Biological Assessment: Direct-Reduced Iron (DRI) Project

voestalpine Texas, LLC
San Patricio and Nueces Counties, Texas

January, 2014

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Project No. 0197207
San Patricio and Nueces Counties, Texas

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ACRONYMS

AEP	American Electric Power
ATOC	Acoustic Thermometry of Ocean Climate
BA	Biological Assessment
BACT	Best Available Control Technology
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalents
CCSC	Corpus Christi Ship Channel
CWIS	Cooling Water Intake Structure
dB	Decibels
dBA	Adjusted Decibels
DMPA	Dredge Material Placement Area
DRI	Direct-Reduced Iron
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ERM	Environmental Resources Management
ESA	Endangered Species Act
ESL	Effects Screening Levels
FERC	Federal Energy Regulatory Commission
FAA	Federal Aviation Administration
GHG	Greenhouse Gas
GIS	Geographic Information Systems
GMFMC	Gulf of Mexico Fisheries Management Council
HAP	Hazardous Air Pollutants
HBI	Hot-Briquetted Iron
Hg	Mercury
HSSE	Health, Safety, Security, and Environment
HUD	US Department of Housing and Urban Development
LNG	Liquefied Natural Gas
MBTA	Migratory Bird Treaty Act
MeHg	Methylmercury
MERA	Modeling and Effects Review Applicability
MGD	Million Gallons Per Day
MMPA	Marine Mammal Protection Act
MMRP	Marine Mammal Research Program
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NAAQS	National Ambient Air Quality Standards
NASS	National Agriculture Statistics Service
NMFS	National Marine Fisheries Service
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System

NRCS	National Resource Conservation Service
NSPS	New Source Performance Standards
NSPS	New Source Performance Standards
OHWM	Ordinary High Water Mark
OSHA	Occupational Safety and Health Administration
Oxy	Occidental Petroleum Corporation
Pb	Lead
PM	Particulate Matter
POCCA	Port of Corpus Christi Authority
POTW	Publically Owned Treatment Works
PSD	Prevention of Significant Deterioration
RO	Reverse Osmosis
SH	State Highway
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
SPCDD	San Patricio County Drainage District
SPMWD	San Patricio Municipal Water District
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
TOB	Top of Bank
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
Tpy	Ton per year
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
TWDB	Texas Water Development Board
TXDOT	Texas Department of Transportation
TXNDD	Texas Natural Diversity Database
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOE	U.S. Department of Energy
USDOT	U.S. Department of Transportation
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service
voestalpine	voestalpine Texas, LLC
VOC	Volatile Organic Compounds

In accordance with the Clean Air Act, voestalpine Texas, LLC (voestalpine) has submitted a Greenhouse Gas (GHG) Permit Application for a proposed direct-reduced iron (DRI) production facility ('the Project') located south of the City of Gregory in San Patricio and Nueces Counties, Texas. The Project is a portion of the currently permitted La Quinta Trade Gateway Terminal owned by the Port of Corpus Christi Authority (POCCA). voestalpine plans to initiate construction of the Project in April 2014, and begin operation by the fourth quarter of 2015.

The purpose of this Biological Assessment (BA) is to provide the results of an analysis of the potential impacts of the Project on species protected by the Endangered Species Act (ESA) as outlined in the requirements for GHG permit applications. The information provided in this BA incorporates a literature review including historical studies at the site, desktop assessments, limited field reconnaissance, and information obtained from informal consultations with federal agencies. Additionally, this analysis provides recommendations on the U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS) determinations of effect for each federally listed species.

Potential impacts from the Project include physical disturbances associated with construction and operation, noise, light, dust, erosion, sedimentation, air emissions, surface water intake and wastewater discharges to surface water. Air emissions were determined to impact the largest area on and surrounding the Project site. Accordingly, the boundaries of the Action Area were determined based upon air emission dispersion modeling results.

The Action Area is defined in 50 CFR 402.02 as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action". For the purposes of this BA, an Action Area consisting of the Project site and a buffer extending 1.5 miles from the Project site boundary would encompass any potential impacts to threatened and endangered species and designated critical habitat due to the construction and operation of the Project.

No loss of threatened or endangered species and/or critical habitat is expected to result from construction or operation of the Project. No protected species or critical habitats were observed during field reconnaissance and none are expected to occur within the Action Area. The mitigation measures described in USACE permit # 23269 will provide an additional 192 acres of habitat that could provide nearby refuge for any protected species should they occur. Additionally, per guidance from the USFWS, construction, maintenance, and operation plans for the facility will contain training materials and protocols to be utilized in the event a protected species is observed in or near the Project area.

A species-specific analysis of potential impacts and habitats within the Action Area resulted in a determination of *may affect, but is not likely to adversely affect* for 8 of the 11 threatened and endangered species analyzed in this report. The

remaining three species will not be affected by the Project, as it has been determined that they do not occur with the Action Area. A summary of the threatened and endangered species and recommended determination of effects is presented below in Table ES-1.

TABLE ES-1: Anticipated Effects on Federally Listed Species Potentially Occurring in the Action Area

Common Name	*Scientific Name*	*Recommended Determination of Effect*
Northern aplomado falcon	*Falco femoralis septentrionalis*	May affect, not likely to adversely affect
Piping plover	*Charadrius melodus*	May affect, not likely to adversely affect
Whooping crane	*Grus Americana*	May affect, not likely to adversely affect
Ocelot	*Leopardus pardalis*	No effect
Gulf coast jaguarundi	*Herpailurus yagouaroundi cacomitli*	No effect
West Indian manatee	*Trichechus manatus*	May affect, not likely to adversely affect
Atlantic hawksbill sea turtle	*Eretmochelys imbricate*	May affect, not likely to adversely affect
Green sea turtle	*Chelonia mydas*	May affect, not likely to adversely affect
Kemp's Ridley sea turtle	*Lepidochelys kempii*	May affect, not likely to adversely affect
Leatherback sea turtle	*Dermochelys coriacea*	No effect
Loggerhead sea turtle	*Caretta caretta*	May affect, not likely to adversely affect

1.0 INTRODUCTION

1.1 PROPOSED ACTION

voestalpine Texas, LLC (voestalpine) intends to construct a direct-reduced iron (DRI) production facility ('the Project') located south of the City of Gregory in San Patricio and Nueces Counties, Texas (Figure 1).

In accordance with the Clean Air Act, voestalpine has submitted a Greenhouse Gas (GHG) Permit Application for a proposed direct-reduced iron (DRI) production facility ('the Project') located south of the City of Gregory in San Patricio and Nueces Counties, Texas. The Project is a portion of the currently permitted La Quinta Trade Gateway Terminal owned by the Port of Corpus Christi Authority (POCCA). voestalpine plans to initiate construction of the Project in April 2014, and begin operation by the fourth quarter of 2015.

The purpose of this Biological Assessment (BA) is to provide the results of an analysis of the potential impacts of the Project on species protected by the Endangered Species Act (ESA) as outlined in the requirements for GHG permit applications. The information provided in this BA incorporates a literature review including historical studies at the site, desktop assessments, limited field reconnaissance, and information obtained from informal consultations with federal agencies. Additionally, this analysis provides recommendations on the U.S. Fish and Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS) determinations of effect for each federally listed species.

1.2 DEFINITION OF STUDY AREAS

This document references two unique study areas: the Project site and the Action Area.

The Project site is defined by the physical boundary of the property on which the proposed facility would be located. Figure 1 indicates the boundaries of the Project site and Figure 2 depicts the planned development.

The Action Area is defined in 50 CFR 402.02 as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action". The analysis of species and designated critical habitat potentially affected by the Project is focused on impacts within the Project's Action Area, which extends 1.5 miles from the Project boundary. Figure 5 shows the boundary of the Action Area, and Section 3.0 discusses how this boundary was determined.

1.3 AGENCY REGULATIONS

1.3.1 National Ambient Air Quality Standards

Air pollutants are divided into two different categories, primary and secondary. Primary pollutants include pollutants such as nitrogen oxides (NO_X), sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter (PM), Volatile Organic

Compounds (VOC), and lead (Pb). These pollutants are directly emitted by specific emission sources. Secondary pollutants are formed when primary pollutants react with atmospheric compounds (e.g. water, nitrogen, oxygen) under various atmospheric conditions (for example, temperature, humidity, light intensity). An example of a secondary pollutant is ground-level ozone, which is formed when the precursor pollutants of NO_X and VOC chemically react in the presence of sunlight. The U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) concentrations for six different pollutants: SO_2, nitrogen dioxide (NO_2), CO, PM with specific mean aerodynamic diameters of particle size less than 10 micrometer and 2.5 micrometer (i.e., PM_{10} and $PM_{2.5}$), lead, and ozone.

San Patricio is designated "attainment" for the pollutants $PM_{2.5}$, PM_{10}, Pb, CO, SO_2, NO_2 and ozone because ambient concentrations of these pollutants are less than their respective NAAQS. Because of this, the facility would not be required to conduct a Non-attainment New Source Review, rather a Prevention of Significant Deterioration (PSD) permit application will be appropriate.

1.3.2 Threatened, Endangered, and Other Protected Species

The Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 50 CFR 17) provides for the conservation of ecosystems upon which endangered species of fish, wildlife, and plants depend. The Act:

- Authorizes the determination and listing of species as endangered and threatened;
- Prohibits unauthorized taking, possession, sale, and transport of endangered species;
- Provides authority to acquire land for the conservation of listed species, using land and water conservation funds;
- Authorizes establishment of cooperative agreements and grants-in-aid to States that establish and maintain active and adequate programs for endangered and threatened wildlife and plants;
- Authorizes the assessment of civil and criminal penalties for violating the Act or regulations; and
- Authorizes the payment of rewards to anyone furnishing information leading to arrest and conviction for any violation of the Act or any regulation issued thereunder.

Section 7 of the Endangered Species Act requires the EPA and other federal agencies to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species. When the action of a federal agency may affect a protected species, that agency is required to consult with either the NMFS or the USFWS, depending upon the protected species that may be affected. The

USFWS and NMFS maintain an online database that may be utilized in a preliminary desktop assessment to determine which, if any, threatened or endangered species may have the potential to occur near the Project site. If it is determined that the Project could potentially impact these species, it may be necessary to preform species-specific surveys onsite. Information regarding the potential for impact to threatened and endangered species is provided in this biological assessment as a supplement to the GHG permit application. The EPA and federal agencies will utilize the information in the permit application to make an official determination of the potential for the Project to impact protected species at the site. If potential impact is deemed possible, the agencies will typically recommend mitigation or avoidance measures as permit conditions. The EPA and voestalpine have coordinated with the UWFWS and NMFS to identify any potential impacts to listed species resulting from construction of the Project.

1.3.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712) implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. The MBTA makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations. The USFWS is responsible for administering and enforcing the MBTA, and issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, educational, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. A list of the 1,007 species of birds protected by the MBTA is available at 50 CFR 10.13.

1.3.4 Magnuson – Stevens Act and Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801-1884) was originally established in 1976, and was recently amended in 2007. The MSA is the primary law governing marine fisheries management in United States federal waters. The purposes of the MSA include:

- Conservation of fishery resources;
- To support the enforcement of international fishery agreements;
- To promote domestic commercial and recreational fishing under sound conservation and management principles;
- To provide for the preparation and implementation of fishery management plans to achieve and maintain optimum yield from each fishery;
- To establish Regional Fishery Management Councils to prepare, monitor, and revise fishery management plans under circumstances that enable

participation by the States, fishing industry, consumer and environmental organizations, and other interested parties, and which take into account the social and economic needs of the States;

- To encourage development of underutilized fisheries; and
- To promote the protection of essential fish habitat.

The MSA defines Essential Fish Habitat (EFH) as those waters and substrate necessary to fish for spawning, feeding, breeding, or growth to maturity. When the action of a federal agency may affect essential fish habitat, that agency is required to consult with the NMFS. The NMFS maintains an online database that may be utilized in a preliminary desktop assessment to determine which, if any, EFH may have the potential to occur near the Project site. If it is determined that the Project could potentially impact EFH, species-specific habitat surveys may be performed onsite. Information regarding the potential for impacts to EFH is provided in a separate EFH assessment as a supplement to the GHG permit application. The EPA will utilize the information in the EFH supplement and permit application to make an official determination of the potential for the Project to impact protected species at the site. If potential impact is deemed possible, the NMFS will typically recommend mitigation or avoidance measures as permit conditions. The EPA and VA have coordinated with NMFS to minimize impacts to EFH resulting from construction of the Project.

1.3.5 Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) (16 U.S.C. 1361-1423) was originally written in 1972, and amended in 1994. The MMPA confers federal protection on all marine mammals in U.S. federal waters and placed a moratorium on the "take" and import, with certain exceptions, of marine mammals and marine mammal products. The term "take" is defined as "to hunt, harass, capture, or kill". The purposes of the MMPA include:

- The conservation and protection of marine mammals;
- Establishment of the Marine Mammal Commission;
- Authorization and establishment of the International Dolphin Conservation Program;
- Establishment of the Marine Mammal Health and Stranding Response Network; and
- Protection of polar bears.

The term "harassment" as it refers to this law means any act of pursuit, torment, or annoyance which has the potential to injure or disturb a marine mammal or marine mammal stock. The MMPA is enforced by the National Oceanic and Atmospheric Administration Office of Law Enforcement.

1.3.6 Wetlands and Waters of the U.S.

The U.S. Army Corps of Engineers (USACE) regulates "waters of the U.S.", wetlands and special aquatic sites under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. The USACE and the Environmental Protection Agency (EPA) define wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands typically include swamps, marshes, bogs, and other similar areas". This definition takes into consideration three distinct environmental parameters: hydrology, soil, and vegetation (as detailed in the *1987 Corps of Engineers Wetlands Delineation Manual [USACE Manual]*). Positive wetland indicators of all three parameters are normally present in wetlands.

The term "waters of the U.S." means:

a. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; these are referred to as traditional navigable waters (TNWs);

b. All interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:

    1. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or

    2. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

    3. Which are used or could be used for industrial purpose by industries in interstate commerce;

c. All impoundments of waters otherwise defined as waters of the U.S. under the definition;

d. Tributaries of waters identified in paragraphs (a) through (d) above;

e. The territorial seas;

f. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f);

    1. The term "adjacent" means bordering, contiguous, or neighboring. Wetlands separated from other Waters of the U.S. by man-made dikes or barriers, natural river berms, beach dunes and the like are "adjacent wetlands."

g. Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40

Code of Federal Regulations (CFR) 123.11(m) which also meet the criteria of this definition) are not waters of the U.S.; and

h. Waters of the U.S. do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with the EPA.

In 2006, the Supreme Court addressed the jurisdictional scope of Section 404 of the CWA, specifically the term "the waters of the U.S.," in *Rapanos v. U.S.* and in *Carabell v. U.S.* The decision provides two new analytical standards for determining whether waterbodies that are not TNWs, including wetlands adjacent to those non-TNWs, are subject to CWA jurisdiction:

1. If the waterbody is relatively permanent, or if the waterbody has a wetland that directly abuts (i.e. the wetland is not separated from the tributary by uplands, a berm, dike, or similar feature) a relatively permanent waterbody (RPW), otherwise known as the Plurality Test.
2. If a waterbody, in combination with all wetlands adjacent to that waterbody, has a significant nexus with TNWs, which can be determined using the Kennedy Test.

Justice Kennedy stated during *Rapanos* that "wetlands possess the requisite nexus, and thus come within the statutory phrase 'navigable waters,' if the wetlands, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable.'"

When the action of a federal agency may affect wetlands, that agency is required to consult with the USACE. The USACE determines the jurisdictional status of any wetlands identified at the Project site. If it is determined that the Project could potentially impact jurisdictional wetlands, permitting and mitigation may apply. A wetland delineation providing acreages of potential impacts to wetlands should be provided with the federal permit application. The USACE and EPA will utilize the information in the permit applications to make an official determination of the potential for the Project to impact wetlands at the site. If potential impact is deemed possible, the USACE will typically recommend mitigation or avoidance measures as permit conditions. EPA and voestalpine are currently coordinating with USACE to efficiently utilize the project area and effectively minimize impacts to wetlands resulting from construction of the Project.

2.0 PROJECT DESCRIPTION

The Project consists of the development, construction and operation of a production facility that will utilize a natural gas-based process to produce hot-briquetted iron (HBI), a superior form of DRI, from iron ore and iron oxide pellets. voestalpine plans to ship the HBI overseas to be utilized by their steel division in Linz, Austria.

2.1 PROJECT SCHEDULE

The first construction phase of the Project is scheduled to start in or around April 2014. First production is expected for the last quarter of 2015, with consideration of a second phase being initiated subsequently depending on market conditions. voestalpine has acquired enough land for this initial phase of construction, as well as for a potential future expansion.

2.2 PROJECT LOCATION

The proposed facility is to be located on an approximately 478-acre parcel of land that is a portion of 1,114 acres currently owned by the POCCA to be developed as the La Quinta Trade Gateway Terminal (terminal). voestalpine has entered into an agreement with POCCA to lease the 478 acres and to construct the HBI facility and a wharf as part of the container terminal. The Project site area is located south of the City of Gregory, TX, east of the City of Portland, TX, and west of the City of Ingleside, TX. Texas State Highway (SH) 361 traverses northwest to southeast east of the site, SH 35 traverses west to east just north of the site, and U.S. Highway 181 traverses northeast to southwest west of the site. The immediate surrounding area is a mixture of industrial and residential development (Figure 3).

The POCCA property is bounded on the east by a drainage easement paralleling La Quinta Road known as La Quinta Ditch, and on the south by Corpus Christi Bay. The 478-acre project site consists of approximately 473-acres interior to the POCCA boundary, and 5 acres associated with the dock along the southern boundary of the POCCA property. The northern boundary of the Project site is located parallel to and approximately 200 feet south of the northern POCCA boundary. The eastern boundary of the project site is located parallel to and approximately 250-400 feet west of the eastern POCCA boundary along La Quinta Ditch. The majority of the southern boundary of the Project is located approximately 1,800 feet north of the shoreline of Corpus Christi Bay; however, a utility corridor 200-250 feet wide extends south to an approximately 1,020-foot wide wharf along the north shore of Corpus Christi Bay.

2.3 SITE DESCRIPTION

The selected site is a greenfield location owned by POCCA that is part of a long-term federally funded development known as the La Quinta Trade Gateway Terminal. Key to development of the terminal site was the recent extension of

the La Quinta Ship Channel, a spur of the Corpus Christi Ship Channel, to provide deep water access to the Project site. The conceptual terminal project consists of the existing Gulf Compress cotton storage facility, a multi-purpose dock with cranes, a container storage yard, a road and rail loop, a landscaped buffer, an American Electric Power (AEP) substation, and over 400 acres for other facilities, including the Project (Figure 2). Pursuant to lease agreements, voestalpine will construct an approximately 1,020 ft wharf with a single ship-berthing area, seawater intake and treated process water discharge structures, and a utility corridor containing an access road, pipelines, electrical conduit, and a material conveyor for the HBI facility as the initial phase of the terminal project. The HBI facility will be located in the eastern portion of the property, north of the area for the container terminal and wharf. POCCA will retain ownership of the wharf and land utilized by the Project. Additional funds for the terminal development will be needed before POCCA's plans for the remaining components of the terminal can advance beyond preliminary engineering. voestalpine is collaborating with POCCA to utilize existing planning documents and permits where possible and plans to initiate construction in April 2014.

Adjacent property north of the POCCA site consists of a lightly developed commercial and industrial area and SH 35. Immediately north of the highway are residences and commercial buildings associated with the City of Gregory. Directly east of the site are disturbed areas and disposal ponds associated with the Sherwin Alumina Company. Corpus Christi Bay is located immediately south of the site. Immediately west of the site is a dredged material placement area. West of the dredge material placement area is a San Patricio County Drainage District (SPCDD) Ditch and Green Lake, which are just east of the Northshore Golf and Country Club and residences associated with the City of Portland. There are several pipelines that traverse west to east across the site, and a communications tower is located in the southeastern portion of the site.

Site land cover is comprised primarily of cultivated cropland (Figure 3). According to the latest land cover data from the U.S. Department of Agriculture National Agriculture Statistics Service (USDA NASS) the site contains areas of cotton, sorghum, shrubland, deciduous forest, herbaceous grassland, and herbaceous and woody wetlands. According to the USDA-National Resource Conservation Service (NRCS) Web Soil Survey, soils on-site include clay, clay loam, sandy clay loam, and fine sandy loam soils. Soil boring logs taken by Dames and Moore in 1996 indicate that surficial soils are generally gray silty clay between 6 and 10 feet in depth, with underlying layers of brown sandy clay.

2.4 SITE HISTORY

Historic environmental documents provided by POCCA, U.S. Geological Survey (USGS) topographic quadrangle maps dating from 1918, and aerial photographs from 1950 to the present were reviewed to determine the historical use of the Project site. Desktop analysis of these studies and photographs indicates that the Project site has exhibited a variety of land uses including oil and gas exploration,

agricultural farm land and support structures, tenant residence, and native ranch land. In the late 1970s Tenneco Energy acquired the project site for potential future development, and leased it to a tenant farmer. POCCA purchased the property from Tenneco Energy in late 1996.

The historical aerial photographs depict an access road currently known as La Quinta Road extending to south-southeast from the frontage road of SH-35, traversing parallel and outside of the eastern Project boundary. The road historically provided access to various agricultural support structures and tenant residences. The agricultural support structures are no longer extant, but historically extended across the northeast boundary of the Project site, and included a residence with an associated septic tank and garage, an oil storage shed, an equipment storage shed, a maintenance shed, a hay storage shed, and other miscellaneous chemical and paint storage sheds (Dames and Moore, 1996).

The La Quinta Road historically continued south-southeast to tenant residences associated with the historic La Quinta Mansion property that is located southeast of the Project boundary. The historic portion of La Quinta Road leading toward the mansion has since been gated off, and the road has been extended southeast to serve as additional access to the Sherwin Alumina facility located east of the Project boundary. The access road currently extending west onto the Project site from La Quinta Road is present on historical aerial photographs, and appears to have provided access to at least three former oil and gas exploration sites in the southern portion of the POCCA property, one of which is located within the Project site boundary. The majority of the area within the Project site boundary has been historically maintained as undeveloped and agricultural land. Detailed analysis of the historical topographic maps and aerial photography is provided below, and the maps are provided in Appendix A.

- The 1918 topographic map depicts the northern portion of the Project site as cultivated farm land and the southern portion as undeveloped native land with the exception of an unimproved roadway that parallels the shoreline of Corpus Christi Bay and an improved road historically known as La Quinta Road, which parallels the eastern boundary of the Project site. Structures are depicted north of the Project boundary and immediately west of La Quinta Road. A structure is also depicted outside of the southeastern boundary of the Project site at the intersection of La Quinta Road and the shoreline roads.

- The 1925 topographic map shows the expansion of the Green Lake Drainage located west of the Project site. An additional drainageway outside the Project site appears to parallel the northern boundary of the Project site and cross La Quinta Road before proceeding south to Corpus Christi Bay. The structures north of the Project and west of La Quinta Road are no longer mapped. Three structures are now located along La Quinta road outside the southeastern boundary within the Project site. An access road is visible extending onto the Project site from La Quinta Road, and has two associated structures, one of which appears to be

within the Project site boundary. The Portland/Gregory cemetery also first appears on the 1925 map and is located outside of the northwestern boundary of the Project site.

- The 1951 topographic map and 1950 aerial photograph depict the northern and the southern portions of the Project site as native grass and shrub land, while the central portion of the Project site is agricultural land. A cluster of agricultural support structures appear along La Quinta Road and across the east-central boundary of the Project site in the aerial photograph. An additional area of residential structures are visible offsite and southeast of the Project site that are likely related to the structures depicted on the topographic maps. An unimproved roadway is present in the southern portion that connects to La Quinta Road and transects west across the Project site. Two other structural features are marked as "Fan Marker" and "Airway Beacon," which are located in the eastern central section of the Project site. In addition, an USGS survey datum also first appears on the 1951 map adjacent to and centered along the shoreline within the Project site.

- The 1961 and 1968 aerial photos and the 1969 topographic map depict the same general features from the 1951 map and aerial photograph. The agricultural support area recorded by Dames and Moore (1996) first appears as a cluster of five (5) buildings along the eastern central boundary and directly west of La Quinta Road. Structures previously located on the 1925 and the 1951 maps within the southeastern corner are non-extant. The USGS survey datum that first appeared on the 1951 map is now labeled Quintana, which is possibly a reference to La Quinta, the estate and ranch of Joseph F. Green where U.S. President William Howard Taft stayed during his visit to the towns of Gregory, Taft, Rincon Ranch, and Corpus Christi in October 1909.

- The 1974 aerial photograph and the 1975 topographic map show the undeveloped Project site much as it was in the 1968 photograph and the 1969 map respectively with continued farming and the presence of the agricultural support area located along the eastern central Project site's boundary. The 1975 map depicts an unimproved road that was last seen adjacent to the coast on the 1951 map. An oil/gas well is located near the north central portion of the Project site.

- The 1983, 1995, 2004, 2005, and 2006 aerial photographs continue to depict the northern and eastern central sections of the Project site as agricultural farm land and tenant residences, and the southern section as native ranch land and coastal dunes near Corpus Christi Bay. A small pond is observed in the southeast corner of the Project site. The Enterprise pipeline meter station is also visible in this series of aerial photographs.

- 2006 to 2011: The Project site is owned by POCCA. A majority of the Project site is used primarily as agricultural farm land, which extends

further southward towards Corpus Christi Bay than previously seen in the 2006 aerial photograph.

2.5 EMISSIONS CONTROLS

San Patricio County is currently in attainment status; therefore, this Project will need to meet the requirements of a PSD permit. Per 30 TAC §116.111(a)(2)(c), new or modified facilities must utilize Best Available Control Technology (BACT), with consideration given to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the facility.

The Project will utilize BACT to control emissions and minimize impacts to the surrounding environment. Emission controls include baghouse and wet scrubbers to minimize dust emissions from process sources and water and chemical suppression to minimize dust emissions from fugitive sources. Criteria pollutant emissions are limited from the main reactor and reformer through the use of state of the art combustion of natural gas. Predicted emissions rates from the Project are shown in below:

TABLE 2-1. Modeled Emissions for All Pollutants Associated with the Project.

Pollutant	*Average Emission Rate (lbs/hour)*	*Annual Emission Rate (ton/year)*
TSP	25.1	105.4
PM10	21.9	91.4
PM2.5	16.1	65.9
NOx	148.3	415.0
SO_2	11.2	34.8
CO	398.7	712.1
VOC	9.7	37.6
CO_2	599490	1820103
CO_2e	599645	1824492
Benzene	5.09E-04	2.23E-03
Dichlorobenzene	2.91E-04	1.27E-03
Formaldehyde	1.82E-02	7.96E-02
n-Hexane	4.36E-01	1.91E+00
Naphthalene	1.48E-04	6.48E-04
Toluene	8.24E-04	3.61E-03
PAH	2.04E-05	8.92E-05
Lead	3.01E-03	1.02E-02
Mercury	1.33E-06	5.82E-06
Cadmium	6.65E-06	2.91E-05
Chromium	6.60E-04	2.89E-03
Magnesium Oxide	7.98E-02	3.49E-01
Manganese	7.05E-03	3.09E-02
Nickel	3.99E-03	1.75E-02
Copper	1.33E-03	5.82E-03
Zinc	2.66E-03	1.16E-02
Total HAPs	0.46	2.05

Additional detail on air emissions modeling is provided in Section 3 of this report, with analysis of potential effects of emissions on sensitive receptors detailed in Section 5.

2.6 NOISE

Noise is defined as unwanted sound that interferes with normal human activities. Sound is defined by the loudness (measured in decibels (dB)) and the frequency (measured in hertz). In noise impact analyses with regards to human receptors, the combined effect of loudness and frequency is measured as adjusted decibels (dBA). The Occupational Health and Safety Administration (OSHA) regulates occupational noise exposure under 29 CFR 1910.95. Employers are required to implement a hearing conservation program including noise monitoring, employee notification, and employee hearing testing if the 8-hour time-weighted average exceeds 85 dBA of noise exposure. Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level. The U.S. Department of Housing and Urban Development (HUD) outlines noise criteria and standards in 24 CFR Part 51. HUD considers exterior noise at sensitive receptors to be "acceptable" if it does not exceed a day and night average sound level of 65 dB, "normally unacceptable" between 65 dB and 75 dB, and "unacceptable" above 75 dB.

The City of Portland has adopted noise control regulations as outline in Article X of Chapter 11 (Section 11-181 through Section 11-187) of the Portland, TX Code of Ordinances. Section 11-182 (a) (6) defines nuisance noise related to construction as:

"The erection, including construction, excavation, demolition, alteration, or repair work, or the permitting or causing thereof, of any building or other structure, or the operation or the permitting or causing the operation of any tools or equipment used in construction, excavation, drilling, demolition, alteration or repair work:

a. Other than during the daytime on weekdays; or
b. At any time such that the sound level at or across a real property boundary exceeds eighty (80) dBA; or
c. This section shall not apply in cases of extreme and urgent necessity in the interest of public safety and convenience, and then only with specific approval obtained from the director of public works, or any duly appointed representatives."

Section 11-182(b) outlines "evidence of unreasonable conduct" to include:

(1) "The making of noise which exceeds sixty-three (63) decibels in any residentially zoned area (as defined by the city zoning ordinance) when measured from property under separate ownership.

(2) The making of noise which exceeds seventy (70) decibels in any commercially zoned area as defined by the city zoning ordinance, when measured from property under separate ownership.

(3) The making of noise which exceeds seventy-two (72) decibels in any industrially zoned area as defined by the city zoning ordinance, when measured from property under separate ownership. "

Actions outside the parameters described above may require special approvals, environmental reviews, and attenuation measures.

Ambient noise within the Project site and Action Area was measured on December 17th and 18th, 2012 using a decibel meter at the locations shown in Figure 4. Weather conditions during the survey were documented from recorded data at the National Weather Service Station KCRP located approximately 15 miles southwest of the Project site at the Corpus Christi International Airport (wunderground.com, 2012). The majority of noise measurements on the Project site and Action Area were taken between 9:30 am and 11:15 am on December 17th, with weather conditions including NW winds ranging from 10-15 miles per hour, temperatures ranging from approximately 65 to 85 degrees Fahrenheit, and no precipitation. Noise measurements surrounding the Dredge Material Placement Areas (DMPAs) were taken between 7:30 am and 9:30 am on December 18th, with weather conditions including S winds ranging from approximately 5 to 15 miles per hour, temperatures ranging from approximately 45 to 70 degrees Fahrenheit, and no precipitation. Measured sound levels ranged between 40.8 dB and 60.2 dB. The lowest levels of ambient noise were measured at the wetland areas associated with Green Lake Ditch near the northwest boundary of the Project site, and along the western boundary of the DMPAs. The highest noise levels were measured along the access road approximately 800 feet north of the construction dock at the north shore of Corpus Christi Bay. The elevated noise levels at this area were attributed to the dredging activity occurring at the La Quinta Channel.

Construction and operation noise at the Project site have the potential to impact sensitive receptors at nearby natural habitat areas. The U.S. Department of Transportation (USDOT) and EPA have determined that noise at construction sites typically ranges from 74-101 dBA at a distance of 50 feet. The loudest construction activities associated with the Project will likely be associated with driving steel piles for the Project. The noise associated with the Project construction is not likely to exceed those of the pile-driving activities (100 dB at 100 feet) associated with the POCCA container terminal that have been previously permitted.

A formula used to calculate noise attenuation over distance is known as the inverse square law. Under free-field conditions, where there are no reflections or

additional attenuation, sound is known to decrease at a rate of 6 dB for each doubling of distance (Michael Minor and Associates, 1996-2001). Assuming that pile-driving activities would produce up to 100 dB at 100 feet, and using this formula, a radius of approximately 7,200 feet from pile-driving activities may experience noise exceeding 63 dB (level of City of Portland ordinance). However, this formula does not take into account additional attenuation factors including existing structures, topography, foliage, ground cover, and atmospheric conditions.

Elevated topography such as hills and berms placed between a noise source and receptor can have a significant effect on noise levels. The Dredge Material Placement Area and vegetated buffer immediately west of the Project site associated with the POCCA development will provide noise mitigation by physically blocking the majority of the City of Portland from construction and operational noise emanating from the central portion of the Project site. In fact, the ambient noise measurements taken in December 2012 indicated that noise levels were generally 5 to 10 dB lower on the west side of the DMPA than the east side, despite the fact that they had not yet been filled at the time of survey. The addition of mounded dredge material to the DMPAs will likely increase their effectiveness in noise mitigation from these baseline measurements. However, this buffer would neither physically block receptors in the southern portion of the City of Portland from noise associated with construction of the wharf area, nor the northern portion of the BayRidge community from noise associated with any construction in the northern portion of the site. There is no appreciable topographic change to serve as a physical barrier between the City of Gregory and noise emanating from the Project site. However, the pile-driving activities are located over 13,000 feet from residences associated with the City of Gregory, thus natural attenuation will reduce the noise to acceptable levels at these receptors. Ambient noise at the northern project boundary closest to the City of Gregory was measured to be approximately 50 dB.

Areas with at least 30 feet of dense evergreen foliage have been shown to reduce noise levels by up to 5 dB (Michael Minor and Associates, 1996-2001). There are areas of foliage associated with the riparian corridor around Green Lake that exceed 30 feet in width. Non-reflective ground cover including grass and loose soil typical of the Project site will also attenuate noise at a much greater rate than water or pavement. A previous Environmental Document for the POCCA terminal states that noise associated with pile-driving would attenuate to 60 dBA at a distance of 3,000 feet (Shiner Moseley and Associates, Inc. July 2003). The closest future residential areas associated with Northshore Country Club are approximately 2,700 feet southwest of the southwest corner of the Project site. The location of the DMPAs would mitigate noise originating from construction of the majority of the Project site, with the exception of the ship-berthing area. The closest pile-driving activities for this portion of the Project are expected to occur approximately 4,300 feet east of these sensitive receptors, thus noise levels are expected to attenuate to less than 60 dBA at this distance based upon the estimation from the POCCA document. Based upon available data, construction of the Project is not expected to result in noise levels exceeding the 63 dB

threshold for residentially zoned areas in the City of Portland. Although the City of Gregory has not adopted any noise regulations, construction and operation of the Project is not expected to result in noise levels exceeding the residential standards adopted by the City of Portland.

The loudest operational noise at the Project site would likely be associated with the blower for the shaft furnace. MIDREX, a recognized manufacturer, states that typical noise performance for the shaft furnace is 95-105 dB inside the blower area, and 85-90 dB immediately outside the blower area. The proposed location of the Project shaft furnace is greater than 5,500 feet away from the residential area. Assuming a noise level of approximately 90 dB at 100 feet from the furnace, operational noise associated with this portion of the Project is expected to attenuate to approximately 55 dB at the nearest residential receptors under normal conditions. The DMPA/vegetated buffer for the POCCA terminal will further reduce any noise generated at the Project as it is located between the Project and the residential area. Based upon available data, operation of the Project is not expected to result in noise levels exceeding the 63 dB threshold for residentially zoned areas in the City of Portland or Gregory.

Noise effects on wildlife receptors have not been well-documented, but may include habitat displacement and/or avoidance, behavioral modification, and in rare cases, potential injury or mortality (Radle, 2007). Deer have been shown to be sensitive to noise, with some individuals changing their home ranges to different locations. However, the same study indicated that they may also become habituated to certain noises over time. A study on little cotton rats indicated that population density was lower in high-noise areas, and that rats in the high noise area exhibited general behavioral differences from control groups, such as being timid and less social. Noise has been shown to disrupt feeding activity and induce avoidance flights in bald eagles; however, avoidance behavior decreased with continued noise exposure, indicating potential habituation.

Noise travels differently in water and marine noise requires additional consideration. Underwater noise in Corpus Christi Bay is affected by natural sources (i.e., wind, wave, and surf) and anthropogenic sources such as vessel traffic and construction. The loudest underwater noise at the Project site would likely be associated with pile-driving activities occurring during construction of the ship dock. These noises are expected to be comparable to those of the pile-driving activities associated with the POCCA terminal, estimated at 100 dB at 100 feet. A common formula for calculating noise levels in water is to add 62 dB to the noise level referenced in air, thus underwater noise from pile-driving activities is estimated at 162 dB at 100 feet (NOAA, 2012). Operational noises occurring underwater would be associated with ship berthing, loading, and unloading activities at the dock, as well as the potential operation of water intake and discharge pumps. These noises are expected to fall within the range of current noise-generating activities that occur in Corpus Christi Bay.

An Acoustic Thermometry of Ocean Climate (ATOC) survey conducted in the late 1990s resulted in 195 dB pulses of low-frequency sound throughout the Pacific Ocean. A concurrent Marine Mammal Research Program (MMRP) was conducted to determine potential effects on marine life due to the ATOC survey, using aerial surveys, tagging, playback studies, visual observations, undersea recordings, and auditory measurements. The study found that no observations of overt or obvious short-term changes occurred in the avoidance and distribution, behavior, and vocalization of humpback whales during the surveys (Radle, 2007).

