish and Wildlife Service (USFWS) is charged with the responsibility of enforcement of federal wildlife laws and providing comments on proposed construction projects with a federal nexus under the National Environmental Policy Act (NEPA), within the framework of several federal laws including the Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA) and Bald and Golden Eagle Protection Act (BGEPA). POWER reviewed the USFWS Information for Planning and Consultation (IPaC) (Project Code: 2025-0040257) website for federally protected species and designated critical habitats within the study area.

Upon PUC approval of the Project Route and prior to construction, surveys will be completed as necessary to identify any potentially suitable habitat for federally listed species. If a suitable habitat is identified, then consultation with the USFWS Texas Coastal Ecological Services Field Office may be completed to determine the need for any required species-specific surveys, avoidance measures, and/or permitting under Section 7 of the ESA.

1.2.4 Federal Aviation Administration

According to Federal Aviation Administration (FAA) regulations, Title 14 Code of Federal Regulations (CFR) 77.9, the construction of a transmission line requires FAA notification if a transmission tower structure height will exceed 200 feet or the height of an imaginary surface extending outward and upward at one of the following slopes:

- A 100:1 slope for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of each airport described in paragraph (d) of 14 CFR 77.9 having at least one runway longer than 3,200 feet, excluding heliports.

- A 50:1 slope for a horizontal distance of 10,000 feet from the nearest runway of a public or military airport described in paragraph (d) of 14 CFR 77.9 where its longest runway is no longer than 3,200 feet in length, excluding heliports.

- A 25:1 slope for a horizontal distance of 5,000 feet for heliport described in paragraph (d) of 14 CFR 77.9.

Paragraph (d) of 14 CFR 77.9 includes public-use airports listed in the Airport/Facility Directory (currently the Chart Supplement), public-use or military airports under construction, airports operated by a federal agency or Department of Defense (DoD), or an airport or heliport with at least one FAA-approved instrument approach procedure.

Notification is not required for structures that will be shielded by existing structures of a permanent and substantial nature or by natural terrain or topographic features of equal or greater height and will be located in a congested area of a city, town or settlement where the shielded structure will not adversely affect safety in air navigation.

Following PUC approval of the Project Route, CenterPoint Houston will make a final determination of the need for FAA notification, based on specific structure locations and design. If any of the FAA notification criteria are met for the route approved for construction, a Notice of Proposed Construction or Alteration, FAA Form 7460-1, will be completed and submitted to the FAA Southwest Regional Office in Fort Worth, Texas, at least 45 days prior to construction. The result of this notification, and any subsequent coordination with the FAA, could include changes in line design and/or potential requirements to mark and/or light the structures.

1.2.5 Military Aviation and Installation Assurance Siting Clearinghouse

The United States DoD Military Aviation and Installation Assurance Siting Clearinghouse (previously the United States DoD Siting Clearinghouse) works with industry to overcome risks to national security while promoting compatible domestic energy development. Energy production facilities and transmission projects involving tall structures, such as electrical transmission towers, may degrade military testing and training operations. The electromagnetic interference from electricity transmission lines can impact critical

DoD testing activities. Title 16 TAC § 22.52 states that upon filing of the CCN application, the DoD shall be notified and an affidavit attesting to the notification shall also be provided with the application's proof of notice. The DoD shall also be provided written notice of the public meeting and if a public meeting is not held, the DoD shall be noticed of the planned filing of the CCN application prior to the completion of the routing study. On September 26, 2024, the DoD was contacted about the proposed Project to provide notification and to solicit any input from the DoD about the proposed Project. In addition, on December 10, 2024, public meeting notice was provided via mail and email to the DoD Military Aviation and Installation Assurance Siting Clearinghouse for the public meeting that was held for the proposed Project on November 21, 2024. A notice of the filing of the CCN application will be sent to the DoD Military Aviation and Installation Assurance Siting Clearinghouse when the CCN application is filed with the PUC.

1.2.6 Texas Parks and Wildlife Department

The Texas Parks and Wildlife Department (TPWD) is the state agency with the primary responsibility of protecting the state's fish and wildlife resources in accordance with the Texas Parks and Wildlife Code Sections 12.0011(b), 64.003, 68.015 and 1.011. POWER solicited comments from the TPWD during the scoping phase of the Project, and a copy of this EA will be submitted to TPWD when the CCN application is filed with the PUC. POWER also reviewed the Texas Natural Diversity Database (TXNDD) records of state-listed species occurrences and rare vegetation communities. POWER considered these during the route evaluation process. Once the PUC approves the Project Route, CenterPoint Houston will complete a field review of the proposed ROW to determine potential impacts to any state-listed species prior to construction. Based on these results, additional coordination with TPWD may be necessary to determine avoidance measures to state-listed threatened or endangered species, and other state regulated fish and wildlife resources.

1.2.7 Floodplain Management

Flood Insurance Rate Maps, published by the Federal Emergency Management Agency (FEMA), were reviewed to determine floodplain boundaries within the study area. The mapped 100-year floodplains are associated with the tidally influenced water features within and adjacent to the study area. The 100-year floodplain represents a flood event that has a one percent chance of being equaled or exceeded for any given year. Construction of the Project is not anticipated to create any significant changes in the existing topographical grades and is not anticipated to significantly alter existing flow regimes within the floodplain. Coordination with the Galveston County floodplain administrator will be completed after the PUC route approval to determine if any permits are necessary.

1.2.8 Texas Commission on Environmental Quality

The Texas Commission on Environmental Quality (TCEQ) is the state agency with the primary responsibility for protecting the state's water quality. The construction of the Project may require a Texas Pollution Discharge Elimination System (TPDES) General Construction Permit (TXR150000) as implemented by the TCEQ under the provisions of Section 402 of the CWA and Chapter 26 of the Texas Water Code. Construction activities will be compliant with the TXR150000 permit conditions.

1.2.9 Texas Historical Commission

Cultural resources are protected by federal and state laws if they have some level of significance under the criteria of the National Register of Historic Places (NRHP) (36 CFR 60) or under state guidance (13 TAC § 2.26 (7-8)). Chapter 26 of the TAC requires state agencies and political subdivisions of the state to notify the Texas Historical Commission (THC) of ground-disturbing activity on public land. POWER contacted the THC to identify known cultural resources within the study area boundary. POWER also reviewed Texas Archeological Research Laboratory (TARL) records for known locations of archeological sites and the THC's online, restricted-access Texas Archeological Sites Atlas (TASA) and Texas Historical Sites Atlas (THSA) for the locations of recorded cemeteries, NRHP properties, State Antiquities Landmarks (SALs) and Official Texas Historical Markers (OTHMs). Once the Project Route is approved by the PUC, depending on a state or federal nexus, additional coordination with the THC will occur, if required, to determine the need for cultural resource surveys or additional permitting requirements. CenterPoint Houston will implement an unanticipated discovery procedure during construction activities. If artifacts are discovered during construction, activities will cease in the area of discovery and CenterPoint Houston will notify the State Historic Preservation Office (SHPO) for additional consultation.

1.2.10 Texas Department of Transportation

The Texas Department of Transportation (TxDOT) has been notified of the Project. The Project Route does not cross TxDOT roadways, although the Project is located adjacent to a TxDOT roadway. Best Management Practices (BMPs) will be used, as required, to minimize erosion and sedimentation resulting from the construction. Traffic control measures will comply with applicable portions of the Texas Manual of Uniform Traffic Control Devices.

1.2.11 Texas General Land Office

The Texas General Land Office (GLO) requires a miscellaneous easement for ROWs within any state-owned riverbeds or navigable streams or tidally influenced waters. Coordination with the GLO will be completed after PUC approval of the Project Route.

The Texas Land Commissioner administers the Texas Coastal Management Program (CMP) under the GLO, which has the responsibility for implementing the Texas CMP. This program intends to help ensure the environmental and economic well-being of the Texas coast through proper management of Coastal Natural Resource Areas (CNRAs). The Texas CMP has federal and state project and permit action review processes to evaluate consistency with the program. The proposed Project is located within the Coastal Management Zone (CMZ) (Texas GLO 2025) and thus a consistency review action is anticipated to be associated with the USACE NWP process.

In 1996, the federal government approved the Texas CMP, overseen by the Coastal Coordination Council (CCC), to improve the management of the state's coastal resources and ensure the long-term ecological and economic productivity of the area. The Texas CMP is a "networked" program linking the regulations, programs, and resources of local, state, and federal agencies with management responsibilities in the CMZ, under the authority of the federal Coastal Zone Management Act of 1972 (Texas GLO 2025).

The purpose of the Texas CMP is to make more effective and efficient use of public funds and to more effectively and efficiently manage CNRAs and the activities that may affect them. The program is based on goals and policies that guide the use and development of CNRAs, preserve and protect CNRAs, and improve government processes. The CCC has adopted rules promulgating the goals and policies, including protecting, preserving, restoring, and enhancing the diversity quality, quantity, functions, and values of CNRAs while allowing for compatible use (including economic development), preventing the destruction of protective features, establishing clear guidelines, and operating in a transparent manner. The full list of goals is provided in 31 TAC § 27.1. The Coastal Coordination Act requires agency or subdivision actions to comply with these goals and policies. As directed in the Coastal Coordination Act, the GLO assists the CCC in implementing the Texas CMP and the Texas Land Commissioner manages the program.

When construction is proposed within CMZ, the GLO must conduct a state or federal consistency review to determine whether the proposed activity is consistent with the Texas CMP goals and policies. A Coastal Zone Consistency Statement must also be submitted to the USACE along with any Section 404/10 permit application.

As a state agency, the PUC is charged with complying with the policies of the Texas CMP when approving CCNs for electric transmission lines located in the CMZ.

1.3 DESCRIPTION OF PROPOSED DESIGN AND CONSTRUCTION

1.3.1 Structure Design

CenterPoint Houston proposes to use double-circuit capable tubular concrete or steel poles with a vertical phase configuration in existing road ROW. CenterPoint Houston is seeking a 25-ft aerial easement adjacent to the road ROW. In two locations, CenterPoint Houston will seek to secure a ground easement within Galveston Island State Park. Depending on the terrain and other considerations, such as the length of span between structures and clearance requirements needed to cross streams, wetland areas, utility crossings and roadway crossings, CenterPoint Houston may require wider ROW widths and alternative structure types (e.g., tubular concrete poles or flat-tap poles).

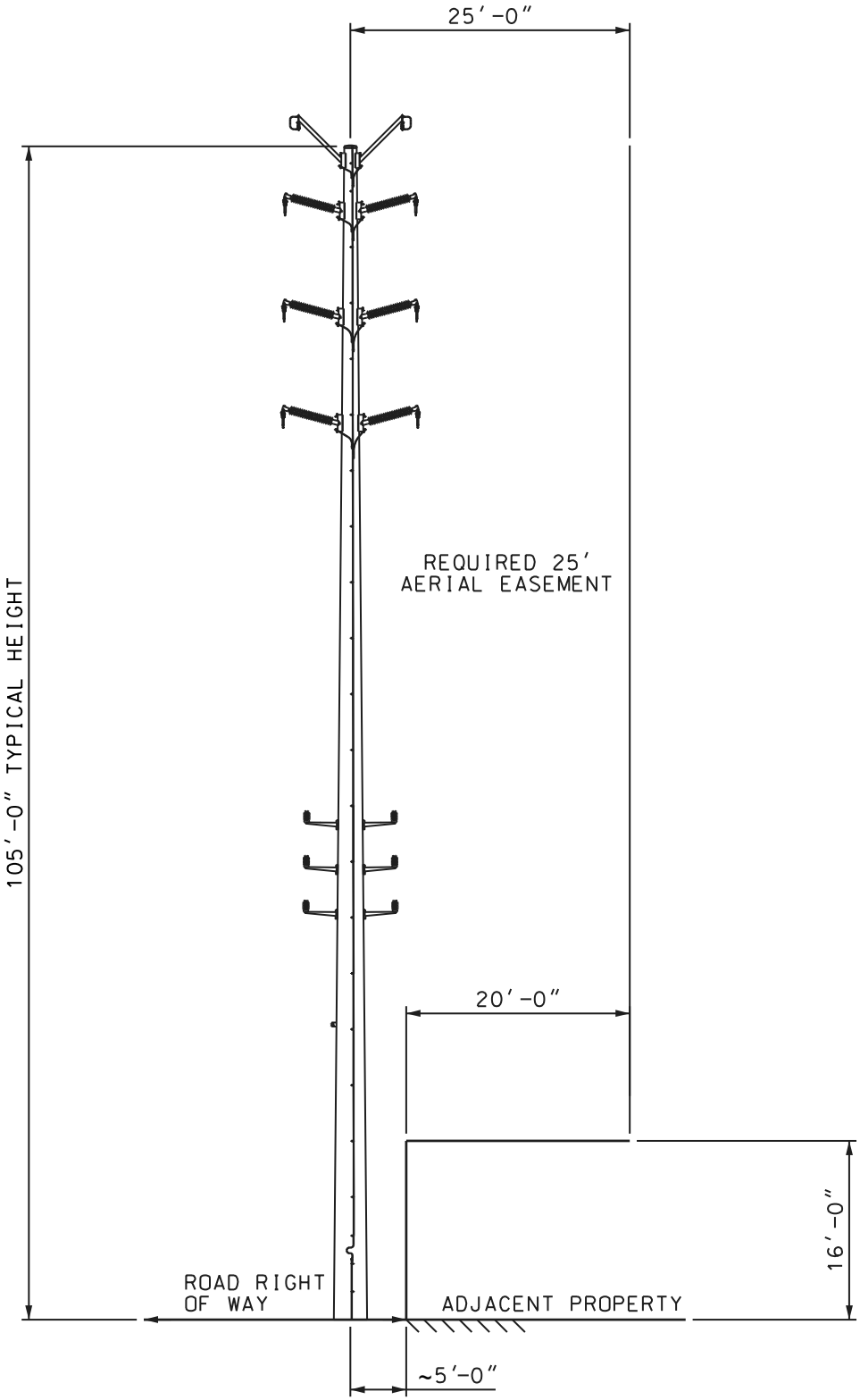
Construction will consist of directly embedded concrete poles within a steel casing and steel poles requiring drilled shaft foundations made of steel-reinforced concrete within a steel casing. Typical concrete or steel poles will have a height of 105 feet with distribution underbuild in an 80 feet ROW and have a span length of approximately 300 feet (Figures 1-2 and 1-3).

1.3.2 Surveying

Surveying of the transmission line ROW is required to locate the centerline, the structure locations, obstacles above and below ground, and the edges of both new and existing road ROW. Surveying will be conducted after the PUC approves the Project Route.

1.3.3 Clearing

Tree and shrub clearing may be needed in areas where new ROW is acquired. If a Stormwater Pollution Prevention Plan (SWPPP) is required, it will be implemented along the approved route prior to the start of clearing. Mechanized cutters and hand tools will be used to remove impeding vegetation to ground level.



Note:

This drawing was prepared by POWER with information provided by CNP for a specific project, taking into consideration the specific and unique requirements of the project. Reuse of this drawing or any information contained in the drawing for any purpose is prohibited unless written permission from both POWER and POWER's client is granted.

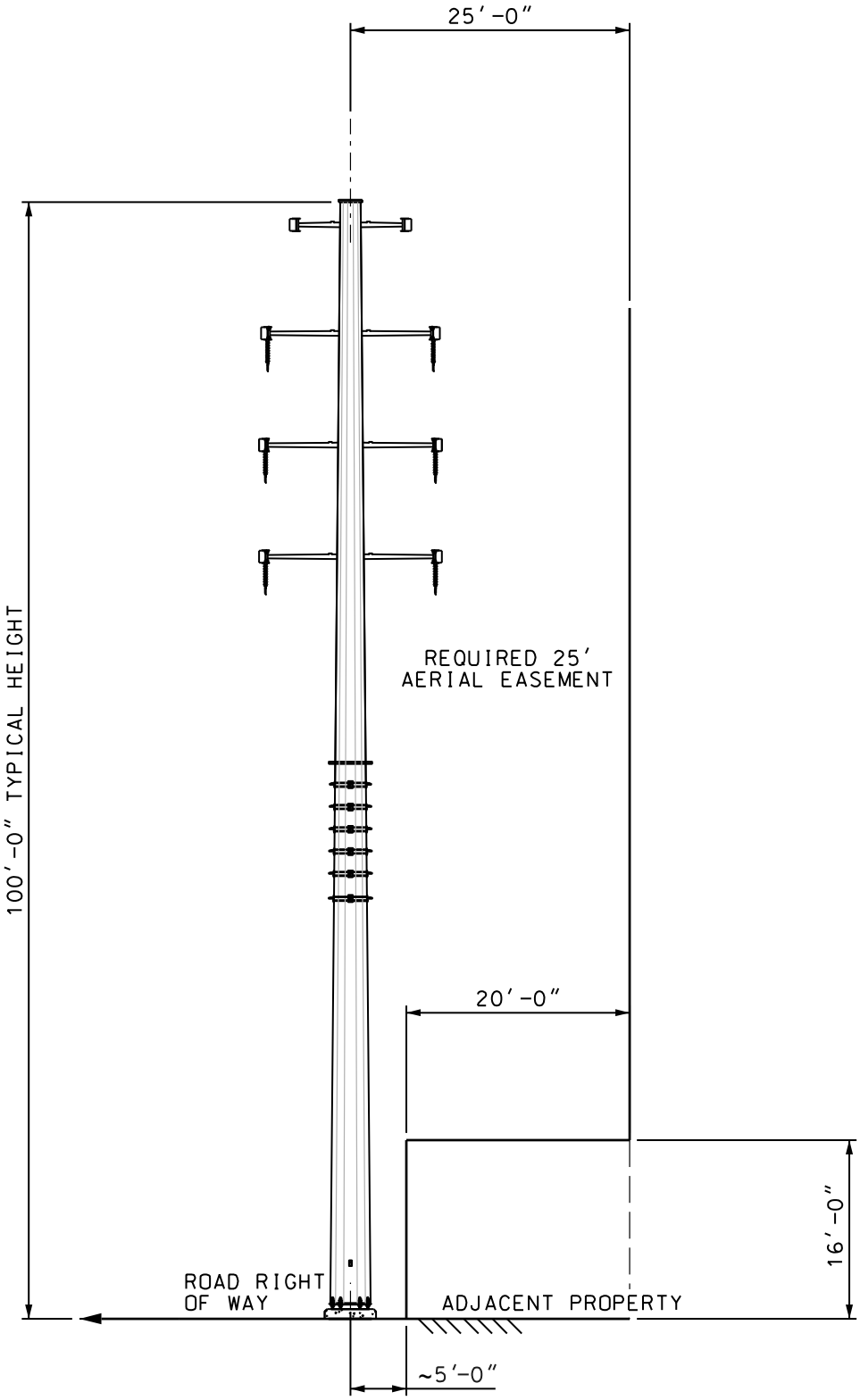
Revised: December 2024
Printed: December 2024

138 KV STEWART TO WEST BAY PROJECT

FIGURE 1-2
TYPICAL 138 KV DOUBLE-CIRCUIT CONCRETE POLE

POWER ENGINEERS

CenterPoint Energy



Note:

This drawing was prepared by POWER with information provided by CNP for a specific project, taking into consideration the specific and unique requirements of the project. Reuse of this drawing or any information contained in the drawing for any purpose is prohibited unless written permission from both POWER and POWER's client is granted.

Revised: December 2024
Printed: December 2024

138 KV STEWART TO WEST BAY PROJECT

FIGURE 1-3
TYPICAL 138 KV DOUBLE-CIRCUIT DEADEND STEEL POLE

POWER ENGINEERS

CenterPoint Energy

1.3.4 Structure Placement

Specialized wide-track vehicles, tractor trailers and line trucks with trailers will be used to transport construction materials along the ROW to the structure locations. Typically, the concrete foundations will be installed before the steel poles are erected to allow the foundations to cure and reach adequate strength.

Steel pole sections will be delivered to the site location shortly before the poles are ready to be set. A large crane will then set the pole sections onto the foundation.

1.3.5 Conductor and Static Wire Installation

Once the structures have been erected, the stringing and clipping-in of conductors and static wires will begin. During the conductor and static wire installation, each road crossing will have temporary guard structures and/or conductor shields installed for public and laborer protection while stringing in the new conductors. Existing transmission and distribution circuits will have temporary guard structures and/or conductor shields installed for public and laborer protection while stringing in the new conductors.

1.3.6 Cleanup

Cleanup operations will be performed as construction activities are completed. Cleanup includes removal of debris, unused materials and trash. Any necessary soil stabilization and reestablishing of vegetation cover will also occur during cleanup, following the procedures dictated in the SWPPP, if required. Pre-construction contours will also be restored following construction.

2.0 DESCRIPTION OF THE STUDY AREA

POWER identified the study area boundary, considering the identified endpoints: the start of the Project location, the West Bay Substation, and CenterPoint Houston's existing Circuits 48 and 59 of the existing 138 kV transmission line. The study area boundary is depicted in Figure 2-1.

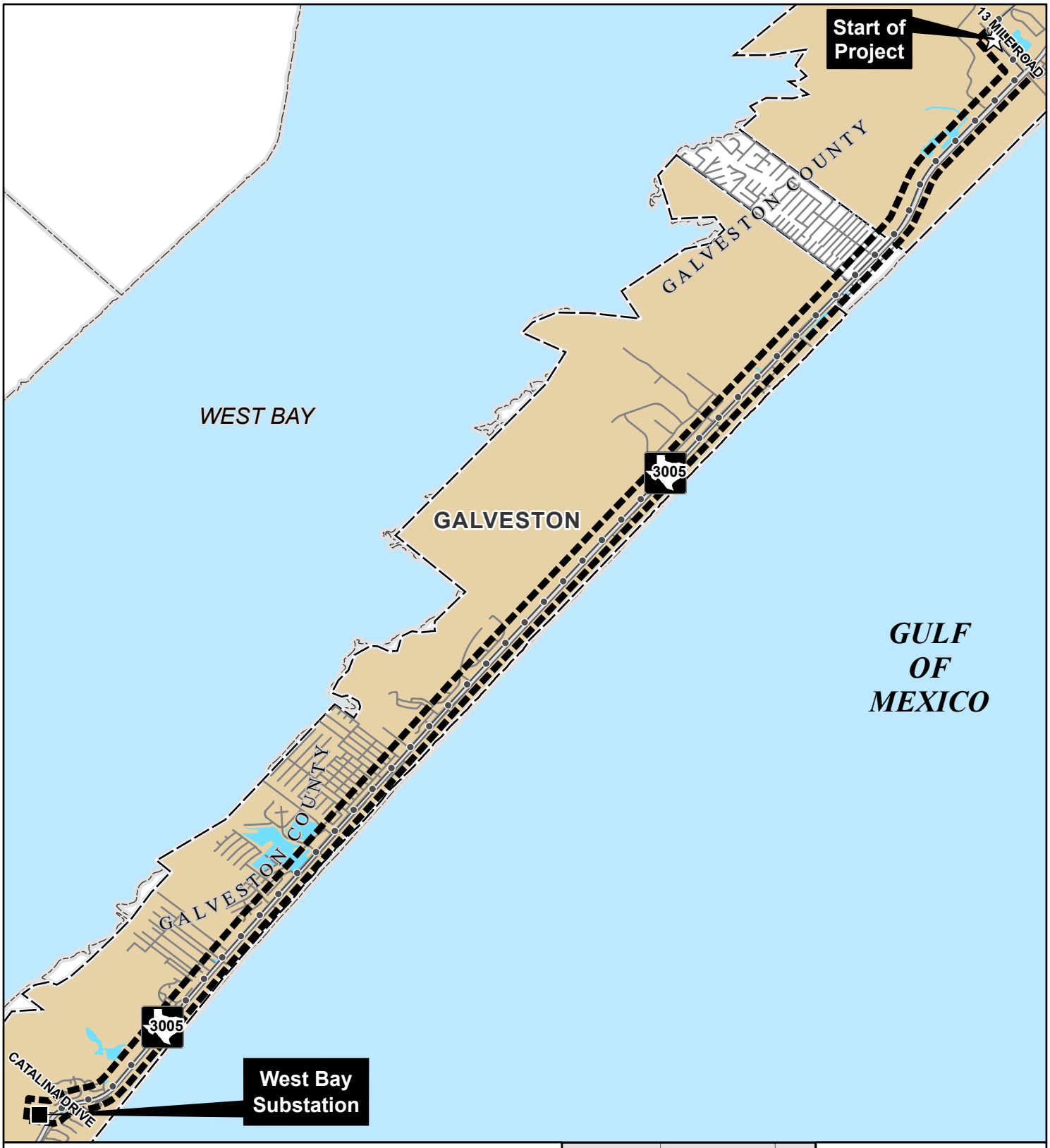
The study area was defined to provide an area large enough to evaluate and rebuild the existing 138 kV transmission line. The rebuilt portions of existing Circuits 48 and 59 will continue to connect the existing CenterPoint Houston Stewart and West Bay Substations. The eastern study area boundary is defined by the start of the Project and is located approximately 0.34 mile northwest of the intersection of San Luis Pass Road (FM 3005) and 13 Mile Road. The western study area boundary is defined by the existing West Bay Substation and is located approximately 0.17 mile west of the intersection of San Luis Pass Road (FM 3005) and Catalina Drive. The northern study area boundary parallels the existing CenterPoint Houston 138 kV transmission line. The southern study area boundary parallels the San Luis Pass Road (FM 3005). The study area boundaries are defined to provide adequate room for evaluation of the Project Route east to west, and the need to minimize potential land use conflicts within the study area.

To describe the environmental setting of the study area, land use and environmental resource data was collected for community values and environmental integrity.

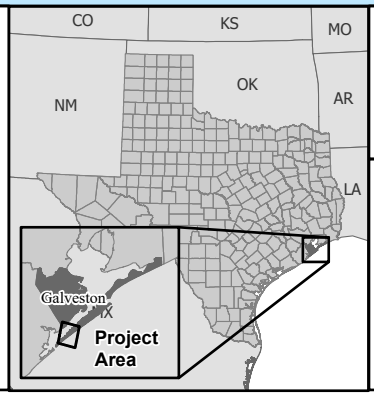
2.1 COMMUNITY VALUES

The term "community values" has not been formally defined for regulatory purposes by the PUC but is included as a consideration for transmission line certification under Section 37.056(c)(4)(A-D) of PURA. In several dockets, the PUC has used the following as a working definition: "the term 'community values' may be interpreted as a shared appreciation of an area or other natural resource by a national, regional or local community." The PUC CCN application requires information related to the following items that may provide indications of community value impacts:

This page left blank intentionally.



Start of Project
Existing Substation
Existing Transmission Line
Study Area Boundary
3005 Farm-to-Market Road
County / Local Road
River / Stream
Waterbody
City Limit
County Boundary



CENTERPOINT ENERGY
138 KV STEWART TO WEST BAY PROJECT
FIGURE 2-1
STUDY AREA

N
0
1
Miles

CenterPoint Energy
POWER ENGINEERS
Date: 3/12/2025

This page left blank intentionally.

- Public meeting or public open house required by 16 TAC § 22.52.
- Approval or permits required from other governmental agencies.
- Brief description of the area traversed.
- Habitable structures within 300 feet of the centerline for a 138 kV transmission line.
- Amplitude Modulation radio (AM radio), Frequency Modulation radio (FM radio), microwave and other electronic installations in the area.
- FAA-registered airstrips, private airstrips and heliports located in the area.
- Irrigated pasture or croplands utilizing center-pivot or other traveling irrigation systems.

POWER collected this information and evaluated the study area for community values that may be of importance to a particular community. Examples of a particular community value would be avoidance of a park or recreational area, historical or archeological site or a scenic vista, which can be related to aesthetics. Community values data were collected for land use, recreational and park areas and historical and aesthetic values. Recreational and park areas and historical and aesthetic values are further discussed in more detail in Sections 2.2 and 2.3. POWER also mailed consultation letters to local officials to obtain insight into community values from appointed and elected officials.

2.2 Land Use

For the purpose of this study, land jurisdiction is defined as the control maintained by major landholders or land managers. Jurisdiction does not necessarily represent ownership. Potential conflicts could arise from crossing jurisdictional boundaries that were evaluated in this study. For example, a 138 kV transmission line crossing publicly held land may cause a conflict with ongoing planning processes or a land management plan. Land jurisdictions were identified and delineated primarily from geographic information system (GIS) metadata (National Agricultural Imagery Program [NAIP] 2022; PLATTS 2024; Galveston County 2024).

Existing land data collected included urban and residential areas, agriculture, oil and gas facilities, planned land use, transportation, aviation, utilities and communication towers. The primary sources of land use information were obtained from interpretation of aerial photographs, United States Geological Survey (USGS) topographical maps and field reconnaissance surveys. In addition, the economic and demographic characteristics within the study area county were gathered and are further discussed under Socioeconomics in Section 2.3.

2.2.1 Urban and Residential Areas

The urban and residential classification represents concentrations of surface disturbing land uses, which include habitable structures and other developed areas characterized with low, medium and high intensities. The various levels of development include a mix of institutional, commercial and industrial land uses.

The PUC definition of a habitable structure was used for this routing study. 16 TAC § 25.101(a)(3) defines habitable structures as "[s]tructures normally inhabited by humans or intended to be inhabited by humans on a daily or regular basis. Habitable structures include but are not limited to: single-family and multi-family dwellings and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, churches, hospitals, nursing homes and schools." Habitable structures were identified using aerial photographs (NAIP 2022) supplemented with readily available websites with aerial imagery, including Google Earth and reconnaissance surveys from public points of view (Google Earth 2024).

Low, Medium and High Intensity developed areas were identified using aerial photograph interpretation and reconnaissance surveys. These classifications are described below:

- **Low Intensity** areas typically include rural settings with single-family housing units.
- **Medium Intensity** areas typically include single-family housing units that are grouped in residential subdivisions and may include peripheral commercial structures.
- **High Intensity** areas include highly developed areas where people reside or work in high numbers. Examples include apartment complexes and commercial or industrial parks.

The study area is generally located on the west end of Galveston Island in Galveston County. Existing developments include residential and commercial developments concentrated along major roadway corridors, including San Luis Pass Road (FM 3005). No developed high intensity areas were identified in the study area. The study area is defined by medium and low intensity development; single family residences are scattered throughout the study area.

Schools

The study area is located within the Galveston Independent School District (ISD). No schools were identified within the study area (Texas Education Agency 2024).

2.2.2 Planned Land Use

The planned land use component identifies objectives and policies regarding land use goals and plans, including conservation easements, managed lands, and proposed developments. Cities and counties typically prepare comprehensive land use plans to provide strategic direction for an individual city or county. The website for Galveston County was reviewed and correspondence was submitted to county officials to identify any planned land use conflicts. No comprehensive land use plans were identified within the study area (Galveston County 2024). The website for the City of Galveston was reviewed for a comprehensive land use plan. The City of Galveston 2011 comprehensive plan is comprised of long-range goals, strategies, and objectives (City of Galveston 2011). No land use conflicts were identified within the study area.

Conservation Easements

A conservation easement is a restriction that property owners voluntarily place on specified uses of their property to protect natural, productive, or cultural features. The property owner retains legal title to the property and determines the types of uses to allow or restrict. The property can still be bought, sold and inherited, but the conservation easement is tied to the land and binds all present and future owners to its terms and restrictions. Conservation easement language will vary as to the individual property owner's allowances for additional developments on the land. The land trusts facilitate the easement and ensure compliance with the specified terms and conditions.

A review of numerous non-governmental groups (e.g., National Conservation Easement Database [NCED], The Nature Conservancy [TNC] and Texas Land Conservancy [TLC]) that are land trusts and hold databases for conservation easements within Texas indicated there is a conservation easement within the study area. The Galveston Island State Park encompasses 1,882 acres in the eastern portion of the study area and is held by The Trust for Public Land (NCED 2024; TNC 2024; TLC 2024).

2.2.3 Agriculture

The agriculture classification represents a combination of irrigated and non-irrigated cultivated row crops, which are primarily corn, cotton, hay and sorghum. Agricultural areas are further divided into pasture and cultivated crops based on aerial photography interpretation and reconnaissance surveys. Pasture areas are

typically comprised of grasses, legumes or grass-legume mixtures planted for livestock grazing, or the production of seed or hay crops, typically on a perennial cycle. Cultivated crops are areas used to produce annual row crops and perennial woody crops, such as orchards and vineyards.

Agriculture has a significant influence on the economy throughout Texas and Galveston County has an active agricultural sector. According to the United States Department of Agriculture's (USDA) National Agricultural Statistics Service's 2017 Census of Agriculture, the total market value for agricultural products sold within Galveston County was $9,233,000. Livestock, poultry, and products sales accounted for a majority of agricultural sales in Galveston County. The number of farms in Galveston County increased from 612 in 2012 to 633 in 2017 (a 3% change) (USDA 2012 and 2017). Detailed agricultural information for Galveston County is provided in Table 2-1.

TABLE 2-1 AGRICULTURE

COUNTY	TOTAL MARKET VALUE OF AGRICULTURAL PRODUCTS			DISTRIBUTION OF PRODUCTS (2017)		NUMBER OF FARMS		
	2012	2017	Change	Crop Sales	Livestock Sales	2012	2017	Change
Galveston County	(D)	$9,233,000	(D)	49%	51%	612	633	+3%

Source: USDA 2012 and 2017.
D = Withheld by the county to avoid disclosing data for individual operations.

2.2.4 Oil and Gas Facilities

Oil and gas well data was obtained from the Railroad Commission of Texas (RRC; 2024a) which provided a GIS layer for existing oil and gas wells, pipelines, and supporting facilities. Oil and gas well data point categories were reviewed and included the following general types: permitted locations, dry hole, horizontal, vertical, storage, and directional well locations. The 2024 RRC dataset along with aerial photograph interpretation and field reconnaissance were used to identify and map existing oil and gas related facilities. An abandoned pipeline was identified near the start of the Project within the study area. No known oil and gas wells were identified within the study area.