Noise from pile-driving activities has been shown to affect fish with swim bladders, such as those in the family Sciaenidae. At sound levels over 200 dB, fish have been shown to exhibit effects ranging from minor hemorrhaging, to internal injuries, to death (BOEM, 2012). Fishes from the Sciaenidae family that are common to Corpus Christi Bay and may occur in the vicinity of the pile-driving activities for the project include, but are not limited to: red drum (*Sciaenops ocellatus*), black drum (*Pogonias cromis*), Atlantic croaker (*Micropogonias undulatus*), and speckled trout (*Cynoscion nebulosus*). Any injury to these and other fish species from noise associated with construction of the Project would likely be limited to the initial strike of the pile-driver, as the noise from this strike would likely elicit temporary avoidance from the area during subsequent strikes. Additionally, assuming noise from pile-driving is 162 dB at 100 feet (NOAA, 2012), fish would have to be within approximately 1.2 feet of the strike point to experience noise levels exceeding 200 dB.

Based upon the NOAA and Bureau of Ocean Energy Management (BOEM) studies, there would be a potential for noise to adversely affect sensitive species occurring within 1.2 feet of the pile-driving activities associated with construction of the Project. However, the Project construction plan includes back-filling the wharf area prior to pile-driving on the land created by the fill activity. Pile-driving on land rather than open water will minimize impacts and preclude the possibility of marine species from occurring within the radius of potential adverse pile-driving noise. In addition to this physical exclusion of marine species from the pile-driving area, the Project will provide pre-construction awareness training of personnel performing in-water construction activities to ensure protected species including the northern aplomado falcon, piping plover, whooping crane, sea turtles, and manatee are not adversely affected by pile-driving associated with the Project. Specifically, construction and operations personnel will be informed of the potential presence of these species, and provided education materials with narrative descriptions and pictures to facilitate identification. Personnel will be instructed to cease work if a protected species is observed, avoid the animal, and notify the construction or operations manager who will notify the USFWS.

The noise generated during construction will be temporary and adverse impacts will be localized to an approximately 1.2-foot radius around the piles, a relatively small portion of the Action Area, attenuating to typical city ordinance levels before reaching known sensitive wildlife receptors. As described above, the

construction design will physically exclude marine species from entering the pile-driving area, and construction and operations personnel will be provided with identification materials and training regarding protected species. Operational noise levels will be below the threshold of adverse impacts, and similar to noises currently existing within the area. Based upon available data, construction design, and contractor education, the noise associated with construction and operation of the Project is effectively minimized and not expected to have any appreciable impacts to threatened or endangered species or critical habitat.

2.7 DUST AND ATMOSPHERIC DEPOSITION

The generation of dust and atmospheric deposition of metals from construction and operation of the Project has the potential to adversely affect the resources within the Action Area.

2.7.1 Dust

Dust accumulation as a result of construction activity and vehicle traffic may affect vegetation by covering the surface of the plant including flowers, leaves, and stems. This has the potential to impede critical biological processes by blocking pores and light receptor cells on the plant's surface, inhibiting plant growth (Coffin, 2007). Airborne dust also reduces air breathability for both humans and wildlife, and may also spread chemicals or pathogens if contaminated, which can cause health problems when inhaled (Kruse, 2004).

Ocean ecosystems rely on dust deposition to introduce minerals, particularly iron, into an environment where naturally occurring sources are limited. However, high levels of dust deposition can impact coastal ecosystems by increasing turbidity and changing nutrient ratios. Increased turbidity diffuses sunlight and limits growth of submerged aquatic vegetation, which in turns impacts the animals that dwell or forage there. It can also impede absorption of dissolved oxygen in fish. High levels of dust may cause nitrogen fixation, increase CO_2 uptake, and lead to shifts in phytoplankton productivity, namely rapid increases in diatom abundance. This hyper-productivity of diatoms skews the ratio of surface water nutrients, and can negatively impact sensitive species (Bopp et al. 2003, Griffin and Kellogg 2004, Moore et al. 2006). Large increases of nutrients such as phosphorous and nitrogen may lead to algal blooms, which monopolize sunlight and nutrients, killing fish and invertebrates. Airborne dust particles may also bond with toxic substances or carry microorganisms and transport them into the marine environment, potentially causing contamination or introducing pathogens (Griffin and Kellogg 2004).

A recent water quality study by the Coastal Bend Bays and Estuaries Program indicates that turbidity in northern Corpus Christi Bay ranges from 11-20 Nephelometric Turbidity Units (NTU) and has not exhibited significant temporal changes in over 30 years examined by the study (CBBEP 78, 2012). An NTU is a turbidity measurement that quantifies the amount of light scattered at 90 degrees

by suspended particles. The turbidity for northern Corpus Christi Bay is considered relatively low, as the study recorded areas where turbidity ranged from 101-300 NTUs in nearby Baffin Bay. (CBBEP 78, 2012). It can be inferred from this data that previous construction and operational dust from the existing facilities along northern Corpus Christi Bay has not resulted in significant increases in turbidity of the bay.

The Project will use dust control measures during construction activities to minimize generation of fugitive dust. These dust control measures will be outlined in accordance with a Construction Stormwater General Permit (CGP) and subsequent Stormwater Pollution Prevention Plan (SWPPP) that will be obtained prior to construction of the Project. Any dust generated from construction activities will be temporary, minimized using best management practices (BMPs) as required by the construction stormwater permit, and is expected to be negligible.

The operational facility will also use dust control measures to minimize dust from raw material, product and off-specification material storage piles such as containment domes. The Project will employ best available emissions control technologies to limit dust emissions for the pellet and product handling systems such as closed conveyors and sizing operations. The main vehicular traffic areas will be paved to minimize vehicle-generated dust. The implementation of these control measures and construction BMPs will minimize the amount of dust generated by the Project. The low turbidity of northern Corpus Christi Bay despite the construction and operation of several industrial facilities indicates that dust has not historically resulted in significant impacts to the bay habitat. Detrimental or adverse effects from dust on threatened or endangered species or critical habitats are not anticipated as a result of the Project.

2.7.2 Atmospheric Deposition

The atmospheric deposition of heavy metals such as mercury and chromium has the potential to contribute to the bioaccumulation of toxic compounds in marine animals. The presence of methylmercury in fish tissue in the Gulf of Mexico is a well-documented example of this bioaccumulation, and is monitored by the Food and Drug Administration (FDA) and EPA, who have issued a fish consumption advisory for certain population groups (EPA, 2004). Air emissions from the Project may contain trace amounts of inorganic mercury that has the potential to contribute to toxic bioaccumulation if it is converted from the inorganic form to methylmercury through a process called mercury methylation. Using accepted EPA guidance, mercury deposition was modeled and the maximum mercury deposition at a single receptor is estimated at 0.196 micrograms per square meter per year. Total deposition over a 10 kilometer grid is 0.2512 grams per year.

Mercury methylation occurs primarily in estuarine sediments, but may also occur within the water column. Most mercury methylation is believed to be

mediated by anaerobic microorganisms, namely sulfate- and iron-reducing bacteria, although recent studies suggest that the ability to methylate mercury may be more widespread among microbes. The current view is that for inorganic mercury to be available for methylation, it must be in solution or easily transferrable from particles to solution (Marvin-DiPasquale *et al*., 2009). An indirect measure of mercury methylation in estuaries can be observed in the ratio of methylmercury to total mercury in sediments. At a mercury contaminated site in Lavaca Bay, Texas, marsh and intertidal mudflats had the highest fraction of methylmercury, 0.5% to 1.4% (Bloom *et al*., 1999).

Methylmercury is thought to be accumulated directly from water by phytoplankton and other primary producers such as seagrasses and marsh plants, which are then consumed by zooplankton, benthic consumers, and herbivorous fish, which are then consumed by piscivorous fish, biomagnifying the methylmercury concentrations at each subsequently higher trophic level. The initial point of entry into the food web becomes a critical target in understanding and predicting methylmercury bioaccumulation. Predicting the rate of methylmercury uptake by primary producers is a challenging task due to variability in dilution and dispersion of methylmercury, as well as biomass of the primary producers. Additionally, factors such as partitioning onto sediment particles and binding to dissolved organic carbon have been shown to reduce the bioavailability of methylmercury for uptake (Zhong and Wang, 2009).

Mercury bioaccumulation models for the Gulf of Mexico are considered limited by critical data. Existing datasets characterizing concentrations of total mercury and methylmercury in the Gulf of Mexico are inadequate and, in some cases, non-existent (Pollman *et al*. 2010). Additional field data on methylmercury concentrations, development of regional quantitative bioaccumulation models, additional studies on partitioning and bioavailability of methylmercury, quantitative estimates of primary productivity and its relation to methylmercury concentrations in the environment, and studies on mercury flux caused by migration of fish are necessary to develop models of bioaccumulation in the Gulf of Mexico (GOMA, 2013).

Accordingly, a literature review indicates that data on concentrations of heavy metals within Corpus Christi Bay or fish tissue samples from CCB fish is limited. A recent water quality study indicated that dissolved chromium concentration in water was found to range from 3.5-6.7 ug/l while chromium concentration in sediment was found to range from 12 – 22 mg/kg in northern Corpus Christi Bay. These concentrations are not currently exhibiting temporal changes. In the same study, mercury concentrations in sediment of northern CCB in the vicinity of the Project ranged from 0.05 –

0.16 mg/kg and are probably decreasing. Mercury concentration in water was not provided in the study. (CBBEP 78, 2012).

The available Corpus Christi Bay data is insufficient to quantify the mercury loading due to the atmospheric deposition, thus data on the Gulf of Mexico is considered more appropriate for comparison to the Project. Methylmercury can be imported into the Gulf of Mexico and its various habitats from adjacent watersheds, from the atmosphere, and from the neighboring Atlantic Ocean. It can also be produced within the Gulf through the methylation of inorganic mercury. Inorganic mercury can also be acquired through the food web, but unlike methylmercury, it is assimilated less well from food and excreted more rapidly. (GOMA, 2013)

The raw material that will be used by the Project is first processed offsite. The ore is sintered and treated to increase the purity of the ferrous ore and remove non-ferrous materials (particularly non-metals). These non-ferrous materials may include heavy metals; however, iron ore typically does not contain a high level of non-ferrous metal. It is likely some non-ferrous metals are removed in the ore sintering and treating process. The non-ferrous metal content of the resultant pelletized material is typically below analytical detection limits. This pelletized material will be shipped to the Project site, where it will be utilized as raw material for the DRI process.

Emissions estimates from modeling of the DRI process indicate that no more than 5.82E-06 tons per year (0.00528 kg/yr) of inorganic mercury will be emitted from the Project, and that the actual mercury deposition will be below this value. Pollman *et al*. estimated the total mercury flux for the Gulf of Mexico at 205,100 kg/yr, of which 44,000 kg/yr is attributed to atmospheric deposition (GOMA, 2013). Therefore, the Project emissions would contribute to approximately 0.000012% of atmospheric deposition, or 0.0000026% of the total annual mercury loading of the Gulf of Mexico in this worst-case scenario. Furthermore, it is estimated that the total methylmercury flux due to atmospheric deposition is 320 kg/yr, indicating a methylmercury to mercury ratio of approximately 0.73%. Using this ratio, the methylmercury flux attributable to the Project is calculated to be 0.000038 kg/yr. Extrapolation over 50 years results in cumulative mercury emissions of approximately 0.264 kg, which would correspond to approximately 0.0019 kg of methylmercury flux over the life of the Project. (Table 2-2)

Analysis of available Corpus Christi Bay water quality data indicates that mercury and chromium levels are steady to decreasing. Extrapolation of modeled emissions data to estimated Gulf of Mexico mercury concentrations indicates that the Project will result in an insignificant contribution to the flux of mercury and methylmercury attributed to air deposition, thus any bioaccumulation impacts are expected to be negligible. Due to the implementation of control measures and resulting minimal emissions, no

adverse effects from heavy metal deposition on threatened or endangered species or critical habitats are anticipated as a result of the Project.

2.8 WATER AND WASTEWATER

The Project is currently evaluating water sourcing and wastewater options for the DRI facility. The Project will require machinery cooling water and process water. The current water sourcing concept consists of a seawater intake in Corpus Christi Bay. The current wastewater discharge concept consists of an approximately 300 meter discharge pipeline extending from the DRI facility through a utility corridor and terminating at a discharge structure located at the wharf for the Project that will be constructed at the northern shore of Corpus Christi Bay. The intake structure will be located at the west end of the wharf, while the discharge structure will be located at the east end.

2.8.1 Water Sourcing and Water Rights

The procurement of water for machinery cooling and process water needs has the potential to affect resources in the Action Area. Due to the fact that a seawater intake is necessary for the Project, water rights permitting and 316(b) permitting will be required, as impacts to aquatic organisms would occur.

The Project intends to utilize the surface waters of Corpus Christi Bay to obtain water necessary to support industrial processes at the proposed site. Surface waters are regulated by the state and subject to state permitting requirements administered by the Texas Commission on Environmental Quality (TCEQ), Texas Water Development Board (TWDB) and local water/river authorities.

The Project is located in the Nueces River basin in San Patricio County. The freshwater rights in this area are 95% owned by the City of Corpus Christi and are contained in the Lakes of Corpus Christi, Choke Canyon and Lake Texana. The Mary Rhodes Pipeline, 54 inches, runs from Lake Texana to the SPMWD and to the City of Corpus Christi. Water from Lake Texana is blended with the other lake water, and pumped to cities and industry by the SPMWD.

The Project will require withdrawal of approximately 10.45 MGD of saline surface water that will be diverted via a cooling water intake structure (CWIS) located in Corpus Christi Bay. The CWIS will be located within an embayment in the steel sheetpile wall at the southern portion of the wharf. Circulating water pumps with variable frequency drives and the compressor for the air burst associated with the CWIS will be located at the top of the wharf. The CWIS will be comprised of multiple passive wedgewire screens with 3mm slot openings that will each be mounted at the terminus of an 18" diameter vertical intake pipe extending down from the southern portion of the dock, from approximately -17 ft to -24 ft mean sea level (MSL). The screens would be located at outside of the sheetpile wall, oriented vertically, and equipped with a compressed air burst to resist biofouling. The anti-biofouling system would engage automatically via a pressure-differential sensor, or could be manually run when necessary. The

intake will convey seawater through piping approximately 50 ft upward to the wharf, where it will travel 90 ft to the north side of the wharf, and then approximately 600 ft east and then 2,000 ft north to its point of use at the facility. A chloride injection system will be applied to the seawater prior to traveling through flowmeters and straining systems, and then on to the facility. The CWIS design and operation will fall under the authority of section 316(b) of the Clean Water Act (40 CFR 122.21(r)), and voestalpine is currently coordinating with the EPA, TCEQ, USFWS, and NOAA NMFS to ensure that the design is protective of sensitive biological resources.

Impacts related to the diversion of surface water from Corpus Christi Bay will be minimal compared to diversion of freshwater from the Nueces River Basin that would otherwise flow to Corpus Christi Bay. Recently published status reports on the Corpus Christi Bay complex indicate that freshwater inflow is a high priority concern, as these inflows have been heavily reduced due to anthropogenic use and modification (Johns, 2004). Estuarine species such as crabs, oysters, and shrimp are dependent on the pulses of freshwater from streams that feed Corpus Christi Bay, and could be adversely impacted by any reduction in freshwater inflow. The Project utilization of the saline bay waters for industrial cooling and process water avoids the potential impacts from a freshwater diversion.

However, the seawater intake has the potential to impact aquatic fauna that occur within the zone of hydraulic influence around the intake structure. Impacts are classified as impingement and entrainment. Impingement refers to fish and other organisms becoming trapped against intake screens when water is drawn into the cooling water intake structure (CWIS), often resulting in injury or mortality. Entrainment occurs when small organisms such as fish eggs and larvae are drawn through the intake screens and into the cooling water system, where they are exposed to high pressure, chemicals, and temperatures that often result in mortality. To minimize impacts to aquatic organisms the intake will be designed using the best technology available and permitted pursuant to the rules described in Section 316(b) of the Clean Water Act. The primary components of the rule include:

1. The CWIS design and operation will fall under the authority of section 316(b) of the Clean Water Act (40 CFR 122.21(r)). New facilities are subject to the Phase I rules of this regulation. The rule applicability includes those facilities that have a design intake flow of greater than 2 MGD (315.7 m^3/h) and that use at least 25% of the water withdrawn for exclusively for cooling purposes.
2. The Phase I rule provides (2) tracks for the applicant to demonstrate compliance with the 316(b) rules. The Project will likely follow the Track I CWIS Design Requirements that include:
    a. Through-screen intake velocity must be less than or equal to 0.5 feet per second; (40 CFR 125.84(c)(1))

b. Location- and capacity-based limits on proportional intake flow must be met (for estuaries or tidal rivers, intake flow must be less than or equal to 1 percent of the tidal excursion volume; for oceans, there are no proportional flow requirements); (40 CFR 125.84(c)(2)) and

c. Design and construction technologies for minimizing impingement mortality must be selected if certain conditions exist where the cooling water intake structure is located 125.84(c)(3); and design and construction technologies for minimizing entrainment must be selected and implemented. (40 CFR 125.84(c)(4)

3. The specific Track I requirements consist of the following items to be provided with the permit application:

    a. Characterization of the source water physical data;

    b. Characterization of the cooling water intake structure (CWIS) design;

    c. Characterization of the source water biology; and

    d. Characterization of the proposed CWIS operation.

The Project is currently conducting studies to characterize the physical and biological baseline conditions of Corpus Christi Bay, and will design the CWIS to minimize impingement and entrainment using the best technology available. Any impacts to aquatic organisms will be within the limits outlined by the 316(b) rule and permitted by a National Pollutant Discharge Elimination System (NPDES) individual permit issued by the TCEQ under the Texas Pollutant Discharge Elimination System (TPDES).

voestalpine is likewise evaluating options for a modest potable water supply for necessary personnel requirements at the facility. The most likely scenario for potable water supply is an extension from an existing water line along Highway 181 that would parallel the west site of a new terminal access road. voestalpine and the Port would share the initial portion of the extension until it splits into one branch to serve the DRI facility and one branch to serve the remainder of the Port. The secondary option for potable water supply is an extension from an existing water line in the Bay Ridge subdivision west of the site. Both of these options require crossing jurisdictional wetlands associated with the Green Lake ditch west of the facility. Regardless of the potable water supply option chosen, voestalpine will avoid impacts to these wetlands by boring under or bridging over the jurisdictional area, with construction activities occurring in uplands. The relatively small volume of potable water required for the Project would have negligible effects on the freshwater supply in the area.

2.8.2 *Water Use*

The majority of the seawater diversion will be utilized for non-contact cooling water in a heat exchanger loop with cooling towers and a filter backwash system. The remainder of the diversion will be routed to a desalination/reverse osmosis (RO) system that will produce 0.70 MGD of desalinated water that is used for makeup to the recirculating industrial process water system. The desalinated water is routed to a clarifier water collecting pond where it is used as make-up water for the process water treatment unit. The process water treatment unit is comprised of a screw classifier, clarifier water collecting pond, two clarifiers, a sludge tank, sludge dewatering, drain pit, cooling and collection system tank, and process blowdown treatment. The process water treatment unit supplies all water to the industrial processes at the facility. The two main industrial processes that utilize water at the facility are the DRI process and HBI cooling process. Approximately 0.32 MGD of the industrial make-up water circulated through the HBI cooling and DRI processes is discharged to the outfall, and the remaining 0.38 MGD is lost to evaporation. The DRI process also generates condensate that is incorporated back into the industrial process water system. The majority of the DRI and HBI process water will be recirculated through the process water treatment units, cooling tower water heat exchangers, and back into the processes.

The process water blowdown will have a totalizing flowmeter and dedicated sampling point for verification of compliance with categorical discharge limits. This effluent will then combine with waters from the cooling tower, filter backwash and RO reject blowdowns and discharge through a common outfall structure back into the bay. A totalizing flow monitoring and sampling station will be provided for the combined discharge for purposes of compliance sampling as well as to monitor water usage.

2.8.3 *Wastewater Discharge*

In addition to water intake, the discharge of wastewater from the Project has the potential to impact resources within the Action Area. The wastewater produced from operation of the Project will be ultimately discharged to Corpus Christi Bay. The current wastewater discharge concept is a discharge pipe leading south of the Project to an outfall located at the east end of the wharf that discharges water directly into Corpus Christi Bay.

Approximately 8.49 MGD of return flow including cooling tower blowdown, filter backwash, reverse osmosis reject water, and industrial process water blowdown from a wastewater treatment unit would be discharged through 36-in pipe at approx. -32 ft MSL at the east side of dock at coordinates 27.880670, -97.278464. Actual diversions and discharge will be measured with totalizing flow meters.

Preliminary CORMIX modeling for the discharge structure has been conducted to evaluate the dilution factor of the structure and assess the potential for any thermal impacts. The preliminary modeling indicates that the dilution factors vary with ambient density and current velocity conditions, with the least dilution

occurring at slack tide. During slack tide (ambient current velocity of near zero), the dilution factor at the edge of the 200 ft. mixing zone was modeled at 11.3. The highest modeled dilution factor (37.4 at 200 ft) occurred in the unlikely condition that ambient water density was greater than that of the effluent.

As such, this wastewater may contain a variety of constituents of concern and characteristics that can adversely affect water quality. The following is a list of those and other measurable parameters that may be present and monitored in the wastewater stream :

- pH
- Fecal coliform bacteria
- Total dissolved salt
- Total suspended solids
- Ammonia-N
- Cyanide
- Phenols
- Chlorides
- Magnesium
- Sulfates
- Boron
- Potassium
- Sodium
- Strontium
- Copper
- Lead
- Silver
- Zinc
- Nickel
- Chromium
- Mercury
- Flouride
- Nitrate
- Molybdenum
- Hydrazine
- Phosphorous
- Adsorbable Organohalogens

Based on estimated flow volumes, the combined process wastewater and RO reject will likely have a salinity of approximately 48.1 ppt, which is approximately 1.5 times higher than the average salinity of Corpus Christi Bay. This hypersaline discharge has the potential to affect aquatic resources within the discharge area. The average annual salinity of Corpus Christi Bay is approximately 32 practical salinity units (psu), but ranges between 25 and 38 psu. Preliminary modeling indicates a dilution factor of 11.3 to 37.4 at a 200 ft mixing zone to be protective of a worst-case scenario. This translates to an increase of approximately 0.9 to 2.0 ppt above ambient salinity at the edge of the mixing zone at slack tide.

Additionally, the wastewater discharged from the Project will be heated above the ambient temperature of Corpus Christi Bay. The discharge temperature is anticipated to be approximately 89.6 °F (32 °C), which is likely to be greater than the maximum temperatures of Corpus Christi Bay that are typically 86 °F (30° C). Thermal discharges are permitted by Section 316(a) of the Clean Water Act, provided that they are protective of the aquatic resources of the waterbody. The effluent temperature will not exceed the TCEQ water quality standard temperature criteria of 95°F for Corpus Christi Bay (Segment 2481), thus the discharge will be protective of resources within the waterbody.

Furthermore, West Indian manatees have been shown to gather at thermal discharges to thermoregulate during periods of cold water temperatures. In the absence of these sources of warm water, manatees are vulnerable to cold temperatures and can die from both hypothermia and prolonged exposure to cold (USFWS, 2001). In Texas, a manatee was repeatedly sighted in Buffalo Bayou near downtown Houston during November and December 1995, most often observed at the warm water outfall of a wastewater treatment plant (Fertl and Schiro, 2005). In the event that a wayward manatee were to stray into the vicinity of the Project outfall, the discharge could provide similar temporary habitat for the animal, resulting in a potentially beneficial impact.

All of the combined constituents have the potential to influence the aquatic resources of Corpus Christi Bay if present in unallowable concentrations. A portion of the constituents could contribute to nutrient loading associated with harmful algal blooms. However, ambient nutrient concentrations of Corpus Christi Bay are inherently low due to no direct river inflow source and negligible agriculture with relatively little anthropogenic influence. Hypersaline discharges could alter the salinity of the bay and contribute to salinity stratification. These have been linked to hypoxic zones in the southeastern portion of the bay with the northern portion of the bay exhibiting relatively high levels of dissolved oxygen (Applebaum et al, 2005). However, impacts to aquatic resources resulting from the constituents of the wastewater stream are not anticipated due to the treatment of the wastewater, the large mixing area of the bay, and the stable water quality in the area of the permitted discharge. Tidal flushing and ship traffic associated with the La Quinta Channel is also likely to promote mixing of the water column and support water quality.

Similar to deposition from air emissions, the discharge of heavy metals such as mercury and chromium in the Project wastewater has the potential to contribute to the bioaccumulation of toxic compounds in marine animals as described in Section 2.7. The Project has applied for, and will operate in accordance with an industrial wastewater TPDES permit, that will monitor these constituent concentrations. Project modeling of wastewater emissions estimates indicate that up to 4.25E-04 kilograms per year of inorganic mercury may be emitted from the Project, though actual emissions are likely to be a lesser amount than this "worst-case" value. Pollman *et al*. estimated the total mercury flux for the Gulf of Mexico at 205,100 kg/yr, of which 1,100 kg/yr is attributed to watershed inputs (GOMA, 2013). Consequently, the Project wastewater would contribute to no more than 0.000039% of watershed inputs, or 0.00000021% of the total annual mercury loading of the Gulf of Mexico. Pollman *et al.* estimated that the total methylmercury flux due to watershed inputs is 33 kg/yr, indicating a methylmercury to mercury ratio of approximately 3%. Using this ratio, the methylmercury flux attributable to the Project wastewater is calculated to be no more than 0.014 kg/yr. Extrapolation over 50 years results in cumulative mercury emissions of approximately 0.021 kg, which would correspond to approximately 0.71 kg of methylmercury flux over the life of the Project. (Table 2-2)

TABLE 2-2. Comparison of Modeled Mercury Emissions with Estimated Gulf of Mexico Mercury Loading

Mercury (Hg) or Methylmercury (MeHg) Source	*Total Hg Flux (kg/yr)*	*50-yr Cumulative Total Hg Flux (kg)*	*Percentage of Total Hg Flux for GOM*	*MeHg/Hg Ratio*	*MeHg Flux (kg/yr)*	*50-yr Cumulative Total MeHg Flux (kg)*	*Percentage of Total MeHg Flux for GOM*
Yucatan Channel (Atlantic Ocean)[1]	160,000	8,000,000	78.01%	0.58	9,200	460,000	96.30%
Watershed Inputs[1]	1,100	55,000	0.54%	0.03	33	1,650	0.35%
Atmospheric Deposition[1]	44,000	2,200,000	21.45	0.0073	320	16,000	3.35%
Proposed voestalpine air emissions	0.0053[2]	0.26	0.0000026%	0.0073[3]	0.000038[3]	0.0019	0.00000040%
Proposed voestalpine water discharge	0.00043[2]	0.02	0.00000021%	0.03[3]	0.014[3]	0.71	0.00015%
Gulf of Mexico Totals	**205100.0057**	**10,255,000.29**	**100%**	NA	**9553.01**	**477,650.71**	**100%**
voestalpine Totals	**0.0057**	**0.29**	**0.0000028%**	NA	**0.014**	**0.7102532661**	**0.00015%**

[1]Values taken from Pollman et. al. 2010 (GOMA, 2013)
[2]Values taken from voestalpine emissions modeling, total emissions, not deposition
[3]Extrapolated ratios for atmospheric deposition and watershed inputs and applied to voestalpine air emissions and water discharge, respectively

A recent water quality study documented that dissolved chromium concentration in the waters of northern Corpus Christi Bay was found to range from 3.5-6.7 ug/l while chromium concentration in sediment was found to range from 12 – 22 mg/kg (CBBEP 78, 2012). These concentrations were not shown to be increasing or decreasing significantly over time. In the same study, mercury concentrations in sediment of northern CCB in the vicinity of the Project ranged from 0.05 – 0.16 mg/kg and are described as probably decreasing (CBBEP 78, 2012). Mercury concentration in water was not provided in the study.

The Project's processing and wastewater treatment effectively minimize the metals content of the wastewater discharge. The raw material that will be used by the Project is first processed offsite. The ore is sintered and treated to increase the purity of the ferrous ore and remove non-ferrous materials (particularly non-metals). These non-ferrous materials may include heavy metals; however, iron ore typically does not contain a high level of non-ferrous metal. It is likely some non-ferrous metals are removed in the process. The non-ferrous metal content of the resultant pelletized material is typically below analytical detection limits. This pelletized material will be shipped to the Project site, where it will be utilized as raw material for the DRI process. Furthermore, the wastewater treatment process removes additional metals from the waste stream prior to discharge, resulting in minimal emissions.

The water discharge will be permitted via an individual NPDES (TPDES) permit administered by TCEQ. The discharge of the treated process wastewater will meet federal categorical discharge requirements (40 CFR 420 – direct-reduced iron) for new sources outlined in the New Source Performance Standards (NSPS), which are currently 0.00465 lb TSS / 1000 lb product. The discharge will also comply with the current NPDES (TPDES) discharge limits for specific pollutants as defined by Texas Surface Water Quality Standards for protection of the state surface waters. These measures are designed to protect and maintain the quality of Texas' waters and should prevent any potential adverse impacts to water quality and aquatic resources resulting from wastewater discharge associated with the Project.

Project wastewater discharge modeling indicates that the metal constituents of the discharge will not only be below the anticipated TPDES discharge limits, but will be present in such small quantities that they will likely be below minimum analytical limits (MALs) set by TCEQ and well below Maximum Contaminant Levels (MCLs) set by the EPA for drinking water standards (Table 2-3). The TCEQ MAL is defined as "the lowest concentration at which a particular substance can be quantitatively measured with a defined precision level, using approved analytical methods" and is based on analyses of the analyte in the matrix of concern (i.e., wastewater effluents) (TCEQ, 2013). The EPA MCL is defined as an enforceable standard of "the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to levels below which there is no known or expected risk to health as feasible using the

best available treatment technology and taking cost into consideration" (EPA, 2013).

TABLE 2-3. Comparison of Estimated Metals Concentrations in Effluent with TCEQ MAL and EPA MCL

Metal	*Effluent Concentration (ug/l)*	*TCEQ MAL (ug/l)*	*EPA MCL (ug/l)*
Cadmium	0.005	1	5
Chromium	2	10	100
Copper	1	10	1300
Lead	0.5	5	15
Mercury	0.001	0.2	2
Nickel	3	10	None
Zinc	2	5	None

In addition to the wastewater discharged to Corpus Christi Bay, a small amount of sanitary wastewater will be discharged from the facility through a pipeline to tie into the nearest publically-owned treatment works (POTW). The current concept for the sanitary wastewater is to construct a pipeline extending northwest from the facility along the east end of the new terminal access road and across Green Lake Ditch to a tie-in west of the ditch at the Bay Ridge subdivision. It has not yet been determined if sanitary pipelines will also be extended from the facility to the wharf through the utility corridor. If these lines are constructed they would not result in any additional impacts as they would also discharge to the POTW located outside of the Action Area.

The wastewater discharge will be monitored in accordance with TPDES permitting requirements, and will not result in exceedances Texas Surface Water Quality Standards for Corpus Christi Bay. The anticipated thermal discharge has the potential to result in a beneficial impact to West Indian manatees were they to occur within the vicinity of the Project outfall. Extrapolation of the Project's modeled wastewater discharge to estimated Gulf of Mexico mercury concentrations indicates that the Project will result in an insignificant contribution to the flux of mercury and methylmercury attributed to air deposition, thus any bioaccumulation impacts are expected to be negligible. Project wastewater discharge modeling indicates that the metal constituents of the discharge will not only be below the anticipated TPDES discharge limits, but will be present in such small quantities that they will likely be below TCEQ MALs and well below EPA MCLs for drinking water standards. Due to the implementation of processing, treatment, and monitoring measures and resulting minimal concentrations of constituents of concern, no adverse effects from the wastewater discharge on threatened or endangered species or critical habitats are anticipated as a result of the Project.

2.9 WETLANDS AND WATERS OF THE U.S.

Currently, voestalpine is proposing to construct a wharf and dock equipped with a cooling water intake structure (CWIS) and discharge outfall that would impact wetlands and waters of the U.S. Original wetlands surveys were conducted to determine potential impacts from the development of the La Quinta Trade Gateway Terminal by POCCA. According to the wetlands delineation report submitted to the USACE by POCCA in February 2002, wetland delineations were performed onsite from April through December in 2001. Based upon these delineations and several site visits, in August 2001 the USACE issued a determination (D-12367) that jurisdictional wetlands existed within the 1,114-acre area owned by POCCA. The determination identified 33.566 acres of jurisdictional wetlands that would be impacted by the proposed terminal project, as well as 10.28 acres of avoided jurisdictional wetlands associated with Green Lake, and 2.277 acres of non-jurisdictional wetlands. The wetland acreages and impacts from the proposed terminal project are detailed in Table 2-4 below.

TABLE 2-4. Jurisdictional Status and Potential Impacts to Wetlands from the Proposed La Quinta Terminal.

Wetland Type	*Jurisdictional Status*	*Acres Identified Onsite*	*Acres Impacted by Proposed Terminal*
WETLANDS			
Brackish supratidal	Jurisdictional	0.126	0.126
High marsh	Jurisdictional	0.543	0.543
Bare supratidal beach	Jurisdictional	1.38	1.38
Smooth cordgrass marshes	Jurisdictional	1.964	1.964
Non-jurisdictional wetlands	Non-Jurisdictional	2.277	0
Avoided terrestrial wetlands	Jurisdictional	10.28	0
Total Wetlands		**16.57**	**4.013**
WATERS OF THE U.S.			
Unvegetated bay bottom	Jurisdictional	27.143	27.143
Low density seagrasses	Jurisdictional	2.41	2.41
Total Waters of the U.S.		**29.553**	
Total Wetlands and Waters		**46.123**	**33.566**

On August 27, 2004 the USACE authorized the dredging of 29.5 acres of waters of the U.S. to -39 ft MLT and the fill of the 4 acres of wetlands for the proposed terminal project under permit #23269, provided that POCCA would plant 19.2 acres of seagrass and 6.6 acres of smooth cordgrass as mitigation within the 200-acre beneficial use site located south of the La Quinta Channel Extension. The permit was extended under permit SWG-2001-02261 on June 17, 2009 to provide additional time to complete the previously authorized work. On July 11, 2011 SWG-2001-02261 was amended to allow for dredging to -45 ft MLT and an additional ten-year extension of time to complete the project and conduct maintenance dredging.

The wharf and dock will be built by voestalpine, but the land and structures will remain owned by the Port of Corpus Christi. The voestalpine facility is considered part of the La Quinta Trade Gateway Terminal project. The footprint of the voestalpine dock will be within the permitted boundaries and will result in the dredge of approximately 12.4 acres of bay bottom and fill of approximately 5.9 acres within the areas authorized by SWG-2001-02261.

The current concepts for the potable and sanitary wastewater pipelines include construction of new pipelines that each cross Green Lake Ditch to tie-ins west of the ditch near the Bay Ridge subdivision. Impacts to the wetlands associated with Green Lake Ditch would be avoided via bridging over or boring underneath the ditch, with construction occurring in non-jurisdictional areas. It has not yet been determined if potable and sanitary pipelines will be extended from the facility to the wharf through the utility corridor. If these lines are constructed they would not result in any additional impacts to jurisdictional wetlands as they would be located within the wharf fill areas authorized by SWG-2001-02261.

2.10 VESSEL TRAFFIC

The operation of the Project would require up to 75 vessel calls at the dock per year to deliver raw materials and transport product from the DRI facility. Statistics from the Port of Corpus Christi indicate that 6,082 vessels (ships and barges) were active within the port in 2012. Using this number, it is estimated that voestalpine's proposed annual vessel traffic would account for approximately 1% of the annual vessel traffic in the Port. This modest increase in vessel traffic within the La Quinta Channel is not expected to significantly impact other vessel operations. Although the vessel traffic has the potential to result in collisions with protected marine species were they to occur within the Action Area, the use of experienced vessel pilots within Corpus Christi Bay will minimize the potential for impacts.

Federal and State vessel pilots are mandated by U.S. Coast Guard regulations in 33 CFR 164 to maintain safe operating speeds within Texas port waters. It is important to remember that part of the key to safe navigation of main shipping channels is the avoidance of obstacles that would endanger each vessel, mariners aboard those vessels, and the maritime environment. 33 CFR 164.11 (p) states:

"The person directing the movement of the vessel sets the vessel's speed with consideration for…The proximity of the vessel to fixed shore and marine structures…"

Safe navigation involves avoiding all collision hazards within the waterway including other vessels, buoys, floating debris, manmade

structures, and observed marine wildlife. The mission statement for the Aransas-Corpus Christi Pilot's Association states this clearly:

"As pilots our goal is to provide a public service of the highest quality and training in order to protect the interest of the local port authority, local communities and the State of Texas. This service includes ensuring the safe transit of all vessels being piloted while safeguarding the environment."

Vessels traversing the Action Area will be controlled by pilots to operate at speeds to maintain safety while docking and maneuvering within the La Quinta Channel, which are expected to minimize the potential for collisions with sea turtles and manatees.

3.0 IDENTIFICATION OF THE ACTION AREA

3.1 ACTION AREA DEFINED

The Action Area is defined in 50 CFR 402.02 as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action". For the purposes of this BA, the Action Area was determined and delineated by identifying the maximum area that could potentially be impacted by construction and operation of the Project.

Potential impacts from the Project include physical disturbances associated with construction and operation, noise, light, dust, erosion, sedimentation, air emissions, surface water intake and wastewater discharges to surface water. Air emissions were determined to impact the largest area on and surrounding the Project site. Accordingly, the boundaries of the Action Area were determined based upon air emission dispersion modeling results.

Air dispersion modeling indicated that an Action Area consisting of the Project site and a buffer extending 1.5 miles (Figure 5) from the Project site boundary would encompass any potential impacts to threatened and endangered species and designated critical habitat due to the construction and operation of the Project.

3.2 ACTION AREA DELINEATION METHODOLOGY AND RESULTS

The boundary of the Action Area was delineated by applying a conservative buffer to extend beyond the area delineated using EPA "significant impact levels" (SILs). The SILs are determined by performing a detailed air dispersion modeling analysis using the US EPA and TCEQ guidelines appropriate to the source and emissions. A detailed modeling protocol is included with the TCEQ PSD Pre-construction Air Permit Application.

ERM used the most up-to-date air models provided by the EPA and most recent guidance provided by the EPA and the TCEQ to perform the modeling analysis. The analysis takes into account local terrain, actual meteorological data (provided by TCEQ), Project plant design including stack and building parameters, and worst-case maximum emission rates from the individual sources proposed by this application.

3.2.1 Significant Impact Level Dispersion Modeling

Using the state of the art air dispersion modeling techniques, the maximum predicted concentration due to the Project for each pollutant and averaging period are included below in comparison to the SIL.

TABLE 3-1. Summary of Criteria Pollutant Air Dispersion Modeling

Pollutant	*Standard*	*Averaging Period*	*Max Off-site Concentration ($\mu g/m^3$)*	*SIL ($\mu g/m^3$)*	*Less than SIL?*
NO_2	NAAQS	1-hour	6.7	7.5	Yes
		Annual	0.47	1	Yes
CO	NAAQS	1-hour	754	2000	Yes
		8-hour	295	500	Yes
PM_{10}	NAAQS	24-hour	4.0	5	Yes
		Annual	0.52	1	Yes
$PM_{2.5}$	NAAQS	24-hour	1.18	1.2	Yes
		Annual	0.26	0.3	Yes
SO_2	TCEQ Minor Source	30 Minutes	0.99	1,021	<2%
SO_2	TX AAQS	1-Hour	0.99	196	Yes*
		3-Hour	0.8	1,300	Yes*
		24-Hour	0.34	365	Yes*
		Annual	0.06	80	Yes*

**Below Texas de minimis levels*

The SIL is a level set by the EPA, below which, modeled source impacts would be considered insignificant. If a maximum concentration value is less than the SIL, the modeled source impacts are considered insignificant and are not considered to cause or contribute to a violation of a NAAQS or PSD Increment for that pollutant and averaging period. All maximum concentration values are less than the respective SIL. These pollutant impacts are considered insignificant based on stringent limits set to protect the most sensitive human populations. Consequently, these impacts are not expected to impact federally-protected species.

Sulfur Dioxide emissions were less than the levels necessary for voestalpine to demonstrate that site wide emissions were less than the SILs; however, TCEQ does require the facility to show that off-site impacts are below specific levels. Modeling is conducted on a 30 minute basis and if the impacts are less than 2% the allowable levels, then TCEQ deems that those emissions will not cause or contribute to state property line exceedances. The SO_2 impacts from the model are estimated at less than 0.1% the allowable level. Consequently, emissions should not cause or contribute to a violation of the state standards. Furthermore, modeling demonstrated that SO_2 impacts were below the Texas de minimis levels for the State Ambient Air Quality Standards.

The dispersion model predicts concentrations at specific downwind receptor locations for pollutant averaging periods. Since all pollutants and averaging periods were below the respective SIL at all locations outside of the subject site, the Action Area was based on a conservative distance of 1.5 miles out from the proposed Project site boundary.

The Action Area was used to analyze the potential impacts to protected species and/or their habitat by the Project. The results of the analysis of potential impacts to protected species are presented in subsequent sections.

3.2.2 Other Contaminants

In addition to the emission rates calculated for PSD criteria pollutants; emission rates for other pollutants were calculated that may be emitted by the project. This analysis was performed in accordance with TCEQ guidelines on the modeling of non-criteria pollutants. Consequently, voestalpine conducted a Modeling and Effects Review Applicability (MERA) determination as part of the Texas PSD pre-construction application to determine which non-criteria pollutant emissions would require complex air modeling. Based on this review, all toxic pollutants were deemed to have impacts sufficiently low enough not to warrant continued modeling. Based on the MERA review, the highest values against the TCEQ effects screening levels (ESLs) were less than 2% the pollutant specific ESL.

4.0 FEDERALLY LISTED SPECIES AND DESIGNATED CRITICAL HABITAT THAT MAY POTENTIALLY OCCUR IN THE PROJECT AREA

The USFWS, NMFS, and TPWD threatened and endangered species databases and Texas Natural Diversity Database (TXNDD) occurrence data were reviewed to determine which, if any, federally-listed species may have the potential to occur on or near the Project site. The species that occur on the federal lists for San Patricio and Nueces Counties are presented in Table 4-1 below.

4.1 FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES

TABLE 4-1: Federally Listed Threatened and Endangered Species Occurring in San Patricio And Nueces Counties

Common Name	*Scientific Name*	*Federal Status*
Birds		
Brown pelican*	*Pelecanus occidentalis*	DLR
Northern aplomado falcon	*Falco femoralis septentrionalis*	LE
Piping plover	*Charadrius melodus*	LT
Red knot*	*Calidris canutus rufa*	PT
Sprague's pipit*	*Anthus spragueii*	C
Whooping crane	*Grus americana*	LE
Yellow-billed cuckoo*	*Coccyzus americanus*	PT
Flowering Plants		
South Texas ambrosia*	*Ambrosia cheiranthifolia*	LE
Slender rush-pea*	*Hoffmannseggia tenella*	LE
Mammals		
Ocelot	*Leopardus pardalis*	LE
Gulf coast jaguarundi	*Herpailurus yagouaroundi cacomitli*	LE
West Indian manatee	*Trichechus manatus*	LE
Blue whale*	*Balaenoptera musculus*	LE
Finback whale*	*Balaenoptera physalus*	LE
Humpback whale*	*Megaptera novaeangliae*	LE
Sei whale*	*Balaenoptera borealis*	LE
Sperm whale*	*Physeter macrocephalus*	LE
Reptiles		
Atlantic hawksbill sea turtle	*Eretmochelys imbricata*	LE
Green sea turtle	*Chelonia mydas*	LT
Kemp's Ridley sea turtle	*Lepidochelys kempii*	LE
Leatherback sea turtle	*Dermochelys coriacea*	LE
Loggerhead sea turtle	*Caretta caretta*	LT

LE = Listed Endangered
LT = Listed Threatened
DLR = Delisted and in recovery
PT = Proposed Threatened
C = Candidate for listing
* = Not carried forward for analysis
Source: USFWS, NMFS, 2013

Four of the 22 listed species are either in recovery or only proposed or candidates for listing, and are thus not currently protected by the ESA. The brown pelican has been delisted and is in recovery, the red knot was proposed to be listed as threatened on September 30, 2013 and is currently undergoing public comment, the yellow-billed cuckoo was proposed to be listed as threatened on October 3, 2013 and is currently undergoing public comment, and the Sprague's pipit is a candidate for listing. These four species were removed from further analysis, due to their lack of current applicability to the ESA.

The two species of flowering plants, South Texas ambrosia and slender rush-pea were only listed in Nueces County. These species were removed from further analysis because the Action area does not encompass any terrestrial area in Nueces County, only Corpus Christi Bay where these species cannot occur.

In addition to the West Indian manatee, five species of marine mammals, the blue, finback, humpback, sei, and sperm whales are listed by the NMFS for the state of Texas. These whales only occur offshore in the Gulf of Mexico, and are not known to enter Corpus Christi Bay, thus they are removed from further analysis.

The remaining 11 ESA-protected species with the potential to occur in the Action Area are discussed in detail below.

4.1.1 Northern Aplomado Falcon

The northern aplomado falcon is a medium-sized bird of prey, approximately 14-18 inches in length with a wingspan of 31-40 inches. Adults have a steel gray back, a white buffy upper breast with a dark band and a cinnamon-colored belly. They have a white streak over the eye, a dark brown head, and narrow banded tail (TPWD 2012f).

The aplomado falcon ranges through most of South America, Mesoamerica, and formerly inhabited desert grasslands and coastal prairies of Texas, New Mexico, and Southeastern Arizona. Preferred habitat consists of open terrain with scattered trees or shrubs. In the U.S., they were found along yucca-covered sand ridges in coastal prairies, riparian woodlands in open grasslands, and in desert grasslands with scattered mesquite and yucca. Aplomado falcons do not build their own nests, but in the period from March to June have been known to take over old or freshly constructed nests of other raptors. Declines of U.S. populations began in the 1930s, the species was considered extirpated in the 1950s, and was listed as federally endangered in 1986. More than 1,142 captive-bred falcons have been released in southern and west Texas (US Dept. of Defense and USFWS 2007).

4.1.2 *Piping Plover*

Piping plovers are small, migratory shorebirds about 7 inches long with a wingspan of about 15 inches. Piping plovers have white undersides, a tan colored upper body, and orange legs year round. During the breeding season, adults develop a black tipped orange beak, dark narrow breast band, and a dark strip across the forehead (TPWD 2007).

Once widespread throughout North America, remnant populations of piping plovers breed in three distinct populations: Atlantic Coast, Great Lakes, and Northern Great Plains. Piping plovers were listed as federally endangered in 1986 (USFWS 2001b). They winter along Gulf Coast beaches from Mexico to Florida, along the Atlantic Coast, and on Caribbean islands. An estimated 35% of the known population of piping plovers winter in Texas (TPWD 2007).

Piping plovers winter along the Gulf Coast from mid-July to April. The preferred wintering habitat is bare or very sparsely vegetated intertidal ocean beach, wash-over passes, wrack lines, ephemeral ponds, lagoons, salt marshes, tidal mudflats, sandflats, and algal flats. These are areas periodically covered by water and then exposed by tides or wind. The soft sand, mud, or algae supports the invertebrates that comprise the plovers' diet. Plovers are visual predators that feed on marine worms, insects, crustaceans, mollusks, and other small marine animals and their eggs and larvae. Plovers feed primarily during the day and forage most aggressively during the falling tide (TPWD 2007). Plovers roost and preen on sandy beaches, in wash-over passes, or on tidal flats near their foraging territory. Seaweed, small dunes, and driftwood provide cover (USFWS 2001b).

Approximately 435 acres of designated critical habitat occurs in San Patricio County. The area is southwest of the Project along Indian Point with the City of Portland as the northeast boundary. The area is a large basin of tidal ponds, sand spits, and wind tidal flats owned and managed by the City of Portland (USFWS 2001b).

4.1.3 *Whooping Crane*

This large migratory bird can approach 5 feet in height and have a wingspan of 7.5 feet. Whooping Cranes are white with black, bristly feathers on the side of their head and black primary wing feathers visible only in flight. They have yellow eyes and long black-gray legs and bills (USFWS 2007).

There are less than 500 wild whooping cranes and only one wild, self-sustaining population. This population breeds and nests in wetland habitat in Wood-Buffalo National Park, Canada and winters in the Aransas National Wildlife Refuge, Texas. Birds arrive on the Texas wintering grounds from late October to mid-December and typically depart between March 25 and April 15 (USFWS 2007).

Wintering habitat includes salt marshes and tidal flats on the mainland and barrier islands, dominated by salt grass, saltwort, smooth cordgrass, glasswort, and sea ox-eye. Whooping cranes are omnivorous and forage for blue crabs, clams, and the wolfberry plant in their Texas wintering grounds. Occasionally whooping cranes fly to upland sites to drink fresh water or feed on acorns, snails, crayfish, and insects (USFWS 2007).

The project area is located approximately 60 miles southwest of the Aransas National Wildlife Refuge, which is designated critical habitat (USFWS 2012a). There have been no confirmed observations of whooping cranes in San Patricio County (USGS 2006).

4.1.4 Ocelot

The ocelot is a predatory feline that weighs up to 35 pounds and reaches 4 feet in length. Their color varies from pale to tawny browns with brown spots with black borders. Ocelots are distributed from Texas and Arizona to Mexico, and Central and South America (USFWS 2010).

These nocturnal predators prefer dense cover. In Texas, ocelots occur in dense thorny shrub lands with 75-95% coverage of species including spiny hackberry, brasil, desert yaupon, wolfberry, lotebush, amargosa, white brush, catclaw, blackbrush, lantana, guayucan, cenizo, elbowbush, and Texas persimmon. Tracts of at least 100 acres of isolated dense brush or 75 acres of brush interconnected to other tracts of habitat by brush corridors are considered important habitat (TPWD 2012g).

Fewer than 100 ocelots exist in the U.S., and they are concentrated in south Texas at the Lower Rio Grande Valley National Wildlife Refuge and Santa Ana National Wildlife Refuge (both near Alamo, TX), Laguna Atascosa National Wildlife Refuge near Brownsville, and on a private ranch several miles away from Brownsville (USFWS 2010).

4.1.5 Gulf Coast Jaguarundi

This feline is slightly larger than a domestic cat and has a dark gray-brown uniform coat. The body is similar in appearance to a large weasel, is long and low with short legs, a small flattened head, and narrow brown eyes (USFWS 2012c).

There is little information available concerning the biology of the jaguarundi in Texas. They are very rare in the dense, shrub thickets of South Texas (Davis and Schmidly 1994). Scientists speculate that their habitat requirements are similar to that of the ocelot. Tracts of at least 100 acres of isolated dense brush or 75 acres of brush interconnected to other tracts of habitat by brush corridors are considered important habitat.

4.1.6 *West Indian Manatee*

Manatees are large, seal-shaped marine mammals with paired flippers and a round, paddle-shaped tail. They are typically grey in color, and adults average nine feet in length and weigh about 2,000 pounds (USFWS 2001a). West Indian manatees range between marine and freshwater habitats, living in rivers, bays and coastal areas from the southeastern coast of the United States to the northern coast of South America (USFWS 2001a).

As opportunistic herbivores, manatees prefer shallow grass beds in coastal and riverine areas as feeding habitat. Manatees require sources of freshwater and are sensitive to cold. In winter they are drawn to natural and anthropogenic sources of warm water such as springs or power plant outfalls (USFWS 2012h). Canals and boat basins, where warmer water temperatures persist as temperatures in adjacent bays and rivers decline, may also be used as temporary thermal refuges (USFWS 2001a).

Occurrences of manatees in Texas are rare; however, manatees occasionally wander into the Texas Gulf Coast and bay systems. They are most common in river mouth and estuarine habitats in shallow waters off the coasts of Florida, Mexico, and Central America, but are sighted in Corpus Christi Bay every few years. The most recent siting of a manatee in Corpus Christi Bay occurred on September 20, 2012 near the Lawrence Street T-Head located approximately 9 miles southwest of the Project in Corpus Christi, TX (CCCT 2012). A single manatee was observed in a debris-strewn drainage ditch at the Koch Refinery on the La Quinta Channel, Corpus Christi in December, 1995. There have been infrequent manatee sightings in the Corpus Christi Bay from 1995-2005 (Fertl and Schiro 2005).

4.1.7 *Atlantic Hawksbill Sea Turtle*

The Atlantic hawksbill is listed as endangered throughout its range (USFWS 2012d). The hawksbill is a small to medium-sized turtle averaging 2.5 feet in length and weighing 176 pounds or less. Hawksbills have an elongated oval shell with thick overlapping scutes (similar to plates or scales) on the carapace, flippers with two claws, and a hawk-like beak (USFWS 2012d). The plastron (flat under portion of the shell) is yellowish while the carapace (convex upper portion of the shell) is patterned with streaks of brown and black on an amber background (NMFS 1993).

Hawksbill sea turtles nest in low density on small beaches, usually at night, where the female digs a hole and deposits an average of 140 eggs. Hawksbills have a 6-month nesting season in which they nest an average of 4.5 times at intervals of approximately 14 days (NMFS 1993). Remigration intervals (i.e., intervals between successive nesting years) average 2 to 3 years (USFWS 2012d, NMFS 1993). Age at sexual maturity is estimated at 20 years or more in the Caribbean. Nesting occurs sometime between April and December and varies slightly with locality (USFWS 2012d). As with other sea turtles, post-hatchlings

take shelter in the weed or drift lines that accumulate at convergence zones in the pelagic environment (NMFS 1993). Drift lines are linear piles of natural and man-made material that accumulate at convergence zones on the ocean surface and are often associated with *Sargassum* communities.

Hawksbills are carnivorous and consume mostly sponges, a unique and specific feeding habit that ties them to the needs of their prey, which require a hard substrate. As juveniles and adults they are associated with coral reefs, shallow coastal areas, lagoons, oceanic islands, and narrow creeks or passes (USFWS 2012d).

The hawksbill is distributed in tropical and subtropical seas of the Atlantic, Pacific, and Indian Oceans. About 15,000 females are estimated to nest each year throughout the world, with the Caribbean accounting for 20 to 30 percent of the world's hawksbill population (USFWS 2012d). Within the continental U.S., nesting is restricted to the southeastern coast of Florida (NMFS 1993). Hawksbills have been sighted in all the Gulf States and along the eastern seaboard as far north as Massachusetts, although sightings north of Florida are rare (NMFS 1993).

There has only been one documented hawksbill nesting on the Texas Coast in 1998 at Padre Island National Seashore (NPS 2012b). Hawksbills are observed with some regularity in Florida and Texas. Sightings of small turtles in Texas are believed to originate from nesting beaches in Mexico (NMFS 1993). Critical habitat has been designated in three small islands associated with Puerto Rico: Mona, Culebra, and Vieques (USFWS 2012d), but none in the continental U.S.

Hawksbills nest on small beaches, exhibit a wide tolerance for nesting substrate, and typically place their nests under vegetation (NMFS 1993). As previously mentioned, post-hatchlings spend months floating in weed-lines in the pelagic environment (NMFS 1993, USFWS 2012d). Adults are associated with coral reefs, rocky outcrops and shoals, which are optimum sites for sponge growth (NMFS 1993). They are seldom seen in water deeper than 65 feet (USFWS 2012d).

4.1.8 Green Sea Turtle

The breeding populations of green turtles in Florida are listed as endangered, all other populations in the U.S. are listed as threatened. The green sea turtle is classified as threatened in the state of Texas (TPWD 2012c).

The green sea turtle is a large sea turtle, whose carapace averages 3-4 feet in length and can weigh over 400 pounds (USFWS 2012b, NMFS 1991). Green sea turtles have a heart-shaped shell, smooth carapace, and flippers with one claw, (USFWS 2012b). The plastron is yellowish white while the carapace changes in color from solid black to a variety of shades of green, grey, brown, and black in irregular patterns (NMFS 1991).

Green sea turtles nest on beaches with turbulent surf, usually at night. The female deposits 75-200 eggs, with mean clutch size of the Florida population reported at 136 eggs (USFWS 2012b, NMFS 1993). Green sea turtles deposit one to eight clutches (average is 3.3) per season at intervals of 12-14 days (NMFS 1991). Nesting occurs at intervals of 2, 3, 4 or more years (NMFS 1991). Age at sexual maturity varies greatly throughout the range, and is estimated at 20-50 years. Nesting season varies with locality. In the Southeastern U.S., it is June through September (USFWS 2012b).

Adult green sea turtles are primarily herbivorous; however, there are reports of consumption of various invertebrates such as mollusks, sponges, crustaceans, and jellyfish (NMFS 1991, NatureServe 2012a). As subadults and adults, green sea turtles migrate to shallow, relatively protected, benthic feeding grounds, commonly pastures of sea grasses and or algae (NMFS 1991).

The green sea turtle is distributed in tropical and subtropical seas around the world. Within U.S. Atlantic waters, green sea turtles are found around Puerto Rico, the U.S. Virgin Islands, and the continental United States from Texas to Massachusetts (NMFS 1991). Within the continental U.S., green turtles nest in small numbers in Georgia, South Carolina, and North Carolina, and in larger numbers in Florida and Hawaii. An estimated 5,000 females nested in Florida in 2010 (USFWS 2012b). Critical habitat was designated in 1998 around Culebra Island, Puerto Rico (NOAA 2012).

The historical decline in the green sea turtle is attributed to disease, degradation of habitat, overexploitation by man for food, and other factors (NMFS 1991, NPS 2012d). A commercial fishery for green turtles existed in Texas at the turn of the nineteenth century, and turtles were primarily harvested in Aransas Bay, Matagorda Bay, and Laguna Madre (NMFS 1991).

Green sea turtles nest on high energy beaches with minimal human disturbance, usually on islands (NMFS 1991). Post-hatchlings spend months floating in weed-lines in the pelagic environment (NMFS 1993, USFWS 2012b). Adults are associated with shallow waters (except when migrating) inside reefs, bays, inlets, and shoals with abundant vegetation (USFWS 2012b, NatureServe 2012a).

In Texas, sightings of green sea turtles are rare. South Padre Island is the only location on the Texas coast where green turtle nesting has been documented. In the last few years, one to five nests have been reported each year. Most green sea turtles found in Texas waters are juveniles (NPS 2012d).

A sea turtle stranding is when a marine mammal floats or swims into shore and becomes stuck on the shore or in shallow water. Only one green turtle stranding was reported for San Patricio County in the most recent year of available data, 2007 (STSSN 2012).

4.1.9 Kemp's Ridley Sea Turtle

The Kemp's Ridley sea turtle was listed as endangered throughout its range in 1970 (NMFS 2011). The Kemp's Ridley sea turtle is one of the smallest sea turtles, reaching about 2 feet in length and weighing up to 100 pounds. Adults have an oval carapace that is almost as wide as it is long (USFWS 2012e). The coloration changes throughout development from the overall gray-black color of hatchlings to the lighter grey-olive carapace and cream white to yellowish plastron of adults (NMFS 2011).

After hatching, juvenile Kemp's Ridley sea turtles spend an average of two years in the Gulf pelagic environment and may associate with floating *Sargassum* communities. The majority of these juveniles remain with Gulf of Mexico currents while others are transported to the Gulf Stream of the Northwest Atlantic (NMFS 2011).

After reaching a carapace size of approximately 8 inches, juveniles occupy the neritic zone of the Northern Gulf of Mexico (USFWS 2012e). During the juvenile developmental stage, turtles prefer areas that are somewhat protected, with temperate waters, shallower than 50 meters. There appears to be seasonal, temperature induced movement between shallow coastal feeding grounds and offshore areas. As adults, Kemp's Ridley sea turtles utilize shallow, nearshore waters of less than 37 meters; however, it is not uncommon for them to venture over deeper water (NMFS 2011). Kemp's Ridley sea turtles are primarily carnivorous, (i.e. consuming crabs and other crustaceans). Habitat associations appear to coincide with distributions of preferred prey species but defined habitat preferences remain to be defined (NWFS 2011).

The Kemp's Ridley turtle has a range along the Gulf coast of Mexico and the U.S. and the Atlantic Coast as far north as Nova Scotia (USFWS 2012e). Nesting is essentially limited to the western Gulf of Mexico, primarily in Tamaulipas and Veracruz, Mexico. Nesting also occurs regularly in Texas and infrequently in a few other U.S. states (NMFS 2011).

The Kemp's Ridley is the most endangered species of sea turtle. Their populations suffered a precipitous decline due to over-harvest of eggs and loss of juveniles and adults to commercial fishing (NPS 2012c). An international effort focused on the protection of nesting sites, has led to an exponential increase in the nesting population (NMFS 2011).

Kemp's Ridley turtles have a highly restricted nesting area within the western Gulf of Mexico. Kemp's Ridley sea turtles nest on fine grain beaches, usually during daylight, and deposit an average clutch of 100 eggs. Kemp's Ridley sea turtles nest an average of 2.5 times per season at intervals of 14-28 day. Nesting occurs at intervals of 2, 3, 4 or more years (NMFS 2011). Age at sexual maturity is estimated at 12 years (USFWS 2012e). Nesting occurs from April to July in synchronized emergences (NMFS 2011). The primary nesting sites are in Tamaulipas, Mexico, with consistent nesting events in Veracruz and Texas

(USFWS 2012e). Nesting in Texas occurs primarily at Padre Island National Seashore, and has been steadily increasing since surveys began in 1987(NPS 2012c). A total of 911 nests were documented on the Texas coast from 2002-2010 (NMFS 2011).

From 1978-1988 an international, multiagency project was undertaken to create a secondary nesting colony for Kemp's Ridley sea turtles at Padre Island National Seashore, Texas. Since 1986, systematic efforts to detect and protect nests along the Texas coast have led to increased awareness and exponential increase in the number of Kemp's Ridley hatchlings along the Texas coast. In 2011, there were 199 nests documented and protected on the Texas coast and 16,092 hatchlings released (NPS 2012c). From 1980-1991, in the area around Corpus Christi Bay, 126 Kemp's Ridley turtles were sighted. The vast majority of which were strandings along the Gulf side of North Padre and Mustang Island (Manzella and Williams 1992). No critical habitat within the U.S. has been designated, although petitions to do so along the Texas coast have been submitted (WEG 2010).

4.1.10 Leatherback Sea Turtle

The Leatherback sea turtle was listed as endangered throughout its range in 1970 (USFWS 2012f).The Leatherback sea turtle is the largest of all sea turtles, reaching up to 8ft in length and weighing over 1,200 pounds. Unlike other sea turtles, leatherbacks do not have hard, bony shells, but rather a mosaic of small bones covered by firm, rubbery skin with seven longitudinal ridges (USFWS 2012f). Their front flippers are proportionally longer than other sea turtles, and both front and rear flippers lack claws (NMFS 1992). Their color is slate black to bluish-black spotted by irregular pale patches (NPS 2012e).

Leatherback sea turtles nest on sandy beaches, primarily at night, and deposit 80-95 eggs per clutch. Female leatherback turtles nest an average of 5-7 times per season at intervals of 9-10 days. Nesting occurs at intervals of 2-3 years and sexual maturity is believed to occur around 16 years. Nesting in the U.S. occurs from about March to July (NMFS 1992, USFWS 2012f).

After hatching, Leatherback sea turtles are thought to move offshore to the pelagic environment (TEWG 2007). Leatherbacks are the most pelagic, migratory and wide-ranging of all sea turtles (USFWS 2012f). Adult leatherbacks are highly migratory, travel hundreds of miles from marine feeding grounds to nesting beaches (NMFS 1992).

The Leatherback turtle has a worldwide distribution, in tropical and temperate waters of the Atlantic, Pacific, and Indian Oceans. In 1980, the nesting population was estimated at 115,000, and by 1995 this number was reduced to an estimated 34,500. However, recent population estimates for the North Atlantic alone, range from 34,000-94,000 adult leatherbacks. Important nesting areas in the Atlantic occur in Gabon, Africa, and French Guiana, with nesting sites under U.S. jurisdiction in the U.S. Virgin islands, Puerto Rico and Florida. The only major nesting site in the continental U.S. is along the southeastern Florida coast. From

2006-2010, the number of nests along Florida beaches varied between 540 and 1,747 per year (USFWS 2012f).

The most serious threat to leatherbacks is the disturbance of nesting grounds (TPWD 2012e). The crash of the Pacific leatherback population is thought to be a result of exploitation of humans, incidental fisheries take and loss and degradation of nesting habitat (USFWS 2012f).

Leatherback sea turtles nest on tropical and subtropical sloping sandy beaches, backed by vegetation. Preferred nesting beaches are in proximity to deep water, generally rough seas, and lack a fringing reef (NMFS 1992, USFWS 2012f, NatureServe 2012b).

Habitat requirements for juveniles and post hatchlings remain unknown. The leatherback diet consists almost entirely of jellyfish (NPS 2012e, NMFS 1992). The adult leatherback utilizes the pelagic environment, moves hundreds of thousands of miles between nesting beaches and distant feeding grounds, and seldom approaches land, except for nesting (NatureServe 2012b).

Leatherbacks are rare visitors to the Texas Gulf Coast (TPWD 2012e). A 1956 sighting from a low-flying airplane of 100 individuals near Port Aransas coincided with a dense school of cabbage head jellyfish (Leary 1957). In 2008, a single leatherback nest was located at Padre Island National Seashore. Prior to this nesting, only historical records of nesting occurred in Texas from the 1920s and 1930s. No nests have been detected since 2008 (NPS 2012e).

4.1.11 Loggerhead Sea Turtle

The Loggerhead sea turtle was initially listed as threatened throughout its range in 1970. In 2011, the listing was revised and nine distinct population segments were defined, four as threatened and five as endangered (USFWS 2012g).

The loggerhead sea turtle is a medium to large turtle, their carapace averages 3 feet in length and weighs between 170- 350 pounds (NPS 2012f). Loggerhead sea turtles are characterized by a large head with blunt jaws. The thick bony carapace is covered by non-overlapping scutes. The carapace and flippers are reddish brown while the plastron is yellow (NMFS 2008, USFWS 2012g).

Loggerhead sea turtles nest on high energy beaches, usually at night, and deposit a mean clutch size of 100-126 eggs along the southeastern U.S. coast. Loggerhead sea turtles deposit one to seven clutches (average is 4.1) per season at intervals of approximately 14 days. Nesting occurs at 2-3 year intervals and sexual maturity is believed to be around 32-35 years. The U.S. nesting season is April to September with a peak in June and July (USFWS 2012g).

After hatching, loggerheads spend weeks or months in the pelagic zone of neritic waters along the continental shelf and then transition to drift lines. These occur commonly in convergence zones and are associated with floating *Sargassum*

communities. Post-hatchlings float and forage as omnivores. Juveniles enter an oceanic phase thought to last 7-11.5 years before transitioning to the neritic zone. Juveniles in the North Atlantic inhabit estuarine environments and essentially all continental shelf waters (NMFS 2008). Juveniles and adult loggerheads utilize both neritic and oceanic environments. Adult loggerheads utilize open ocean areas in the neritic zone and consume a variety of organisms, primarily mollusks and benthic crabs (NMFS 2008).

Adult loggerheads are primarily carnivorous. They consume a variety of organisms found in the neritic zone, primarily mollusks and benthic crabs (NMFS 2008).

The loggerhead is distributed in the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans. The loggerhead is commonly found throughout the North Atlantic including the Gulf of Mexico, northern Caribbean, Bahamas, east to West Africa, and the Mediterranean. Only two loggerhead nesting aggregations have more than 10,000 nesting females per year: Masirah, Oman and South Florida in the U.S. In the U.S., Loggerheads nest from Texas to Virginia, and about 80% of loggerhead nesting in the U.S. occurs in six Florida counties (NMFS 2008).

Loggerheads are less valued for eating, therefore hunting has not been as great a factor in their decline as other sea turtles. The loss of eggs (due to humans and predators, and mortality due to fishing have had the most severe effects on loggerheads (NPS 2012f).

Loggerheads sea turtles nest on steeply sloped, relatively narrow, coarse-grained beaches. Nests are laid between the high tide line and dune front, usually on ocean beaches, but occasionally on appropriate estuarine shorelines (NMFS 2008).

There is no critical habitat designated in the U.S. In Texas, a relatively stable number of 1-6 loggerhead nests are found annually. These nests have been found statewide with the greatest occurrence on the Padre Island National Seashore (NPS 2012f).

4.2 DESIGNATED FEDERAL CRITICAL HABITAT

There is no designated federal critical habitat on the Project site or within the Action Area. The nearest designated federal critical habitat is piping plover habitat located outside the Action Area approximately 3 miles southwest of the Project. The plover habitat occurs along Indian Point with the City of Portland as the northeast boundary. The area is a large basin of tidal ponds, sand spits and wind tidal flats owned and managed by the City of Portland (USFWS 2001b).

4.3 TEXAS NATURAL DIVERSITY DATABASE

ERM submitted a TXNDD request to the TPWD. The TXNDD, established in 1983, is the TPWD's most comprehensive source of information on which includes rare, threatened, and endangered plants, animals, invertebrates, exemplary natural communities, and other significant features (elements). The TXNDD is continually updated, providing current or additional information on statewide status and locations of these unique elements of natural diversity. However, the data is not all-inclusive, as there are gaps in coverage and species data, due to the lack of access to land or data, and a lack of staff and resources to collect and process data on all rare and significant resources. Although it is based on the best data available to TPWD regarding rare species, these data cannot provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features in any area. Nor can these data substitute for on-site evaluation by qualified biologists. The TXNDD information is intended to assist users in avoiding harm to rare species or significant ecological features.

Response to the TXNDD request included an element occurrence listing, element occurrence report, and geographic information systems (GIS)-compatible shapefile of element occurrence boundaries. Figure 6 depicts an aerial map of the site vicinity overlain with the shapefile obtained from TXNDD. Element occurrence records corresponding with the boundaries depicted in Figure 6 are attached in Appendix C of this document. No state or federally-listed threatened or endangered species are shown to occur on the Project site. The circle overlapping the northwest corner of the Project site is identified as within the range of the bracted blazing star (*Liatris bracteata*), also called the coastal gay-feather, which is a rare plant species, but is not considered threatened or endangered, and is neither state nor federally protected. Additional rare, threatened, and endangered species are shown to occur within the vicinity of Project site. The keeled earless lizard and threeflower broomweed are shown to occur approximately 2-5 miles east of the site in the Ingleside area; each are considered rare and are not protected. The islands southwest and southeast of the Project are home to rookeries containing a variety of bird species including the brown pelican and reddish egret (both state endangered). The piping plover (federally threatened) is shown to occur approximately 5 miles southwest of the site at sandflats along both sides of SH 181, as well as approximately 11 miles southeast of the Project area on Mustang Island. The gulf coast jaguarundi (federally endangered) is shown to occur approximately 5 miles northeast and 5 miles southeast of the Project area. Additional occurrences east and northeast of the Project site include the loggerhead sea turtle, green sea turtle, Texas diamondback terrapin, gulf saltmarsh snake, black-spotted newt, and West Indian Manatee.

5.0 EFFECTS ANALYSIS

The following sections discuss the methods and results of desktop review and field surveys performed to determine the ecological receptors present within the Action Area as well as the potential effects on these receptors from the Project.

5.1 METHODS

5.1.1 Desktop and Literature Review

As presented in Section 4, the USFWS and TPWD threatened and endangered species databases and TXNDD occurrence data were reviewed to determine which, if any, federally-listed species may have the potential to occur on or near the Project site. No federally-listed threatened or endangered species were shown to occur on the Project site or within the Action Area. Applicable state and federal agency correspondence associated with the existing U.S. Army Corps of Engineers (USACE) permit for the POCCA terminal was also reviewed. No occurrences of threatened or endangered species at the Project site or objections to construction were mentioned.

5.1.2 Habitat Assessment and Field Surveys

Subsequent to the desktop and literature review, a field reconnaissance visit was performed on October 16-19, 2012. This field survey documented the presence or absence of threatened and endangered species, as well as provided characterization of habitats and land use within the Action Area. Information obtained during desktop review was visually checked in the field to "ground-truth" the data and to provide the most comprehensive analysis of the existing conditions at the subject site. All vegetation and wildlife observed were identified to the species level of taxonomy, if possible. A photographic log of the conditions observed at the subject site is provided in Appendix B.

5.2 RESULTS

The following sections provide the results of the background information, field observations, and analysis performed to evaluate the potential for the proposed action to affect the federally listed threatened and endangered species that have the potential to occur in the Action Area.

5.2.1 Background Research

In addition to the county species lists and TXNDD data presented in Section 4 of this report, USACE Permit #23269 for the POCCA La Quinta container terminal project was reviewed, as it includes information on the consultations with other federal and state agencies regarding the Project site. The USFWS submitted a letter on January 20, 2004 stating that the USFWS has no objection to the authorization of construction of the terminal components, provided their suggested mitigation plans were addressed. The NMFS submitted an email on

March 23, 2004 stating that the NMFS did not object to issuance of the permit, as any adverse effects on marine and anadromous fishery resources would be minimal. The TPWD submitted a letter dated January 16, 2004 stating that their staff had participated in several interagency meetings regarding the terminal, and that agency recommendations incorporated into the terminal plans had minimized impacts to a large degree. The letter stated that TPWD had no objection to the proposed terminal, but also recommended additional mitigation measures. The POCCA agreed to the additional mitigation measures and the permit was approved on August 27, 2004, and was extended and amended in 2011.