2.2.5 Transportation/Aviation/Utilities

Transportation

Federal, state, and local roadways were identified using TxDOT county transportation maps, Texas Natural Resources Information System data, and field reconnaissance surveys. The roadway transportation system within the study area does not include any Interstate Highways, United States

Highways (US Hwys) or State Highway (SHs). Roadways located within the study area include FM 3005 and numerous local roads, paved and unpaved (TxDOT 2024a).

TxDOT's "Project Tracker" which contains detailed information by county for every project which is or could be scheduled for construction was reviewed to identify any state roadway projects planned within the study area. TxDOT Project Tracker indicates that there are two projects located within the study area. The two projects are a landscape and scenic enhancement and safety improvement project located along FM 3005 with construction to begin within four years (TxDOT 2024b).

There were no railroads identified within the study area (TxDOT 2024a; USDOT 2024).

Aviation

POWER reviewed the Houston Sectional Aeronautical Chart (FAA 2024a) and the Chart Supplement for the South Central United States (US) (formerly the Airport/Facility Directory) (FAA 2024b) to identify FAA registered facilities within the study area or within the FAA notification criteria buffer distance subject to notification requirements listed in 14 CFR 77.9. Facilities subject to notification requirements listed in 14 CFR 77.9 include public-use airports listed in the Airport/Facility Directory (currently the Chart Supplement[1]), public-use or military airports under construction, airports operated by a federal agency or DoD, or an airport or heliport with at least one FAA-approved instrument approach procedure.

The Chart Supplement for the South Central US used in conjunction with the Houston Sectional Aeronautical Chart contains all public-use airports, seaplane bases and public-use heliports, military facilities, and selected private-use facilities specifically requested by the DoD for which a DoD Instrument Approach Procedure has been published in the US Terminal Procedures Publication.

No public-use or military FAA registered airports were identified within the study area (FAA 2024a and 2024b).

No public-use heliports or heliports with an instrument approach procedure are listed for the study area in the Chart Supplement for the South Central US (FAA 2024a and 2024b).

[1] The Chart Supplement for the South Central US used in conjunction with the Houston Sectional Aeronautical Chart contains all public-use airports, seaplane bases and public-use heliports, military facilities, and selected private-use facilities specifically requested by the DoD for which a DoD Instrument Approach Procedure has been published in the US Terminal Procedures Publication.

In addition, POWER also reviewed the FAA database (FAA 2024c), USGS topographic maps and recent aerial photography, and conducted field reconnaissance from publicly accessible areas to identify private-use airstrips and private-use heliports not subject to notification requirements listed in 14 CFR 77.9. No private-use heliports or private-use airstrips were identified within the study area.

Utilities

Utility features reviewed include existing electrical transmission lines, distribution lines, pipelines, water and gas/oil wells, and water and gas/oil storage tanks. Data sources used to identify existing electrical transmission and distribution lines include utility company and regional system maps, aerial imagery, USGS topographic maps, additional available planning documents, and field reconnaissance surveys. Transmission lines identified include the existing 138 kV transmission line within the study area. Distribution lines are prevalent throughout the developed portions of the study area but were not mapped.

One public water well was identified within the study area (Texas Water Development Board [TWDB] 2025).

As stated previously, an abandoned pipeline was identified near the start of the Project within the study area.

2.2.6 Communication Towers

Review of the Federal Communication Commission (FCC) database indicated that no AM or FM radio transmitters are located within the study area. The FCC did indicate that there are two communication towers identified as transmitters/microwave towers/other electronic installations within the study area (FCC 2024).

2.2.7 Parks and Recreational Areas

Recreational, park and preservation areas were identified through state, federal and local agency websites, county documents and reconnaissance surveys. This category primarily includes existing areas that are:

- Dedicated as park land or open space by a governmental body, organized group, club or church;
- Recognized as nationally or regionally significant preservation or recreation areas; or
- Formally designated unique or undisturbed natural areas.

Federal and state databases searches and county/local maps were reviewed to identify any parks and/or recreational areas within the study area. Field reconnaissance surveys were also conducted to identify any additional parks or recreational areas.

National/State/County/Local Parks

No national parks were identified within the study area (National Park Service [NPS] 2024a). The Galveston Island State Park is located within the study area. The state park provides camp sites, lodging, a pavilion, swimming, fishing, restrooms, and hiking trails (TPWD 2024a). In addition, Galveston Island State Park is held under a conservation easement. This conservation easement was discussed further in Section 2.2.2.

No local parks were identified within the study area (Galveston County 2024).

Additional recreational opportunities, including hunting and fishing, may occur on private properties within the study area. However, these are not typically considered to be open to the general public.

Wildlife Viewing Trails

A review of the TPWD *Upper Texas Coast - Great Texas Coastal Birding Trail* indicated that the study area is within the Galveston Loop. One site of interest located along the Galveston Loop, within the study area, is the Galveston Island State Park (TPWD 2024b).

2.3 Socioeconomics

The following is a description of the socioeconomic patterns related to population and employment in Galveston County, Texas. The trend analysis is based upon the most recent United States Census Bureau (USCB) information for the years 2010 and 2050 (USCB 2010 and 2024).

2.3.1 Population Trends

Galveston County experienced a population increase of 20% between 2010 and 2020. By comparison, population at the state level increased by nearly 16% from 2010 to 2020 (USCB 2010).

According to Texas State Data Center (TXSDC) projections, Galveston County is projected to experience population growth during the next 30 years. In Galveston County, the population is projected to increase by 15.2% from 2020 to 2030, 13.9% from 2030 to 2040, and 11.7% from 2040 to 2050. By comparison, the population of Texas is expected to experience population increases of 12.9%, 11.8%, and 10.4% over

the next three decades, respectively (TXSDC 2022). Table 2-2 presents the past population trends and projections for Galveston County and for the state of Texas.

TABLE 2-2 POPULATION TRENDS

STATE / COUNTY	PAST		PROJECTED		
	2010	2020	2030	2040	2050
Texas	25,145,561	29,145,505	32,912,882	36,807,213	40,645,784
Galveston County	291,309	350,682	403,844	459,869	513,814

Sources: USCB 2010; TXSDC 2022.

2.3.2 Employment

From 2010 to 2023, the civilian labor force in Galveston County saw an increase of 21.2% (31,180 people). By comparison, the civilian labor force at the state level grew by 24.6% (2,943,813 people) over the same time period (USCB 2024). Table 2-3 presents the civilian labor force for Galveston County and the state of Texas for the years 2010 and 2023.

Between 2010 and 2023, the unemployment rate for Galveston County experienced a decrease from 6.9% in 2010, to 5.5% in 2023. By comparison, the state of Texas also experienced a decrease in the unemployment rate over the same period. The state's unemployment rate decreased from 7.0% in 2010 to 5.1% in 2023 (USCB 2024). Table 2-3 presents the employment and unemployment data for Galveston County and the state of Texas for the years 2010 and 2023.

TABLE 2-3 CIVILIAN LABOR FORCE AND EMPLOYMENT

STATE/COUNTY	2010	2023
Texas		
Civilian Labor Force	11,962,847	14,906,660
Employment	11,125,616	14,140,748
Unemployment	837,231	765,912
Unemployment Rate	7.0%	5.1%
Galveston County		
Civilian Labor Force	147,417	178,597
Employment	137,205	168,710
Unemployment	10,212	9,887
Unemployment Rate	6.9%	5.5%

Source: USCB 2024.

2.3.3 Leading Economic Sectors

The major occupations that employed the most people in Galveston County in 2023 are those occupations listed under the category of management, business, science and arts, followed by the category of sales and office (USCB 2024). Table 2-4 presents the number of persons employed in each occupation category during 2023 in Galveston County.

TABLE 2-4 OCCUPATIONS IN GALVESTON COUNTY

OCCUPATION	GALVESTON COUNTY
Management, business, science and arts	75,005
Service	28,193
Sales and office	31,824
Natural resources, construction and maintenance	14,029
Production, transportation and material moving	19,659

Source: USCB 2024.

In 2010 and 2023, the industry groups that employed the most people in Galveston County were educational services, health care and social assistance. Table 2-5 presents the number of persons employed in each of the industries in Galveston County for the years 2010 and 2023.

TABLE 2-5 INDUSTRIES IN GALVESTON COUNTY

INDUSTRY GROUP	GALVESTON COUNTY	
	2010	2023
Agriculture, forestry, fishing and hunting and mining	2,020	2,890
Construction	11,484	12,741
Manufacturing	15,709	18,226
Wholesale trade	3,719	3,307
Retail trade	13,064	15,975
Transportation and warehousing and utilities	8,309	9,423
Information	1,836	1,734
Finance and insurance and real estate and rental and leasing	8,965	10,636
Professional, scientific and management and administrative and waste management services	13,987	19,505
Educational services and health care and social assistance	32,506	42,431
Arts, entertainment and recreation and accommodation and food services	12,830	16,341
Other services, except public administration	6,328	7,474
Public administration	6,448	8,027

Source: USCB 2024.

2.4 HISTORICAL VALUES

Section 37.056(c)(4)(C) of PURA incorporates historical and aesthetic values as a consideration when evaluating proposed electric transmission facilities. The PUC's standard application for a CCN further stipulates that known historical sites within 1,000 feet of a route should be listed, mapped, and their distances from the centerline of the route documented in the application filed for consideration. Archeological sites within 1,000 feet of a route need not be shown on maps for the protection of the site. Sources consulted to identify known sites (national, state, or local commission) shall also be listed.

The THC is the state agency responsible for preservation of the state's significant cultural resources. The THC, working in conjunction with the TARL, maintains records of previously recorded cultural resource sites as well as records of previous field investigations. Information from the THC's Restricted Online Archeological Sites Atlas was acquired in addition to GIS shapefiles from TARL to identify and map locations of previously recorded cultural (archeological and historical) resources within the study area.

Together, archeological and historical sites are often referred to as cultural resources. Under the NPS' standardized definitions, cultural resources include districts, sites, buildings, structures, or objects important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. For this study, cultural resources have been divided into three major categories: archeological resources, historical resources, and cemeteries. These three categories correlate to the organization of cultural resource records maintained by the THC and TARL.

- Archeological resources are locations on the ground surface or buried within the earth where human activity has measurably altered or left deposits of physical remains (e.g., burned rock middens, stone tools, petroglyphs, house foundations, bottles). Archeological resources can date to either prehistoric times or the historic era.
- Historical resources typically include standing buildings (e.g., houses, barns, outbuildings), but can also include structures (dams, canals, bridges, roads, silos) and districts that are non-archeological in nature.
- Cemeteries are places of intentional human interment and may include large public burial grounds with multiple burials, small family plots with only a few burials, or individual grave sites. In some instances, cemeteries may be designated as Historic Texas Cemeteries by the THC and may be recognized with an OTHM. Other cemeteries may also be documented as part of the THC's Record, Investigate, and Protect program.

2.4.1 Cultural Background

The Project area is located within the Southeast Texas archeological region (Patterson 1995; Story et al. 1990; Perttula 2004), which is located within the THC's Eastern Planning Region (Mercado-Allinger et al. 1996) (Figure 2-2).

2.4.2 Prehistoric

Generally, the sequence of recognized archeological manifestations in southeast Texas has been divided into three periods: Paleoindian, Archaic, and Late Prehistoric or Ceramic periods. These cultural periods are roughly equivalent to broad patterns of environmental change, described by Aten (1983). These patterns are the Late Glacial (12,000 to 9,000 years before present [BP]), post-Pleistocene adaptations that resulted in a shift in economic orientation and an increasing population (9,000 to 3,000 BP), and lastly, essentially modern environmental conditions which developed approximately 3,000 BP. Ricklis (2004) proposes a prehistoric cultural sequence for southeast Texas consisting of four occupational periods: Paleoindian (circa 11,500 to 8,000 BP), Archaic (circa 8,000 to 1,500 BP [inland]; 5,000 to 2,220 BP [coastal]), and the Ceramic Period (circa 2,000 to 300 BP).

Paleoindian Period

The earliest well-established human occupations of North America are referred to as Paleoindian. Isolated Paleoindian chipped stone projectile points, typed as Clovis, have been found on the upper Texas coast in surficial or mixed contexts (Hester 1980; Patterson 1980; Wheat 1953). Story et al. (1990) summarized the distribution and context of Paleoindian remains in southeast Texas and found that, except for well inland of the modern coastline, Paleoindian artifacts on the upper Texas coast are from disturbed or secondary contexts.

Aten (1983:116-117) estimates that during the Paleoindian period, the coastline of the Gulf of Mexico was between 30 and 40 kilometers seaward of its present location. Woodlands apparently covered much of the upper Texas coast and probably extended onto the now-submerged continental shelf. Most of the archeological sites dating to this period may lie offshore, be deeply buried in the terraces of major streams, or have been obliterated by Holocene erosion (Abbot 2001; Hester 1980). Paleoindian remains have been recovered along McFaddin Beach, redeposited from an actively eroding site offshore (Long 1977; Turner and Tanner 1994).

0 30 60 120 180 240

Miles

Source: Mercado- Allinger et. al., 1996

Legend

Cultural Resource Planning Region Boundary

County Boundary

CENTERPOINT ENERGY 138 KV STEWART TO WEST BAY PROJECT

FIGURE 2-2

LOCATION OF THE STUDY AREA IN RELATION TO THE CULTURAL RESOURCE PLANNING REGIONS OF TEXAS

CenterPoint Energy

POWER ENGINEERS

Date: 1/24/2025

Because limited data exists for the Paleoindian period in this area, only certain assumptions can be made regarding Paleoindian cultural development in the region. The presence of large projectile points suggests that hunting large mammals was undoubtedly an important component of the subsistence strategy, although a collection of readily available plant foods probably also contributed to the diet (Collins 2002). Environmental changes that brought about the extinction or dislocation of Rancholabrean megafauna triggered a shift away from Paleoindian adaptations toward a broad-based subsistence orientation termed Archaic (Aten 1983; Willey and Phillips 1958).

Archaic Period

Probably the most prominent characteristic of the Archaic period is that it epitomizes the foraging lifestyle. The Archaic period on the upper Texas coast is marked by sea-level rise and climatic fluctuation in the middle to late Holocene, from circa 9,000 to 1,850 BP (Aten 1983). Relatively stable sea levels and essentially modern, highly productive estuaries were not established until around 3,000 years ago (Ricklis 2004), after which subsistence systems increasingly focused on coastal zone resources. Thus, Ricklis (2004) frames the Archaic period in southeast Texas in terms of inland and coastal adaptations. Numerous sites dating to this period have been found along inland primary streams throughout the region and contain stone projectile points that are diverse and reduced in size from the earlier Paleoindian period. These dart points also tend to be made of poorer quality local resources suggesting reduced group mobility and tighter group territories. A lack of faunal and botanical remains at inland archeological sites precludes inferring more than a generalized hunting and gathering subsistence system.

Well-established cemeteries also appear in the archeological record of inland southeast Texas by the middle Archaic (circa 6,000 to 3,000 BP) (Ricklis 2004; Story 1985). Excavation of 41AU36 on the lower Brazos River revealed a cemetery in use from the middle Archaic through the early Ceramic period (Hall 1981). By the late Archaic (ca. 3000 to 1,500 BP), cemeteries have increased substantially in size and most burials contain a diverse array of grave goods (Ricklis 2004). Story (1985) suggests that the abundance of cemeteries on the western margin of the coastal prairie zone indicates increased territoriality amongst groups in response to an ever-increasing population. Hall (2000) posits that highly productive environments such as river valley bottoms and the floodplains of major streams were home to an aggregate of resources that were predictable, concentrated, and fixed on the landscape. Such resources allowed late Archaic groups to operate within smaller, more exclusive territories.

The Archaic period on the upper Texas coast extended from about 5,000 to 2,200 years ago (Ricklis 2004). However, very few intact early Archaic components are known from this coastal region. Aten

(1983), and Story (1985) suggest the inland margin of the coastal plain may have been occupied more intensely than the coast as sea levels rose during the early Archaic. The coastline reached its current location between 5,000 and 3,000 BP (Aten 1983) and the earliest known shell middens in the area date to this period (Howard et al. 1991). Coastal Archaic sites that have been tested or excavated near the modern shoreline generally consist of shell-bearing sites with lithic tools and debitage, shell and bone tools, and the bones of fish, mammals, and reptiles (Story 1985).

Aten (1979 and 1983) hypothesized the establishment of seasonal rounds, including regular movements from littoral to inland areas during the late Archaic, after relatively modern stable conditions had been established. The Akokisa, who inhabited the region during the early post-contact period, have been demonstrated to move in a yearly round from small, dispersed band-sized or less groups during the warm seasons to aggregated villages during the colder months (Aten 1979:466; Newcomb 1961).

Ceramic Period

Pottery first appeared in southeast Texas along the coast around 2,000 years ago, ushering in the Early Ceramic period. Based on stylistic elements and the progressively earlier dated occurrences as one moves eastward, they arrived in the region via diffusion from Louisiana or the Lower Mississippi River Valley, suggesting an increasing interregional influence from neighboring groups (Aten 1979; Ricklis 2004). There were no apparent major shifts in lifeways during the early years after pottery was introduced. The contents of shell-bearing sites along the upper Texas coast during the Early Ceramic period vary little from the late Archaic shell middens, except for the addition of pottery and a few evolving dart point types, primarily Gary and Kent types (Ricklis 2004). Discrete cemeteries located close to major streams continue to enforce the notion of well-established group territories in response to increasing populations first evident during the Archaic (Aten 1983). Ceramics appeared in inland southeast Texas several centuries later (Aten 1979: 425) and most likely disseminated from the coastal zone where sandy-paste wares had become commonplace (Ricklis 2004).

Story (et al. 1990) used the introduction of ceramics on the upper Texas coast circa 2,000 BP as the unifying base of the Mossy Grove tradition, a local expression of the Woodland period in the lower Mississippi Valley. Inland and coastal Mossy Grove groups evidently developed separate adaptive systems, evident in differences in material culture (Ensor and Carlson 1991; Moore 1995; Patterson 1996) and different frequencies of treponematosis (Wilson 2001) between the inland and coastal groups. The abundant, uniform resources of the deciduous forests of inland east Texas, according to Story (1985) would lead to less selective pressures resulting in higher population densities and eventually less group

mobility. As the coast became more attractive to groups during the Late Archaic, boundary formation in this region from growing population densities would lead to these divergent coastal and inland adaptations. Mossy Grove material culture includes Goose Creek, Tchefuncte, Baytown, and San Jacinto ceramics. Lithic tools observed in coastal Mossy Grove sites are limited compared to the inland counterparts, and coastal sites contain more tools and ornaments made from bone and shells (Aten and Bollich 2024). Both archeological sites recorded within the study area, sites 41GV170 and 41GV200, contain artifacts associated with the Mossy Grove tradition.

Around 1,300 BP, small, light, straight, and expanded stem arrow points began to appear in archeological assemblages, indicating the introduction of the bow and arrow – a hallmark of the Late Prehistoric period in southeast Texas. Findings at the Mitchell Ridge site on Galveston Island suggest that the Late Prehistoric period in the region can be divided into two sub-periods. The initial Late Prehistoric is associated with the introduction of the bow and arrow as evidenced primarily by the presence of Scallorn arrow points. The final Late Prehistoric period in southeast Texas correlates with changes taking place throughout much of Texas. These changes include the appearance of bison bone in archeological assemblages around 700 to 800 years ago in association with a variety of stone tools. Stone tools associated with the appearance of bison include Perdiz arrow points, thin bifacial knives, expanded base drills and perforators, and unifacial end scrapers. The occurrence of bison bone with these tools suggests a significant shift towards reliance on bison and other large game hunting and the processing of meat and hides (Ricklis 2004).

Ceramics in the region continued to evolve during the Late Prehistoric period. Grog tempering is introduced near approximately A.D. 1000 (Aten 1979: 395-398; Ricklis 2004). Bone-tempering, although rare, appears later, and decorative elements become more elaborate (Ricklis 2004). The change in external design elements along the upper Texas coast reflect those of various types of the Coles Creek-Plaquemine sequence occurring in coastal Louisiana and the Lower Mississippi River Valley, suggesting a continued interaction with groups from the east (Ricklis 2004). Caddo influences are apparent in Late Prehistoric ceramic assemblages east near Conroe and Livingston (Ricklis 2004).

Based on findings at the Mitchell Ridge Site (41GV66) including radiocarbon data from discrete features and associated artifacts of strongly inferable chronological positions, Ricklis (1994) provided a framework for the Galveston Bay area ceramic periods, suggesting the precision of Aten's detailed ceramic seriation for the region was not supported by empirical evidence. Ricklis (1994) divided his chronology into the Preceramic Period, ending ca. A.D. 100; the Early Ceramic Period (ca. A.D. 100.-700), which spans from the introduction of pottery to the appearance of arrow points in the artifact

assemblage; the Initial Late Prehistoric Period (ca. A.D. 700-1250), during which the arrow point may have completely replaced the dart point, and grog-tempered pottery appeared; and the Final Late Prehistoric Period (A.D. 1250-1500), during which 41GV66 attracted more intensive occupation, marked by Perdiz arrow points and prismatic blades similar to inland assemblages, and the presence of bison bone.

2.4.3 Post-contact

Ricklis (1994:23) included the Protohistoric Period (A.D. 1500-1700) and the Early Historic Period in his chronology for the Galveston Bay area. Although there is no evidence for drastic changes in lifeways at 41GV66 during the Protohistoric Period, the aboriginal inhabitants of the Galveston Bay area had limited access to European-manufactured goods such as glass and beads, found in two burials of the period. During this Early Historic Period, increasingly intensive contact with Euro-American traders, missionaries, and military personnel resulted in rapid changes in native culture and demography. European contact in the region began in the early sixteenth century with the landing of Cabeza de Vaca and his ill-fated party landed on the southern tip of the Texas coastline in 1528. It is believed that his party crossed Oyster Creek, Old Caney Creek, and the Brazos and San Bernard rivers in their quest for provisions. Spanish explorers in the sixteenth century called Galveston Island the Island of Misfortune or the Island of Snakes. The Alonso Álvarez de Pineda expedition in 1519 claimed the island, as well as the entire Gulf Coast for Spain (Kleiner 2024).

Luis de Moscoso, who took command of Hernando De Soto's expedition in 1542 to explore today's southeastern United States to obtain gold and other riches from the native peoples, provided the earliest documented evidence that Galveston natives had maize and traded fresh ears of corn to the Spaniards (Foster 2008). Evidence from Mitchell Ridge suggests that native groups were suffering major population loss as a result of epidemics from introduced Old World diseases. The natives of Galveston Bay were participating in the French-Indian fur trade, and there may have been a partial shift to a horticultural subsistence base in the mid-1700s (Ricklis 1994).

The historic Akokisa, an Atakapan-speaking group, moved in small mobile bands in the summer and congregated in large, aggregated villages in the winter (Aten 1979; Newcomb 1961). Despite Mosoco's earlier claim to the contrary, Newcomb (1961) notes that the Frenchman Simars de Bellisle, captured by the Akokisa in 1720, described the Akokisa as hunters, gatherers, and fishermen, and stated that they grew no crops (Newcomb 1961). By 1720, the Akokisa had Spanish horses, and, by 1750, were trading with the French in Louisiana for weapons (Foster 2008). Aten (1983) tells that the Akokisa had passed

into oblivion by 1830; however, Moore (1992) has found evidence that a few of the Akokisa and closely related Bidai were alive well into the twentieth century.

Between 1815 and 1821, the area of Galveston County was dominated by freebooters, filibusters, and pirates, including Louis Michel Aury and Jean Laffite. Jean Laffite, who was appointed governor of Galveston Island by the Republic of Mexico, established a community he named Campeche, after a town on the Yucatán coast. The fort that he constructed in 1817 lasted only a year before it was destroyed by a storm, but by 1819, Campeche had a population of between 1,000 and 2,000. In 1822, the first group of American colonists settled on the mainland in modern-day Galveston County. Mexican authority in Galveston Island lasted until the Texas Revolution, and the first American colonists settled on the island in 1827 (Kleiner 2024).

Galveston County was formed in 1838 and organized in 1839. Its population declined in 1839, coinciding with a yellow fever epidemic. Despite eight yellow fever outbreaks between 1839 and 1867, Galveston developed into a cosmopolitan and sophisticated city, and its port supported the surrounding area's agriculture and commerce. When Texas joined the United States in 1845, Galveston was the largest city in the state, with a population of 3,500. Large numbers of European immigrants arrived at the port during the 1840s and 1850s (Kleiner 2024).

During the 1850s, slavery became a crucial issue in Galveston. Illegal slave trade arose during the Civil War, although slave markets operated in Galveston during the 1850s. Prominent families in the area were split concerning the abolition of the trade (Kleiner 2024). Although most of the population was German Unionists, the county voted in favor of secession from the Union. During the Civil War, Galveston was captured by Union forces in 1862 and recaptured at the Battle of Galveston in 1863. On June 19, 1865, Union forces landed on the island and proclaimed freedom for the slaves of the area (Kleiner 2024).

In 1880, Galveston was still the largest city in Texas (Kleiner 2024). Galveston County had strong Union inclinations but that did not prevent outbreaks of violence during reconstruction. In 1866, the people of the county clashed with an occupying white infantry company, and the local police would be replaced in 1867. Reconstruction forces would remain in Galveston County until 1870 (Kleiner 2024). Improvements in transportation and other developments increased growth in the county during the late 1800s (Kleiner 2024). The completion of the Galveston and Western Railway, also known as Little Susie, on Galveston Island supported a growing tourist industry. The Island boasted over 140 saloons and 10 hotels. In the 1890s, the deepwater port was completed, supporting the manufacturing industry. A bridge supporting wagon travel was completed by the cusp of the 20th century, connecting to the mainland (Kleiner 2024).

In 1900, a Category 4 hurricane hit Galveston, destroying much of the city and killing at least 8,000 people (Kleiner 2024; McComb 2024). The storm transformed the island and left the city with no choice but to burn the bodies in large piles. In 1902, a seawall was constructed that would help decrease the potential damage for future storms. In 1910, Galveston formed a commission city government and raised the grade throughout much of the city. The Hotel Galvez, an NRHP-listed building referred to as "The Playground of the Southwest," was constructed in 1911, the first sign of growing tourism in the area. Railway access improved to the island with the construction of the causeway between 1910 and 1930 (Kleiner 2024).

During the years between the World Wars, Galveston participated in blatant disregard for prohibition. The island offered illegal drinks, gambling, and prostitution. The citizenry took pride in the "free state of Galveston." These illegal establishments would eventually be shut down in the 1950s (McComb 2024). Galveston County remains one of the most populated counties in the state, with tourism, agriculture, and gas and oil as major economic industries (Kleiner 2024).

2.4.4 Previous Investigations

Eleven professional cultural resource management investigations are mapped within the study area (Table 2-6) (THC 2024b). Beginning in 1979, investigations were conducted in advance of sewer construction (Foradas 2006), residential development (Iruegas 2003; Sick 2008), and recreation and park development (Griffith and Fields 2011; Mahoney et al. 2011; Mahoney et al. 2016; McWilliams and Fields 2012; Padilla et al. 2011; Turpin 2003). Little information is available on the TASA for a survey undertaken in 1979 (THC 2024b).

TABLE 2-6 PREVIOUS INVESTIGATIONS CONDUCTED WITHIN THE STUDY AREA

ATLAS #	AUTHOR(S)	DATE	REPORT TITLE	INVESTIGATION FIRM/AGENCY
8500001982	-	1979	-	-
8500011218/ 8500013206	Jeff Turpin	2003	A Reassessment of Prehistoric Site 41GV99, Bolivar Peninsula Beach Restoration, Galveston Co., TX (Turpin 2003)	TAS, Inc., Austin
8500011219/ 8500013207	Sergio Iruegas, Reign Clark, and Russell Brownlow	2003	An Intensive Cultural Resources Survey on Approximately 800 Acres at the Western End of Galveston Island. Galveston County, Texas (Iruegas et al. 2003)	Horizon Environmental Services, Inc., Austin
8500011597	James Foradas	2006	An Intensive Pedestrian Survey for the Proposed Galveston West End Sewer Construction Project in Galveston County, Texas (Foradas 2006)	HRAGP, Houston

TABLE 2-6 PREVIOUS INVESTIGATIONS CONDUCTED WITHIN THE STUDY AREA

ATLAS #	AUTHOR(S)	DATE	REPORT TITLE	INVESTIGATION FIRM/AGENCY
8500015138	Charles Bludau Jr.	2008	-	-
8500015248	Rebecca Sick	2008	Cultural Resources Intensive Pedestrian Survey of 115 acres associated with the Spoonbill Bay Development Project in Galveston County, Texas (Sick 2008)	USACE, Galveston District, Houston
8500019362	R. B. Mahoney (editor), Christopher R. Lintz, Anthony S. Lyle, Ruth A. Mathews, and Logan D. McNatt	2011	Texas Parks and Wildlife Department Report of Archeological Investigations for 2011 (Mahoney et al. 2011)	Texas Parks and Wildlife Department, Austin
8500019786	Antonio E. Padilla, Amy E. Benton and Jon C. Lohse	2011	Results of an Archaeological Survey at Galveston Island State Park, Galveston County, Texas (Padilla et al. 2011)	Center for Archaeological Studies, Texas State University-San Marcos, Galveston
8500020258	Timothy B. Griffith and Ross C. Fields	2011	Archeological Survey of Proposed Multi-Use Camping Area and Nearby Facilities at Galveston Island State Park, Galveston County, Texas (Griffith and Fields 2011)	Prewitt and Associates, Inc., Austin
8500020729	Jennifer K. McWilliams and Ross C. Fields	2013	Archeological Survey of 50 Acres at Galveston Island State Park, Galveston County, Texas (McWilliams and Fields 2012)	Archeological Survey of 50 Acres at Galveston Island State Park, Galveston County, Texas
8500008315	R. B. Mahoney (editor), L. A. Alvarado, R. B. Barnes, M. A. Howard, J. D. Lowe, A. S. Lyle, R. B. Mahoney, and R. A. Mathews	2016	Texas Parks and Wildlife Department Report of Archeological Investigations for 2016 (Mahoney et al. 2016)	Texas Parks and Wildlife Department, Austin

Source: THC 2024b.

2.4.5 Records Review

The THC, working in conjunction with TARL, maintains records of previously recorded cultural resources as well as records of previous field investigations. On September 27, 2024, GIS shapefiles were acquired from TARL to identify and map the locations of previously recorded archeological resources within the study area. Data pertaining to cultural resources was obtained from TASA in September 2024. TxDOT's Historic Resources Aggregator was reviewed for properties and bridges listed or determined eligible for listing on the NRHP (TxDOT 2024c). At the national level, the NRHP database (NPS 2024b) and NPS websites for National Historic Landmarks (NPS 2024c) and National Historic Trails (NPS

2024d) were reviewed. USGS topographic maps were reviewed in order to identify cemeteries within the study area that were not recorded in the other online sources. No SALs, NRHP-listed properties, National Historic Trails, cemeteries, Historic Texas Cemeteries, OTHMs, or Registered Texas Historic Landmarks, are recorded within the study area (THC 2024a and 2024b; TxDOT 2024c). Two archeological sites have been recorded in the study area, including one that has been determined eligible for listing on the NRHP. The results of the record search are summarized in Table 2-7.

TABLE 2-7 CULTURAL RESOURCES RECORDED WITHIN THE STUDY AREA

RECORDED ARCHEOLOGICAL SITES	STATE ANTIQUITIES LANDMARKS	NRHP-LISTED PROPERTIES	CEMETERIES	OTHM
2	0	0	0	0

Source: THC 2024a and 2024b.

Of the two archeological sites recorded in the study area, one is pre-contact in age, and one has both a pre-and post-contact component (Table 2-8). Site 41GV170 is a campsite with pre-contact ceramics, pumice, asphaltum, lithics, and mammal and bird bone fragments (Matthews 2011; THC 2024b). The majority of artifacts (75%) observed at the site were pre-contact ceramic sherds, and all but one are indicative of the Mossy Grove tradition. Mossy Grove ceramic types reported from the site include Goose Creek, San Jacinto, and Baytown ceramics. A single Rockport sherd is also reported, which is not typical of the Mossy Grove tradition, and is representative of coastal groups along the central Texas coast. Pumice and asphaltum were observed in abundance, as well as two tertiary flakes, two biface fragments, a possible shell tool, and a burned bone fragment. Although the site has been impacted by land development (Matthews 2011), it has been determined eligible for listing on the NRHP (THC 2024b). Site 41GV200 is a pre-contact scatter of Tchefuncte ceramic sherds. Seven of these sherds retrofit, meaning they were from the same ceramic vessel. The site has not been formally evaluated for inclusion on the NRHP (THC 2024b).

TABLE 2-8 ARCHEOLOGICAL SITES RECORDED WITHIN THE STUDY AREA

TRINOMIAL	ELIGIBILITY DETERMINATION	PERIOD	DESCRIPTION
41GV170	eligible	pre-contact and post-contact	campsite with pre-contact ceramics, pumice, asphaltum, lithics, mammal and bird bone fragments; post-contact and modern land development
41GV200	undetermined	pre-contact	scatter of eight Tchefuncte ceramic sherds, seven that retrofit

Notes: THC 2024b

Review of previously recorded cultural resource site data indicates that the study area has not been examined entirely during previous cultural resource investigations. Consequently, the review of records does not include all possible cultural resource sites within the study area. To further assess and avoid potential impacts to cultural resources, high probability areas (HPAs) for prehistoric archeological sites were defined during the route analysis process. Within the study area, the pre-contact HPAs typically occur on terraces overlooking permanent sources of water, including West Bay, the Gulf of Mexico, and unnamed tributaries to these waterbodies. Much of the study area has been impacted by road, commercial, and residential developments.

Post-contact resources are also likely to be found near water sources. However, they will also occur in proximity to primary and secondary roads, which provide access to the sites. Buildings and cemeteries are also more likely to be located within or near post-contact communities. Review of the historic topographical USGS 7.5-minute Lake Como (USGS 1933, 1952a, 1954, 1969, and 1974a), San Luis Pass (USGS 1952b, 1963a, and 1974b), and Sea Isle (USGS 1963b and 1974c) quadrangles show numerous structures within the study area.