5.2.2 Habitat at the Project Site and in the Action Area

This section provides a description of the potential habitat at the Project site and in the Action Area to provide context to evaluate the potential for occurrence and effects determinations for the listed threatened and endangered species.

5.2.2.1 Overview of Habitats at the Project Site

A review of the USGS topographic quadrangle maps and aerial photographs of the area (Appendix A) indicate that the northern portion of the Project area has been utilized as cultivated cropland since at least 1918. Disturbances potentially corresponding to oil exploration activities are visible in a 1960 aerial photograph. The south-central portion of the Project site appears to have historically been native grassland, but has since experienced use as cultivated cropland, oil exploration, and undeveloped land. The southern portion of the site contains coastal marsh comprised of smooth cordgrass marsh, high marsh, and brackish supratidal wetlands associated with the northern shore of Corpus Christi Bay.

During field observations performed in October 2012, the site was observed to contain areas of cultivated cropland, grassland with scattered shrubs, riparian forest, herbaceous and woody wetlands, and coastal marsh. The Project site is bordered by two major drainages including La Quinta Ditch on the east boundary, and the Green Lake Ditch at the northwest portion of the site. An additional manmade drainage originates at the southernmost spoil pond in the southwest boundary of the site, and extends south to Corpus Christi Bay. Figure 7 details the locations of the different habitat areas, additional detail on each of these habitat areas as observed during field reconnaissance is presented below, and a photographic log is presented in Appendix B.

Cultivated Cropland Habitat

The majority of the site consists of the cultivated cropland habitat. This habitat was observed as a recently-harvested sorghum field characterized by an open area of loose clay loam soils tilled into rows. An abundance of mourning doves (*Zenaida macroura*) and occasional killdeer (*Charadrius vociferous*) were observed foraging in the western portion of this habitat during field reconnaissance.

Grassland and Scattered Shrubs

This habitat was observed in the southern portion of the subject site. Grass and herbaceous vegetation observed included green sprangletop (*Leptochloa dubia*), goldenrod (*Solidago sp.*), sunflower (*Helianthus sp.*), king ranch bluestem (*Bothriochloa ischaemum*), and silky bluestem (*Dichanthium sericeum*). Shrubs observed included honey mesquite (*Prosopis glandulosis*), turk's cap (*Malvaviscus drummondii*), and cedar elm (*Ulmus crassifolia*). Ephemeral drainage swales were observed crossing this habitat, originating at the southern boundary of the agricultural field and draining south to the shoreline of Corpus Christi Bay. This habitat has the potential to serve as a foraging area for threatened or endangered species such as the northern aplomado falcon.

Riparian Forest

This habitat was observed fringing portions of the La Quinta Ditch and Green Lake Ditch. Vegetation observed included Bermuda grass (*Cynodon dactylon*), switchgrass (*Panicum virgatum*), honey mesquite, Mexican palm (*Sabal mexicana*), Texas Sabal Palm (*Sabal texana*), hackberry (*Celtis occidentalis*), and Chinese tallow (*Triadica sebifera*) trees. This habitat has the potential to serve as a foraging area for threatened and endangered species such as the whooping crane.

Herbaceous and Woody Wetlands

These wetland habitats were observed associated with La Quinta Ditch and Green Lake Ditch, as well as an isolated pond. The wetlands observed associated with Green Lake Ditch corresponded with the jurisdictional wetlands described in the existing USACE permit. The wetlands observed associated with La Quinta Ditch and the isolated pond correspond to the non-jurisdictional wetlands described in the existing USACE permit. Some of the isolated non-jurisdictional wetlands in the central portion of the subject site that were described in the permit were not observed during field reconnaissance, as they appeared to have been plowed and planted as part of the agricultural land use. Wetland indicators (as described by the USACE Regional Supplement to the Wetland Delineation Manual: Atlantic and Gulf Coastal Plains Region) that were observed associated with the wetland areas included the presence of:

- facultative and obligate wetland vegetation
- inundated and ponded areas
- saturated soils
- drift deposits
- algal mats
- aquatic fauna
- surface soil cracks

- sparsely vegetate concave surface
- drainage patterns
- inundation/saturation visible on aerial imagery
- geomorphic position
- hydrogen sulfide odor
- 1 cm muck soil
- Coast prairie redox

Vegetation and wildlife associated with the herbaceous and woody wetlands is described in the riparian forest, La Quinta Ditch, and Green Lake Ditch habitat descriptions. This habitat has the potential to serve as a foraging area for threatened and endangered species such as the whooping crane.

Coastal Marsh Habitat

The coastal marsh habitat was observed along the southern boundary of the Project site and corresponds with the jurisdictional wetlands associated with the shore of Corpus Christi Bay identified in the existing USACE permit. This habitat includes typical Texas coastal marsh zones of cordgrass marsh, intertidal marsh, and supratidal brackish marsh. The cordgrass marsh area is dominated by smooth cordgrass (*Spartina alterniflora*), which provides important habitat for a wide variety of shorebirds. Shorebirds observed during field reconnaissance of this area included great blue heron (*Ardea herdoias*), great egrets (*Ardea alba*), brown pelicans (*Pelecanus occidentalis*), long-billed curlew(*Numenius americanus*), and an osprey (*Pandion haliaetus*).

The intertidal marsh at the site is comprised primarily of smooth cordgrass, black mangrove (*Avicennia germinans*), saltgrass (*Distichlis spicata*), saltwort (*Batis maritima*), and glasswort (*Salicornia sp.*). The intertidal area provides habitat for many estuarine species, but was dominated by the fiddler crab (*Uca rapax*) at the site.

The supratidal brackish marsh areas included saltgrass, marsh-hay cordgrass (*Spartina patens*), and sea oxe-eye (*Borrichia frutescens*). The supratidal brackish marsh areas receive freshwater input from approximately ten ephemeral drainages that convey water south from the cultivated cropland habitat. The brackish marsh areas were observed to be utilized by a variety of birds during field reconnaissance. The coastal marsh habitat has the potential to serve as a foraging area for threatened and endangered species such as the piping plover and whooping crane.

La Quinta Ditch

The La Quinta Ditch was observed as an intermittent man-altered stream extending south-southeast from TX-35 for approximately 2.1 miles, then

meandering south as a natural intermittent stream for approximately 1/3-mile until discharging in Corpus Christi Bay. The man-altered portion of the ditch borders La Quinta Road, and is a straight channel with an ordinary high water mark (OHWM) width averaging approximately 30 feet, and a top-of-bank (TOB) width measuring approximately 60-80 feet. The banks of the ditch are sloped at approximately 30%, and depth of the ditch with respect to the TOB ranges from 4 to 8 feet, increasing in depth toward the south. Portions of the ditch are crossed by roads and pipelines, and are improved with concrete and corrugated metal culverts. Stone rip-rap is placed in several areas along the ditch for access and erosion control. The natural portion of the ditch has an OHWM width ranging from approximately 4 to 40 feet, and a TOB width ranging from approximately 60-120 ft. The channel in the natural portion of the ditch is actively downcutting, and the banks exhibit shelving in some areas. The banks of the ditch are sloped at approximately 50-75%, and the depth of the ditch with respect to TOB ranges from 10 to 20 feet.

The La Quinta Ditch exhibits a variety of vegetation and wildlife use. Vegetation observed in the manmade portion of the ditch includes Bermuda grass, cattail (*Typha latifolia*), spikerush (*Eleocharis sp.*), flatsedge (*Cyperus sp.*), and fringed by bushy bluestem (*Andropogon glomeratus*), green sprangletop, honey mesquite, and cedar elm. In addition to the above, vegetation observed in the natural portion of the ditch included groundsel tree (*Baccharis halimifolia*), black willow (*Salix nigra*), salt cedar (*Tamarix sp.*), Texas Sabal palm, Mexican palm, rattlebox (*Sesbania drummondii*), sea ox-eye, and saltgrass. Wildlife observed within La Quinta ditch included the gulf coast ribbon snake (*Thamnophis proximus orarius*), minnows (likely the bay anchovy, *Anchoa mitchilli*), and a variety of unidentified aquatic insects.

Additional evidence of wildlife utilizing the ditch was observed by the presence of tracks, including those of raccoon (*Procyon lotor*), canine (*Canis* sp.), and feral pig (*Sus scofra*). This habitat has the potential to serve as a foraging area for threatened and endangered species such as the whooping crane and northern aplomado falcon.

Green Lake Ditch

The Green Lake Ditch is a perennial man-altered drainage in the northwestern portion of the site. The ditch conveys stormwater runoff from the City of Gregory and the eastern portion of the City of Portland south-southwest to Corpus Christi Bay. The ditch has been channelized, but retains a riparian buffer for the portion bordering the Project site. The ditch has an OHWM width ranging from approximately 40 to 50 feet, and a TOB width ranging from approximately 60-100 feet. The banks of the ditch are sloped at approximately 50%, and the depth of the ditch with respect to TOB ranges from approximately 4 to 10 feet. Herbaceous and woody wetlands with hydrological connection the ditch were observed, exhibiting vegetation including sugarberry (*Celtis laevigata*), black willow, Chinese tallow, Chinaberry (*Melia azedarach*), rattlebox, Texas sabal palm, flatsedge, and cattail. This habitat has the potential to serve as a foraging

area for threatened and endangered species such as the whooping crane and northern aplomado falcon.

Manmade Drainage

The manmade drainage habitat originates as an underground pipe extending east through the eastern berm of the spoil pond, then turns abruptly south before surfacing along the southwestern edge of the cultivated portion of the site. The aboveground portion of the ditch extends approximately 1,000 feet south until it is piped underground again at the southwest corner of the cultivated area. The drainage continues underground southward for approximately 450 feet until discharging at an outfall structure on the beach. This habitat is not expected to support any threatened or endangered species.

5.2.2.2 Overview of Habitats in the Action Area

A review of the USGS topographic quadrangle maps and aerial photographs of the area indicate that the Action Area has primarily been utilized for agriculture since at least 1918, but has undergone a shift toward residential and industrial development over the last century. West of the site, the urban areas associated with the City of Portland have continually expanded north and east since 1960, occupying former agricultural fields within the Action Area. Conversely, the urban area associated with the City of Gregory has remained relatively similar to its appearance in 1960. The industrial areas east of the site formerly associated with the Reynolds Metal and Alcoa facilities (now Sherwin Alumina and Gregory Power) are first visible in the 1956 and 1960 aerial photographs. The La Quinta Channel and spoil islands southeast of the Project site first appear in a 1956 aerial photograph.

During field observations performed in October 2012, the Action Area was observed to contain a myriad of potential habitat areas including cultivated cropland and pastureland, dredge material placement areas, residential and recreational properties associated with the City of Portland, open water associated with Green Lake, the City of Gregory and associated light industrial and commercial facilities, the Sherwin Alumina industrial area, spoil islands, and shoreline, channel, and open water habitats of Corpus Christi Bay. Additional detail on each of these habitat areas as observed during field reconnaissance is presented below, and a photographic log is presented in Appendix B.

Cultivated Cropland and Pastureland Habitat

The majority of the Action Area northwest of the Project site between the City of Gregory and the City of Portland consists of the cultivated cropland and pastureland habitat. This habitat was observed as recently-harvested or fallow fields that are likely utilized for sorghum or cotton production. This habitat is not expected to have the capacity to support any threatened or endangered species.

Dredge Material Placement Area Habitat

The dredge material placement areas (spoil ponds) are located within an approximately 1 mile long and 1,000 ft. wide area immediately west of the Project site boundary, surrounded by cultivated cropland. The spoil ponds consist of two adjacent bermed areas encompassing approximately 50 acres and 70 acres, respectively. The berms for the spoil ponds are approximately 15 ft. higher than the surrounding elevation, and are covered in upland vegetation including Bermuda grass, green sprangletop, switchgrass, Texas croton (*Croton texensis*), and sunflower. Two unidentified raptors (likely northern harrier, *Circus cyaneus* or hawk species, *Buteo sp.*) were observed exhibiting foraging behavior over the spoil ponds.

City of Portland

Residences on the outskirts of the City of Portland fall within the Action Area. The nearest residences are located approximately 1/3-mile west of the southwest corner of the Project site boundary, and are associated with the Northshore Country Club. Additional residences associated with the BayRidge development are located approximately ½-mile west of the Project boundary. There are also playgrounds, pools, tennis courts, and sports fields associated with the Northshore Country Club located approximately 0.9 miles west of the Project boundary. The majority of a golf course associated with Northshore Country Club is located immediately west of Green Lake; however, one of the holes is located southeast of Green Lake, approximately 1,500 feet west of the southwest corner of the Project site. The golf course provides habitat for birds and other wildlife as well, but is not expected to support any threatened and endangered species.

Green Lake

Green Lake is located within the Action Area between the Project site boundary and Northshore Country Club. This lake is comprised of open water habitat that is hydrologically connected to an SPCDD drainage ditch and fringed with wetland areas. The OHWM width of the lake ranges from approximately 50 feet to 300 feet. Wildlife including turtles, double-crested cormorants, and other birds were observed utilizing this habitat during field reconnaissance. This habitat has the potential to serve as a foraging area for threatened and endangered species such as the whooping crane and northern aplomado falcon.

City of Gregory

The City of Gregory is located in the northern portion of the Action Area. The nearest residences are located approximately ½-mile from the Project site boundary. Light industrial buildings including a Gulf Compress cotton storage facility and Martin Marietta Materials are located immediately northwest of the Project boundary. A cemetery is located at the southeastern corner of the US

Hwy 181 and TX-35 intersection. Commercial buildings including a Crossfit center, equipment rental, and parking lots are present along the south side of TX-35. Of these areas, only the cemetery has the potential to provide wildlife habitat, though it would not likely be utilized by any threatened or endangered species.

Sherwin Alumina and Gregory Power

The Sherwin Alumina plant and Gregory Power plant are located on property east of La Quinta Road and within the Action Area. Approximately 900 acres of what appear to be bauxite tailings ponds full of "red mud" that are a byproduct of aluminum production are associated with the Sherwin Alumina plant. An additional approximately 200 acres of landfill areas are located south of the tailings ponds. A sign indicating a "Capped Area – Excavation Prohibited" was observed during field reconnaissance. Due to the extensive modification of the area and caustic nature of the tailings ponds, no suitable wildlife habitat is present in this area.

Spoil Island

A spoil island is located approximately ½-mile southeast of the mouth of the La Quinta Ditch. The spoil island was not visited during field reconnaissance, but appears to exhibit emergent marsh and sand flat habitat from interpretation of aerial imagery. During field reconnaissance at the mouth of La Quinta Ditch, egrets and other unidentified shorebirds were observed utilizing the northwest portion of the spoil island. Several brown pelicans were observed flying to and from the direction of the spoil island, suggesting that they may utilize this habitat as well. This habitat has the potential to serve as foraging area for threatened and endangered species including the piping plover and whooping crane.

Corpus Christi Bay

Habitat associated with Corpus Christi Bay within the Action Area includes shoreline, the La Quinta Channel, and open water habitats. Interpretation of aerial imagery indicates approximately 50 acres of emergent marsh areas are present bordering the shoreline east of the Project boundary and within the Action Area. The existing permit for the POCCA terminal indicates that 4.013 acres of smooth cordgrass wetlands were located along the shoreline at the southern boundary of the Project site. Field reconnaissance in October 2012 confirmed the presence of smooth cordgrass marsh in these areas but did not re-delineate the extent of the area. West of the Project boundary and within the Action Area is an approximately 45-acre area of emergent marsh bordering the shoreline. The shoreline and emergent marsh areas of Corpus Christi Bay are estuarine habitats important to many resident species of birds, and also serve as rest stops and foraging areas for migratory species. Estuarine areas are the primary habitat for oysters and several species of crabs, and serve as nurseries for juvenile fish and shrimp species. This habitat has the potential to provide

foraging area for threatened and endangered species including the piping plover and whooping crane.

The existing turning basin for the La Quinta Channel is currently located approximately 2/3-mile southeast of the Project boundary. The channel is currently being extended west through the Action Area to facilitate industrial traffic access to the proposed POCCA terminal. Although channel habitats generally exhibit less species richness and diversity for fishes than shallow nearshore habitat, they may serve as habitat for larger pelagic fish species. This habitat also has the potential to provide transportation avenues for threatened and endangered sea turtles and marine mammals traveling between areas.

The open water habitat in Corpus Christi Bay supports a wide variety of aquatic species including fish, shorebirds, and crustaceans. Bottlenose dolphins (*Tursiops truncates*) and mullet (*Mugil sp.*) were observed during field reconnaissance, as these species briefly emerge above the water's surface. Shorebirds were also observed foraging over the bay, diving into the water to capture fish. This habitat has the potential to support threatened and endangered species such as sea turtles and marine mammals.

5.2.3 Potential for Occurrence and Recommended Determination of Effect for Federally Listed Species

5.2.3.1 Northern Aplomado Falcon

The northern aplomado falcon was once distributed throughout the Trans-Pecos region and southern coastal prairies of Texas, but has been considered extirpated in South Texas since the 1950s. Historically, its preferred habitat in southern Texas was coastal prairie and marsh habitats that supported open grasslands with scattered small trees and shrubs or grasslands adjacent to woodlands associated with freshwater drainages and estuaries (TPWD, 2012f). Based upon historic habitat use, the native grass and woodland areas associated with Green Lake, the La Quinta Ditch, and the southern portion of the Project site could potentially be utilized by this species if it were to occur within the Action Area.

Although the USFWS does not list this species as potentially occurring in San Patricio County, the TPWD considers this falcon to have potential occurrence within the county. Reintroduction of the species to southern Texas using captive-bred individuals has been attempted at the Laguna Atascosa and Matagorda Island National Wildlife Refuges (Brown and Collopy, 2008). The Laguna Atascosa National Wildlife refuge is located approximately 100 miles south of the Action Area. Matagorda Island National Wildlife Refuge is a portion of the Aransas National Wildlife Refuge located approximately 30 miles northeast of the Action Area. The northern aplomado falcon is considered non-migratory throughout its range, thus migration through the Action Area by the reintroduced populations is not likely. Although no northern aplomado falcons are currently known to enter the Action Area, there is a slight potential for the reintroduced populations to expand their range to include the Action Area in the

future. Likelihood of such expansion is difficult to ascertain as little is known about the dispersal and survival of young northern aplomado falcons.

A literature review did not find any published studies or information regarding the effects of GHG emissions on northern aplomado falcons. Analysis of estimated heavy metals emissions data provided in Section 2.7.2 indicates that the Project will result in insignificant contributions to atmospheric deposition, thus any bioaccumulation impacts are expected to be negligible. The deposition of nitrogen, sulfur, and particulate matter from air emissions will not exceed the SIL for the areas of the Action Area outside the Project site where the species may occur, and are not expected to contribute to acidification or eutrophication of the bay. Potential water intake and wastewater discharge associated with the operation of the Project are not expected to cause direct impacts to the northern aplomado falcon. The Project will provide treatment for wastewater prior to discharge in accordance with its future NPDES permit, and discharge will be monitored to prevent toxic or thermal discharges exceeding levels considered protective of aquatic resources. Additional noise will be similar to current conditions (Section 2.6) and production of dust will be minimized during construction through the implementation of best management practices (Section 2.7).

The USFWS indicated during a meeting on July 24, 2013 that they did not anticipate any adverse impacts from the Project to this species; USFWS recommended the implementation of flashing lights on the DRI tower and bird diversion devices on structures greater than 15 feet in height to minimize potential for bird strikes. USFWS also recommended that construction, maintenance, and operations plans include language and training materials regarding the northern aplomado falcon. The Project will light and mark vertical structures and has created a project-specific Health, Safety, Security, and Environment (HSSE) Plan that provides pictures and a narrative description of the animal, as well as management and USFWS notification procedures in the event that the animal is sighted during construction or operation of the Project.

Based upon the potential suitable habitat onsite and the slight potential for the reintroduced populations in southern Texas to expand their range in the future, there is potential for the northern aplomado falcon to occur within the Action Area. However, the lack of occurrence in the region since the 1950s, the extremely remote possibility of range expansion, and implementation of USFWS recommendations indicates that the potential for occurrence and adverse effects is insignificant. Additionally, the creation of the 192-acre beneficial use area may create additional habitat that could be utilized by the falcon if it were to occur. Therefore, a determination of "*May affect, not likely to adversely affect*" is recommended for this species.

5.2.3.2 Piping Plover

Although the piping plover occurs in San Patricio County, there are no documented occurrences of piping plovers in the Action Area (TXNDD 2012).

Designated critical habitat for the piping plover occurs approximately three miles southwest of the Project site along HWY 181, in a large basin of tidal ponds, sand spits, and wind tidal flats owned and managed by the City of Portland. While the designated critical habitat area is not located within the Action Area, there is potential for migrating piping plovers to enter the Action Area on a temporary and transient basis.

Piping plovers prefer bare or very sparsely vegetated intertidal ocean beach, wash-over passes, wrack lines, ephemeral ponds, lagoons, salt marshes, tidal mudflats, sandflats, and algal flats. Potential habitats that may be utilized by the piping plover within the Action Area include bare areas within the coastal marsh habitat along the shoreline of Corpus Christi Bay and the bare sandy beaches at the spoil islands located ½ -mile southeast of the Project boundary. Due to the minimal amount of potential habitat in the Action Area, any presence of piping plovers in the Action Area is expected to be temporary and transient in nature. Piping plovers are typically present at the Texas coast between mid-July and April although a few birds can be found along the coast year round (TPWD 2007).

Vertical structures such as the DRI tower for the Project, and overhead electrical supply wires have the potential to result in avian mortality due to strikes. These strikes have been shown to occur most frequently involving migratory birds striking towers utilizing steady burning, red obstruction lights during low visibility conditions, such as night, fog, and inclement weather (FAA 2012). Due to the slight potential for piping plovers to traverse the Action Area during migration, there is a low risk of incidental take of this species due to striking vertical structures associated with the Project. The potential for incidental take due to strikes will be minimized by the use of mitigation strategies that may include the use of flashing lights, down-shielding any continuous night lighting, the use of bird-diverters, and utilizing construction designs that do not necessitate guy wires .

There is a slight potential for piping plovers to forage within the Action Area or transit across the Action Area during migration; however, there are no confirmed occurrences of piping plovers in the Action Area, and the transient nature of any potential occurrence would limit exposure time. Therefore potential adverse effects from air emissions would likely be minimal or non-existent.

A literature review did not find any published studies or information regarding the effects of GHG emissions on piping plovers. Analysis of estimated heavy metals emissions data provided in Section 2.7.2 indicates that the Project will result in insignificant contributions to atmospheric deposition, thus any bioaccumulation impacts are expected to be negligible. The deposition of nitrogen, sulfur, and particulate matter from air emissions will not exceed the SIL for the areas of the Action Area outside the Project site where the species may occur, and are not expected to contribute to acidification or eutrophication of the bay. Potential water intake and wastewater discharge associated with the operation of the Project are not expected to cause direct impacts to the piping

plover. The Project will provide treatment for wastewater prior to discharge in accordance with its future NPDES permit, and discharge will be monitored to prevent toxic discharges. Given the size of the bay compared to the potential wastewater stream, no alterations to the available assemblage of forage species would be anticipated. Additional noise will be similar to current conditions (Section 2.6) and production of dust will be minimized during construction through the implementation of best management practices (Section 2.7).

The USFWS indicated during a meeting on July 24, 2013 that they did not anticipate any adverse impacts to this species; USFWS recommended the implementation of flashing lights on the DRI tower and bird diversion devices on structures greater than 15 feet in height to minimize potential for bird strikes. USFWS also recommended that construction, maintenance, and operations plans include language and training materials regarding the piping plover. The Project will light and mark vertical structures and has created a project-specific HSSE Plan that provides pictures and a narrative description of the animal, as well as management and USFWS notification procedures in the event that the animal is sighted during construction or operation of the Project.

There is a limited potential for piping plovers to enter or utilize habitat within the Action Area. However, the minimization of risk of incidental take due to striking vertical structures associated with the Project, the limited potential for air emission exposure, limited potential for wastewater discharge to affect foraging areas, and the implementation of USFWS recommendations indicate that the potential for adverse impacts is insignificant. Additionally, the creation of the 192-acre beneficial use area may create additional habitat that could be utilized by the piping plover if it were to occur. Therefore, a determination of "*May affect, but is not likely to adversely affect*" is recommended for this species.

5.2.3.3 Whooping Crane

Although the whooping crane is listed as potentially occurring in San Patricio County, no documented observations have been confirmed within the Action Area. The wintering grounds for the crane are located approximately 25 miles northeast of the Action Area in the Aransas National Wildlife Refuge, which is also designated as critical habitat for the species. While the Action Area is not located within the designated critical habitat area, there is potential for migrating cranes to enter the Action Area on a temporary and transient basis.

Potential habitats that may be utilized by the whooping crane located within the Action Area include uplands, cropland, palustrine wetlands, salt flats, and salt marsh. The whooping crane's preferred habitats of salt flats and salt marsh may potentially be present along the shoreline of Corpus Christi Bay and at the spoil islands located approximately ½-mile southeast of the Project boundary, but within the 1.5-mile buffer of the Action Area. Whooping cranes may potentially utilize these areas to forage, and may use the uplands, cropland, and palustrine wetland habitats on and adjacent to the Project site as temporary foraging habitat to drink fresh water and feed on invertebrates. Due to the distance from their

wintering grounds and presence of little preferred habitat, any presence of whooping cranes in the Action Area is expected to be temporary and transient in nature. Whooping cranes are typically present at the Texas coast between October and May, thus any potential occurrences in the Action Area would be limited to this period.

Based on the unlikely presence of whooping cranes within the Action Area, noise and lighting impacts due to construction and operation of the Project will result in no adverse effects to the whooping crane. Noise and lighting associated with the Project may result in a minimal positive effect of serving as a deterrent to divert potential transiting individuals away from the Action Area and toward the more suitable habitat of the Aransas National Wildlife Refuge.

Vertical structures such as the DRI tower for the Project, and overhead electrical supply wires have the potential to result in avian mortality due to strikes. These strikes have been shown to occur most frequently involving migratory birds striking towers utilizing steady burning, red obstruction lights during low visibility conditions, such as night, fog, and inclement weather (FAA 2012). Due to the slight potential for whooping cranes to traverse the Action Area during migration, there is a low risk of incidental take of this species due to striking vertical structures associated with the Project. The potential for incidental take due to strikes will be minimized by the use of mitigation strategies that may include the use of flashing lights, down-shielding any continuous night lighting, the use of bird-diverters, and utilizing construction designs that do not necessitate guy wires.

Based on the slight potential for whooping cranes to forage within the Action Area or transit across the Action Area during migration, there is a potential of adverse effects on this species due to air emissions from the Project. However, because there are no confirmed occurrences of whooping cranes in the Action Area and the transient nature of any potential occurrence would limit exposure time, potential adverse effects from air emissions would likely be minimal or non-existent.

A literature review did not find any published studies or information regarding the effects of GHG emissions on whooping cranes. Analysis of estimated heavy metals emissions data provided in Section 2.7.2 indicates that the Project will result in insignificant contributions to atmospheric deposition, thus any bioaccumulation impacts are expected to be negligible. The deposition of nitrogen, sulfur, and particulate matter from air emissions will not exceed the SIL for the areas of the Action Area outside the Project site where the species may occur, and are not expected to contribute to acidification or eutrophication of the bay. Potential water intake and wastewater discharge associated with the operation of the Project are not expected to cause direct impacts to the whooping crane. The Project will provide treatment for wastewater prior to discharge in accordance with its future NPDES permit, and discharge will be monitored to prevent toxic or thermal discharges exceeding levels considered protective of aquatic resources. Given the size of the bay compared to the potential

wastewater stream, no alterations to the available assemblage of forage species would be anticipated. Additional noise will be similar to current conditions (Section 2.6) and production of dust will be minimized during construction through the implementation of best management practices (Section 2.7).

The USFWS indicated during a meeting on July 24, 2013 that they did not anticipate any adverse impacts from the Project to this species; USFWS recommended the implementation of flashing lights on the DRI tower and bird diversion devices on structures greater than 15 feet in height to minimize potential for bird strikes. USFWS also recommended that construction, maintenance, and operations plans include language and training materials regarding the whooping crane. The Project will light and mark vertical structures and has created a project-specific HSSE Plan that provides pictures and a narrative description of the animal, as well as management and USFWS notification procedures in the event that the animal is sighted during construction or operation of the Project.

There is limited potential for whooping cranes to enter the Action Area during migration or to forage in winter. However, the minimization of risk of incidental take due to striking vertical structures associated with the Project, the limited potential for air emission exposure, limited potential for wastewater discharge to affect foraging areas, and the implementation of USFWS recommendations indicate that the potential for adverse impacts is insignificant. Additionally, the creation of the 192-acre beneficial use area may create additional habitat that could be utilized by the whooping crane if it were to occur. Therefore, a determination of "*May affect, but is not likely to adversely affect*" is recommended for this species.

5.2.3.4 Ocelot

There is no preferred habitat for ocelots in the Action Area, and there are no documented occurrences of ocelots in the Action Area or San Patricio County (TXNDD 2012).

The ocelot has the potential to occur in the dense thorny shrub lands with 75-95% coverage of species including spiny hackberry, brasil, desert yaupon, wolfberry, lotebush, amargosa, white brush, catclaw, blackbrush, lantana, guayucan, cenizo, elbowbush, and Texas persimmon. Tracts of at least 100 acres of isolated dense brush or 75 acres of brush interconnected to other tracts of habitat by brush corridors are considered important habitat (TPWD 2012g).

There is no habitat resembling these requirements in the Action Area or Project site. The Action Area and Project site are composed of managed cropland, pastureland, landscaped residential properties, industrial sites, riparian areas associated with Green Lake and La Quinta Ditches, and the marsh associated with the shoreline of Corpus Christi Bay.

There are fewer than 100 ocelots in the U.S., all of which are concentrated in South Texas in the Rio Grande Valley (USFWS 2010). Because ocelots require habitat corridors of dense cover and shrubland (which does not continuously occur between the Rio Grande Valley and San Patricio County), it is highly unlikely that ocelots would extend their range to within the proximity of the Action Area. In the unlikely event that an ocelot was to enter into the Action Area, it would likely be constrained to the riparian areas associated with Green Lake Ditch or the La Quinta ditch that will not be impacted by the construction footprint of the Project.

Operational air emissions, noise, and dust impacts related to the Project are not expected to affect the ocelot, as it is not currently known to occur in this portion of Texas, and therefore not expected to occur in the Action Area. Operational impacts related to water intake and discharge will not affect the ocelot as it does not utilize Corpus Christi Bay for habitat.

A meeting with USFWS on July 24, 2013, and subsequent follow-up telephone conversation on January 8, 2014 indicated that USFWS did not anticipate any impacts to this species, as construction would occur only in habitats not utilized by the ocelot. No species-specific mitigation measures were recommended.

The lack of suitable habitat coupled with the location of known extant populations, makes it highly unlikely that an ocelot will utilize or pass through the Action Area or Project site. The lack of impacts and unlikelihood of occurrence of this species make the possibility of adverse impacts insignificant and discountable. Therefore a determination of "*No effect*" is recommended for this species.

5.2.3.5 Gulf Coast Jaguarundi

Jaguarundi occurrence records were requested from the TXNDD, and yielded two occurrence records. Based on TXNDD records, sightings of the Gulf Coast jaguarundi occurred approximately 5 miles northeast and 5 miles southeast of the Project area. These unconfirmed sightings occurred in 1984 and 1991 respectively and represent the most recent information on the potential occurrence of the jaguarundi in San Patricio County. The last confirmed sighting of this subspecies within the U.S. was in April 1986, when a roadkill specimen was collected two miles east of Brownsville, Texas, and positively identified as a jaguarundi. The closest known jaguarundis to the U.S. border are found approximately 95 miles southwest in Nuevo Leon, Mexico (USFWS, 2012i).

There is little information concerning the biology and habitat requirements of the jaguarundi in Texas, it is believed that their habitat requirements of dense brush cover are similar to that of the ocelot. Tracks of at least 100 acres of isolated dense brush or 75 acres of brush interconnected to other tracts of habitat by brush corridors are considered important habitat. There is no habitat resembling these requirements in the Action Area or Project site. The Action Area and Project site are composed of managed cropland, pastureland, landscaped residential

properties, industrial sites, riparian areas associated with Green Lake and La Quinta Ditches, and the marsh associated with the shoreline of Corpus Christi Bay. In the unlikely event that a jaguarundi was to enter into the Action Area, it would likely be constrained to the riparian areas associated with Green Lake Ditch or the La Quinta ditch that will not be impacted by the construction footprint of the Project.

Operational air emissions, noise, and dust impacts related to the Project are not expected to affect the jaguarundi, as it is not currently known to occur in Texas, and therefore not expected to occur in the Action Area. Operational impacts related to water intake and discharge will not affect the jaguarundi as it does not utilize Corpus Christi Bay for habitat.

A meeting with USFWS on July 24, 2013, and subsequent follow-up telephone conversation on January 8, 2014 indicated that USFWS did not anticipate any impacts to this species, as construction would occur only in habitats not utilized by the jaguarundi. No species-specific mitigation measures were recommended.

The lack of dense cover to provide suitable habitat, coupled with the extreme rarity of the jaguarundi make it highly unlikely that the jaguarundi will utilize or travel through the Action Area. The lack of impacts and unlikelihood of occurrence of this species make the possibility of adverse impacts insignificant and discountable. Therefore a recommendation of "*No effect*" is recommended for this species.

5.2.3.6 West Indian Manatee

Manatees are marine mammals and require warm water with a freshwater influx and shallow seagrass for feeding. They are most common in river mouth and estuarine habitats. West Indian Manatees typically occur in shallow waters off the coasts of Florida, Mexico, and Central America, but are sighted in Corpus Christi Bay every few years. The most recent siting of a manatee in Corpus Christi Bay occurred on September 20, 2012 (CCCT 2012), while the sighting nearest to the Project was at the Koch Refinery on the La Quinta Channel, Corpus Christi in December, 1995 (Fertl and Schiro 2005). There have been no documented Manatee sightings within the Action Area (TXNDD 2012).

Potential habitats utilized by Manatees within the Action Area are the shallow near-shore areas adjacent to the north shore of Corpus Christi Bay and along the La Quinta Channel. A combination of shallow seagrass beds and warm water outfalls from industrial processes along the La Quinta Channel may provide seasonally suitable habitat for manatees.

Due to the distance from their known range in Florida, any presence of manatees in the Action Area is expected to be temporary and transient in nature. If such an occurrence took place it would most likely occur in the spring, summer, or fall when temperatures in the bay are suitable for manatees.

Construction of the Project may result in the loss of seagrass beds along the northern shore of Corpus Christi Bay, which may present potential manatee forage areas should one occur within the Action Area. However, the loss of these areas will be mitigated by the creation of the beneficial use area south of the channel. The creation of this shallow water habitat will promote the growth of additional seagrass with a goal of no net loss.

A literature review did not find any published studies or information regarding the effects of GHG emissions on manatees. Analysis of estimated heavy metals emissions data provided in Section 2.8.3 indicates that the Project will result in insignificant contributions to atmospheric deposition, thus any bioaccumulation impacts are expected to be negligible. The deposition of nitrogen, sulfur, and particulate matter from air emissions will not exceed the SIL for the areas of the Action Area outside the Project site where the species may occur, and are not expected to contribute to acidification or eutrophication of the bay. Potential water intake and wastewater discharge associated with the operation of the Project are not expected to cause adverse impacts to the manatee. The Project will provide treatment for wastewater prior to discharge in accordance with its future NPDES permit, and discharge will be monitored to prevent toxic discharges. Given the size of the bay compared to the potential wastewater stream, no alterations to the available assemblage of forage vegetation would be anticipated. In the event that a wayward manatee were to occur in the Action Area, the warmer water associated with the discharge outfall may improve the suitability of the potential manatee habitat in the Action Area, resulting in a beneficial impact for this species. The Project construction plan includes back-filling the wharf area prior to pile-driving on the land created by the fill activity. Pile-driving on land rather than open water will minimize impacts and preclude the possibility of manatees from occurring within the radius of potential adverse pile-driving noise. Additional operational noise will be similar to current conditions (Section 2.6) and production of dust will be minimized during construction through the implementation of best management practices (Section 2.7).

The USFWS indicated during a meeting on July 24, 2013 that they did not anticipate any adverse impacts from the Project to this species; USFWS recommended that construction, maintenance, and operations plans include language and training materials regarding the manatee. The Project has created a project-specific HSSE Plan that provides pictures and a narrative description of the animal, as well as management and USFWS notification procedures in the event that the animal is sighted during construction or operation of the Project.

There is a limited potential for manatees to travel through the Action Area. However, the transient nature of any occurrences, the mitigation for any loss of seagrass due to the Project, the limited potential for wastewater discharge to affect forage vegetation, and the implementation of USFWS recommendations indicate that the potential for adverse impacts from the Project is insignificant. Additionally, the creation of the 192-acre beneficial use area may create additional seagrass habitat that could be utilized by the manatee if it were to

occur. Furthermore, the potential thermal component of the wastewater discharge could protect any wayward manatees during cold water periods, which would result in an additional beneficial impact. Therefore a determination of "*May affect, but is not likely to adversely affect*" is recommended for this species.

5.2.3.7 Atlantic Hawksbill Sea Turtle

There is no preferred habitat for Atlantic hawksbill turtles in the Action Area, and there are no documented occurrences of Atlantic hawksbill turtles in the Action Area (TXNDD 2012).

The Atlantic hawksbill sea turtle nests on small, oceanic beaches. Within the continental U.S., nesting is restricted to the southeastern coast of Florida (NMFS 1993). Atlantic hawksbill turtles consume primarily sponges, which require a hard substrate, and are therefore often associated with coral reefs, rocky outcrops, lagoons, shoals, and oceanic islands. Corpus Christi Bay lacks the preferred beaches and the hard substrate required for sponge growth and is therefore not favorable foraging habitat for hawksbill turtles.

The closest known observation of the hawksbill sea turtle was in 1998 at Padre Island National Seashore (approximately 35 miles south of the Action Area), where the only recorded hawksbill nest in Texas occurred (NPS 2012b). The USFWS designated critical habitat for hawksbills on three islands associated with Puerto Rico.

Because Corpus Christi Bay and the Action Area do not provide preferred foraging or nesting habitat it is unlikely that a hawksbill sea turtle would be found in this area. An Atlantic hawksbill sea turtle could theoretically enter the Action Area or surrounding bay, but the occurrence would be isolated, unlikely and short term.

A literature review did not find any published studies or information regarding the effects of GHG emissions on sea turtles. Analysis of estimated heavy metals emissions data provided in Section 2.8.3 indicates that the Project will result in insignificant contributions to atmospheric deposition, thus any bioaccumulation impacts are expected to be negligible. The deposition of nitrogen, sulfur, and particulate matter from air emissions will not exceed the SIL for the areas of the Action Area outside the Project site where the species may occur, and are not expected to contribute to acidification or eutrophication of the bay. Potential water intake and wastewater discharge associated with the operation of the Project are not expected to cause direct impacts to the species. The Project will provide treatment for wastewater prior to discharge in accordance with its future NPDES permit, and discharge will be monitored to prevent toxic or thermal discharges exceeding levels considered protective of aquatic resources. Given the size of the bay compared to the potential wastewater stream, no alterations to the available assemblage of forage species would be anticipated. The Project construction plan includes back-filling the wharf area prior to pile-driving on the

land created by the fill activity. Pile-driving on land rather than open water will minimize impacts and preclude the possibility of turtles from occurring within the radius of potential adverse pile-driving noise. Additional operational noise will be similar to current conditions (Section 2.6) and production of dust will be minimized during construction through the implementation of best management practices (Section 2.7).

The USFWS indicated during a meeting on July 24, 2013 that they did not anticipate any adverse impacts from the Project to this species; USFWS recommended that construction, maintenance, and operations plans include language and training materials regarding their potential occurrence. The Project has created a project-specific HSSE Plan that provides pictures and a narrative description of the animal, as well as management and USFWS notification procedures in the event that the animal is sighted during construction or operation of the Project.

There is a slight potential for Hawksbill sea turtles to travel through the Action Area and Corpus Christi Bay. However, the lack of preferred habitat suggests that this species would only occur as a transient, and the implementation of USFWS recommendations indicate that the potential for adverse impacts from the Project is insignificant. Therefore, a determination of "*May affect, but is not likely to adversely affect*" is recommended for this species.

5.2.3.8 Green Sea Turtle

There is no critical habitat for green sea turtle in the Action Area, and there are no documented occurrences of green sea turtles within the Action Area (TXNDD 2012).

Corpus Christi Bay lacks preferred nesting habitat but contains suitable foraging habitat for green sea turtles. Consequently, the Action Area also lacks preferred nesting habitat but contains suitable foraging habitat.

South Padre Island is the only location on the Texas coast where green turtle nesting has been documented. In the last few years, one to five nests have been reported each year. Most green sea turtles found in Texas waters are juveniles (NPS 2012d). Documented occurrences of the green sea turtle in San Patricio County occurred approximately 9 miles east of the Project site (TXNDD 2012). One green turtle stranding, when a marine mammal floats or swims into shore and becomes stuck on the shore, was reported for San Patricio County in 2007 (STSSN 2012).

Corpus Christi Bay provides some foraging habitat, thus there is the potential for green sea turtles to occur, however the lack of suitable habitat in the Action Area means that any occurrence of a green sea turtle within the Action Area would be isolated, unlikely and short term.

A literature review did not find any published studies or information regarding the effects of GHG emissions on sea turtles. Analysis of estimated heavy metals emissions data provided in Section 2.8.3 indicates that the Project will result in insignificant contributions to atmospheric deposition, thus any bioaccumulation impacts are expected to be negligible. The deposition of nitrogen, sulfur, and particulate matter from air emissions will not exceed the SIL for the areas of the Action Area outside the Project site where the species may occur, and are not expected to contribute to acidification or eutrophication of the bay. Potential water intake and wastewater discharge associated with the operation of the Project are not expected to cause direct impacts to the species. The Project will provide treatment for wastewater prior to discharge in accordance with its future NPDES permit, and discharge will be monitored to prevent toxic or thermal discharges exceeding levels considered protective of aquatic resources. Given the size of the bay compared to the potential wastewater stream, no alterations to the available assemblage of forage species would be anticipated. The Project construction plan includes back-filling the wharf area prior to pile-driving on the land created by the fill activity. Pile-driving on land rather than open water will minimize impacts and preclude the possibility of turtles from occurring within the radius of potential adverse pile-driving noise. Additional operational noise will be similar to current conditions (Section 2.6) and production of dust will be minimized during construction through the implementation of best management practices (Section 2.7).

The USFWS indicated during a meeting on July 24, 2013 that they did not anticipate any adverse impacts from the Project to this species; USFWS recommended that construction, maintenance, and operations plans include language and training materials regarding their potential occurrence. The Project has created a project-specific HSSE Plan that provides pictures and a narrative description of the animal, as well as management and USFWS notification procedures in the event that the animal is sighted during construction or operation of the Project.

There is a limited potential for green sea turtles to travel through the Action Area. However, the lack of occurrences in the Action Area, limited potential for impacts, and implementation of USFWS recommendations indicate the potential for adverse impacts from the Project is insignificant. Additionally, the creation of the 192-acre beneficial use area may create additional seagrass habitat that could be utilized by the turtle if it were to occur. Therefore a determination of "*May affect, but is not likely to adversely affect*" is recommended for this species.

5.2.3.9 Kemp's Ridley Sea Turtle

There is no critical habitat for the Kemp's Ridley sea turtle in the Action Area, and there are no documented occurrences of Kemp's Ridley sea turtles in the Action Area (TXNDD 2012).

Kemp's Ridley sea turtles are loyal to their nesting sites, which are highly restricted to fine grain beaches along the coast of Veracruz, Mexico and the Padre Island National Seashore in Texas (USFWS 2012e).

Corpus Christi Bay lacks preferred nesting habitat but contains suitable foraging habitat for Kemp's Ridley sea turtles. The Action Area lacks both preferred nesting habitat and suitable foraging habitat.

Padre Island National Seashore is the primary nesting location for Kemp's Ridley sea turtles, however one nesting turtle was observed in Corpus Christi Bay in 2009 (CCCT 2009). From 1980-1991, in the area around Corpus Christi Bay, 126 Kemp's Ridley turtles were sighted. The vast majority of which were strandings, along the Gulf side of North Padre and Mustang Island (Manzella and Williams 1992). The proximity of these strandings correlates with the location of the Padre Island National Seashore nesting site and ocean currents that would carry post-hatchlings.

No critical habitat within the U.S. has been designated, although petitions to do so along the Texas coast have been submitted (WEG 2010).

Based on the presence of foraging habitat and recorded sightings, there is the potential for Kemp's Ridley turtles to occur in Corpus Christi Bay. However the lack of suitable foraging or nesting habitat in the Action Area means that any occurrence of a Kemp's Ridley turtle within the Action Area would be isolated and short term.

A literature review did not find any published studies or information regarding the effects of GHG emissions on sea turtles. Analysis of estimated heavy metals emissions data provided in Section 2.8.3 indicates that the Project will result in insignificant contributions to atmospheric deposition, thus any bioaccumulation impacts are expected to be negligible. The deposition of nitrogen, sulfur, and particulate matter from air emissions will not exceed the SIL for the areas of the Action Area outside the Project site where the species may occur, and are not expected to contribute to acidification or eutrophication of the bay. Potential water intake and wastewater discharge associated with the operation of the Project are not expected to cause direct impacts to the species. The Project will provide treatment for wastewater prior to discharge in accordance with its future NPDES permit, and discharge will be monitored to prevent toxic or thermal discharges exceeding levels considered protective of aquatic resources. Given the size of the bay compared to the potential wastewater stream, no alterations to the available assemblage of forage species would be anticipated. The Project construction plan includes back-filling the wharf area prior to pile-driving on the land created by the fill activity. Pile-driving on land rather than open water will minimize impacts and preclude the possibility of turtles from occurring within the radius of potential adverse pile-driving noise. Additional operational noise will be similar to current conditions (Section 2.6) and production of dust will be minimized during construction through the implementation of best management practices (Section 2.7).

The USFWS indicated during a meeting on July 24, 2013 that they did not anticipate any adverse impacts from the Project to this species; USFWS recommended that construction, maintenance, and operations plans include language and training materials regarding their potential occurrence. The Project has created a project-specific HSSE Plan that provides pictures and a narrative description of the animal, as well as management and USFWS notification procedures in the event that the animal is sighted during construction or operation of the Project.

There is potential for Kemp's Ridley sea turtles to travel through the Action Area. However, the lack of documented occurrences in the Action Area, limited potential for impacts, and implementation of USFWS recommendations indicate the potential for adverse impacts from the Project is insignificant. Additionally, the creation of the 192-acre beneficial use area may create additional seagrass habitat that could be utilized by the turtle if it were to occur. Therefore, a determination of "*May affect, but is not likely to adversely affect*" is recommended for this species.

5.2.3.10 Leatherback Sea Turtle

There is no preferred habitat for the leatherback turtle in the Action Area, and there are no documented occurrences of leatherback sea turtles in the Action Area (TXNDD 2012).

The leatherback sea turtle nests on tropical and subtropical sloping, sandy beaches, in proximity to deep water; and is restricted to southern Florida in the continental U.S. (USFWS 2012 f). Leatherback sea turtles feed almost entirely on jellyfish and are highly migratory and pelagic, moving thousands of miles between nesting beaches and feeding grounds. Leatherbacks rarely approach land, except for nesting.

Corpus Christi Bay lacks preferred nesting habitat and foraging habitat for leatherback sea turtles. The Action Area lacks both preferred nesting habitat and suitable foraging habitat.

Leatherbacks are rare visitors to the Texas Gulf Coast (TPWD 2012e), in 2008, a single leatherback nest was located at Padre Island National Seashore. Prior to this nesting, only historical records of nesting occurred in Texas from the 1920s and 1930s. No nests have been detected since 2008 (NPS 2012e).

Based on the leatherback preference for pelagic environments and lack of historical records, the likelihood a leatherback in Corpus Christi Bay or the Action Area is almost negligible. A leatherback could theoretically enter the Action Area, however any such occurrence would be unlikely, isolated and short term.

A literature review did not find any published studies or information regarding the effects of GHG emissions on sea turtles. Analysis of estimated heavy metals emissions data provided in Section 2.8.3 indicates that the Project will result in insignificant contributions to atmospheric deposition, thus any bioaccumulation impacts are expected to be negligible. The deposition of nitrogen, sulfur, and particulate matter from air emissions will not exceed the SIL for the areas of the Action Area outside the Project site where the species may occur, and are not expected to contribute to acidification or eutrophication of the bay. Potential water intake and wastewater discharge associated with the operation of the Project are not expected to cause direct impacts to the species. The Project will provide treatment for wastewater prior to discharge in accordance with its future NPDES permit, and discharge will be monitored to prevent toxic or thermal discharges exceeding levels considered protective of aquatic resources. Given the size of the bay compared to the potential wastewater stream, no alterations to the available assemblage of forage species would be anticipated. The Project construction plan includes back-filling the wharf area prior to pile-driving on the land created by the fill activity. Pile-driving on land rather than open water will minimize impacts and preclude the possibility of turtles from occurring within the radius of potential adverse pile-driving noise. Additional operational noise will be similar to current conditions (Section 2.6) and production of dust will be minimized during construction through the implementation of best management practices (Section 2.7).

The USFWS indicated during a meeting on July 24, 2013 that they did not anticipate any adverse impacts from the Project to this species; USFWS recommended that construction, maintenance, and operations plans include language and training materials regarding their potential occurrence. The Project has created a project-specific HSSE Plan that provides pictures and a narrative description of the animal, as well as management and USFWS notification procedures in the event that the animal is sighted during construction or operation of the Project.

The lack of suitable pelagic habitat, coupled with the extreme rarity of the leatherback sea turtle in Texas make it highly unlikely that this species will utilize or travel through the Action Area. The lack of impacts and unlikelihood of occurrence of this species make the possibility of adverse impacts insignificant and discountable. Therefore a determination of "*No Effect*" is recommended for this species.

5.2.3.11 Loggerhead Sea Turtle

There is no preferred habitat for the loggerhead sea turtle in the Action Area, and there are no documented occurrences of loggerhead sea turtles in the Action Area (TXNDD 2012).

The loggerhead sea turtle nests on steeply sloped, relatively narrow, coarse-grained beaches. In the U.S., loggerheads nest from Texas to Virginia, with about 80% of loggerhead nests occurring in Florida. Loggerheads primarily consume

mollusks and benthic crabs. Juveniles and adult loggerheads utilize both neritic and oceanic environments, while adult loggerheads prefer to utilize open ocean areas (NMFS 2008).

There is no critical habitat designated in the U.S. In Texas, a relatively stable number of 1-6 loggerhead nests are found annually. These nests have been found statewide with the greatest occurrence on the Padre Island National Seashore (NPS 2012f). There was one sighting of a loggerhead in South Corpus Christi Bay in 2001 (TXNDD 2012).

Based on the loggerhead's wide habitat preference there is a potential for loggerheads to occur in Corpus Christi Bay. Although Corpus Christi Bay may contain acceptable nesting and foraging habitat for the loggerhead, the Action Area lacks both preferred nesting habitat and suitable foraging habitat. In the event that a loggerhead were to enter the Action Area, the occurrence would likely be isolated and short term.

A literature review did not find any published studies or information regarding the effects of GHG emissions on sea turtles. Analysis of estimated heavy metals emissions data provided in Section 2.8.3 indicates that the Project will result in insignificant contributions to atmospheric deposition, thus any bioaccumulation impacts are expected to be negligible. The deposition of nitrogen, sulfur, and particulate matter from air emissions will not exceed the SIL for the areas of the Action Area outside the Project site where the species may occur, and are not expected to contribute to acidification or eutrophication of the bay. Potential water intake and wastewater discharge associated with the operation of the Project are not expected to cause direct impacts to the species. The Project will provide treatment for wastewater prior to discharge in accordance with its future NPDES permit, and discharge will be monitored to prevent toxic or thermal discharges exceeding levels considered protective of aquatic resources. Given the size of the bay compared to the potential wastewater stream, no alterations to the available assemblage of forage species would be anticipated. The Project construction plan includes back-filling the wharf area prior to pile-driving on the land created by the fill activity. Pile-driving on land rather than open water will minimize impacts and preclude the possibility of turtles from occurring within the radius of potential adverse pile-driving noise. Additional operational noise will be similar to current conditions (Section 2.6) and production of dust will be minimized during construction through the implementation of best management practices (Section 2.7).

The USFWS indicated during a meeting on July 24, 2013 that they did not anticipate any adverse impacts from the Project to this species; USFWS recommended that construction, maintenance, and operations plans include language and training materials regarding their potential occurrence. The Project has created a project-specific HSSE Plan that provides pictures and a narrative description of the animal, as well as management and USFWS notification procedures in the event that the animal is sighted during construction or operation of the Project.

There is limited potential for loggerhead sea turtles to travel through the Action Area. However, the lack of documented occurrences in the Action Area, limited potential for impacts, and implementation of USFWS recommendations indicate the potential for adverse impacts from the Project is insignificant. Therefore, a determination of "*May affect, but is not likely to adversely affect*" is recommended for this species.

5.3 DESIGNATED FEDERAL CRITICAL HABITAT

No designated federal critical habitat occurs within the Action Area. The nearest designated federal critical habitat is located approximately three miles southwest of the Project site along HWY 181, in a large basin of tidal ponds, sand spits, and wind tidal flats owned and managed by the City of Portland. No impacts to this area or any other designated federal critical habitat are expected to result from construction or operation of the Project.

The Aransas National Wildlife Refuge is designated as critical habitat for the whooping crane, and is located approximately 25-35 miles northeast of the Project site. The Refuge Complex is comprised of over 115,000 acres including the Blackjack Peninsula (Aransas proper), Matagorda Island, Myrtle Foester Whitmire, Tatton, and Lamar Units. These areas provide vital resting, feeding, wintering, and nesting grounds for migratory birds and native Texas wildlife. The Refuge is world renowned for hosting the largest wild flock of endangered whooping cranes each winter. Other native species observed on the refuge include the American alligator, javelina, roseate spoonbill, white-tailed deer, armadillo, and numerous wildflowers.

The Aransas National Wildlife Refuge is located well outside the Action Area for the Project. Because the Action Area was delineated to encompass any adverse impacts resulting from the Project, including a buffer to maximize the potentially impacted area, ERM does not anticipate any impacts to the Aransas National Wildlife Refuge due to the Project.

5.4 INTERDEPENDENT AND INTERRELATED ACTIONS

There are other interdependent and interrelated actions associated with the Project, both within the Action Area and in the surrounding vicinity. These additional actions have the potential to result in cumulative impacts to ecological receptors in the vicinity of the Project. The interrelated actions include adjacent projects currently under development, proposed projects that are yet to be constructed, and ancillary infrastructure development, summarized in Table 5-1 below.

TABLE 5-1: Interdependent and Interrelated Projects in the Vicinity of the Project

Project	*Description*	*Estimated Construction Date*	*Location Relative to Project*
voestalpine DRI Facility	Construct an HBI/DRI plant within the proposed La Quinta terminal	April 2014	N/A
USACE La Quinta Channel Extension	Extension of the La Quinta Channel 1.5 miles to serve the proposed POCCA La Quinta terminal	Construction completed in mid-2013. Maintenance dredging to occur as needed.	Immediately south of the POCCA La Quinta terminal.
Port of Corpus Christi - La Quinta Trade Gateway Terminal	Construct a container terminal with a 3800-ft, three-berth docking area with nine cranes, 180 acres container storage yard, rail loop, and over 400 acres for additional site development.	The Project is considered the initial phase of the project, and is scheduled to begin in April 2014. The remainder of the terminal development is dependent upon federal funding, thus timeline for construction is currently unknown.	The Project is located within the boundaries of the proposed terminal project.
TPCO America Corporation	Construct a seamless steel pipe manufacturing facility	Initiated construction in August 2011, and is expected to be fully operational in late 2014.	Approximately 0.7 miles northeast of the northern Project site boundary.

The USACE La Quinta Channel Extension project is currently underway within the Action Area, and is expected to be completed in 2013. The Project is dependent upon completion of this channel extension so that deep-draft vessels can deliver iron ore and receive the refined HBI product from the Project. Impacts resulting from dredging the channel extension include physical disturbance and habitat loss, as well as increased siltation in Corpus Christi Bay. Mitigation for the project includes the creation of a beneficial use site in the form a barrier island located immediately south of the channel using the dredge spoils.

The proposed POCCA La Quinta Trade Gateway terminal project is located directly adjacent to the Project and within the Action Area. The construction of the Project is interdependent with the POCCA terminal development, as POCCA is leasing portions of the land reserved for the terminal to voestalpine. voestalpine may also share use and/or ownership of a portion of the terminal's boat docking area, and will utilize portions of the road and rail access proposed for the terminal. The POCCA project has been authorized, but cannot initiate construction until funding is secured.

TPCO America Corporation, a subsidiary of Chinese Tianjin Pipe Corporation, began construction of a seamless steel pipe manufacturing facility in August

2011. The facility is approximately 0.7 miles northeast of the northern Project site boundary, immediately east of SH 35 and SH 361 near Gregory. This facility is interrelated to the Project as it represents a potential purchaser of steel products from voestalpine, and will likely utilize the same road and rail infrastructure. The first phase of the construction, a heat treatment and finishing facility, is scheduled to open in 2013. Construction of an arc furnace facility, rolling mill and administrative offices will begin in 2013. The entire facility will be operational in late 2014 and will use an electric arc furnace and ladle metallurgy furnace to produce 500,000 metric tons per year of 4-in through 10 ¾-in seamless steel pipe which is utilized in the oil and gas industry. The manufacturing facility will be supplied with 2 million gallons of water per day by SPMWD. The Texas Department of Transportation has initiated construction on a new overpass, SH 35 freeway extension, and improvements to the intersection of FM 136 that will provide better access to the site. TPCO America will use BACT to minimize air pollutants as permitted under a TCEQ permit issued in 2010.

5.5 CUMULATIVE EFFECTS

The project site is located in an undeveloped area comprised primarily of cultivated cropland between residential and industrial areas. Existing industrial facilities along the La Quinta Channel southeast of the Project have been extant for decades and will likely persist in the near future. The area is currently experiencing growth primarily related to the Eagle Ford shale development, and is likely to experience additional industrial development concurrent with or subsequent to the construction and operation of the Project. In addition to the industrial facilities, the La Quinta and Corpus Christi Channels are a constant source of barge and commercial vessel traffic that will continue to have an impact on the surrounding areas in the future.

Although the construction and operation of the Project is not expected to result in adverse impacts to listed species independently, it may contribute to potential cumulative effects to listed species that may result from the overall industrial development in the Corpus Christi Bay area. Potential effects include: minimal habitat fragmentation and/or loss, noise and light emissions, deposition from particulate emissions to land and water, water intake and discharge to Corpus Christi Bay, potential bird strikes, and indirect effects related to increased ship, rail, or vehicle traffic. Likewise, while the footprint of the voestalpine dock will result in the dredge of approximately 12.4 acres of bay bottom and fill of approximately 5.9 acres, it will remain within the permitted boundaries and areas authorized by SWG-2001-02261. The USACE permit conditions include mitigation measures to conserve, restore and manage the area habitat.

NMFS determined that any adverse impacts to essential fish habitat would be minimal based upon previous environmental assessments and potential impacts from the proposed container terminal. Previous submittal of a USFWS letter on January 20, 2004 stated that there was no objection to construction authorization of terminal components, provided suggested mitigation plans were addressed. The TPWD submitted a letter dated January 16, 2004 stating that

their staff had participated in several interagency meetings regarding the terminal, and that agency recommendations incorporated into the terminal plans had minimized impacts to a large degree. TPWD had no objection to the proposed terminal, but also recommended additional mitigation measures. The TCEQ submitted a letter dated August 23, 2004 that stated their reasonable assurance that the container terminal project will not violate any water quality standards. With the POCCA agreeing to the additional mitigation measures, the permit was approved on August 27, 2004, and was extended and amended in 2011.

The incorporation and effective implementation of agency requirements and recommendations associated with the development of the Project area and the current Project will ensure that impacts to protected species will be effectively managed thru avoidance, minimization, and mitigation. Accordingly, the protection of the state's aquatic resources through TCEQ water quality standards with a numeric/narrative limit, a designated use, and an anti-degradation policy, will result in the protection of water quality conditions and EFH throughout the operation of the Project.

Air emissions will not cause or contribute to a violation of the state standards. Furthermore, modeling demonstrated that SO_2 impacts were below the Texas de minimis levels for the State Ambient Air Quality Standards.

Implementation of construction best management practices and carefully developed resource protection and mitigation plans designed to minimize and control environmental impacts from these projects is anticipated to result in only minimal cumulative effects to some resources when impacts of the Project are added to those of other area projects. Each project would also be required to secure applicable permits each of which may impose conditions designed to further minimize or avoid impacts; as well as provide mitigation. It is expected that the Project, together with the other projects in the area, would cumulatively benefit the local and regional economy through job creation, purchases of goods and services, and increased tax revenues.

5.6 DETERMINATION OF EFFECT SUMMARY

A species-specific analysis of potential impacts resulted in a determination of *may affect, but is not likely to adversely affect* for 8 of the 11 threatened and endangered species analyzed in this report. The remaining three species will not be affected by the Project. A summary of the threatened and endangered species and recommended determination of effects is presented below in Table 5-2.

TABLE 5-2: Anticipated Effects on Federally Listed Species Potentially Occurring in the Action Area

Common Name	*Scientific Name*	*Recommended Determination of Effect*
Northern aplomado falcon	*Falco femoralis septentrionalis*	May affect, not likely to adversely affect
Piping plover	*Charadrius melodus*	May affect, not likely to adversely affect
Whooping crane	*Grus Americana*	May affect, not likely to adversely affect
Ocelot	*Leopardus pardalis*	No effect
Gulf coast jaguarundi	*Herpailurus yagouaroundi cacomitli*	No effect
West Indian manatee	*Trichechus manatus*	May affect, not likely to adversely affect
Atlantic hawksbill sea turtle	*Eretmochelys imbricate*	May affect, not likely to adversely affect
Green sea turtle	*Chelonia mydas*	May affect, not likely to adversely affect
Kemp's Ridley sea turtle	*Lepidochelys kempii*	May affect, not likely to adversely affect
Leatherback sea turtle	*Dermochelys coriacea*	No effect
Loggerhead sea turtle	*Caretta caretta*	May affect, not likely to adversely affect

6.0 CONSERVATION AND MITIGATION MEASURES

The loss of potential habitat associated with the Project will be mitigated in accordance with the POCCA permits issued for the container dock and ship terminal (USACE permit # 23269). Per the permit's mitigation plan, the dredged material from the extension of La Quinta Channel and turning basin will be utilized to create a 192 acre beneficial use area on the seaward side of the channel known as beneficial use site (BUS) 6, or alternatively referred to as Site GH. BUS 6 is currently being constructed west of the existing spoil island and consists of an armored levee and fill that will provide vegetated and unvegetated shallow water habitat.

The approximately 3 miles of submerged and emergent perimeter levee for BUS 6 is currently being constructed using clayey dredged material discharged into the open bay using hydraulic dredges via pipe and excavators. The bay (south) side of the levee will be emergent and fortified with stone armoring to protect it from erosion. The channel (north) side of the perimeter levee will be submerged to allow for hydrologic connectivity and water exchange with the bay. Dredge material will be placed between the emergent and submerged levees to create the new shallow water habitat

Two mitigation sites are anticipated, one on the northwestern side of the new spoil island and one on the northeastern side. The western mitigation site is associated with the Project mitigation, and will be planted with 19.2 acres of seagrass and 6.6 acres of cordgrass. These acreages greatly exceed the impacted acreage, ensuring that there is no net loss of wetland habitat. Post-planting monitoring will be undertaken at intervals of 6 months, 1, 2, and 3 years after planting to determine the success of mitigation. Construction of the mitigation site shall begin within one year of the dredging activities for the ship berthing area is completed.

The shallow water habitat at BUS 6 creates habitat that may be colonized and utilized by additional seagrass, oysters, fisheries, marsh vegetation, and shorebirds. This mitigation area would provide suitable habitat for marine and avian threatened and endangered species in the event they were to occur within the Action Area, which may result in a beneficial impact from the Project. The mitigation at BUS 6 will be executed, managed, and monitored via the Port of Corpus Christi's Beneficial Use Plan Implementation Group with support from voestalpine to ensure that goals are achieved.

6.1 THREATENED AND ENDANGERED SPECIES

No loss of threatened or endangered species and/or critical habitat is expected to result from construction or operation of the Project. No protected species were observed during field reconnaissance and none are expected to occur at the Project site due to the limited availability of suitable habitat. The mitigation measures described in USACE permit # 23269 will provide an additional 192

acres of habitat that could provide nearby refuge for marine and avian protected species should they occur.

A meeting with the USFWS on July 24, 2013 indicated that USFWS did not anticipate any adverse impacts to protected species from the Project due to the variety of avoidance, conservation, and mitigation measures associated with the Project. However, the USFWS recommended the implementation of additional mitigation measures to minimize potential for avian strikes, including lighting and marking structures greater than 15 feet in height. It was also recommended that construction, maintenance, and operations plans include language and training materials regarding the protected species. voestalpine will light and/or mark vertical structures and has created a project-specific HSSE Plan that provides pictures and a narrative description of the protected species, as well as management and USFWS notification procedures in the event that a protected animal is sighted during construction or operation of the Project. A summary of mitigation measures as they apply to each protected species is provided in Table 6-1.

TABLE 6-1: Mitigation Measures to Avoid and Minimize Impacts to Protected Species

Protected Species	*Mitigation Measures*
Northern aplomado falcon	•DMPA increases noise attenuation at Green Lake •Air emissions will be below SIL and controlled by BACT •Dust limited by containment domes, closed conveyors, and construction BMPs •Pre-treatment of raw ore minimizes heavy metal content and additional BACT in process further limits mercury emissions and deposition •Use of flashing lights on tower and bird diverters on power lines to minimize avian strikes •Creation of a 192-acre beneficial use area planted with 19.2 acres of seagrass and 6.6 acres of cordgrass •Construction and operations personnel will be provided education and training regarding identification and procedures
Piping plover	•Air emissions will be below SIL and controlled by BACT •Dust limited by containment domes, closed conveyors, and construction BMPs •Pre-treatment of raw ore minimizes heavy metal content and additional BACT in process further limits mercury emissions and deposition •Use of flashing lights on tower and bird diverters on power lines to minimize avian strikes •Creation of a 192-acre beneficial use area planted with 19.2 acres of seagrass and 6.6 acres of cordgrass •Construction and operations personnel will be provided education and training regarding identification and procedures

Protected Species	*Mitigation Measures*
Whooping crane	•DMPA increases noise attenuation at Green Lake •Air emissions will be below SIL and controlled by BACT •Dust limited by containment domes, closed conveyors, and construction BMPs •Pre-treatment of raw ore minimizes heavy metal content and additional BACT in process further limits mercury emissions and deposition •Use of flashing lights on tower and bird diverters on power lines to minimize avian strikes •Creation of a 192-acre beneficial use area planted with 19.2 acres of seagrass and 6.6 acres of cordgrass •Construction and operations personnel will be provided education and training regarding identification and procedures
Ocelot	•DMPA increases noise attenuation at Green Lake •Air emissions will be below SIL and controlled by BACT •Dust limited by containment domes, closed conveyors, and construction BMPs •Pre-treatment of raw ore minimizes heavy metal content and additional BACT in process further limits mercury emissions and deposition •Construction and operations personnel will be provided education and training regarding identification and procedures
Gulf coast jaguarundi	•DMPA increases noise attenuation at Green Lake •Air emissions will be below SIL and controlled by BACT •Dust limited by containment domes, closed conveyors, and construction BMPs •Pre-treatment of raw ore minimizes heavy metal content and additional BACT in process further limits mercury emissions and deposition •Construction and operations personnel will be provided education and training regarding identification and procedures
West Indian manatee	•Pile-driving noise during construction will occur on land, excluding marine life from area of potential adverse effect •Air emissions will be below SIL and controlled by BACT •Dust limited by containment domes, closed conveyors, and construction BMPs •Pre-treatment of raw ore minimizes heavy metal content and additional BACT in process further limits mercury emissions and deposition •Creation of a 192-acre beneficial use area planted with 19.2 acres of seagrass and 6.6 acres of cordgrass •Wastewater treatment minimizes constituents of concern in wastewater discharge •Thermal effluent may provide additional protective habitat for wayward animals •Construction and operations personnel will be provided education and training regarding identification and procedures
Atlantic hawksbill sea turtle	•Pile-driving noise during construction will occur on land, excluding marine life from area of potential adverse effect •Air emissions will be below SIL and controlled by BACT •Dust limited by containment domes, closed conveyors, and construction BMPs •Pre-treatment of raw ore minimizes heavy metal content and additional BACT in process further limits mercury emissions and deposition •Creation of a 192-acre beneficial use area planted with 19.2 acres of seagrass and 6.6 acres of cordgrass •Wastewater treatment minimizes constituents of concern in wastewater discharge •Construction and operations personnel will be provided education and training regarding identification and procedures

Protected Species	*Mitigation Measures*
Green sea turtle	•Pile-driving noise during construction will occur on land, excluding marine life from area of potential adverse effect •Air emissions will be below SIL and controlled by BACT •Dust limited by containment domes, closed conveyors, and construction BMPs •Pre-treatment of raw ore minimizes heavy metal content and additional BACT in process further limits mercury emissions and deposition •Creation of a 192-acre beneficial use area planted with 19.2 acres of seagrass and 6.6 acres of cordgrass •Wastewater treatment minimizes constituents of concern in wastewater discharge Construction and operations personnel will be provided education and training regarding identification and procedures
Kemp's Ridley sea turtle	•Pile-driving noise during construction will occur on land, excluding marine life from area of potential adverse effect •Air emissions will be below SIL and controlled by BACT •Dust limited by containment domes, closed conveyors, and construction BMPs •Pre-treatment of raw ore minimizes heavy metal content and additional BACT in process further limits mercury emissions and deposition •Creation of a 192-acre beneficial use area planted with 19.2 acres of seagrass and 6.6 acres of cordgrass •Wastewater treatment minimizes constituents of concern in wastewater discharge •Construction and operations personnel will be provided education and training regarding identification and procedures
Leatherback sea turtle	•Pile-driving noise during construction will occur on land, excluding marine life from area of potential adverse effect •Air emissions will be below SIL and controlled by BACT •Dust limited by containment domes, closed conveyors, and construction BMPs •Pre-treatment of raw ore minimizes heavy metal content and additional BACT in process further limits mercury emissions and deposition •Creation of a 192-acre beneficial use area planted with 19.2 acres of seagrass and 6.6 acres of cordgrass •Wastewater treatment minimizes constituents of concern in wastewater discharge •Construction and operations personnel will be provided education and training regarding identification and procedures
Loggerhead sea turtle	•Pile-driving noise during construction will occur on land, excluding marine life from area of potential adverse effect •Air emissions will be below SIL and controlled by BACT •Dust limited by containment domes, closed conveyors, and construction BMPs •Pre-treatment of raw ore minimizes heavy metal content and additional BACT in process further limits mercury emissions and deposition •Creation of a 192-acre beneficial use area planted with 19.2 acres of seagrass and 6.6 acres of cordgrass •Wastewater treatment minimizes constituents of concern in wastewater discharge •Construction and operations personnel will be provided education and training regarding identification and procedures

6.2 FISHERIES CONSERVATION

According to Gulf of Mexico Fisheries Management Council (GMFMC) data, there are seven Fishery Management Plans (FMPs) in the Gulf of Mexico, five of which are described as including all estuaries in the Gulf of Mexico, and thus

applicable to Corpus Christi Bay. These include the Red Drum FMP, Reef Fish FMP, Coastal Migratory Pelagics FMP, Shrimp FMP, and Stone Crab FMP. Additionally, the NMFS maintains an FMP for Atlantic Highly Migratory Species (HMS) that contains shark species that may occur in Corpus Christi Bay.

The NMFS and GMFMC have identified essential fish habitat (EFH) associated with each of these FMPs. POCCA has previously coordinated with NMFS to minimize impacts to EFH and provide a mitigation plan for impacts resulting from the proposed container terminal at the Project site. NMFS did not object to issuance of the existing POCCA permit. A detailed analysis of potential impacts to EFH resulting from the Project is provided in an additional supplemental document for the GHG permit application related to this BA.

7.0 LITERATURE CITED

Applebaum, et. al. 2005. Status and Trends of Dissolved Oxygen in Corpus Christi Bay, Texas, U.S.A. Environmental Monitoring and Assessment (2005) **107:** 297–311.

Bopp, L., K.E. Kohfeld, and C.Le Quere. 2003. Dust impact on marine biota and atmospheric CO2 during glacial periods. Paleoceanography 18(2): 1-16.

Brown, J.L.* and M.W. Collopy. 2008. Nest Site Characteristics Affect Nest-Survival Rates of Northern Aplomado Falcons (*Falco femoralis septentrionalis*). Auk 125:105-112.

Bureau of Ocean Energy Management. 2012. Effects of Noise on Fish, Fisheries, and Invertebrates in the U.S. Atlantic and Arctic from Energy Industry Sound-Generating Activities: Literature Synthesis. U.S. Department of the Interior. February 13, 2012.