2.5 AESTHETIC VALUES

Section 37.056(c)(4)(C) of PURA incorporates aesthetics as a consideration when evaluating proposed electric transmission facilities. There are currently no formal guidelines provided for managing visual resources on private, state or county-owned lands located within the study area. For the purposes of this study, the term aesthetics is defined by POWER to include the subjective perception of natural beauty in a landscape and measurement of an area's scenic qualities. The visual inventory was conducted by describing the regional setting and determining the viewer sensitivity ratings. Related literature, aerial photograph interpretation, and reconnaissance surveys were used to describe the regional setting and to determine the landscape character types for the area.

Consideration of the visual environment includes a determination of aesthetic values (where the major potential effect of a project on the resource is considered visual) and recreational values (where the location of a transmission line could potentially affect the scenic enjoyment of the area). POWER considered the following criteria that combine to give an area its aesthetic identity:

- Landform and topography (hills, valleys, etc.)
- Prominence of water in the landscape (rivers, lakes, etc.)
- Vegetation variety (woodland, meadows)

- Diversity of scenic elements
- Degree of human development or alteration
- Overall uniqueness of the scenic environment compared with the larger region

The study area is primarily coastal residential development with the land use being predominately coastal marshland. The majority of the study area has been impacted by land improvements associated with residential, commercial activities and various utility corridors including the existing 138 kV transmission line. Overall, the study area viewscape consists of coastal marshland community.

No known outstanding aesthetic resources, designated views, designated scenic roadways or unique visual elements were identified from the literature review or from reconnaissance surveys of the study area (America's Scenic Byways 2024). The study area is located within the Texas Independence Trail Region; however, there are no sites designated of interest located within the study area (THC 2024c).

A review of the NPS website did not identify any National Wild and Scenic Rivers Systems, National Parks, National Monuments, National Historic Sites, National Historic Landmarks, National Historic Trails or National Battlefields within the study area (National Wild and Scenic Rivers Systems 2024; NPS 2024c, 2024d, and 2024e).

Based on these criteria, the study area exhibits a moderate degree of aesthetic quality for the region. The majority of the study area maintains the appearance of a coastal marshland community. Although some portions of the study area are visually appealing, the overall aesthetic quality of the study area is distinguishable from that of adjacent mainland areas within the region.

For this study, the potential visual impacts considered for the Project were limited to line-of-sight views within the immediate foreground (one-half mile, unobstructed) from points located on FM roads and recreational and park areas.

2.6 NATURAL RESOURCES / ENVIRONMENTAL INTEGRITY

Resource inventory data were collected for physiography, geology, soils, surface waters, wetlands, and ecological resource areas. These data were obtained from readily available sources and mapped within the study area utilizing GIS layers. Additional data collection activities consisted of file and record reviews conducted utilizing the various state and federal regulatory agencies, a review of published literature, and review of various maps and aerial photographs. Maps and data layers reviewed included but were not

limited to USGS 7.5-minute topographic maps, aerial imagery, Bureau of Economic Geology (BEG) Geologic Atlas, and NWI maps.

2.6.1 Physiography and Geology

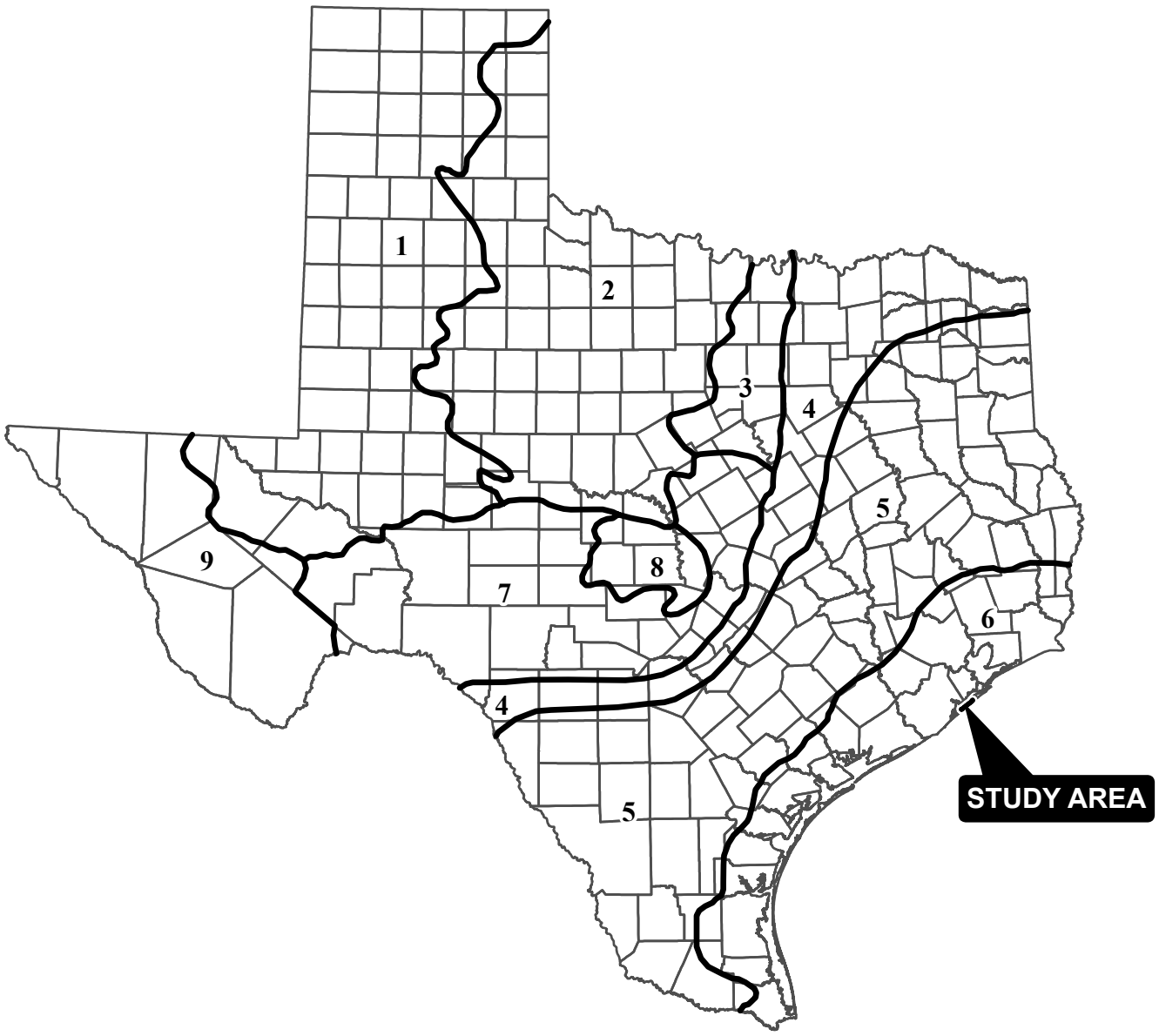
As shown in Figure 2-3, the study area is located within the Coastal Prairies subprovince of the Gulf Coastal Prairies Physiographic Province. The Coastal Prairies landscape is nearly level with deltaic sand and mud bedrock types with elevations ranging from sea level to 300 feet above mean sea level (amsl) (Bureau of Economic Geology [BEG] 1996). Within the study area, elevations remain relatively flat and range between approximately level at sea level to 20 feet amsl near the shore of the Gulf of Mexico and 30 feet amsl further inland of Galveston Island (USGS 2022a, 2022b, and 2022c).

According to the USGS Texas Water Science Center's Geologic Database of Texas (USGS 2014), the geologic unit underlying the study area is Quaternary-aged barrier-island deposits. These deposits are comprised of mostly sand with some silt and clay. The sand within this unit is fine-grained and abundant with shells and shell fragments and interfingers with clay and silt in a landward direction (USGS 2014).

Geological Hazards

Several potential geologic features affecting the construction and operation of a transmission line were evaluated within the study area. Geologic areas reviewed included fault lines, active or abandoned mining locations, aggregate operation locations, and potential subsurface contamination. Subsurface contamination (soils or groundwater) from previous commercial activities or dumps/landfills may require additional considerations during routing and/or may create a potential hazard during construction activities.

The study area does not intersect any normal fault lines (USGS 2014). According to the RRC, there is one abandoned natural gas pipeline in the northeast corner of the study area (RRC 2024a). No active or reclaimed coal mine sites (RRC 2024b and 2024c), no historical abandoned coal mining locations (RRC 2015), no uranium mining activities (RRC 2024d), and no aggregate/gravel production operations (TCEQ 2025) were identified within the study area.



N

0 30 60 120 180 240

Miles

Source: Texas Bureau of Economic Geology, 1996

Legend

Physiographic Region Boundary

1 High Plains
2 North-Central Plains
3 Grand Prairie
4 Blackland Prairies
5 Interior Coastal Plains
6 Gulf Coastal Prairies
7 Edwards Plateau
8 Central Texas Uplift
9 Trans-Pecos Basin and Range

County Boundary

CENTERPOINT ENERGY 138 KV STEWART TO WEST BAY PROJECT

FIGURE 2-3

LOCATION OF THE STUDY AREA IN RELATION TO THE PHYSIOGRAPHIC REGIONS OF TEXAS

CenterPoint Energy

POWER ENGINEERS

Date: 1/24/2025

Subsurface contamination (soils or groundwater) from previous commercial activities or dumps/landfills may require additional considerations during transmission routing and/or may create a potential hazard during construction activities. No subsurface contamination sites, including state or federal superfund sites (United States Environmental Protection Agency [USEPA] 2025; TCEQ 2024a), or solid waste facilities (TCEQ 2024b) were identified within the study area.

2.6.2 Soils

Mapped Soil Units

Natural Resources Conservation Service (NRCS) Web Soil Survey data (NRCS 2025) was reviewed to identify and characterize mapped soils within the study area. Soil map units represent a collection of delineated areas defined and named the same in terms of their soil components (e.g., series). Mapped soils within the study area are listed in Table 2-9, including a brief description of the soil unit, landform of occurrence, and hydric and prime farmland classification status.

TABLE 2-9 MAPPED SOIL UNITS OCCURRING WITHIN THE STUDY AREA

SOIL MAP UNIT	LANDFORM	HYDRIC	PRIME FARMLAND
Beaches, 0 to 1 percent slopes, very frequently flooded	Beaches	No	No
Brazosport fine sand, 0 to 1 percent slopes, frequently flooded, storm surge	Back-barrier flats	No	No
Galveston fine sand, 0 to 2 percent slopes, occasionally flooded, storm surge	Back-barrier flats	No	No
Galveston-Drumbay fine sands, 0 to 2 percent slopes, occasionally flooded, storm surge	Back-barrier flats	No	No
Galveston-Nass occasionally ponded complex, 0 to 4 percent slopes, occasionally flooded, storm surge	Back-barrier flats	No	No
Galveston-Urban land complex, 0 to 3 percent slopes, occasionally flooded, storm surge	Back-barrier flats	No	No
Mentzel-Jumbilecove, very frequently flooded-Brazosport frequently flooded complex, 0 to 1 percent slopes	Tidal flats	Yes	No
Mustang-Nass complex, 0 to 1 percent slopes, occasionally flooded, occasionally ponded	Depressions on barrier flats	Yes	No
Mustang-Urban land complex, 0 to 1 percent slopes, occasionally flooded, storm surge	Depressions on barrier flats	Yes	No
Nass very fine sandy loam, 0 to 1 percent slopes, occasionally flooded, occasionally ponded, storm surge	Depressions on barrier flats	Yes	No
Sanluis fine sand, 0 to 3 percent slopes, occasionally flooded, storm surge	Foredunes	No	No

Source: NRCS 2025

Hydric Soils

The National Technical Committee for Hydric Soils defines hydric soils as soils formed under conditions of saturation, flooding, or ponding long enough during growing seasons to develop anaerobic conditions in the upper soil horizons. These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support growth and reproduction of hydrophytic vegetation (NRCS 2025).

According to NRCS, the following mapped soil units contain major soil components classified as hydric: Mentzel-Jumbilecove, very frequently flooded-Brazosport frequently flooded complex, 0 to 1% slopes; Mustang-Nass complex, 0 to 1% slopes, occasionally flooded, occasionally ponded; Mustang-Urban land complex, 0 to 1% slopes, occasionally flooded; and Nass very fine sandy loam, 0 to 1% slopes, occasionally flooded, occasionally ponded, storm surge (Table 2-9). Map units dominantly comprised of hydric soils might have small inclusions of non-hydric soils in higher areas of the landform. Conversely, map units dominated by non-hydric soils might have small inclusions of hydric soils in lower areas of the landform.

Prime Farmland Soils

The United States Secretary of Agriculture, within U.S.C. §7-4201(c)(1)(A), defines prime farmland as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. They have the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods. Soils designated as farmland of statewide importance are farmlands with soils that meet most of the requirements of prime farmland but fail due to the absence of sufficient natural moisture or water management facilities. The USDA would consider these soils prime farmland if such practices were installed. According to NRCS Web Soil Survey data (NRCS 2025) for the study area, there are no soil map units designated as prime farmland and as farmland of statewide importance within the study area.

Transmission line projects are typically not subject to the requirements of the Farmland Protection Policy Act unless they are associated with federal funding, which the proposed Project is not. Additionally, transmission line construction is not typically considered a conversion of prime farmlands as the site can still be used for farming after construction is complete.

2.6.3 Water Resources

Information on water resources within the study area were obtained from a variety of sources including but not limited to the USEPA, the National Hydrography Dataset, TWDB, aerial photography, USGS 7.5-minute topographic maps, field reconnaissance surveys, and aerial imagery.

Surface Water

The study area is located entirely within the West Galveston Bay River Sub Basin within the San Jacinto-Brazos River Basin (TPWD 2025a). The study area is also located within the Mustang Bayou, Halls Bayou, and Dickinson Bayou watersheds (TPWD 2025a). No named surface waters were identified to be mapped within the study area (USEPA 2024). However, current aerial imagery indicates there are several unnamed ponds and drainage features throughout the study area (Google Earth 2024).

Ground Water

The study area is not located within a major or minor aquifer system (TWDB 2025). No natural or historical springs are mapped within the study area. There is one public water well mapped within the study area (TWDB 1975 and 2025).

Special Status Waters

Under 31 TAC § 357.43 and 31 TAC § 358.2, TPWD has designated Ecologically Significant Stream Segments (ESSS) based on habitat value, threatened and endangered species, species diversity, and aesthetic value criteria (TPWD 2025b). No designated ESSS were identified within the study area (TPWD 2025b).

In accordance with Section 303(d) and 304(a) of the CWA, the TCEQ identifies surface waters for which effluent limitations are not stringent enough to meet water quality standards and for which the associated pollutants are suitable for measurement by total maximum daily load (TMDL). TMDL is a scientifically derived target for water quality that determines the greatest amount of a particular substance that can be added to a 303(d) and 304(a) waterbody without compromising its health. Review of TCEQ's (2024c) Texas Integrated Report of Water Quality Impairments did not indicate any impaired Section 303(d) or 304(a) surface waters within the study area.

Floodplains

FEMA's Flood Insurance Rate Maps and National Flood Hazard Layer were reviewed for the study area (FEMA 2024). The 100-year flood (1% flood or base flood) represents a flood event that has a 1% chance of being equaled or exceeded for any given year. FEMA data indicated that the nearly entirety of the study area lies within FEMA designated 100-year floodplain. The data further indicated that the study area lies within flood Zone AE and Zone VE. Zone AE is described as base floodplain areas where base flood elevations are provided (FEMA 2023). Zone VE is described coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves (FEMA 2022).

Future Surface Water Developments

Review of the 2022 TWDB State Water Plan and the 2021 Regional Water Plan for Region H did not indicate any proposed surface water developments within the study area (TWDB 2021 and 2022).

2.6.4 Ecological Resources

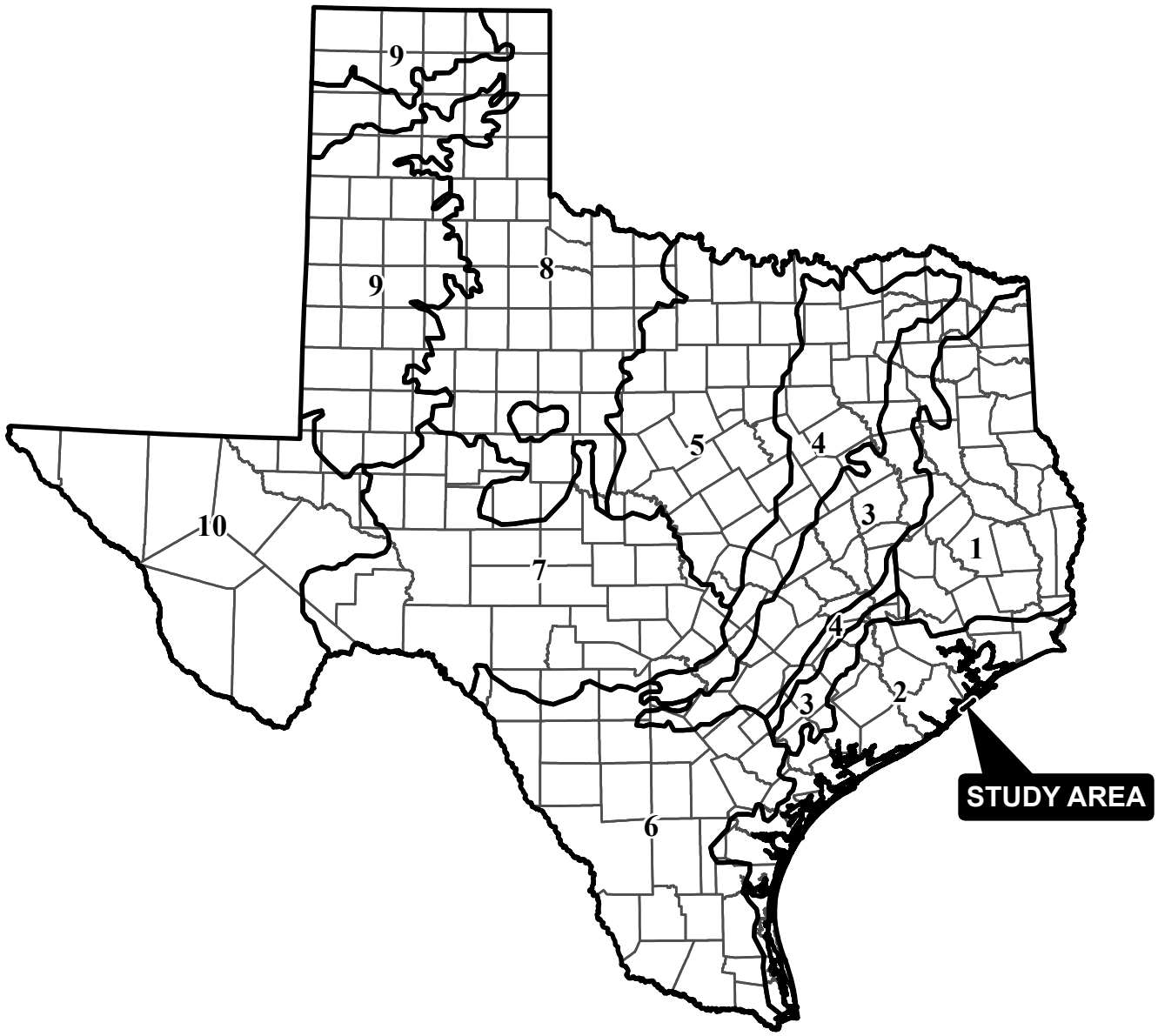
Data and information on ecological resources within the study area were obtained from a variety of sources, including aerial photograph interpretation, correspondence with the USFWS, TPWD, and published literature and technical reports.

Ecological Region

As shown in Figure 2-4, the study area is located within the Gulf Prairies and Marshes vegetational area (Gould et al. 1960). Additionally, the study area is located within the Western Gulf Coastal Plain Level III Ecoregion and Mid-Coast Barrier Islands and Coastal Marshes Level IV Ecoregion (Griffith et al. 2007). A general description of the ecoregions within the study area is included below. The plant species in the vegetation communities of the ecoregions are dependent on location, hydrology, soils, and disturbance history or land management activities.

Western Gulf Coastal Plain Level III Ecoregion

The Western Gulf Coastal Plain is a relatively flat strip of land adjacent to the Gulf of Mexico and distinguished by potential natural vegetation grasslands. Inland plains are older, more irregular, and have mostly forest or savanna type vegetation compositions (Griffith et al. 2007). Because of this ecoregion's characteristics, a large percentage of it is cropland with principal crops including rice, grain, and soybeans.



0 30 60 120 180 240

Miles

Source: Gould, et. al., 1960.

Legend

Vegetational Areas Boundary

1 Pineywoods
2 Gulf Prairies and Marshes
3 Post Oak Savannah
4 Blackland Prairies
5 Cross Timbers and Prairies
6 South Texas Plains
7 Edwards Plateau
8 Rolling Plains
9 High Plains
10 Trans-Pecos

County Boundary

CENTERPOINT ENERGY 138 KV STEWART TO WEST BAY PROJECT

FIGURE 2-4

LOCATION OF THE STUDY AREA IN RELATION TO THE VEGETATIONAL AREAS OF TEXAS

CenterPoint Energy

POWER ENGINEERS

Date: 1/24/2025

Mid-Coast Barrier Islands and Coastal Marshes Level IV Ecoregion

The Mid-Coast Barrier Islands and Coastal Marshes ecoregion primarily encompasses Holocene deposits with saline, brackish, and freshwater marshes, barrier islands, and tidal flat sands and clays. Dominant vegetation in saline areas include smooth cordgrass (*Spartina alterniflora*), marshhay cordgrass (*Spartina patens*), and coastal saltgrass (*Distichlis spicata*) where other native vegetation includes seacoast bluestem (*Schizachyrium scoparium* var. *littorale*), sea-oats (*Uniola paniculata*), common reed (*Phragmites australis*), gulfdune paspalum (*Paspalum monostachyum*), and soilbind morning-glory (*Ipomoea pes-caprae*) (Griffith et al. 2007).

Ecological Systems

Review of the TPWD (2025c) Texas Ecosystem Analytical Mapper indicates the dominant (total of more than 5% of the study area) ecological systems within the study area include Urban Low Intensity, Gulf Coast: Salty Prairie, Coastal and Sandsheet: Deep Sand Grassland, and Coastal: Sea Ox-eye Daisy Flats. Descriptions of each ecological system and common species found within each system are detailed below (TPWD 2025c).

Urban Low Intensity

Urban Low Intensity includes built-up areas not entirely covered by impervious cover and includes non-industrial areas of cities and towns (TPWD 2025c).

Gulf Coast: Salty Prairie

Gulf cordgrass (*Spartina spartinae*) may form pure stands within the ecological system or form mosaics with marshhay cordgrass or saltgrass (*Distichlis* spp.) at lower elevations or species such as bermudagrass (*Cyndodon dactylon*) and little bluestem (*Schizachyrium scoparium*) at slightly higher elevations. Other common grasses include Gulf muhly (*Muhlenbergia capillaris*), shoregrass (*Monanthochloe littoralis*), switchgrass (*Panicum virgatum*), and bushy bluestem (*Andropogon glomeratus*), and shrubs such as baccharis (*Baccharis* spp.), Chinese tallow (*Triadica sebifera*), huisache (*Acacia smallii*), mesquite (*Prosopis* spp.), or sumpweed (*Iva annua*) (TPWD 2025c). Sea ox-eye daisy (*Borrichia frutescens*) and saltwort (*Batis maritima*) are commonly encountered forbs.

Coastal and Sandsheet: Deep Sand Grassland

Seacoast bluestem, rat-tail grass (*Sporobolus indicus*), threeawns (*Aristida* spp.), and gulfdune paspalum (*Paspalum monostachyum*) are key species in the coastal areas of this ecological system whereas tanglehead grass (*Heteropogon contortus*) dominates some more inland (TPWD 2025c). Slightly lower areas may be dominated by marshhay cordgrass or gulf cordgrass.

Coastal: Sea Ox-eye Daisy Flats

Sparse, low shrublands with salt-tolerant species such as sea ox-eye daisy, Carolina wolfberry (*Lycium carolinianum*), saltwort, gutta-percha (*Palaquium gutta*), and tornillo (*Prosopis pubescens*) characterize this type. Mesquite may be scattered and species such as annual seepweed (*Suaeda linearis*), marshhay cordgrass, Gulf cordgrass, saltgrass, seashore paspalum (*Paspalum vaginatum*), and glasswort (*Salicornia* spp.) may be present (TPWD 2025c).

Wetlands

Mapped wetlands information was incorporated into the analysis of the study area from USFWS NWI database (USFWS 2024a). NWI maps are based on topography and interpretation of infrared satellite data and color aerial photographs and are classified under the Cowardin System (Cowardin et al. 1979). Since the date of NWI data mapping, mapped wetland features within the study area may have changed, and actual site conditions may differ in wetland classification, size, or presence. The wetland types identified within the study area include palustrine emergent (PEM), palustrine scrub-shrub (PSS), estuarine and marine deepwater (E1), and estuarine and marine wetland (E2 and M2) (USWFS 2024a). Unmapped wetlands may also potentially occur in association with riparian areas near any surface drainage or pond within the study area.

PEM wetlands are defined as all non-tidal wetlands dominated by persistent emergent erect, rooted, herbaceous hydrophytes, excluding mosses and lichens, that occur in less than 2.5 meters of water and have a salinity of less than 0.5 parts per thousand (ppt) (Cowardin et al. 1979). Mapped PEM wetlands occur throughout the study area and are associated with depressional topography and floodplains (Google Earth 2024; USFWS 2024a). Within the study area dominant species that can potentially occur within PEM wetlands include smooth cordgrass, saltgrass, marshhay cordgrass, and sea ox-eye daisy (Elliot 2014).

PSS wetlands include non-tidal wetlands that have less than 2.5-meter water depth and 0.5 ppt salinity and have more than 30% areal coverage of woody vegetation less than 6.0 meters in height (Cowardin et al. 1979). Mapped PSS wetlands occur in the northeastern section of the study area and are associated with scattered tree vegetation along streams and ponds (Google Earth 2024; USFWS 2024a). Within the study area potential plant species occurring within PSS wetlands may include honey mesquite (*Prosopis glandulosa*), baccharis, sumpweed, little bluestem, seacoast bluestem, bermudagrass, King Ranch bluestem (*Bothriochloa ischaemum var. songarica)* or buffelgrass (*Pennisetum ciliare*) (Elliot 2014).

E1 deepwaters and E2 and M2 wetlands consist of emergent tidal wetlands and adjacent tidal wetlands that are usually semi-enclosed by land but have some access to the open ocean where ocean water is occasionally diluted by freshwater runoff from land. E1 communities are estuarine subtidal open water wetlands. E2 and M2 communities are intertidal emergent wetlands consisting of salt and brackish marshes (Cowardin et al. 1979). Mapped E1, E2, and M2 wetlands occur in the northwestern corner and along the northern boundary of the study area. Within the study area, common plant species in E1 and E2 wetlands may include sea ox-eye daisy, saltgrass, seaside heliotrope (*Heliotropium curassavicum*), saltmarsh bulrush (*Scirpus maritimus*), soft-stem bulrush (*Scirpus validus*), knotroot bristlegrass (*Setaria geniculata*), marshhay cordgrass, and gulf cordgrass (Stutzenbaker 2010).

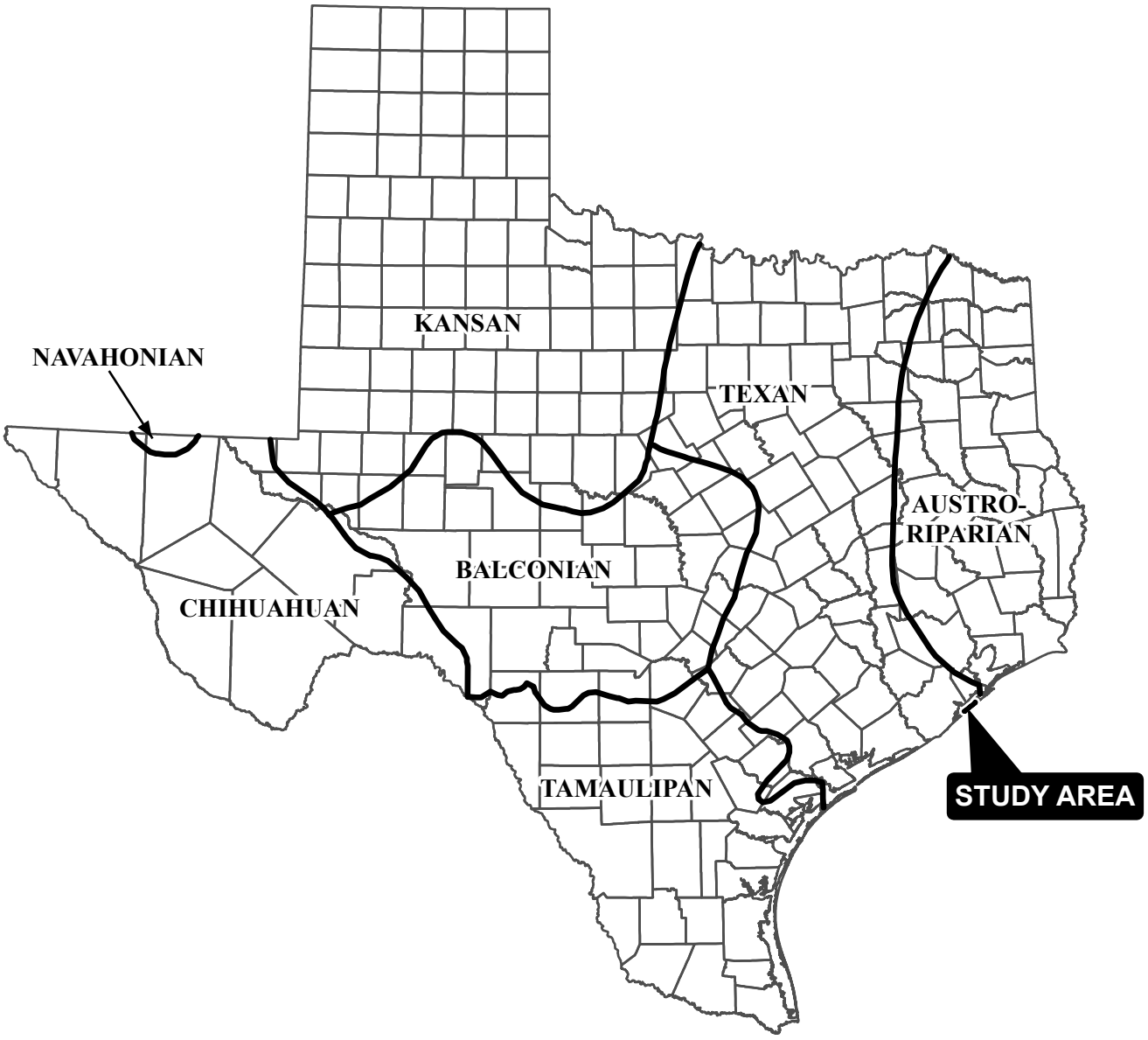
Coastal Management Program

As specified in 31 TAC § 26.16, the PUC must comply with CMP policies when approving CCNs for electric transmission lines that are located within the CMZ under the Coastal Zone Management Act of 1972 (Texas GLO 2025). The PUC may grant a certificate for the construction of generating or transmission facilities within the coastal boundary as defined in 31 TAC § 27.1 only when it finds that the proposed facilities are consistent with the applicable goals and policies of the CMP specified in 31 TAC § 26.12, or that the proposed facilities will not have any direct and significant impacts on any of the applicable CNRAs. As outlined in 31 TAC § 16.1, CNRAs are defined as waters of the open Gulf of Mexico, waters under tidal influence, submerged lands, coastal wetlands, submerged aquatic vegetation, tidal sound and mud flats, oyster reefs, hard substrate reefs, coastal barriers, coastal shore areas, gulf beaches, critical dune areas, special hazard areas (floodplains, etc.), critical erosion areas, coastal historic areas, and coastal preserves.

The study area is located within the CMZ boundary (Texas GLO 2015) and contains CNRAs. As such, the need to coordinate with the Texas GLO after PUC approval of the Project Route is anticipated.

2.6.5 Wildlife and Fisheries

The study area is located within the Texan Biotic Province (see Figure 2-5) as described by Blair (1950) that acts as a transition zone for its adjacent provinces with forests to the east and grasslands to the west. The following sections list species that may occur in and characterize the faunal diversity of the study area today.



0 30 60 120 180 240

Miles

Source: Blair, 1950, modified

Legend

Biotic Province Boundary

County Boundary

CENTERPOINT ENERGY
138 KV STEWART TO WEST BAY PROJECT
FIGURE 2-5
LOCATION OF THE STUDY AREA IN RELATION TO THE BIOTIC PROVINCES OF TEXAS

CenterPoint Energy

POWER ENGINEERS

Date: 1/24/2025

Amphibians

A representative list of amphibian species (frogs, toads, and salamanders) that may occur within the study area are listed in Table 2-10. The likelihood of occurrence of each species within the study areas will depend upon suitable habitat. Frogs and toads may occur in all vegetation types, while salamanders are typically restricted to hydric habitats (Dixon 2013).