Corpus Christi Bay National Estuary Program (CCBNEP). 1996. Current Status and Historical Trends of the Estuarine Living Resources within the Corpus Christi Bay National Estuary Program Study Area. CCBNEP-06D - Volume 4 of 4. January 1996.

Coastal Bend Bays and Estuaries Program (CBBEP).1998.State of the Bay- A report for the future. Pg. 40
http://www.cbbep.org/publications/virtuallibrary/StateoftheBayPart2.pdf

Coastal Bend Bays and Estuaries Program (CBBEP) 78. August 2012. Water and Sediment Quality Status and Trends in the Coastal Bend Area – Phase 2: Data Analysis. Montagna, P.A and, T.A. Palmer. Texas A&M University - Corpus Christi, Harte Research Institute for Gulf of Mexico Studies, 520 pp.

Coffin, A.W. 2007. From Roadkill to Road Ecology: A Review of the Ecological Effects of Roads. Journal of Transport Geography 15: 396-406.

Corpus Christi Caller-Times. (CCCT) 2009. A Kemp's ridley sea turtle nests on North Beach.
http://www.caller.com/videos/detail/kemps-ridley-sea-turtle-nests-north-beach/

Corpus Christi Caller-Times. (CCCT) 2012. Manatee spotted in Nueces, Corpus Christi Bay. http://www.caller.com/news/2012/sep/20/manatee-stranded-nueces-corpus-christi-bays/

Dames and Moore. 1996. Phase I Environmental Site Assessment and Phase II Limited Baseline Assessment. 960 Acre Vacant Property. La Quinta Road, Gregory, San Patricio and Nueces Counties, Texas.

Davis, W. and Schmidly, D. 1994. The Mammals of Texas. Online Addition. Texas Parks and Wildlife Department. Austin, Texas. http://www.nsrl.ttu.edu/tmot1/Default.htm

Environmental Protection Agency (EPA). 2004. "What You Need to Know About Mercury in Fish and Shellfish". 2004 EPA and FDA Advice for Women Who Might Become Pregnant, Women Who Are Pregnant, Nursing Mothers, and Young Children. http://water.epa.gov/scitech/swguidance/fishshellfish/outreach/advice_index.cfm

Environmental Protection Agency (EPA). 2013. "Drinking Water Contaminants - National Primary Drinking Water Regulations". http://water.epa.gov/drink/contaminants/#one

Fertl, D., Schiro A.J. et. a. 2005. Manatee occurrence in the Northern Gulf of Mexico, west of Florida. Gulf and Caribbean Research Vol 17, 69-94. http://www.ziphiusecoservices.com/pdfs/peer-reviewed/2005/manatee-gomex.pdf

Field et al. 2009. The Ecology of Dust. Frontiers in Ecology and the Environment. Volume 8, Issue 8. The Ecological Society of America. Pages 423-430.

Griffin, D.W. and C. A. Kellogg. 2004. Dust Storms and Their Impact on Ocean and Human Health: Dust in Earth's Atmosphere. EcoHealth (1): 284-295.

Gulf of Mexico Alliance (GOMA). 2013. White Paper on Gulf of Mexico Mercury Fate and Transport: Applying Scientific Research to Reduce the Risk from Mercury in Gulf of Mexico Seafood. February 2013. http://www.gulfofmexicoalliance.org/projects/files/74GOMA_Hg_White_Paper_Feb_2013.pdf

Gulf of Mexico Fishery Management Council (GMFMC). 1998. Generic amendment for addressing essential fish habitat requirements in the following fishery management plans of the Gulf of Mexico. October 1998. Tampa, Florida,

Howells, R. (2002) Freshwater Mussels (Unionidae) of the Pimpleback-complex (*Quadrula spp.*) in Texas. Management Data Series No.197. Texas Parks and Wildlife Department. http://www.tpwd.state.tx.us/publications/pwdpubs/media/mds_inland/mds-197.pdf

Johns, Norman D. Bays in Peril: A Forecast for Freshwater Flows to Texas Estuaries. National Wildlife Federation. October 2004.

Kruse, H., A.M. Kirkemo, and K. Handeland. 2004. Wildlife as Source of Zoonotic Infections. Emerging Infectious Diseases 10(12): 2067-2072.

Leary, T. 1957. A Schooling of Leatherback Turtles, Dermochelys coriacea coriacea, on the Texas Coast. Copeia, Vol. 1957, No. 3 (Aug. 27, 1967), p.232 http://www.texasturtles.org/Schooling_Texas_Dermochelys.pdf

Luensmann, Peggy. 2010. Falco peregrinus. In: Fire Effects Information System, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/

Manzella, S. and Williams, J. 1992. The Distribution of Kemp's Ridley Sea Turtles along the Texas Coast: An Atlas. NOAA Technical Report NMFS 110. Galveston, TX http://spo.nwr.noaa.gov/tr110opt.pdf

Michael Minor and Associates. 1996-2001. "General Introduction to Acoustics". Available online at: http://www.drnoise.com/PDF_files/Detailed%20Introduction%20to%20Acoustics.pdf

Moore, J.K., S.C. Doney, K. Lindsay, N. Mahowald, and A.F.Michaels. 2006. Nitrogen fixation amplifies the ocean biogeochemical response to decadal timescale variations in mineral dust deposition. Tellus 58B: 560-572.

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1991. Recovery Plan for U.S. Population of Atlantic Green Turtle. http://www.nmfs.noaa.gov/pr/pdfs/recovery/turtle_green_atlantic.pdf

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1992. Recovery Plan for Leatherback Turtles in the U.S. Caribbean, Atlantic and Gulf of Mexico. National Marine Fisheries Service, Washington. D.C http://ecos.fws.gov/docs/recovery_plan/920406.pdf

National Marine Fisheries Service and U.S. Fish and. Wildlife Service. 1993. Recovery Plan' for Hawksbill Turtles in the U.S. Caribbean Sea, Atlantic Ocean, and Gulf of Mexico. National Marine Fisheries Service, St. Petersburg, Florida.

National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2008. Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle (Caretta caretta), Second Revision. National Marine Fisheries Service, Silver Spring, MD.

National Marine Fisheries Service. 2009. Recovery Plan for Smalltooth Sawfish (Pristis pectinata). Prepared by the Smalltooth Sawfish Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland. http://www.nmfs.noaa.gov/pr/pdfs/recovery/smalltoothsawfish.pdf

National Marine Fisheries Service, U.S. Fish and Wildlife Service, and SEMARNAT. 2011. Bi-National Recovery Plan for the Kemp's Ridley Sea Turtle (Lepidochelys kempii), Second Revision. National Marine Fisheries Service. Silver Spring, Maryland 156 pp. + appendices. http://www.nmfs.noaa.gov/pr/pdfs/recovery/kempsridley_revision2.pdf

National Oceanic and Atmospheric Administration. NOAA. 2012. Green Turtle (*Chelonia mydas*). http://www.nmfs.noaa.gov/pr/species/turtles/green.htm

National Park Service (NPS) 2012a. Padre Island National Seashore. Sea Turtle Recovery Project. http://www.nps.gov/pais/naturescience/strp.htm

National Park Service (NPS). 2012b. Padre Island National Seashore. The Hawksbill Sea Turtle
http://www.nps.gov/pais/naturescience/hawksbill.htm

National Park Service (NPS). 2012c. Padre Island National Seashore. The Kemp's Ridley Sea Turtle. http://www.nps.gov/pais/naturescience/kridley.htm

National Park Service (NPS). 2012d. Padre Island National Seashore. The Green Sea Turtle

National Park Service (NPS). 2012e. Padre Island National Seashore. The Leatherback Sea Turtle.
http://www.nps.gov/pais/naturescience/leatherback.htm

National Park Service (NPS). 2012f. Padre Island National Seashore. The Loggerhead Sea Turtle.
http://www.nps.gov/pais/naturescience/loggerhead.htm

Natural Resources Conservation Service (NRCS). 2012. Official Soil Series Descriptions (OSD).
http://soils.usda.gov/technical/classification/osd/index.html

NatureServe. 2012a. Green Turtle
http://www.natureserve.org/explorer/servlet/NatureServe?searchSciOrCommonName=Chelonia+mydas

NatureServe. 2012b. Leatherback Turtle
http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Dermochelys+coriacea

Sea Turtle Stranding and Salvage Network (STSSN). 2012. NOAA. Southeast Fisheries Science Center
http://www.sefsc.noaa.gov/species/turtles/strandings.htm

Shields, Mark. 2002. Brown Pelican (Pelecanus occidentalis), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved

from the Birds of North America Online:
http://bna.birds.cornell.edu/bna/species/609 doi:10.2173/bna.609

Shiner Moseley and Associates, Inc. July 2003. Environmental Document for the Proposed La Quinta Container Terminal. Prepared for the Port of Corpus Christi Authority.

Texas Commission on Environmental Quality (TCEQ). 2013. TCEQ-10411_10055-inst (Instructions): Completing the Industrial Wastewater Permit Application. Revised May 15, 2012.
http://www.tceq.texas.gov/assets/public/permitting/waterquality/forms/10411_10055ins.pdf

Texas Natural Diversity Database (TXNDD) 2012.
http://www.tpwd.state.tx.us/huntwild/wild/wildlife_diversity/txndd

Texas Parks & Wildlife Department. 2007. Piping Plover (Charadrius melodus)
http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_w7000_0013_piping_plover.pdf

Texas Parks & Wildlife Department. 2012a. American Peregrine Falcon. (Falco peregrinus anatum)
http://www.tpwd.state.tx.us/huntwild/wild/species/amperegrine/

Texas Parks and Wildlife. 2012b. Eskimo Curlew (Numenius borealis).
http://www.tpwd.state.tx.us/huntwild/wild/species/eskcurl/

Texas Parks and Wildlife Department. 2012c. Green Sea Turtle (Chelonia mydas).
http://www.tpwd.state.tx.us/huntwild/wild/species/greentur/

Texas Parks and Wildlife. 2012d. Hawksbill Sea Turtle (Eretmochelys imbricata)
http://www.tpwd.state.tx.us/huntwild/wild/species/seaturtle/

Texas Parks and Wildlife Department 2012e. Leatherback Sea Turtle (Dermochelys coriacea)http://www.tpwd.state.tx.us/huntwild/wild/species/lethback/

Texas Parks & Wildlife Department. 2012f. Northern Aplomado Falcon. (Falco femoralis) http://www.tpwd.state.tx.us/huntwild/wild/species/aplomfal/

Texas Parks and Wildlife Department. 2012g. Ocelot. (Leopardus pardalis)
http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_w7000_0013_ocelot.pdf

Turtle Expert Working Group. 2007. An Assessment of the Leatherback Turtle Population in the Atlantic Ocean. NOAA Technical Memorandum NMFS-SEFSC-55, 116 p. http://www.sefsc.noaa.gov/turtles/TM_555_DcTEWG.pdf

U.S. Army Corps of Engineers, Galveston District. August 27, 2004. Department of the Army Permit #23269. Galveston, TX.

U.S. Department of Defense and U.S. Fish & Wildlife Service. 2007. Northern Aplomado Falcon. http://www.fws.gov/endangered/esa-library/pdf/aplomado_falcon_fact_sheet.pdf

U.S. Fish and Wildlife Service. 1993. Endangered and threatened wildlife and plants; determination of threatened status for the Pacific coast population of the western snowy plover; final rule. Federal Register 58(42):12864-12874.

U.S. Fish and Wildlife Service. 1997. Endangered Red Wolves. http://library.fws.gov/Pubs4/endangered_red_wolves.pdf

U.S. Fish & Wildlife Service. 1999. Final Rule to Remove the American Peregrine Falcon from the Federal List of Endangered and Threatened Wildlife. Federal Register /Vol. 64, No. 164http://www.fws.gov/endangered/esa-library/pdf/f990825.pdf

U.S. Fish and Wildlife Service. 2001a. Florida Manatee Recovery Plan, (*Trichechus manatus latirostris*), Third Revision. U.S. Fish and Wildlife Service. Atlanta, Georgia.http://www.fws.gov/northflorida/Manatee/Documents/Recovery%20Plan/MRP-start.pdf

U.S. Fish and Wildlife Service. 2001b. Piping Plover Critical Habitat. http://www.fws.gov/plover/

U.S. Fish and Wildlife Service. 2001c. Western Snowy Plover (Charadrius alexandrinus nivosus) Pacific Coast Population Draft Recovery Plan. Portland, Oregon. xix + 630 pp. http://www.westernsnowyplover.org/pdfs/draft_recovery_plan.pdf

U.S. Fish & Wildlife Service. 2006. Peregrine Falcon. (Peregrinus falco). http://library.fws.gov/ES/peregrine06.pdf

U.S. Fish & Wildlife Service. 2007. Whooping Crane Recovery Plan, Final Third Revision http://ecos.fws.gov/docs/recovery_plan/070604_v4.pdf

U.S. Fish and Wildlife Service. 2007b. National Bald Eagle Management Guidelines. http://www.fws.gov/southdakotafieldoffice/NationalBaldEagleManagementGuidelines.pdf

U.S. Fish and Wildlife Service. 2009. Draft post-delisting monitoring plan for the brown pelican. U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, Ventura, California. 19 pp.

U.S. Fish & Wildlife Service. 2010 The Ocelot. *Leopardus pardalis.* http://www.fws.gov/endangered/esa-library/pdf/ocelot.pdf

U.S. Fish & Wildlife Service. 2011a. Eskimo Curlew; 5-year Review: Summary and Evaulation. Fairbanks, AK http://www.gpo.gov/fdsys/pkg/FR-2011-06-22/pdf/2011-15355.pdf

U.S. Fish & Wildlife Service. 2011b. 12-Month Finding on a Petition To List Texas Fatmucket, Golden Orb, Smooth Pimpleback, TexasPimpleback, and Texas Fawnsfoot as Threatened or Endangered; Proposed Rule. Federal Register Vol.76 No.194 Part 2 pp.6217-71 http://www.gpo.gov/fdsys/pkg/FR-2011-10-06/pdf/2011-25471.pdf

U.S. Fish & Wildlife Service. 2012a. Critical Habitat Portal. Grus americana. http://criticalhabitat.fws.gov/crithab/

U.S. Fish and Wildlife Service. 2012b. Green Sea Turtle (Chelonia mydas). North Florida Ecological Services Office. http://www.fws.gov/northflorida/SeaTurtles/Turtle%20Factsheets/green-sea-turtle.htm

U.S. Fish & Wildlife Service. 2012c. Gulf Coast Jaguarundi (Herpailurus yagouaroundi cacomitli) Species Profile. http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A05H

U.S. Fish and Wildlife Service. 2012d. Hawskbill Sea Turtle (Ertmochelys imbricate). North Florida Ecological Services Office. http://www.fws.gov/northflorida/SeaTurtles/Turtle%20Factsheets/hawksbill-sea-turtle.htm

U.S. Fish and Wildlife Service. 2012e. Kemp's Ridley Sea Turtle (Lepidochelys kempii). North Florida Ecological Services Office. http://www.fws.gov/northflorida/SeaTurtles/Turtle%20Factsheets/kemps-ridley-sea-turtle.htm

U.S. Fish and Wildlife Service. 2012f. Leatherback . North Florida Field Office. Leatherback Sea Turtle (Dermocheyls coriacea). http://www.fws.gov/northflorida/SeaTurtles/Turtle%20Factsheets/leatherback-sea-turtle.htm

U.S. Fish and Wildlife Service. 2012g. Loggerhead Sea Turtle (Caretta caretta). North Florida Ecological Services Office. http://www.fws.gov/northflorida/SeaTurtles/Turtle%20Factsheets/loggerhead-sea-turtle.htm

U.S. Fish and Wildlife Service. 2012h. West Indian Manatee (Trichechus manatus) Species Profile. http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A007

U.S. Fish and Wildlife Service. 2012i. Draft Gulf Coast jaguarundi (Puma yagouaroundi cacomitli) Recovery Plan, First Revision. U.S. Fish and Wildlife Service, Southwest Region. Albuquerque, NM

U.S. Geological Survey.2012. Physiographic Regions of the U.S. http://tapestry.usgs.gov/physiogr/physio.html

U.S. Geological Survey. 2006. A Comprehensive Review of Observational and Site Evaluation Data of Migrant Whooping Cranes in the United States, 1943-99. State Summaries. TX-Figure 1. http://www.npwrc.usgs.gov/resource/birds/wcdata/tx_fig1.htm

Wild Earth Guardians. 2010. Petition to Designate Critical Habitat for the Kemp's Ridley Sea Turtle (Lepidochelys kempii). http://www.nmfs.noaa.gov/pr/pdfs/petitions/kempsridley_criticalhabitat_feb2010.pdf

Wunderground.com. 2012. History for Corpus Christi Texas. December 17, 2012 and December 18, 2012. National Weather Service Daily Summary. http://www.wunderground.com/history/airport/KCRP/2012/12/18/DailyHistory.html?req_city=NA&req_state=NA&req_statename=NA&MR=1

Figures

January 2014
Project No. 0197207

Environmental Resources Management
206 E. 9th St., Suite 1700
Austin, Texas 78701
T: (512) 459-4700
F: (512) 459-4711

Environmental Resources Management

DESIGN:	T Wycoff	DRAWN:	I Tobar	CHKD.:	T Wycoff
DATE:	11/22/2013	SCALE:	AS SHOWN	REVISION:	0
FILE:	K:\GIS\Voestalpine\La_Quinta\MXD\BA\Fig1_SiteLocation.mxd				

FIGURE 1
SITE LOCATION
La Quinta Biological Assessment
voestalpine Texas LLC
San Patricio and Nueces Counties, Texas

ERM

Environmental Resources Management

DESIGN:	T Wycoff	DRAWN:	I Tobar	CHKD.:	T Wycoff
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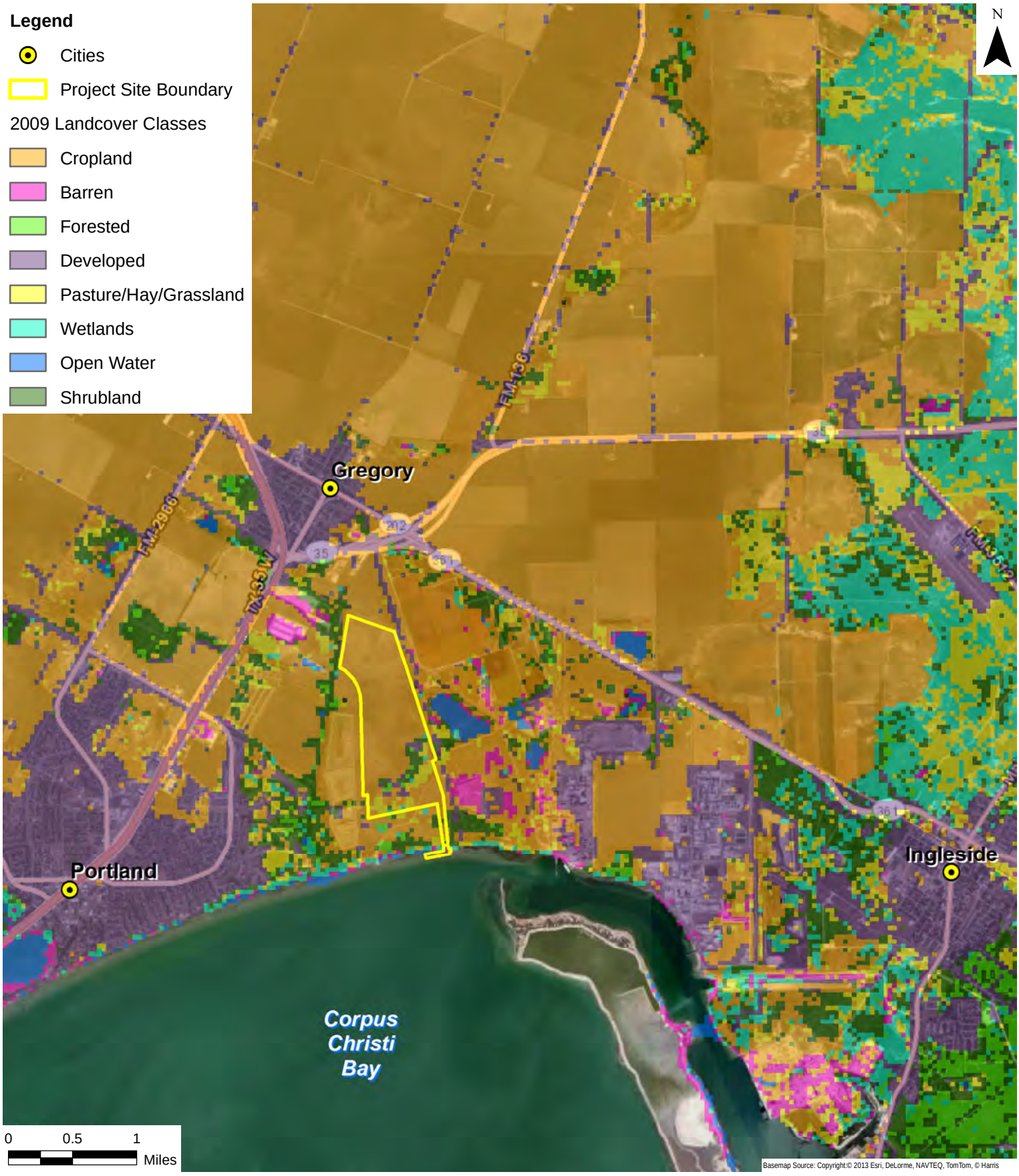
FIGURE 2
PORT OF CORPUS CHRISTI
LA QUINTA TRADE GATEWAY
La Quinta Biological Assessment
voestalpine Texas LLC
San Patricio and Nueces Counties, Texas

Source:
La Quinta Ship Channel Multi-Purpose Container Dock & Terminal,
Port of Corpus Christi, Initiatives: The voestalpine Group.
Available at:
http://www.portofcorpuschristi.com/index.php/initiatives/the-voestalpine-group

ERM



Environmental Resources Management

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DATE:	11/22/2013	SCALE:	AS SHOWN	REVISION:	0

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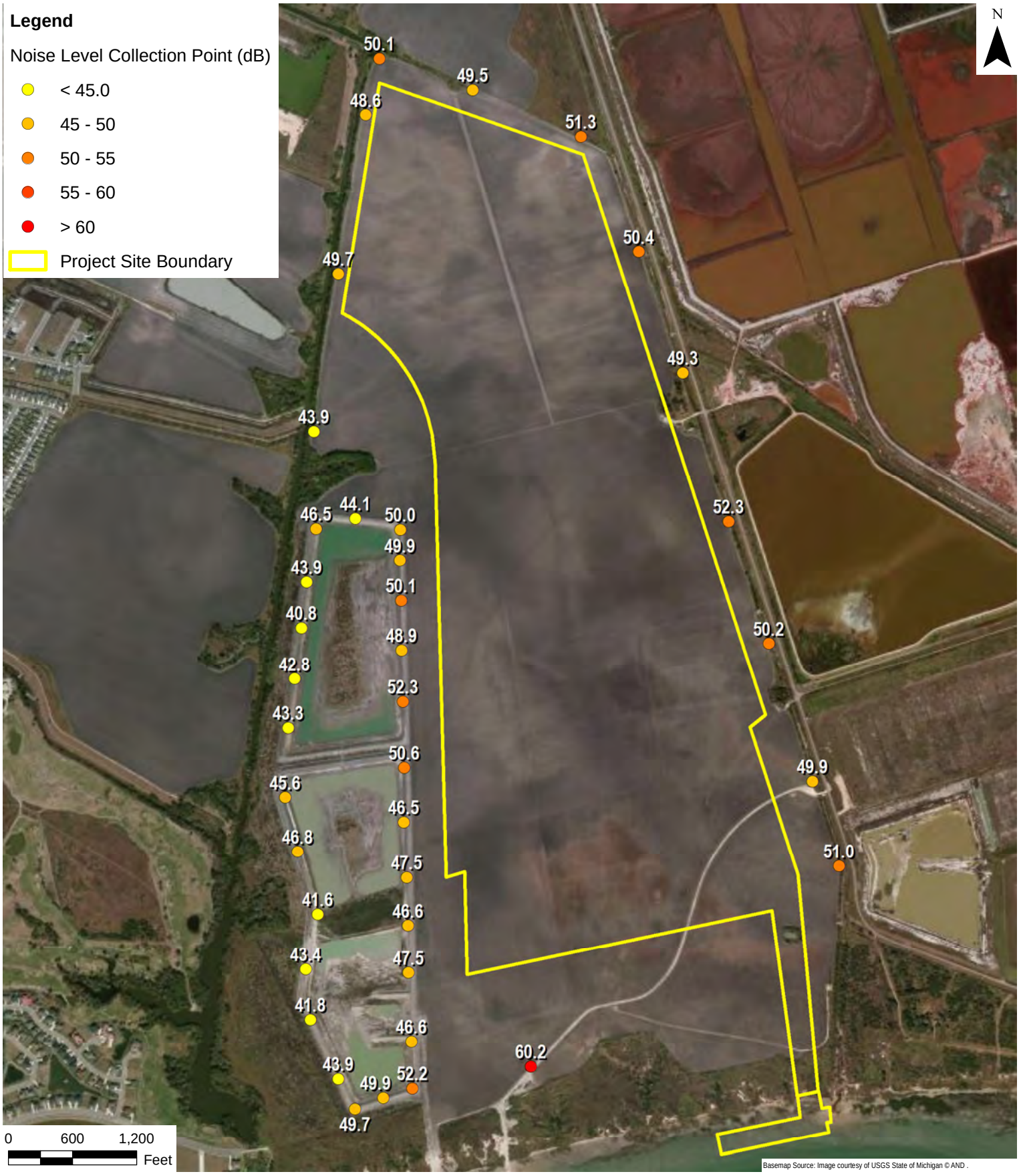
FIGURE 3
LAND COVER
La Quinta Biological Assessment
voestalpine Texas LLC
San Patricio and Nueces Counties, Texas

ERM



Environmental Resources Management

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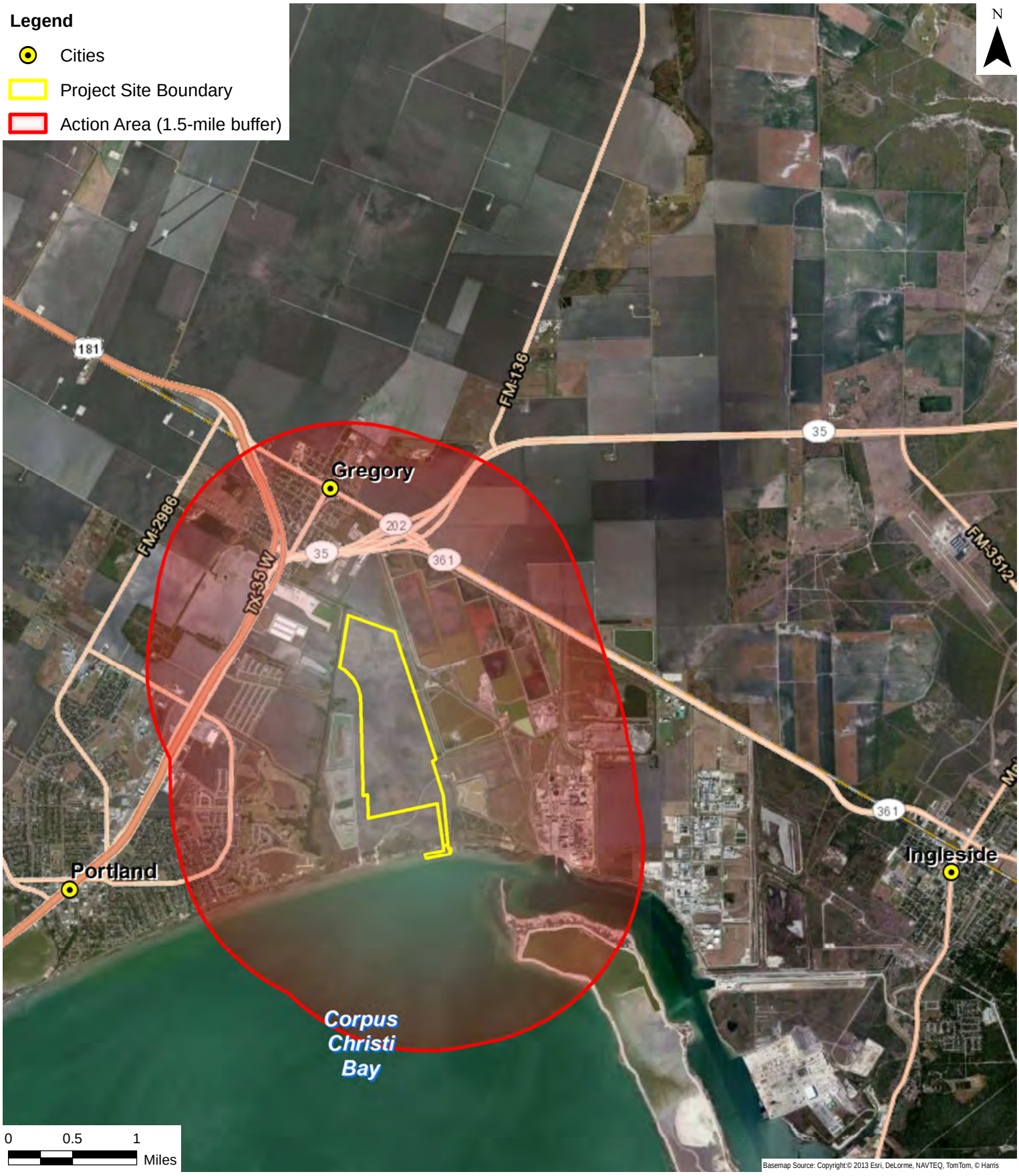
FIGURE 4
NOISE SAMPLING RESULTS
La Quinta Biological Assessment
voestalpine Texas LLC
San Patricio and Nueces Counties, Texas

ERM



Environmental Resources Management

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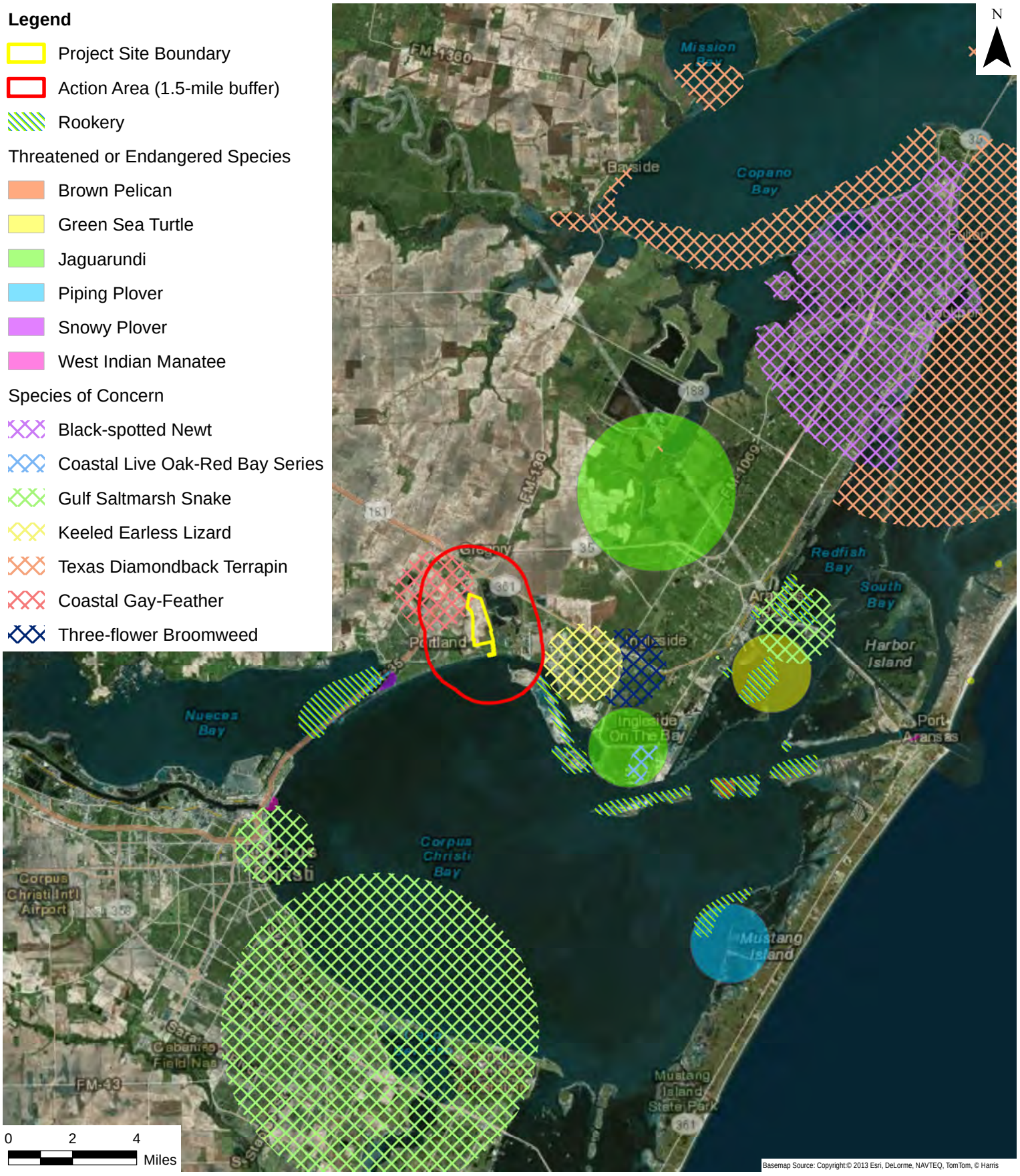
FIGURE 5
ACTION AREA
La Quinta Biological Assessment
voestalpine Texas LLC
San Patricio and Nueces Counties, Texas

ERM

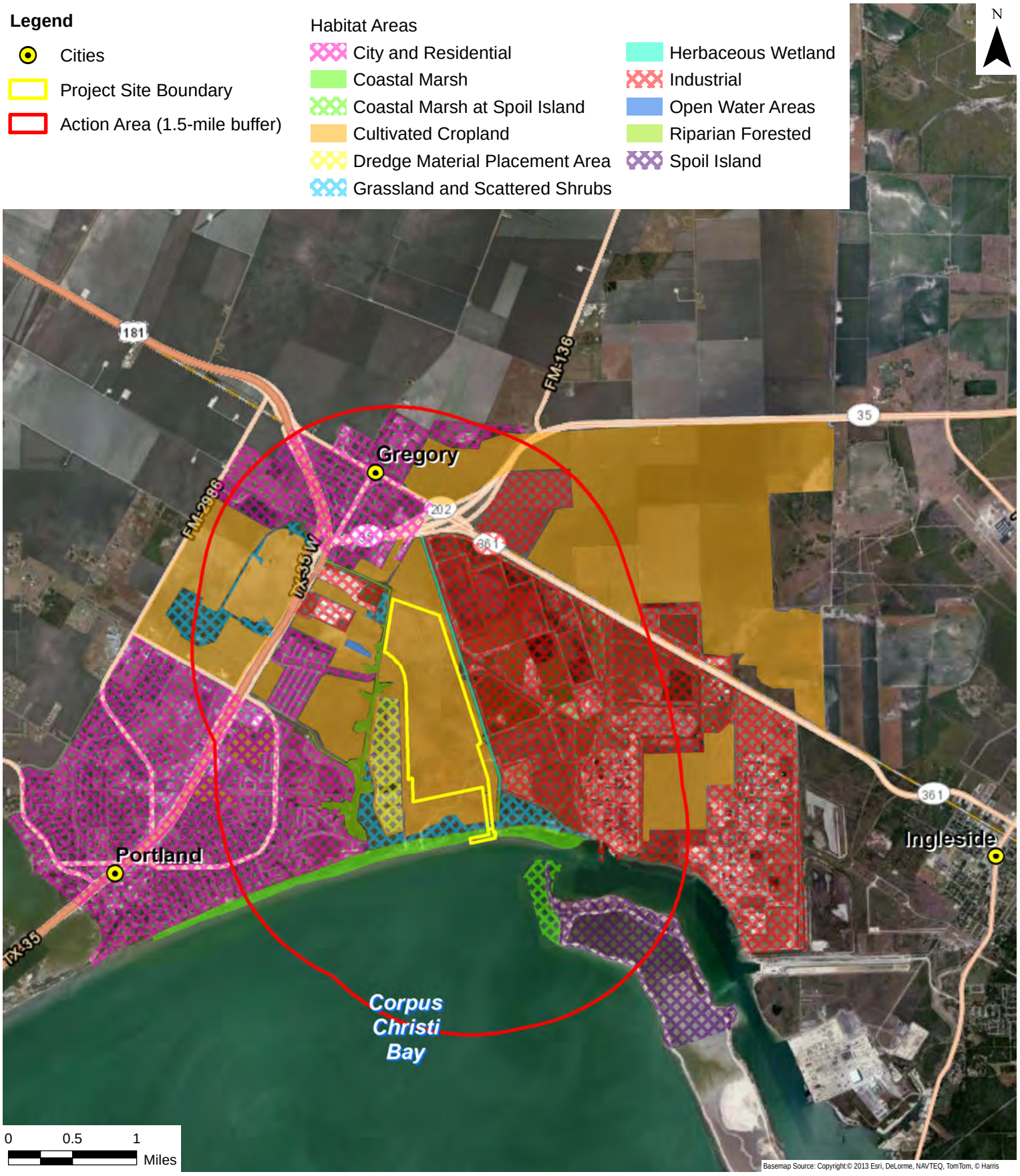


Environmental Resources Management

DESIGN:	T Wycoff	DRAWN:	I Tobar	CHKD.:	T Wycoff
DATE:	11/22/2013	SCALE:	AS SHOWN	REVISION:	0
FILE:	K:\GIS\Voestalpine\La_Quinta\MXD\BA\Fig6_TXNDD_ElementOccurrence.mxd				

FIGURE 6
TXNDD ELEMENT OCCURRENCE DATA
La Quinta Biological Assessment
voestalpine Texas LLC
San Patricio and Nueces Counties, Texas

ERM



Environmental Resources Management

DESIGN:	T Wycoff	DRAWN:	I Tobar	CHKD.:	T Wycoff
DATE:	11/22/2013	SCALE:	AS SHOWN	REVISION:	0
FILE:	K:\GIS\Voestalpine\La_Quinta\MXD\BA\Fig7_Habitat_ActionArea.mxd				

FIGURE 7
HABITAT WITHIN THE ACTION AREA
La Quinta Biological Assessment
voestalpine Texas LLC
San Patricio and Nueces Counties, Texas

ERM

Historical Aerial and Topographic Maps

Appendix A

January 014
Project No. 0197207

Environmental Resources Management
206 E. 9th St., Suite 1700
Austin, Texas 78701
T: (512) 459-4700
F: (512) 459-4711

Historical Topographic Map

N	TARGET QUAD NAME: CORPUS CHRISTI MAP YEAR: 1918 SERIES: 30 SCALE: 1:125000	SITE NAME: Texas Site ADDRESS: S Gregory Portland, TX 78374 LAT/LONG: 27.8959 / -97.2994	CLIENT: ERM - Southeast, Inc. CONTACT: Graham Donaldson INQUIRY#: 3321812.4 RESEARCH DATE: 05/14/2012

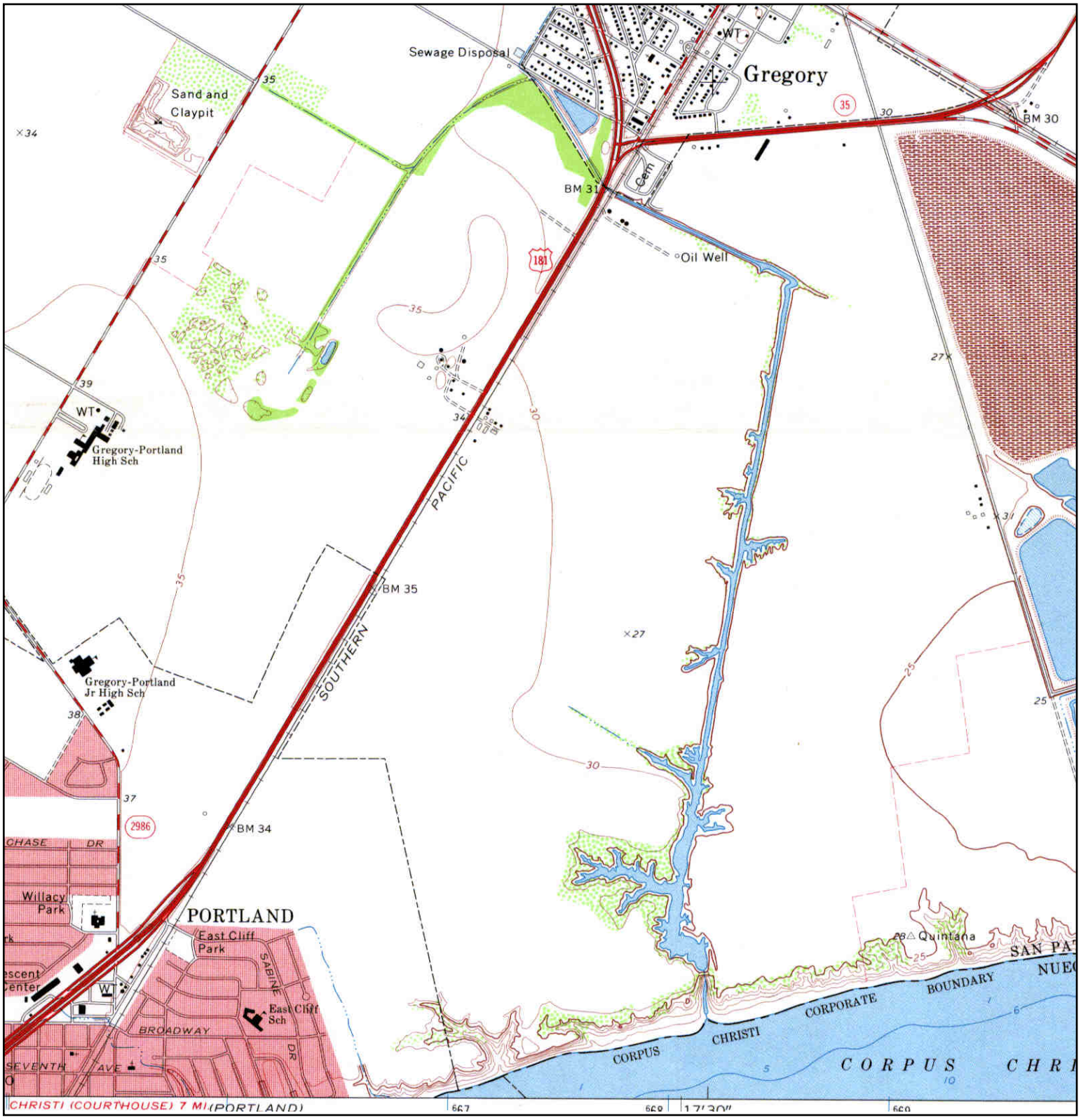
Historical Topographic Map

N	TARGET QUAD NAME: CORPUS CHRISTI MAP YEAR: 1925 SERIES: 15 SCALE: 1:62500	SITE NAME: Texas Site ADDRESS: S Gregory Portland, TX 78374 LAT/LONG: 27.8959 / -97.2994	CLIENT: ERM - Southeast, Inc. CONTACT: Graham Donaldson INQUIRY#: 3321812.4 RESEARCH DATE: 05/14/2012

Historical Topographic Map

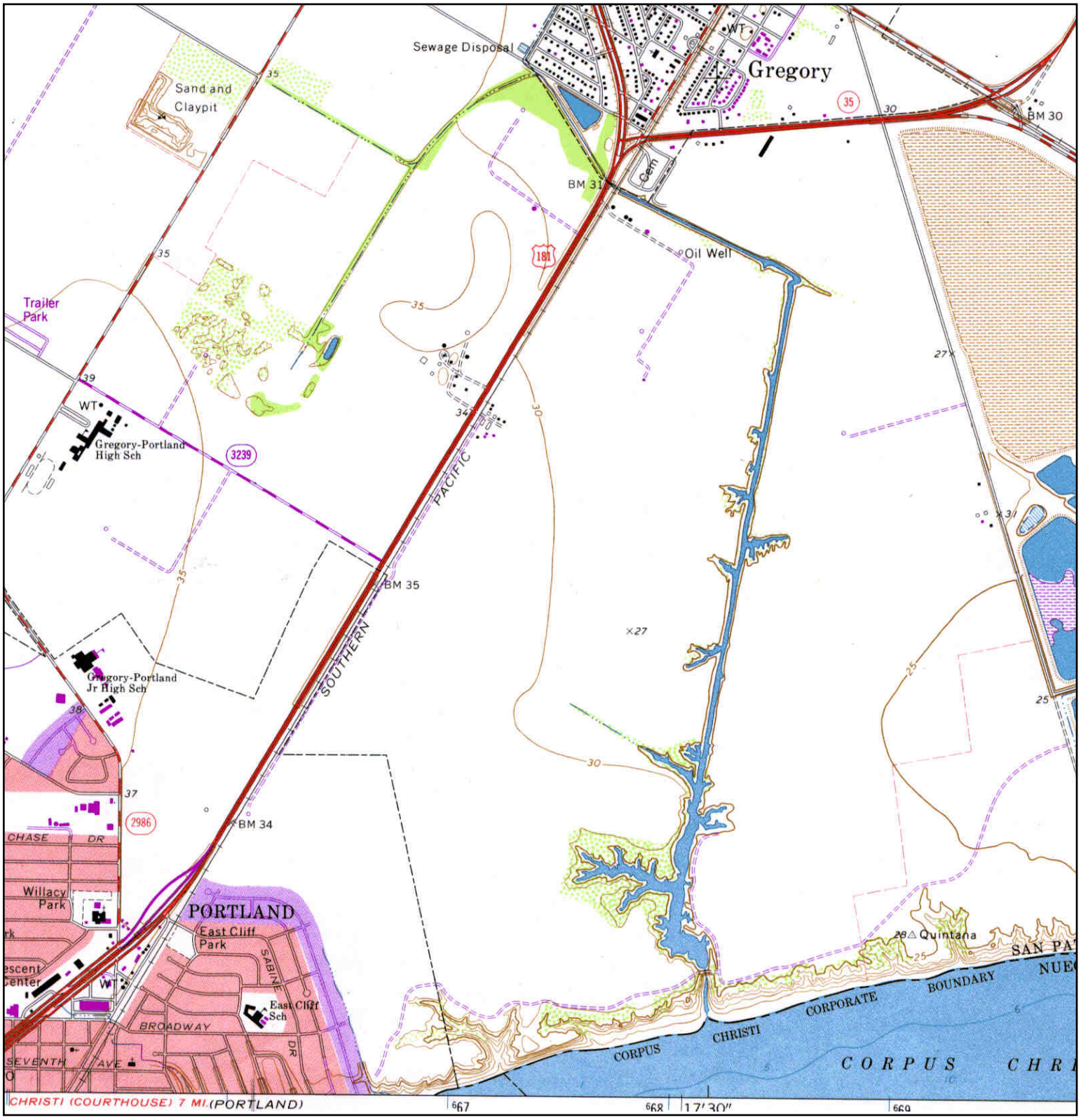
N	TARGET QUAD NAME: CORPUS CHRISTI MAP YEAR: 1951 SERIES: 15 SCALE: 1:62500	SITE NAME: Texas Site ADDRESS: S Gregory Portland, TX 78374 LAT/LONG: 27.8959 / -97.2994	CLIENT: ERM - Southeast, Inc. CONTACT: Graham Donaldson INQUIRY#: 3321812.4 RESEARCH DATE: 05/14/2012

Historical Topographic Map



N	**TARGET QUAD** NAME: GREGORY MAP YEAR: 1969 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Texas Site ADDRESS: S Gregory Portland, TX 78374 LAT/LONG: 27.8959 / -97.2994	CLIENT: ERM - Southeast, Inc. CONTACT: Graham Donaldson INQUIRY#: 3321812.4 RESEARCH DATE: 05/14/2012

Historical Topographic Map



N	TARGET QUAD NAME: GREGORY MAP YEAR: 1975 PHOTOREVISED FROM :1969 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Texas Site ADDRESS: S Gregory Portland, TX 78374 LAT/LONG: 27.8959 / -97.2994	CLIENT: ERM - Southeast, Inc. CONTACT: Graham Donaldson INQUIRY#: 3321812.4 RESEARCH DATE: 05/14/2012

Date EDR Searched Historical Sources:

Aerial Photography May 15, 2012

Target Property:

S Gregory

Portland, TX 78374

Year	Scale	Details	Source
1950	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1950	ASCS
1950	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1950	ASCS
1960	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1960	USGS
1960	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1960	USGS
1969	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1969 Best Copy Available from original source	TXDOT
1969	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1969 Best Copy Available from original source	TXDOT
1979	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1979	TXDOT
1979	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1979	TXDOT
1983	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1983	USGS
1983	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1983	USGS
1995	Aerial Photograph. Scale: 1"=500'	/Composite DOQQ - acquisition dates: 1995	EDR
1995	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1995	USGS-CIR
1995	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1995	USGS-CIR
2004	Aerial Photograph. Scale: 1"=1000'	Flight Year: 2004	USDA-CIR
2004	Aerial Photograph. Scale: 1"=1000'	Flight Year: 2004	USDA-CIR
2005	Aerial Photograph. Scale: 1"=500'	Flight Year: 2005	EDR
2006	Aerial Photograph. Scale: 1"=500'	Flight Year: 2006	EDR

INQUIRY #: 3321812.5

YEAR: 1950

= 1000'

N

INQUIRY #: 3321812.5

YEAR: 1950

= 1000'

N


INQUIRY #: 3321812.5
YEAR: 1960
= 1000'
N

INQUIRY #: 3321812.5

YEAR: 1960

= 1000'

N

INQUIRY #: 3321812.5

YEAR: 1969

N

= 1000'

INQUIRY #: 3321812.5

YEAR: 1969

N

= 1000'

INQUIRY #: 3321812.5

YEAR: 1979

= 1000'

N

INQUIRY #: 3321812.5

YEAR: 1979

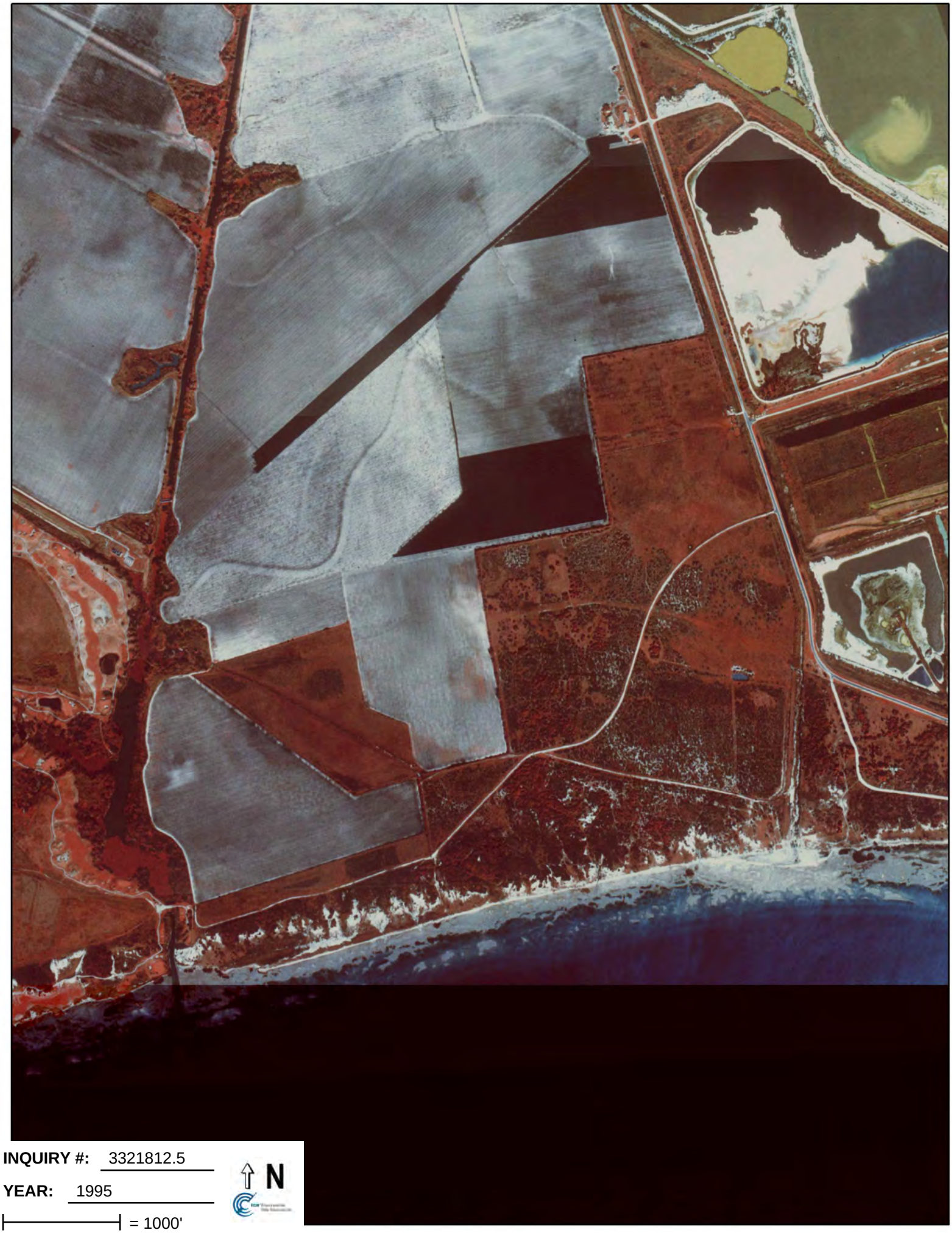
= 1000'

N


INQUIRY #: 3321812.5
YEAR: 1983
= 1000'
N


INQUIRY #: 3321812.5
YEAR: 1983
= 1000'
N


INQUIRY #: 3321812.5
YEAR: 1995
= 500'
N

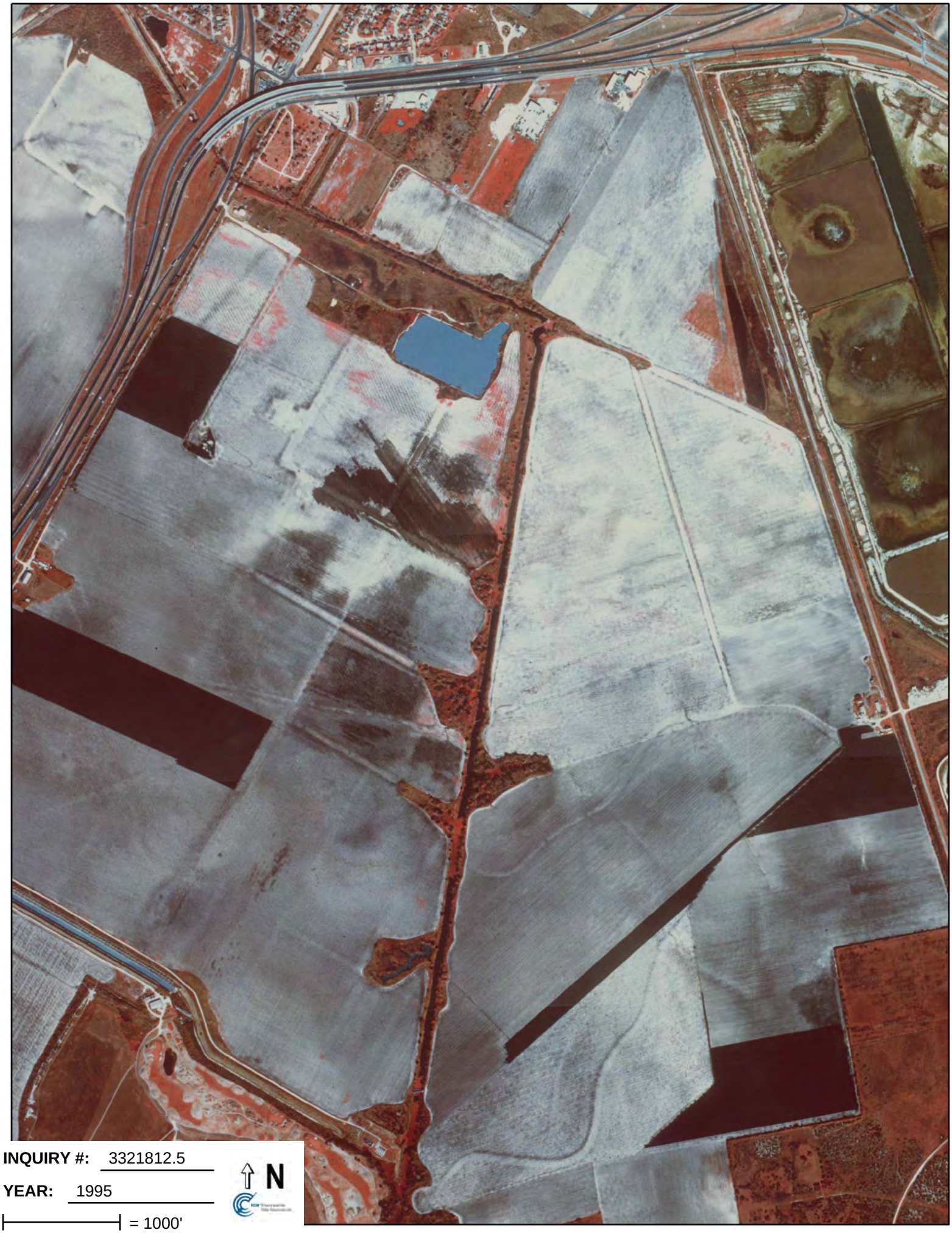


INQUIRY #: 3321812.5

YEAR: 1995

= 1000'

N



INQUIRY #: 3321812.5

YEAR: 1995

= 1000'

N

INQUIRY #: 3321812.5

YEAR: 2004

= 1000'

N

INQUIRY #: 3321812.5

YEAR: 2004

= 1000'

N


INQUIRY #: 3321812.5
YEAR: 2005
= 500'
N


INQUIRY #: 3321812.5
YEAR: 2006
= 500'
N

Photographic Log

Appendix B

January 2014
Project No. 0197207

Environmental Resources Management
206 E. 9th St., Suite 1700
Austin, Texas 78701
T: (512) 459-4700
F: (512) 459-4711

Photograph: *1*	View SE of entrance to La Quinta Road and eastern boundary of Project site from TX-35.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *2*	View SW from La Quinta Road to POCCA entrance gate and road onto Project site.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *3*	View to north from Project site entrance of USACE signage.	
voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *4*	W view from La Quinta Road of Koch pipeline ROW and cultivated cropland habitat in northern portion of Project site.	
voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *5*	W view from La Quinta Road of Air Liquide and Enterprise Products pipelines crossing La Quinta Ditch.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *6*	SW view of Air Liquide, Enterprise, and Southcross pipelines and remote monitoring station at eastern boundary of Project site.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *7*	NW View of Boardwalk Pipeline crossing La Quinta Ditch at southeast boundary of Project site.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *8*	View NE of communications tower located at southeastern portion of Project site.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *9*	S view of grassland and scattered shrub habitat with ephemeral drainages located in the southern portion of the Project site.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *10*	Additional S view of grassland and scattered shrub habitat located in the southern portion of the Project site.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *11*	View W of herbaceous wetland habitat with vegetation including cattails (*Typha latifolia*) in north portion of La Quinta Ditch.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *12*	View W of standing water in north portion of La Quinta Ditch.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *13*	View N of herbaceous wetland habitat with vegetation including sedges (*Cyperus sp.*) and spikerush (*Eleocharis sp.*) within the north portion of La Quinta Ditch..

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *14*	S view of erosion control present in la Quinta Ditch.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *15*	N view of evidence of feral hog rooting activity in la Quinta Ditch.	
voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *16*	N view of deep pool area in La Quinta Ditch approximately 275 feet northeast of the communications tower.	
voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *17*	View to N of gulf coast ribbon snake (*Thamnophis proximus orarius*) in La Quinta Ditch habitat.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *18*	View N along the unmaintained southern portion of La Quinta Ditch.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *19*	View of raccoon and canine tracks within La Quinta ditch habitat.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *20*	Additional N view of the unmaintained southern portion of La Quinta Ditch.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *21*	View N of concrete debris and pool at mouth of La Quinta Ditch.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *22*	View S from mouth of La Quinta Ditch to Corpus Christi Bay.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *23*	View to S of oysters associated with structure remnant at mouth of La Quinta Ditch.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *24*	S view of long-billed curlews (*Numenius americanus*) foraging at the mouth of La Quinta Ditch.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *25*	W view of pipeline crossing Green Lake Ditch habitat.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *26*	NW view of Green Lake Ditch and bordering riparian forested habitat.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *27*	SW view of cattails (*T. latifolia*) and other riparian forested vegetation bordering Green Lake ditch habitat.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *28*	View NW of wetlands located west of the spoil ponds and associated with Green Lake.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *29*	W view of inundation in wetlands located west of the spoil ponds and associated with Green Lake.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *30*	NW view of wetlands associated with Green Lake Ditch.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *31*	View W of wetland habitat associated with Green Lake Ditch.	
voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *32*	NE View of riparian forested area associated with La Quinta Ditch.	
voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *33*	View W of disturbed forested area associated with La Quinta Ditch.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *34*	View NW from the southeast corner of the southernmost Dredge Material Placement Area (spoil pond).

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *35*	View west to observation platform from east berm of southernmost spoil pond.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *36*	S view of western berm of southernmost spoil pond.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *37*	NE view of sign for Northshore Country Club area of the City of Portland.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *38*	E view of playground and pool associated with Northshore Country Club.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *39*	E view of golf course associated with Northshore Country Club.	
voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *40*	View to NW of residence and pond in Northshore Country Club.	
voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *41*	View SE of sign indicating future residential development located approximately 1,800 feet to ½-mile west of the Project boundary.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *42*	E view of entrance to BayRidge community located approximately ½-mile west of the Project site boundary.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *43*	N view of BayRidge community located approximately ½-mile west of the Project site boundary.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *44*	View SE toward the Project site from the east edge of the BayRidge community.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *45*	View NE from the east edge of the BayRidge community of a berm bordering the drainage and pipeline ROW extending east from the community to the Green Lake Ditch.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *46*	NW view of double-crested cormorants utilizing Green Lake habitat approximately 1,800 feet west of the Project site boundary.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *47*	SW view of Green Lake habitat.	
voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *48*	E view of the Gulf Compress cotton storage facility from US Hwy 181 frontage road.	
voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *49*	SE view of Martin Marietta Materials from US Hwy 181 frontage.	
voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *50*	View to N of rail west of site leading into Gregory, TX.	
voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *51*	View W from La Quinta Road to light industrial and commercial buildings, power transmission lines, and wind turbine located north of the Project site and immediately south of TX-35.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *52*	E view of tailings pond and Sherwin Alumina facility on adjacent property from La Quinta Road.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *53*	SE view of Koch pipeline ROW extending onto adjacent Sherwin Alumina property.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *54*	View E from La Quinta Road of gated entrance to a laydown yard on adjacent Sherwin Alumina property.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *55*	Additional view east from La Quinta Road to bags of unidentified material and equipment associated with the Sherwin Alumina laydown yard.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *56*	View east from La Quinta Road to road, pipeline ROW and valve access points on adjacent Sherwin Alumina property.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *57*	NE view from La Quinta Road of gated entrance to capped landfill area on adjacent Sherwin Alumina property.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *58*	SW view of adjacent Cheniere property from La Quinta Road.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *59*	S view of access road/landing area for dredging operations, POCCA terminal area, and Corpus Christi Bay.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *60*	W view from access road/landing area across future POCCA terminal area and toward mouth of manmade drainage.

voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

Photograph: *61*	SE view across Corpus Christi Bay to the spoil island from the mouth of the manmade drainage southwest of the Project site.	
voestalpine Texas, LLC	***ERM***	*La Quinta Site* *San Patricio County, TX*

TXNDD Element Occurrence Data

Appendix C

January 2014
Project No. 0197207

Environmental Resources Management
206 E. 9th St., Suite 1700
Austin, Texas 78701
T: (512) 459-4700
F: (512) 459-4711

Occurrence List for Quads Surrounding Request Area

Scientific Name:	Common Name:	Occurrence Number:	State Status:	Federal Status:	Eo Id:
Allium elmendorfii	Elmendorf's onion	11			5009
Allium elmendorfii	Elmendorf's onion	19			3083
Caretta caretta	Loggerhead Sea Turtle	7	T	LT	8973
Charadrius alexandrinus	Snowy Plover	5			1202
Charadrius melodus	Piping Plover	31	T	LT	2083
Charadrius melodus	Piping Plover	68	T	LT	1698
Chelonia mydas	Green Sea Turtle	1	T	LT	1881
Chloris texensis	Texas windmill-grass	28			7590
Chloris texensis	Texas windmill-grass	29			3579
Echinocereus reichenbachii var. albertii	black lace cactus	5	E	LE	6453
Gopherus berlandieri	Texas Tortoise	17	T		5785
Grindelia oolepis	plains gumweed	15			3535
Grindelia oolepis	plains gumweed	19			3515
Grindelia oolepis	plains gumweed	20			3516
Herpailurus yaguarondi	Jaguarundi	8	E	LE	1473
Herpailurus yaguarondi	Jaguarundi	44	E	LE	804
Holbrookia propinqua	Keeled Earless Lizard	9			1060
Malaclemys terrapin littoralis	Texas Diamondback Terrapin	1			3963
Malaclemys terrapin littoralis	Texas Diamondback Terrapin	25			6412
Nerodia clarkii	Gulf Saltmarsh Snake	11			7347
Nerodia clarkii	Gulf Saltmarsh Snake	13			807

Scientific Name:	Common Name:	Occurrence Number:	State Status:	Federal Status:	Eo Id:
Nerodia clarkii	Gulf Saltmarsh Snake	14			5853
Nerodia clarkii	Gulf Saltmarsh Snake	16			6547
Nerodia clarkii	Gulf Saltmarsh Snake	17			1377
Notophthalmus meridionalis	Black-spotted Newt	10	T		7800
Notophthalmus meridionalis	Black-spotted Newt	25	T		1845
Pelecanus occidentalis	Brown Pelican	1	E		7521
Psilactis heterocarpa	Welder machaeranthera	1			5210
Psilactis heterocarpa	Welder machaeranthera	6			4850
Psilactis heterocarpa	Welder machaeranthera	18			3499
Quercus virginiana-persea borbonia series	Coastal Live Oak-redbay Series	3			5746
Rookery		46			1089
Rookery		47			7543
Rookery		48			3130
Rookery		49			1214
Rookery		50			1215
Rookery		51			4522
Rookery		52			3921
Rookery		53			7625
Rookery		54			2721
Rookery		55			8048
Rookery		56			5422
Rookery		63			2795
Rookery		64			4542

Scientific Name:	Common Name:	Occurrence Number:	State Status:	Federal Status:	Eo Id:
Rookery		65			1372
Rookery		66			7224
Rookery		75			5657
Rookery		572			5740
Siren sp. 1	South Texas Siren (Large Form)	22	T		3234
Thurovia triflora	threeflower broomweed	2			858
Trichechus manatus	West Indian Manatee	1	E	LE	6570

Element Occurrence Record

Scientific Name: Caretta caretta
Occurrence #: 7 **Eo Id:** 8973
Common Name: Loggerhead Sea Turtle
Track Status: Track all extant and selected historical EOs
TX Protection Status: T
Global Rank: G3 **State Rank:** S4 **Federal Status:** LT

Location Information:

Watershed:

12110202 - South Corpus Christi Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-G2, Port Ingleside

Directions:

Shamrock Island, on the bay side of Mustang Island. The directions were created by database staff.

Survey Information:

First Observation: 2001-04-10 **Survey Date:** 2001-04-10 **Last Observation:** 2001-04-10
Eo Type: **Eo Rank:** E **Eo Rank Date:** 2001-04-10
Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 10 April 2001: One individual was observed with a curved carapace length of 250 millimeters.

Managed Area:

Managed Area Name

Reference:

Citation:

Texas Parks and Wildlife Department. 2008. Texas Parks and Wildlife Department - Coastal Fisheries Division summary of stranding and catch information for tracked sea turtles and terrapin.

Specimen:

Element Occurrence Record

Scientific Name: Charadrius alexandrinus
Occurrence #: 5 **Eo Id:** 1202
Common Name: Snowy Plover
Track Status: Track all extant and selected historical EOs
TX Protection Status:
Global Rank: G4 **State Rank:** S3B **Federal Status:**

Location Information:

Watershed:

12110201 - North Corpus Christi Bay

County Name:	State:	Mapsheet:
San Patricio	TX	27097-G3, Portland

Directions:

NORTHEASTERN EDGE OF SUNSET LAKE ON NORTHERN AREA OF INDIAN POINT PENINSULA; SOUTHWEST OF PORTLAND

Survey Information:

First Observation: 2002-05-25 **Survey Date:** 2002-06-02 **Last Observation:** 2002-06-02
Eo Type: **Eo Rank:** E **Eo Rank Date:** 2002-06-02
Observed Area: 49.00

Comments:

General Description: WIDE SANDY FLAT ON NORTHEASTERN EDGE OF 'LAKE'

Comments: OBSERVERS: GENE BLACKLOCK AND OTHERS; LEAST TERNS ALSO NESTING IN AREA

Protection Comments:

Management Comments:

Data:

EO Data: 25 MAY - 2 JUNE 2002, 3 NESTING PAIR; NESTS WERE NOT SOUGHT BUT THREE YOUNG-OF-YEAR OBSERVED LATE IN THE SEASON

Managed Area:

Managed Area Name

Reference:

Citation:

NEWSTEAD, DAVID, ERIN ALBERT, GENE BLACKLOCK. 2002. CENSUS AND ASSESSMENT OF NESTING ACTIVITY OF THE SNOWY PLOVER (CHARADRIUS ALEXANDRINUS) ALONG THE TEXAS CENTRAL COAST. 2002. PREPARED FOR COASTAL BEND BAYS AND ESTUARIES PROGRAM, INC. SEPTEMBER 2002.

Linam, Lee Ann. 2002. Final Report Project WER 09(72): Implementation of candidate species monitoring. Grant No. E-9. 1 November 2002.

Specimen:

Element Occurrence Record

Scientific Name: Charadrius melodus **Occurrence #:** 31 **Eo Id:** 2083

Common Name: Piping Plover **Track Status:** Track all extant and selected historical EOs

TX Protection Status: T

Global Rank: G3 **State Rank:** S2 **Federal Status:** LT

Location Information:

Watershed:

12110202 - South Corpus Christi Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-F2, Crane Islands NW

Directions:

BAYSIDE FLATS AND ISLANDS JUST NORTH OF WILSONS CUT ON MUSTANG ISLAND

Survey Information:

First Observation: **Survey Date:** **Last Observation:** 1991

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data:

Managed Area:

Managed Area Name

Reference:

Citation:

LINAM, LEE ANN JOHNSON. 1992. SECTION 6 PERFORMANCE REPORT. JOB NO. 9.1: PIPING PLOVER AND PEREGRINE FALCON COASTAL HABITAT USE. JANUARY 3, 1992.

Specimen:

Element Occurrence Record

Scientific Name: Charadrius melodus
Occurrence #: 68 **Eo Id:** 1698
Common Name: Piping Plover
Track Status: Track all extant and selected historical EOs
TX Protection Status: T
Global Rank: G3 **State Rank:** S2 **Federal Status:** LT

Location Information:

Watershed:

12110201 - North Corpus Christi Bay

County Name:	State:	Mapsheet:
San Patricio	TX	27097-G3, Portland

Directions:

SANDFLATS FROM INDIAN POINT TO PORTLAND (BOTH SIDES OF US 181)

Survey Information:

First Observation: 2000-03-21 **Survey Date:** **Last Observation:** 2000-04-18
Eo Type: **Eo Rank:** E **Eo Rank Date:** 2000-04-18
Observed Area:

Comments:

General Description: CATEGORIEZED AS THREE HABITAT TYPES: WET SANDFLAT, DAMP SANDFLAT, AND DRY SANDFLAT

Comments: REPORT ALSO LISTS OTHER BIRD SPECIES OBSERVED

Protection Comments:

Management Comments:

Data:

EO Data: DATES WITH NUMBERS OF PLOVERS OBSERVED: 00-03-21 = 9; 00-03-22 = 4; 00-04-08 = 8; 00-04-09 = 6; 00-04-17 = 9; 00-04-18 = 8; TOTAL OF 44; 11 OBSERVED IN WET SANDFLAT; 16 IN DAMP SANDFLAT; 17 ON DRY SANDFLAT

Managed Area:

Managed Area Name

Reference:

Citation:

TEXAS DEPARTMENT OF TRANSPORTATION. 2001. RE-EVALUATION: US181 CONTROLLING CSJ 0101-04-062 FROM NORTH END OF NUECES BAY CAUSEWAY TO PORTLAND (675 FEET SOUTH OF FM 893 UNDERPASS) STUDY AREA B: CSJ 0101-05-026. JANUARY, 2001.