TABLE 2-10 AMPHIBIAN SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]
Frogs/Toads	
American bullfrog	*Lithobates catesbeianus*
Blanchard's cricket frog	*Acris blanchardi*
Cope's gray treefrog	*Hyla chrysoscelis*
Crawfish frog	*Lithobates areolatus*
Cuban treefrog	*Osteopilus septentrionalis*
Eastern narrow-mouthed toad	*Gastrophryne carolinensis*
Gray treefrog	*Hyla versicolor*
Great Plains narrow-mouthed toad	*Gastrophryne olivacea*
Greenhouse frog	*Eleutherodactylus planirostris*
Green treefrog	*Hyla cinerea*
Gulf Coast toad	*Incilius nebulifer*
Hurter's spadefoot toad	*Scaphiopus hurterii*
Pickerel frog	*Lithobates palustris*
Rio Grande chirping frog	*Eleutherodactylus cystignathoides*
Southern leopard frog	*Lithobates sphenocephalus*
Spotted chorus frog	*Pseudacris clarkii*
Spring peeper	*Pseudacris crucifer*
Squirrel tree frog	*Hyla squirella*
Woodhouse's toad	*Anaxyrus woodhousii*
Salamanders/Newts	
Eastern newt	*Notophthalmus viridescens*
Marbled salamander	*Ambystoma opacum*
Small-mouthed salamander	*Ambystoma texanum*
Three-toed amphiuma	*Amphiuma tridactylum*
Western dwarf salamander	*Eurycea paludicola*

[1] According to Dixon 2013.
[2] Nomenclature follows: Society for the Study of Amphibians and Reptiles (Crother 2017).

Reptiles

A representative list of reptiles (turtles, lizards, and snakes) that may occur in the study area are listed in Table 2-11. The likelihood of occurrence of each species within the study areas will depend upon suitable habitat. These include those species that are more commonly observed near water (e.g., aquatic turtles) and those that are more common in terrestrial habitats (Dixon 2013).

TABLE 2-11 REPTILIAN SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]
Crocodilians	
American alligator	*Alligator mississippiensis*
Lizards	
Broad-headed skink	*Plestiodon laticeps*
Brown anole	*Anolis sagrei*
Common five-lined skink	*Plestiodon fasciatus*
Common spotted whiptail	*Aspidocelis gularis*
Eastern six-lined race runner	*Aspidoscelis sexlineata*
Green anole	*Anolis carolinensis*
Little brown skink	*Scincella lateralis*
Mediterranean gecko	*Hemidactylus turcicus*
Northern fence lizard	*Sceloporus undulatus hyacinthinus*
Prairie skink	*Plestiodon septentrionalis*
Slender glass lizard	*Ophisaurus attenuatus*
Texas spiny lizard	*Sceloporus olivaceus*
Turtles	
Alligator snapping turtle	*Macrochelys temminckii*
Common snapping turtle	*Chelydra serpentina*
Diamond-backed terrapin	*Malaclemys terrapin*
Eastern box turtle	*Terrapene carolina*
Eastern mud turtle	*Kinosternon subrubrum*
Eastern musk turtle	*Sternotherus odoratus*
Green sea turtle	*Chelonia mydas*
Kemp's ridley sea turtle	*Lepidochelys kempii*
Leatherback sea turtle	*Dermochelys coriacea*
Loggerhead sea turtle	*Caretta caretta*
Northern map turtle	*Graptemys geographica*

TABLE 2-11 REPTILIAN SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]
Ornate box turtle	*Terrapene ornata*
Pallid spiny softshell turtle	*Apalone spinifera pallida*
Pond slider	*Trachemys scripta*
Smooth softshell turtle	*Apalone mutica*
Yellow mud turtle	*Kinosternon flavescens*
Snakes	
Blotched water snake	*Nerodia erythrogaster*
Broad-banded watersnake	*Nerodia fasciata confluens*
Canebrake rattlesnake	*Crotalus horridus*
Checkered gartersnake	*Thamnophis marcianus*
Dekay's brownsnake	*Storeria dekayi*
Diamond-backed watersnake	*Nerodia rhombifer*
Eastern copperhead	*Agkistrodon contortrix*
Eastern gartersnake	*Thamnophis sirtalis sirtalis*
Eastern hog-nosed snake	*Heterodon platirhinos*
Eastern yellow-bellied racer	*Coluber constrictor flaviventris*
Flat-headed snake	*Tantilla gracilis*
Glossy swampsnake	*Liodytes rigida*
Graham's crayfish snake	*Regina grahamii*
Louisiana milk snake	*Lampropeltis triangulum amaura*
Mississippi green watersnake	*Nerodia cyclopion*
Northern cottonmouth	*Agkistrodon piscivorus*
Plain-bellied watersnake	*Nerodia erythrogaster*
Prairie kingsnake	*Lampropeltis calligaster calligaster*
Pygmy rattlesnake	*Sistrurus miliarius streckeri*
Rough earthsnake	*Haldea striatula*
Rough greensnake	*Opheodrys aestivus*
Saltmarsh snake	*Nerodia clarkii*
Scarletsnake	*Cemophora coccinea*
Speckled kingsnake	*Lampropeltis holbrooki*
Texas coral snake	*Micrurus tener*
Texas glossy snake	*Arizona elegans arenicola*
Western coachwhip	*Masticophis flagellum testaceus*
Western diamond-backed rattlesnake	*Crotalus atrox*

TABLE 2-11 REPTILIAN SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]
Western mudsnake	*Farancia abacura reinwardti*
Western ratsnake	*Pantherophis obsoleta*
Western ribbonsnake	*Thamnophis proximus*

[1] According to Dixon 2013.
[2] Nomenclature follows: Society for the Study of Amphibians and Reptiles (Crother 2017).

Birds

A representative list of numerous avian species that may occur within the study area as year-round residents, summer residents, and/or winter residents/migrants is presented in Table 2-12. Texas Ornithological Society (Lockwood and Freeman 2014) data and TPWD ecoregion specific avian check lists (Stevenson 2024) were reviewed for species distribution and life history information. Additional transient bird species may migrate within or through the study area in the spring and fall and/or use the area to nest (spring/summer) or overwinter. Both the Central and Mississippi flyways funnel through Texas and many species of birds reach their extreme southernmost range during winter migration and northernmost range during their fall migration in this region. The Texas coast is an important stopover location for many birds during migration, especially during the migratory "fallout" phenomenon. "Fallout" may happen if a strong storm crosses the Gulf of Mexico during spring migration, causing birds to be caught in the storm and become exhausted. The migrating birds immediately seek food, shelter, and habitat along the Texas coast. These "fallout" habitats are typically located closer to the coast but wandering birds may potentially occur within the study area. Migratory bird species that are native to the United States or its territories are protected under the MBTA. The likelihood of the occurrence of each species depends upon availability of suitable habitat and season.

TABLE 2-12 BIRD SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]	LIKELY SEASONAL OCCURRENCE[3]
ACCIPITRIFORMES: Accipitridae		
Bald eagle	*Haliaeetus leucocephalus*	R
Broad-winged hawk	*Buteo platypterus*	M
Cooper's hawk	*Accipiter cooperii*	M, WR
Mississippi kite	*Ictinia mississippiensis*	M, SR
Northern harrier	*Circus cyaneus*	M, WR
Red-shouldered hawk	*Buteo lineatus*	R
Red-tailed hawk	*Buteo jamaicensis*	R
Sharp-shinned hawk	*Accipiter striatus*	M, WR
White-tailed kite	*Elanus leucurus*	R
ACCIPITRIFORMES: Cathartidae		

TABLE 2-12 BIRD SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]	LIKELY SEASONAL OCCURRENCE[3]
Black vulture	*Coragyps atratus*	R
Turkey vulture	*Cathartes aura*	R
ACCIPITRIFORMES: Pandionidae		
Osprey	*Pandion haliaetus*	M, WR
ANSERIFORMES: Anatidae		
American wigeon	*Mareca americana*	M, WR
Black-bellied whistling-duck	*Dendrocygna autumnalis*	R
Blue-winged teal	*Spatula discors*	M, SR
Bufflehead	*Bucephala albeola*	M, WR
Cackling goose	*Branta hutchinsii*	M
Canada goose	*Branta canadensis*	M
Canvasback	*Aythya valisineria*	M, WR
Cinnamon teal	*Spatula cyanoptera*	M, WR
Common goldeneye	*Bucephala clangula*	M, WR
Fulvous whistling duck	*Dendrocygna bicolor*	SR
Gadwall	*Anas strepera*	M, WR
Greater scaup	*Aythya marila*	M, WR
Greater white-fronted goose	*Anser albifrons*	M, WR
Green-winged teal	*Anas crecca*	M, WR
Hooded merganser	*Lophodytes cucullatus*	M, WR
Lesser scaup	*Aythya affinis*	M, WR
Mallard	*Anas platyrhynchos*	WR
Mottled duck	*Anas fulvigula*	R
Northern pintail	*Anas acuta*	M, WR
Northern shoveler	*Spatula clypeata*	M, WR
Redhead	*Aythya americana*	M, WR
Red-breasted merganser	*Mergus serrator*	M, WR
Ring-necked duck	*Aythya collaris*	M, WR
Ross's goose	*Anser rossii*	M, WR
Ruddy duck	*Oxyura jamaicensis*	M, WR
Snow goose	*Anser caerulescens*	M, WR
Wood duck	*Aix sponsa*	R
APODIFORMES: Apodidae		
Chimney swift	*Chaetura pelagica*	M, SR
APODIFORMES: Trochilidae		
Black-chinned hummingbird	*Archilochus alexandri*	SR
Ruby-throated hummingbird	*Archilochus colubris*	SR
Rufous hummingbird	*Selasphorus rufus*	WR
CAPRIMULGIFORMES: Caprimulgidae		
Chuck-will's-widow	*Antrostomus carolinensis*	M, SR

TABLE 2-12 BIRD SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]	LIKELY SEASONAL OCCURRENCE[3]
Common nighthawk	*Chordeiles minor*	M, SR
CHARADRIIFORMES: Charadriidae		
American golden-plover	*Pluvialis dominica*	M
Black-bellied plover	*Pluvialis squatarola*	M
Killdeer	*Charadrius vociferus*	R
Piping plover	*Charadrius melodus*	M, WR
Semipalmated plover	*Charadrius semipalmatus*	M, WR
CHARADRIIFORMES: Laridae		
Black tern	*Chlidonias niger*	M
Bonaparte's gull	*Chroicocephalus philadelphia*	M, WR
Caspian tern	*Hydroprogne caspia*	R
Common tern	*Sterna hirundo*	M
Forster's tern	*Sterna forsteri*	R
Franklin's gull	*Leucophaeus pipixcan*	M
Herring gull	*Larus argentatus*	M, WR
Laughing gull	*Leucophaeus atricilla*	R
Least tern	*Sternula antillarum*	SR
Ring-billed gull	*Larus delawarensis*	M, WR
CHARADRIIFORMES: Recurvirostridae		
American avocet	*Recurvirostra americana*	WR
Black-necked stilt	*Himantopus mexicanus*	SR
CHARADRIIFORMES: Scolopacidae		
American woodcock	*Scolopax minor*	WR
Baird's sandpiper	*Calidris bairdii*	M
Dunlin	*Calidris alpina*	M, WR
Greater yellowlegs	*Tringa melanoleuca*	M, WR
Least sandpiper	*Calidris minutilla*	M, WR
Lesser yellowlegs	*Tringa flavipes*	M, WR
Long-billed curlew	*Numenius americanus*	WR
Long-billed dowitcher	*Limnodromus scolopaceus*	M, WR
Marbled godwit	*Limosa fedoa*	M, WR
Red knot	*Calidris canutus*	M
Ruddy turnstone	*Arenria interpres*	M, WR
Sanderling	*Calidris alba*	M, WR
Solitary sandpiper	*Tringa solitaria*	M, WR
Spotted sandpiper	*Actitis macularius*	M, WR
Western sandpiper	*Calidris mauri*	M, WR
White-rumped sandpiper	*Calidris fuscicollis*	M
Willet	*Tringa semipalmata*	R
Wilson's phalarope	*Phalaropus tricolor*	M

TABLE 2-12 BIRD SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]	LIKELY SEASONAL OCCURRENCE[3]
Wilson's snipe	*Gallinago delicata*	M, WR
CICONIIFORMES: Ciconiidae		
Wood stork	*Myceteria americana*	SR
COLUMBIFORMES: Columbidae		
Eurasian collared dove	*Streptopelia decaocto*	R
Inca dove	*Columbina inca*	R
Mourning dove	*Zenaida macroura*	R
Rock pigeon	*Columba livia*	R
White-winged dove	*Zenaida asiatica*	R
CORACIIFORMES: Alcedinidae		
Belted kingfisher	*Megaceeryle alcyon*	WR
CUCULIFORMES: Cuculidae		
Greater roadrunner	*Geococcyx californianus*	R
Yellow-billed cuckoo	*Coccyzus americanus*	M, SR
FALCONIFORMES: Falconidae		
American kestrel	*Falco sparverius*	M, WR
Merlin	*Falco columbarius*	M, WR
GALLIFROMES: Cracidae		
Northern bobwhite	*Colinus virginianus*	R
GAVIIFROMES: Gaviidae		
Common loon	*Gavia immer*	M, WR
GRUIFORMES: Rallidae		
American coot	*Fulica americana*	R
Black rail	*Laterallus jamaicensis*	M
Common gallinule	*Gallinula galeata*	R
King rail	*Rallus elegans*	R
Purple gallinule	*Porphyrio martinicus*	M, SR
Sora	*Porzana carolina*	M, WR
Virginia rail	*Rallus limicola*	R
PASSERIFORMES: Bombycillidae		
Cedar waxwing	*Bombycilla cedrorum*	M, WR
PASSERIFORMES: Cardinalidae		
Blue grosbeak	*Passerina caerulea*	SR
Dickcissel	*Spiza americana*	M, SR
Indigo bunting	*Passerina cyanea*	SR
Northern cardinal	*Cardinalis cardinalis*	R
Painted bunting	*Passerina ciris*	M, SR
Rose-breasted grosbeak	*Pheucticus ludovicianus*	M
Scarlet tanager	*Piranga olivacea*	M
Summer tanager	*Piranga rubra*	SR

TABLE 2-12 BIRD SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]	LIKELY SEASONAL OCCURRENCE[3]
PASSERIFORMES: Certhiidae		
Brown creeper	*Certhia americana*	M, WR
PASSERIFORMES: Corvidae		
American crow	*Corvus brachyrhynchos*	R
Blue jay	*Cyanocitta cristata*	R
Horned lark	*Eremophila alpestris*	R
PASSERIFORMES: Corvidae		
Chipping sparrow	*Spizella passerina*	M, WR
Field sparrow	*Spizella pusilla*	M, WR
Fox sparrow	*Passerella iliaca*	M, WR
Lark sparrow	*Chondestes grammacus*	M, SR
Le Conte's sparrow	*Ammodramus leconteii*	WR
Lincoln's sparrow	*Melospiza lincolnii*	M, WR
Nelson's sparrow	*Ammospiza nelsoni*	WR
Savannah sparrow	*Passerculus sandwichensis*	M, WR
Seaside sparrow	*Ammodramus maritimus*	R
Song sparrow	*Melospiza melodia*	M, WR
Swamp sparrow	*Melospiza georgiana*	M, WR
Vesper sparrow	*Pooecetes gramineus*	M, WR
White-crowned sparrow	*Zonotrichia leucophrys*	M, WR
White-throated sparrow	*Zonotrichia albicollis*	M, WR
PASSERIFORMES: Fringillidae		
American goldfinch	*Spinus tristis*	M, WR
House finch	*Haemorhous mexicanus*	R
House sparrow	*Passer domesticus*	R
Pine siskin	*Spinus pinus*	M
PASSERIFORMES: Hirundinidae		
Barn swallow	*Hirundo rustica*	SR
Cliff swallow	*Petrochelidon pyrrhonota*	SR
Northern rough-winged swallow	*Stelgidopteryx serripennis*	M
Purple martin	*Progne subis*	SR
Tree swallow	*Tachycineta bicolor*	M, WR
PASSERIFORMES: Icteridae		
Boat-tailed grackle	*Quiscalus major*	R
Brewer's blackbird	*Euphagus cyanocephalus*	M, WR
Brown-headed cowbird	*Molothrus ater*	SR
Common grackle	*Quiscalus quiscula*	R
Eastern meadowlark	*Sturnella magna*	R
Great-tailed grackle	*Quiscalus mexicanus*	R
Orchard oriole	*Icterus spurius*	SR

TABLE 2-12 BIRD SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]	LIKELY SEASONAL OCCURRENCE[3]
Red-winged blackbird	*Agelaius phoeniceus*	R
PASSERIFORMES: Laniidae		
Loggerhead shrike	*Lanius ludovicianus*	R
PASSERIFORMES: Mimidae		
Brown thrasher	*Toxostoma rufum*	R
Northern mockingbird	*Mimus polyglottos*	R
PASSERIFORMES: Motacillidae		
American pipit	*Anthus rubescens*	M, WR
PASSERIFORMES: Parulidae		
American redstart	*Setophaga ruticilla*	M, SR
Bay-breasted warbler	*Setophaga castanea*	M
Black-and-white warbler	*Mniotilta varia*	SR
Blackburnian warbler	*Setophaga fusca*	M
Black-throated green warbler	*Setophaga virens*	M
Chestnut-sided warbler	*Setophaga pensylvanica*	M
Common yellowthroat	*Geothlypis trichas*	SR
Magnolia warbler	*Setophaga magnolia*	M
Nashville warbler	*Leiothlypis ruficapilla*	M
Northern parula	*Setophaga americana*	SR
Orange-crowned warbler	*Oreothlypis celata*	M, WR
Ovenbird	*Seiurus aurocapilla*	M
Prothonotary warbler	*Protonotaria citrea*	SR
Swainson's warbler	*Limnothlypis swainsonii*	SR
Tennessee warbler	*Leiothlypis peregrina*	M
Wilson's warbler	*Cardellina pusilla*	M
Yellow warbler	*Setophaga petechia*	M
Yellow-rumped warbler	*Setophaga coronata*	M
PASSERIFORMES: Paridae		
Carolina chickadee	*Poecile carolinensis*	R
Tufted titmouse	*Baeolophus bicolor*	R
PASSERIFORMES: Polioptilidae		
Blue-gray gnatcatcher	*Polioptila caerulea*	SR
PASSERIFORMES: Regulidae		
Golden-crowned kinglet	*Regulus satrapa*	M, WR
Ruby-crowned kinglet	*Regulus calendula*	M, WR
PASSERIFOMES: Sittidae		
Red-breasted nuthatch	*Sitta canadensis*	WR
PASSERIFOMES: Sturnidae		
European starling	*Sturnus vulgaris*	R
PASSERIFORMES: Troglodytidae		

TABLE 2-12 BIRD SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]	LIKELY SEASONAL OCCURRENCE[3]
Bewick's wren	*Thryomanes bewickii*	R
Carolina wren	*Thryothorus ludovicianus*	R
House wren	*Troglodytes aedon*	M
Marsh wren	*Cistothorus palustris*	R
Sedge wren	*Cistothorus stellaris*	M, WR
Winter wren	*Troglodytes hiemalis*	M, WR
PASSERIFORMES: Turdidae		
American robin	*Turdus migratorius*	M, WR
Eastern bluebird	*Sialia sialis*	SR
Hermit thrush	*Catharus guttatus*	M, WR
PASSERIFORMES: Tyrannidae		
Acadian flycatcher	*Empidonax virescens*	M, SR
Eastern kingbird	*Tyrannus tyrannus*	SR
Eastern phoebe	*Sayornis phoebe*	M, WR
Eastern wood-pewee	*Contopus virens*	SR
Great crested flycatcher	*Myiarchus crinitus*	SR
Least flycatcher	*Empidonax minimus*	M
Scissor-tailed flycatcher	*Tyrannus forficatus*	SR
PASSERIFORMES: Vireonidae		
Blue-headed vireo	*Vireo solitarius*	M, WR
White-eyed vireo	*Vireo griseus*	M, SR
PELECANIFORMES: Pelicanidae		
American white pelican	*Pelecanus erythrorhynchos*	M, WR
Brown pelican	*Pelecanus occidentalis*	R
PELECANIFORMES: Ardeidae		
American bittern	*Botaurus lentiginosus*	M, WR
Black-crowned night-heron	*Nycticorax nycticorax*	R
Cattle egret	*Bubulcus ibis*	R
Great blue heron	*Ardea herodias*	R
Great egret	*Ardea alba*	R
Green heron	*Butorides virescens*	SR
Least bittern	*Ixobrychus exilis*	SR
Little blue heron	*Egretta caerulea*	SR
Snowy egret	*Egretta thula*	SR
Tricolored heron	*Egretta tricolor*	SR
Yellow-crowned night-heron	*Nyctanassa violacea*	R
PELECANIFORMES: Threskiornithidae		
Roseate spoonbill	*Platalea ajaja*	SR
White ibis	*Eudocimus albus*	R
White-faced ibis	*Plegadis chihi*	R

TABLE 2-12 BIRD SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]	LIKELY SEASONAL OCCURRENCE[3]
PICIFORMES: Picidae		
Downy woodpecker	*Dryobates pubescens*	R
Northern flicker	*Colaptes auratus*	R
Pileated woodpecker	*Dryocopus pileatus*	R
Red-bellied woodpecker	*Melanerpes carolinus*	R
Yellow-bellied sapsucker	*Sphyrapicus varius*	M, WR
PODICIPEDIFROMES: Grebes		
Eared grebe	*Podiceps nigricollis*	M, WR
Pied-billed grebe	*Podilymbus podiceps*	M, WR
STRIGIFORMES: Tytonidae		
Barn owl	*Tyto furcata*	R
STRIGIFORMES: Strigidae		
Barred owl	*Strix varia*	R
Eastern screech-owl	*Megascops asio*	R
Great horned owl	*Bubo virginianus*	R
SULIFORMES: Anhingidae		
Anhinga	*Anhinga anhinga*	SR
SULIFORMES: Phalacrocoracidae		
Double-crested cormorant	*Nannopterum auritum*	M, WR
Neotropic cormorant	*Nannopterum brasilianum*	R

[1] According to Lockwood and Freeman (2014).
[2] Nomenclature follows: American Birding Association (ABA) (ABA 2024)
[3] Likely seasonal occurrence abbreviations: M – migrant, R – permanent resident, SR – summer resident, WR – winter resident

Mammals

A representative list of mammals that may occur in the study area are listed in Table 2-13 (Schmidly and Bradley 2016). The likelihood of occurrence of each species within the study area will depend upon suitable habitat.

TABLE 2-13 MAMMAL SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]
American badger	*Taxidea taxus*
American beaver	*Castor canadensis*
American mink	*Mustela vison*
Attwater's pocket gopher	*Geomys attwateri*
Big brown bat	*Eptesicus fuscus*
Big free-tailed bat	*Nyctinomops macrotis*
Black rat	*Rattus rattus*

TABLE 2-13 MAMMAL SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]
Black-tailed jackrabbit	*Lepus californicus*
Bobcat	*Lynx rufus*
Brazilian free-tailed bat	*Tadarida brasiliensis*
Common raccoon	*Procyon lotor*
Coyote	*Canis latrans*
Deer mouse	*Peromyscus maniculatus*
Eastern cottontail	*Sylvilagus floridanus*
Eastern fox squirrel	*Sciurus niger*
Eastern gray squirrel	*Sciurus carolinensis*
Eastern mole	*Scalopus aquaticus*
Eastern pipistrelle	*Perimyotis subflavus*
Eastern red bat	*Lasiurus borealis*
Eastern spotted skunk	*Spilogale putorius*
Eastern woodrat	*Neotoma floridana*
Evening bat	*Nycticeius humeralis*
Feral pig	*Sus scrofa*
Fulvous harvest mouse	*Reithrodontomys fulvescens*
Gray fox	*Urocyon cinereoargenteus*
Hispid cotton rat	*Sigmodon hispidus*
Hispid pocket mouse	*Chaetodipus hispidus*
Hoary bat	*Aeorestes cinereus*
House mouse	*Mus musculus*
Least shrew	*Cryptotis parva*
Long-tailed weasel	*Mustela frenata*
Marsh rice rat	*Oryzomys texensis*
Nine-banded armadillo	*Dasypus novemcinctus*
Northern pygmy mouse	*Baiomys taylori*
Northern yellow bat	*Lasiurus intermedius*
Norway rat	*Rattus norvegicus*
Nutria	*Myocastor coypus*
Red fox	*Vulpes vulpes*
Ringtail	*Bassariscus astutus*
Roof rat	*Rattus rattus*
Seminole bat	*Lasiurus seminolus*

TABLE 2-13 MAMMAL SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]
Silver-haired bat	*Lasionycteris noctivagans*
Southern short-tailed shrew	*Blarina carolinensis*
Striped skunk	*Mephitis mephitis*
Swamp rabbit	*Sylvilagus aquaticus*
Thirteen-lined ground squirrel	*Ictidomys tridecemlineatus*
Virginia opossum	*Didelphis virginiana*
White-footed mouse	*Peromyscus leucopus*
White-tailed deer	*Odocoileus virginianus*

[1] According to Schmidly and Bradley (2016).
[2] Nomenclature follows: Bradley et al. (2014).

Fishes and Aquatic Invertebrates

In Texas, the divisions of the biotic provinces were separated on the basis of terrestrial vertebrate distributions; however, the distribution of freshwater fishes generally corresponds with the terrestrial biotic province boundaries. Areas showing the greatest deviation from this general rule include northeast Texas and the coastal zone (Hubbs 1957). Review of USGS (2022a, 2022b, and 2022c) topographic maps indicates that mapped surface waters within the study area include ponds and ephemeral streams with potential connectivity to the Gulf of Mexico and West Bay. Additionally, unmapped surface waters may occur within the study area.

Large ponds provide consistent aquatic habitats for all trophic levels with fish being the most prominent. The relatively stable water levels of perennial ponds facilitate stable population growth. Species adapted for deeper waters will utilize pond environments (Hubbs 1957). Potential ponds located in the study area will exhibit variability in terms of their age, drainage, use by livestock, past fish stocking, and fertilization history. Typically for pond habitat, fluctuations in water levels are experienced during summer months because of high evaporation rates and repeated heavy rainfall required to fill ponds. Periods of extended drought in the region may reduce these seasonal water level fluctuations or dry ponds completely. Ephemeral flowing streams support aquatic species primarily adapted to ephemeral pool habitats. Species in ephemeral aquatic habitats are typically adapted to rapid dispersal and completion of life cycles. In streams dominated by scoured, sandy-clay bottoms, accumulations of woody debris or leaf pack provide the most important feeding and refuge areas for invertebrates and forage fish. Softer, muddy bottoms generally harbor substantial populations of burrowing invertebrates (e.g., larval diptera and oligochaetes), which can be an important food source to higher trophic levels (Thomas et al. 2007).

A representative list of fishes that may occur in the study area is listed in Table 2-14 (Thomas et al. 2007 and Bowling 2012). The likelihood of occurrence of each species within the study area will depend upon suitable habitat.

TABLE 2-14 FISH SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]
Atlantic croaker	*Micropoganias undulates*
Bantam sunfish	*Lepomis symmetricus*
Black drum	*Pogonias cromis*
Blue catfish	*Ictalurus furcatus*
Bluegill	*Lepomis macrochirus*
Channel catfish	*Ictalurus punctatus*
Darter goby	*Ctenogobius boleosoma*
Fat sleeper	*Dormitator maculatus*
Gizzard shad	*Dorosoma cepedianum*
Golden topminnow	*Fundulus chrysotus*
Green sunfish	*Lepomis cyanellus*
Gulf killifish	*Fundulus grandis*
Hogchoker	*Trinectes maculatus*
Inland silverside	*Menidia beryllina*
Largemouth bass	*Micropterus salmoides*
Longear sunfish	*Lepomis megalotis*
Naked goby	*Gobiosoma bosc*
Pinfish	*Lagodon rhomboides*
Pugnose minnow	*Opsopoeodus emiliae*
Red drum	*Sciaenops ocellatus*
Sailfin molly	*Poecilia latipinna*
Sand seatrout	*Cynoscion arenarius*
Sheepshead	*Archosargus probatocephalus*
Sheepshead minnow	*Cyprinodon variegatus*
Silver perch	*Bairdiella chrysoura*
Southern flounder	*Paralichthys lethostigma*
Spotted seatrout	*Cynoscion nebulosus*
Striped mullet	*Mugil cephalus*
Threadfin shad	*Dorosoma petenense*

TABLE 2-14 FISH SPECIES POTENTIALLY OCCURRING WITHIN THE STUDY AREA[1]

COMMON NAME[2]	SCIENTIFIC NAME[2]
Warmouth	*Lepomis gulosus*
Western mosquitofish	*Gambusia affinis*
White mullet	*Mugil curema*

[1] According to Thomas et al. (2007).
[2] Nomenclature follows: Thomas et al. (2007)

Threatened and Endangered Species

Information on sensitive wildlife and vegetation resources within the study area was obtained from a variety of sources, including correspondence with the USFWS and TPWD. Additional information was obtained from published literature and technical reports.

For the purpose of this EA, emphasis was placed on obtaining documented occurrences of special status species and/or their designated critical habitat within the study area. Documented occurrences of unique vegetation communities within the study area were also reviewed. Special status species include those listed by the USFWS (2025a) as threatened, endangered, or proposed for listing; and those species listed by TPWD identified by Rare, Threatened, and Endangered Species by County, Annotated County Lists (TPWD 2024c). Spatial data of known occurrences for listed species and/or sensitive vegetation communities was obtained from the TPWD's TXNDD on December 20, 2024 (TPWD 2024d). The TXNDD data provides a data record, known as an element of occurrence record (EOR), of state-listed rare or threatened/endangered species and rare vegetation communities that have been documented within a given area. The TXNDD data does not preclude the potential for a species to exist within the study area. Only a species-specific survey within the study area can determine the presence or absence of a special status species.

The USFWS regulates activities affecting plants and animals designated as endangered or threatened under the ESA (16 U.S.C. § 1531 *et seq.*). A USFWS IPaC Official Species List (USFWS 2025a; Project Code: 2025-0040257) and Resource List was received on January 10, 2025. The IPaC report identifies federally listed threatened, endangered, and proposed species and designated critical habitat potentially occurring within the study area (USFWS 2025a). By federal definition, an endangered species is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as likely to become endangered within the near foreseeable future throughout all or a significant portion of its range. Proposed species are those that have been proposed in the Federal Register to be listed under the ESA. Candidate species are those that have sufficient information on their biological vulnerability and threats to support listing as threatened or endangered and are likely to be proposed for listing in the near

future. The ESA also provides for the conservation of "designated critical habitat," which is defined by the USFWS as the areas of land, water, and air space that an endangered species needs for survival. These areas include sites with food and water, breeding areas, cover or shelter sites, and sufficient habitat to provide for normal population growth and behavior for the species. The IPaC report received indicated that the study area intersects final designated critical habitat for the piping plover (*Charadrius melodus*) in the southwestern corner of the study area and proposed critical habitat for the rufa red knot (*Calidris canutus rufa*) along the southern edge of the study area (USFWS 2025a).

The TPWD also regulates plants and animals designated at the state level as endangered or threatened (Chapters 67 and 68 of the TPWC and § 65.171 - 65.176 of Title 31 of the TAC; and Chapter 88 of the TPWC and § 69.01 - 69.9 of the TAC). Under Texas law, endangered animal species are those deemed to be "threatened with statewide extinction" and endangered plant species are those "in danger of extinction throughout all or a significant portion of its range." Threatened animal and plant species are those deemed likely to become endangered within the foreseeable future.

Special Status Plant Species

USFWS (2025a) IPaC species list for the study area and TPWD (2024c) county listings were reviewed for special status plant species potentially occurring within the study area. One state listed threatened plant species, the Houston daisy (*Rayjacksonia aurea*), was identified as having the potential to occur within the study area county (TPWD 2024c) (see Table 2-15). A brief description of this species' life history, habitat requirements, and potential to occur within the study area are summarized below.

Houston Daisy

The Houston daisy is a tap-rooted member of the sunflower family with golden-yellow flowers. Although it can grow up to waist height, in its characteristically harsh environment, it is often found to grow only a few inches. It is found in Galveston and Harris counties occurring historically in poorly drained depressions or seasonal wet spots amongst sparse grasslands and other open and disturbed habitats. Soils preferred by this species are loams or sandy loams and can often be found with other rare endemic plants such as the Texas prairie dawn (*Hymenoxys texana*) and Texas windmill grass (*Chloris texensis*) (NatureServe 2025). This species may have the potential to occur within the study area where suitable habitat is available.

TPWD's TXNDD data identified one EOR for special status plant species occurring within the entirety of the study area (TPWD 2024d). The EOR was observed for the Grand Prairie evening primrose (*Oenothera pilosella* ssp. *sessilis*) in 1985 with the record of this sighting being created in 2004. Although

this species is not federally or state listed, it is considered to be a species of greatest conservation need under the State Wildlife Action Plan (SWAP) (TPWD 2023). The SWAP identifies what mitigative actions can be taken to provide the best chance of continual survival for the species listed under the plan.

Special Status Animal Species

The USFWS (2025a) IPaC official species list and the TPWD's (2024c) Rare, Threatened, and Endangered Species of Texas by County interactive web map identified federal and state-listed animal species potentially occurring within the study area. Federally listed and/or federally proposed, state-listed, and candidate status animal species potentially occurring within county of the study area are listed in Table 2-14. Some federal status species listed in the TPWD Annotated County Lists of Rare Species but were not identified by the USFWS IPaC, and vice versa, but have been included in Table 2-15 with their respective legal statuses for consistency. Only USFWS listed threatened or endangered species are afforded federal protection under the ESA. State-listed species may receive protection under other federal and/or state laws, such as the MBTA, BGEPA, Chapters 67, 68, and 88 of the Texas Parks and Wildlife Code, and Section 65.171–65.184 and 69.01–69.14 of Title 31 of the TAC. A brief description of each species' life history, habitat requirements, and any documented occurrences within the study area are summarized below.

TPWD's TXNDD data identified two EORs for special status animal species occurring within the study area (TPWD 2024d). One EOR was observed for the saltmarsh snake (*Nerodia clarkii*) 0.16 mile north of the study area with no observation date provided, but a record of this sighting was created in 2004. Although this species is not federally or state-listed, it is considered to be a species of greatest conservation need under the SWAP (TPWD 2023). The other EOR was observed for the piping plover on the western side of the study area. It was last observed in 2008 with the record for that observation being created in 2019. The piping plover is a federally and state-listed threatened species. This EOR was observed within the boundary of the piping plover's designated critical habitat located in the southwestern corner of the study area.

TABLE 2-15 LISTED THREATENED AND ENDANGERED SPECIES FOR GALVESTON COUNTY[1]

SPECIES		LEGAL STATUS[3]	
COMMON NAME[2]	SCIENTIFIC NAME[2]	USFWS	TPWD
Birds			
Attwater's greater prairie-chicken	*Tympanuchus cupido attwateri*	E	E
Black rail	*Laterallus jamaicensis*	-	T
Eastern black rail	*Laterallus jamaicensis* spp. *jamaicensis*	T	-

TABLE 2-15 LISTED THREATENED AND ENDANGERED SPECIES FOR GALVESTON COUNTY[1]

SPECIES		LEGAL STATUS[3]	
COMMON NAME[2]	SCIENTIFIC NAME[2]	USFWS	TPWD
Eskimo curlew	*Numenius borealis*	E	E
Piping plover	*Charadrius melodus*	T	T
Reddish egret	*Egretta rufescens*	-	T
Rufa red knot	*Calidris canutus rufa*	T	T
Swallow-tailed kite	*Elanoides forficatus*	-	T
White-faced ibis	*Plegadis chihi*	-	T
White-tailed hawk	*Buteo albicaudatus*	-	T
Whooping crane	*Grus americana*	E	E
Wood stork	*Mycteria americana*	-	T
Flowering Plants			
Houston daisy	*Rayjacksonia aurea*	-	T
Fishes			
Great hammerhead	*Sphyrna mokarran*	-	T
Oceanic whitetip shark	*Carcharhinus longimanus*	T	T
Shortfin mako shark	*Isurus oxyrinchus*	-	T
Smalltooth sawfish	*Pristis pectinata*	E	E
Insects			
Monarch butterfly	*Danaus plexippus*	PT	-
Mammals			
Atlantic spotted dolphin	*Stenella frontalis*	-	T
Blue whale	*Balaenoptera musculus*	E	E
Bryde's whale	*Balaenoptera edeni brydei*	-	E
Cuvier's beaked whale	*Ziphius cavirostris*	-	T
Dwarf sperm whale	*Kogia simus*	-	T
False killer whale	*Pseudorca crassidens*	-	T
Finback whale	*Balaenoptera physalus*	E	E
Gervais's beaked whale	*Mesoplodon europaeus*	-	T
Humpback whale	*Megaptera novaeangliae*	E	-
Killer whale	*Orcinus orca*	-	T
North Atlantic right whale	*Eubalaena glacialis*	E	E
Pygmy killer whale	*Feresa attenuate*	-	T
Pygmy sperm whale	*Kogia breviceps*	-	T
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*	-	T

TABLE 2-15 LISTED THREATENED AND ENDANGERED SPECIES FOR GALVESTON COUNTY[1]

SPECIES		LEGAL STATUS[3]	
COMMON NAME[2]	SCIENTIFIC NAME[2]	USFWS	TPWD
Rice's whale	*Balaenoptera ricei*	E	E
Roughtoothed dolphin	*Steno bredanensis*	-	T
Sei whale	*Balaenoptera borealis*	E	E
Short-finned pilot whale	*Globicephala macrohynchus*	-	T
Sperm whale	*Physeter macrocephalus*	E	E
Tricolored bat	*Perimyotis subflavus*	PE	-
West Indian manatee	*Trichechus manatus*	T	T
Reptiles			
Alligator snapping turtle	*Macrochelys temminckii*	PT	T
Green sea turtle	*Chelonia mydas*	T	T
Hawksbill sea turtle	*Eretmochelys imbricata*	E	E
Kemp's Ridley sea turtle	*Lepidochelys kempii*	E	E
Leatherback sea turtle	*Dermochelys coriacea*	E	E
Loggerhead sea turtle	*Caretta caretta*	T	T
Texas horned lizard	*Phrynosoma cornutum*	-	T

[1] According to USFWS (2025a) and TPWD (2024c).
[2] Nomenclature follows: USFWS (2025a) and TPWD (2024c)
[3] Legal status abbreviations: E – Endangered, PE – Proposed Endangered, PT – Proposed Threatened, T – Threatened

Federally Listed Threatened and Endangered Species for Galveston County

Birds

Attwater's Greater Prairie-chicken

The Attwater's greater prairie-chicken is a grouse species that is endemic to the coastal prairie habitats of Texas and Louisiana. This species is barred in brown and white. Males have distinctive long pinnae on their neck which are raised above their heads during courtship dances. Preferred habitat includes mid to tall-grass prairies with diverse species of grasses and flowering plants (USFWS 2025b). Key grass species include big bluestem (*Andropogon gerardii*), little bluestem, indiangrass (*Sorghastrum nutans*), and switchgrass. Today, only two populations exist: one at Attwater Prairie Chicken National Wildlife Refuge in Colorado and Austin counties and the other on private property in Goliad County (USFWS 2025b). This species is not anticipated to occur within the study area due to the study area being outside of known breeding populations.

Eastern Black Rail

The eastern black rail is the smallest rail species in North America and breeds within the Atlantic Gulf Coastal Prairies of Texas. The species can be found inhabiting salt and brackish marshes with dense vegetation coverage, impounded and un-impounded salt and brackish marshes, higher elevations of these wetland zones, and inland coastal prairies and associated wetlands. Regardless of the water regime, eastern black rails require dense vegetation coverage that is generally less than or equal to 1.0 meter in height. Vegetation structure is noted to be more important than species composition in determining habitat suitability (USFWS 2025c). This species has the potential to occur within the study area wherever suitable habitat is available.

Eskimo Curlew

The Eskimo curlew is a small shorebird with a slightly decurved bill with brown feathers and white speckles. Its spring migration from Argentina to Canada and as far north as Alaska occurs from March to May. Due to low population numbers, little is known about their exact distribution throughout their range. Wintering primarily occurs on the Pampas grasslands of Argentina. Typical breeding habitats occur in open sites of the arctic tundra. Non-breeding habitat includes grasslands, pastures, fields, and less frequently in marshes and mudflats (TPWD 2025d). This species has the potential to occur within the study area as a rare transient migrant wherever suitable habitat is available.

Piping Plover

The piping plover is a small migratory shorebird that nests within the Great Lakes, Northern Great Plains or Atlantic Coast (USFWS 2025d). Primary fall migration to Texas is from July to early September, while spring migration occurs from March to early May. Piping plovers are also state listed species and are common to locally uncommon winter residents along the Gulf of Mexico coastline (Lockwood and Freeman 2014). Multiple lakes, ponds, streams, and other aquatic features occur within the study area that could potentially be utilized for migratory habitat by the piping plover during winter migration. There is designated critical habitat for piping plover within the western portion of the study area. This species has the potential to occur within the study area as a transient migrant wherever suitable habitat is available.

Rufa Red Knot

Rufa red knots are migratory and breed in the drier arctic tundra areas while overwintering takes place along shorelines of the Gulf of Mexico and Central and South America (USFWS 2025e). Spring migration occurs in large flocks and takes place from April to June. This species, which is also state listed, preferers habitat that includes the shoreline of coasts and bays and sometimes inland mudflats. Their primary prey items are small mussels, clams, snails, and other invertebrates (USFWS 2013). There

is proposed critical habitat for rufa red knot within the study area This species has the potential to occur within the study area as a transient migrant wherever suitable habitat is available.

Whooping Crane

The study area is located within the central migratory corridor for the whooping crane (USGS 2025). The migration path includes a 220-mile-wide corridor that begins at their nesting site at Wood Buffalo National Park in Canada and continues south to their wintering grounds at the Aransas National Wildlife Refuge along the Texas coast (USFWS 2025f). The migratory corridor contains 95% of all confirmed whooping crane stopover sightings, during migration. Whooping cranes, which are also state listed species, overwinter in the Aransas National Wildlife Refuge from November through March. During migration, they typically fly at altitudes greater than 1,000 feet but will roost and feed in areas away from human disturbance during nightly stopovers. Stopover areas include large rivers, lakes and associated wetlands, playa lakes, pastureland, and cropland (USFWS 2009). Aquatic features and pastureland located within the study area might be utilized during migration. This species has the potential to occur within the study area as a transient migrant wherever suitable habitat is available.

Fishes

Oceanic Whitetip Shark

The oceanic whitetip shark is a large pelagic species found throughout the world typically in open ocean, around outer continental shelfs, and in deep waters around oceanic islands. They are large-bodied sharks with distinctive mottled patterns on their dorsal, pectoral, and tail fins. This species is a top predator feeding on bony fish, squid, large sportfish, sea birds, marine mammals, and other sharks (National Oceanic and Atmospheric Administration [NOAA] 2024a). The oceanic whitetip shark is also a state listed species. This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Smalltooth Sawfish

The smalltooth sawfish is a cartilaginous-bodied species of ray with a distinct long, flat snout edged with teeth that resemble a saw. They primarily live in tropical seas and estuaries of the Atlantic and can also be found in shallow coastal waters and sometimes lower reaches of freshwater river systems. In the United States, the smalltooth sawfish almost exclusively inhabits the waters of Florida (NOAA 2024b). The smalltooth sawfish is also a state listed species. This species is not anticipated to occur within the study area due to the study area being outside of the known range of this species and lack of suitable marine habitat.

Mammals

Blue Whale

Blue whales are the largest species of whale on earth and have a slender body shape with a mottled blue-gray color that appears light blue under water (NOAA 2023a). The blue whale occurs in all oceans of the world; however, there are only two records from the Gulf of Mexico: one stranded in 1924 near Sabine Pass and another stranded in 1940 near San Luis Pass. Blue whales inhabit Arctic feeding grounds in the spring and summer, moving to more temperate waters in the fall and winter for mating and parturition (Schmidly and Bradley 2016). The blue whale is also a state listed species. This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Finback Whale

The finback whale is the second largest species of whale, second to the blue whale. It has a distinctive fin on its back near the tail with a streamlined body and V-shaped head. Their black or dark brownish-gray coloration often sets this species apart from other whale species. They are found in deep offshore waters of all major oceans, primarily in temperate and polar regions and less in tropical regions (NOAA 2024c). Most finback whales migrate from the Arctic to Antarctic areas (NOAA 2024c). The finback whale is also a state listed species. This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Humpback Whale

The humpback whale gets its name from the distinctive hump on its back. They travel great distances every year and have one of the largest migrations of any mammal. The humpback whale inhabits tropical, subtropical, temperate, and subpolar waters worldwide. They are known to utilize open ocean and coastal waters (NOAA 2024d). According to TPWD's Rare, Threatened, and Endangered Species of Texas data (2024c), the Gulf of Mexico's distinct population segment is not considered at risk of extinction and is not currently listed as endangered in the ESA. This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

North Atlantic Right Whale

The North Atlantic right whale are stocky-bodied whales with no dorsal fins. This species of whale is primarily found in Atlantic coastal waters along the continental shelf. This species migrates northward in spring and summer to feeding grounds off the coast of New England and Canada. In the fall, this species travels to shallow waters off the southeast coast of the United States. Diet mainly consists of copepods and zooplankton (NOAA 2024e). This species of whale only occurs accidentally in the Gulf of Mexico, and the only record of one stranding along the Texas coast was reported in Brazoria County in 1972

(Schmidly and Bradley 2016). The North Atlantic right whale is also a state listed species. This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Rice's Whale

Rice's whales have slender bodies with three prominent ridges in front of their blowholes. They are a rare species of whale with less than 100 individuals remaining. Rice's whales are typically observed and are year-round residents of the northeastern portion of the Gulf of Mexico along the continental shelf between 330 and 1,300 feet deep. Though, most acoustic detections occur off the west coast of Florida. This species feeds on krill, copepods, red crabs, shrimp, and small fish (NOAA 2024f). Rice's whale is also a state listed species. This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Sei Whale

Sei whales are long and sleek with a dark bluish-gray color and white colored undersides. They can often be seen covered in oval-shaped scars, likely from cookie-cutter shark (*Isistius brasiliensis*) and sea lamprey (*Petromyzon marinus*) bites (NOAA 2024g). The sei whale migrates between wintering grounds at low latitudes and feeding grounds at high latitudes, generally occupying open ocean and deep waters along the edges of continental shelves. This species feeds on copepods, euphausiids, squid, krill, and small fish. Sei whales are found in the offshore waters of the Gulf of Mexico and Caribbean Sea and up the western North Atlantic Ocean. However, sei whales have a tendency not to enter semi-enclosed waters such as the Gulf of Mexico (National Marine Fisheries Service [NMFS] 2011). Only one record of a stranded mummified skeleton was reported in Brazoria County in 2002 (Schmidly and Bradley 2016). The sei whale is also a state listed species. This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Sperm Whale

The sperm whale is the largest species of toothed whale and is mostly dark gray in color with an extremely large head. They are highly migratory and occur worldwide in all oceans with the widest distribution of any marine mammal. This species spends most of its time in deep waters, as represented by its main diet of squid, sharks, skates, and other deepwater fish species (NOAA 2024h). In the Gulf of Mexico, they are the most numerous large whales. Most sightings are from the continental edge and upper continental slope, in depths between 328 and 6,562 feet (Schmidly and Bradley 2016). The sperm whale is also a state listed species. This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

West Indian Manatee

The West Indian manatee is a large marine mammal with paddle-shaped pectoral flippers used to steer and hold vegetation. This species inhabits marine, brackish, and freshwater systems near shores that feature seagrasses (USFWS 2025g). More specifically, they can be found in temperate and equatorial waters of the southeastern United States, the Caribbean basin, northern and northeastern South America, and equatorial West Africa. The extent of their range is limited by their intolerance to colder temperatures during the winter months (Lefebvre 1989). This species is rare in Texas rivers, estuaries, canals, and bays with sightings occurring as far south as the mouth of the Rio Grande (Schmidly and Bradley 2016). The West Indian manatee is also a state listed species. This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Reptiles

Green Sea Turtle

Green sea turtles are the largest species of hard-shelled sea turtle and eat mostly seagrasses and algae that give them their distinctive greenish color. The adults are primarily herbivorous, though they also forage on invertebrates, mollusks, sponges, crustaceans, and jellyfish. These turtles are found worldwide, including in the Gulf of Mexico. Green sea turtles prefer lagoons and shoals with an abundance of marine grasses and algae (NOAA 2024i). Terrestrial habitat is typically limited to nesting activities from April to September on deep, coarse to fine sands with little organic content along high-energy beaches (Meylan et al. 1990; Allard et al. 1994). The green sea turtle is also a state listed species. This species has the potential to occur within the study area during nesting season wherever suitable terrestrial habitat is available.

Hawksbill Sea Turtle

Hawksbill sea turtles have mottled shells with serrated edges. Their heads taper to a point and their lower jaw is V-shaped, giving them a hawk-like appearance. They are highly migratory species that utilize a variety of habitats during different life stages but is typically found in shallow coastal waters with rocky bottoms, coral reefs, estuaries, and mangrove-bordered bays in water generally less than 60 feet deep. In Texas, juvenile hawksbills have been documented to be associated with stone jetties. This species prefers foraging near coral reefs, rocky outcrops, and high-energy shoals, which are optimum sites for sponge growth, sponge being one of their principal food sources. Other forage foods include crabs, sea urchins, shellfish, jellyfish, plant material, and fish (NOAA 2024j). Hawkbills nest in small numbers on remote low- and high-energy beaches typically under vegetation (NMFS and USFWS 1993). Nesting season varies by location but occurs in most of these places between April and November (NOAA 2024j). In Texas, only one hawksbill nest has ever been documented (NPS 2023a). The hawksbill sea turtle is also a

state listed species. This species has the potential to occur within the study area as a rare occurrence during nesting season wherever suitable terrestrial habitat is available.

Kemp's Ridley Sea Turtle

Kemp's Ridley sea turtles have a triangular head with a hooked beak and are grayish-green in color. This sea turtle species is found in shallow waters along the coast primarily in the Gulf of Mexico, often in bays and lagoons with juveniles foraging in less than 3 feet of water. Nesting occurs between April and July primarily in Rancho Nuevo, Tamaulipas, Mexico. Sporadic nesting has been reported from Mustang Island, Texas southward to Isla Aguada, Campeche, Mexico (NOAA 2024k). Large populations have been documented within Sabine Pass, both within and outside the channel entrance. The abundance of young Kemp's Ridley sea turtles was found to increase considerably during the warm season months (Renaud and Williams 1995). The Kemp's Ridley sea turtle is also a state listed species. This species has the potential to occur within the study area during nesting season wherever suitable terrestrial habitat is available.

Leatherback Sea Turtle

The leatherback sea turtle is the largest turtle species in the world. The leatherback sea turtle spends most of its life in the ocean, seldom approaching land except for nesting. The leatherback has the largest distribution of any reptile. They prefer the open ocean near the edge of the continental shelf, but also can be found in gulfs, bays, and estuaries. Preferred terrestrial habitat includes sandy, sloping beaches, often near deepwater and rough seas. The leatherback's nesting beaches are primarily within tropical latitudes during March to July, with the largest concentration in Trinidad and Tobago, the West-Indies, and Gabon, Africa (NOAA 2024l). In Texas, only one leatherback sea turtle nest has been reported since 2008 (NPS 2023b). The leatherback sea turtle is also a state listed species. This species has the potential to occur within the study area as a rare occurrence during nesting season wherever suitable terrestrial habitat is available.

Loggerhead Sea Turtle

The loggerhead sea turtle gets its name from its large head, which supports jaw muscles powerful enough for hard-shelled prey. The loggerhead sea turtle typically nests on high-energy beaches with narrow, steeply sloped sand dunes from April to September. Post-hatchling loggerheads utilize pelagic habitats and return to nearshore coastal areas as juveniles to continue maturing into adulthood. Adult habitats overlap with the juvenile stage, except for most bays and estuaries along the Atlantic and Gulf coasts, which are infrequently used by adults (NOAA 2024m). The loggerhead sea turtle is also a state listed species. This species has the potential to occur within the study area during nesting season wherever suitable terrestrial habitat is available.

Federally Proposed Threatened and Endangered Species

Insects

Monarch Butterfly

The monarch butterfly ranges from North and South America to the Caribbean, Australia, New Zealand, the Pacific Islands, and Western Europe. The species has been proposed as a candidate species for protection under the ESA due to decreasing populations and habitat loss. Eastern and western monarch populations migrate both north and south on an annual basis. Populations usually overwinter in Mexico, Texas, Florida, and California and then spend the spring and summer months migrating back north. The entire migration cycle lasts for four generations of monarchs and no individual makes the round trip. Monarchs are heavily dependent on milkweed plants (*Asclepias* spp.) as larval hosts and to help produce poison. Preferred overwintering habitat includes appropriate roosting vegetation, dense tree cover, access to streams, and warm enough temperatures to allow for flight (USFWS 2025h). This species has the potential to occur as a temporary migrant at specific times of year within the study area wherever suitable habitat is available.

Mammals

Tricolored Bat

The tricolored bat has a large extensive range throughout eastern and central North America. Throughout its range, the species has many types of roost sites and locations due to their expansive foraging habitat. Tricolored bats are closely associated with forested landscapes and bottomland riparian forest with most foraging occurring within forested riparian corridors. In spring and summer, non-reproductive individuals roost in trees near perennial streams. Maternal and other summertime roosts are found in dead or live tree foliage, caves, mines, and rock crevices, with maternal colonies also occasionally occurring within man-made structures. Winter hibernation sites are typically found within caves, mines, cave like tunnels, or large box culverts adjacent to forest habitat (USFWS 2025i). This species is a habitat generalist and has the potential to occur within the study area wherever suitable habitat is available.

Reptiles

Alligator Snapping Turtle

The alligator snapping turtle inhabits perennial freshwater ecosystems such as lakes, canals, rivers, creeks, bayous, and ponds, usually within muddy or thickly vegetated substrates. The aquatic features in which they are found typically feed into the Gulf of Mexico, though the southwestern extent of their current range in Texas does not include the brackish and marine coastline (USFWS 2025j). The species may also enter brackish waters near the coast and inhabit urban surface water environments. Favored compositional features of their preferred habitats include high canopy forest areas and structures such as

tree root masses stumps, and submerged trees (USFWS 2025j). The alligator snapping turtle is also a state listed species. This species is not anticipated to occur within the study area due to the study area being outside of the known range of this species.

Other Federally Protected Species

Birds

Golden Eagle

The golden eagle (*Aquila chrysaetos*) is one of the largest raptors in North America. Breeding range spans from western and northern Alaska, eastward to the Northwest Territories of Canada, south to northern Mexico and Texas, western Oklahoma, and western Kansas. The species' North American winter range extends from south-central Alaska, southern Canada, and casually further southward. As habitat generalists, this species has been found inhabiting open to semi-open country that includes prairies, sage brush, artic alpine and tundra, savanna, sparse woodlands, and mountainous or hilly barren areas. In Texas, golden eagles occur more commonly in the western portion of the state where they breed at high elevations (8,600 amsl) in mountains and canyons (USFWS 2025l). This species is not anticipated to occur within the study area due to the study area being outside of known breeding populations.

State Listed Threatened and Endangered Species

Birds

Black Rail

The black rail has a large range throughout North, Central, and South America. Breeding habitat includes marshes with salt, brackish, and freshwater salinity; grass swamps; wet prairies; and pond borders. In Texas, preferred habitat includes salty prairies and high salt marshes where grass stem counts of 10 to 20 centimeters or higher (TPWD 2015). Nest locations are places in concealed spots in the center of clumps of vegetation or near the upper limits of marsh plants. Wintering habitat along the Gulf Coast has been identified as either tidally or non-tidally influenced persistent, herbaceous emergent wetlands occurring over the wetland-upland interface. Black rails are rare to locally uncommon residents of the upper and central Texas coast (Oberholser 1974; Lockwood and Freeman 2014). This species has the potential to occur within the study area wherever suitable habitat is available.

Reddish Egret

Reddish egrets are medium-sized herons with a distinctive reddish head and gray body. The reddish egret is a permanent resident of the Texas Gulf Coast and inhabits brackish marshes, shallow salt ponds, and tidal flats. In the spring, nests are built on the ground or in low vegetation on dry coastal islands in brushy thickets of Spanish dagger (*Yucca gloriosa*) and prickly-pear cactus (*Opuntia* sp.). Additionally for

breeding, reddish egrets utilize few natural inter-bay islands, emergent shell reefs, and man-made islands. Post breeding, reddish egrets disperse and occasionally travel inland during the summer, foraging along ponds and small lakes (Koczur et al. 2020). This species has the potential to occur within the study area wherever suitable habitat is available.

Swallow-tailed Kite

The swallow-tailed kite historically occurred along the coastal plains, interior lowlands, and riparian areas throughout the southeastern United States and into central Texas. Today in Texas, the species is a rare to uncommon migrant throughout the eastern third of the state and a rare to locally uncommon summer resident in southeast Texas. The most recent breeding records exist from Chambers, Liberty, Orange, and Tyler counties (Lockwood and Freeman 2014). Habitats include lowland forested swampy areas ranging into open woodland, marshes, rivers, lakes, and ponds. Nesting occurs in tall trees within clearings or on forest woodland edge, usually in pine, bald cypress, or other deciduous trees (Meyer 1995). This species is not anticipated to occur within the study area due to the study area being outside of the known range of this species.

White-faced Ibis

The white-faced ibis prefers freshwater marshes, wetlands, swamps, ponds, rivers, sloughs, and irrigated rice fields, but will also use brackish and saltwater habitats (Lockwood and Freeman 2014). This species is a colonial nester and forages on insects, newts, leeches, earthworms, snails, crayfish, frogs, and fish (TPWD 2025e). The white-faced ibis is an uncommon to common resident of Texas and commonly breeds and winters along the Gulf Coast. This species nests in small to large colonies in association with other species of waterbirds. Nesting typically occurs on islands along the central and upper coast but occasionally can be found to nest in inland marshes and swamps (Arvin 2007). This species has the potential to occur within the study area wherever suitable habitat is available.

White-tailed Hawk

The white-tailed Hawk is an uncommon to locally common resident in the Coastal Prairies and southeastern South Texas Brush County. Along the coast, this species is known to occupy prairies, cordgrass flats, and scrub-live oak. Further inland, the species may occupy prairie, mesquite and oak savanna, and mixed savanna-chaparral (Lockwood and Freeman 2014). This species has the potential to occur within the study area wherever suitable habitat is available.

Wood Stork

The wood stork is a colonial bird that breeds in Florida, Georgia, South Carolina, and Mexico. Nesting occurs in mangrove or cypress trees within brackish or freshwater swamp habitat. Post breeding, storks

from Mexico migrate northward along the Mississippi River Valley. Migrating wood storks use prairie ponds, flooded pastures or fields, ditches, and other shallow standing water habitats to forage for fish and other small animals. This species usually roosts communally in tall snags and sometimes in association with other wading birds (Coulter et al. 1999). Wood storks have not been reported to nest in Texas since 1960 and the only known breeding colonies north of Mexico occur in Florida, Georgia, South Carolina, and North Carolina (USFWS 1996). This species is not anticipated to occur within the study area due to its believed extirpation from Texas.

Fishes

Great Hammerhead

The great hammerhead shark is a circumtropical species inhabiting coastal and semi-oceanic waters. It is generally found over continental shelves and adjacent deep waters. Great hammerhead sharks are solitary and migrate great distances, seeming to prefer warm water currents. This species is a high trophic level predator with a diet that consists of a wide variety of teleosts, cephalopods, and crustaceans. The great hammerhead's range in the western Atlantic Ocean is from Massachusetts southward to Uruguay and including the Gulf of Mexico (Miller et al. 2014). This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Shortfin Mako Shark

Shortfin mako sharks have very pointed snouts and long gill slits with blue-gray backs. They are a highly migratory pelagic species with a widespread distribution spanning temperate and tropical waters across the globe. Juveniles occasionally occur inshore where the continental shelf is narrow and will use the water column from the surface to 2,000 feet deep where adults are usually found. The Gulf of Mexico is used as wintering grounds for some shortfin mako sharks (NOAA 2024n). This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Mammals

Atlantic Spotted Dolphin

Atlantic spotted dolphins are born with dark gray backs and continually develop white spots as they age. As these dolphins mature, the spots become darker and more widespread. They can be found in warm temperate, subtropical, and tropical waters throughout the Atlantic Ocean. Their North American range includes waters as far north as Massachusetts, and as far south as the Gulf of Mexico. They prefer coastal waters and/or waters along the continental shelf that are 65 to 820 feet deep. These dolphins are social animals and are found in groups ranging from 50 to 200 individuals. In coastal waters, groups consist of

five to 15 individuals (NOAA 2022a). This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Bryde's Whale

Bryde's whales are commonly mistaken for the sei whale but are smaller and prefer warmer waters. They have a wide distribution and occur in tropical, subtropical, and warm temperate waters around the world. Some populations tend to migrate with the seasons while other populations are residents of their home range. Their heads make up about one quarter of its entire body length which are skeel and their flippers are slender and pointed. Bryde's whales spend most of the day within 50 feet of the surface but can reach depths of up to 1,000 feet (NOAA 2024o). This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Cuvier's Beaked Whale

A Cuvier's beaked whale's body can vary in color that ranges from dark gray to a reddish brown. The reddish-brown color is often caused by infestation of microscopic algae. This medium-sized whale is often covered with linear and oval-shaped scars thought to be caused by cookie-cutter shark and lamprey bites. As they mature, individuals become paler and develop a distinctive indentation on their heads. This whale species can be found in temperate, subtropical, and tropical waters. They prefer deep, pelagic waters of the continental slope and edge and can dive up to 3,300 feet (NOAA 2025e). This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Dwarf Sperm Whale

Dwarf sperm whales have small compact bodies with a brown to blue-gray colored back. They are often mistaken for the pygmy sperm whale, its closest relative, and look very similar and are hard to distinguish from each other. These whales inhabit temperate and tropical waters. In the United States, dwarf sperm whales live in the waters of Hawaii, the Pacific Northwest, the western North Atlantic, and the northern Gulf of Mexico. They can dive at least 1,000 feet deep in search of food but feed in shallower areas when compared to pygmy sperm whales (NOAA 2025a). This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

False Killer Whale

False killer whales are members of the dolphin family and are dark gray, often appearing black. They generally prefer offshore tropical and subtropical waters that are deeper than 3,300 feet. In the United States, they are found around Hawaii, all Pacific remote island areas, the Mariana Archipelago, American Samoa, Gulf of Mexico, and in the warm Gulf Stream waters of the east coast. This species forms strong social bonds and is found in small subgroups of a few individuals that are associated with a larger

aggregation that may spread over tens of kilometers (NOAA 2024p). This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Gervais's Beaked Whale

Gervais's beaked whales have a small to medium sized body with a moderately long beak and indistinct sloping forehead. Many species of beaked whale are very difficult to distinguish from one another because they lack easily discernable physical characteristics. This species prefers deep tropical, subtropical, and warm temperate waters of the Atlantic Ocean but can occasionally be found in cold temperate areas. There is little information known about this species worldwide although they are the most sighted whale of their genus along the Atlantic coast and Gulf of Mexico (NOAA 2025b). This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Killer Whale

Killer whales are the ocean's top predators. They are a very distinctive species and are mostly black with white undersides and white patches near the eyes. These whales are highly social and live in social groups called pods where a unique communication system is used through clicks, whistles, and calls. Killer whales are found in all oceans but are most abundant in colder waters around Antarctica, Norway, and Alaska; they are also found in tropical and subtropical waters. Offshore killer whales have the largest range of any community but are sometimes seen in coastal nearshore waters (NOAA 2025g). This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Pygmy Killer Whale

The pygmy killer whale is a small member of the oceanic dolphin family and are often mistaken for false killer whales. These whales are generally less active than other oceanic dolphin species and are frequently seen resting in groups at the surface. They are a small bodied species with dark gray to black coloration with some distinctive small white areas on their lips and abdomen. This species prefers deeper areas of warmer tropical and subtropical waters where prey is concentrated (NOAA 2025c). They can occasionally occur close to shore around oceanic islands (NOAA 2025c). This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Pygmy Sperm Whale

Pygmy sperm whales have small compact bodies with a small and rounded dorsal fin. They have wrinkled skin and a brown to blue-gray colored back and paler undersides with white or pink tones. Pygmy sperm whales are often mistaken with dwarf sperm whales, their closest relative. In the wild, it is very difficult to distinguish between them because of their similar appearances and geographic ranges. They have a wide distribution and live in tropical, subtropical, and temperate waters. Most commonly, they can be

found off coasts and along continental shelves. In the United States, this species most commonly occurs off the southeastern coasts. They can dive at least 1,000 feet in search of food and feed in mid- and deep-water environments as well as the ocean floor (NOAA 2025d). This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Rafinesque's Big-eared Bat

The Rafinesque's big-eared bat inhabits bottomland hardwood forests and roost in tree cavities, under bark or dry leaves, or in man-made structures. This species favors mature trees with an average diameter of 43 inches and height of 69 feet. Tree species used by Rafinesque's big-eared bats include American beech (*Fagus grandifolia*), American sycamore (*Platanus occidentalis*), bald cypress (*Taxodium distichum*), blackgum (*Nyssa sylvatica*), cherrybark oak (*Quercus pagoda*), eastern cottonwood (*Populus deltoides*), overcup oak (*Quercus lyrata*), pignut hickory (*Carya glabra*), shagbark hickory (*Carya ovata*), southern magnolia (*Magnolia grandiflora*), swamp chestnut oak (*Quercus michauxii*), sweetgum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), water tupelo (*Nyssa aquatica*), white oak (*Quercus alba*), and willow oak (*Quercus phellos*) (Loeb et al. 2011). This species is not anticipated to occur within the study area due to the lack of suitable roosting and foraging habitat.

Roughtoothed Dolphin

Roughtoothed dolphins are relatively small compared to other dolphins and have gray bodies with a white throat and mouth. Their teeth are distinctive, having a rough surface formed by numerous irregular ridges. They inhabit deep oceanic waters throughout tropical and warmer temperate areas of the world but are generally found in the Atlantic, Indian, and Pacific Oceans. The abundance of their prey is a main determining factor in preferred habitat (NOAA 2022b). This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Short-finned Pilot Whale

Short-finned pilot whales have bulbous heads with no obvious rostrum and black or dark brown bodies. They are one of two species of pilot whale, along with the long-finned pilot whale (*Globicephala melas*) and are very difficult to distinguish at sea. They prefer warmer tropical and temperate waters and can be found at varying distances from the shore but prefer deeper waters. This species of whale primarily feeds on squid but is known to also feed on octopus and fish from waters of 1,000 feet in depth or more. Areas with a high density of squid are their main foraging habitats (NOAA 2025f). This species is not anticipated to occur within the study area due to the lack of suitable marine habitat.

Reptiles

Texas Horned Lizard

The Texas horned lizard inhabits open, arid to semiarid regions with sparse vegetation including open desert, grasslands, and shrubland containing bunch grasses, cacti, and yucca (TPWD 2025f). Preferred soils vary from pure sands and sandy loams to coarse gravels, conglomerates, and desert pavements (Henke and Fair 1998). Texas horned lizards are active between early spring to late summer and thermo-regulate by basking or burrowing into the soil. During winter inactivity periods, this species aestivates beneath the surface six to 12 inches deep under rocks, leaf litter, or abandoned animal burrows. Populations are thought to have decreased because of land use conversions, increased pesticide/herbicide use, collection, and increased fire ant populations. The Texas horned lizard forages primarily on the red harvester ant (*Pogonomyrmex barbatus*), but also consumes grasshoppers, beetles, and grubs (Dixon 2013; Henke and Fair 1998). Historically, the Texas horned lizard occurred throughout most of Texas, but habitat loss and the spread of non-native fire ants (*Solenopsis invicta*) have caused population declines (Dixon 2013). According to Henke and Fair (1998) Texas horned lizards no longer occur in Texas east of Fort Worth to Corpus Christi, except for small, isolated populations. This species is not anticipated to occur within the study area due to the lack of suitable habitat.

3.0 PROJECT ROUTE IDENTIFICATION

3.1 ROUTING STUDY METHODOLOGY

This section describes the methodologies and assumptions that were used to conduct the environmental assessment and route analysis for the 138 kV Stewart to West Bay Project. A base map was developed for the POWER planning team and CenterPoint Houston to delineate the study area boundaries. The POWER planning team was comprised of technical experts within each respective resource field. Field reconnaissance was conducted, and preliminary evaluation criteria were developed. Based on data pertinent to the study area, the POWER planning team and CenterPoint Houston also established criteria, consistent with PUC standards, for the resource analysis. Data were collected pertaining to land use, recreational and park areas, historical and aesthetic values and environmental integrity. Available GIS coverage with associated metadata was reviewed, and relevant resource data were selected and mapped. Sensitive resource locations were identified on an environmental and land use composite constraints map. The existing transmission line route and existing roadway ROW were evaluated within an approximate 900-foot-wide study area. No modifications to the existing transmission line route were necessary, and the existing transmission line route within the existing road ROW was considered the Project Route. Data was tabulated for the Project Route and a comparative potential impact assessment of the Project Route was completed in accordance with PURA and PUC substantive rules.

The study approach included the following major tasks:

- Base Map Development
- Study Area Delineation
- Development of Evaluation Criteria
- Data Collection and Mapping
- Reconnaissance Surveys
- Resource Analysis
- Opportunities and Constraints Evaluation
- Evaluation of the Existing Transmission Line Route and Roadway ROW
- Public Involvement Program
- Confirmation that the Existing Roadway Route ROW was feasible for the Project Route
- Impact Assessment of Project Route

- Presentation of Project Route that best addresses PURA and the PUC's Substantive Rules

A detailed description of the methodologies used to complete this environmental assessment and route analysis follows.

3.1.1 Base Map Development

The base map was a map covering the area between the study area boundaries and was used to initially display resource data for the study area. Resource data categories and factors that were determined appropriate within the study area were selected and mapped.

Data typically displayed, if present, on the base map includes:

- Major land jurisdictions and uses.
- Major roads, including County Roads (CRs), FMs, US Hwys and SHs.
- Existing transmission line and pipeline corridors.
- Parks and recreational areas.
- Major political subdivision boundaries.
- Lakes, rivers, creeks and ponds.
- USACE mapped NWI wetlands.

The base map provides a broad overview of various resource locations indicating obvious routing constraints and areas of potential routing opportunities.

3.1.2 Study Area Delineation

The study area boundary (see Figure 2-1) was defined to include the existing 138 kV transmission line route between the Project endpoints and an area wide enough to perform the route analysis. The existing 138 kV transmission line helped to define the study area boundaries along with major physiographic features, jurisdictional boundaries, sensitive resources, land uses, and existing roadways and other utility corridors. The study area boundary was depicted on a study area map (Figure 2-1) that was included with consultation letters, dated September 26, 2024, that were sent to agencies and officials to solicit comments on the Project (see Appendix A).

3.1.3 Evaluation Criteria

Evaluation criteria were developed to reflect accepted practices for routing and evaluating electric transmission lines in Texas (see Table 3-1). Emphasis was placed on acquiring the types of information identified in Section 37.056(c)(4)(A)-(D) of PURA, the PUC CCN application and 16 TAC § 25.101, including the policy of prudent avoidance. Evaluation criteria were further refined based on data collection, reconnaissance surveys and agency and public input. The route analysis activities were conducted with consideration and incorporation of the evaluation criteria. Route analysis activities included data collection, reconnaissance surveys, resource analysis, identification of routing opportunities and constraints and evaluation of the existing transmission line and roadway ROW. Evaluation criteria data were collected, mapped, tabulated and analyzed (Section 4.0) for the Project Route and ultimately used as a basis for the evaluation of the Project Route in accordance with PURA and PUC rules.

TABLE 3-1 LAND USE AND ENVIRONMENTAL EVALUATION CRITERIA

LAND USE
Length of Project Route
Number of directly affected habitable structures[1] within 300 feet of ROW centerline
Number of directly affected habitable structures[1] also within 300 feet of an existing transmission line
Length of ROW using existing roadway ROW
Length of ROW using existing transmission line easement
Length of ROW parallel and adjacent to existing transmission line ROW
Length of ROW parallel and adjacent to other existing ROW (highway, pipeline, canals, etc.)
Length of ROW paralleling and adjacent to apparent property lines (or other natural or cultural features)[2]
Length of route across parks/recreational areas[3]
Number of additional parks/recreational areas[3] within 1,000 feet of route centerline
Length of ROW across agricultural land/cropland
Length of ROW across pastureland
Length of ROW across land irrigated by traveling systems (rolling or pivot type)
Length of ROW across conservation easements and/or mitigation banks (Special Management Area)[4]
Number of pipeline crossings
Number of transmission line crossings
Number of US and state highway crossings
Number of FM road crossings
Number of FAA-listed airports[5] within 20,000 feet of ROW centerline having at least one runway more than 3,200 feet
Number of FAA-listed airports[5] within 10,000 feet of ROW centerline having no runway more than 3,200 feet

TABLE 3-1 LAND USE AND ENVIRONMENTAL EVALUATION CRITERIA

LAND USE
Number of private airstrips within 10,000 feet of ROW centerline
Number of heliports within 5,000 feet of ROW centerline
Number of commercial AM radio transmitters within 10,000 feet of ROW centerline
Number of FM radio transmitters, microwave relay stations, and other electronic installations etc. within 2,000 feet of ROW centerline
AESTHETICS
Estimated length of ROW within foreground visual zone[6] of US and state highways
Estimated length of ROW within foreground visual zone[6] of FM roads
Estimated length of ROW within foreground visual zone[6][7] of park and recreational areas[3]
ECOLOGY
Length of ROW across upland woodlands/brushlands
Length of ROW across bottomland/riparian woodlands
Length of ROW across National Wetland Inventory mapped wetlands
Length of ROW across USFWS designated critical habitat of federal-listed threatened or endangered species
Length of ROW across open water (lakes or ponds)
Number of stream crossings
Length of ROW parallel (within 100 feet) to streams
Length of ROW across FEMA mapped 100-year floodplain
CULTURAL RESOURCES
Number of cemeteries within 1,000 feet of the ROW centerline
Number of recorded archeological and historic sites crossed by ROW
Number of additional recorded archeological and historic sites within 1,000 feet of ROW centerline
Number of National Register of Historic Places listed or determined-eligible properties crossed by ROW
Number of additional National of Register Historic Places listed or determined-eligible properties within 1,000 feet of ROW centerline
Length of ROW across areas of high archeological site potential

Notes: All length measurements are shown in miles unless noted otherwise.
[1]Single-family and multi-family dwellings, and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, business structures, churches, hospitals, nursing homes, schools, or other structures normally inhabited by humans or intended to be inhabited by humans on a daily or regular basis within 300 feet of the centerline of a transmission project of 230 kV or less.
[2]Apparent property boundaries created by existing roads, highways, or railroad ROWs are not "double-counted" in the length of ROW parallel to apparent property boundaries criteria.
[3]Defined as parks and recreational areas owned by a governmental body or an organized group, club, or church within 1,000 feet of the centerline of the Project.
[4]For this particular Project, the length of route across parks/recreational areas overlaps with the length of ROW across conservation easements and/or mitigation banks (Special Management Area) and was accounted for in the length across parks/recreational areas to avoid being "double-counted".
[5]As listed in the Chart Supplement South Central US (FAA 2024b formerly known as the Airport/Facility Directory South Central US) and FAA 2024a.
[6]One-half mile, unobstructed. Lengths of ROW within the visual foreground zone of interstates, US and state highway criteria are not "double-counted" in the length of ROW within the visual foreground zone of FM roads criteria.
[7]One-half mile, unobstructed. Lengths of ROW within the visual foreground zone of parks/recreational areas may overlap with the total length of ROW within the visual foreground zone of interstates, US, and state highway criteria and/or with the total length of ROW within the visual foreground zone of FM roads criteria.

3.2 DATA COLLECTION AND CONSTRAINTS MAPPING

Once the study area boundary was identified, comprehensive data collection activities began. POWER developed a list of potentially interested regulatory agencies, elected officials and organizations to receive a Project scoping letter. The purpose of the letter was to inform the various officials and agencies of the Project and to give them the opportunity to provide information regarding sensitive resources and potential issues within the study area. POWER utilized websites from Galveston County, in addition to confirmation through telephone calls, to identify local officials. Various federal and state agencies that may have potential concerns or regulatory permitting requirements for the Project were also contacted. Copies of correspondence with the various federal and state regulatory agencies, county and local officials, departments and non-governmental agencies are included in Appendix A.

Federal, state, and local agencies and officials, and NGOs contacted include:

- FAA
- FEMA
- NPS
- NRCS
- USACE
- DoD - Military Aviation and Installation Assurance Siting Clearinghouse
- USEPA
- USFWS
- RRC
- TCEQ
- TxDOT – Division of Aviation
- TxDOT – District Engineers
- TxDOT – Environmental Affairs Division
- TxDOT – Planning and Programming
- Texas GLO
- THC
- TPWD
- TWDB
- Galveston County Officials
- Galveston County Engineer
- Galveston County Economic Development

- Galveston County Historical Commission
- Galveston ISD
- City of Jamaica Beach
- Houston-Galveston Area Council
- The Nature Conservancy
- Texas Land Trust Council
- Texas Land Conservancy
- Texas Agricultural Land Trust
- Bayou Land Conservancy
- Gulf Coast Birding Observatory
- Galveston Bay Foundation
- Artist Boat Organization

Available data were mapped to identify existing conditions and to determine potential conflicts that would result from the Project. Resource data were collected for land use, historical (cultural and archeological) and aesthetic values, physiographic and geologic features, surface waters, wetlands and biological resource areas. Data were mapped within the study area using GIS layers. Additional data collection consisted of file and record reviews conducted with various state regulatory agencies, a review of published literature and a review of various maps and readily available aerial imagery on the internet (NAIP 2022; Google Earth 2024). Results from the resource inventory data were described in Section 2.0 and are reflected on the Project Route with Environmental and Land Use Constraints Map (Appendix D).

3.3 RECONNAISSANCE SURVEY

POWER personnel conducted a reconnaissance survey of the study area on October 10, 2024, to confirm the findings of the research and data collection activities and to identify potential constraints that may not have been previously noted. The reconnaissance survey confirmed some data point accuracy and identified changes in land use that occurred after the date of the aerial photography. The reconnaissance survey was limited to visual observations conducted from public roads and existing public ROWs located within the study area.

3.4 RESOURCE ANALYSIS

The composite constraints map was used as a foundation for the resource analysis. Criteria were developed for each resource to establish constraint parameters which facilitated the evaluation of the existing transmission line route and roadway ROW. The following definitions were considered:

- **Resource Value**: A measure of rarity, intrinsic worth, singularity or diversity of a resource within a particular area.
- **Protective Status**: A measure of the formal concern as expressed by legal protection or special status designation.
- **Present and Known Future Uses**: A measure of the level of potential conflict with land management and land use policies.
- **Hazards**: A measure of the degree to which construction and operation of the transmission line could be affected by a known resource hazard.

Using this framework, overlays of individual resources were mapped to provide a visual representation of constraint areas, and to evaluate rebuilding the existing line within existing roadway ROW. Where feasible, identified constraints were avoided to the extent practicable to minimize potential impacts or conflicts.

3.5 OPPORTUNITIES AND CONSTRAINTS EVALUATION

Information gathered during the data collection task, review of agency comments and management plans, internal review, and discussions with the Project team were used to evaluate the existing transmission line route ROW and constraints within the study area.

3.5.1 Existing Linear Corridors

POWER identified existing linear corridor features as potential paralleling opportunities in accordance with PURA Section 37.056(c) and 16 TAC § 25.101(b)(3)(B)(i-iii). Apparent property boundaries and the existing roadway ROW were evaluated for potential utilization opportunities. Data sources used to identify existing linear ROWs include utility company regional system maps, aerial imagery, USGS topographical maps, CAD files from CenterPoint Houston (Galveston County 2024), additional available planning documents and reconnaissance surveys (PLATTS 2024; NAIP 2022).

3.5.2 Apparent Property Boundaries

Apparent property boundaries and fence lines were initially identified using parcel data that was downloaded and purchased (Galveston County 2024) supplemented by readily available existing aerial photography (NAIP 2022).

3.5.3 Roadway ROWs

POWER evaluated the existing roadway ROW along San Louis Pass Road/FM 3005 and 13 Mile Road. The proposed Project, a rebuild of the existing double circuit transmission line, is proposed to utilize the existing roadway ROW.

3.5.4 Existing Transmission Line ROWs

POWER evaluated the existing 138 kV transmission line corridor and the adjacent land uses.

3.5.5 Existing Pipeline ROWs

POWER reviewed aerial photography and RRC data to identify pipeline ROWs within the study area. One abandoned pipeline was identified within the study area.

3.6 PROJECT ROUTE IDENTIFICATION

CenterPoint Houston indicated the portion of existing Circuits 48 and 59 proposed for rebuild between the existing West Bay Substation and the Project starting point. POWER evaluated the existing roadway alignment and an area approximately 900-feet-wide to confirm feasibility of utilizing the existing road ROW.

3.6.1 Public Involvement Program

CenterPoint Houston hosted a public meeting. The purpose of the public meeting was to solicit comments, concerns and input from residents, landowners, public officials and other interested parties concerning the Project with reference to the Project route, the overall transmission line routing process, and to:

- Promote a better understanding of the Project, including the purpose, need, potential benefits and impacts and the PUC CCN application approval process.
- Inform the public about the routing procedure, schedule and decision-making process.
- Allow the decision-making process to adequately identify and consider the values and concerns of the public and community leaders.

The public meeting was held on November 21, 2024, from 5:00 to 8:00 p.m., at Parker Elementary School, 6802 Jones Drive, Galveston, Texas 77551.

Individual notification letters announcing the public meeting were directly mailed by CenterPoint Houston to 1,108 landowners whose property is located within 320 feet of the Project route. Instead of 300 feet, 320

feet was used to account for the ±20 feet horizontal accuracy of the aerial photography used. The notification letters provided the location, time, and purpose of the meeting. Copies of the landowner notice for the public meeting are provided in Appendix B.

At the public meeting, personnel from CenterPoint Houston and POWER staffed information stations, with each station devoted to a particular aspect of the Project. The stations included maps (two sets of two display maps (1.0 inch = 1,000 feet)), illustrations, photographs and text explaining each topic. In addition to the information stations, CenterPoint Houston also provided two staffed GIS computer stations. Landowners were provided the opportunity to view their properties or areas of interest in more detail at the GIS stations. POWER staff recorded their comments in a digital format and upon request provided an annotated 8.5-inch by 11-inch color snapshot of their area of interest for the attendee to take home.

Interested citizens and property owners were encouraged to visit each station so that the entire process could be explained in the logical sequence of Project development. Using the information station format is advantageous because it allows attendees to process information in a more relaxed manner, and also allows them to focus on their particular area of interest and ask specific questions. Furthermore, one-to-one discussions with CenterPoint Houston and POWER personnel typically encourage more interaction from those citizens who might be hesitant to participate in a more formal speaker-audience format. The names of the information stations were: Registration and Information; Project Need; ROW/Construction; Electromagnetic Field (EMF) Information; Routing and Environmental; GIS Computer Stations; Refreshments; and Questionnaire Drop Off.

CenterPoint Houston established a Project website, http://www.centerpointenergy.com/stewart-westbayproject, to provide information to the public. The website content explains the scope of the Project including the need for the Project and the construction and route, as well as the PUC's process to review and approve the Project. The website also provides several Project documents, EMF information, maps and aerial photos and a link to the PUC website.

Upon entering the public meeting, visitors were asked to sign in and were handed an information packet, including a questionnaire and a map (see Appendix B) indicating the portion of the existing transmission line proposed to be rebuilt between the existing West Bay Substation and the start of the Project location (the Project Route). The questionnaire solicited comments on the Project and an evaluation of the information presented at the meeting. The information packet also included a welcome sheet that explained how the meeting was organized, a Frequently Asked Questions sheet about the Project, the PUC

Certification Process, a project schedule, the transmission need display, a construction display, the PUC's landowner brochure, landowner protest form, landowner intervention form and State of Texas Landowner's Bill of Rights. Copies of the information packet documents are located in Appendix B.

Of the 1,108 notification letters sent for the public meeting, eight people signed in at the public meeting, which represents approximately one percent of the notified landowners. Two questionnaires were received at the public meeting. POWER reviewed and evaluated each questionnaire.

As a result, the analysis indicated that 100% of those individuals that submitted a questionnaire agreed that the need for the Project had been adequately explained. The questionnaire solicited comments asking if a list of features was incorrectly shown on the Environmental and Land Use Constraints Map or if they were aware of any additional features that were not included. Both questionnaires stated "no" (indicating that features were correctly shown and that the attendees were not aware of any additional features for inclusion).

The questionnaire solicited comments pertaining to any concern with a particular area along the existing transmission line shown on the Environmental and Land Use Constraints Map. No concerns were provided on the questionnaires.

When asked on the questionnaire which of these following situations applied to them (the existing transmission line is near my home, business, on my land, none of the above or other), both questionnaires (100%) indicated that the existing transmission line was near their home.

The questionnaire asked if the information that was provided and the exhibits displayed at the public meeting met their needs. Both questionnaires (100%) responded "yes."

The questionnaire asked whether the respondent had visited the Stewart to West Bay website to view the information about the Project. Both questionnaires (100%) answered "yes."

The questionnaire also requested additional comments. The single response received was regarding maintenance around the existing structures.

3.6.2 Comments from Agencies, Officials and Organizations

POWER developed a list of federal, state, and local agencies and organizations that would potentially have an interest in the Project. Section 3.2 lists agencies, organizations and public officials that were sent scoping letters regarding the Project. Maps of the study area were included with each letter. Copies of the agency scoping letters sent and responses received are located in Appendix A.

Responses received are summarized on the following pages.

- FAA responded with a letter dated October 23, 2024, stating that if CenterPoint Houston is planning to sponsor any construction or alterations which may affect navigable airspace, a FAA Form 7460-1 must be filed electronically via a website.

- FEMA responded with a letter dated October 8, 2024, requesting that the community floodplain administrator be contacted for the review and possible permit requirements. CenterPoint Houston will coordinate with community floodplain administrator as required.

- The USACE responded with an email dated September 26, 2024, stating that they had recently launched a new Regulatory Request System and asked that any requests be submitted through this new system. CenterPoint Houston will coordinate with USACE as required.

- The USACE Realty Specialist responded with an email dated September 26, 2024, stating that based on their review that Real Estate would have no interest in the Project area.

- The USFWS Texas Coastal and Central Plains Ecological Services Field Office responded with a letter dated September 23, 2024, providing a list of the federally listed threatened and endangered species for the study area county. The USFWS also provided the definitions of the affected determinations and referenced the MBTA and BGEPA.

- The RRC responded with a letter dated October 17, 2024, stating that information regarding existing oil and gas well and pipeline locations, oil and gas drilling permit and pipeline permitting, and surface mining operations can be found via a website.

- The GLO responded with a letter dated October 10, 2024, stating that it did not appear that the GLO will have any environmental issues or land use constraints at this time.

- The THC responded with a letter dated November 6, 2024, stating that an archeological survey is required.

- The TPWD responded with an email dated November 12, 2024, stating that they did not anticipate significant adverse impacts to threatened, or endangered species, or other fish and wildlife resources.

- The TxDOT Houston District responded with a letter dated October 28, 2024, providing some information that they had gathered from their technical reports completed for the FM 3005 project.

3.6.3 Project Route

The Project Route was identified on an overlay of the composite environmental and land use constraints map. The Project Route was evaluated based upon maximizing the use of the existing roadway ROW while avoiding areas of high environmental constraints or conflicting land uses. Aerial photography was used as the background of the composite constraints overlay to evaluate and confirm the feasibility of rebuilding the existing line within the existing roadway ROW. During the route evaluation process, the location of residential areas, habitable structures, industrial facilities, pipelines, surface water crossings, wetlands, property boundaries, agricultural land and other sensitive resource areas were considered. POWER utilized the following to evaluate the Project Route:

- Input received from scoping activities with local officials, regulatory agencies, and others.
- Results from reconnaissance surveys of the study area.
- Review of aerial photography.
- Findings of the data collection activities.
- Environmental and land use composite constraints maps.
- Apparent property boundaries from the study area county appraisal district.
- Evaluation of the Existing Transmission Line Route and Roadway ROW
- Location of existing developments.

The Project Route was evaluated in accordance with PURA § 37.056 (c)(4)(A)-(D), 16 TAC § 25.101, including the PUC's policy of prudent avoidance, while also considering the evaluation criteria in Table 3-1.

The Project Route is shown in relation to environmental and other land use constraints on topographic base in Figure 4-1 and on aerial photographic base in Figure 4-2. For the purposes of this analysis, only one route is addressed in this report. The analysis of the Project Route involved inventorying and tabulating the number or quantity of each environmental criterion located along the route (e.g., number of habitable structures within 300 feet). The number or amount of each factor was determined by POWER using GIS layers, maps, recent aerial photography, and field verification from publicly accessible areas where practical. Potential environmental impacts are addressed in Section 4.0 of this document.

This page left blank intentionally

4.0 IMPACT OF THE PROJECT ROUTE

Potential impacts of the Project that could occur from, and are unique to, the construction and operation of a transmission line are discussed separately in this section of the EA. Evaluation of the potential impacts of the Project Route identified in Section 3.0 was conducted by tabulating the data for each of the 41 evaluation criteria in Table 3-1. The data tabulation for land use and environmental criteria for the Project Route is presented in Table 4-1.

TABLE 4-1 LAND USE AND ENVIRONMENTAL DATA FOR THE PROJECT ROUTE EVALUATION

Evaluation Criteria		
Land Use		Route
1	Length of Project Route (miles)	10.78
2	Number of directly affected habitable structures[1] within 300 feet of ROW centerline	900
3	Number of directly affected habitable structures[1] also within 300 feet of an existing transmission line	900
4	Length of ROW using existing road ROW	10.68
5	Length of ROW using existing transmission line easement	0.10
6	Length of ROW parallel and adjacent to existing transmission line ROW	0
7	Length of ROW parallel and adjacent to other existing ROW (highway, pipeline, canals, etc.)	0
8	Length of ROW paralleling and adjacent apparent property lines (or other natural or cultural features)[2]	0
9	Length of route across parks/recreational areas[3]	1.59
10	Number of additional parks/recreational areas[3] within 1,000 feet of route centerline	0
11	Length of ROW across agricultural land/cropland	0
12	Length of ROW across pastureland	0
13	Length of ROW across land irrigated by traveling systems (rolling or pivot type)	0
14	Length of ROW across conservation easements and/or mitigation banks (Special Management Area)[4]	0
15	Number of pipeline crossings	0
16	Number of transmission line crossings	0
17	Number of US and state highway crossings	0
18	Number of FM road crossings	0
19	Number of FAA registered airports[5] within 20,000 feet of ROW centerline having at least one runway more than 3,200 feet	0
20	Number of FAA registered airports[5] within 10,000 feet of ROW centerline having no runway more than 3,200 feet	0
21	Number of private airstrips within 10,000 feet of the ROW centerline	0
22	Number of heliports within 5,000 feet of the ROW centerline	0
23	Number of commercial AM radio transmitters within 10,000 feet of the ROW centerline	0
24	Number of FM radio transmitters, microwave towers, and other electronic installations within 2,000 feet of ROW centerline	2
Aesthetics		
25	Estimated length of ROW within foreground visual zone[6] of US and state highways	0
26	Estimated length of ROW within foreground visual zone[5]of FM roads	10.78
27	Estimated length of ROW within foreground visual zone[6][7] of parks/recreational areas[3]	2.42

TABLE 4-1 LAND USE AND ENVIRONMENTAL DATA FOR THE PROJECT ROUTE EVALUATION

Evaluation Criteria		
Ecology		
28	Length of ROW across upland woodlands/brushlands	1.14
29	Length of ROW across bottomland/riparian woodlands	0.63
30	Length of ROW across NWI mapped wetlands	0.03
31	Length of route across USFWS designated critical habitat for federally-listed threatened or endangered species	0.70
32	Length of ROW across open water (lakes, ponds)	0
33	Number of stream crossings	0
34	Length of ROW parallel (within 100 feet) to streams	0
35	Length of ROW across FEMA mapped 100-year floodplain	10.64
Cultural Resources		
36	Number of cemeteries within 1,000 feet of the ROW centerline	1
37	Number of recorded archeological and historic sites crossed by ROW	0
38	Number of additional recorded archeological and historic sites within 1,000 feet of ROW centerline	5
39	Number of NRHP listed or determined eligible properties crossed by ROW	1
40	Number of additional NRHP listed or determined eligible properties within 1,000 feet of ROW centerline	0
41	Length of ROW across areas of high archeological site potential	5.54

Notes: All length measurements are shown in miles unless noted otherwise.
[1]Single-family and multi-family dwellings, and related structures, mobile homes, apartment buildings, commercial structures, industrial structures, business structures, churches, hospitals, nursing homes, schools, or other structures normally inhabited by humans or intended to be inhabited by humans on a daily or regular basis within 300 feet of the centerline of a transmission project of 230 kV or less.
[2]Apparent property boundaries created by existing roads, highways, or railroad ROWs are not "double-counted" in the length of ROW parallel to apparent property boundaries criteria.
[3]Defined as parks and recreational areas owned by a governmental body or an organized group, club, or church within 1,000 feet of the centerline of the Project.
[4]For this particular Project, the length of route across parks/recreational areas overlaps with the length of ROW across conservation easements and/or mitigation banks (Special Management Area) and was accounted for in the length across parks/recreational areas to avoid being "double-counted"..
[5]As listed in the Chart Supplement South Central US (FAA 2024b formerly known as the Airport/Facility Directory South Central US) and FAA 2024a.
[6]One-half mile, unobstructed. Lengths of ROW within the visual foreground zone of interstates, US and state highway criteria are not "double-counted" in the length of ROW within the visual foreground zone of FM roads criteria.
[7]One-half mile, unobstructed. Lengths of ROW within the visual foreground zone of parks/recreational areas may overlap with the total length of ROW within the visual foreground zone of interstates, US, and state highway criteria and/or with the total length of ROW within the visual foreground zone of FM roads criteria.

CenterPoint Houston provided construction cost estimates for the Project Route, including ROW acquisition. The estimated total cost for the Project Route is summarized in Table 4-2.

TABLE 4-2 SUMMARY OF COST ESTIMATES

ESTIMATED CONSTRUCTION COST[1]	ESTIMATED ROW COST[1]	TOTAL
$81,627,000	$23,670,000[2]	$105,297,000

[1] Cost for the Project Route is estimated with predominantly double-circuit concrete poles in a vertical configuration.
[2] Includes $5 million for temporary construction easements.

4.1 COMMUNITY VALUES

Impacts on community resources can be divided into direct and indirect effects. Direct effects are those that would occur if the location and construction of a transmission line results in the removal or loss of public access to a valued resource. Indirect effects are those that would result in a loss in the enjoyment or use of a resource due to the characteristics of the proposed transmission line, poles, or ROW.

4.2 LAND USE

The magnitude of potential impacts to land use resulting from the construction of a transmission line is determined by the amount of land or land use type displaced by the actual ROW and by the compatibility of the transmission line ROW with adjacent land uses. This Project is a rebuild of an existing transmission line within existing roadway ROW with limited additional aerial easements; therefore, overall potential impacts are anticipated to be minimized by utilizing the existing roadway ROW. During construction, temporary impacts to land uses within the roadway ROW may occur due to the movement of workers, equipment and materials through the area. Construction noise and dust, in addition to temporary disruptions of traffic flow, may also temporarily affect residents and businesses in the area immediately adjacent to the roadway ROW. Coordination between CenterPoint Houston, their contractors and the landowners regarding temporary construction easements, roadway ROW access, and construction scheduling should minimize these disruptions.

The evaluation criteria used to compare potential land use impacts include overall route length, the length of route utilizing existing roadway ROW, the length of the route paralleling existing corridors (including apparent property lines), the proximity of the route to habitable structures, potential impacts to recreational and park areas and the length of route across various land use types. An analysis of the existing land use adjacent to the existing roadway ROW was required to evaluate the potential impacts. The following sections address potential impacts to land use associated with the Project Route.

4.2.1 Project Route Length

The length of a proposed route can be an indicator of the relative magnitude of land use impacts. In general, a shorter route means that less land is crossed, which usually results in the least amount of potential impacts. The total length of the Project Route that will be rebuilt is approximately 10.78 miles. The approximate length of the Project Route is presented in Table 4-1.

4.2.2 Compatible ROW

PUC Substantive Rule § 25.101(b)(3)(B) requires that the PUC consider whether a new transmission line route is within existing compatible ROWs and/or is parallel to existing compatible ROWs, property lines or other natural or cultural features. Criteria were used to evaluate compatible ROW utilization, length of route parallel to existing transmission line ROW, length of route parallel to other existing linear ROWs and length of ROW parallel to apparent property lines. It should also be noted that if the Project Route parallels more than one existing linear corridor, only one linear corridor was tabulated (e.g., the route parallels both an apparent property line and a roadway, but it was only tabulated as paralleling the roadway).

The Project Route will be rebuilt utilizing approximately 10.68 miles of roadway ROW and adjacent aerial easement. The Project Route is not parallel to other existing ROW, apparent property lines or other natural or cultural features (see Table 4-1).

In many instances, the existing roadway ROW is located in close proximity to existing habitable structures or crosses sensitive areas, such as Galveston Island State Park. Typically, these types of constraints would prohibit utilizing many road ROWs; however, rebuilding the existing line within the existing roadway ROW along FM 3005 and 13 Mile Road would result in fewer new impacts when compared to rebuilding the line in another location; therefore, it is preferable to utilize the roadway ROW along FM 3005 and 13 Mile Road.

Approximately 0.10 miles of the Project Route will be rebuilt utilizing existing transmission line ROW. The Project Route is not parallel or adjacent to any other additional existing transmission line ROW.

Typically, a more representative account for the consideration of whether new transmission line routes are within and/or parallel to existing compatible ROWs, apparent property lines, or other natural or cultural features is demonstrated with the percentage of total route length parallel to any of these existing linear features. The percentage can be calculated for the Project Route by adding up the total length within and/or parallel to existing transmission lines, other existing ROW, and apparent property lines and then dividing the result by the total length of the route. The percentage of the Project Route within and/or paralleling existing linear features is 100%.

4.2.3 Urban and Residential Areas

One of the most important measures of potential land use impacts is the number of habitable structures located in the vicinity of a proposed alternative route. POWER determined the number and distance of habitable structures located within 300 feet of the centerline of the Project Route through the interpretation of aerial photography and during reconnaissance surveys. The horizontal accuracy of the aerial photograph used to identify habitable structures was calculated at ±10 feet. To account for this margin of error and to ensure that all habitable structures were properly identified, POWER identified habitable structures within 310 feet of the centerline of the Project Route.

The Project Route has 900 habitable structures located within 300 feet of its centerline. These 900 habitable structures are the same habitable structures already located within 300 feet of the existing transmission line. The number of habitable structures located within 300 feet of the Project Route centerline is presented in Table 4-1.

Table 4-6 (Appendix C) presents detailed information on habitable structures within 300 feet of the Project Route centerline. All known habitable structure locations are shown on Figure 4-2 located in Appendix E (map pocket). Based on reconnaissance surveys there are several recreational vehicle parks along the Project Route. To be sure that this analysis accounted for the full impact of the Project Route on habitable structures, POWER and CenterPoint Houston included structures that appeared to be normally inhabited by humans or intended to be inhabited by humans on a daily or regular basis. This included recreational vehicles that appeared to be stationary. Other recreational vehicles that did not appear to be stationary were not included.

4.2.4 Land Use Categories

An analysis of compatibility with land use types adjacent to the existing transmission line was completed for the Project Route. Land use categories occurring within the study area included residential, commercial, agricultural land or cropland, pastureland, and state-owned land.

The Project Route does not cross agricultural land or cropland. The length of crossing agricultural land or cropland for the Project Route is presented in Table 4-1.

The Project Route also does not cross pastureland. CenterPoint Houston will rebuild the existing transmission line within the existing roadway ROW and limited additional aerial easement and is not proposing to fence the ROW or otherwise separate the ROW from adjacent lands. There should not be

any long-term or significant displacement of current grazing activities within pasturelands. The length across pastureland for the Project Route is presented in Table 4-1.

The Project Route does not cross any agricultural lands with known mobile irrigation systems (rolling or pivot). The length across agricultural lands with known mobile irrigation systems (rolling or pivot) for the Project Route is presented in Table 4-1.

4.2.5 Transportation/Aviation/Utilities

Transportation

Potential impacts to transportation include temporary disruption of traffic and conflicts with future proposed roadways or utility improvements. Traffic disruptions would include those associated with the movement of equipment and materials to the ROW, slightly increased traffic flow and periodic congestion during the construction phase of the Project. These impacts are typically considered minor, temporary and short-term. CenterPoint Houston would be required to obtain road-crossing permits from TxDOT for any crossing of state-maintained roadways.

There are no US Hwys, SHs, or FM roads crossed by the Project Route. The number of US Hwys, SHs and FM road crossings for the Project Route are presented in Table 4-1.

Aviation

According to FAA regulations, Title 14 CFR 77, the construction of a transmission line requires FAA notification if the tower structure height exceeds the height of a theoretical line extending outward and upward at a slope of 100:1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of a public or military airport having at least one runway longer than 3,200 feet. The FAA also requires notification if tower structure heights exceed a 50:1 slope for a horizontal distance of 10,000 feet from the nearest runway of a public or military airport where no runway is longer than 3,200 feet in length, and if tower structure heights exceed a 25:1 slope for a horizontal distance of 5,000 feet for heliports.

No public or military FAA registered airports with at least one runway longer than 3,200 feet are located within 20,000 feet of the Project Route.

No public or military FAA registered airports with at least one runway shorter than or equal to 3,200 feet are located within 10,000 feet of the Project Route.

There are no heliports located within 5,000 feet of the Project Route.

Following PUC approval of the Project Route, CenterPoint Houston will make a final determination for the need for FAA notification, based on specific route location and structure design. The result of this notification and any subsequent coordination with the FAA could include changes in the line design and/or potential requirements to mark and/or light the structures.

There are no private airstrips located within 10,000 feet of the Project Route.

The number of airports, airstrips and heliports for the Project Route is presented in Table 4-1.

Utilities

Pipelines (including those carrying oil and gas) will be identified on engineering drawings and flagged prior to construction. CenterPoint Houston will coordinate with the respective pipeline companies at each crossing for continued safe operation of a pipeline during transmission line construction and operation. The Project Route does not cross any known pipelines. The number of pipeline crossings for the Project Route is presented in Table 4-1.

No other known existing electric transmission lines, except for the 138 kV transmission line that will be rebuilt, were identified within the study area. The number of transmission line crossings for the Project Route is presented in Table 4-1.

4.2.6 Communication Towers

The Project Route would not have a significant impact on electronic communication facilities or operations in the study area. No commercial AM radio towers were identified within 10,000 feet of the Project Route centerline. There are no FM radio transmitters or microwave towers but two "other electronic installations" within 2,000 feet of the Project Route.

Table 4-6 (Appendix C) presents detailed information on electronic communication facilities. The number of AM radio towers located within 10,000 feet and FM radio and other communication facilities located within 2,000 feet of the Project Route centerline are presented in Table 4-1. The distance of each communication tower from the Project Route was measured using GIS software and aerial photograph interpretation (see Table 4-3). All known communication tower locations are shown on Figures 4-1 and 4-2 located in Appendix D and E (map pockets).

TABLE 4-3 ELECTRONIC COMMUNICATION FACILITIES

FIGURE 4-2 MAP ID	TOWER TYPE	DISTANCE FROM PROJECT ROUTE (FEET)*
3001	Other communication tower	192
3002	Other communication tower	89

*POWER aerial photo and USGS interpretation; FCC 2024.

4.2.7 Parks and Recreational Areas

Impacts to community resources, whether direct or indirect, can be gauged as they affect community recreational and park areas. Potential impacts to recreation include the disruption or preemption of recreational activities during the construction of the Project. The Galveston Island State Park was identified within the study area.

No significant impacts to the use or enjoyment of the parks and recreation facilities located within the study area are anticipated from the construction of the Project Route. No adverse impacts are anticipated for any of the fishing or hunting areas resulting from the construction of the Project Route.

Table 4-6 (Appendix C) presents detailed information on parks and recreational areas. The Project Route crosses one such area for approximately 1.59 miles; however, there are no other parks or recreational areas within 1,000 feet of the Project Route. Refer to Table 4-1 for the length across parks or recreational areas and located within 1,000 feet of the Project Route. The distance to park or recreational areas from the Project Route was measured using GIS software and aerial photograph interpretation (see Table 4-4). All known park or recreational area locations are shown on Figures 4-1 and 4-2 located in Appendix D and E (map pockets).

TABLE 4-4 PARK AND RECREATIONAL AREAS

FIGURE 4-2 MAP ID	PARK OR RECREATIONAL AREA	DISTANCE FROM PROJECT ROUTE (FEET)*
4001	Galveston Island State Park	0

*POWER aerial photo and USGS interpretation.

4.3 SOCIOECONOMICS

Construction and operation of the proposed transmission line will not result in a significant change in the population or employment rate within the study area. Construction workers for the Project will commute to the work site on a daily or weekly basis, instead of permanently relocating to the area. The presence of

additional workers would likely result in a temporary increase in local retail sales due to purchases of food, fuel, and other merchandise. No additional staff will be necessary for line operations and maintenance.

4.4 HISTORICAL AND AESTHETIC VALUES

Methods for identifying, evaluating, and mitigating impacts to cultural resources have been established for federal projects or permitting actions, primarily for purposes of compliance with the National Historic Preservation Act (NHPA). Similar methods are often used when considering cultural resources affected by state-regulated actions. In either case, this process generally involves: (1) identifying significant (i.e., national- or state-designated) cultural resources within 1,000 feet of the centerline of routing alternatives; (2) determining the potential impacts of the project on those resources; and (3) implementing, where appropriate, measures to avoid, minimize or mitigate those impacts.

Impacts associated with the construction, operation and maintenance of transmission lines can affect cultural resources either directly or indirectly. Construction activities associated with any proposed project can adversely impact cultural resources if those activities alter the integrity of key characteristics that contribute to a property's significance as defined by the standards of the NRHP or the Antiquities Code of Texas. These characteristics might include location, design, setting, materials, workmanship, feeling or association for architectural and engineering resources, or archeological information potential for archeological resources.

4.4.1 Direct Impacts

Direct impacts are those effects that physically or visually alter the integrity of key aspects or qualities that define the historical significance of the resource. Typically, direct impacts are caused by the actual construction of the line or through increased vehicular traffic during the construction phase.

4.4.2 Indirect Impacts

Indirect impacts include those effects caused by the Project that are farther removed in distance or that occur later in time but are reasonably foreseeable. These indirect impacts might include introduction of visual or audible elements that are out of character with the resource or its setting. Indirect impacts might also occur as a result of alterations in the pattern of land use, changes in population density, accelerated growth rates or increased pedestrian or vehicular traffic after construction. Historic buildings, structures, landscapes and districts are among the types of resources that might be adversely impacted by the indirect impact of the proposed transmission structures and wires.

4.4.3 Mitigation

Mitigation for direct and indirect impacts to cultural resources may be achieved, where appropriate, by avoidance through project design. Additional mitigation measures for direct impacts may include implementing a program for data recovery excavations if an archeological site cannot be avoided. Indirect impacts on historical properties and landscapes can be lessened through careful design and landscaping considerations, such as using vegetation screens or berms where practicable. Additionally, relocation might be possible for some historic structures, if applicable.

4.4.4 Summary of Cultural Resource Impacts

The distance of each recorded cultural resource crossed or located within 1,000 feet of the Project Route was measured using GIS software and aerial photography interpretation. A review of the THC (2024a and 2024b), NPS (2024b-2024e), and TxDOT (2024c) data indicated that one cemetery, three archeological sites, and two shipwrecks have been recorded within 1,000 feet. An additional site that has been determined eligible for listing on the NRHP is also within 1,000 feet of the Project Route (see Tables 4-1 and 4-5).

Site 41GV170 is a campsite with pre-contact ceramics, pumice, asphaltum, lithics, and mammal and bird bone fragments. The site is crossed by the Project Route and has been determined eligible for listing on the NRHP. A review of aerial imagery indicates that at least five of the existing transmission line structures that would be replaced are within the site boundary utilizing existing roadway ROW. The length of the Project Route that crosses 41GV170 is approximately 638 feet. The new transmission line structures are capable of spans of up to 850 feet, and thus could span the recorded boundary of the site. Removal of the existing transmission line structures would be in areas previously disturbed from construction of the existing transmission line and utilizing road ROW, FM 3005. If the site cannot be spanned through the engineering design process, the rebuild construction would be in these previously disturbed areas and within areas that do not contribute to the overall NRHP eligibility of the site.

Site 41GV200 is a pre-contact scatter of eight Tchefuncte ceramic sherds, including seven that retrofit. The site has not been formally evaluated for inclusion on the NRHP and is approximately 249 feet from the Project Route. Two additional archeological sites (41GV174 and 41GV176) are not within the study area but are within 1,000 feet of the Project Route. Site 41GV174 is a pre-contact scatter of Goose Creek Plain ceramic fragments, the Spanish Colonial Revival Stewart mansion built in 1926, and the Stewart Ranch Cemetery. Site 41GV174 is approximately 945 feet from the Project Route. Portions of site 41GV174 have been determined ineligible for listing on the NRHP. Within site 41GV174 is the only

cemetery within 1,000 feet of the Project Route, the Stewart Ranch Cemetery (GV-C080). The cemetery is a designated Historic Texas Cemetery with three reported graves that date between 1950 and 1995 (THC 2024a). The cemetery is approximately 978 feet from the Project Route.

Site 41GV176 is a pre-contact campsite with ceramics, asphaltum, and a chert nodule; and a mid to late-twentieth century trash scatter of amber and clear bottle glass fragments, window glass, concrete fragments, and wire nails. Site 41GV176 has not been formally evaluated for inclusion on the NRHP and is approximately 699 feet from the Project Route. Due to their distances from the Project route, no direct impacts are anticipated for sites 41GV200, 41GV174, 41GV176, and the Stewart Ranch Cemetery. No significant impacts to the viewshed are anticipated because the Project Route will utilize the existing roadway ROW along the existing transmission line.

The Cephas Starret Shipwreck and the Kadosch Shipwreck are recorded within 1,000 feet. Both shipwrecks are designated SALs. The Cephas Starret Shipwreck is approximately 529 feet from the Project Route and the Kadosch Shipwreck is approximately 646 feet from the Project Route. However, the position of the Cephas Starret Shipwreck and the Kadosch Shipwreck are not exact and are most likely located further from the Project Route than indicated by their location available on the TASA. Despite their location information, both wrecks are likely submerged off-shore and further from the Project Route. Due to their distances from the Project Route and location under the water, no impacts are anticipated to the shipwrecks.

TABLE 4-5 ARCHEOLOGICAL SITES WITHIN 1,000 FEET OF THE PROJECT ROUTE

SITE TRINOMIAL	DESCRIPTION	DISTANCE IN FEET FROM CENTERLINE	NRHP ELIGIBILITY
41GV170	pre-contact campsite with ceramics, pumice, asphaltum, lithics, mammal and bird bone fragments; post-contact and modern land development	0	determined eligible
41GV174	pre-contact scatter of Goose Creek Plain ceramic fragments, the Spanish Colonial Revival Stewart mansion built in 1926, and the Stewart Ranch Cemetery (GV-C080)	945	portion has been determined ineligible
41GV176	pre-contact scatter campsite with ceramics, asphaltum, and a chert nodule and a mid to late-20th century trash scatter of amber and clear bottle glass fragments, window glass, concrete fragments, and wire nails	699	undetermined
41GV200	pre-contact scatter of eight Tchefuncte ceramic sherds, seven that retrofit	249	undetermined

Source: THC 2024b.
Notes: Bold entries are crossed by the Project Route.

The Project Route has not been systematically surveyed for cultural resources; therefore, the potential for undiscovered cultural resources exists. HPAs have been designated within the study area and the proposed Project Route length crosses 5.54 miles of HPA. There is the possibility that unknown prehistoric cultural resources and architectural resources may be located along the Project Route. It is anticipated that any sites discovered during engineering or construction phases of the Project Route would be avoided by spanning or minor route adjustments. Thus, the Project Route is not anticipated to have an adverse physical impact on any known cultural resources.

4.5 AESTHETIC VALUES

Aesthetic impacts or impacts to visual resources, occur when the ROW, transmission line or structures of a transmission line create an intrusion into or substantially alter the character of the existing view. In the case of natural scenic areas, the significance of the impact is directly related to the quality of the view. In the case of valued community resources and recreational areas, the significance of the impact is directly related to the importance of the existing setting in the use and enjoyment of an area.

Construction of the Project could have both temporary and permanent aesthetic effects. Temporary impacts would include views of the actual assembly and erection of the concrete poles. Where wooded areas are cleared, the brush and wood debris could have an additional temporary negative impact on the local visual environment. Permanent impacts from the Project would result from visibility of the taller concrete pole structures and the conductors in the existing roadway ROW.

Because no landscapes protected by legislation and no landscapes protected from most forms of development were identified within the study area, potential aesthetic impacts were evaluated by tabulating the linear feet of the Project Route that would potentially create a new or additional impact to potential sensitive views. The length of the Project Route within the foreground visual zone of the following viewpoints or corridors was tabulated:

- US Hwys and SHs within one-half mile with unobstructed views.
- FM roads within one-half mile with unobstructed views.
- Parks and recreational areas within one-half mile with unobstructed views.

The Project Route is not located within the foreground visual zone of any US Hwys or SHs.

The Project Route has approximately 10.78 miles of the route's length located within the foreground visual zone of an FM road.

The Project Route has approximately 2.42 miles of the route's length located within the foreground visual zone of parks and recreational areas.

A summary of the lengths for the Project Route within the foreground visual zone of parks and recreational areas, US Hwys, SHs, and FM roads is presented in Table 4-1.

4.6 ENVIRONMENTAL INTEGRITY

4.6.1 Physiography and Geology

Construction related to rebuilding the existing transmission line is not anticipated to have any significant adverse effects on the physiographic or geologic features and resources of the area. Replacement and erection of the new pole structures proposed for the Project will require the excavation and/or minor disturbance of small quantities of near-surface materials but should have no measurable impacts on the geologic resources or features along the Project Route. Abandoned, plugged, and active oil/gas wells mapped in the study area are not anticipated to be impacted by the Project and no geologic hazards are anticipated to be created by the Project.

4.6.2 Soils

Potential impacts to soils from the construction, operation, and maintenance of electric transmission lines include erosion and compaction. Such impacts can be avoided by CenterPoint Houston's implementation of appropriate mitigative measures during construction. No conversion of prime farmland soils is anticipated because of the Project.

The highest risk for soil erosion and compaction is associated with the clearing and construction phases of the Project. In accordance with CenterPoint Houston standard construction specifications, woody vegetation will be cleared within the ROW as necessary to achieve the conductor to ground clearances of the transmission line. Areas with vegetation removed will have the highest potential for soil erosion and the movement of heavy equipment down the cleared ROW creates the greatest potential for soil compaction. Prior to construction, CenterPoint Houston will develop a SWPPP to minimize potential impacts associated with soil erosion, compaction, and off-ROW sedimentation. Implementation of this plan will incorporate temporary and permanent BMPs to minimize soil erosion on the ROW during rainfall events. The SWPPP will also establish the criteria for mitigating soil compaction and re-

vegetation to maintain soil stabilization during the construction and post construction phases. The native herbaceous layer of vegetation will be maintained, to the extent practical, during construction. Denuded areas will be seeded and/or further stabilized with the implementation of permanent soil berms or interceptor slopes to stabilize disturbed areas and minimize soil erosion potential. The ROW will be inspected during and post construction to identify potential high erosion areas and that BMPs are implemented and maintained.

The potential for erosion and compaction will be minimized by CenterPoint Houston's development and implementation of a SWPPP for the Project.

4.6.3 Water Resources

Surface Water

According to the reviewed data, the Project Route does not cross any named or unnamed surface waters within the study area. CenterPoint Houston proposes to span all surface waters and construct any structures outside of the ordinary high-water marks for any surface waters. CenterPoint Houston will limit the removal of woody vegetation as necessary to meet the necessary conductor to ground clearances. The shorter understory and herbaceous layers of vegetation will remain, where allowable, and BMPs will be implemented in accordance with the SWPPP for the Project to reduce the potential for sedimentation into surface waters. Since CenterPoint Houston intends to span all surface waters and a SWPPP will be implemented during construction, no significant impacts to surface waters are anticipated for the Project Route.

The Project Route has zero stream crossings (there are no river crossings), does not cross open water (lakes, ponds), and does not parallel (within 100 feet) any streams. The length of open water crossings (lakes, ponds), number of streams and rivers crossed, and length of the Project Route paralleling (within 100 feet) streams or rivers are provided in Table 4-1.

Groundwater

The construction, operation, and maintenance of the Project Route is not anticipated to adversely affect groundwater resources within the study area. Potential fuel and/or chemical spills during the construction process could potentially impact both surface water and groundwater resources. Standard operating procedures and spill response specifications relating to petroleum product storage, refueling, and maintenance activities of equipment will be provided as a component of the SWPPP. CenterPoint Houston will take all necessary and available precautions to avoid and minimize the occurrence of such

spills, and remedial and disposal activities associated with any accidental spills will be in accordance with state and federal regulations.

Floodplains

The majority of the Project Route is within FEMA mapped 100-year floodplain. Construction of the Project Route is not anticipated to create any significant changes in the existing topographical grades and is not anticipated to significantly alter existing flow regimes within the floodplain. Engineering design should alleviate the potential of construction activities to adversely impact flood channels and proper structure placement will minimize any flow impedance during a major flood event. Typically, the small footprint of pole structures as proposed for the Project does not significantly alter the flow of water within a floodplain.

The Project Route crosses approximately 10.64 miles of FEMA-mapped floodplain (see Table 4-1). Prior to construction CenterPoint Houston will coordinate with the Galveston County floodplain administrator to acquire any necessary permits.

Future Surface Water Developments

Review of the TWDB State Water Plan (TWDB 2022) and Regional Water Plan (TWDB 2021) did not indicate any planned future surface water development projects proposed within the study area; therefore, the Project Route is not anticipated to impact future surface water development projects.

Ecological Systems

Potential impacts to vegetation of ecological systems within the Project Route will result from clearing the ROW of woody vegetation and/or mowing/clearing of herbaceous vegetation. These activities facilitate ROW access for structure construction, line stringing, and future maintenance activities of the transmission line.

Impacts to vegetation will generally be limited to the roadway ROW. Additional clearing might be necessary in temporary easements outside of the ROW to facilitate the construction of the transmission line. The clearing activities will be completed while minimizing the impacts to existing groundcover vegetation when practical. Future ROW maintenance activities might include periodic mowing and/or herbicide applications to maintain an herbaceous vegetation layer within the ROW.

Clearing trees and shrubs from woodland areas typically generates a degree of habitat fragmentation. The magnitude of anticipated habitat fragmentation was minimized to the extent possible during the routing process by utilizing the existing roadway ROW. Vegetation clearing will occur only where necessary to provide access, workspace, and future maintenance access to the ROW.

As indicated in Table 4-1, the Project Route crosses approximately 0.63 mile of bottomland/riparian woodlands and approximately 1.14 miles across upland woodlands/brushlands.

Wetlands

As indicated in Table 4-1, the Project Route crosses approximately 0.03 mile of NWI mapped wetlands. Unmapped wetlands still have the potential to occur within the study area. Removal of vegetation in wetlands increases the potential for erosion and sedimentation, which can be detrimental to downstream plant communities and aquatic life. Wetland areas also provide habitat to a number of species and are often used as migration corridors for wildlife. Mitigation measures with BMPs will be implemented, as appropriate, in identified areas of wetland potential during construction activities to further avoid and minimize impacts to those areas. CenterPoint Houston proposes to implement BMPs as a component of their SWPPP to prevent off-ROW sedimentation and degradation of potential wetland areas. With the use of these avoidance and minimization measures, the Project Route is not anticipated to have a significant impact on potential wetlands.

The temporary and/or permanent placement of fill material within jurisdictional waterways and wetlands may require a permit from the USACE under Section 404 of the CWA. A delineation of the wetlands crossed by the Project Route will be completed to determine USACE permit requirements prior to construction. If necessary, CenterPoint Houston will coordinate with the USACE–Galveston District prior to clearing and construction to ensure compliance with Section 404 of the CWA. The construction of the Project will likely meet the criteria for the NWP 57 – Electricity Utility Line and Telecommunications Activities.

Texas Coastal Management Program

The entire Project Route is located within the CMZ boundary as defined by 31 TAC § 27.1. CNRAs identified for the Project Route include special hazard areas (FEMA floodplains) and coastal wetlands, but may also include waters of the open Gulf of Mexico, waters under tidal influence, submerged lands, submerged aquatic vegetation, tidal sand and mud flats, oyster reefs, hard substrate reefs, coastal barriers, coastal shore areas, gulf beaches, critical dune areas, special hazard areas (floodplains, etc.), critical

erosion areas, coastal historic areas, and coastal preserves. The entire Project Route is also located seaward of the Coastal Facilities Designation Line as defined in 31 TAC §19.2(a)(21). The proposed Project will be constructed consistent with the applicable goals and policies of the CMP in accordance with 16 TAC § 25.102(a).

As discussed previously, 10.64 miles of FEMA designated 100-year floodplain is mapped within the study area (see Table 4-1). Construction activities would not significantly impede the flow of water within the watershed, significantly impact the overall function of the floodplain, nor adversely affect downstream properties. Prior to construction, if required, CenterPoint Houston will coordinate with the Galveston County floodplain administrator to acquire any necessary floodplain construction permits.

4.6.4 Wildlife and Fisheries

The primary impacts of construction activities on wildlife species are typically associated with temporary disturbances from construction activities, and with the removal of vegetation (habitat modification). Increased noise and equipment movement during construction might temporarily displace mobile wildlife species from the immediate workspace area. These impacts are considered short-term and normal wildlife movements would be expected to resume after construction is completed. Potential long-term impacts include those resulting from habitat modifications and/or fragmentation. The Project Route crosses areas of upland woodlands/brushlands and bottomland/riparian woodlands, which can represent the highest degree of habitat fragmentation by converting the area within the ROW to an herbaceous habitat. During the routing process, POWER attempted to minimize potential woodland habitat fragmentation by utilizing the existing transmission line path, in roadway ROW.

Construction activities might impact small, immobile, or fossorial (living underground) animal species through incidental impacts or from the alteration of local habitats. Incidental impacts to these species might occur due to equipment or vehicular movement on the ROW by direct impact or due to the compaction of the soil if the species is fossorial. Potential impacts of this type are not typically considered significant and are not likely to have an adverse effect on any species population dynamics.

If ROW clearing occurs during bird nesting seasons, potential impacts could occur within the ROW area related to bird eggs and/or nestlings. Increases in noise and equipment activity levels during construction could also potentially disturb breeding or other activities of species nesting in areas immediately adjacent to the ROW. If ROW clearing activities are necessary during the migratory bird nesting season (March 15 to September 15), CenterPoint Houston will comply with state (TPWC Chapter 64) and federal (MBTA)

regulations regarding avian species by having a qualified biologist conduct surveys for active nests prior to ground disturbance and/or vegetation clearing.

Transmission lines can also present additional hazards to birds due to electrocutions and/or collisions. Measures would be implemented to minimize this risk with transmission line through engineering designs. The electrocution risk to birds would not be significant since the engineering design distance between conductors, conductor to structure, or conductor to ground wire for the proposed transmission line is greater than the wingspan of most birds typically expected to occur within the area (i.e., greater than eight feet). The risk for avian collisions with the shield wire can be minimized by installing bird flight diverters or other marking devices on the line within determined high bird use areas.

The study area is located within the Central Migratory Flyway for neo-tropical migratory birds. The risk for bird strikes increases in the fall migration period when low visibility is common due to inclement weather conditions. CenterPoint Houston has an established avian protection plan program implemented through CenterPoint Houston's Environmental Department. Once the Project Route is approved by the PUC, CenterPoint Houston will evaluate avian habitats, and potential high use avian flyways along the route and identify and implement appropriate avian protection measures, where necessary.

Potential impacts to aquatic resources would include potential effects of erosion, siltation, and sedimentation. Vegetation clearing of the ROW might result in increased suspended solids entering surface waters traversed by the Project. Increases in suspended solids might adversely affect aquatic organisms that require relatively clear water for foraging and/or reproduction. Physical aquatic habitat loss or alteration could result wherever riparian vegetation is removed and at temporary crossings required for access. Increased levels of siltation or sedimentation might also potentially impact downstream areas primarily affecting filter feeding benthic and other aquatic invertebrates. Implementation of a SWPPP utilizing BMPs will minimize these potential impacts. No significant adverse impacts are anticipated to any aquatic habitats crossed or located adjacent to the ROW for the Project Route.

Construction of the Project is not anticipated to have significant impacts to wildlife and aquatic resources within the study area. Direct impacts would be associated with the loss of woodland/brushland and bottomland/riparian habitat, which is reflected in the vegetation analysis discussed above. Habitat fragmentation was minimized for the Project Route within woodland areas by utilizing existing roadway ROW. While highly mobile animals might temporarily be displaced from habitats near the ROW during

the construction phase, normal movement patterns should return after Project construction is complete. Implementation of a SWPPP utilizing BMP will minimize potential impacts to aquatic habitats.

Threatened and Endangered Species

In order to assess potential impacts to threatened or endangered species, POWER utilized available information for the species under review. Known occurrence data from TXNDD for the study area and Project scoping comments from TPWD were reviewed as discussed in Section 2.6.5. A USFWS IPaC consultation, TPWD county listings, and USFWS designated critical habitat locations were included in the review.

The TXNDD data provides a GIS data record of state-listed, rare, and federally threatened and endangered species and special status vegetation communities that have been documented within a given area. The absence of species within the TXNDD database is not a substitute for a species-specific field survey as may be needed to assess potential habitat for federally or state-listed special status species. Prior to construction, a field survey would be completed of the Project Route to determine if suitable habitat for threatened and endangered species is present. Additional consultation with the USFWS and TPWD may be required if suitable habitat is observed during field surveys. Review of TPWD'S TXNDD data (TPWD 2024d) identified three EORs within the Project Route, including piping plover, salt marsh snake, and Grand Prairie evening primrose. The piping plover is listed as a threatened species with both the USFWS and TPWD. Although the salt marsh snake and Grand Prairie evening primrose are not federally or state listed, they are endemic to Texas and considered species of greatest conservation need under the SWAP (TPWD 2023). If these species are found during field surveys and/or construction of the Project Route, TPWD recommends that precautions outlined in the SWAP be taken to avoid impacts to them. TPWD's full recommendations are outlined in Appendix A.

Threatened and Endangered Plant Species

Review of the TPWD (2024c) and USFWS (2025a) data identified one plant species that is state-listed within the study area (see Table 2-14 in Section 2.6.5).

The Houston daisy is a state-listed threatened species that may have the potential to occur within the study area where suitable habitat is available. TPWD regulations prohibit the taking, possession, transportation, or sale of any of the plant species designated by state law as endangered or threatened without the issuance of a permit. If necessary, CenterPoint Houston would coordinate with the USFWS

regarding the Houston daisy. The rebuild construction of the Project Route is not anticipated to have adverse effects on federally listed threatened or endangered plant species.

Threatened and Endangered Animal Species

Review of the TPWD (2024c) and USFWS (2025a) data identified 46 animal species that are federally listed and/or federally proposed listed or state-listed for Galveston County (see Table 2-15 in Section 2.6.5).

As indicated in Table 4-1, the Project Route crosses 0.70 mile of USFWS designated critical habitat that could be used by the piping plover. CenterPoint Houston will coordinate with the USFWS and landowners to amend the project as necessary to enable it to proceed without adversely affecting critical habitat. However, due to the Project being a rebuild of an existing transmission line in road ROW, the Project Route is not anticipated to have adverse effects on designated critical habitat of federally listed threatened or endangered animal species.

Federally Listed and Proposed Species

The study area is located outside of the recognized/known distributions of the Attwater's greater prairie chicken, ocean whitetip shark, smalltooth sawfish, blue whale, finback whale, humpback whale, North Atlantic right whale, Rice's whale, sei whale, sperm whale, West Indian manatee, alligator snapping turtle. Therefore, no impacts to these species are anticipated to occur from the Project.

The green sea turtle, hawksbill sea turtle, Kemp's Ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle may occur within the study area wherever suitable habitat is available. However, due to the Project being a rebuild of an existing transmission line in road ROW, it is unlikely that suitable habitat occurs within the expected Project ROW.

The eastern black rail may occur within the study area wherever suitable habitat is available. However, due to the Project being a rebuild of an existing transmission line in road ROW, it is unlikely that suitable habitat occurs within the expected Project ROW.

The Eskimo curlew, piping plover, rufa red knot, and whooping crane may potentially occur temporarily within the study area as transient migrants wherever suitable habitat is available. However, due to the Project being a rebuild of an existing transmission line in road ROW, it is unlikely that suitable habitat occurs within the expected Project ROW. The Project is not anticipated to have adverse impacts to these species nesting habitat due to the Project being limited to existing, maintained road ROW. The USFWS only requires consideration of impacts to the piping plover and rufa red knot for wind energy projects

within their migratory route; however, for due diligence, they have been included in this impact evaluation.

The monarch butterfly is a federally proposed threatened species that may occur within the study area as a temporary migrant at specific times of year within the study area wherever suitable habitat is available. The recent proposal by USFWS to list the monarch butterfly as a threatened species under the ESA includes section 4(d) protective regulations (USFWS 2024b). This species may be susceptible to minor temporary disturbance during construction efforts. However, due to the Project being a rebuild of an existing transmission line in road ROW, it is unlikely that suitable habitat occurs within the expected Project ROW. Due to the Project being limited to existing, maintained road ROW, impacts from the Project Route are not anticipated to occur to this species. If the monarch butterfly becomes federally listed prior to construction, additional consultation with USFWS may be required.

The tricolored bat is a federally proposed endangered species that may occur within the study area wherever suitable habitat is available. TPWD recommends that tree clearing activities should be avoided during the pupping season from May 1 to July 15, during winter torpor from December 15 to February 15, and minimizing the Project's overall tree clearing footprint in anticipation of a listing decision by USFWS. This species may be susceptible to minor temporary disturbance during construction efforts; however, due to the Project being limited to existing, maintained road ROW, impacts from the Project Route are not anticipated to occur to this species' roosting or foraging habitat. If the tricolored bat becomes federally listed prior to construction, additional consultation with USFWS and/or a voluntary environmental review process as detailed by the USFWS Consultation Guidance (USFWS 2024c) for the tricolored bat may be required to determine appropriate mitigation practices.

Other Federally Protected Species

Golden eagles are not anticipated to occur within the study area due to the study area being outside of known habitat and breeding populations. Therefore, impacts to golden eagles are not anticipated.

State-Listed Species

The study area is located outside of the recognized/known distributions of the swallow-tailed kite, wood stork, great hammerhead, shortfin mako shark, Atlantic spotted dolphin, Bryde's whale, Cuvier's beaked whale, dwarf sperm whale, false killer whale, Gervais's beaked whale, killer whale, pygmy killer whale, pygmy sperm whale, Rafinesque's big-eared bat, roughtoothed dolphin, short-finned pilot whale, and Texas horned lizard, and therefore, no impacts to these species are anticipated to occur from the Project.

The black rail, reddish egret, white-faced ibis, and white-tailed hawk may occur within the study area wherever suitable habitat is available. However, due to the Project being a rebuild of an existing transmission line in road ROW, it is unlikely that suitable habitat occurs within the expected Project ROW.

CenterPoint Houston proposes to conduct ROW clearing activities in compliance with state (TPWC Chapter 64) and federal (MBTA) regulations regarding avian species and appoint a qualified biologist to conduct surveys for active nests prior to vegetation clearing.

CenterPoint Houston shall follow the USFWS and TPWD recommendations outlined in Appendix A to avoid and minimize impacts to these species.

5.0 LIST OF PREPARERS

This EA was prepared for CenterPoint Energy by POWER. A list of the POWER employees with primary responsibilities for the preparation of this document is presented below.

RESPONSIBILITY	NAME	TITLE
Project Director	Lisa Barko Meaux	Senior Project Manager I
Project Manager/ Project Coordinator	Denise Williams	Project Manager
Natural Resources	Daniel Ray Mikaela Egbert	Environmental Specialist III Environmental Specialist I
Land Use/Aesthetics	Ashley Brewer Briana Henriques	Environmental Planner I Environmental Planner I
Cultural Resources	Darren Schubert Emily Duke	Project Manager II Cultural Resource Specialist I
Maps/Figures/Graphics	Gray Rackley Evan Doss Kevin Garcia	Senior GIS Analyst I GIS Analyst II GIS Analyst I

This page left blank intentionally.

6.0 REFERENCES CITED

Abbot, James T. 2001. *Houston Area Geoarcheology: A Framework for Archeological Investigation, Interpretation, and Cultural Resource Management in the Houston Highway Management District*. Archeological Studies Program Report 27. Austin: Environmental Affairs Division, Texas Department of Transportation.

Allard, M.W., M.M. Miyamoto, K.A. Bjorndal, A.B. Bolten, and B.W. Bowen. 1994. Support for natal homing in green turtles from mitochondrial DNA sequences. Copeia 1994:34-41.

American Birding Association (ABA). 2024. The ABA Checklist. Version 8.17 – November 2024. https://www.aba.org/aba-checklist/. Accessed January 2025.

America's Scenic Byways. 2024. Information. https://scenicbyways.info/. Accessed December 2024.

Arvin, J.C. 2007. Birds of the South Texas Brushlands. A Field Checklist. Texas Parks and Wildlife Department. Austin Texas. https://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_w7000_1033.pdf Accessed January 2025.

Aten, Lawrence E. 1979. *Indians of the Upper Texas Coast: Ethnohistoric and Archaeological Frameworks.* Ph.D. dissertation, Department of Anthropology, University of Texas at Austin.

_____. 1983. *Indians of the Upper Texas Coast*. New York: Academic Press.

Aten, Lawrence E., and Charles N. Bollich. 2024. The Mossy Grove Tradition. Published by Texas Beyond History. https://www.texasbeyondhistory.net/coast/prehistory/images/mossy.html. Accessed October 2024.

Blair, W.F. 1950. "The Biotic Provinces of Texas." *Texas Journal of Science* 2:93-117.

Bowling, B. 2012 "List of Marine Fishes of Texas." https://txmarspecies.tamug.edu/fish%20names%20table.cfm. Accessed January 2025.

Bradley, R.D., L.K. Ammerman, R.J. Baker, L.C. Bradley, J.A. Cook, R.C. Dowler, C. Jones, D.J. Schmidly, F.B. Stangl, Jr., R.A. Van Den Bussche, and B. Wursig. 2014. Revised checklist of North American mammals north of Mexico, Texas Tech University, Natural Science Research Laboratory. https://archive.org/details/revisedchecklis327brad/revisedchecklis327brad/page/12/mode/2up/. Accessed January 2025.

Bureau of Economic Geology (BEG). 1996. Physiographic Map of Texas. Bureau of Economic Geology, University of Texas at Austin. Austin, Texas.

Campbell, L. 2003. *The Endangered and Threatened Animals of Texas.* Texas Parks and Wildlife Department. 129 pp. https://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_w7000_0013.pdf. Accessed January 2025.

City of Galveston. 2011. 2011 Comprehensive Plan. https://www.galvestontx.gov/626/Comprehensive-Plan. Accessed December 2024.

Collins, Michael B. 2002. *The Gault Site*. Texas and Clovis Research. Athena Review 3(2):24-36.

Coulter, M.C., J.A. Rodgers Jr., J.C. Ogden, and F.C. Depkin. 1999. Wood Stork (*Mycteria americana*), version 2.0. Cornell Lab of Ornithology. *The Birds of North America* (A.F. Poole and F.B. Gill, Editors). https://doi.org/10.2173/bna.409. Accessed January 2025.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service, Office of Biological Services, Washington, D.C.

Crother, B.I. (ed.). 2017. *Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, with Comments Regarding Confidence in Our Understandings* pp. 1-102. SSAR Herpetological Circular 43. https://ssarherps.org/wp-content/uploads/2017/10/8th-Ed-2017-Scientific-and-Standard-English-Names.pdf. Accessed January 2025.

Dixon, J.R. 2013. *Amphibians and Reptiles of Texas*, 3rd ed. Texas A&M University Press. College Station, Texas. 447pp.

Elliot, L. 2014. Descriptions of Systems, Mapping Subsystems, and Vegetation Types for Texas. https://tpwd.texas.gov/landwater/land/programs/landscape-ecology/ems/emst/texasecologicalsystemsdescriptions_2016.pdf. Accessed December 2024.

Ensor, H. Blaine and David L. Carlson. 1991 Conclusion. In Alabonson Road: Early Ceramic Period Adaptation to the Inland Coastal Prairie Zone, Harris County, Texas. Reports of Investigation No. 8. H. Blaine Ensor and David L. Carlson, eds. College Station: Texas A&M University, Archeological Research Laboratory.

Federal Aviation Administration (FAA). 2024a. National Aeronautical Charting Office. Houston Sectional Aeronautical Chart, Effective October 31, 2024. https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/vfr/. Accessed December 2024.

_____. 2024b. Chart Supplement South Central U.S. http://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/dafd/. Accessed December 2024.

_____. 2024c. Airport Data and Information Portal. https://adip.faa.gov/agis/public/#/airportSearch/advanced. Accessed December 2024.

Federal Communication Commission (FCC). 2024. Licensing & Databases. Databases. https://www.fcc.gov/licensing-databases/search-fcc-databases. Accessed December 2024.

Federal Emergency Management Agency (FEMA). 2022. Zone VE and V1-30. https://www.fema.gov/about/glossary/zone-ve-and-v1-30. Accessed January 2025.

_____. 2023. Zone AE. https://www.fema.gov/about/glossary/zone-ae. Accessed January 2025.

_____. 2024. FEMA's National Flood Hazard Layer (NFHL)Viewer. https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd. Accessed December 2024.

Foradas, James G. 2006. *An Intensive Pedestrian Survey for the Proposed Galveston West End Sewer Construction Project in Galveston County, Texas*. HRA Gray & Pape, LLC, Houston.

Foster, William C. 2008. Historic Native Peoples of Texas. University of Texas Press, Austin.

Galveston County. 2024. County of Galveston Appraisal District. https://www.galvestoncountytx.gov/home. Accessed December 2024.

Google Earth, Inc. 2024. Google Earth: Aerial Maps. Google Earth version 7.1.2.2041. Google Inc.

Gould, F.W., G.O. Hoffman, and C.A. Rechenthin. 1960. Vegetational Areas of Texas Including Cropland. Part 1. Texas Parks and Wildlife Department. 3p. https://tpwd.texas.gov/publications/pwdpubs/media/pwd_bn_w7000_0120_01.pdf. Accessed January 2025.

Griffith, G., S. Bryce, J. Omernik, and A. Rogers. 2007. Ecoregions of Texas. Project Report to Texas Commission on Environmental Quality. Austin, Texas. 125pp. https://texashistory.unt.edu/ark:/67531/metapth640838/m1/1/. Accessed January 2025.

Griffith, Timothy B. and Ross C. Fields. 2011. *Archeological Survey of Proposed Multi-Use Camping Area and Nearby Facilities at Galveston Island State Park, Galveston County, Texas.* Prewitt and Associates, Inc., Austin.

Hall, Grant D. 1981. Allens Creek: a study in the cultural prehistory of the Lower Brazos River Valley, Texas. Technical Report 61, Texas Archeological Survey. The University of Texas at Austin. Austin, Texas.

2000. Pecan Food Potential in Prehistoric North America. *Economic Botany* 54: 103-112.

Henke S.E. and W.S. Fair. 1998. Management of Texas Horned Lizards. Wildlife Management Bulletin of the Caesar Kleberg Wildlife Research Institute. Texas A&M University-Kingsville. No. 2.

Henson, Margaret Swett. 2024. Harris County. *Handbook of Texas Online*. Published by the Texas State Historical Association. Available online at: https://www.tshaonline.org/handbook/entries/harris-county (accessed August 2024).

Hester, Thomas R. 1980. "A Survey of Paleo-Indian Archaeological Remains along the Texas Coast." In *Papers on the Archeology of the Texas Coast.* Special Report No. 11. Lynn Highley and Thomas R. Hester, eds. Pp1-12. San Antonio: The University of Texas at San Antonio, Center for Archaeological Research.

Howard, Margaret A., Gail L. Bailey, C. Britt Bousman, Karen M. Gardner, and Ross C. Fields. 1991. *National Register Testing at the Spanish Moss Site (41GV10) and 41GV53, Galveston County, Texas.* Reports of Investigations Number 77. Austin: Prewitt and Associates, Inc.

Hubbs, C. 1957. "Distributional patters of Texas freshwater fishes." *Southwest Naturalist* 2:89-104. https://www.edwardsaquifer.org/wp-content/uploads/2019/02/1957_Hubbs_DistributionalPatterns.pdf. Accessed January 2025.

Iruegas, Sergio, Reign Clark, and Russell Brownlow. 2003. *An Intensive Cultural Resources Survey on Approximately 800 Acres at the Western End of Galveston Island Galveston County, Texas*. Horizon Environmental Services, Inc., Austin.

Kleiner, Diana J. 2024. Galveston County. *Handbook of Texas Online*. Published by the Texas State Historical Association. Available online at: https://www.tshaonline.org/handbook/entries/galveston-county. Accessed October 2024.

Koczur, L.M., M.C. Green, B.M. Ballard, P.E. Lowther, and R.T. Paul. 2020. Reddish Egret (*Egretta rufescens*), version 1.0. In *Birds of the World* (P.G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.redegr.01. Accessed January 2025.

Lefebvre, L.W., T.J. O'Shea, G.B. Rathbun and R.C. Best. 1989. "Distribution, Status, and Biogeography of the West Indian Manatee." Pages 567-610 in C.A. Woods (editor). Biogeography of the West Indies. Sandhill Crane Press, Gainesville, Florida.

Lockwood, M.W. and B. Freeman. 2014. The *TOS Handbook of Texas Birds*, 2nd edition, Revised. Texas A&M University Press. College Station, Texas. 403pp.

Loeb, S.C., M.J. Lacki, and D.A. Miller, eds. 2011. Conservation and management of eastern big-eared bats: a symposium. Gen. Tech. Rep. SRS-145. Asheville, NC: US Department of Agriculture, Forest Service, Southern Research Station. 157 pp.

Long, R.J. 1977. McFaddin Beach. Patillo Higgins Series of Natural History and Anthropology, No. 1. Beaumont: Lamar University.

Mahoney, R.B. (editor), L.A. Alvarado, R.B. Barnes, M.A. Howard, J.D. Lowe, A.S. Lyle, R.B. Mahoney, and R.A. Mathews. 2016. *Texas Parks and Wildlife Department Report of Archeological Investigations for 2016*. Texas Parks and Wildlife Department, Austin.

Mahoney, Richard B. (editor), Christopher R. Lintz, Anthony S. Lyle, Ruth A. Mathews, and Logan D. McNatt. 2011. *Texas Parks and Wildlife Department report of Archeological Investigations for 2011*. Texas Parks and Wildlife Department, Austin.

Mathews, Ruth A. 2011. "Archeological Survey of 41GV170 at Galveston Island State Park, Galveston County, Texas." In *Texas Parks and Wildlife Department Report of Archeological Investigations for 2011*. Texas Parks and Wildlife Department, Austin.

McComb, David G. 2024. Galveston, TX. *Handbook of Texas Online.* Published by the Texas State Historical Association. Available online at: https://www.tshaonline.org/handbook/entries/galveston-tx. Accessed October 2024.

McWilliams, Jennifer K., and Ross C. Fields. 2012. *Archeological Survey of 50 Acres at Galveston Island State Park, Galveston County, Texas*. Prewitt and Associates, Inc., Austin.

Mercado-Allinger, Patricia A., Nancy A. Kenmotsu, and Timothy K. Perttula. 1996. *Archeology in the Central and Southern Planning Region, Texas: A Planning Document*. Edited by Office of the State Archeologist, Special Report 35, and Department of Antiquities Protection, CRM Report 7.

Meyer, K.D. 1995. "Swallow-tailed Kite (*Elanoides forficatus*)," version 2.0. *The Birds of North America* (A.F. Poole and F.B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bna.138. Accessed January 2025.

Meylan, A.B., B.W. Bowden, and J.C. Avise. 1990. "A genetic test of the natal homing versus social facilitation models for green turtle migration." *Science* 248:724-727.

Miller, M.H., J. Carlson, L. Hogan, and D. Kobayashi. 2014. Status review report: great hammerhead shark (*Sphyrna mokarran*). Final Report to National Marine Fisheries Service, Office of Protected Resources. https://repository.library.noaa.gov/view/noaa/16286. Accessed January 2025.

Moore, Roger G. 1992 An Archaeological Survey of the Telge Road Park Tract, Harris County, Texas. Report of Investigations Number 61. Houston: Moore Archeological Consulting, Inc.

_____ . 1995. The Mossy Grove Model of Long-Term Forager-Collector Adaptations in Inland Southeast Texas. Unpublished Ph.D. Dissertation, Rice University, Houston.

National Agricultural Imagery Program (NAIP). 2022. Galveston County, Texas. https://datagateway.nrcs.usda.gov/. Accessed December 2024.

National Conservation Easement Database (NCED). 2024. NCED Easements. https://site.tplgis.org/NCED/planningapp/. Accessed December 2024.

National Marine Fisheries Service (NMFS). 2011. Final Recovery Plan for the Sei Whale (*Balaenoptera borealis*). National Marine Fisheries Service, Office of Protected Resources, Silver Spring, MD. 108 pp. https://repository.library.noaa.gov/view/noaa/15977. Accessed January 2025.

National Marine Fisheries Service and United States Fish and Wildlife Service (NMFS and USFWS). 1993. Recovery Plan for Hawksbill Turtles in the U.S. Caribbean Sea, Atlantic Ocean, and Gulf of Mexico. https://ecos.fws.gov/docs/recovery_plan/931110.pdf. Accessed January 2025.

National Oceanic and Atmospheric Administration (NOAA). 2022a. Atlantic Spotted Dolphin. https://www.fisheries.noaa.gov/species/atlantic-spotted-dolphin. Accessed January 2025.

_____. 2022b. Rough-toothed Dolphin. https://www.fisheries.noaa.gov/species/rough-toothed-dolphin. Accessed January 2025.

_____. 2023a. Blue Whale. https://www.fisheries.noaa.gov/species/blue-whale. Accessed January 2025.

_____. 2024a. Oceanic Whitetip Shark. https://www.fisheries.noaa.gov/species/oceanic-whitetip-shark. Accessed January 2025.

_____. 2024b. Smalltooth Sawfish. https://www.fisheries.noaa.gov/species/smalltooth-sawfish. Accessed January 2025.

_____. 2024c. Fin Whale. https://www.fisheries.noaa.gov/species/fin-whale. Accessed January 2025.

_____. 2024d. Humpback Whale. https://www.fisheries.noaa.gov/species/humpback-whale. January 2025.

_____. 2024e. North Atlantic Right Whale. https://www.fisheries.noaa.gov/species/north-atlantic-right-whale. Accessed January 2025.

_____. 2024f. Rice's Whale. https://www.fisheries.noaa.gov/species/rices-whale. Accessed January 2025.

_____. 2024g. Sei Whale. https://www.fisheries.noaa.gov/species/sei-whale. Accessed January 2025.

_____. 2024h. Sperm Whale. https://www.fisheries.noaa.gov/species/sperm-whale. Accessed January 2025.

_____. 2024i. Green Sea Turtle. https://www.fws.gov/species/green-sea-turtle-chelonia-mydas. Accessed January 2025.

_____. 2024j. Hawksbill Turtle. https://www.fisheries.noaa.gov/species/hawksbill-turtle. Accessed January 2025.

_____. 2024k. Kemp's Ridley Turtle. https://www.fisheries.noaa.gov/species/kemps-ridley-turtle. January 2025.

_____. 2024l. Leatherback Turtle. https://www.fisheries.noaa.gov/species/leatherback-turtle. Accessed January 2025.

_____. 2024m. Loggerhead Turtle. https://www.fisheries.noaa.gov/species/loggerhead-turtle. Accessed January 2025.

_____. 2024n. Atlantic Shortfin Mako Shark. https://www.fisheries.noaa.gov/species/atlantic-shortfin-mako-shark. Accessed January 2025.

_____. 2024o. Bryde's Whale. https://www.fisheries.noaa.gov/species/brydes-whale. Accessed January 2025.

_____. 2024p. False Killer Whale. https://www.fisheries.noaa.gov/species/false-killer-whale. Accessed January 2025.

_____. 2025a. Dwarf Sperm Whale. https://www.fisheries.noaa.gov/species/dwarf-sperm-whale. Accessed January 2025.

_____. 2025b. Gervais's Beaked Whale. https://www.fisheries.noaa.gov/species/gervais-beaked-whale. Accessed January 2025.

_____. 2025c. Pygmy Killer Whale. https://www.fisheries.noaa.gov/species/pygmy-killer-whale. Accessed January 2025.

_____. 2025d. Pygmy Sperm Whale. https://www.fisheries.noaa.gov/species/pygmy-sperm-whale. Accessed January 2025.

_____. 2025e. Cuvier's Beaked Whale. https://www.fisheries.noaa.gov/species/cuviers-beaked-whale. Accessed January 2025.

_____. 2025f. Short-finned Pilot Whale. https://www.fisheries.noaa.gov/species/short-finned-pilot-whale. Accessed January 2025.

_____. 2025g. Killer Whale. https://www.fisheries.noaa.gov/species/killer-whale. Accessed January 2025.

National Park Service (NPS). 2023a. Padre Island. Hawksbill Sea Turtle. https://www.nps.gov/pais/learn/nature/hawksbill.htm#:~:text=Only%20one%20hawksbill%20nest%20has,to%20many%20other%20marine%20species. Accessed January 2025.

_____. 2023b. Padre Island. Leatherback Sea Turtle. https://www.nps.gov/pais/learn/nature/leatherback.htm#:~:text=Leatherbacks%20prefer%20deep%20oceanic%20waters,at%20Padre%20Island%20National%20Seashore. Accessed January 2025.

_____. 2024a. National Parks. Texas. https://www.nps.gov/findapark/index.htm Accessed December 2024.

_____. 2024b. National Register of Historic Places Program: Research. https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466. Accessed September 2024.

_____. 2024c. National Historic Landmarks Program. https://www.nps.gov/orgs/1582/index.htm. Accessed December 2024.

_____. 2024d. National Historic Trails. https://www.nps.gov/subjects/nationaltrailssystem/national-historic-trails.htm. Accessed December 2024.

_____. 2024e. National Trails System Map. https://www.nps.gov/subjects/nationaltrailssystem/index.htm. Accessed December 2024.

National Wild and Scenic Rivers System (NWSRS). 2024. National Wild and Scenic Rivers System Wild and Scenic Rivers by State. http://www.rivers.gov/map.php. Accessed December 2024.

Natural Resources Conservation Service (NRCS). 2025. NRCS Soil Web Survey. http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed January 2025.

NatureServe. 2025. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Houston Tansy-aster (*Rayjacksonia aurea*). https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.133649/Rayjacksonia_aurea. Accessed January 2025.

Newcomb, W.W. 1961. *The Indians of Texas: From Prehistoric to Modern Times.* Austin: University of Texas Press.

Oberholser, H. C. 1974. The bird life of Texas. University of Texas Press, Austin.

Padilla, Antonio E., Amy E. Benton and Jon C. Lohse. 2011. *Results of an Archaeological Survey at Galveston Island State Park, Galveston County, Texas*. Center for Archaeological Studies, Texas State University-San Marcos, Galveston.

Patterson, L.W. 1980. *The Owen Site, 41HR315: A Long Occupation Sequence in Harris County, Texas.* Report No. 3. Houston: Houston Archeological Society.

_____. 1995. *Southeast Texas Archeology*. Report Number 12. Houston Archeological Society.

_____. 1996 Southeast Texas Archeology. Report Number 12. Houston Archaeological Society.

Perttula, Timothy K. 2004. An Introduction of Texas Prehistoric Archeology. In *The Prehistory of Texas*, edited by Timothy K. Perttula, 5-14pp. Texas A&M University Press, College Station, Texas.

PLATTS. 2024. McGraw Hill Financial, Inc., 2 Penn Plaza, New York, New York. Accessed December 2024.4

Renaud, M. and J. Williams. 1995. Movements of Kemp's Ridley (*Lepidochelys kempii*) and Green (*Chelonia mydas*) Sea Turtles Using Lavaca Bay and Matagorda Bay. May 1994–May 1995. Final Report: U.S. Army Corps of Engineers, Galveston and New Orleans Districts. https://chelonian.org/wp-content/uploads/file/CCB_Vol_4_Nos1-4(2001-2005)/Renaud_and_Williams_2005a.pdf. Accessed January 2025.

Railroad Commission of Texas (RRC). 2015. Mining Regions/Fields and Sites. https://www.rrc.texas.gov/surface-mining/historical-coal-mining/mining-regions-fields-and-sites/. Accessed December 2024.

_____. 2024a. Public GIS Map Viewer for Oil, Gas, and Pipeline Data. https://gis.rrc.texas.gov/GISViewer/. Accessed December 2024.

_____. 2024b. Permits, Permitted Coal Mining Locations. Lignite Surface Mine Permit Location Map. https://www.rrc.texas.gov/media/rg3dswyf/coal-mine-map-02-2023.pdf. Accessed December 2024.

_____. 2024c. Surface Coal Mine County Information. https://www.rrc.texas.gov/surface-mining/permits/surface-coal-mine-county-information/. Accessed December 2024.

_____. 2024d. Texas Uranium Exploration Permits. https://www.rrc.texas.gov/surface-mining/programs/uranium-exploration/texas-uranium-exploration-permits/. Accessed December 2024.

Ricklis, Robert A. 1994 Aboriginal Life and Culture on the Upper Texas Coast: Archaeology at the Mitchell Ridge Site, 41GV66, Galveston Island. Corpus Christi: Coastal Archaeological Research, Inc.

_____.2004. "Prehistoric Occupation of the Central and Lower Texas Coast: A Regional Overview." In *The Prehistory of Texas,* edited by Timothy K. Perttula, pp.155-180. Texas A&M University Press, College Station.

Schmidly, D.J. and R.D. Bradley. 2016. *The Mammals of Texas,* 7th edition. University of Texas Press. Austin, Texas. 720pp.

Sick, Rebecca. 2008. Cultural Resources Intensive Pedestrian Survey of 115 acres associated with the Spoonbill Bay Development Project in Galveston County, Texas. Hra Gray & Pape, Houston.

Society for the Study of Amphibians and Reptiles. 2017. Scientific and Standard English Names of Amphibians and Reptiles in North America North of Mexico, with Comments Regarding Confidence in our Understanding. 8th Edition. https://ssarherps.org/wp-content/uploads/2017/10/8th-Ed-2017-Scientific-and-Standard-English-Names.pdf. Accessed January 2025.

Stevenson, J.M. 2024. Birds of Galveston Island State Park: a field checklist. Natural Resource Program, Texas Parks and Wildlife, Austin, Texas. 20pp.

Story, Dee Ann. 1985. "Adaptive Strategies of Archaic Cultures of the West Gulf Coastal Plain." In P*rehistoric Food Production in North America.* R.I. Ford, ed. Pp 19-56. Anthropological Papers No. 75. Ann Harbor: Museum of Anthropology, University of Michigan.

Story, Dee Ann, Janice A. Guy, Barbara A. Burnett, Martha Doty Freeman, Jerome C. Rose, D. Gentry Steele, Ben W. Olive, and Karl J. Reinhard. 1990. *The Archeology and Bioarcheology of the Gulf Coastal Plain*: Volume 1. Research Series No. 38. Fayetteville: University of Arkansas, Arkansas Archeological Survey.

Stutzenbaker, C.D. 2010. *Aquatic and Wetland Plants of the Western Gulf Coast.* Texas A&M University Press, Texas A&M University Press, College Station, Texas. 465 pp.

Texas Commission on Environmental Quality (TCEQ). 2024a. Index to Superfund Sites by County. http://www.tceq.texas.gov/remediation/superfund/sites/county. Accessed January 2025.

_____. 2024b. Municipal Solid Waste Viewer. https://tceq.maps.arcgis.com/apps/webappviewer/index.html?id=33ac0b935f434cee927affd480307b14. Accessed January 2025.

_____. 2024c. 2024 Texas Integrated Report – Index of Water Quality Impairments. https://www.tceq.texas.gov/downloads/water-quality/assessment/integrated-report-2024/2024-imp-index. Accessed January 2025.

_____. 2025. Aggregate Production Site Maps. https://data.texas.gov/stories/s/Search-for-Active-Aggregate-Production-Operations/9kvs-ig69/. Accessed January 2025.

Texas Department of Transportation (TxDOT). 2024a. County Grid Map Search. http://www.dot.state.tx.us/apps-cg/grid_search/county_grid_search.htm. Accessed December 2024.

_____. 2024b. Project Tracker. https://apps3.txdot.gov/apps-cq/project_tracker/. Accessed December 2024.

_____. 2024c. TxDOT Historic Resources of Texas Aggregator. https://txdot.maps.arcgis.com/apps/webappviewer/index.html?id=e13ba0aa78bf4548a8e98758177a8dd5. Accessed September 2024.

Texas Education Agency (TEA). 2024. School District Locator. http://tea.texas.gov/Texas_Schools/General_Information/School_District_Locator/School_District_Locator/. Accessed December 2024.

Texas General Land Office (GLO). 2015. The Texas Coastal Zone. file://houfs1/Enviro/ENVIRO%20Projects/0253743_CNP_Stewart-West%20Bay/PER/02%20Environmental/02%20Resources/04%20Wetlands%20&%20Water/GLOCoastalBoundaryMap.pdf. Accessed January 2025.

_____. 2025. Coastal Management Program. https://www.glo.texas.gov/coastal/protecting-coast/coastal-management-program. Accessed January 2025.

Texas Historical Commission (THC). 2024a. Texas Archeological Sites Atlas (TASA). http://atlas.thc.state.tx.us/. Accessed September 2024.

_____. 2024b. Texas Historical Sites Atlas (THSA). (Restricted Access). http://nueces.thc.state.tx.us/. Accessed September 2024.

_____. 2024c. Texas Historical Commission. Texas Heritage Trails Program – Texas Independence Trail Region. http://texasindependencetrail.com/map. Accessed December 2024.

Texas Land Conservancy (TLC). 2024. Our Work. https://www.texaslandconservancy.org/our-work. Accessed December 2024.

Texas Parks and Wildlife Department (TPWD). 2015. Assessing Black Rail occupancy and vocalizations along the Texas Gulf Coast. Final Report, 16 February 2015. https://tpwd.texas.gov/huntwild/wild/wildlife_diversity/nongame/grants-research/media/2015-black-rail.pdf. Accessed January 2025.

_____. 2023. State Wildlife Action Plan (SWAP). https://tpwd.texas.gov/documents/504/State_Wildlife_Action_Plan_for_Texas_2023_USFWS_Final_Submission.pdf. Accessed January 2025.

_____. 2024a. Texas Parks and Wildlife - Find a Park. http://www.tpwd.state.tx.us/spdest/findadest/. Accessed December 2024.

_____. 2024b. Great Texas Wildlife Trail. Upper Texas Coast - Great Texas Coastal Birding Trail. https://tpwd.texas.gov/huntwild/wildlife/wildlife-trails/utc. Accessed December 2024.

_____. 2024c. Rare, Threatened and Endangered Species of Texas (RTEST) – Query by County. http://tpwd.texas.gov/gis/rtest/. Accessed December 2024.

_____. 2024d. Texas Natural Diversity Database (TXNDD) Information Request Tool Application, Version 3. Austin, Texas. Data received December 2024.

_____. 2025a. Texas Watershed Viewer. https://tpwd.maps.arcgis.com/apps/Viewer/index.html?appid=2b3604bf9ced441a98c500763b8b1048. Accessed January 2025.

_____. 2025b. Ecologically Significant Stream Segments – Region H. https://tpwd.texas.gov/landwater/water/conservation/water_resources/water_quantity/sigsegs/regionl.phtml. Accessed January 2025.

_____. 2025c. Texas Ecosystem Analytical Mapper. https://tpwd.texas.gov/gis/team/. Accessed January 2025.

_____. 2025d. Eskimo Curlew (*Numenius borealis*). https://tpwd.texas.gov/huntwild/wild/species/eskcurl/. Accessed January 2025.

_____. 2025e. White-faced Ibis (*Plegadis chihi*). https://tpwd.texas.gov/huntwild/wild/species/ibis/#:~:text=This%20ibis%20has%20reddish%20legs,stems%20or%20on%20mud%20banks. Accessed January 2025.

_____. 2025f. Texas Horned Lizard (*Phrynosoma cornutum*). https://tpwd.texas.gov/huntwild/wild/species/thlizard/. Accessed January 2025.

Texas State Data Center (TXSDC). 2022. Data. Texas Population Projections Program. 2022 Population Projections Data Downloads. https://demographics.texas.gov/Projections/2022/. Accessed December 2024.

Texas Water Development Board (TWDB). 1975. *Major and Historical Springs of Texas.* Texas Water Development Board, Report 189. Austin, Texas.

_____. 2021. 2021 Regional Water Plans. Region H. https://www.twdb.texas.gov/waterplanning/rwp/plans/2021/index.asp#region-h. Accessed January 2025.

_____. 2022. 2022 State Water Plan. https://www.twdb.texas.gov/waterplanning/swp/2022/index.asp. Accessed January 2025.

_____. 2025. Water Data Interactive. https://www2.twdb.texas.gov/apps/waterdatainteractive/groundwaterdataviewer. Accessed January 2025.

The Nature Conservancy (TNC). 2024. Texas. Places We Protect. http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/texas/placesweprotect/index.htm. Accessed December 2024.

Thomas, C., T.H. Bonner, and B.G. Whiteside. 2007. *Freshwater Fishes of Texas a Field Guide*. Texas A&M University Press. College Station, Texas. 202pp.

Turner, E.S. and P. Tanner. 1994. The McFaddin Beach Site on the Upper Texas Gulf Coast. *Bulletin of the Texas Archaeological Society* 65:319-336.

Turpin, Jeff. 2003. *A Reassessment of Prehistoric Site 41GV99,Bolivar Peninsula Beach Restoration, Galveston Co., TX*. TAS, Inc., Austin.

United States Census Bureau (USCB). 2010. Census 2010. https://www.census.gov/quickfacts/fact/table/galvestoncountytexas,TX/PST045223. Accessed December 2024.

_____. 2024. Explore Census Data. Advance Search. https://data.census.gov/cedsci/advanced. Accessed December 2024.

United States Department of Agriculture (USDA). 2012. 2012 Census of Agriculture – Texas – State and County Profiles. https://agcensus.library.cornell.edu/census_year/2012-census/. Accessed December 2024.

_____. 2017. 2017 Census of Agriculture – Texas – State and County Profiles. https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Texas/. Accessed December 2024.

United States Department of Transportation (USDOT). 2024. Federal Railroad Administration – Safety Map. https://fragis.fra.dot.gov/GISFRASafety/. Accessed December 2024.

United States Environmental Protection Agency (USEPA). 2024. WATERS GeoViewer. https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=074cfede236341b6a1e03779c2bd0692. Accessed December 2024.

_____. 2025. Superfund Sites Where You Live. https://www.epa.gov/superfund/search-superfund-sites-where-you-live. Accessed January 2025.

United States Fish and Wildlife Service (USFWS). 1993. Recovery Plan for the Hawksbill Turtle (*Eretmochelys imbricata*) in the U.S. Caribbean, Atlantic, and Gulf of Mexico. U.S. Fish and Wildlife Service, Atlanta, GA. National Marine Fisheries Service, Washington, D.C. https://www.nrc.gov/docs/ML1020/ML102040291.pdf. Accessed January 2025.

_____. 1996. Revised Recovery Plan for the U.S. Breeding Population of Wood Storks. U.S. Fish and Wildlife Service, Atlanta, GA. https://ecos.fws.gov/docs/recovery_plan/970127.pdf. Accessed January 2025.

_____. 2009. Whooping Cranes and Wind Development, An issue Paper. USFWS Region 2 and Region 6, April 2009. https://tethys.pnnl.gov/sites/default/files/publications/USFWS_2009.pdf. Accessed January 2025.

_____. 2013. Rufa Red Knot (*Calidris canutus rufa*). https://www.fws.gov/sites/default/files/documents/Red%20knot_fact%20sheet.pdf. Accessed January 2025.

_____. 2024a. National Wetland Inventory (NWI) Mapper. https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/. Accessed December 2024.

_____. 2024b. *Endangered and threatened wildlife and plants; Threatened species status with section 4(d) rule for monarch butterfly and designation of critical habitat*. Federal Register, 89(239), 100662–100670. https://www.fws.gov/sites/default/files/documents/2024-12/threatened-species-status-with-section-4-d-rule-for-monarch-butterfly-and-designation-of-critical-habitat_0.pdf. Accessed January 2025.

_____. 2024c. Northern Long-eared Bat and Tricolored Bat Voluntary Environmental Review Process for Development Projects Version 1.0. https://www.fws.gov/sites/default/files/documents/2024-10/nleb_tcb_consultation_guidance_version-1.0_final_0.pdf. Accessed January 2025.

_____. 2025a. Information for Planning and Consultation (IPaC). Report requested and received on January 10, 2025. Project Code: 2025-0040257.

_____. 2025b. Attwater's Greater Prairie Chicken. https://www.fws.gov/species/attwaters-greater-prairie-chicken-tympanuchus-cupido-attwateri. Accessed January 2025.

_____. 2025c. Eastern Black Rail. https://www.fws.gov/species/eastern-black-rail-laterallus-jamaicensis-jamaicensis. Accessed January 2025.

_____. 2025d. Piping Plover. https://www.fws.gov/species/piping-plover-charadrius-melodus. Accessed January 2025.

_____. 2025e. Rufa Red Knot. https://www.fws.gov/species/rufa-red-knot-calidris-canutus-rufa. Accessed January 2025.

_____. 2025f. Whooping Crane. https://www.fws.gov/species/whooping-crane-grus-americana. Accessed January 2025.

_____. 2025g. Manatee. https://www.fws.gov/species/manatee-trichechus-manatus. Accessed January 2025.

_____. 2025h. Monarch. https://www.fws.gov/species/monarch-danaus-plexippus. Accessed January 2025.

_____. 2025i. Tricolored Bat. https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus. Accessed January 2025.

_____. 2025j. Alligator Snapping Turtle. https://www.fws.gov/species/alligator-snapping-turtle-macrochelys-temminckii. Accessed January 2025.

_____. 2025k. Bald Eagle. https://www.fws.gov/species/bald-eagle-haliaeetus-leucocephalus. Accessed January 2025.

_____. 2025l. Golden Eagle. https://www.fws.gov/species/golden-eagle-aquila-chrysaetos. Accessed January 2025.

United State Geological Survey (USGS). 1933. Lake Como, Tex. 1:31,680 topographic map.

_____. 1952a. Lake Como, Tex Quadrangle Map. 7.5 Minute Series.

_____. 1952b. San Luis Pass, Tex Quadrangle Map. 7.5 Minute Series.

_____. 1954. Lake Como, Tex Quadrangle Map. 7.5 Minute Series.

_____. 1963a. San Luis Pass, Tex Quadrangle Map. 7.5 Minute Series.

_____. 1963b. Sea Isle, Tex Quadrangle Map. 7.5 Minute Series.

_____. 1969. Lake Como, Tex Quadrangle Map. 7.5 Minute Series.

_____. 1974a. Lake Como, Tex Quadrangle Map. 7.5 Minute Series.

_____. 1974b. San Luis Pass, Tex Quadrangle Map. 7.5 Minute Series.

_____. 1974c. Sea Isle, Tex Quadrangle Map. 7.5 Minute Series.

_____. 2014. Texas Water Science Center: Geologic Database of Texas. https://data.geographic.texas.gov/collection/?c=79a18636-3419-4e22-92a3-d40c92eced14. Accessed January 2025.

_____. 2022a. San Luis Pass. Tex. Quadrangle Map. 7.5 Minute Series.

_____. 2022b. Sea Aisle. Tex. Quadrangle Map. 7.5 Minute Series.

_____. 2022c. Lake Como. Tex. Quadrangle Map. 7.5 Minute Series.

_____. 2025. Map of Whooping Crane Corridor. https://www.sciencebase.gov/catalog/item/imap/5a314a72e4b08e6a89d707e0. Accessed January 2025.

Wheat, Joe Ben. 1953. *The Addicks Dam Site: An Archeological Survey of the Addicks Dam Basin, Southeast Texas*. River Basin Surveys Papers No. 4, Part 1. Bureau of American Ethnology Bulletin 154. Pp. 143-252.

Willey, Gordon R. and Phillip Phillips. 1958. *Method and Theory in American Archaeology.* Chicago: University of Chicago Press. Wilson, Diane E. 200. Infectious Disease as an Index of Cultural Affiliation on the Texas Coast. Paper presented at the 66th Annual Meeting of the Society for American Archaeology, New Orleans.

Wilson, Diane E. 2001 Infectious Disease as an Index of Cultural Affiliation on the Texas Coast. Paper presented at the 66th Annual Meeting of the Society for American Archaeology, New Orleans.