Specimen:

Element Occurrence Record

Scientific Name: Chelonia mydas
Occurrence #: 1 **Eo Id:** 1881
Common Name: Green Sea Turtle
Track Status: Track all extant and selected historical EOs
TX Protection Status: T
Global Rank: G3 **State Rank:** S3 **Federal Status:** LT

Location Information:

Watershed:

12100405 - Aransas Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-G2, Port Ingleside
San Patricio	TX	27097-G1, Port Aransas
Aransas	TX	27097-H1, Estes
		28097-A1, Rockport
		27097-H2, Aransas Pass

Directions:

The coastal bays between Rockport and Port Ingleside, and both sides of San Jose Island. The directions were created by database staff. The directions are generalized as this record consists of multiple populations/observations.

Survey Information:

First Observation: 1967-06-23 **Survey Date:** 2007-05-23 **Last Observation:** 2007-05-23
Eo Type: **Eo Rank:** E **Eo Rank Date:** 2007-05-23
Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 23 June 1967: A specimen was collected. 22 Oct 1991: One individual was observed with a curved carapace length of 235 millimeters. 25 MAY 1993: One individual was observed with a curved carapace length of 280 millimeters. 02 Nov 1994: One individual was observed with a curved carapace length of 397 millimeters. 27 April 2000: One individual was observed with a curved carapace length of 280 millimeters. 20 April 2001: One individual was observed with a curved carapace length of 394 millimeters. 10 May 2001: One individual was observed with a curved carapace length of 344 millimeters. 23 May 2007: One individual was observed with a curved carapace length of 290 millimeters.

Managed Area:

Managed Area Name

Reference:

Citation:

Texas Parks and Wildlife Department. 2008. Texas Parks and Wildlife Department - Coastal Fisheries Division summary of stranding and catch information for tracked sea turtles and terrapin.

Specimen:

Texas A&I University Museum. 1967. Zimmerman and Chaney, Specimen # 1854 AI. 23 June 1967.

Element Occurrence Record

Scientific Name: Herpailurus yaguarondi **Occurrence #:** 8 **Eo Id:** 1473

Common Name: Jaguarundi **Track Status:** Track all extant and selected historical EOs

TX Protection Status: E

Global Rank: G4 **State Rank:** S1 **Federal Status:** LE

Location Information:

Watershed:

12110201 - North Corpus Christi Bay

County Name: San Patricio

State: TX

Mapsheet: 27097-G2, Port Ingleside

Directions:

FELINE CROSSING FM 1069 NEAR INGLESIDE, TEXAS

Survey Information:

First Observation:

Survey Date:

Last Observation: 1984

Eo Type:

Eo Rank:

Eo Rank Date:

Observed Area:

Comments:

General Description: OAK SCRUB

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: JAGUARUNDI CROSSING THE ROAD NEAR DUSK

Managed Area:

Managed Area Name

Reference:

Citation:

WITHERS, KIM. 1994. PERSONAL COMMUNICATION TO TPWD ENDANGERED SPECIES PROGRAM DATED 18 AUGUST 1994.

Specimen:

Element Occurrence Record

Scientific Name: Herpailurus yaguarondi **Occurrence #:** 44 **Eo Id:** 804

Common Name: Jaguarundi **Track Status:** Track all extant and selected historical EOs

TX Protection Status: E

Global Rank: G4 **State Rank:** S1 **Federal Status:** LE

Location Information:

Watershed:

12100405 - Aransas Bay

County Name:	State:	Mapsheet:
San Patricio	TX	27097-H2, Aransas Pass
Aransas	TX	

Directions:

MCCAMPBELL SLOUGH

Survey Information:

First Observation: **Survey Date:** **Last Observation:** 1991-03-09

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description:

Comments: CLASS II = RELIABLE OBSERVATION/OBSERVER

Protection Comments:

Management Comments:

Data:

EO Data: ONE CLASS II OBSERVATION

Managed Area:

Managed Area Name

Reference:

Citation:

HOMERSTAD, GARY E. 1987. PERFORMANCE REPORT, NONGAME WILDLIFE INVESTIGATIONS, FEDERAL AID PROJECT NO. W-103-R-17, JOB NO. 12: ENDANGERED FELINE STATUS SURVEY. TPWD. OCTOBER 9, 1987.

HOMERSTAD, GARY E. 1988. PERFORMANCE REPORT, NONGAME WILDLIFE INVESTIGATIONS, FEDERAL AID PROJECT NO. W-103-R-18, JOB NO. 12: ENDANGERED FELINE STATUS SURVEY. TPWD. NOVEMBER 9, 1988.

HOMERSTAD, GARY E. 1989. PERFORMANCE REPORT, NONGAME WILDLIFE INVESTIGATIONS, FEDERAL AID PROJECT NO. W-103-R-19, JOB NO. 12: ENDANGERED FELINE STATUS SURVEY. TPWD. OCTOBER 6, 1989.

PRIETO, FELIPE G. 1990. PERFORMANCE REPORT, WILDLIFE RESEARCH AND SURVEYS, FEDERAL AID PROJECT NO. W-125-R-1 AND ESEC6-1, JOB NO. 12: ENDANGERED FELINE POPULATION AND HABITAT ENHANCEMENT. TPWD. OCTOBER 29, 1990.

PRIETO, FELIPE G. 1991. PERFORMANCE REPORT, WILDLIFE RESEARCH AND SURVEYS, FEDERAL AID PROJECT NO. W-125-R-2 AND ESEC6-2, JOB NO. 12: ENDANGERED FELINE POPULATION AND HABITAT ENHANCEMENT. TPWD. NOVEMBER 8, 1991.

BENN, STEPHEN J. 1993. PERFORMANCE REPORT, WILDLIFE RESEARCH AND SURVEYS, FEDERAL AID PROJECT NO. W-125-R-3, JOB NO. 12: ENDANGERED FELINE POPULATION AND HABITAT ENHANCEMENT. TPWD. SEPTEMBER 22, 1993.

Specimen:

Element Occurrence Record

Scientific Name: Holbrookia propinqua
Occurrence #: 9 **Eo Id:** 1060
Common Name: Keeled Earless Lizard
Track Status: Track all extant and selected historical EOs
TX Protection Status:
Global Rank: G3? **State Rank:** S3? **Federal Status:**

Location Information:

Watershed:

12110201 - North Corpus Christi Bay

12100405 - Aransas Bay

County Name: San Patricio

State: TX

Mapsheet:

27097-G2, Port Ingleside

27097-H2, Aransas Pass

27097-H3, Gregory

27097-G3, Portland

Directions:

1 MILE WEST OF INGLESIDE

Survey Information:

First Observation: **Survey Date:** **Last Observation:** 1961-05-19

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data:

Managed Area:

Managed Area Name

Reference:

Citation:

ELLIOTT, LEE. 1994. MEMORANDUM TO DORINDA SULLIVAN DATED DECEMBER 2, 1994 CONCERNING TEXAS A& M-KINGSVILLE VERTEBRATE SPECIMENS CATALOGUE.

Specimen:

TEXAS A & M UNIVERSITY-KINGSVILLE--VERTEBRATE COLLECTION. 1961. UNKNOWN COLLECTOR, SPECIMEN #57 AI. 19 MAY 1961.

Element Occurrence Record

Scientific Name: Liatris bracteata **Occurrence #:** 13 **Eo Id:** 5277

Common Name: coastal gay-feather **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: G2G3 **State Rank:** S2S3 **Federal Status:**

Location Information:

Watershed:

12110201 - North Corpus Christi Bay

County Name: San Patricio

State: TX

Mapsheet: 27097-H3, Gregory

Directions:

SOUTH OF GREGORY

Survey Information:

First Observation: **Survey Date:** **Last Observation:**

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: CLAY IN PRAIRIES AND OPENINGS

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: OCCASIONAL

Managed Area:

Managed Area Name

Reference:

Citation:

Jones, F.B. 1977. Flora of the Texas Coastal Bend. Second edition. Welder Wildlife Foundation, Sinton, Texas. 262 pp.

Specimen:

Element Occurrence Record

Scientific Name: Malaclemys terrapin littoralis
Occurrence #: 1 **Eo Id:** 3963
Common Name: Texas Diamondback Terrapin
Track Status: Track all extant and selected historical EOs
TX Protection Status:
Global Rank: G4T3 **State Rank:** S1S2 **Federal Status:**

Location Information:

Watershed:

12100405 - Aransas Bay
12100407 - Aransas
12100404 - West San Antonio Bay
12100403 - East San Antonio Bay
12100406 - Mission

County Name:	State:
Aransas	TX
Refugio	TX
Calhoun	TX
San Patricio	TX

Mapsheet:

28097-A1, Rockport
28097-A2, Bayside
28096-C7, Tivoli SE
28096-C5, Long Island
28096-A8, Saint Charles Bay SW
28097-B1, Lamar
28096-B7, Mesquite Bay
28096-C8, Tivoli SW
28096-B6, Panther Point
28096-B8, Saint Charles Bay
28097-B2, Mission Bay
27097-H2, Aransas Pass
28096-D7, Austwell
28096-C6, Mosquito Point
27096-H8, Allyns Bight
27097-H1, Estes

Directions:

Texas coast from Copano Bay to San Antonio Bay. The directions were created by database staff. The directions are generalized as this record consists of multiple observations.

Survey Information:

First Observation: 1942 **Survey Date:** 2007-05-30 **Last Observation:** 2007-05-30
Eo Type: **Eo Rank:** E **Eo Rank Date:** 2007-05-30
Observed Area:

Comments:

General Description:

Comments: This record represents the consolidation of EO #s 2-5, 7, 22-24, and 26 which were EOIDs 5807, 2188, 6823, 2036, 4565, 2413, 7109, 1802, and 6102, respectively.

Protection Comments:

Management Comments:

Data:

EO Data: 1942, 15 Aug 1948, Apr 1950, 19 Aug 1951, 1952: A specimen was collected. 24 May 1983, 06 Sep and 01 Oct 1984, 16 May and 08 Oct 1985, 15 Apr, 18 June, and 17 Sep 1986: A single terrapin was observed. June, July, Aug 1985-1987: Terrapin were confirmed in 8 different areas. 24 July 1989 and 19 Oct 1992: A single terrapin was observed. 13 May 1994: Three dead terrapins were collected from a crab trap. 09 Aug 1996, 26 Sep 2000, 01 June 2001, 16 Apr 2002, 06 May 2003, and 30 May 2007: A single terrapin was observed.

Managed Area:

Managed Area Name

MATAGORDA ISLAND WILDLIFE MANAGEMENT AREA

GUADALUPE DELTA WILDLIFE MANAGEMENT AREA

Reference:

Citation:

Mabie, David W. 1988. Progress report on the Texas diamondback terrapin. Internal report to Bruce Thompson, Wildlife Division, Texas Parks and Wildlife Dept.

Texas Parks and Wildlife Department. 2008. Texas Parks and Wildlife Department - Coastal Fisheries Division summary of stranding and catch information for tracked sea turtles and terrapin.

BARRERA, T. 1994. FIELD EVALUATION FOR CONTAMINANTS IN SAN ANTONIO BAY BY USFWS ON 13 MAY 1994. FIELD NOTES.

Specimen:

Texas Cooperative Wildlife Collection, Texas A & M University, College Station, TX; Unknown Collector, Catalog # 4642, 15 August 1948, TCWC.

Field Museum of Natural History, Chicago, IL; Dr. Gordon Gunter, Catalog # 43599, 1942, FMNH.

Museum Of Zoology, University of Michigan, Ann Arbor, MI; R. Russell, Catalog # 103424, 19 August 1951, UMMZ, Topotype.

Bryce C. Brown Collection at the Mayborn Museum, Baylor University, Waco, TX; Owen Axtell, Catalog # 6214, April 1950, BCB.

Texas Natural History Collection, University of Texas at Austin, TX; Unknown Collector, Catalog # 31026, 1952, TNHC.

Element Occurrence Record

Scientific Name: Nerodia clarkii **Occurrence #:** 11 **Eo Id:** 7347

Common Name: Gulf Saltmarsh Snake **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: G4Q **State Rank:** S4 **Federal Status:**

Location Information:

Watershed:

12100405 - Aransas Bay

County Name: Nueces

State: TX

Mapsheet: 27097-H2, Aransas Pass

Directions:

1 MILE SOUTHEAST OF ARANSAS PASS

Survey Information:

First Observation:

Survey Date:

Last Observation: 1962-04-29

Eo Type:

Eo Rank:

Eo Rank Date:

Observed Area:

Comments:

General Description:

Comments: COLLECTED 29 APRIL 1962

Protection Comments:

Management Comments:

Data:

EO Data:

Managed Area:

Managed Area Name

Reference:

Citation:

Specimen:

TEXAS A & M UNIVERSITY-KINGSVILLE--VERTEBRATE COLLECTION. 1962. A.H. CHANEY, SPECIMEN # 407 AI. 29 APRIL 1962.

Element Occurrence Record

Scientific Name: Nerodia clarkii **Occurrence #:** 13 **Eo Id:** 807

Common Name: Gulf Saltmarsh Snake **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: G4Q **State Rank:** S4 **Federal Status:**

Location Information:

Watershed:

12100405 - Aransas Bay

County Name: Nueces

State: TX

Mapsheet:

27097-H1, Estes

27097-H2, Aransas Pass

Directions:

STEDMAN ISLAND

Survey Information:

First Observation: 1974-02-26 **Survey Date:** **Last Observation:** 1985-08

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description:

Comments: COLLECTED 17 JUNE AND 26 FEBRUARY AND 13 JUNE

Protection Comments:

Management Comments:

Data:

EO Data:

Managed Area:

Managed Area Name

Reference:

Citation:

Specimen:

Texas A & M University, Kingsville, Vertebrate Collection. 1985. A.H. Chaney, et.al., Specimen # 5599 AI. 13 June 1985.

Texas A & M University, Kingsville, Vertebrate Collection. 1985. A.H. Chaney, et.al., Specimen # 5558 AI. August 1985.

Texas A & M University, Kingsville, Vertebrate Collection. 1974. A.H. Chaney, et.al., Specimen # 3718 AI. 17 June 1974.

Texas A & M University, Kingsville, Vertebrate Collection. 1974. A.H. Chaney, et.al., Specimen # 3855 AI. 26 February 1974.

Element Occurrence Record

Scientific Name: Nerodia clarkii **Occurrence #:** 14 **Eo Id:** 5853

Common Name: Gulf Saltmarsh Snake **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: G4Q **State Rank:** S4 **Federal Status:**

Location Information:

Watershed:

12110202 - South Corpus Christi Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-F3, Oso Creek NE

Directions:

CORPUS CHRISTI NEAR OSO BAY

Survey Information:

First Observation:	Survey Date:	Last Observation:
Eo Type:	**Eo Rank:**	**Eo Rank Date:**

Observed Area:

Comments:

General Description:

Comments: NO DATE GIVEN, BUT BETWEEN 1976 AND 1980

Protection Comments:

Management Comments:

Data:

EO Data:

Managed Area:

Managed Area Name

Reference:

Citation:

Specimen:

TEXAS A & M UNIVERSITY-KINGSVILLE--VERTEBRATE COLLECTION. NO DATE. A.H. CHANEY, SPECIMEN # 4516 AI.

Element Occurrence Record

Scientific Name: Nerodia clarkii **Occurrence #:** 16 **Eo Id:** 6547

Common Name: Gulf Saltmarsh Snake **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: G4Q **State Rank:** S4 **Federal Status:**

Location Information:

Watershed:

12110202 - South Corpus Christi Bay

County Name: Nueces

State: TX

Mapsheet: 27097-G4, Corpus Christi

Directions:

CORPUS CHRISTI SEA WALL

Survey Information:

First Observation: **Survey Date:** **Last Observation:** 1972-03-07

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data:

Managed Area:

Managed Area Name

Reference:

Citation:

ELLIOTT, LEE. 1994. MEMORANDUM TO DORINDA SULLIVAN DATED DECEMBER 2, 1994 CONCERNING TEXAS A& M-KINGSVILLE VERTEBRATE SPECIMENS CATALOGUE.

Specimen:

TEXAS A & M UNIVERSITY-KINGSVILLE--VERTEBRATE COLLECTION. 1972. UNKNOWN COLLECTOR, SPECIMEN # 3102 AI. 7 MARCH 1972.

Element Occurrence Record

Scientific Name: Nerodia clarkii **Occurrence #:** 17 **Eo Id:** 1377

Common Name: Gulf Saltmarsh Snake **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: G4Q **State Rank:** S4 **Federal Status:**

Location Information:

Watershed:

12100405 - Aransas Bay

County Name: San Patricio

State: TX

Mapsheet: 27097-H2, Aransas Pass

Directions:

1 MILE SOUTHEAST OF ARANSAS PASS

Survey Information:

First Observation: **Survey Date:** **Last Observation:** 1962-04-29

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data:

Managed Area:

Managed Area Name

Reference:

Citation:

ELLIOTT, LEE. 1994. MEMORANDUM TO DORINDA SULLIVAN DATED DECEMBER 2, 1994 CONCERNING TEXAS A& M-KINGSVILLE VERTEBRATE SPECIMENS CATALOGUE.

Specimen:

TEXAS A & M UNIVERSITY-KINGSVILLE--VERTEBRATE COLLECTION. 1962. UNKNOWN COLLECTOR, SPECIMEN # 407 AI. 29 APRIL 1962.

Element Occurrence Record

Scientific Name: Notophthalmus meridionalis
Occurrence #: 10 **Eo Id:** 7800
Common Name: Black-spotted Newt
Track Status: Track all extant and selected historical EOs
TX Protection Status: T
Global Rank: G1 **State Rank:** S2 **Federal Status:**

Location Information:

Watershed:

12100405 - Aransas Bay

County Name:

Aransas

State:

TX

Mapsheet:

28097-A1, Rockport
27097-H1, Estes
28097-A2, Bayside
27097-H2, Aransas Pass

Directions:

ROCKPORT

Survey Information:

First Observation: **Survey Date:** **Last Observation:** 1930-06-27
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description:

Comments: COLLECTED 27 JUNE 1930

Protection Comments:

Management Comments:

Data:

EO Data:

Managed Area:

Managed Area Name

Reference:

Citation:

Specimen:

University of Michigan, Museum of Zoology. 1930. H.K. Gloyd, Catalog # 69994 UMMZ. 27 June 1930.

Element Occurrence Record

Scientific Name: Pelecanus occidentalis
Occurrence #: 1 **Eo Id:** 7521
Common Name: Brown Pelican
Track Status: Track all extant and selected historical EOs
TX Protection Status: E
Global Rank: G4 **State Rank:** S3B **Federal Status:**

Location Information:

Watershed:

12110202 - South Corpus Christi Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-G2, Port Ingleside

Directions:

PELICAN ISLAND, CORPUS CHRISTI BAY

Survey Information:

First Observation: **Survey Date:** 1986-03 **Last Observation:** 1993
Eo Type: **Eo Rank:** C **Eo Rank Date:**
Observed Area: 600.00

Comments:

General Description: DREDGE SPOIL (ARTIFICIAL ISLAND) SANDY CLAY, SAND AND SHELL; SOME VEGETATION TO 2 METERS

Comments: TWO SIMILAR SITES IN MEXICO

Protection Comments:

Management Comments:

Data:

EO Data: ONE OF ONLY TWO BROWN PELICAN NESTING COLONIES IN TEXAS; 300 NESTING PAIRS IN 1986; FEWER THAN 10 PAIR IN 1970'S; AN IMPORTANT BREEDING SITE FOR THE GULF COAST PELICAN POPULATION

Managed Area:

Managed Area Name

Reference:

Citation:

BLANKINSHIP, DAVID R. 1987. INVESTIGATIONS OF EASTERN BROWN PELICANS (PELECANUS OCCIDENTALIS CAROLINENSIS) IN TEXAS AND MEXICO, 1986. FINAL REP., 20181-0935-85, USFWS OES, ALBUQUERQUE. 12 pp.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Quercus virginiana-persea borbonia series **Occurrence #:** 3 **Eo Id:** 5746

Common Name: Coastal Live Oak-redbay Series **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: G3 **State Rank:** S3 **Federal Status:**

Location Information:

Watershed:

12110201 - North Corpus Christi Bay

12100405 - Aransas Bay

County Name:	State:	Mapsheet:
San Patricio	TX	27097-G2, Port Ingleside

Directions:

NAVAL STATION INGLESIDE, SOUTH OF FM 1069, WEST OF FM 2725, NORTH OF CORPUS CHRISTI SHIP CHANNEL, BETWEEN PORT INGLESIDE AND INGLESIDE-ON-THE-BAY

Survey Information:

First Observation: **Survey Date:** 1992-06-17 **Last Observation:** 1992-06-17

Eo Type: **Eo Rank:** BC **Eo Rank Date:** 1992-06-17

Observed Area:

Comments:

General Description: QUERCUS VIRGINIANA-Q. HEMISPHAERICA-PERSEA BORBONIA DENSE THICKETY WOODLAND OR SHRUBLAND, FEW OPENINGS, HUNDREDS OF POTHOLES, SOME PERMANENT PONDS, DIVERSE GROUND LAYER, DEEP SANDS OF INGLESIDE BARRIER

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: NONE

Managed Area:

Managed Area Name

NS INGLESIDE

Reference:

Citation:

CARR, W.R. 1992. FIELD SURVEY OF NAVAL STATION INGLESIDE, 17 JUNE 1992.

Specimen:

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 46 **Eo Id:** 1089

Common Name: **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR **State Rank:** SNR **Federal Status:**

Location Information:

Watershed:

12100405 - Aransas Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-G2, Port Ingleside

Directions:

NATURAL ISLAND IN THE INTRACOASTAL WATERWAY; THE SHAMROCK ISLANDS, 5 MILES SOUTH OF PORT INGLESIDE

Survey Information:

First Observation: 1973 **Survey Date:** **Last Observation:** 1992

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: NATURAL ISLAND (1) IN THE INTRACOASTAL WATERWAYS; ELEVATION IS 2 METERS

Comments: COLONY NUMBER 614-186

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LAUGHING GULL, SANDWICH TERN, ROYAL TERN, GREAT EGRET, REDDISH EGRET, CATTLE EGRET, SNOWY EGRET, BLACK SKIMMER, ROSEATE SPOONBILL, GREAT BLUE HERON, TRICOLORED HERON, BLACK-CROWNED NIGHT-HERON, WHITE-FACED IBIS, LITTLE BLUE HERON, WHITE IBIS, CASPIAN TERN, SOOTY TERN

Managed Area:

Managed Area Name

SHAMROCK ISLAND

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

Martin, Catrina. 1991. Texas Colonial Waterbird Census Summary - 1990. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 13 March 1991.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 47 **Eo Id:** 7543

Common Name: **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR **State Rank:** SNR **Federal Status:**

Location Information:

Watershed:

12100405 - Aransas Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-G2, Port Ingleside

Directions:

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 0.5 MILE SOUTH OF PORT INGLESIDE

Survey Information:

First Observation: 1973 **Survey Date:** **Last Observation:** 1992

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: SPOIL ISLANDS (2) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 10 METERS

Comments: COLONY NUMBER 614-185

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE BLACK SKIMMER, LEAST TERN

Managed Area:

Managed Area Name

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 48 **Eo Id:** 3130

Common Name: **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR **State Rank:** SNR **Federal Status:**

Location Information:

Watershed:

12100405 - Aransas Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-G2, Port Ingleside

Directions:

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 2 MILES EAST OF PORT INGLESIDE

Survey Information:

First Observation: 1973 **Survey Date:** **Last Observation:** 1992

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: SPOIL ISLAND (1) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 6 METERS MAXIMUM

Comments: COLONY NUMBER 614-184

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LAUGHING GULL, TRICOLORED HERON, GREAT BLUE HERON, BLACK-CROWNED NIGHT-HERON, CATTLE EGRET, GREAT EGRET, SNOWY EGRET, REDDISH EGRET, WHITE-FACED IBIS, BLACK SKIMMER, BROWN PELICAN, ROSEATE SPOONBILL, WHITE IBIS, LITTLE BLUE HERON

Managed Area:

Managed Area Name

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

Martin, Catrina. 1991. Texas Colonial Waterbird Census Summary - 1990. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 13 March 1991.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 49 **Eo Id:** 1214
Track Status: Track all extant and selected historical EOs
Common Name:
TX Protection Status:
Global Rank: GNR **State Rank:** SNR **Federal Status:**

Location Information:

Watershed:

12100405 - Aransas Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-G2, Port Ingleside 27097-G1, Port Aransas

Directions:

NATURAL ISLAND IN THE INTRACOASTAL WATERWAY 4 MILES EAST OF PORT INGLESIDE

Survey Information:

First Observation: 1977 **Survey Date:** **Last Observation:** 1992
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: NATURAL ISLAND (1) IN THE INTRACOASTAL WATERWAY; ELEVATION IS 2 METERS; DREDGED MATERIAL DEPOSITS

Comments: COLONY NUMBER 614-183

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LEAST TERN

Managed Area:

Managed Area Name

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 50 **Eo Id:** 1215

Common Name: **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR **State Rank:** SNR **Federal Status:**

Location Information:

Watershed:

12110201 - North Corpus Christi Bay

County Name:	State:	Mapsheet:
San Patricio	TX	27097-G2, Port Ingleside

Directions:

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 2 MILES WEST-NORTHWEST OF PORT INGLESIDE

Survey Information:

First Observation: 1977 **Survey Date:** **Last Observation:** 1989

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: SPOIL ISLAND (1) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 4 METERS

Comments: COLONY NUMBER 614-182

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE GREAT BLUE HERON

Managed Area:

Managed Area Name

Reference:

Citation:

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 51 **Eo Id:** 4522

Common Name: **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR **State Rank:** SNR **Federal Status:**

Location Information:

Watershed:

12110202 - South Corpus Christi Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-G2, Port Ingleside

Directions:

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 4.25 MILES EAST OF PORT INGLESIDE

Survey Information:

First Observation: 1978 **Survey Date:** **Last Observation:** 1992

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: SPOIL ISLAND (1) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 1 METER

Comments: COLONY NUMBER 614-181

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LEAST TERN

Managed Area:

Managed Area Name

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 52 **Eo Id:** 3921
Track Status: Track all extant and selected historical EOs
Common Name:
TX Protection Status:
Global Rank: GNR **State Rank:** SNR **Federal Status:**

Location Information:

Watershed:

12100405 - Aransas Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-G2, Port Ingleside
San Patricio	TX	

Directions:

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 3 MILES EAST OF INGLESIDE

Survey Information:

First Observation: 1978 **Survey Date:** **Last Observation:** 1990
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: SPOIL ISLAND (1) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 0.5 METER

Comments: COLONY NUMBER 614-180

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE GREAT BLUE HERON

Managed Area:

Managed Area Name

Reference:

Citation:

Martin, Catrina. 1991. Texas Colonial Waterbird Census Summary - 1990. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 13 March 1991.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 53 **Eo Id:** 7625

Common Name: **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR **State Rank:** SNR **Federal Status:**

Location Information:

Watershed:

12110201 - North Corpus Christi Bay

County Name:	State:	Mapsheet:
San Patricio	TX	27097-G3, Portland

Directions:

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 1 MILE SOUTHWEST OF PORTLAND

Survey Information:

First Observation: 1979 **Survey Date:** **Last Observation:** 2000-SPRG

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: HIGHWAY CAUSEWAY & LAKE SHORE; ELEVATION IS 0.8 METER

Comments: COLONY NUMBER 614-161

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE BLACK SKIMMER; SPRING 2000, SNOWY PLOVERS OBSERVED NESTING AND WITH HATCHLINGS (U01DOT01TXUS) ALONG WESTERN SHORE OF SUNSET LAKE

Managed Area:

Managed Area Name

Reference:

Citation:

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

TEXAS DEPARTMENT OF TRANSPORTATION. 2001. RE-EVALUATION: US181 CONTROLLING CSJ 0101-04-062 FROM NORTH END OF NUECES BAY CAUSEWAY TO PORTLAND (675 FEET SOUTH OF FM 893 UNDERPASS) STUDY AREA B: CSJ 0101-05-026. JANUARY, 2001.

Specimen:

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 54 **Eo Id:** 2721

Common Name: **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR **State Rank:** SNR **Federal Status:**

Location Information:

Watershed:

12110201 - North Corpus Christi Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-G2, Port Ingleside 27097-G3, Portland

Directions:

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 2 MILES SOUTHWEST OF INGLESIDE

Survey Information:

First Observation: 1978 **Survey Date:** **Last Observation:** 1988

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: SPOIL ISLAND (1) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 6 METERS

Comments: COLONY NUMBER 614-160

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE GREAT BLUE HERON

Managed Area:

Managed Area Name

Reference:

Citation:

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 55 **Eo Id:** 8048

Common Name: **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR **State Rank:** SNR **Federal Status:**

Location Information:

Watershed:

12110201 - North Corpus Christi Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-G3, Portland
San Patricio	TX	

Directions:

SPOIL ISLANDS AT NUECES BAY CAUSEWAY 2 MILES SOUTHWEST OF PORTLAND

Survey Information:

First Observation: 1973 **Survey Date:** **Last Observation:** 1992

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: SPOIL ISLANDS; ON SAND/SHELL SALT/MUD FLAT WITH GRAVEL/SHELL BEACH; ELEVATION IS 1 METER; NESTS SUBJECT TO FLOODING

Comments: COLONY NUMBER 614-141

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LAUGHING GULL, SNOWY EGRET, TRICOLORED HERON, BLACK-CROWNED NIGHT-HERON, GREAT BLUE HERON, LITTLE BLUE HERON, REDDISH EGRET, ROSEATE SPOONBILL, GREAT EGRET

Managed Area:

Managed Area Name

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

Martin, Catrina. 1991. Texas Colonial Waterbird Census Summary - 1990. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 13 March 1991.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1981-1985. TEXAS COLONIAL WATERBIRD CENSUS SUMAMRY.

Specimen:

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 63 **Eo Id:** 2795

Common Name: **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR **State Rank:** SNR **Federal Status:**

Location Information:

Watershed:

12100405 - Aransas Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-H2, Aransas Pass 27097-G2, Port Ingleside

Directions:

NATURAL AND SPOIL ISLANDS IN THE INTRACOASTAL WATERWAY 1 MILE SOUTHEAST OF ARANSAS PASS

Survey Information:

First Observation: 1973 **Survey Date:** **Last Observation:** 1987

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: NATURAL ISLANDS (2)AND 7 DREDGED MATERIAL ISLANDS IN THE INTRACOASTAL WATERWAY; ELEVATION IS 2 METERS

Comments: COLONY NUMBER 614-103

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LAUGHING GULL, CASPIAN TERN, GREAT BLUE HERON, TRICOLORED HERON, SNOWY EGRET, GREAT EGRET, FORSTER'S TERN

Managed Area:

Managed Area Name

Reference:

Citation:

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery
Occurrence #: 64 **Eo Id:** 4542
Track Status: Track all extant and selected historical EOs
Common Name:
TX Protection Status:
Global Rank: GNR **State Rank:** SNR **Federal Status:**

Location Information:

Watershed:

12100405 - Aransas Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-H1, Estes 27097-H2, Aransas Pass

Directions:

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 0.5 MILE WEST OF ARANSAS PASS TO 2 MILES WEST

Survey Information:

First Observation: 1973 **Survey Date:** **Last Observation:** 1989
Eo Type: **Eo Rank:** **Eo Rank Date:**
Observed Area:

Comments:

General Description: SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY; ELEVATION IS 1 METER; ALONG ARANSAS CHANNEL AND OIL WELL CHANNELS

Comments: COLONY NUMBER 614-102

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LAUGHING GULL

Managed Area:

Managed Area Name

Reference:

Citation:

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 65 **Eo Id:** 1372

Common Name: **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR **State Rank:** SNR **Federal Status:**

Location Information:

Watershed:

12100405 - Aransas Bay

County Name:	State:	Mapsheet:
San Patricio	TX	27097-H2, Aransas Pass

Directions:

SPOIL ON MAINLAND ADJACENT TO THE INTRACOASTAL WATERWAY

Survey Information:

First Observation: 1980 **Survey Date:** **Last Observation:** 1981

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: CONFINED DREDGED DISPOSAL SITE ADJACENT TO INTRACOASTAL WATERWAY; ELEVATION IS 2.4 METERS

Comments: COLONY NUMBER 614-101

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE LEAST TERN, BLACK SKIMMER

Managed Area:

Managed Area Name

Reference:

Citation:

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1981-1985. TEXAS COLONIAL WATERBIRD CENSUS SUMAMRY.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Rookery **Occurrence #:** 66 **Eo Id:** 7224

Common Name: **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: GNR **State Rank:** SNR **Federal Status:**

Location Information:

Watershed:

12100405 - Aransas Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-H2, Aransas Pass 27097-H1, Estes

Directions:

SPOIL ISLANDS ON THE INTRACOASTAL WATERWAY 0.5 MILE EAST OF ARANSAS PASS

Survey Information:

First Observation: 1973 **Survey Date:** **Last Observation:** 1992

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description: SPOIL ISLAND (1) ON THE INTRACOASTAL WATERWAY; ELEVATION IS 3 METERS

Comments: COLONY NUMBER 614-100

Protection Comments:

Management Comments:

Data:

EO Data: NESTING COLONY OF THE GREAT BLUE HERON, GREAT EGRET

Managed Area:

Managed Area Name

Reference:

Citation:

Wagner, Matt. 1992. Texas Colonial Waterbird Census Summary 1991 - 1992. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 1992.

Martin, Catrina. 1991. Texas Colonial Waterbird Census Summary - 1990. Compiled for Texas Parks & Wildlife Dept. and Texas Colonial Waterbird Society. 13 March 1991.

TEXAS COLONIAL WATERBIRD SOCIETY AND TEXAS PARKS & WILDLIFE DEPARTMENT. 1986-1989. TEXAS COLONIAL WATERBIRD CENSUS SUMMARY. SPECIAL ADMINISTRATIVE REPORTS.

Mullins, L.M. ET.AL. 1982. An atlas and census of Texas waterbird colonies, 1973-1980. Texas Colonial Waterbird Society.

Specimen:

Element Occurrence Record

Scientific Name: Thurovia triflora **Occurrence #:** 2 **Eo Id:** 858

Common Name: threeflower broomweed **Track Status:** Track all extant and selected historical EOs

TX Protection Status:

Global Rank: G2G3 **State Rank:** S2S3 **Federal Status:**

Location Information:

Watershed:

12110201 - North Corpus Christi Bay

County Name: San Patricio

State: TX

Mapsheet:

27097-G2, Port Ingleside

27097-H2, Aransas Pass

Directions:

INGLESIDE

Survey Information:

First Observation: 1936 **Survey Date:** **Last Observation:** 1936-09-19

Eo Type: **Eo Rank:** **Eo Rank Date:**

Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: IN FLOWER

Managed Area:

Managed Area Name

Reference:

Citation:

Specimen:

Texas A & M University, Tracy Herbarium. 1936. H.B. Parks #20416, 20417, Specimen # 18987, 23120 TAES. 19 September 1936.

Element Occurrence Record

Scientific Name: Trichechus manatus
Occurrence #: 1 **Eo Id:** 6570
Common Name: West Indian Manatee
Track Status: Track all extant and selected historical EOs
TX Protection Status: E
Global Rank: G2 **State Rank:** S1 **Federal Status:** LE

Location Information:

Watershed:

12110202 - South Corpus Christi Bay

12110201 - North Corpus Christi Bay

12100405 - Aransas Bay

County Name:	State:	Mapsheet:
Nueces	TX	27097-G4, Corpus Christi
Aransas	TX	27097-G2, Port Ingleside
		27097-G1, Port Aransas
		28097-A1, Rockport

Directions:

Corpus Christi Bay and Port Aransas. These are generalized directions as this record consists of multiple on-the-ground observations.

Survey Information:

First Observation: 2001-09-23 **Survey Date:** 2006-10-31 **Last Observation:** 2006-10-31
Eo Type: **Eo Rank:** E **Eo Rank Date:** 2011-01-23
Observed Area:

Comments:

General Description:

Comments:

Protection Comments:

Management Comments:

Data:

EO Data: 23 Sep 2001 and 5, 31 Oct 2006: One manatee observed. 23 Jan 2011: A manatee washed up on shore and later died.

Managed Area:

Managed Area Name

Reference:

Citation:

Cobb, Robyn. 2006. E-mail sent to Sandy Birnbaum, Natural Diversity Database Manager, concerning a manatee sighting in the Jewell Fulton Channel, near Ingelside On-the-Bay, TX.

Cobb, Robyn. 2006. E-mail sent to Sandy Birnbaum, Natural Diversity Database Manager, on 10 October concerning a manatee sighting in the Port Aransas City Marina Boat Basin, Port Aransas, TX.

PRESSLY, LORETTA. 2001. E-MAIL TO GARETH ROWELL CONCERNING MANATEE SIGHTING IN CORPUS CHRISTI BAY. SEPTEMBER 28, 2001.

Kiii News. 2011. Rockport Manatee Dies. http://www.kiiitv.com/story/13897645/rockport-manatee-dies. (Posted: Jan 24, 2011. Updated: Jan 31, 2011. Accessed: Sep 16, 2011.)

Specimen: