# Draft Supplemental Environmental Assessment

# Office of Risk Management/Coastal Protection and Restoration Authority Beach Repairs -West Belle Headland Repair Project (TE-0176)

FEMA-4577-DR-LA
Lafourche Parish, Louisiana
Public Assistance
Project Number 4577-00337
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FEMA

**U.S. Department of Homeland Security**
**Federal Emergency Management Agency, Region VI**
**Louisiana Integration and Recovery Office**
**1500 Main Street, Baton Rouge, Louisiana 70802**

BOEM Bureau of Ocean Energy Management

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| | |
|---|---|
| ACHP | Advisory Council on Historic Preservation |
| APE | Area of Potential Effects |
| ASTM | American Society for Testing and Materials |
| AWOIS | Automated Wreck and Obstruction Information System |
| BMP | Best Management Practice |
| BOEM | Bureau of Ocean Energy Management |
| BSEE | Bureau of Safety and Environmental Enforcement |
| CAA | Clean Air Act |
| CBRA | Coastal Barrier Resources Act |
| CBRS | Coastal Barrier Resources System |
| CEC | Coastal Engineering Consultants, Inc. |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| CHHA | Coastal High Hazard Area |
| CMP | Coastal Master Plan |
| CO | Carbon Monoxide |
| CPRA | Coastal Protection and Restoration Authority |
| CUP | Coastal Use Permit |
| CWA | Clean Water Act |
| CWPPRA | Coastal Wetlands Planning, Protection and Restoration Act |
| dB | Decibel |
| dBA | A-Weighted Sound Level |
| DHS | Department of Homeland Security |
| DR | Declared Disaster |
| DO | Dissolved Oxygen |
| EA | Environmental Assessment |
| EFH | Essential Fish Habitat |
| EHP | Environmental and Historic Preservation |
| EIS | Environmental Impact Statement |
| EO | Executive Order |
| ER | Engineering Regulation |
| ESA | Environmental Site Assessment |
| ESTO | Eastern Shawnee Tribe of Oklahoma |
| F | Fahrenheit |
| FEMA | Federal Emergency Management Agency |
| FIMA | Federal Insurance and Mitigation Administration |
| FIRM | Flood Insurance Rate Map |
| FONSI | Finding of No Significant Impact |
| ft | foot/feet |
| GEFF | Geomorphic and Ecological Form and Function |
| GIWW | Gulf Intracoastal Waterway |
| GOHSEP | Governor's Office of Homeland Security and Emergency Preparedness |
| GOM, Gulf | Gulf of Mexico |
| GLPC | Greater Lafourche Port Commission |

| | |
|---|---|
| GMFMC | Gulf of Mexico Fishery Management Council |
| HMGP | Hazard Mitigation Grant Program |
| HP | Historical Preservation |
| HTRW | Hazardous, Toxic, and Radioactive Waste |
| Hz | Hertz |
| in | Inch |
| JBCI | Jena Band of Choctaw Indians |
| JPA | Joint Permit Application |
| kHz | Kilohertz |
| Km | Kilometers |
| KREWE | Krewe Energy |
| LA | Louisiana |
| LAC | Louisiana Administrative Code |
| LCWCRTF | Louisiana Coastal Wetlands Conservation and Restoration Task Force |
| LDEQ | Louisiana Department of Environmental Quality |
| LDHH | Louisiana Department of Health and Hospitals |
| LDNR | Louisiana Department of Natural Resources |
| LDOA | Louisiana Division of Archaeology |
| LDWF | Louisiana Department of Wildlife and Fisheries |
| LIRO | Louisiana Integration and Recovery Office |
| LOOP | Louisiana Offshore Oil Port |
| LORM | Louisiana Office of Risk Management |
| MARPOL | International Convention for the Prevention of Pollution from Ships |
| MCY | Million Cubic Yards |
| MHW | Mean High Water |
| m | meter |
| mg/m3 | milligrams per cubic meter |
| mi | miles |
| mm | millimeter |
| MMS | Minerals Management Service |
| MW | Megawatt |
| NAVD | North American Vertical Datum |
| NEPA | National Environmental Policy Act |
| NFIP | National Flood Insurance Program |
| NFWF | National Fish and Wildlife Foundation |
| NHPA | National Historic Preservation Act |
| NLAA | Not likely to adversely affect |
| NM | Nautical Miles |
| NNA | Non-competitive Negotiated Agreement |
| NOAA | National Oceanic and Atmospheric Administration |
| NORM | Naturally Occurring Radioactive Material |
| NOx | Nitrogen Oxide |
| NPDES | National Pollutant Discharge Elimination System |
| NRHP | National Register of Historic Places |
| OCM | Office of Coastal Management |
| OCS | Outer Continental Shelf |

| | |
|---|---|
| OCSLA | Outer Continental Shelf Lands Act |
| OEHP | Office of Environmental Planning and Historic Preservation |
| OPA | Other Protected Area |
| PA | Public Assistance |
| PL | Public Law |
| PM | Particulate Matter |
| ppm | Parts per million |
| REC | Recognized Environmental Condition |
| SAV | Submerged Aquatic Vegetation |
| SCUBA | Self Contained Underwater Breathing Apparatus |
| SEA | Supplemental Environmental Assessment |
| SHPO | State Historic Preservation Office/Officer |
| SPOC | Single-Point-of-Contact |
| SO2 | Sulfur Dioxide |
| SOI | Secretary of the Interior |
| SOV | Solicitation of Views |
| SOW | Scope of Work |
| SSBA | Ship Shoal Borrow Area |
| TE-# | Project identification number |
| US | United States |
| USACE | United States Army Corps of Engineers |
| USC | United States Code |
| USCG | United State Coast Guard |
| USEPA | United States Environmental Protection Agency |
| USFWS | United States Fish and Wildlife Service |
| VGP | Vessel General Permit |
| VIDA | Vessel Incidental Discharge Act |
| VOC | Volatile Organic Compound |
| WBH | West Belle Headland |
| WDP | Wildlife Diversity Program |
| WQC | Water Quality Certification |
| YBP | Years Before Present |
| µg/m3 | micrograms per cubic meter |

# 1.0 INTRODUCTION

## 1.1 Project Authority

Hurricane Zeta made landfall in Louisiana (LA), approximately 25 miles west of the West Belle Headland (WBH) as a Category 3 hurricane on October 28, 2020. It passed over Louisiana, Mississippi and parts of Alabama with hurricane force winds. The President issued a major disaster declaration under the authority of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law (PL) 93-288, as amended, on January 12, 2021, with an Incident Period from October 26 to October 29, 2020. That declaration authorized the Department of Homeland Security's (DHS) Federal Emergency Management Agency (FEMA) to provide federal assistance in designated areas of LA (FEMA DR-4577-LA). Because FEMA is providing federal financial Public Assistance (PA) to the LA Office of Risk Management (LORM) for the proposed Coastal Protection and Restoration Authority (CPRA) - West Belle Headland Repair Project (TE-0176) described in this Supplemental Environmental Assessment (SEA), FEMA is serving as the lead agency for the overall project.

As defined by the Council on Environmental Quality's Regulations for Implementing the National Environmental Policy Act (NEPA) § 1508.5, cooperating agencies may participate in the preparation of environmental documentation, including assisting with developing the purpose and need. Involvement as a cooperating agency is related to each agency's jurisdiction and special expertise including: (1) identifying issues to be addressed in the SEA; (2) arranging for the collection and/or assembly of necessary resource, environmental, social, economic, and institutional data; (3) analyzing data; (4) developing alternatives; (5) evaluating alternatives and estimating the effects of implementing each alternative; and (6) carrying out other tasks necessary for the development of the SEA.

The Outer Continental Shelf (OCS) Lands Act of 1953 (OCSLA) (43 US Code (USC) 1301, 43 USC 1331, et seq.) defines the OCS as submerged lands lying seaward of states' seaward boundary which, for states on the Gulf of Mexico (GOM, Gulf), is either 3 or 9 nautical miles (NM) from the coastline, depending on the state. The Bureau of Ocean Energy Management (BOEM) within the United States (US) Department of the Interior is responsible for implementation of the OCSLA and section 8(k) authorizes BOEM's jurisdiction over sand and gravel, oil and gas, alternative energy, and other mineral development on the OCS. Under the 1994 amendment [Public Law (PL) 103-426] to section 8(k) of the OCSLA [43 USC 1337(k)(2)], if OCS sand resources are to be used for shore protection, beach restoration, or coastal wetlands restoration projects by federal, state, or local government agencies, or in construction projects authorized by or funded in whole or in part by the federal government, BOEM may enter into a Non-competitive Negotiated Agreement (NNA) that addresses potential use of OCS sand and gravel resources including with the State of Louisiana. Because TE-0176 involves dredging of OCS sand resources in federal waters, for the purposes of this SEA, BOEM is serving as a joint consulting (Cooperating) agency.

Project actions, or portions thereof, assessed in this SEA require compliance with Sections 9 or 10 of the Rivers and Harbors Act (RHA), Section 404(b)(1) of the Clean Water Act (CWA), and/or Section 103 of the Marine Protection, Research and Sanctuaries Act (MPRSA) and thus require authorization (permits) from the US Army Corps of Engineers (USACE). USACE will ensure that

FEMA, BOEM, LORM, and CPRA are aware of any information USACE needs to complete its permit authorization review of TE-0176. USACE will also prepare and submit to the US Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) Fisheries notifications regarding compliance with the Endangered Species Act (ESA) (16 US Code [USC] 1531 et seq.), Marine Mammal Protection Act (MMPA), and Coastal Barrier Resources Act (CBRA). Because of their permitting authority and wetlands expertise, USACE is serving as a joint consulting (Cooperating) agency.

Prior to Hurricane Zeta, a NEPA analysis was prepared on behalf of CPRA and BOEM, and an Environmental Assessment (EA) for the East Timbalier Island Restoration Project (TE-0143/0118) – Final EA for Issuance of an NNA for the Use of OCS Sand – Lafourche Parish, LA, was finalized on February 2019 (Stantec 2019). A portion of that EA included coastal restoration efforts on WBH and is referred to in this SEA as the "2019 EA." On June 3, 2019, BOEM issued a Finding of No Significant Impact (FONSI) and Final EA for TE-0143/0118, and work on the WBH component of TE-0143/0118 commenced in March 2020. Approximately 80 percent of TE-0143/0118 had been completed when Hurricane Zeta occurred, resulting in major damages to completed work (CECI 2022) (Glassen n.d.).

Any federal agency may adopt another federal agency's EA when such adoption would save time and money (40 Code of Federal Regulations (CFR) Sections 1500.4[n], 1500.5[h], and 1506.3), provided the original document satisfies the adopting agency's NEPA requirements. FEMA has adopted CPRA/BOEM's 2019 EA and is providing supplemental information through this SEA.

This SEA is being prepared in accordance with FEMA Instruction 108-1-1 and DHS Instruction 023-01-001-01, Rev. 1, pursuant to Section 102 of NEPA, as implemented by 40 CFR 1500-1508, promulgated by the President's Council on Environmental Quality (CEQ). The purpose of this SEA is to evaluate the potential impacts of the Proposed Project on the physical and human environment that will be modified or were not considered or previously analyzed in the 2019 EA. This SEA incorporates components from the 2019 EA either as text or by reference and provides additional information and analysis as needed to address changes to baseline conditions or project details that were not analyzed in the 2019 EA. Changed circumstances since the 2019 EA that are relevant to environmental concerns and the scope of work include removal of the East Timbalier Island restoration component from the Preferred Alternative, additionally protected natural resources, and the environmental effects of implementing TE-0176 following damages that were caused to the nearly completed TE-0143/0118 project by Hurricane Zeta. In coordination with BOEM, and USACE, FEMA has prepared this SEA to evaluate and document compliance with federal laws, regulations, and Executive Orders (EO) applicable to the WBH Repair Project (TE-0176).

FEMA, BOEM, and USACE will use the findings in this SEA to jointly meet their NEPA obligation to determine whether a FONSI for their federal actions within the purview of their jurisdictions related to the TE-0176 Project is appropriate or whether preparation of an Environmental Impact Statement (EIS) is warranted.

## 1.2 Background and Site Description

The WBH Repair Area is within the Terrebonne Basin of Lafourche Parish, LA. The Terrebonne Basin consists of four contiguous water bodies, from west to east, including Caillou Bay, Lake Pelto, Terrebonne Bay, and Timbalier Bay. The bays are separated from the open Gulf by a series of barrier islands. The WBH is located on the far eastern side of the Terrebonne Basin (Figure 1-1) (CECI 2022).

The TE-0143/0118 Project Area assessed in the 2019 EA included restoration areas on East Timbalier Island, a restoration area extending the WBH, a feeder beach along WBH westward of the West Belle Pass Jetties, a Renourishment Area on the WBH, four borrow areas in the Gulf, two sediment pump-out areas and three conveyance corridors connecting the borrow and pump-out areas to the restoration areas and is shown in Figure 1-2. Due to a change in project conditions and budgetary constraints, the East Timbalier Island component of TE-0143/0118 was removed and only the WBH component was carried forward for implementation (FONSI 2019).

Work on the TE-0143/0118 Project commenced on March 7, 2020, and construction of the WBH component was approximately 80 percent completed when Hurricane Zeta impacted the Project Area in October 2020 (CECI 2022). The WBH Project Area experienced major damage during Hurricane Zeta and the completed work was destroyed (CECI 2022). A Post-Hurricane Zeta survey conducted from December 2 through December 12, 2020, determined that the volumetric losses of sediment were approximately 1.37 million cubic yards (MCY) of beach and 1.24 MCY of dune for a total sediment loss of approximately 2.61 MCY (CECI 2022).

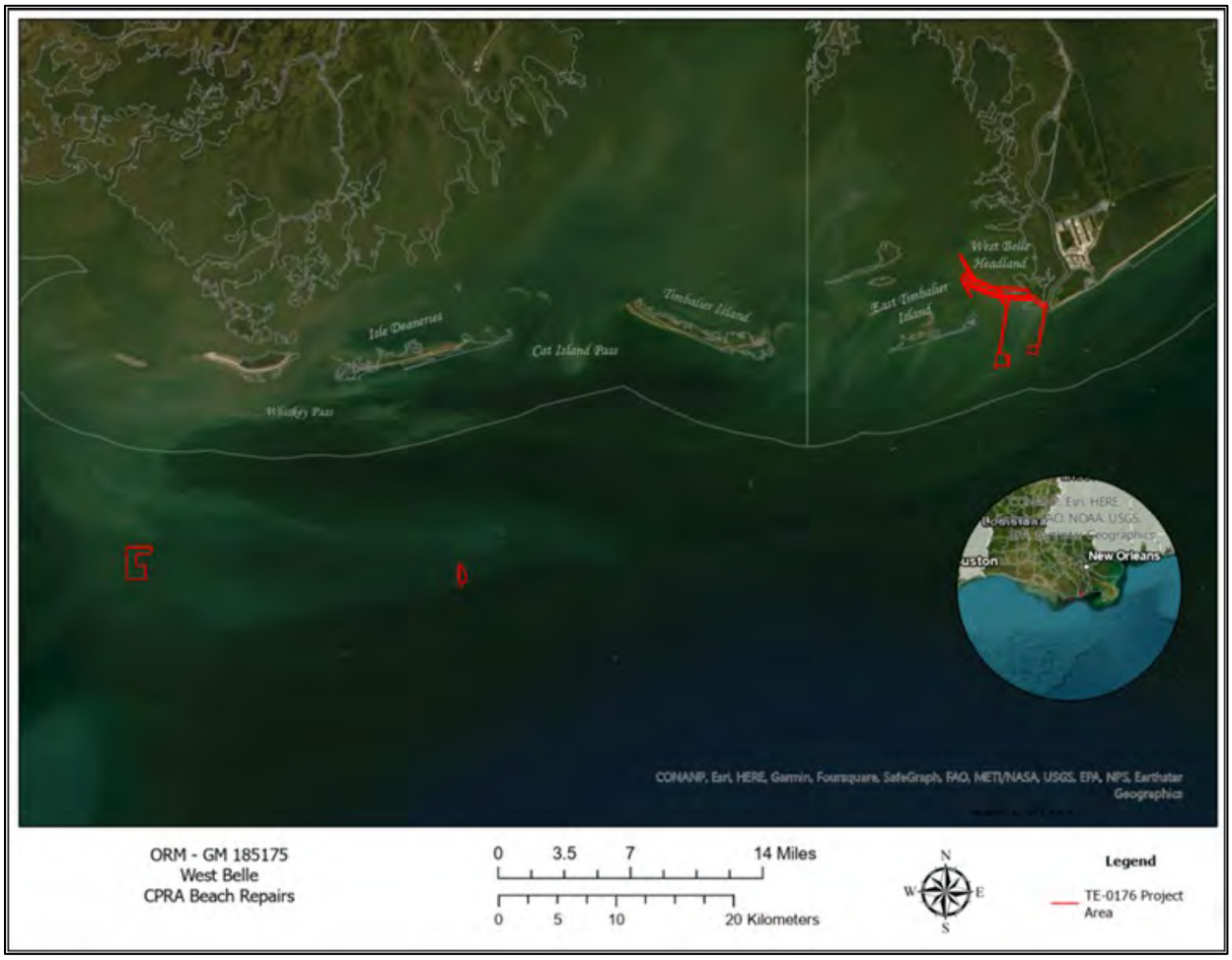


**Figure 1-1.** West Belle Headland Repair Project Area (TE-176)

The project area assessed in this SEA (Figures 1-1, 1-3a and 1-3b) includes: 1) the restoration areas on WBH; 2) a Feeder Beach along WBH (westward of the West Belle Pass Jetties); 3) two pump-out areas located to the south of the WBH repair area; 4) two conveyance corridors between the pump-out locations and the WBH repair area; and 5) two sand borrow areas located on the OCS within South Pelto Lease Block 12 (PL12) and Ship Shoal Block 88 (SS88) (Figures 1-1 and 1-3b). Borrow Area TE-0176-A is a westward extension of the Ship Shoal Borrow Area (SSBA, located in PL12) assessed and utilized for the TE-0143/0118 Project. Borrow Area TE-0176-B is a westward extension of the SS88 Borrow Area that was utilized for the TE-0100 Caillou Lake Headlands Restoration Project.

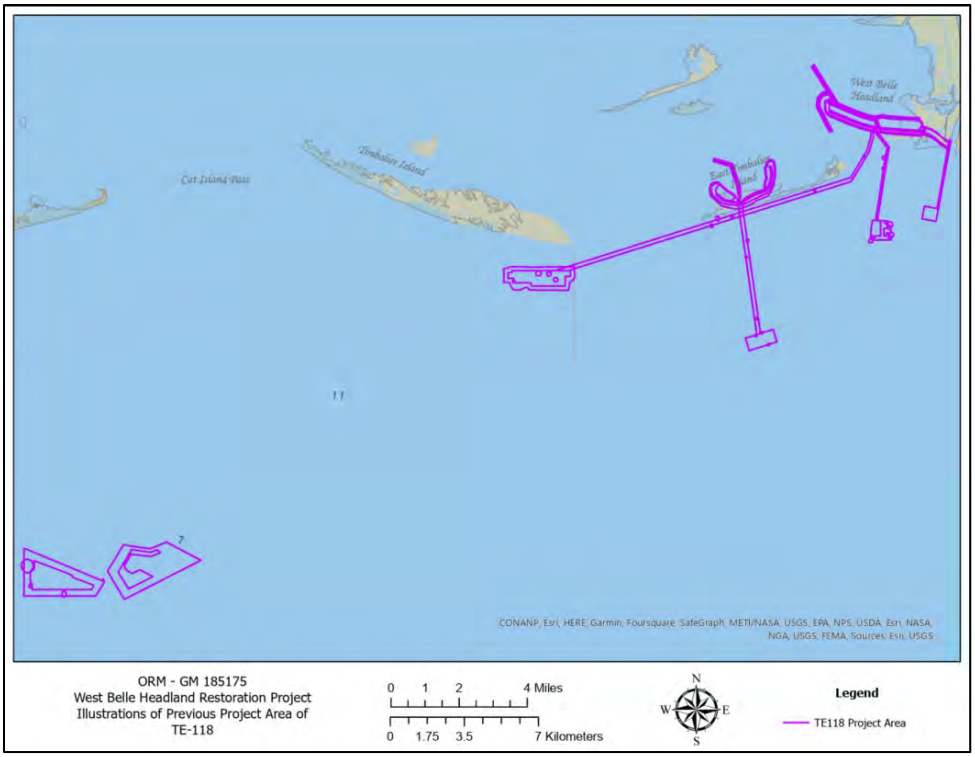


**Figure 1-2.** Project Area Assessed in the 2019 EA (TE-0143/0118)

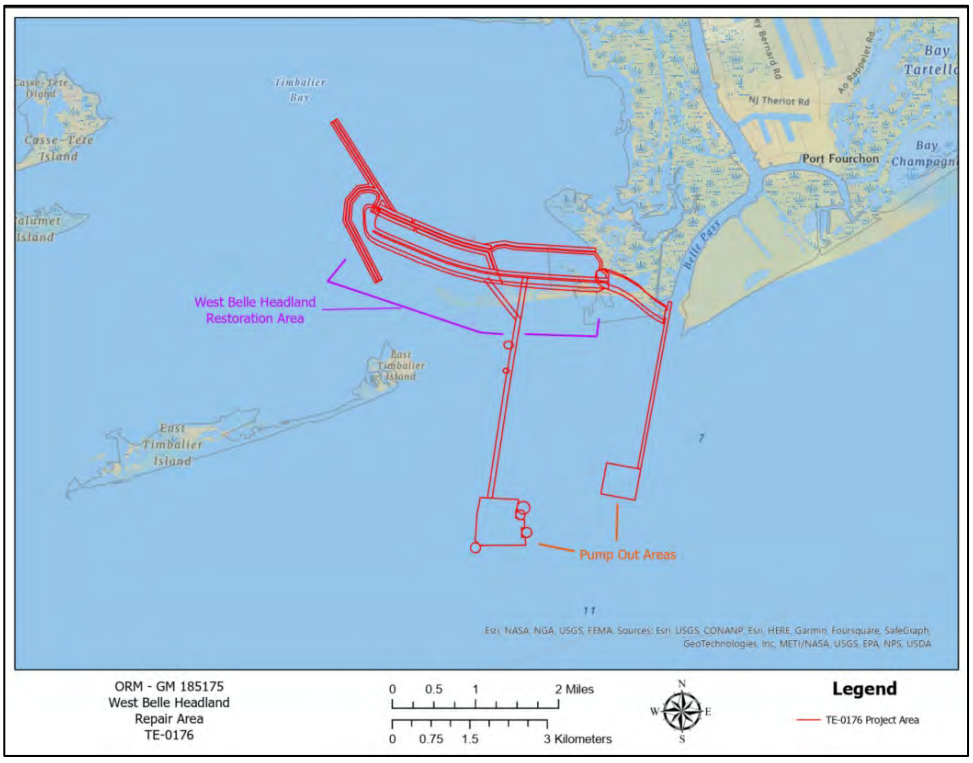


**Figure 1-3a.** West Belle Headland Repair Project Area (TE-0176)

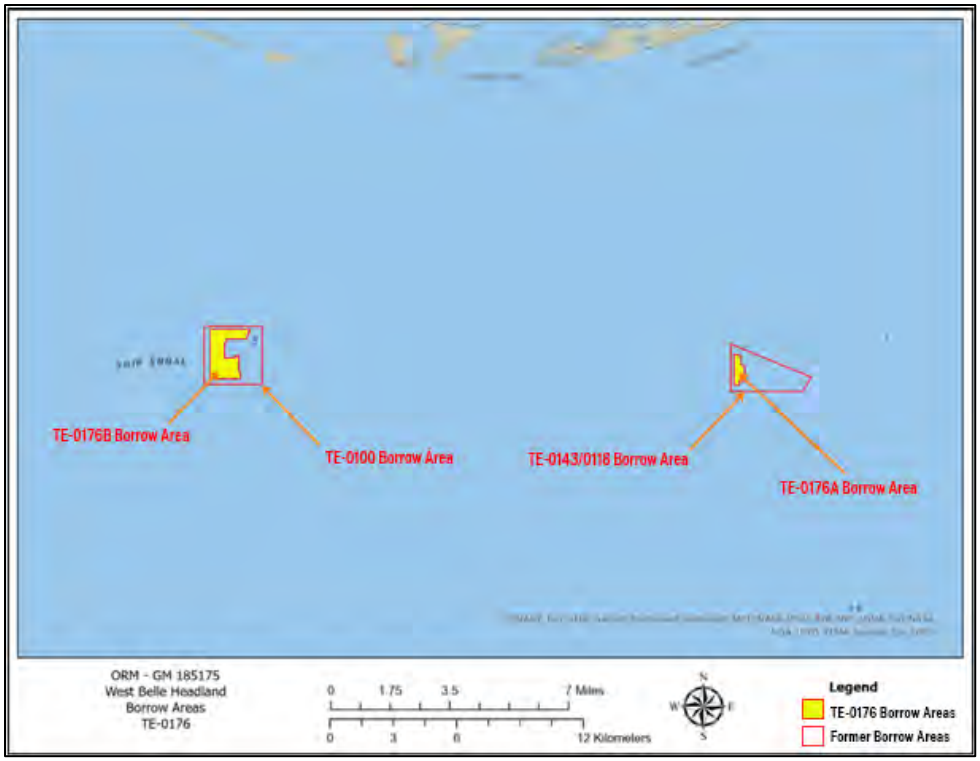


**Figure 1-3b.** West Belle Headland Repair Project Borrow Areas (TE-0176)

## 2.0 PURPOSE AND NEED

The PA program provides grant assistance to state, tribal, and local governments, and certain types of not-for-profit organizations so that communities can respond to, recover from, and mitigate the effects of major disaster. The purpose of the PA program is to reduce the loss of life and property caused by natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. CPRA (Grantee through LORM) is proposing to repair and mitigate damages caused by Hurricane Zeta.

The purpose of the BOEM proposed action is to respond to a request for use of OCS sand under the authority granted to the Department of the Interior by the OCSLA. Public Law 103-426 gives BOEM the authority to convey, on a noncompetitive basis, the rights to OCS sediment resources for use in beach nourishment projects.

Analysis of land loss and shoreline erosion conducted in the proposed project area prior to Hurricane Zeta estimated that the WBH Project Area would lose approximately 207 acres of supratidal habitat; 173 acres of Essential Fish Habitat (EFH); designated critical habitat for the piping plover (*Charadrius melodus*) on the WBH; storm protection for the Timbalier Bay Estuarine System; and protection of oil and gas infrastructure. WBH was estimated to lose approximately 38 percent of its remaining original area if the No Action Alternative was implemented (Stantec 2019).

Prior to Hurricane Zeta, approximately 80 percent of the TE-0143/0118 project components that were analyzed in the 2019 EA had been completed. Hurricane Zeta's severe wave action and complete storm surge over-wash caused erosion damage to the majority of TE-0143/0118's constructed components. The TE-0143/0118 project was being constructed to provide dune, beach and salt-marsh habitat and a buffer to reduce the forces and effects of wave action, saltwater intrusion, storm surge and tidal currents on the WBH estuary and wetlands. The loss of recently constructed (TE-0143/0118) dune, beach and salt-marsh habitat caused by Hurricane Zeta within the proposed TE-0176 project area currently impacts the quality and quantity of unique foraging and nesting areas for threatened, endangered and protected species, as well as migratory bird species. Additionally, the loss of TE-0143/0118 project components exposes oil and gas infrastructure and sensitive marsh habitat inland of the WBH to the forces and effects of increased wave action, saltwater intrusion, storm surge and tidal currents. Due to the extensive damages sustained from Hurricane Zeta, there is a need to reestablish the geomorphic and ecological form and function (GEFF) of the WBH.

# 3.0 ALTERNATIVES

Per 40 CFR 1501.5I(2), NEPA requires federal agencies to consider the effects of a proposed action and any reasonable alternatives on the human and natural environment. The purpose is to identify reasonable alternatives to the proposed action to allow for a meaningful outcome of the alternatives' effects on the human and natural environment. This section describes the alternatives considered in addressing the purpose and need.

The 2019 EA considered and assessed seven alternatives including the No Action Alternative. Project alternatives were considered in detail during a regional analysis of alternatives for ecosystem restoration on East Timbalier Island, WBH, Casse Tete Island, and Calumet Island. The alternatives varied in magnitude of beach, dune, and marsh habitat restoration in the various areas, including beach and dune width and height; marsh size, width, height, and length; and density of sediment placed. Various combinations of template scales and island restoration alternatives were evaluated at 5-year intervals for a 20-year project life (Stantec 2019). The details of the alternatives analysis that was conducted are presented in Section 2.2 (Alternative Analysis) of the 2019 EA. The alternatives considered in the 2019 EA, including the No Action Alternative and Preferred Action alternative are included by reference and are carried forward in this SEA.

In this SEA, the Preferred Action Alternative assessed in the 2019 EA has been modified to address changes to the WBH that occurred as a result of Hurricane Zeta and the need to rebuild the components of TE-0143/0118 that had been completed prior to the Hurricane. The FONSI for the 2019 EA removed the East Timbalier Island component of the Preferred Alternative due to project restrictions and budgetary constraints (FONSI 2019); therefore, that component has also been removed in this SEA.

## 3.1 No Action Alternative

The No Action Alternative assumes that no action will be implemented to halt ongoing erosion and land loss and no action will be taken to address the previous loss of land eroded because of

prior natural wave action, storm surge, tidal currents, and weather events, including Hurricane Zeta.

Analysis of land loss and shoreline erosion conducted in the proposed project area prior to Hurricane Zeta estimated that the WBH Project Area would lose approximately 207 acres of supratidal habitat; 173 acres of Essential Fish Habitat (EFH); designated critical habitat for the piping plover (*Charadrius melodus*) on the WBH; storm protection for the Timbalier Bay Estuarine System; and protection of oil and gas infrastructure. WBH was estimated to lose approximately 38 percent of its remaining original area if the No Action Alternative was implemented (Stantec 2019).

A large percentage of the area that was assessed for land loss and shoreline erosion under the No Action Alternative in the 2019 EA was lost because of Hurricane Zeta. It is expected that the remaining area that is above Mean High Water (MHW) at the WBH will continue to erode and be further reduced over time.

## 3.2 Preferred Action Alternative

Under the Preferred Action Alternative, the TE-0176 Repair Project area will be approximately 17,500 linear feet (ft) in length and will have essentially the same footprint as the constructed TE-118 project would have had. Appendix A contains the WBH Repair Project (TE-0176) narrative, referred to in this SEA as TE-0176 Narrative Scope of Work (SOW) 2024 and the March 2023 WBH Repair 90 Percent Design Plans for TE-0176 (CECI 2023). The TE-0176 Narrative SOW 2024 is the Preferred Action Alternative and includes additional project details as described in this section. In addition, the sand fencing and vegetation planting described in the Preferred Action Alternative is based on the project components as described in the Proposed Action (Section 2.1) of the 2019 EA for TE-0143/0118.

The proposed TE-0176 project will include construction of beach, dune and marsh habitat and reinforcement of the shoreline through fill placement utilizing offshore sand sources. TE-0176 will result in the restoration and creation of approximately 1,641.1 acres of dune, supratidal, and intertidal marsh habitat.

The target elevation of the dune will be +7.5 ft North American Vertical Datum (NAVD)88, with fore and back slopes of 1V:25H and a typical width of 100 ft at the crest. The target elevation of the beach will be +5.0 ft NAVD 88, with a slope of 1V:25H from the beach berm crest extending seaward to the intersection with the existing grade, and a typical width of 290 ft.

The marsh feature will be approximately 8,500 linear ft in length and involves the placement of sand to create intertidal marsh habitat. The marsh platform target elevation is +3.0 ft NAVD88 with an average width of 1,145 ft.

Two borrow areas located on the OCS will be utilized to provide sand fill for deposition into the repair project template and are located within PL12 and SS88 Lease Blocks (Figures 1-1 and 1-3b). Borrow Area TE-0176-A involves a dredge cut design into a westward expansion area based on the current adjacent cuts of the PL12 borrow area utilized for the TE-0143/0118 project. The average percent sand and grain size were computed to be 95% and 0.166 millimeter (mm),

respectively. The TE-0176-A Borrow Area contains an estimated volume of 2.31 MCY of beach, dune, and marsh compatible sand. Borrow Area TE-0176-B involves a dredge cut design into a westward extension of adjacent cuts of the SS88 Borrow Area previously utilized for the Caillou Lake Headlands Restoration Project (TE-0100) ranging from -27 ft NAVD 88 to -34 ft NAVD 88. Sediment analyses performed during the design phase indicated good quality sand containing an average grain size of 0.19 mm classified as very fine sand in the Wentworth scale and fine sand in American Society for Testing and Materials (ASTM) soil size ranges and comprised of over 96% sand (CEC 2013). The estimated volume of beach, dune, and marsh compatible sand available within TE-0176-B is 8.14 MCY.

The two methodologies proposed for excavating and transporting sand from the borrow areas to the Repair area are hopper dredging and cutterhead-scow dredging. Hopper dredges are self-propelled seagoing vessels and, after filling the hopper with dredged sand, will sail to either the West Belle Pump-Out Area or the West Belle Feeder Beach Pump-Out Area. The hopper dredge will directly pump out the sand suspended within its hopper to the fill site template through a submerged sediment pipeline. The dredged sand will be pumped onto dry beach and discharged into the fill area where it will be graded using conventional earth moving equipment. The cutterhead dredge will suspend sand mechanically with a rotating cutter and then transfer it onto scow barges. The scow barges will be towed by tugs to the designated pump-out areas where the sand will be transferred to the fill site through a submerged sediment pipeline.

Both pump-out areas and sediment pipeline conveyance corridors proposed to be used to convey sand from the dredges or barges to the WBH are located within Louisiana State Waters and were previously permitted and utilized for TE-0143/0118. The West Belle Pump-Out Area is located approximately 2.3 NM south-southwest of the WBH Project Area. The associated West Belle Conveyance Corridor is 300 ft in width and a proposed bifurcation and extension of that corridor is an additional TE-0176 project component being permitted that was not included in TE-0143/0118. The bifurcation will allow the construction contractor to install the sediment pipeline within the conveyance corridor with up to 90-degree bends improving access to the project fill areas. The West Belle Feeder Beach Pump-Out Area is located south-southwest of the fill template and just west of the Belle Pass Navigation Channel. The West Belle Feeder Beach Conveyance Corridor is 200 ft in width and approximately 2.1 NM in length and terminates at the eastern side of the previously constructed West Belle Feeder Beach.

The in-water work for TE-0176 will be conducted using barge or vessel-based heavy equipment with no bottom disturbance allowed (excluding the dredge component) other than anchoring in the permitted allowable areas.

The land-based work will be conducted by bulldozers, excavators, front-end loaders, marsh-buggies, and off-road vehicles. Land-based equipment will access the fill template of the Project Area via barge-transport through an existing access channel and excavated from approximately the -9.0 ft NAVD88 contour to the fill area or along the West Belle Feeder Beach from Belle Pass. The alignment of the access channel will be the same as the one that was permitted and utilized for TE-0143/0118 and is utilized by the Krewe Energy facility (KREWE).

# 4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the existing baseline conditions and resources and the environmental impacts to those resources if the No Action Alternative or the Preferred Alternative were implemented. This section only describes the environmental resources and impacts that are relevant to the decision-making process. Descriptions of the baseline environmental resources are based on and, where applicable, taken from their descriptions and assessments in the 2019 EA for TE-0143/0118, either as text or by reference, in addition to applicable information and analysis needed to address changes to baseline conditions or project details that were not analyzed in the 2019 EA. Relevant changed circumstances since the 2019 EA include removal of the East Timbalier Island restoration component from the preferred alternative, additionally protected natural resources, and the environmental effects of TE-0176 implementation following damages that were caused to the nearly completed TE-0143/0118 project by Hurricane Zeta.

Potential environmental effects that could result from implementing the No Action or the Preferred Action Alternatives are presented under each resource area. The significance of an action is measured in terms of its context and intensity.

Physical Resources

## 4.1 Oceanographic and Coastal Processes

The three principle marine processes that influence coasts are erosion, transportation, and deposition. Waves, currents, eddies, gyres, tides, and the transport of sand on and off beaches are all components of oceanographic and coastal processes.

### *4.1.1 Existing Conditions*

A detailed description of the oceanographic and coastal processes for the TE-118 Project Area is presented in the Preliminary Design Report (Stantec 2017). The WBH restoration component of TE-0143/0118 was 80 percent completed when Hurricane Zeta impacted the Project Area in October 2020. The TE-0143/0118 WBH Project Area experienced major damage during Hurricane Zeta and the completed work was heavily damaged or destroyed (CECI 2022). The remaining WBH following Hurricane Zeta has been exposed to ongoing erosion.

### *4.1.2 Alternative 1: No Action Alternative*

Long term, direct and indirect, moderate adverse effects to oceanographic and coastal processes would result from implementation of the No Action Alternative. The remaining WBH would continue to erode and over time would convert to subtidal habitats.

Indirect effects would be expected to include the continued deterioration, degradation, and fragmentation of the Terrebonne Basin Barrier Island system and over time they would be expected to convert to subtidal habitats. The interior estuarine bays and beach ridges would continue to be

transformed into marine open water habitat. Penetration of salt water into areas previously isolated from direct exchange and increased tidal flows could enhance erosion of some marsh types.

### *4.1.3 Alternative 2: WBH Repair*

Long term, direct and indirect, moderate beneficial effects and short and long term, direct and indirect, negligible to minor adverse effects would be expected as a result of implementing the Preferred Alternative. TE-0176 would restore the GEFF of the beach and dunes of the WBH enabling the barrier shoreline to absorb wave energy during storms and fair-weather conditions. This will provide some storm surge protection and reduce storm damage to upland areas and oil and gas infrastructure landward of the beach and dune along with decreasing interior land loss rates.

Long term, direct, minor adverse effects to existing Gulf habitats in the Project Area would be expected. Placement of dredged sediment to rebuild the WBH would bury existing Gulf intertidal and subtidal habitats, altering the topography and bathymetry within the reconstruction area.

Indirect beneficial effects would be expected from the deposition and natural redistribution of sediments along the sediment-deprived barrier system. The dredged sediment will be subjected to natural physical and coastal processes that would, over time, begin to more closely resemble the sediment they are covering on the WBH. However, repair would reduce potential adverse impacts associated with increased storm surge and wave potential to interior estuarine wetlands and beach ridges.

Short term, direct, negligible adverse effects would also be expected from the use of the pump-out areas for temporary mooring of the hopper dredge or barge offloading equipment via anchoring systems. Temporary disturbance of the Gulf bottom would be negligible during anchor and sediment pipeline installation and removal. Anchor lines will not alter the wave field or sediment transport patterns. Dredging of the borrow areas and associated pipeline corridor are not expected to change the beach erosion patterns near the proposed Project area. Access dredging for land-based equipment placement is limited to the existing access corridor utilized by the KREWE. Dredged materials would be placed along the access channel and might alter the bathymetry but would not affect the wave field or sediment transport patterns.

The dredged material used in island, dune, and marsh construction would consist of naturally occurring material deposited in the Gulf over time by riverine and coastal sediment transport processes. Dredging would result in suspension of sediment and disturbance to natural sediment sorting and layering within the borrow area and water depth would increase as sediments were removed. Over the long term, dredged materials removed from the borrow areas would be expected to rearrange by natural processes, and pre-dredging bathymetric contours would return to the dredged areas. Dredging the borrow areas as described in the Preferred Alternative would not be expected result in any noticeable changes to long-term storm erosion patterns or otherwise affect adjacent shorelines (Stantec 2019).

## 4.2 Geology

Geological resources are natural resources that originate from the earth's crust. They include solid, gas, and liquid elements that can be extracted for various purposes. Geological resources can be classified into groundwater, mineral resources, energy production and underground space. Geological resources are found both on the surface and below the surface of the earth.

### *4.2.1 Existing Conditions*

The geologic setting of the TE-0176 Project Area is dominated by the geomorphology of the Mississippi River Plain. Seven major deltaic complexes were created and abandoned over the past 9,000 years. The Lafourche Delta was created approximately 3,500 to 400 Years Before Present (YBP), which includes East Timbalier Island, WBH, along with Timbalier Bay and the inlet systems adjacent to the islands. The sedimentary geology of the Project Area is well described in literature including the historical geomorphic study of Little Pass, Timbalier and its associated ebb-tidal delta (Miner 2007) and the borrow area investigations for an older WBH restoration project (TE-0052, CPE 2009) and TE-0143/0118 (Stantec 2019).

### *4.2.2 Alternative 1: No Action Alternative*

Short and long term, direct, moderate adverse effects to geologic resources would be expected under the No Action Alternative. Historic land loss and erosion will continue, and the barrier shoreline will eventually convert to shallow open water bottoms. Sand resources within the beach and dune system will be over washed into the back-barrier system or lost offshore during significant storm events such as occurred during Hurricane Zeta. The WBH and adjacent land that is remaining following Hurricane Zeta will continue to lose their GEFF.

Long term, indirect, moderate adverse effects to Geologic Resources would be expected under the No Action Alternative. The remaining WBH will continue to erode and migrate landward because of natural processes. Sedimentary modifications produced by headland migration would include textural changes, steepening, and reorientation of stratification. The reworking of sediment, which would accompany headland migration, could potentially alter the texture of sediment, depending on the material available for deposition and the composition of the sediment being reworked. In absence of restoration, the interior bay and beach ridge system along with their sediment resources will continue to be transformed into marine open water habitat.

No direct or indirect effects to the geology or sand resources in the OCS borrow areas would be expected under the No Action Alternative.

### *4.2.3 Alternative 2: WBH Repair*

Long term, direct, moderate beneficial effects to Geologic Resources would be expected under Alternative 2. Repair of the WBH by placement of beach and dune compatible sand will improve the ability of the headland to resist shoreline erosion, wave overtopping, and beach formation. Installation of sand fencing and dune vegetation would provide a mechanism for future aeolian sand transport and dune enhancement for additional shoreline protection. The addition of dredged sand to the Project Area would provide previously unavailable source sand to the sand-starved

system from outside the relatively closed system, which is consistent with the principles of the Coastal Master Plan (CPRA 2017) (Stantec 2019).

Short term, direct, minor adverse effects would be expected following the placement of borrow area sediment into the high-energy barrier system which could result in consolidation due to variations in grain size composition. Those adverse effects would be minimized by using sediments with grain size composition that is compatible with the sediment in the existing barrier system (Stantec 2019).

Re-dredging a pre-existing access channel to the WBH Project Area will occur as a component of Alternative 2. Prior to Hurricane Zeta in 2020, a similar process of dredging was successfully used under TE-118 to provide source materials. Dredging sediment associated with the project would be placed within the fill area of TE-0176. Direct impacts on geology and sand resources are described above. Access channel dredging depths were set equal to or shallower than the former navigation channel depths. Infilling of these areas is expected from natural tidal flow and suspended sediment weathering into the channel. As a result, impacts associated with developing the access channel would be short-term and minor (Stantec 2019).

Long term, direct, minor adverse effects to geologic resources would be expected from the mining of sand from the OCS borrow areas. That action is considered small-scale mining based on modelling studies conducted in the borrow areas (Stone 2000; Stone et al. 2004, 2009) (Stantec 2019).

Long term, indirect beneficial effects would be expected to Geologic Resources and coastal geomorphology from the deposition and natural redistribution of newly available sand along the WBH and adjacent barrier system.

No indirect effects to geologic resources would be expected in the PL12 and SS88 borrow areas.

## 4.3 Air Quality

In accordance with Federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. The measurements of these criteria pollutants in ambient air are expressed in units of parts per million (ppm), milligrams per cubic meter (mg/m3), or micrograms per cubic meter (μg/m3). The air quality in a region is a result not only of the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological air basin, and the prevailing meteorological conditions.

### *4.3.1 Existing Conditions*

The proposed Project Area lies in the Southern Louisiana-Southeast Texas Interstate Air Quality Control Region. Lafourche Parish meets all national ambient air quality standards, according to the Louisiana Department of Environmental Quality (LDEQ) Office of Environmental Assessment, which monitors air quality at a station south of Thibodeaux, LA (the nearest station to the Proposed Project area) (LDEQ 2023). No significant point sources of air-borne pollutants

occur in the vicinity of the Proposed Project Area, and air quality is generally good. The most prominent source of airborne pollutants in the area is the exhaust from boats. Offshore breezes mix and freshen the air and frequent precipitation prevents accumulation of particulates (Stantec 2019).

### *4.3.2 Alternative 1: No Action Alternative*

The No Action Alternative would not have any direct or indirect impacts on air quality. Existing conditions would persist.

### *4.3.3 Alternative 2: WBH Repair*

Short term, direct and indirect minor adverse effects would be expected to Air Quality under Alternative 2. Air emissions associated with the proposed TE-0176 Project would result from diesel engines powering the dredging activities and travel between the dredge site and pump-out operations. Additional emissions would result from equipment used in the placement and relocation of the mooring buoys. Air emissions at the beach fill areas would result from bulldozers, graders, and other equipment. The majority of emissions would be caused by dredging and fill activities which are estimated to occur for 190 days of the estimated total construction period of about 310 days (CECI 2022). Most emissions would occur at the dredge site and pump-out areas. The principal emissions would consist of nitrogen oxides (NOx), with smaller volumes of carbon monoxide (CO), sulfur dioxide (SO2), particulate matter (PM), and volatile organic compounds (VOC). Emissions of NOx and VOC are potential precursors to ozone, primarily during June through September. Similar effects on air quality would be expected to occur across the Project Area due to the movement of vessels between the sediment sources and the pump-out areas. Most emissions would occur over OCS waters, with smaller emission amounts occurring in Lafourche Parish, LA (Stantec 2019).

Effects to air quality would occur throughout implementation of the project. However, air quality would return to pre-project conditions shortly after the completion of construction activities.

## 4.4 Water Quality

Water quality is the condition of the water, including chemical, physical, and biological characteristics, usually with respect to its suitability for a particular purpose such as drinking or swimming.

### *4.4.1 Existing Conditions*

Waters in the Project Area are used for oil and gas production, SCUBA diving, fishing, boating, and other recreation. Proposed activities within the Project Area will require a CWA Section 401 Water Quality Certification (WQC) from LDEQ involving assessment of four categories for water use under Louisiana Environmental Regulatory Code (Louisiana Administrative Code (LAC) Title 33, Chapter 11):

- *Primary Contact Recreation* includes activities such as swimming, water skiing, tubing, snorkeling, skin diving, and other activities that involve prolonged body contact with water and probable ingestion.

- *Secondary Contact Recreation* includes fishing, wading, recreational boating, and other activities that involve only incidental or accidental body contact and minimal probability of ingesting water.

- *Fish and Wildlife Propagation* includes the use of water by aquatic biota for aquatic habitat, food, resting, reproduction, and cover. The aquatic biota includes indigenous fishes and invertebrates, reptiles, amphibians, and other aquatic fauna consumed by humans.

- *Oyster Propagation* includes the use of water to maintain biological systems that support economically important species of oysters, clams, mussels, and other mollusks consumed by humans so that their productivity is preserved and the health of human consumers of these species is protected.

Primary Contact Recreation is impaired in waters in and around the Project Area due to oil and gas production. Over several decades, drilling materials, such as water-based mud and cuttings, have been released in the region. Discharges are periodically tested and must meet National Pollutant Discharge Elimination System (NPDES) limits set by the United States Environmental Protection Agency (USEPA) (Stantec 2019).

Fish and Wildlife Propagation is impaired in waters of the area due to elevated levels of mercury (LDEQ, 2006). One of the suspected causes of this impairment is atmospheric deposition. On March 8, 2006, the Louisiana Department of Health and Hospitals (LDHH), along with LDEQ and the Louisiana Department of Wildlife and Fisheries (LDWF), issued a fish consumption advisory for king mackerel (*Scomberomorus cavalla*), cobia (*Rachycentron canadum*), blackfin tuna (*Thunnus atlanticus*), and greater amberjack (*Seriola dumerili*) caught off the coast of Louisiana due to elevated levels of mercury (LDEQ 2006) (Stantec 2019).

### *4.4.2 Alternative 1: No Action Alternative*

The No Action Alternative would not have any direct impacts on water quality. Long term, indirect minor adverse effects would be expected as the result of the loss of the WBH which would allow increased exchange of higher salinity Gulf waters with the Timbalier Bay estuary system. The resulting increased salinity would over time lead to further loss of brackish and intermediate marsh vegetation, rendering the mainland shoreline more vulnerable to erosion.

### *4.4.3 Alternative 2: WBH Repair*

Proposed activities within the Project Area require a CWA Section 401 WQC from LDEQ, including monitoring during construction activities.

Short term, direct, minor adverse effects to Water Quality would be expected under the Preferred Alternative because of pump-out operations. Turbidity levels in the pump-out areas would be elevated above normal in the mixing zone during dredging. Visible plumes at the water surface would be expected in the immediate vicinity of the operation. Similar water quality effects would be expected at the beach nourishment location. During placement, sand slurry will be pumped onto the beach through a temporary pipeline. Fine-grained sand will settle out rapidly and water will separate from the slurry and drain off the beach into the surf zone, or percolate into the sand. Silt- or clay-sized sediment would be expected to stay in suspension for a longer period and could drain back into the surf zone causing elevated turbidity. Elevated turbidity levels are expected to dissipate rapidly, returning to background levels over a short period of time (Stantec 2019). The Construction Contractor will implement a spill contingency plan for hazardous, toxic, or petroleum material at the borrow areas (see Section 6.2 of this SEA).

During dredging, sand would be collected from the dredge site with a hopper dredge or cutterhead dredge. Silt or clay that may be present in the sandy substrate might become suspended in the water column near the dredge site but would settle in hours to days depending on current. If the disturbed sediment were anoxic, the biological oxygen demand in the water column would increase (Stantec 2019). Turbidity and suspended particulate levels in the water column above the borrow areas normally fluctuate because of seasonal riverine inputs and their discharge rate. Increased turbidity associated with dredging is expected to affect water quality only in the immediate area of dredging (Stantec 2019).

Reductions in salinity provided by the buffering capacity of the repaired WBH would provide a more favorable condition for brackish and intermediate marsh vegetation, rendering the mainland shoreline less vulnerable to erosion and land loss.

## 4.5 Noise

Noise is a localized phenomenon typically associated with human activities and habitations. Sound is a particular auditory effect produced by a given source and is measured with instruments that record instantaneous sound levels in decibels (dB). A-weighted sound level measurements (dBA) are used to characterize sound levels that can be sensed by the human ear. A-weighted denotes the adjustment of the frequency content of a sound-producing event to represent the way in which the average human ear responds to the audible event.

The Noise Control Act establishes coordination of federal noise-control activities and provides information to the public regarding noise emissions (Stantec 2019).

### *4.5.1 Existing Conditions*

Noise sources in and near the project area include commercial and recreational boats, aircraft, and industry-related noise (such as oil and gas facility operation). The project area does not have any noise-sensitive institutions, structures, or facilities. Noise levels in the project area are typical of commercial oil and gas activities and is limited to that generated by oil and gas platforms, service vessels, and other vessels passing through the area. Recreational boaters contribute minimally to the noise in the area (Stantec 2019).

In recent years, concerns have been raised regarding potential impacts of anthropogenic underwater noise on aquatic organisms. Underwater sounds could potentially interrupt or impair communication, foraging, migratory, and other behaviors of aquatic organisms. Because of this concern, field investigations characterized underwater sounds typical of bucket, hydraulic cutterhead, and hopper dredging operations (Dickerson et al. 2001). Cutterhead dredging operations were relatively quiet compared to other sound sources. Hopper dredges produced more intense sounds similar to those generated by comparable-sized vessels. Bucket dredging created a complex spectrum of sounds, different from cutterhead or hopper dredges. Hopper dredges create two relatively continuous sources of noise: large commercial vessel engine and propeller sounds and drag head sounds when contacting the substrate (Stantec 2019).

Source levels reported for marine dredging operations ranged from 160 to 180 dB re1uPa @ 1m for 1/3 octave bands with peak intensity between 50 and 500 Hz. Underwater sounds produced by each dredge type are influenced by factors including substrate type, geomorphology of the waterway, site-specific hydrodynamic conditions, equipment maintenance status, and dredge plant operator skill (Dickerson et al. 2001). Peak source levels from dredging-induced sounds do not exceed Level A Criterion (190 dB re 1uPA rms) for injury/mortality to marine mammals during any aspect of dredging operations (Reine, et al. 2014; Stantec 2019).

### *4.5.2 Alternative 1: No Action Alternative*

No Effects from noise would be expected from implementation of the No Action Alternative and existing conditions would persist.

### *4.5.3 Alternative 2: WBH Repair*

Short and long term, direct, minor adverse effects to ambient noise conditions would be expected in association with dredging, pumping, transport, deposition, and ship/machinery operations during implementation of TE-0176. Effects would be expected to be minor because the project area is characterized by ongoing noise associated with existing oil and gas platforms, service vessels, and other vessels already passing through the area. Recreational boaters also contribute minimally to noise in the area.

Noise associated with WBH construction would result from barge transport, unloading and transfer operations. Noise will be generated by equipment such as dredge vessels, barges, bucket cranes, and bulldozers. Bulldozers and graders would be used for beach and dune construction (Stantec 2019).

Dredging noise in the borrow areas could result in localized temporary displacement of bird populations. Dredging noise could also affect marine mammals, sea turtles, and fishery organisms in areas of project operations. Possible effects vary depending on a variety of internal and external factors and can be divided into masking (obscuring of sounds of interest by interfering sounds, generally at similar frequencies), response, discomfort, hearing loss and injury (Thomsen et al. 2009). Direct effects could include discomfort, hearing loss, and injury. Deeper water operations

can propagate sound over greater distances than activities in confined nearshore areas (Hildebrandt 2004) (Stantec 2019).

Noise associated with dredging is predominately low frequency (below 1 kHz). Estimated source sound pressure levels during dredging ranges between 168 and 186 dB re one µPa at 1 m and is generally continuous. Studies to date have been limited and undertaken on a few dredges at a limited number of sites. The limited available data indicates that dredging is not as noisy as seismic surveys, pile driving, and sonar; but it is louder than most shipping, offshore wind turbines, and drilling. Dredging to create new waterways or channels or to extract marine aggregates produces broadband and continuous sound, mainly at lower frequencies (Thomsen et al. 2009, Stantec 2019).

## 4.6 Water Resources

Water resources include groundwater, surface water, wetlands, and floodplains. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes.

### *4.6.1 Surface Water*

Surface water is any body of water above ground, including streams, rivers, lakes, wetlands, reservoirs, and creeks. The Gulf of Mexico is a surface water. Approximately 74 percent of all the water used in the United States in 2015 came from surface-water sources.

#### *4.6.1.1 Existing Conditions*

The WBH Project Area is within the Gulf surface water body.

#### *4.6.1.2 Alternative 1: No Action Alternative*

Long term, indirect, minor adverse effects to surface water associated with water quality as discussed in Section 4.4.2 would be expected under the No Action Alternative. No effects to surface water resources would occur from water use.

#### *4.6.1.3 Alternative 2: WBH Repair*

Short term, direct, minor adverse effects to surface water associated with water quality as discussed in Section 4.4.3 would be expected under the Preferred Action Alternative. No effects to surface water resources would occur from water use.

### *4.6.2 Groundwater*

Groundwater is water underground in saturated zones beneath the ground surface and it includes, but is not limited to, groundwater resources that constitute drinking water supplies and the rocks or sediments which it moves through.

#### *4.6.2.1 Existing Conditions*

Groundwater in the Project Area is associated with the Gulf Coast Regional Aquifer System as described in Water-Resources Investigations Report 89-4071 (Williamson et al. 1990). The thickness of the aquifer system increases toward the Gulf in a general wedge shape and has a thickness of more than 17,000 ft near the coastline of southeastern Louisiana. The shallower parts of the aquifer contain freshwater, but the deeper and offshore parts mostly contain highly mineralized water. The aquifer system is comprised primarily of fine- and coarse-grained sediments and extends offshore beneath the Gulf truncating at the edge of the Continental Shelf (Williamson et al. 1990).

#### *4.6.2.2 Alternative 1: No Action Alternative*

No effects to groundwater resources would occur from implementing the No Action Alternative.

#### *4.6.2.3 Alternative 2: WBH Repair*

No effects to groundwater resources would occur from implementation of the Preferred Alternative. None of the actions associated with the repair of the WBH would affect the quality or quantity of groundwater resources in the Project Area.

### *4.6.3 Wetlands*

Wetlands are areas where the frequent and prolonged presence of water at or near the soil surface drives the natural system including the kind of soils that form, the plants that grow and the fish and/or wildlife communities that use the habitats. Swamps, marshes, and bogs are well-recognized types of wetlands.

Coastal and tidal wetlands are primarily associated with estuaries where sea water mixes with fresh water to form an environment of varying salinities. Many shallow coastal areas are unvegetated mud flats or sand flats. Some grasses, sedges, and rushes have adapted to an environment of varying salinities and form the tidal salt marshes that are found along Gulf coastal areas. Saltwater swamps form where mangroves and other salt-loving shrubs and/or trees dominate the habitat. Some tidal freshwater wetlands form beyond the upper edges of tidal salt marshes where the influence of saltwater ends.

Jurisdictional wetlands are defined by the USACE Wetlands Delineation Manual (USACE 1987) as: those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Most jurisdictional wetlands (i.e., those wetlands protected by the CWA) meet three criteria: a prevalence of wetland-associated vegetation, hydric (wetland type) soils, and wetland hydrology.

EO 11990, Protection of Wetlands, requires minimization of the destruction, loss or degradation of wetlands and encourages preservation and enhancement of their natural and beneficial values. EO 11990 requires federal agency actions to avoid, to the extent possible, adverse impacts on

wetlands and to avoid supporting actions affecting wetlands when there are practicable alternatives to implementing the proposed project. FEMA-funded projects in or near wetlands may require coordination with USACE, EPA and the applicable State Water Quality Agency. Any action located in or near wetlands can result in compliance/permitting requirements.

#### *4.6.3.1 Existing Conditions*

No vegetated marsh habitat is currently located within with the TE-0176 Project Area. Restoration of the WBH under TE-0143/0118 was approximately 80 percent completed when Hurricane Zeta occurred. No proposed vegetation planting for the dune, marsh, or intertidal marsh habitat restoration/creation had been completed when the storm occurred (CECI 2022).

#### *4.6.3.2 Alternative 1: No Action Alternative*

Long term, direct and indirect, minor adverse effects to coastal wetlands would be expected from implementation of the No Action Alternative. Barrier islands/headlands provide protection to adjacent and coastal wetlands by dampening currents and storm surges which helps to reduce erosion and loss of these habitats. Barrier islands/headlands also help to regulate mixing of saline Gulf waters with more brackish waters influencing coastal wetlands. Increased salinity in wetlands could kill vegetation associated with interior coastal marsh habitats and result in possible conversion to unvegetated or less stable marshes. Over time, those habitats could become revegetated with more saline tolerant species; however, if water salinity does not stabilize, the habitat could remain unvegetated, more susceptible to erosion, and endure an increase in shoreline/land loss rate.

#### *4.6.3.3 Alternative 2: WBH Repair*

Long term, direct and indirect, moderate beneficial effects to coastal wetlands would be expected to occur from implementation of the Preferred Alternative. Marsh habitats were in the process of being constructed/restored as part of Project TE-0143/0118 when Hurricane Zeta occurred. Habitat construction that had occurred up to that point was lost. Implementation of the Preferred Alternative under TE-0176 will result in a direct beneficial effect from the creation of 1,641.1 acres of dune, vegetated marsh platform and intertidal marsh habitat improving the GEFF of the WBH. Long term, indirect, beneficial effects to coastal wetlands would be expected because reconstruction, stabilization, and improvement of the GEFF of the WBH would reduce coastline erosion and prevent erosion of in-shore wetlands. Reconstruction of the WBH would also help return coastal salinity regimes to conditions prior to the loss of the WBH, benefiting vegetated coastal wetland habitats.

### *4.6.4 Floodplains*

EO 11988 (Floodplain Management) requires federal agencies to avoid or minimize development in the floodplain except when there are no practicable alternatives. A floodplain is defined as the lowland and relatively flat areas adjoining inland and coastal waters including, at a minimum, that area subject to a one percent or greater chance of flooding in any given year. FEMA complies with EO 11988 through 44 CFR Part 9, Floodplain Management and Protection of Wetlands. FEMA

uses Flood Insurance Rate Maps (FIRM) created by the National Flood Insurance Program (NFIP) as the best available flood data.

#### *4.6.4.1 Existing Conditions*

The WBH is located in Flood Zone V (Coastal Floodplain) based on the FIRM Panel 22057C0975E dated June 16, 2021. No flood zone data is available for the borrow areas.

#### *4.6.4.2 Alternative 1: No Action Alternative*

No effects to Floodplains would be expected from implementation of the No Action Alternative. Under the No Action Alternative, the WBH would not be repaired/restored, and therefore no development would occur in the Flood Zone V.

#### *4.6.4.3 Alternative 2: WBH Repair*

Long term, indirect, minor beneficial effects to Floodplains and associated barrier islands/headlands would occur through implementation of the Preferred Alternative. The 2019 EA examined seven alternatives to the Preferred Alternative including the No Action Alternative, which were determined not practicable. These alternatives were considered in detail during a regional analysis for ecosystem restoration on Calumet Island, Casse Tete Island, East Timbalier Island and WBH. The alternatives varied in magnitude of beach, dune and marsh habitats restored in various areas. Variations ranged from beach and dune width and height; marsh width, height, and length; and density of sediment placed. Various combinations of template scales and island restoration alternatives were evaluated at 5-year intervals for a 20-year project life (Stantec 2019). Section 2.2 (Alternative Analysis) of the 2019 EA details the alternatives that were considered, and Appendix B of the 2019 EA provides an Alternatives Analysis Report.

Completion of the 8-step process, as outlined in 44 CFR Part 9, resulted in a determination that there is no practicable alternative to building TE-0176 in the floodplain. The Preferred Alternative satisfies most qualitative benefits, including but not limited to: creating and sustaining habitat, achieving the Coastal Master Plan (CMP) objectives, restoring barrier islands/headlands in their current footprints, and achieving synergy with other projects (completed and planned) within the system. Socioeconomic factors, which include promoting a viable working coast by protecting existing infrastructure and/or coastal activities, were also considered. In addition, WBH provides sanctuary for several threatened species of birds, particularly Piping Plover and Red Knot, and provide stopover habitat for protected migratory birds.

Based on the FEMA FIRM Panel Number 22057C0975E (effective date June 16, 2021, accessed on May 18, 2023, at https://msc.fema.gov/portal/home), WBH is located within a Coastal High Hazard Area (CHHA), more specifically identified as a V Zone. FEMA defines a V Zone as a coastal area having a one percent or greater chance of flooding with an additional hazard associated with storm waves.

Prior to construction, coordination with the local floodplain administrator will occur to mitigate any environmental, safety and/or health risks posed to the floodplain and its coastal occupants.

The State of Louisiana must obtain, and abide by, the necessary permits and their conditions preceding construction activities to minimize any adverse effects. All coordination pertaining to these activities should be retained as part of the project file in accordance with the respective PA grant program instructions. Construction Best Management Practices (BMPs) will be included in daily construction activities.

An EO 11988/11990 Floodplain Management/Wetland – Checklist (44 CFR Part 9) (8-Step Review) was conducted as part of the Impacts Analysis for Section 4.6.4 of this SEA. The completed 8-Step Review is included in Appendix C of this SEA. FEMA has determined that constructing TE-0176 in the V Zone will result in minimal impacts to and within the floodplain, provided applicable BMPs are followed.

## 4.7 Climate

Climate is the description of the long-term pattern of weather in a particular area and is typically characterized as the average weather for a particular region and time period.

### *4.7.1 Existing Conditions*

The climate of coastal Louisiana is influenced by Gulf waters and winds. Those maritime conditions support a humid subtropical climate, with long, hot, humid summers, and mild, abbreviated winters (USACE 2004). Summer temperatures average approximately 81.0° Fahrenheit (F). Winters are typically mild, with average temperatures of approximately 52.0°F, however short periods of colder temperatures may be induced by dry continental arctic air (Stantec 2019).

Maritime tropical air masses typically move inland and mix with continental air masses, producing abundant rainfall, impeding winter air mass passage, and reducing extreme inland temperatures. Localized rain events, which consist of severe summer storms, and sporadic, high-energy winter disturbances, are typically controlled by these offshore unstable air masses and winds. The average rainfall in the coastal zone of Louisiana is approximately 54 inches per year (Stantec 2019).

Coastal Louisiana is a vulnerable target for tropical waves, tropical depressions, tropical storms, and hurricanes generated in the tropical Atlantic, Caribbean Sea, and Gulf. Tropical storms make landfall on the Louisiana coast on an average of two times every three years and a hurricane makes landfall every 2.8 years (Roth 2010). The shallow nature of the sea floor approaching the WBH facilitates storm surge flooding of coastal areas, which increases beach erosion and island wash over. As tropical storms approach or pass by the coastline, the counterclockwise (cyclonic) wind circulation can drive waves and surges that can impact both the Gulf-facing and back-barrier shorelines. In addition to storm surge flooding, the post-storm retreat can erode tidal inlet shores and potentially result in breach formation (Stantec 2019).

Hurricane Zeta made landfall in Louisiana, approximately 25 miles west of the TE-0143/0118 Project, as a Category 3 hurricane on October 28, 2020, when work on the WBH component of

TE-118 was 80 percent complete. Hurricane Zeta resulted in major damages to the TE-0143/0118 work that had been completed.

### *4.7.2 Alternative 1: No Action Alternative*

The No Action Alternative would not have any direct or indirect effects on the climate and existing conditions would persist.

### *4.7.3 Alternative 2: WBH Repair*

Implementation of Alternative 2 would not have any direct or indirect effects on the climate and existing conditions would persist.

Bio-Physical Environment

## 4.8 Coastal Barrier Resources System (CBRA)

The CBRA (PL 97-348) restricted development in the Coastal Barrier Resources System (CBRS) in an effort to protect the system and prevent future flood damage. As codified in 44 CFR Part 206.340, it shall be the policy of FEMA to achieve the goals of CBRA in carrying out disaster relief on units of the CBRS. It is FEMA's intent that such actions be consistent with the purpose of CBRA to minimize the loss of human life, the wasteful expenditure of Federal revenues, and the damage to fish, wildlife and other natural resources associated with coastal barriers along the Atlantic and Gulf coasts and to consider the means and measures by which the long-term conservation of these fish, wildlife, and other natural resources may be achieved under the Stafford Act. Generally, no new expenditures or financial assistance may be made available under authority of the Stafford Act for any purpose within the CBRS. However, after consultation with the USFWS, FEMA may make disaster assistance available within the CBRS for several excepted actions, provided such assistance is consistent with the purposes of CBRA. Because TE-0176 involves repair of facilities for the management, protection and enhancement of fish and wildlife resources and habitats, including but not limited to, stabilization projects for fish and wildlife habitats, and repair of nonstructural projects for shoreline stabilization that are designed to mimic, enhance, or restore natural stabilization systems, it is excepted from the expenditure prohibition by 44 CFR Part 206.345(b)(5,6).

The CBRS is a system of protected coastal areas that includes ocean-front land, the Great Lakes, and Other Protected Areas (OPAs). The seaward side of a CBRS unit includes the entire sand-sharing system, including the beach and nearshore area. The sand-sharing system of coastal barriers is normally defined by the 30-ft bathymetric contour. Coastal barriers serve as important buffers between coastal storms and inland areas, often protecting properties on land from greater flood damage. Coastal barriers also provide protective habitats for aquatic plants and animals.

### *4.8.1 Existing Conditions*

The WBH portion of the TE-0176 Project Area is within or adjacent to CBRS Timbalier Bay units S04/S05. The borrow areas for TE-0176 located on Ship Shoal are in the offshore area defined by the 30-ft contour within CBRS units S05/S06.

### *4.8.2 Alternative 1: No Action Alternative*

Long term, direct, moderate adverse effects to CBRS Timbalier Bay units S04/S05 would be expected under the No Action Alternative. Because repair of the WBH would not occur, erosion of land associated with Timbalier Bay units S04/S05 and the remaining land area that was restored as part of TE-0143/0118 and TE-0052 would be eventually lost. Because dredging would not occur in the borrow areas, no effects would occur to those locations in CBRS units S05/S06.

### *4.8.3 Alternative 2: WBH Repair*

Under 16 USC 3504(a)(3) if financial assistance is statutorily provided, any project to prevent the erosion of, or to otherwise stabilize, any inlet, shoreline, or inshore area on CBRS units numbered S01 through S08 and LA-07 for purposes other than encouraging development is statutorily exempt from CBRA Consultation and CBRA's federal financial assistance prohibition. WBH is in or adjacent to CBRS Units S04/S05 and the borrow areas are in the offshore area defined by the 30-ft contour offshore of CBRS Units S05/S06.

Regardless, long term, direct, moderate beneficial effects to CBRS Timbalier Bay Units S04/S05 would be expected under the Preferred Alternative. Repair of the WBH would restore the GEFF of the portion of the CBRS area that has been lost to erosion since completion of TE-0052 and additional WBH area lost because of Hurricane Zeta. Repair of the WBH would also provide protection to adjacent CBRS areas associated with Timbalier Bay Unit S04. Appendix B includes agency coordination associated with CBRS Timbalier Bay Unit S04.

## 4.9 Vegetation Resources

Vegetation in barrier island/headland complexes is an important factor in maintaining the GEFF of those islands/headlands because it stabilizes beach and dune sediment, assists in dune-building by trapping aeolian sand, stabilizes marsh soil against wave action, and builds marsh areas by trapping over-washed sediment. Vegetation provides habitat for resident wildlife, and shelter and foraging habitat for migratory birds. Vegetative detritus is an important component of the estuarine food chain for planktonic fish, invertebrate larval and juvenile stages, foraging migratory birds, and other detritus-feeding organisms (Stantec 2019).

### *4.9.1 Existing Conditions*

Vegetation that occurred on land in the WBH Project Area prior to Hurricane Zeta was generally characterized by marsh hay cordgrass (*Spartina patens*), panicum (*Panicum* sp.), saltgrass (*Distichlis spicata*), and black mangrove (*Avicennia germinans*) (Stantec 2019). Hurricane Zeta caused major erosion on the WBH and most of the existing vegetative resources were lost.

No characterization of potential submerged aquatic vegetation (SAV) in the WBH Project Area was found. However, SAV communities occur extensively in shallow coastal waters in the northern Gulf (Carter, J., Merino, J.H., Merino, S.L. 2009 in DeMarco et al. 2018). The primary environmental conditions driving SAV presence or absence are light availability, physical disturbance from wind and waves (exposure), and salinity (Bornette, G., Puijalon, S., 2011 in DeMarco et al. 2018). Water depth, total suspended solids, turbidity, and epiphytes can alter light availability to SAV. Generally, as light availability decreases or exposure increases, the ability for SAV species to colonize and persist decreases. SAV species are not typically located at depths greater than 2 m (6.5 ft) in Louisiana coastal waters (Cho and Poirrier 2005a; Merino et al. 2009 in DeMarco et al. 2018). No SAV is known within the dredge borrow areas (Stantec 2019).

### *4.9.2 Alternative 1: No Action Alternative*

Long term, direct, minor adverse effects to vegetation would be expected from implementation of the No Action Alternative. Terrestrial vegetation that is still present on WBH would be lost over time as the remainder of the headland continues to erode.

No effects to vegetation at the borrow sites would be expected from implementation of the No Action Alternative. No SAV is expected to occur in the borrow areas because of the retrieval depth of the borrow sediments.

### *4.9.3 Alternative 2: BWH Repair*

Long term, direct, beneficial effects to terrestrial vegetation and short term, indirect negligible adverse effects to SAV would occur from implementation of the Preferred Alternative. The Preferred Alternative would create approximately 1,641.1 acres of vegetated beach, dune, and intertidal marsh habitats. The newly created dune and marsh platforms will be planted with native vegetation, providing valuable habitats for wildlife for shelter, nesting, feeding, roosting, cover, nursery, and other life requirements. TE-0176 would restore and rehabilitate the GEFF of dune, supratidal and intertidal vegetated coastal barrier habitats and reduce conversion of those habitats to open water habitat.

Long term, indirect, beneficial effects to vegetation would occur. Beneficial effects to interior vegetated marsh areas north of the TE-0176 Project area would be expected because the repaired and vegetated dune, beach, and marsh habitats on the WBH would provide a more robust marine-estuarine geomorphologic boundary between open Gulf waters and the coastal shoreline.

Short term, indirect negligible adverse effects to SAV in water adjacent to the TE-0176 working areas could occur as a result of increased turbidity during construction. Impacts associated with reduced light and settling sediments could adversely affect SAV during TE-0176 construction. Those effects would be short term and SAV existing in the area would be expected to recover/reestablish following the completion of project construction.

## 4.10 Benthic Resources

Benthic animals are directly or indirectly involved in most of the physical and chemical processes that occur in estuaries (Day et al. 1989). Some epibenthic organisms, such as oysters and mussels, provide commercial and recreational fisheries as well as create oyster reef habitats used by marine and estuarine organisms. Benthos generally includes the entire bottom community and its immediate physical environment (Day et al., 1989 and Stantec 2019).

Substrate is the most crucial factor in the distribution of benthic fauna. Densities of faunal organisms increase with sediment particle size (Defenbaugh 1976), although the distribution is also influenced by temperature, salinity, depth, and distance from shore (Defenbaugh 1976). Less important factors include illumination, food availability, currents, tides, and wave shock. The density of offshore infauna is generally greater during the spring and summer than in the winter (Brooks 1991 and Stantec 2019).

### *4.10.1 Existing Conditions*

Strand biota commonly seen on sandy Gulf beaches are not residents but are transient offshore fauna (Britton and Morton 1989). Three groups of strand biota (bottom dwelling, flotsam dwelling, and sargassum-associated) are carried onto the upper beach by high tides and storm waves (Stantec 2019).

Two natural environmental perturbations that occur over the Louisiana continental shelf and threaten the South Pelto Lease Block and Ship Shoal benthic communities are anoxic to hypoxic bottom conditions and tropical cyclones. Conditions change annually from anoxic to hypoxic with inconsistent intensities and ranges (Rabalais et al. 1993). On average, tropical storms make landfall on the Louisiana coast on an average of two times every three years and a hurricane makes landfall every 2.8 years; these storms vary in intensity (Roth 2010 and Stone 2000). It can take from one to two years for the benthic communities to recover from these events (Baker et al. 1981 and Stantec 2019).

Ship Shoal is a high-relief subaqueous shoal composed of fine sand. The diversity of benthic macrofauna on Ship Shoal is high and the community structure differs from the surrounding deeper and muddier environments (Stone et al. 2009). The macro benthic community on Ship Shoal has high biomass (average of 26.7 g/m2) and high species diversity (161 species) (Dubois et al. 2009). Species diversity and total abundance significantly increase with decreasing sediment grain size and increasing bottom water dissolved oxygen. Section 3.2.2.1 (Benthic Resources) of the 2019 EA provides a more in-depth discussion of benthic resources in the Project Area.

### *4.10.2 Alternative 1: No Action Alternative*

Long term, direct, minor adverse effects to benthic resources would be expected under the No Action Alternative. Eventual loss of the WBH that remained following Hurricane Zeta would reduce and ultimately eliminate the ecological benefits it provided to the estuarine faunal community, which includes available nutrients and detritus. Adjacent wetlands to the north of the TE-0176 Project Area will also eventually suffer a reduction in the ecological benefits they provide to the resources of Terrebonne Basin. Over time, this loss of the barrier island and estuarine

habitats could lead to the conversion of primarily estuarine-dependent benthic species assemblages to more marine-dominated and open water benthic species assemblages.

No effects to the sediment borrow areas would be expected under the No Action Alternative.

### *4.10.3 Alternative 2: WBH Repair*

Short term, direct, minor adverse effects to Benthic Resources would be expected under the Preferred Alternative. The primary impact-producing factor affecting benthic resources would be from mechanical disturbance of the sea bottom. It would be expected to take two to three years for the dredged area to recover to pre-Project conditions. Physical disturbances at the sand borrow areas include disruption of the sea bottom by sand removal, suspension of fine-grained sediment at the bottom and in a surface dredge plume, and dispersion and persistence of turbidity.

Removal of sand resources can expose underlying sediment and change the sediment structure and composition of a borrow area, altering its suitability for burrowing, feeding, or larval settlement for some benthic organisms. Decreases in mean grain size and increases in silt and clay in borrow sites can follow dredging (NRC 1995). Changes in sediment composition can prevent recovery to an assemblage like that which occurred in the borrow area prior to dredging and could affect the nature and abundance of food organisms for commercial and recreational fishery stocks (Coastline Surveys Limited 1998; Newell et al. 1998).

Ship Shoal is about 3 m (10 ft) deep in the shallowest areas and is surrounded by deeper waters. As a result, the borrow area may serve as a fish refuge from hypoxic conditions. Dredge activities could reduce the value of the borrow area as a refuge for benthic fauna from hypoxia as a result of a reduction in shoal elevation or the creation of depressions which could increase the possibility of hypoxic conditions at the dredged sites. Dredged areas on Ship Shoal will be relatively small compared to the surface area of the entire shoal and the duration of stagnant or poorly oxygenated water in dredged depressions or swales would be expected to be temporary.

Removal of sediment from the borrow areas can alter seabed topography, creating pits, trenches, or craters that may refill rapidly or remain persistent for long periods. Borrow areas can remain well defined eight years after dredging. In general, shallow dredging over large areas causes less harm than small but deep pits, particularly pits opening into sediment layers with different characteristics (Stantec 2019).

Deep pits, greater than 3 m (10 ft), can harm bottom communities. Deep borrow areas can reduce bottom current velocities, resulting in deposition of fine particulate matter which can change the biological assemblage. Reduced bottom circulation in deep dredge pits can decrease dissolved oxygen to hypoxic or anoxic levels and increase hydrogen sulfide levels (NRC 1995). Summer hypoxic zones in the borrow areas can worsen this potential problem. Bottom areas projected to be disturbed in the proposed borrow areas are on the order of hundreds of acres, and dredge areas are expected to be broad enough to allow current flow to follow bottom contours. This should prevent hypoxic water from being trapped in the borrow sites.

Dredging causes suspension of silt and clay at the drag head. This fine-grained sediment increases turbidity at the bottom and in the water column while it disperses and drifts with the current. Increased turbidity interferes with the food gathering process of filter feeders and organisms that feed by sight. Suspended bottom sediment also decreases light penetration and the amount and wavelengths of light that reaches the bottom resulting in a decrease in photosynthetic activity. Suspension and dispersion of sediment can also cause changes in sediment and water chemistry, as nutrients and other substances are released from the substrate and dissolved during the dredging process. Suspended sediment concentrations in near bottom waters can be elevated up to several hundred meters laterally from the drag head (LaSalle et al. 1991).

Sediment on the crest areas of Ship Shoal and in the proposed borrow areas is composed primarily of clean sand (Kulp et al. 2001). High releases of nutrients during dredging would not be expected. The turbidity plume from dredging in the sandy substrates is expected to be relatively low. Dispersion should be localized and primarily in the immediate vicinity of the borrow areas. The borrow areas normally experience very high turbidity levels due to their proximity to the Atchafalaya and Mississippi Rivers which normally have turbid discharges. Turbidity from dredging activity in the borrow areas would likely be similar to conditions normally experienced by the benthos. Impacts should be evaluated in terms of average background conditions as well as occasional high-level disturbances associated with storms, floods, hypoxia, or trawling (Herbich 1992). Physical disturbance of the bottom and resulting biological impacts from dredging are similar to effects caused by storms, but at a much smaller spatial scale (Stantec 2019).

Borrow areas can be recolonized by the transport of larvae from neighboring populations by currents and subsequent growth of the larvae to adults; immigration of motile species from adjacent areas; organisms in bypassed areas or that slump from the sides of borrow pits; or the return of undamaged organisms from the dredge plume. The rate of recolonization depends on the size of the pool of available colonists (Bonsdorff 1983, Hall 1994). Many benthic species have distinct peak periods of reproduction and recruitment. Larval recruitment and adult migration are the primary recolonization mechanisms so biological recovery from physical impacts generally should be most rapid if dredging is completed before seasonal increases in larval abundance and adult activity (Herbich 1992).

The general pattern of succession of marine benthic species following cessation of dredging begins with initial recolonization. Initial recolonization occurs relatively rapidly by small opportunistic species that reach peak population densities within months of the availability of a new habitat. The population density of the initial colonizers declines as adult species migrate into the disturbed area. The transitional period and assemblage with higher species diversity and a wide range of functional types may last for years, depending on environmental factors. Major changes in species assemblages and community composition usually occur shortly after dredging, resulting in a different type of community. The number of individuals, species, and biomass of benthic infauna may approach pre-dredging levels within one to three years after dredging in fine-grained sand, but recovery of community composition and trophic structure may take longer. In general, recovery times from dredging of six to eight months are characteristic for many estuarine muds, two to three years for sand and gravel, and five to ten years as the deposits become coarser (Coastline Surveys Limited 1998, Newell et al. 1998).

The recovery time for benthic assemblages after dredging also depends largely on the degree and duration of the sediment alteration (Van Dolah 1996). Recolonization success and recovery are also affected by compaction and stabilization processes involving complex interactions between particle size, water currents, waves, and biological activities of the benthos following sediment deposition (Oakwood Environmental Ltd. 1999). Perturbations to infaunal communities in dredged areas are generally considered negligible because burrowing organisms recolonize rapidly (Wilber and Stern 1992). The borrow area is bordered by oil and gas pipelines that will restrict dredging activity in buffer areas around the structures. Tracts of undisturbed sand would be bypassed in areas set back from pipelines. These undisturbed areas of seed sand harbor native organisms that would furnish larvae for recolonization and/or may immigrate to the unpopulated dredged sites. Adjacent areas of seabed outside the borrow area have very similar grain-size characteristics and would provide a source of larvae and juveniles for initial benthic infauna recolonizers and transitional assemblages that follow (Stantec 2019).

Short term, indirect, minor adverse effects to Benthic Resources in proximity to dredging areas would be expected under the Preferred Action Alternative. Impacts from suspension and deposition of sediments can be detrimental or beneficial. Deposition of sediment can smother and bury benthic fauna, although some organisms are able to migrate vertically to the new surface. Dredging effects can extend to nearby areas (McCaully et al. 1977, Johnson and Nelson 1985). Conversely, biodiversity of benthos can increase downstream of the dredge site (C-CORE 1995). In some areas, population density and species composition of benthic invertebrates increased rapidly outside dredging sites and the level of enhancement decreased with increasing distance from the dredged area. (Stephenson et al. 1978, Jones and Candy 1981, Poiner and Kennedy 1984). The enhancement was attributed to the release of organic nutrients from the dredge plume (Ingle 1952, Biggs 1968, Sherk 1972, Oviatt et al. 1982; Coastline Surveys Limited 1998; Newell et al. 1998).

### 4.11 Plankton Resources

The three types of plankton are bacterioplankton, phytoplankton, and zooplankton (Knox 2001). Bacterioplankton are the bacterial component of plankton and carry out a broad array of essential chemical transformations critical to the ecological function of aquatic systems. Bacteria are the most important decomposers of organic matter. Bacteria can fix nitrogen from dinitrogen gas and are the only organisms capable of converting it to the inert dinitrogen form (i.e., denitrification). Bacteria also transform sulfur, iron, manganese, mercury, and many other elements in aquatic systems (Stantec 2019).

Phytoplankton are single-cell algae that drift with the motion of water. Diatoms and dinoflagellates are the dominant groups of phytoplankton. The species composition of a given phytoplankton community is a function of various environmental factors including salinity, turbidity, nutrients, turbulence, and depth (Day et al. 1989). Phytoplankton provide a major, direct food source for animals in the water column and sediment. They are responsible for at least 40 percent of photosynthesis and have an important role in nutrient cycling (Day et al. 1989). Large scale blooms (red and brown tides) can lead to hypoxia and cause fish kills (Stantec 2019).

Zooplankton are faunal components of the plankton and include small crustaceans, jellyfishes and siphonophores; worms; mollusks; and egg and larval stages of most benthic and nektonic animals (Rounsefell 1975). In most estuaries, zooplankton feed on phytoplankton and/or ingest detritus (Conner and Day 1987). Most zooplankton are filter feeders and the suspended detrital particles in the waters of the Terrebonne Basin are likely a major food source.

Physical factors affecting zooplankton populations include tidal flushing, inflow of fresh water carrying organic detritus, river discharge, water depth, tidal changes, turbidity, and dissolved oxygen (Conner and Day 1987). The distribution of zooplankton is mainly influenced by salinity (Bouchard and Turner 1976). Some zooplankton are euryhaline, others have distinct salinity preferences. Salinity may be the primary control of the number of species, and temperature, competition, and predation may control the number of individuals (Perret et al. 1971). Section 3.2.2.2 (Plankton Resources) of the 2019 EA for Project TE-0143/0118 provides a more in-depth discussion of plankton resources in the TE-0176 Project Area.

### *4.11.1 Existing Conditions*

In the Barataria Basin, the zooplankton community is dominated by copepods of the genus Acartia (Gillespie 1971 1978; Bouchard and Turner 1976; Conner and Day 1987). The copepod *Acartia tonsa* is the dominant member of the zooplankton community throughout Louisiana (Perret et al. 1971). Zoeae (a larval stage of some crustaceans) can be a large component of the meroplankton. Fish eggs and larvae from Gulf menhaden (*Brevoortia patronus*), bay anchovy (*Anchoa mitchilli*), inland silverside (*Menidia beryllina*), and striped mullet (*Mugil cephalus*) are found throughout the Barataria Basin (Conner and Day 1987). In some Louisiana waters, zooplankton are dominated by Harris mud crab (*Rhithropanopeus harrisii*).

The pelagic offshore plankton contain primary producers (phytoplankton and bacteria and secondary producers (zooplankton). Offshore zooplankton consists of holoplankton including protozoans, gelatinous zooplankton, copepods, chaetognaths, polychaetes, and euphausids and meroplankton including polychaetes, echinoderms, gastropods, bivalves, and fish larvae and eggs (DOI-MMS 2002).

The average algal biomass over Ship Shoal varies seasonally. Sediment algal biomass was highest in spring and summer when it exceeded that of the overlying water column over much of Ship Shoal (Stone et al. 2009). Light reaches the seafloor on Ship Shoal to stimulate the growth of benthic algae, year-round (Stone et al. 2009). The bottom benthic algae biomass is high, and the high proportion of diatoms (compared to settled phytoplankton) suggests that the benthic primary production may comprise most of the primary production on Ship Shoal (Stone et al. 2009). Section 3.2.2.2 (Plankton Resources) of the 2019 EA for Project TE-0143/0118 provides a more in-depth discussion of plankton resources in the Project Area.

### *4.11.2 Alternative 1: No Action Alternative*

Long term, direct and indirect, minor adverse effects to the estuarine faunal community resulting from a reduction in the ecological benefits that plankton resources provide, would be expected under the No Action Alternative. Eventual complete loss of the WBH and associated wetland

habitats along with the loss of adjacent wetlands could lead to the conversion of primarily estuarine-dependent plankton species assemblages to more marine-dominant and open water plankton species assemblages. This conversion might alter the predator-prey balance by changing the makeup of the community of planktivorous fishes in adjacent coastal waters.

### *4.11.3 Alternative 2: WBH Repair*

Short term, direct, minor adverse effects to plankton could occur in association with mortality due to construction activities and the placement of fill to rebuild the WBH under the Preferred Alternative. During construction, there would also be a localized and short-term decrease in available dissolved oxygen and an increase in turbidity, temperature, and biological oxygen demand. Following construction and dredging operations, the area would return to ambient conditions and plankton would be expected to recolonize the area.

Short term, direct, minor adverse effects to plankton could also occur in association with mortality as a result of dredging in the borrow areas due to a temporary decrease in dissolved oxygen and an increase in turbidity, temperature and biological oxygen demand.

Long term, indirect, minor beneficial effects to plankton would be expected under the Preferred Alternative as a result of the conversion of the remaining heavily eroded WBH into beach, dune, supratidal, and intertidal habitats. Protection, creation, and nourishment of transitional barrier habitats would enhance and increase, to some level, aquatic productivity, and nutrient transformation functions in the localized area.

## 4.12 Fisheries

Fishery resources are comprised of myriad biological (e.g., plankton, fish, and mammal species), chemical (e.g., salinity, oxygen concentration), and physical (e.g., sediment type, oil and gas reserve, currents, space) attributes which can be further differentiated by quantity, quality, and relational attributes.

Populations of most major commercially important fish and invertebrate species have been declining throughout the TE-0176 Project Area. Only Spanish mackerel (*Scomberomorus maculatus*) populations have increased in the area (LCWCRTF and WCRA 1999, Saucier and Baltz 1993, Zimmerman and Minello 1984, Rozas and Odum 1987, Hettler 1989, Kneib 1991 Rozas 1992, Rozas and Reed 1993). Most of the economically important saltwater fishes and crustaceans harvested in Louisiana spawn offshore and then use estuarine areas for a nursery habitat (Herke 1971).

Fish species in the Gulf are generally temperate, with incursions of subtropical Caribbean fauna (DOI-MMS 2002). Seasonal distribution and abundance fluctuations of Gulf fishes are generally related to oceanographic conditions (Stantec 2019).

### *4.12.1 Existing Conditions*

Prior to Hurricane Zeta, aquatic habitats associated with the WBH included large expanses of shallow open water. The moderate- to high-salinity marine and estuarine waters and shoreline habitat associated with the WBH provided nursery, spawning, and foraging habitat for many estuarine-dependent commercially and recreationally important finfish and shellfish species. Habitats associated with the WBH included surf zone beach, back island low-energy zones including sand and mud flats or marsh habitats and intra-island ponds, lagoons, and meanders. Restoration of the WBH was approximately 80 percent completed under Project TE-0143/0118 when Hurricane Zeta occurred resulting in major damages to the restoration work that had been completed. Continuing erosion is further impacting the current Project Area. Section 3.2.3 (Fisheries) of the 2019 EA provides a description of habitats and fish species associated with aquatic habitats on and surrounding WBH prior to Hurricane Zeta.

The sand borrow areas support estuarine-dependent species such as white shrimp (*Litopenaeus setiferus*), brown shrimp (*Farfantepenaeus aztecus*) and spotted seatrout (*Cynoscion nebulosus*) fisheries as well as Federally managed species such as mackerels, snappers, groupers, billfishes, and sharks. Sand banks and the interiors of sand banks are important habitats for demersal fish in the Western Gulf (Brooks et al. 2003). Ship Shoal is a very productive ground for demersal fishes (Baker et al. 1981). The biomass of demersal fishes on Ship Shoal was found to be much higher than the biomass on the Louisiana continental shelf (Baker et al. 1981).

From April through October, Ship Shoal and much of the surrounding area form an important offshore spawning/hatching/foraging ground for a large segment of the Gulf of Mexico blue crab (*Callinectes sapidus*) fishery (Condrey and Gelpi 2010). Persistent concentrations of spawning, hatching, and foraging female blue crabs have been observed on Ship Shoal (Condrey and Gelpi 2010). Ship and Trinity Shoals appear to be the most important spawning/hatching/foraging grounds for blue crab, especially in August (Stone et al. 2009).

### *4.12.2 Alternative 1: No Action Alternative*

Long term, indirect, minor adverse effects to fisheries would be expected under the No Action Alternative. Nursery, spawning, and foraging habitats associated with the WBH would continue to be modified into more open water habitat as the remaining headland and associated habitats continue to erode.

No effects to the sand borrow areas would be expected under the No Action Alternative. Existing fisheries in the borrow areas would not be changed.

### *4.12.3 Alternative 2: WBH Repair*

Short term, direct, minor adverse effects and long term, indirect, minor beneficial effects to fisheries associated with the WBH would be expected under the Preferred Action Alternative. Placement of fill and construction activities associated with headland repair would disturb fisheries habitat during project implementation. Beneficial effects to fisheries would be expected following completion of Repair activities. Newly established habitat for nursery, spawning and foraging associated with Headland Repair would over time, be expected to be beneficial to fish species that utilized the habitats prior to Hurricane Zeta and previous headland loss due to erosion.

Short term minor adverse effects to fisheries associated with the sand borrow areas would be expected as a result of mechanical disturbance during dredging and the removal of sand from the areas. Mortality of fisheries resources such as crabs and other benthic species that are unable to move away from project activities would be expected. Other more mobile species would be expected to move away from and avoid direct impacts associated with collision or burial during dredging. Impacts to species could occur in association sediment plumes produced during dredging. More mobile species would be expected to move out of the areas during project activities. Removal of sand from the borrow areas would also disturb and remove benthic habitat features utilized by fisheries resources. Over time, following project implementation, the dredge areas would be expected to reestablish benthic characteristics suitable for fisheries species that utilized the borrow areas prior to project implementation.

## 4.13 Wildlife Resources

Wildlife resources refer to fish, wildlife, and their aquatic and terrestrial habitats. These resources are managed by the State of Louisiana for the benefit of all residents and visitors. Wildlife resources include all wild game animals, wild game birds, and aquatic animal life.

Over the last 10 to 20 years, dabbling ducks, wading birds, shorebirds, seabirds, furbearers, and alligators have experienced decreasing populations in eastern Terrebonne Basin because of marsh loss and their conversion to saltier marsh types. The greatest loss of coastal wetlands has occurred in the fresh and intermediate marshes of the Terrebonne Basin. Fresh and intermediate marshes and swamps in the Terrebonne Basin represent a major fall staging and wintering area for migratory waterfowl (USACE 2004). Duck populations in the Barataria and Terrebonne basins have also declined because of marsh loss and their conversion to saltier marsh types (Stantec 2019).

Louisiana's coastal zone supports 19 percent of the United States' winter population for 14 species of ducks and geese. The North American Waterfowl Management Plan identified coastal Louisiana as one of the most important regions for the maintenance of continental waterfowl populations in North America (USACE 2004).

### *4.13.1 Existing Conditions*

#### Herpetofauna

Two species of toads have been reported from Louisiana salt marsh and beach habitats, but they have not been documented on the barrier islands/headlands (Dundee and Rossman 1989, USFWS 2011).

#### Terrestrial Mammals

No wildlife surveys have been conducted in the WBH Project Area. Some mammals that may occur on land in proximity to the Project Area include raccoon (*Procyon lotor*), coyote (*Canis latrans*) and the exotic nutria (*Myocastor coypus*). Amphibians, reptiles, and terrestrial mammals would not be present in the borrow areas due to the lack of suitable habitat (Stantec 2019).

**Marine Mammals**

The bottlenose dolphin (*Tursiops truncates*) occurs throughout the estuaries and bays of the Gulf and is expected to potentially occur in the project area. NOAA Fisheries has identified a bottlenose community in the Terrebonne/Timbalier Bay area. The degree to which individual dolphins in the Project Area are migratory is not known. Throughout the Gulf, there is some evidence that dolphins move into more northerly bay systems in summer, and into more southerly systems in winter. The Atlantic spotted dolphin (*Stenella frontalis*) does not occur in inshore areas but is known to occur in nearshore shelf waters and could be present in proximity to the borrow areas (Stantec 2019).

The West Indian manatee (*Trichechus manatus*) is discussed in Section 4.15.5 of this SEA.

**Avian Communities**

The WBH Project Area is located at the bottom of the Mississippi Flyway, and birds from central and northern North America start to converge in the area in fall. Shorebirds begin arriving in mid-July and peak in September. Waterfowl migration begins in mid-August, and populations peak in December. Birds of prey and passerine birds also converge in Louisiana. Some stay all winter, but many stay only a few days before they move southward. The spring return of migrants starts in late February or early March and peaks in late April and early May. Most wading birds do not migrate from Louisiana (Conner and Day 1987). Birds that occur in the WBH Project Area can be divided functionally into swimmers, sea birds, waders, shore birds, birds of prey, and passerine birds (Stantec 2019).

Ducks are part of the swimmer functional group. Although most ducks prefer freshwater marshes and rarely use saline marshes, the marshes near the project area may provide habitat for the mottled duck (*Anas fulvigula*), which is the only duck that breeds in large numbers in the coastal marshes of Louisiana (Wicker et al. 1982). Over 12 other species of ducks could be found in the project area. Except for the mottled duck, all the game species of ducks are migratory winter residents. Section 3.2.5 (Avian Communities) of the 2019 EA provides a list of duck species that have potential to occur in the WBH Project Area. Other swimming birds that occur in saline habitats include the pied-billed grebe (*Podilymbus podiceps*), black-necked grebe (*Podiceps nigricollis*), snow goose (*Anser caerulescens*), and Canada goose (*Branta canadensis*) (American Ornithologists' Union 1983, as cited in Gosselink 1984).

Seabirds are most common along the barrier islands and inland bays of the Barataria-Terrebonne Estuary (Conner and Day 1987). A survey published in 1984 noted that colonies of black skimmers (*Rynchops niger*) and least terns (*Sterna antillarum*) were present (Gosselink 1984).

Over 18 species of wading birds some of which include the clapper rail (*Rallus crepitans*), yellow rail (*Coturnicops noveboracensis*), black rail (*Laterallus jamaicensis*), least bittern (*Lxobrychus exilis*), great blue heron (*Ardea herodias*), great egret (*Casmerodius albus*), snowy egret (*Egretta thula*) and white ibis (*Eudocimus albus*) have potential to occur in proximity to the project area (Gosselink 1984). Section 3.2.5 (Avian Communities) of the 2019 EA provides a list of wading birds that have potential to occur in the TE-0176 Project Area.

Shore birds are primarily winter visitors and occur on sand beaches and tidal mud flats in large numbers (Conner and Day 1987). Over twenty species of shore birds have potential to occur in the project area, some of which include black-bellied plover (*Pluvialis squatorola*), black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), greater yellowlegs (*Tringa melanoleuca*), lesser yellowlegs (*Tringa flavipes*), willet (*Catoptrophorus semipalmatus*), wimbrel (*Numenius phaeopus*), and several species of sandpipers (*Calidris* spp.) (Gosselink 1984). Section 3.2.5 (Avian Communities) of the 2019 EA for Project TE-118 provides a list of shore birds that have potential to occur in the WBH Project Area.

Birds of prey that occur in saline habitats and have potential to be present in the proposed Project area include the northern harrier (*Circus hudsonius*), American kestrel (*Falco sparverius*), merlin (*Falco columbarius*), peregrine falcon (*Falco peregrinus*) and short-eared owl (*Asio flammeus*) (Gosselink 1984).

Passerine birds that occur in saline habitats and have potential to occur in the proposed Project area include the tree swallow (*Tachycineta bicolor*), bank swallow (*Riparia riparia*), cliff swallow (*Hirundo pyrrhonota*), barn swallow (*Hirundo rustica*), sedge wren (*Cistothorus stellaris*), marsh wren (*Cistothorus palustris*), Savannah sparrow (*Passerculus sandwichensis*), sharp-tailed sparrow (*Ammodramus caudacuta*), and seaside sparrow (*Ammodramus maritimus*) (Gosselink 1984).

### *4.13.2 Alternative 1: No Action Alternative*

**Herpetofauna, Terrestrial Mammals**

No effects to amphibians, reptiles or terrestrial mammals would be expected under the No Action Alternative. Most of the West Belle Headland was washed away as a result of Hurricane Zeta. Available habitat for these species is currently very limited and most of these species would not be expected to currently utilize the area.

**Marine Mammals**

No effects to marine mammals in proximity to the West Belle Headland would be expected under the No Action Alternative. Existing conditions would not change.

**Avian Communities**

Long term, indirect, negligible adverse effects to coastal, marine, and colonial nesting birds would be expected under the No Action Alternative. There currently is very limited suitable habitat for these species in the project area. Without implementation of the TE-0176, fragmentation and loss of the remaining Headland would continue and any remaining habitat for avian species, with the possible exception of some species of wading birds, would be expected to disappear.

### *4.13.3 Alternative 2: WBH Repair*

**Herpetofauna, Terrestrial Mammals**

No direct impacts to amphibians, reptiles and terrestrial mammals would be expected as a result of implementing the Preferred Alternative. There currently is very limited habitat suitable for these species in the area of TE-0176. These species would not be expected to currently occur in the project areas.

Long term indirect beneficial effects to amphibians, reptiles and terrestrial mammals would be expected as a result of implementing the Preferred Alternative. The repair of the headland and associated beach, dune and marsh habitat would provide habitat for these species, and they would be expected to utilize the repair areas over time.

**Marine Mammals**

No direct impacts to marine mammals would be expected as a result of implementing the Preferred Alternative. One of the primary impact-producing factors affecting marine mammals is collision by vessels. Collisions between a marine mammal and a service or dredge vessel can be lethal or result in crippling injuries. Marine mammals are not likely to be physically injured by dredging because they generally do not rest on the bottom, and most can avoid contact with dredge or service vessels. Blue, fin, or sei whales would not be adversely affected by hopper dredging operations because they are deep water species and are not likely to be found near the dredging sites. There has never been a report of a whale taken by a hopper dredge (Stantec 2019).

The marine mammals most likely to be found in the nearshore waters off Louisiana, such as bottlenose dolphins and Atlantic spotted dolphin, are agile swimmers and are presumed capable of avoiding physical injury during dredging. The Florida manatee is extralimital in Louisiana coastal waters. Sightings off the Louisiana coast or strandings on Louisiana shorelines are rare. The manatee is not expected to be impacted by dredging operations. Sand mining poses no foreseeable threat to migratory and highly mobile marine mammals (Virginia Institute of Marine Science 2000). Section 4.15.5 of this SEA provides additional discussion of the West Indian manatee.

Short term, indirect minor adverse effects to marine mammals could occur as a result of implementing the Preferred Alternative. Dredging can indirectly affect marine mammals due to noise and turbidity plumes. Dredging noise could cause marine mammals to avoid the noise or to be attracted to it. Mammals could change their behavior in response to sound, and habituation to the noise could occur where mammals are exposed repeatedly to the sounds. Proper maintenance of dredge equipment could help reduce effects of noise (Byrnes 2004). Suspended sediment generated by the dredging could temporarily interfere with marine mammal feeding or other activities. Marine mammals could leave the area and turbidity is expected to have negligible effects.

Visual and acoustic disturbance from construction could result in temporary modification in the behavior of bottlenose dolphins. Dolphins and other marine mammals could temporarily vacate the area, so dredging is expected to have only a negligible impact on the animals. Impacts would

be short-term and temporary and would not be expected to have lasting effects on marine mammal populations in the area.

**Avian Communities**

Short term, direct negligible adverse effects and long term, direct beneficial effects to Avian Communities would be expected as a result of implementing the Preferred Alternative. Construction activities and associated noise will result in disturbance to the avifauna that are still utilizing the project area following Hurricane Zeta. Current bird use of the WBH for nesting and roosting would not be expected or would be minimal because most of the Headland was lost as a result of the storm. Some foraging could still occur on areas of the WBH that were not completely destroyed by the Hurricane.

Following project completion, avian species would be expected to start utilizing the habitats associated with the headland. Use of the area by avifauna would be expected to increase as vegetation, shoreline and associated natural wave and tidal regimes, wetland habitats and transitional habitats are established and become stabilized. Reestablishing the forage base of beach, intertidal, and subtidal invertebrates that support many of the shorebirds may take several years. Reestablishment of the population of forage fishes associated with the beach and marsh environment would also be expected to occur over time.

Short term, indirect negligible adverse effects would be expected under the Preferred Alternative as a result of the temporary loss of prey items and foraging habitat for some bird species that utilize the littoral/subtidal zone. These effects would be expected to be short term and negligible because most of the littoral/subtidal zone associated with the WBH was lost because of Hurricane Zeta. Additional Project factors that could affect coastal and marine birds include air emissions; water quality degradation from the dredge plume at the dredging site and slurry discharge at the beach nourishment site; dredge, vessel, and construction equipment noise; light attraction: and discarded trash and debris from dredge or service vessels.

Emissions of pollutants into the atmosphere from dredge, service vessel and construction equipment activities are expected to have minimal effects on air quality because of the prevailing atmospheric conditions, emission heights, and pollutant concentrations. Emissions from dredging and pump-out operations, bulldozers and other equipment onshore are below the air emissions exemption criteria. Therefore, no impacts on birds from emissions related to the Preferred Alternative are expected.

Noise associated with dredging, vessels, and construction equipment could affect avian species in proximity of the Project Area. Effects as discussed in Section 4.4.5 of this SEA would be expected to be minor because the project area is characterized by ongoing noise associated with oil and gas platforms, service vessels, and other vessels that pass through the area. Recreational boaters also contribute to the noise in the area.

Seabirds could be attracted by lights on the dredge vessels or associated equipment. Coastal and marine birds could ingest or become entangled in discarded trash and debris which could lead to serious injury and death. The USCG prohibits the disposal of trash and debris into the marine

environment. The Bureau of Safety and Environmental Enforcement (BSEE) prohibits disposal of OCS equipment, containers, and other material into offshore waters by lessees (30 CFR 250.300). The International Convention for the Prevention of Pollution from Ships (MARPOL) (Annex V, Public Law 100-220; 101 Statute 1458; effective January 1989) prohibits the disposal of any plastics at sea or in coastal waters. Mortality of avian species associated with project related trash and debris would be expected to be negligible.

Critical Biological Resources

## 4.14 Essential Fish Habitat

Essential Fish Habitat (EFH) is defined as waters and substrates that are necessary for fish reproduction and growth to reproductive maturity. The proposed TE-0176 Project is located within areas designated as EFH.

### *4.14.1 Existing Conditions*

EFH designated in and near TE-0176 include estuarine emergent wetlands, estuarine water bottoms (e.g., sand, shell, and soft bottoms), estuarine water column, marine water column, and marine non-vegetated water bottoms (NOAA Fisheries Letter May 23, 2017; Williams 1998). Wetlands near the Project Area are tidally influenced saline marsh and beach berm vegetated primarily with smooth cordgrass, with patches of salt grass and black mangroves (Williams, 1998). The EFH associated with marsh habitats on the WBH were destroyed as a result of Hurricane Zeta and ongoing erosion prior to the Hurricane.

The proposed fill areas, offshore sand borrow areas, pump-out areas and pipeline conveyance corridors are in areas designated as EFH for federally managed species. A summary list of EFH species listed in the TE-0176 Project Area that were identified by NOAA Fisheries and listed in the NOAA Fisheries Letter to the JPN MVN-2015-0895-CQ dated May 23, 2017, are included in Table 3-3 in Section 3.3.1 of the 2019 EA for Project TE-118 (Stantec 2019). These species are from the Shrimp, Red Drum, Reef Fish, Coastal Migratory, and Highly Migratory Fishery Management Plans. Detailed information on federally managed fisheries and their EFH is provided in the 2005 generic amendment of Fishery Management Plans for the Gulf of Mexico Fishery Management Council (GMFMC). The generic amendment was prepared as required by the Magnuson-Stevens Act (Magnuson-Stevens Act, P.L. 104-297).

In addition to being designated as EFH for various federally managed fishery species, wetlands and water bottoms of barrier islands, nearshore muddy sea floor, and sandy shoals in the TE-0176 Project Area provide unique nursery and foraging habitat for a variety of important marine fishery species such as Atlantic croaker (*Micropogonias undulatus*), blue crab (*Callinectes sapidus*), Gulf menhaden (*Brevoortia patronus*), spotted seatrout (*Cynoscion nebulosus*), sand seatrout (*Cynoscion arenarius*), southern flounder (*Paralichthys lethostigma*), and black drum (*Pogonias cromis*) (Williams, 1998). Table 3-4 in Section 3.3.1 of the 2019 EA (Stantec 2019) provides a list of important species and life stages that are identified in the Project Area. Some of these species serve as prey for other fish species managed under the Magnuson-Stevens Act by the GMFMC

(e.g., mackerels, snappers, and groupers) and highly migratory species managed by NOAA Fisheries (e.g., billfishes and sharks) (Stantec 2019).

Barrier islands/headlands directly provide essential habitat for many fish species. They are important because they provide a buffer to estuaries and attendant wetlands by attenuating energy of ocean waves (List et al. 1994). Barrier islands/headlands constrict tidal flow at inlets facilitating estuarine circulation and attenuating the tidal prism that influences estuarine gradients and marsh flooding hydroperiod (List and Hansen 1992) and they attenuate storm surge levels for the mainland (Stone et al. 2005). The tidal inlets that exist because of the barrier islands play an important role in the life cycle of many estuarine dependent species (O'Connell et al. 2005; Christmas et al. 1982).

### *4.14.2 Alternative 1: No Action Alternative*

Conditions and effects to EFH described in the No Action Alternative analysis in the 2019 EA remain unchanged. Long term, minor adverse effects to EFH would be expected under the No Action Alternative. Long term impacts to EFH resulting from the continued erosion and eventual disappearance of the remaining WBH would be expected as a result of not implementing TE-0176. The remaining value of the WBH area as EFH would be reduced to the background value of open water, which is not in short supply. The adjacent wetlands that are presently protected by the remaining WBH would lose their protection, and their shoreline would continue to degrade as a result of ongoing erosion.

### *4.14.3 Alternative 2: WBH Repair*

Because TE-0176 will repair Hurricane Zeta damage to improved EFH conditions created by the nearly completed TE-0143/0118 through implementation of mainly the same/similar actions, effects to EFH described in the Preferred Alternatives analyses on WBH and at the OCS Borrow Areas in the 2019 EA would be the same/similar. Short and long term, direct and indirect, moderate beneficial effects and short term minor adverse effects to EFH would be expected under the Preferred Action Alternative.

In the long term, construction of TE-0176 would improve marine/estuarine EFH by re-establishing marsh and protecting marsh habitat from erosion as well as re-establishing barrier island surf zone, tidal inlet, and lagoon habitats. The proposed TE-0176 features would provide long-term benefits, such as enhanced habitat, surf zone stability, increased food and shelter resources, improved water quality, and greater access to interior island locations during storm or high-water events.

Marsh, inner marsh, and marsh edge habitat would increase with the vegetative plantings. Detrital material formed by the decomposition of emergent vegetation would contribute to the aquatic food web associated with the WBH and near-shore Gulf ecosystems. Decreases in erosion and tidal scour would also protect estuarine mud bottoms and marsh ponds. A continuous shoreline and introduction of new sand to the sand-starved system will help to reduce the tidal prism locally as spits build away from the fill area into inlets. Construction of the proposed TE-0176 Project would greatly benefit brown shrimp, white shrimp, and red drum (*Sciaenops ocellatus*). King mackerel, cobia, bonnethead shark (*Sphyrna tiburo*), and lane snapper (*Lutjanus synagris*) would also likely

benefit since these species depend on various types of estuarine features during their life cycles, and on prey species that rear in marsh habitat (Stantec, 2019).

Short term minor adverse effects to EFH would be expected during construction of the TE-0176 Project. Construction activities would result in localized increases in turbidity which would temporarily reduce water quality in the fill emplacement areas. Following construction, turbidity would return to ambient conditions. Short-term, direct, adverse impacts to habitats supportive of various life stages of brown shrimp, white shrimp, juvenile cobia, lane snapper, and bonnethead shark would occur during the construction phase of the Proposed Project as beach, dune, and marsh habitat are created. The establishment of intertidal marsh habitat would be expected to increase the quality and quantity of EFH associated with the WBH over time (Stantec 2019).

Short term, direct, minor adverse impacts to EFH would be expected as a result of dredging in the borrow areas. Impacts on the shrimp fishery are expected to be negligible because brown and white shrimp prefer mud bottoms (Defenbaugh 1976, Williams 1965). Turbidity of the water column would increase during dredging, affecting pelagic and shallow EFH of brown shrimp, white shrimp, red drum, king mackerel, cobia, bonnethead shark, and lane snapper. Turbidity would be expected to return to ambient conditions once dredging is complete (DOI MMS 2004).

The borrow areas on Ship Shoal are identified as EFH for adult brown and white shrimp. Investigations of the potential long-term impacts of mining on Ship Shoal to shrimp populations concluded that direct mortality to the shrimp would likely be minimal (Stone et al. 2009). This was determined based on the small quantities of shrimp that were collected during multiple sampling events. The study also found little evidence that spotted seatrout whose diet includes white and brown shrimp, were in abundance on the surface of Ship Shoal (Stone et al. 2009).

Short term, direct, negligible adverse effects to EFH associated with noise during TE-0176 Project development would be expected. A limited number of studies have indicated that dredge noise occurs in the low frequency range (< 1200 Hertz (Hz)), which is within the audible range of many species of fish. Exposure to underwater sound may potentially affect communication, foraging, predator evasion, and navigation of marine organisms, which to various degrees rely on sound to communicate and to derive information about their environment. Sound generated by hopper dredging is continuous rather than punctuated and is primarily within the low frequency range. Dredging-induced sound could block or delay the migration of anadromous fishes, interrupt or impair communication, or impact foraging behavior. Potential short-term impacts to EFH include movement of prey species away from the construction area, interruption of feeding or spawning by some species, and other effects on behavioral patterns. Impacts to EFH associated with noise are expected to be negligible and temporary because tens of thousands of acres with similar substrate to the proposed borrow areas are available to organisms outside of the areas to be dredged. Large areas of similar habitat exist on Tiger and Trinity Shoals, Sabine Bank, and along subaqueous portions of the Chandeleur Islands/Shoals chain in coastal Louisiana (Stantec 2019).

The OCS Study MMS 2009-024 (Stone et al. 2009) highlights the fact that although there may be large sediment volumes in Ship Shoal, the presence of oil infrastructure and obstructions (pipelines, flow lines, rigs, abandoned pipes, wrecks) may preclude exploration and development of sand in many areas (Stone et al. 2009). Avoidance buffers of 1,000 ft were established during

borrow area design around oil and gas infrastructure and other magnetic anomalies occurring in and around the proposed borrow areas to ensure quality of the borrow sediment, to enhance the safety of dredging operations, and to ensure that sediment cover over buried pipelines is not compromised as the seafloor equilibrates following dredging. A 2010 paper concluded that surveys indicate that dredgeable sands on the shoal are restricted to Ship Shoal Blocks 88 and 89, South Pelto Blocks 12 and 13, and western Ship Shoal Blocks 84, 85, 98, and 99. These areas represent less than 10 percent of the total volume of sand on the Ship Shoal (Khalil et al. 2010).

An evaluation by the BOEM of dredging activities on Ship Shoal noted that mobile fish and invertebrates would be able to swim clear of dredge operations and that only the less mobile species of fish, or those that feed exclusively on nonmobile prey, would be expected to experience affects from dredging (Van Dolah 1998, DOI MMS 2004). The duration of stagnant or poorly oxygenated water in dredged depressions or swales would be temporary or non-existent because of water-column mixing above the fair-weather wave base.

Infilling and recovery of the borrow pits are expected to take approximately 3 to 5 years due to the relatively shallow borrow area design and high sand transport rates in the Ship Shoals (Kulp et al. 2001, Stone et al. 2009, Nairn et al. 2005, Penland et al. 1988, List et al. 1994).

Sufficient biological communities would remain undisturbed to support recolonization and substrate texture would be rapidly reestablished. The borrow areas would be recolonized by migration of adult organisms or by larval and juvenile organisms recruited from adjacent undisturbed sand habitats. Impacts to EFH due to the temporary loss of benthic communities is small when considering the harvest levels of many of the commercially important species in the area (Nairn et al. 2007).

Another potential impact is the temporary loss of a hypoxia refuge for benthic invertebrates sensitive to low Dissolved Oxygen (DO) concentrations. While Ship Shoal is situated in an area prone to hypoxia, the estimates of bottom DO concentrations over the entire shoal were fairly high and constant in spring, summer and autumn. Shallow depths, wave action and biogenic activity all probably contribute to Ship Shoals higher DO concentrations (Stone et al. 2009). As the borrow areas fill back to shallower depths, and only a fraction of the shoal is currently utilized for borrow, the refuge status should remain in undisturbed areas and be restored in areas subject to borrow.

Blue crab spawning, reproducing, and foraging occurs on Ship Shoal from April through October (Stone et al. 2009). The borrow areas provide valuable nursery and foraging habitat for the blue crab. Female crabs apparently go through a continuous cycle of reproduction, producing a new egg mass (sponge) approximately every twenty-one days. Fecundity appears to be correlated with infaunal prey density, which declines somewhat over the course of the crab reproductive season (Stone et al. 2009). While blue crabs are a significant inshore fishery resource in Louisiana, there is no fishery for them on Ship Shoal.

Impacts to EFH associated with dredging are temporary due to high rates of sand transport associated with substantial current velocities over the shoal that facilitate rapid recovery of the borrow areas (Nairn et al. 2004).

## 4.15 Threatened and Endangered Species

Sensitive and protected biological resources include federally listed, endangered, threatened, or proposed species and designated critical habitat for the species. The ESA specifically charges Federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All Federal agencies must ensure an action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a threatened or endangered species or result in the destruction of critical habitat for these species, unless the agency has been granted an exception. The Secretary of the Interior, using the best available scientific data, determines which species are officially threatened or endangered.

There are 23 animal and 3 plant species under the jurisdiction of the USFWS and/or NOAA Fisheries, presently classified as Threatened or Endangered within the State of Louisiana or Gulf waters. Thirteen of the listed species have potential to occur in the TE-0176 Project Area. Table 4-1 provides a list of Federally listed species with the potential to occur in the project area.

**Table 4-1. Listed Species with the potential to occur in the TE-0176 Project Area**

| Common Name | Scientific Name | Federal Status | State Status |
|---|---|---|---|
| Atlantic Sturgeon (Gulf subspecies) | *Acipenser oxyrinchus desotoi* | T | E |
| Giant Manta Ray | *Mobula birostris and M. alfredi* | T | E |
| Oceanic Whitetip Shark | *Carcharinus lonigmanus* | T | NL |
| West Indian Manatee | *Trichechus manatus* | T | E |
| Fin Whale | *Balaenoptera physalus* | E | E |
| Humpback Whale | *Megaptera novaeangliae* | E | E |
| Rice's Whale | *Balaenoptera ricei* | E | NL |
| Sei Whale | *Balaenoptera borealis* | E | E |
| Sperm Whale | *Physeter macrocephalus* | E | E |
| Green Sea Turtle | *Chelonia mydas* | T | T |
| Hawksbill Sea Turtle | *Eretmochelys impricate* | E | E |
| Kemp's Ridley Sea Turtle | *Lepidochelys kempii* | E | E |
| Leatherback Sea Turtle | *Dermochelys coriacea* | E | E |
| Loggerhead Sea Turtle | *Caretta caretta* | T | T |
| Eastern Black Rail | *Laterallus jamaicensis jamaicensis* | T | NL |
| Piping Plover | *Charadrius melodus* | T, CH | T |
| Rufa Red Knot | *Calidris canutus rufa* | T | T |

Note: E=Endangered, T=Threatened, CH=Critical Habitat, NL=Not Listed. Source: Stantec 2019, LDWF WDP 2022

The following sections provide brief descriptions of the Federally listed species with potential to occur in the project area along with potential effects of implementing the No Action and the Preferred Action Alternatives.

### *4.15.1 Atlantic (Gulf) Sturgeon*

The Gulf Sturgeon (*Acipenser oxyrinchus desotoi*) is a Federally threatened fish species that can occur in all saltwater habitats, except during the spawning season when it is found in major rivers that empty into the Gulf of Mexico.

#### *4.15.1.1 Existing Conditions*

Gulf sturgeon inhabit riverine and estuarine environments in the spring during breeding, and either move offshore or parallel to shore between adjacent estuary systems during winter months. Historically, Gulf sturgeon occurred from the Mississippi River to Tampa Bay. Its present range extends from Lake Pontchartrain and the Pearl River system in Louisiana and Mississippi east to the Suwannee River in Florida. Sporadic occurrences have been recorded as far west as the Rio Grande between Texas and Mexico, and as far east and south as Florida Bay (NMFS 2005).

#### *4.15.1.2 Alternative 1: No Action Alternative*

No effects to the Gulf sturgeon are expected under the No Action Alternative. Existing conditions would persist.

#### *4.15.1.3 Alternative 2: WBH Repair*

The Gulf sturgeon is unlikely to be present in the TE-0176 Project Area because TE-0176 is located west of the Mississippi River (NMFS 2005; Stantec 2019). FEMA and BOEM have determined that implementation of the Preferred Alternative would have no effect to the Gulf sturgeon.

### *4.15.2 Giant Manta Ray*

The giant manta ray (*Mobula birostris*) was Federally listed by NMFS as a threatened fish species effective February 21, 2018, and was not assessed in the 2019 EA. Giant manta rays can occur in tropical, subtropical, and temperate bodies of water and are commonly found offshore, in oceanic waters, and in productive coastal areas. The species has also been observed in estuarine waters, oceanic inlets, and within bays and intercoastal waterways.

#### *4.15.2.1 Existing Conditions*

Giant manta rays frequently inhabit nearshore habitats, intracoastal waterways, coastal bays, tidal outflows, inlets, river mouths, and estuaries. Nursery habitat is located within the Flower Garden Banks National Marine Sanctuary (FGBNMS) in the Gulf and the highly developed coastline of southeast Florida. In the Southeast, giant manta rays have been observed along the U.S. east coast as far north as New Jersey, within the Gulf, Mississippi delta region, and off the coasts of US Virgin Islands and Puerto Rico (MRCF NOAA 2022).

#### *4.15.2.2 Alternative 1: No Action Alternative*

No effects to the giant manta ray are expected and existing conditions would persist under the No Action Alternative.

#### *4.15.2.3 Alternative 2: WBH Repair*

USACE has determined through the adherence and compliance with the Protected Species Construction Conditions (PSCC) and the Vessel Strike Avoidance Measures (VSAM), that the project would have no effect on the giant manta ray. All pump-out areas, conveyance corridors, and sediment deposition areas for the headland repairs will be temporary in nature and would not create an obstruction that the species would not be able to move around these features to access foraging areas. Turbidity would also be temporary in nature and CPRA has provided BMPs that include placement of containment berms in the fill placement areas to keep sediment within the repair project target areas. All terms, conditions and conservation measures and recommendations identified by the Agencies will be adhered to and are included in Section 6.2 and Appendix B of this SEA.

Conditions from Manta Ray Framework, Protected Species Construction Conditions, and NOAA Fisheries Vessel Strike Avoidance Measures

- **Equipment** – Turbidity curtains, if used, shall be made of material in which protected species cannot become entangled and be regularly monitored to avoid protected species entrapment. All turbidity curtains and other in-water equipment shall be properly secured with materials that reduce the risk of protected species entanglement and entrapment.
    - In-water lines (rope, chain, and cable, including the lines to secure turbidity curtains) shall be stiff, taut, and non-looping. Examples of such lines are heavy metal chains or heavy cables that do not readily loop and tangle. Flexible in-water lines, such as nylon rope or add rigidity and prevent the line from looping and tangling. In all instances, no excess line shall be allowed in the water. All anchoring shall be in areas free from hardbottom and seagrass.
    - Turbidity curtains and other in-water equipment shall be placed in a manner that does not entrap protected species within the project area and minimizes the extent and duration of their exclusion from the project area.
    - Turbidity barriers shall be positioned in a way that minimizes the extent and duration of protected species exclusion from important habitat (e.g. critical habitat, hardbottom, seagrass) in the project area.
- **Operations** – For construction work that is generally stationary (e.g., barge-mounted equipment dredging a berth or section of river, or shore-based equipment extending into the water):
    - Operations of moving equipment shall cease if a protected species is observed within 150 ft of operations.
    - Activities shall not resume until the protected species has departed the project area of its own volition (e.g., species was observed departing or 20 minutes have passed since the animal was last seen in the area).
- **Consultation Reporting Requirements** – Any interaction with a protected species shall be reported immediately to NOAA Fisheries SERO PRD and the local authorized stranding/rescue organization.

- **Vessels** – For projects requiring vessels, the action agency, and any permittee shall ensure conditions in the Vessel Strike Avoidance Measures are implemented as part of the project/permit issuance:
    - Operate at the minimum safe speed when transiting and maintain a vigilant watch for protected species to avoid striking them. Even with a vigilant watch, most marine protected individuals are extremely difficult to see from a boat or ship, and you cannot rely on detecting them visually and then taking evasive action. The most effective way to avoid vessel strikes is to travel at a slow, safe speed. Whenever possible, assign a designated individual to observe for protected species and limit vessel operation to only daylight hours.
    - Follow deep-water routes (e.g., marked channels) whenever possible.
    - Operate at "Idle/No Wake" speeds in the following circumstances:
        - While in any project construction areas
        - While in water depths where the draft of the vessel provides less than four feet of clearance from the bottom, or
        - In all depths after the protected species has been observed in and has recently departed the area.
    - When a protected species is sighted, attempt to maintain a distance of 150 ft or greater between the animal and the vessel. Reduce speed and avoid abrupt changes in direction until the animal has left the area.

### *4.15.3 Oceanic Whitetip Shark*

The oceanic whitetip shark (*Carcharinus lonigmanus*) was Federally listed by NMFS as a threatened fish species effective January 30, 2018, and was not assessed in the 2019 EA. No Critical Habitat was designated at that time nor has been to date.

#### *4.15.3.1 Existing Conditions*

The oceanic whitetip shark is distributed worldwide in epipelagic tropical and subtropical waters between 30º North latitude and 35º South latitude (Baum et al. 2006). In the Western Atlantic, oceanic whitetips occur from Maine to Argentina, including the Caribbean and Gulf of Mexico. It is a tropical, epipelagic species usually found offshore in the open ocean, on the outer continental shelf, or around oceanic islands in deep water, occurring from the surface to at least 152 m depth. This species has a clear preference for open ocean waters between 10˚N and 10˚S but can be found in decreasing numbers out to latitudes of 30˚N and 35˚S, with abundance decreasing with greater proximity to continental shelves (Backus et al. 1956; Strasburg 1958; Compagno 1984; Bonfil et al. 2008). Recent telemetry data reveal an open ocean pelagic distribution occupying the upper layer of the water column (Howdy-Jordan et al. 2013) with no strong affinity for shallow environments. During eight years of a long-term study monitoring finer-scale movements of benthic forage fishes before, during, and after a sand mining event at Canaveral Shoals off the Florida coast, no oceanic whitetip sharks were ever observed in the shallow dredging environment (Watwood et al. 2018).

#### *4.15.3.2 Alternative 1: No Action Alternative*

No effects to the oceanic whitetip shark are expected and existing conditions would persist under the No Action Alternative.

#### *4.15.3.3 Alternative 2: WBH Repair*

Based on the life cycle requirements and general species distribution range in the deep, open ocean in the upper layer of the water column, there is no reason to believe the oceanic whitetip sharks would occur in shallow (e.g., <90') nearshore dredging environments associated with borrow area dredging for coastal restoration projects such as TE-0176. Based upon recent telemetry data, they are not associated with nearshore shallow water environments where borrow area dredging occurs. The species is expected to be absent from all areas where the project may have direct or indirect environmental effects, and interaction with the dredging activities is unlikely. Since they are surface oriented pelagic species, they are not known to associate with "sand shoals" targeted for dredging. There are no known records of oceanic whitetip entrainment associated with dredging operations. Therefore, FEMA determines that TE-0176 will have "no effect" on oceanic whitetip sharks.

### ***4.15.4 West Indian Manatee***

Manatees live in marine, brackish and freshwater systems in coastal and riverine areas throughout their range. Preferred habitats of the West Indian manatee include areas near the shore featuring underwater vegetation such as seagrass and eelgrass. They feed along grass bed margins with access to deep water channels, where they flee when threatened (USFWS 2023).

#### *4.15.4.1 Existing Conditions*

Manatees have occasionally been sighted in coastal marshes along the Louisiana Gulf Coast. The West Indian manatee is known to occur on the Louisiana coast, and manatees typically frequent protected inshore waters such as bays and coastal streams (NOAA 2010).

#### *4.15.4.2 Alternative 1: No Action Alternative*

No effects to the West Indian manatee would occur and existing conditions would persist from implementation of the No Action Alternative.

#### *4.15.4.3 Alternative 2: WBH Repair*

West Indian manatees would not be expected to utilize the WBH Project Area as a result of limited available habitat preferred by the species. Standard manatee protection procedures prescribed in the USFWS "Standard Management Conditions for In-Water Activities" and as part of the USACE permit (MVN 2015-00895-CQ) would be followed to decrease the potential of injury (see Section 6.2 and Appendix B of this SEA). USACE determined that through the inclusion of the "Standard Management Conditions for In-Water Activities" as conditions of the issued permit, the Preferred Alternative for TE-0176 is not likely to adversely affect (NLAA) the West Indian manatee. USFWS issued concurrence on September 11, 2023, with the USACE determination that

implementation of the Preferred Alternative is not likely to adversely affect (NLAA) federally listed or proposed species.

### *4.15.5 Whales*

Fin whales (*Balaenoptera physalus*) are typically found in deep, offshore waters. They travel in the open seas away from the coast. Humpback whales (*Megaptera novaeangliae*) travel great distances during their seasonal migration between high-latitude summer feeding grounds and winter mating and calving areas in tropical waters. While calving, they prefer shallow, warm waters commonly near offshore reef systems. Humpback whale feeding grounds are generally in cold, productive waters. Sei whales (*Balaenoptera borealis*) have a wide distribution and live in subtropical, temperate, and subpolar waters around the world. They prefer temperate waters in the mid-latitudes. Sei whales are typically observed in deeper waters far from the coastline. Sperm whales (*Physeter macrocephalus*) inhabit all the world's oceans. Their distribution is dependent on their food source and suitable conditions for breeding (NOAA Fisheries 2023).

On August 23, 2021, NMFS announced the revised taxonomy and common name of the Bryde's whale Gulf subspecies to Rice's whale (*Balaenoptera ricei*) and those species were not assessed in the 2019 EA as such. The changes to the taxonomic classification and nomenclature did not affect the species listing status under ESA. Any future proposed Critical Habitat would likely be comparable in scope and distribution that follows closely to current core distribution ranges. If core and critical habitat did align, even with potential expansion westward towards Texas, this depth range still falls well outside the action area.

#### *4.15.5.1 Existing Conditions*

Sperm whales occur in the Gulf but are rare in inshore waters. Other endangered whales, including North Atlantic right whales and humpback whales, have been observed occasionally in the Gulf (Stantec 2019).

#### *4.15.5.2 Alternative 1: No Action Alternative*

No effect to whales would occur and current conditions in the Project Area would not change from implementation of the No Action Alternative.

#### *4.15.5.3 Alternative 2: WBH Repair*

Whales are not likely to occur in proximity to the Project Area because of their normal ranges and lack of suitable habitat for the species. No collision of whales with dredging equipment or other project associated vessels would be expected. Both the Bryde's whale and Rice's Whale are expected to occur completely outside of the action area (which is limited to <50-m depths), since their core distribution area is identified along the continental shelf break in 100 to 400-m depths, predominantly in the northeastern Gulf with some historical sightings and recent acoustic studies suggesting this range may extend westward towards Texas (Soldevilla et al. 2022) [https://www.fisheries.noaa.gov/species/rices-whale]. An independent evaluation of distribution

data by Rosel et al 2019 similarly notes that the majority of sightings documented have occurred in the DeSoto Canyon area of the northern Gulf and/or in water depths between 150m to 410m.

Dredging can be a source of continuous underwater noise in nearshore areas, particularly in the lower frequencies (1,000 Hz) (Richardson et al. 1995). Expected noise levels are not sufficient to cause hearing loss or other auditory damage to marine mammals (Richardson et al. 1995). Some observations near dredging operations and other industrial activities have documented avoidance behavior, while in other cases animals seem to develop a tolerance for the noise (Richardson et al. 1995). Based on the low probability of whale presence in proximity to project activities that could cause noise disturbance and the very low likelihood of hopper dredge or trawler interactions, FEMA and BOEM determine that the Preferred Alternative will not adversely affect any species of whale.

### *4.15.6 Sea Turtles*

All five species of Federally listed sea turtles that occur in the Gulf of Mexico including green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys impricate*), Kemp's ridley sea turtle (*Lepidochelys kempii*), leatherback sea turtle (*Dermochelys coriacea*) and loggerhead Sea Turtle (*Caretta caretta*) could potentially occur in Louisiana coastal waters. The loggerhead, Kemp's ridley and green sea turtles are known to occur in Louisiana waters (DWH LA TIG 2022).

#### *4.15.2.1 Existing Conditions*

The loggerhead, Kemp's ridley and green sea turtles are known to occur in Louisiana waters (DWH LA TIG 2022). The period of greatest sea turtle activity in the TE-0176 Project Area is spring and summer.

#### *4.15.2.2 Alternative 1: No Action Alternative*

No affect to sea turtles would be expected as a result of implementing the No Action Alternative. Existing conditions would persist and the remnants of the WBH that are remaining following Hurricane Zeta would continue to erode. Currently no remaining suitable habitat for turtle nesting occurs in the WBH Project Area.

#### *4.15.2.3 Alternative 2: WBH Repair*

There would be a potential for incidental take of sea turtles during dredging operations associated with TE-0176. USACE with concurrence from USFWS has concurred on a determination of "not likely to adversely affect" based on the proposed activities for TE-0176. Short-term impacts to sea turtles in the borrow areas could occur as a result entrainment and dismemberment in dredge suction draglines, or collisions with dredge or service vessels. Hopper dredge drag heads can entrap and kill turtles. Historically, sea turtle takes associated with sand mining activities for beach restoration have been few compared to channel dredging, especially for projects in OCS waters. Dredging with hopper dredges for Gulf beach nourishment projects could occasionally kill sea turtles, particularly loggerheads and Kemp's ridleys. Service vessels could also pose a threat to

sea turtles in the project area due to the potential for collision of vessels with turtles. Collisions with vessels are a particular concern for sea turtles because they mate, bask, and forage on the surface. The chances of the Proposed Project affecting hawksbills are discountable (NMFS 2005). Leatherbacks are unlikely to be found associated with relatively nearshore, shallow borrow areas such as Ship Shoal and thus are unlikely to be impacted by dredging activity. Management measures such as the use of turtle exclusion devices and observers would help to avoid, minimize, and reduce potential for direct impacts to sea turtles. Consultation with National Marine Fisheries Service (NMFS) and USFWS was conducted as part of this Proposed Project. All terms and conditions and conservation recommendations identified by the Agencies will be adhered to for TE-0176. The terms conditions and conservation measures are included in Section 6.2 and Appendix B of this SEA.

Indirect affects to sea turtles could occur as a result of the degradation of benthic feeding areas in the borrow areas, discarded trash and debris from dredge or service vessels and sediment plumes created by dredge operations. Sea turtles feed on benthic invertebrates including fish, crabs, jellyfish, sponges, and sea grasses. Dredging in shallow areas can destroy sea turtle foraging habitat. Sea turtles are highly mobile and can move to better forage areas until the affected area becomes recolonized by benthic organisms. The areas in the borrow sites that will be disturbed are relatively minor compared to the surrounding area so impacts to sea turtle foraging would be expected to be minor and temporary.

Sea turtles have been known to consume plastic bags, tar balls, and other discarded trash or litter. Regulations such as the Marine Debris Research, Prevention, and Reduction Act (Public Law 109–449, Dec. 22, 2006) reduce the accumulation of plastic and other debris in the marine environment, thereby reducing the likelihood of causing adverse impacts on sea turtles. Sediment plumes created by dredge operations would be minor and short-term so effects to sea turtles associated with the plumes would be expected to be minor and short term.

Activities including beach renourishment could result in sand compaction. Compaction negatively affects nesting site selection and could discourage nesting along the affected area. Sand placed on the beach that differs in characteristics such as grain size, sorting, and moisture content can alter incubation temperatures, reduce egg hatching, reduce survivorship, and affect sex ratios of hatchlings. Once sand is placed on the beach, physical reworking of the material will occur that can initially cause the creation of escarpments. These escarpments may initially impair the ability of adult turtles to reach the upper beach and cause the nesting turtles to abandon nesting attempts. Currently no potential turtle nesting habitat occurs in the TE-0176 Project Area. In the long term, TE-0176 could provide suitable nesting habitat that does not currently exist in the proposed Project Area.

As discussed under potential Direct Effects, consultation with NOAA Fisheries and USFWS was conducted as part of this Proposed Project. All terms and conditions and conservation recommendations identified by the Agencies will be adhered to for TE-0176. The terms conditions and conservation measures are included in Section 6.2 and Appendix B of this of this SEA.

### *4.15.7 Piping Plover, Red Knot, and Eastern Black Rail*

The only Federally listed species that are known to have occurred on the WBH prior to Hurricane Zeta are the threatened piping plover (*Charadrius melodus*) and red knot (*Calidris canutus rufa*). Designated Critical Habitat for the piping plover also occurred on the Headland prior to the Hurricane. Habitat preferred by the piping plover and red knot includes sparsely vegetated sand including supratidal beach, dune and over wash fans. Preferred foraging habitats include intertidal beach, sand flats and mud flats.

The eastern black rail (*Laterallus jamaicensis jamaicensis*) was listed as a threatened species under the ESA by a Final Rule effective November 9, 2020, and was not assessed in the 2019 EA. The final listing included a rule intended to help ensure beneficial conservation actions continue, while minimizing impacts to landowners and other stakeholders. Critical habitat designation for the eastern black rail was deemed not prudent (USFWS 2020a).Eastern black rails are small, secretive marsh birds historically known to exist in 35 states east of the Rocky Mountains, Puerto Rico, Canada, Brazil, and several countries in the Caribbean and Central America, and are dependent on wetlands (vegetated marsh) with dense overhead cover and moist to saturated soils adjacent to very shallow water. They utilize wetland-upland transition zones to forage in wet areas and shelter in uplands (USFWS 2020b).

#### *4.15.7.1 Existing Conditions*

Hurricane Zeta caused extensive damage to the WBH and most of the available habitat for the piping plover and the red knot was lost. The land that does remain within the project area consists of a limited amount of sandy barrier island/headland beach habitat or is subtidal.

#### *4.15.7.2 Alternative 1: No Action Alternative*

No affects to piping plover, red knots, eastern black rail, or piping plover Critical Habitat are expected as a result of implementing the No Action Alternative. WBH did not contain suitable eastern black rail habitat prior to the Hurricane, nor contains any after the Hurricane. Most of the WBH along with any suitable habitats for the piping plover and red knot were lost because of Hurricane Zeta. Any remaining land area that was left following the storm continues to erode and will disappear over time.

#### *4.15.7.3 Alternative 2: WBH Repair*

Piping plovers or red knots are currently not expected to occur in the Project Area because there is limited, or no, suitable habitat present for those species. Because WBH is currently an eroded beach or subtidal, the Project Area does not contain any suitable eastern black rail habitat and are highly unlikely to be present in the Project Area. TE-0176 will not provide suitable eastern black rail habitat and implementation of the Preferred Alternative would have no adverse or beneficial effects to that species. Long term beneficial effects to piping plover and red knot would be expected because TE-0176 will reestablish suitable habitat for those species which was destroyed by Hurricane Zeta and continuing erosion of the WBH. On September 2, 2023, a determination by CPRA and USACE was provided to the USFWS. USFWS issued concurrence on September 11, 2023, with the CPRA/USACE determination that implementation of the Preferred Alternative may

affect but is not likely to adversely affect (NLAA) federally listed or proposed species or their Critical Habitat.

Historic, Cultural and Human-Based Resources and Environment

## 4.16 Historic and Cultural Resources

The consideration of impacts to historic and cultural resources is mandated under Section 101(b) 4 of NEPA as implemented by 40 CFR Part 1501-1508. Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effects of a federally funded or assisted project ("an undertaking") on historic properties and allows the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. Additionally, federal agencies are required to consult with Indian Tribal Governments on a government-to-government basis as required in EO 13175 (Consultation and Coordination with Indian Tribal Governments). FEMA has chosen to address potential impacts to historic properties through the Section 106 consultation process of the NHPA as implemented through 36 CFR Part 800.

The Section 106 process requires the identification of historic properties that may be affected by the Preferred Action or alternatives within the project's Area of Potential Effects (APE). Historic properties, defined in Section 101(a)(1)(A) of the NHPA, include districts, sites (archaeological and religious/cultural), buildings, structures, and objects that are listed in or determined eligible for listing in the National Register of Historic Places (NRHP). Historic properties are identified by qualified agency representatives in consultation with interested parties.

Cultural resources are defined by the NHPA as precontact and historic sites, structures, districts, or any other physical evidence of human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or any other reason. Depending on the condition and use, such resources can provide insight into living conditions in previous civilizations and can retain cultural and religious significance to modern groups.

Typically, cultural resources are subdivided into archaeological properties (precontact or historic sites where human activity has left physical evidence of that activity, but no structures remain standing) or architectural properties (buildings or other structures or groups of structures that are of historic or aesthetic significance). Archaeological properties comprise areas where human activity has measurably altered the earth and / or deposits of physical remains or material culture are found.

Traditional cultural properties or sacred sites can include archaeological properties, structures, neighborhoods, prominent topographic features, habitat, plants, animals, and minerals that Indigenous peoples or other groups consider essential for the preservation of traditional culture.

Architectural properties include standing buildings, bridges, dams, and other structures of historic or aesthetic significance. Generally, architectural resources must be more than 50 years old to be considered for the National Register of Historic Places (NRHP). More recent structures might warrant protection if they have the potential to gain significance in the future or if they already meet significance and integrity criteria.

The evaluation and consultation processes prescribed in Section 106 of the NHPA requires the Federal action agency to conduct an assessment of the potential impact of an undertaking on

historic properties that are within the proposed project's APE. APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

### *4.16.1 Existing Conditions*

To fulfill its Section 106 responsibilities, FEMA initiated consultation on TE-0176 with the Eastern Shawnee Tribe of Oklahoma (ESTO) and the Jena Band of Choctaw Indians (JBCI) on 7/20/2023 to determine whether the Proposed Action has any potential effects to ancestral lands or properties that may be of religious or cultural significance.

FEMA consulted with the State Historic Preservation Office (SHPO) on 7/20/2023 and SHPO concurred with FEMA's determination of No Historic Properties Affected on 08/18/2023.The West Belle Conveyance Corridor, located in Terrebonne Bay and adjacent waters, has been subjected to multiple, overlapping cultural resources survey efforts. The West Belle Conveyance corridor was examined via a hydrographic and side scan sonar survey in 2009 (Report No. 22-3542) and an archaeological survey in 2021 (Report No. 6772).

Cultural resources in the project area were identified by Secretary of the Interior (SOI) qualified FEMA EHP staff on April 17, 2023, utilizing the Louisiana Office of Cultural Development's Cultural Resources National Register database; the Louisiana Cultural Resources Map and associated site files (Louisiana Division of Archaeology (LDOA) website), various digital archives, photographs, historic aerials, historic topographic maps, and FEMA's internal files to identify historic properties within or adjacent to the project areas. In addition to these sources, information was gathered from the Automated Wreck and Obstruction Information System (AWOIS).

As a result of the current research, a total of 19 previously recorded archaeological sites, 18 anomalies, 9 shipwrecks, and 2 clusters of structures were identified for a total of 48 cultural resources located within 1 mile of the APE. Of these, there is one site located within the APE (Site 16LF7) and two sites adjacent to the APE (Site 16LF8 and Site 16LF86). No work will be conducted in the vicinity of 16LF8 and 16LF86; these sites are near or immediately adjacent the project area.

The West Belle Conveyance Corridor will be bifurcated, which will represent a change in the project footprint for this component. The original corridor extends approximately 2 miles north from the West Belle Marsh area and turns to the northwest and extends an additional 0.6 miles. This area is composed of open water and artificially created man-made land. The new portion of the conveyance corridor will extend directly north from the bend for approximately 0.4 miles. This area is also composed of open water and artificially created man-made land. Prior to Hurricane Zeta, this area had been filled with dredged material.

One previously recorded archaeological site (16LF7) is located within project footprint of the Feeder Beach Conveyance Corridor (Figure 3). This site was identified in 1976 during a cultural resources survey (Gagliano, et al; Report No. 22-0002). Site 16LF7 was described as a scatter of precontact ceramics and midden deposits. The ceramic artifacts were tentatively identified as

Plaquemines. The site was recommended as Not Eligible for the National Register of Historic Places (NRHP) in 1976 because of a lack of depositional integrity due to erosion and wave disturbance. The site was revisited in 2010 and no evidence of the site was identified due to complete submersion (HDR, Inc. Site Form Update). SHPO agreed with the recommendations regarding the site and has determined 16LF7 to be ineligible for the NRHP. As such, no further work is required, and no avoidance is necessary.

Sand Borrow Areas are outside the purview of the Section 106 process, due to their location outside the State of Louisiana, however, still within the waters of the U.S., and therefore have only been under review and consideration by Secretary of the Interior (SOI) qualified FEMA staff. In connection with the Hydrological survey and with the staff of BOEM, one area has shown to be an unidentified anomaly within the borrow areas that will be avoided as it has not been investigated or identified, and no documentation on it has been put forth for peer review.

Correspondence with the SHPO and any Tribal entities are in Appendix D.

### *4.16.2 Alternative 1: No Action Alternative*

Long term, direct and indirect, minor adverse effects to subsurface, coastal, and submerged cultural resources would be expected as a result of implementing the No Action Alternative. Under the no action alternative, the repair of the WBH would not occur, and the wave action would continue to impact the area on an escalated level. By having the WBH strengthened, it provides protection by dampening currents and storm surges which helps to reduce erosion and the loss of structural integrity of sites and structures. Over time the sites will be submerged and further effected by wave action that disrupt soil stratigraphy, integrity, and provenance vital to data reclamation.

### *4.16.3 Alternative 2: WBH Repair*

Long term, direct and indirect, moderate beneficial effects to subsurface, coastal, and submerged cultural resources would be expected as a result of implementing the Preferred Alternative. By having the WBH strengthened, it provides protection by dampening currents and storm surges which helps to reduce erosion and the loss of structural integrity of sites and structures. Damage to subsurface, coastal, and submerged cultural resources would be reduced and the ability and potential for researchers to examine and record them would be increased.

## 4.17 Socioeconomic and Human Resources

Socioeconomic Resources are defined as the basic attributes and resources associated with population, demographics, and economic activity.

### *4.17.1 Population and Housing*

This section assesses the relation between existing housing in the Project Area, the potential for an increased demand for housing associated with a project related increase in work force and the resulting effects of the increased demand on the available resource.

#### *4.17.1.1 Existing Conditions*

The Project area is located on a remote and uninhabited coastal barrier island and headland in Lafourche Parish and the Ship Shoal area offshore of Terrebonne Parish. No communities or human populations are present in the Project Area. Port Fourchon is near the Project area and Grand Isle is on a nearby barrier island.

#### *4.17.1.2 Alternative 1: No Action Alternative*

No impacts to population and housing would be expected and existing conditions would not change from implementation of the No Action Alternative.

#### *4.17.1.3 Alternative 2: WBH Repair*

Short term, direct minor beneficial and adverse effects to population and housing would be expected under the Preferred Alternative. Implementation of the Preferred Alternative would have beneficial effects as a result of job creation.

Short term, direct minor adverse effects could occur if existing housing is not available in areas adjacent to the project for the increased work force. Fluctuations in jobs and housing are common in this area due to market changes associated with the oil and gas industry.

### *4.17.2 Employment and Income*

See the discussion under Existing Conditions in Section 4.17.1.1.

#### *4.17.2.1 Existing Conditions*

The Project Area is located on a remote and uninhabited coastal headland in Lafourche Parish. There are no communities or human populations in the Project Area and therefore there is no employment or income base. The area supports sources of income related to oil and gas exploration and production and commercial and recreational fishing. Port Fourchon services over 90 percent of the Gulf's deep water oil production (GLPC 2017) and over 250 companies use Port Fourchon as a base of operation (Stantec 2019).

#### *4.17.2.2 Alternative 1: No Action Alternative*

No impacts to employment and income would be expected and existing conditions would not change as a result of implementing under the No Action Alternative.

#### *4.17.2.3 Alternative 2: WBH Repair*

Short term, direct negligible beneficial effects to Employment and Income would be expected as a result of implementing the Preferred Alternative. Implementation of the Preferred Alternative would be expected to have a negligible economic impact in Lafourche and Terrebonne parishes

and throughout all the coastal Louisiana parishes. Minimal effects on employment and income are expected from activities associated with the Proposed Project.

### *4.17.3 Commercial and Recreational Fisheries Resources*

Fishery resources includes any fishery, any stock of fish, any species of fish, and any habitat of fish. It includes all fish, mollusks, crustaceans, and other marine species caught by fishing vessels.

#### *4.17.3.1 Existing Conditions*

Two of Louisiana's commercial fishing ports, Empire-Venice and Intracoastal City are in the top five landings ports for the US based on poundage in 2015 (NOAA 2017). Empire-Venice, the nearest large commercial fishing port to the proposed Project Area, ranked fourth in the nation for quantity of commercial fisheries landings and fifth in the nation for value of landings in 2015 (NOAA 2017).

Popular recreational reef fish include groupers, snappers, gray triggerfish (*Balistes capriscus*) and greater amberjacks. Natural outcroppings or manmade reefs are not present in the borrow areas. Bottom-anchored oil and gas surface structures provide habitat for reef fishes, but none of these structures are in the proposed borrow areas.

Oceanic pelagic fishes live near the edge of the continental shelf. Commercially important oceanic pelagic fisheries include coastal water species, such as Spanish and king mackerel, greater amberjacks, and several species of tuna (*Thunnus* spp.) and billfishes. Oceanic pelagic fishes make seasonal movements along the continental shelf parallel to shore, and between the nearshore and the shelf edge. Few oceanic pelagic fishes are likely to be present in the shallow nearshore area of the borrow sites.

Bottom-dwelling demersal fishes landed by commercial fishermen in the northeastern Gulf are taken almost exclusively from inland (estuarine) waters. Key species in demersal landings were striped mullet and spotted seatrout.

#### *4.17.3.2 Alternative 1: No Action Alternative*

Long term, indirect, minor adverse effects to fisheries resources would be expected as a result of implementing the No Action Alternative. Under the No Action Alternative, marsh and marsh edge, shallow sand and mud flats, and mangrove stands would not be reconstructed and restored. Repair of these habitats on the WBH would be expected to provide nursery and forage resources for a wide range of fish species over time which would result in beneficial affects to fisheries resources.

#### *4.17.3.3 Alternative 2: WBH Repair*

Short term direct and indirect minor adverse effects to fisheries resources would be expected because of implementing the Preferred Alternative. Temporary disturbances to commercial fishing could occur from use of the pump-out areas during construction. Pipelines would remain in place on the bottom between the dredge offloading location and the shore during the Proposed Project period. The presence of the pipeline will preclude trawling activities in the pipes. Damage to

fishing gear could occur without proper avoidance of the sand transport pipeline and mooring buoys. Adverse impacts would be caused more by obstruction and competing space usage than by alteration of habitat in these areas. Adult shrimp would be expected to move away from dredging activities and the sea-bottom disturbance it causes.

Indirect effects would be expected as a result of the creation of new bottom topography and a possible increase in the silt and clay components of the bottom sediments in areas subjected to dredging. Topographic lows, trenches, or pits could restrict circulation, pond hypoxic water, or create an unsuitable habitat for bottom-dwelling commercial species. Benthic invertebrates used as food sources by bottom-dwelling commercial species would be absent following dredging, until recolonization occurred.

Very few longline sets are known to be used in proximity to the borrow areas, although a few have been reported in the area during the 1990s (CSA 2002). The presence of the dredges and scows will preclude any longline sets in the vicinity for the duration of dredging and sand transporting activities. Commercially valuable fish populations are not expected to be adversely affected by dredging activities due to the ability of adult fish to avoid the dredging operations and the abundance of undisturbed habitat in the vicinity.

Shrimp and demersal fisheries may be affected by a combination of removed or degraded bottom substrates, creation of bottom topography that restricts circulation or ponds hypoxic bottom water, and temporary removal of invertebrate food sources that inhabit the borrow areas. The primary impact-producing factor affecting commercial fisheries would be impacts from mechanical disturbance of the sea bottom on those fish or shellfish species with benthic lifestyles that inhabit sandy bottoms in the borrow areas. Impacts to the shrimp fishery are expected to be negligible because brown and white shrimp appear to prefer mud bottoms (Defenbaugh 1976; Williams 1965). Pink shrimp (*Farfantepenaeus duorarum*) are frequently found on sand bottoms, but they appear to prefer calcareous sediment and are only present in the borrow areas in low densities. Due to the small area of the Ship Shoal borrow sites, commercial fishing, primarily shrimp trawling, is unlikely to be adversely affected with respect to fisheries dependent on the bottom habitat.

### *4.17.4 Visual Resources*

Visual resources include the characteristics of an area such as landforms, vegetation, surface water features, and cultural characteristics including buildings and other features resulting from human activities, that give the landscape its visually aesthetic character. These features form the overall visual character of an area. Examples of visual and aesthetic resources include parks, natural areas, scenic features, open vistas, water bodies, and other landscape features. Cultural resources, such as historic landmarks and historic districts, can also be visual resources.

#### *4.17.4.1 Existing Conditions*

Louisiana's barrier islands and headlands are not completely developed for settlement. Principal developments on the coast are associated with the mineral and fishing industry. Scattered

petroleum-related industries currently dominate the manmade landscape on the barrier islands and headlands, detracting from the aesthetics of the area.

#### *4.17.4.2 Alternative 1: No Action Alternative*

No impacts to aesthetic resources would be expected and existing conditions would not change from implementation of the No Action Alternative.

#### *4.17.4.3 Alternative 2: WBH Repair*

Short term, direct, negligible adverse effects and long term, direct beneficial effects to aesthetic resources would be expected from implementation of the Preferred Alternative. Prior to Hurricane Zeta, WBH was assessable to the general public. Following repair of the WBH, the area would again be accessible by the public. Implementation of the Preferred Alternative would over time greatly increase the visual interests in the area by improving beach, dune, and marsh habitats. This mixture of physical environmental elements creates borders and frames for potential views to the Gulf and other inland water features, which act as the focal point to given scenes.

Short term, direct, negligible adverse effects would occur during dredging because equipment used for dredging would be visible, resulting in a temporary reduction in the aesthetic value offshore. During construction, bulldozers and other equipment would also be visible.

### *4.17.5 Recreational Resources*

Recreation resources are those features in a setting that define a person's experience, such as the natural and cultural resources, special values attached to an area, facilities, infrastructure, personnel, and management regulations and actions.

#### *4.17.5.1 Existing Conditions*

No recreational activities occur on the WBH. Recreational activities that occur in the Project Area can include fishing, shrimping, crabbing, boating, sailing, wading, swimming, and bird and wildlife viewing.

#### *4.17.5.2 Alternative 1: No Action Alternative*

No impacts to recreational resources would be expected and existing conditions would not change from implementation of under the No Action Alternative.

#### *4.17.5.3 Alternative 2: WBH Repair*

Short term direct minor adverse and long term direct and indirect minor beneficial effects would be expected from implementation of the Preferred Alternative. Repair of the WBH would reestablish habitats suitable for recreational activities that were lost because of long-term headland erosion and the impacts of Hurricane Zeta to the area. The reconstruction of the WBH would provide recreational opportunities for many outdoor activities, such as fishing, boating, camping

and wildlife and bird watching. Negative effects to recreational resources associated with the Preferred Alternative might include increased turbidity and water quality degradation from resuspended organic matter in the dredge plume, material spills from vessels, visual impacts from shore, and temporary unavailability of preferred recreational fishing space due to the presence of dredge vessels or dredge plumes.

Visitors attracted to the northern Gulf coast are responsible for thousands of local jobs and billions of dollars in regional economic activity. Most recreational activity occurs along shorelines and includes such activities as beach use, boating, camping, water sports, recreational fishing, and bird watching. The location of the offshore dredge operations limits the affects that the dredge plume (i.e., increased turbidity and water quality degradation from resuspended organic matter) would have on recreational resources. Dredging will occur in relatively clean offshore environments, so chemical contaminants would not be expected to occur in the dredge plume.

Short term direct minor adverse effects to waterborne recreational activities such as boating, fishing, or diving, would potentially occur because of the offshore presence of the dredge vessels and associated dredge plumes, and service vessels. Pleasure craft might encounter the dredge vessels while in operation, but motorboats are highly mobile and can relocate to equivalent, unoccupied areas. The dredge vessel or surface plume might disturb surface waters and occupy space sought by recreational fishermen on private boats or charters. The footprint of the dredging operation is small and the undisturbed equivalent area that is available is so vast that the impact would be expected to be negligible. There are no artificial reef sites near the proposed borrow area, so the potential diving attraction is very minimal. The consequences of boaters encountering the dredge vessel in operation are negligible and may consist of nothing more than experiencing unpleasant odors.

As discussed in Section 4.17.3, recreational fishermen might be impacted as a result of sea-bottom areas being disturbed due to dredging. Game fish dependent on vital and healthy sea bottom may be temporarily displaced until bottom conditions and trophic food source structure is reestablished over an expected two-to-three-year period (Coastline Surveys Limited 1998; Newell et al. 1998).

### *4.17.6 Waterborne Commerce, Navigation and Public Safety*

Water-borne Commerce is the movement of materials, goods or commodities using vessels or other craft plying on navigable waters of the United States.

#### *4.17.6.1 Existing Conditions*

The 3,600-acre Port Fourchon supports considerable internal waterborne commerce (Hughes et al. 2001). Bayou Lafourche is navigable from upstream of the northern end of the Federal navigation project in Lockport, Louisiana to the Gulf. This waterway links the Louisiana communities of Raceland, Lockport, Larose, Golden Meadow, and Leeville to the Gulf Intracoastal Waterway (GIWW). The GIWW intersects Bayou Lafourche at Larose (GIWW mile 35). Waterborne commerce on Bayou Lafourche averaged approximately 1.15 million tons annually from 1987 to 1990 (Hughes et al. 2001). Approximately 270 large supply boats travel in the port's channels daily (Greater Lafourche Port Commission 2017).

The landward side of East Timbalier Island has a considerable amount of waterborne commerce to shuttle supplies and personnel servicing the KREWE production facility.

Authorized navigation channels near WBH include Bayou Lafourche and the Port Fourchon Navigation Channel. Port Fourchon services domestic deep-water oil and gas producers operating in the Gulf. Over 95 percent of the Port's cargo is oil and gas industry related. Approximately 30 percent of the cargo is moved by barge to and from more inland areas and 70 percent is moved by vehicle. The importance of the port was underscored by the aftermath of Hurricanes Katrina and Rita, when oil and gas valued at about $10 billion dollars was unavailable to the nation for a two-month period (GLPC 2005), raising gasoline prices nationwide. The port's facilities also include the South Lafourche Leonard Miller Jr. Airport in Galliano, LA.

Recreational and commercial fishing is common in the area marinas and boat launches are in Port Fourchon and on the bay side of the adjacent Grand Isle. Many commercial and recreational fishing boats are also docked along Bayou Lafourche in various communities (Stantec 2019).

#### *4.17.6.2 Alternative 1: No Action Alternative*

No impacts to waterborne commerce, navigation and public safety would be expected and existing conditions would not change from implementation of the No Action Alternative.

#### *4.17.6.3 Alternative 2: WBH Repair*

Short term, direct, minor adverse effects to waterborne commerce, navigation and public safety would be expected from implementation of the Preferred Alternative. Temporary restrictions to navigation would be expected because of project activities in the borrow and pump-out areas during construction.

The Ports of Terrebonne and Fourchon can provide the relatively low level of services expected to be needed to support the Project. No onshore expansion would be expected to be needed in association with the Proposed Project. Port Fourchon is heavily used for oil and gas activities, commercial fishing and recreational activities, and the increase in waterborne commerce associated with implementing the Preferred Alternative would be expected to be negligible.

During dredging and WBH reconstruction, the use of the areas immediately surrounding the borrow area and the Headland might need to be temporarily restricted for public safety reasons. All U.S. Coast Guard regulations will be adhered to during construction.

### *4.17.7 Infrastructure, Oil, Gas and Other Minerals*

See the discussion under Existing Conditions in Section 4.16.7.2.

#### *4.17.7.1 Existing Conditions*

The Gulf OCS has one of the highest concentrations of oil and gas activity in the world. Onshore infrastructure includes gas processing plants, navigation channels, oil refineries, pipelines and pipeline landfalls, pipe coating and storage yards, platform fabrication yards, separation facilities, service bases, terminals, and industry-related installations such as landfills and disposal sites for drilling and production waste. In addition to onshore service and support facilities, offshore oil and gas facilities have an extensive development of bottom-founded pipelines, surface platforms, caissons, well protectors, and casing stubs (wellhead structures from temporarily plugged and abandoned wells) (DOI-MMS 2002).

WBH is owned by the Louisiana State Land Office. KREWE leases water bottoms in the vicinity of East Timbalier Island from the State. According to the KREWE well head plan, there are three active, seven inactive, and 22 plugged and abandoned oil and/or gas wells located within the Proposed Project boundaries. These were previously owned by oil and gas companies including Gulf, Chevron, Pioneer, Maritech, and Greenhill which are predecessors to KREWE. An additional 15 wells that are not part of the KREWE well head plan are located within the boundaries of the TE-0176 Project Area. Nine of these oil and/or gas wells are plugged and abandoned, two are active, and four are inactive (Stantec 2019).

Port Fourchon is the closest major Louisiana port to the Gulf. The Port covers 3.6 thousand acres and extends approximately 3 miles along the east side of Bayou Lafourche from its junction with Belle Pass and Pass Fourchon to the Flotation Canal (USACE and GLPC 1994). Port Fourchon services 90 percent of all deep-water and roughly 45 percent of all shallow water platforms in the Gulf. The Louisiana Offshore Oil Port (LOOP) is the second component of Port Fourchon's economic contribution. LOOP's onshore facilities, the Fourchon Booster Station and Clovelly Dome Storage Terminal, are located just onshore in Fourchon and 25 miles (40.2 km) inland near Galliano. The Fourchon Booster Station has four 6,000-hp (4.5 MW) pumps, which increase the pressure and crude oil flow in route to the Clovelly Dome Storage Terminal.

#### *4.17.7.2 Alternative 1: No Action Alternative*

Long term, indirect, minor adverse effects to infrastructure, oil, gas and other minerals would be expected under the No Action Alternative. Repair of WBH, which provides some protection during storm events to the inshore coastline to the northeast, would not occur Under the No Action Alternative.

#### *4.17.7.3 Alternative 2: WBH Repair*

Long term, indirect, minor beneficial effects and short term, direct, negligible adverse effects to infrastructure, oil, gas, and other minerals would be expected under the Preferred Alternative. Beneficial effects would be expected as a result of the reconstruction of the WBH which will increase protection of coastal oil and gas infrastructure from erosion impacts associated with storm events.

Short term, direct, negligible adverse effects could occur as a result of impacts to existing oil and gas infrastructure resulting from collision during project implementation. BMPs will be implemented including the establishment of No Work Zones overactive pipelines that do not have a minimum of 3 ft of cover, and the establishment of sediment pipeline and equipment corridors

to avoid crossing active oil and gas infrastructure. CPRA will require the operators to remove inactive and abandoned pipelines within the repair footprint prior to construction. Implementation of these management measures will reduce the potential for impacts to existing infrastructure during project development. There are no pipelines in the borrow areas and the pump-out areas and conveyance corridors were sited to avoid offshore oil and gas infrastructure.

### *4.17.8 Environmental Justice*

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires Federal agencies to make achieving environmental justice part of their mission. Each agency must identify and address "disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations." The intent is to prevent minority and low-income populations from being disproportionately affected by adverse human health and environmental impacts of Federal actions. The EO was created to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of an action. In 2022, 15.7 percent of Lafourche Parish residents lived below the poverty level (U.S. Census 2022).

#### *4.17.8.1 Existing Conditions*

The TE-0176 Project area does not have a minority and/or low-income population. The Project Area is a remote and uninhabited barrier headland in Lafourche Parish and the borrow areas are offshore of Terrebonne Parish. No communities or human populations are present in the Project Area; however, Port Fourchon is nearby. The nearest populated areas to the project are Port Fourchon and Grand Isle.

#### *4.17.8.2 Alternative 1: No Action Alternative*

No impacts to Environmental Justice would be expected and existing conditions would not change as a result of implementing the No Action Alternative.

#### *4.17.8.3 Alternative 2: WBH Repair*

No impacts to minority and/or low-income population would be expected as a result of implementing the Preferred Alternative. No communities or human populations occur in or in proximity to the Proposed Project area.

## 4.18 Hazardous, Toxic and Radioactive Waste (HTRW)

Engineer Regulation (ER) 1165-2-132, Hazardous, Toxic, and Radioactive Waste (HTRW) Guidance for Civil Works projects, requires that a site investigation be conducted as early as possible in a project area to identify and evaluate potential HTRW problems. ER-1165-2-132 states that an initial reconnaissance study for the possible presence of HTRW should be conducted. If

the initial assessment indicates the potential for HTRW, then testing and analysis like a Feasibility Study should be conducted prior to proceeding with the project design. The purpose of ER-1165-2-132 is to outline procedures to facilitate early identification and appropriate consideration of HTRW.

### *4.18.1 Existing Conditions*

Oil and gas exploration has been ongoing in Timbalier Bay since the 1930s. Numerous oil well platforms and storage tanks occur in and near the Project Area, along with numerous pipelines, wellheads, and abandoned waste pits.

Coastal Tech – G.E.C. Inc. (CTC-GEC) performed a Phase I Environmental Site Assessment (ESA) of East Timbalier Island for the TE-118 project on October 13, 2016, in accordance with the scope and limitations of the American Society for Testing and Materials (ASTM) E 1527-13 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process. The assessment found one recognized environmental condition (REC) on the property. The REC was a waste pit located in the proposed East Timbalier Island restoration project area and it was related to oil/gas drilling activities. The waste pit also had been breached. Further investigation of the waste pit found the Oil Field Passive Pit Closure Parameters were all below regulatory levels. The assessment tested for total metals, radionuclides, and naturally occurring radioactive material (NORM). The material appeared innocuous (CTC-GEC 2017).

No testing for HTRW has been conducted directly in association with the TE-0176 Project.

Based on review of the 2019 EA, no ESA was conducted in the WBH Restoration Area that is being assessed under the Preferred Alternative in this SEA. No evidence of contamination by hazardous or toxic wastes at the borrow areas was noted during prior surveys or site investigations conducted in that area. Based on an appropriate inquiry level and professional judgment, the potential for the presence of HTRW within the project limits was determined to be very low (Stantec 2019).

Products containing hazardous materials such as fuels, oils and lubricants will be used during Proposed Project construction activities. Accidental spills could occur during project implementation. A spill could potentially result in adverse effects on wildlife, soils, water, and vegetation. Equipment necessary to quickly contain any spills would be present on or near project equipment. Construction contractors would be responsible for the management of hazardous materials and wastes, which would be handled in accordance with Federal and State regulations.

### *4.18.2 Alternative 1: No Action Alternative*

The No Action Alternative would not have any direct or indirect impacts associated with HTRW and existing conditions would persist (Stantec 2019).

### *4.18.3 Alternative 2: WBH Repair*

Short and long term, minor adverse effects could occur in association with the implementation of the Preferred Alternative. Under the Preferred Alternative, accidental spills and releases of waste/fuel, although remote, are possible. The Construction Contractor will prevent oil, fuel, or other hazardous substances from entering the air or water. This will be accomplished by design and procedural controls. All wastes and refuse generated by project construction would be removed and properly disposed. The Construction Contractor will implement a spill contingency plan for hazardous, toxic, or petroleum material for the borrow area. Compliance with USEPA Vessel General Permits (VGP) would be ensured, as applicable (See Section 6.2 of this SEA) (Stantec 2019).

# 5.0 CUMULATIVE EFFECTS

Cumulative effects on environmental resources result from incremental effects of projects, when combined with other past, present, and reasonably foreseeable future projects in the area regardless of what agency or person undertakes such other actions (40 CFR 1508.7). Cumulative effects can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies or individuals (including corporations).

## 5.1 Past, Present and Reasonably Foreseeable Future Projects in the Project Area

### Barrier Headland and Marsh Creation (TE-0052)

The TE-0052 Barrier Headland and Marsh Creation Project was approved in 2006. The Project which was completed in 2012 is located along the Chenier Caminada headland to the west of West Belle Pass, at the southeastern edge of Timbalier Bay in Lafourche Parish. TE-0052 is within and immediately adjacent to the TE-0176 project area. TE-0052 encompassed 411 acres and included rebuilding a large portion of the beach, dune, and back barrier marsh that occurred in the project area prior to 2006 (LCWCRTF 2023).

### East Timbalier Barrier Island Restoration Project (TE-0143/0118)

Work on the TE-0143/0118 East Timbalier Barrier Island Restoration Project commenced on March 7, 2020. Construction of the WBH component of TE-0143/0118 was approximately 80 percent completed when Hurricane Zeta impacted the Project Area in October 2020. The TE-0176 Project Area experienced major damage during Hurricane Zeta and the completed work was destroyed. The Project included restoring the GEFF of the WBH, construction of back-barrier marsh and constructing a feeder beach along WBH to provide sediment to renourish the site of the TE-0052 Barrier Headland and Marsh Creation Project (Stantec 2019).

### Caminada Beach and Headland Restoration Project (BA-0045)

The Caminada Beach and Headland Restoration Project conducted by CPRA extends over 13 miles and required over 8 MCY of sediment. Placement of sand in the restoration area began in August of 2013. BA-0045 restored approximately 800 acres of sandy beach and dune habitats between Belle Pass and Caminada Pass at the southern end of Lafourche and Jefferson Parishes. The Caminada Headland Beach and Dune Restoration project utilized sediment deposits from Ship

Shoal. Several additional Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) projects preceded the Caminada Beach and Headland Restoration Project and additional ongoing projects work synergistically with BA-0045 to improve the entire Caminada barrier island system (CPRA 2023).

### 2023 Louisiana Comprehensive Master Plan for a Sustainable Coast

The 2023 Coastal Master Plan is the fourth plan developed by Louisiana which includes a $50 billion investment to build and maintain land, reduce flood risk to communities and provide habitat to support ecosystems. The Plan includes 65 coastal restoration projects that will build or maintain between an estimated 233 and 314 square mi of land and reduce expected damages to coastal resources over the next 50 years. The Master Plan includes 65 restoration and 12 structural risk reduction projects and $11 billion for nonstructural risk reduction and $19 billion in dredging projects proposed to be implemented throughout coastal Louisiana. TE-0176 is located at the southernmost junction of the Terrebonne and Barataria Regions distinguished in the Plan. The Plan includes 30 restoration projects across both of those Regions (CPRA 2023).

### Oil and Gas Lease Sale 261

Oil and Gas Lease Sale 261 was held on December 20, 2023, and included 13,482 unleased blocks of which 311 leases for tracts covering 1.7 million ac in federal waters of the Gulf were sold (BOEM 2023). The lease area is generally to the south and 2 tracts within three miles of the TE-0176 Project Area were leased.

## 5.2 Cumulative Effects

Long term, direct, moderate beneficial and short term, direct, minor adverse cumulative effects to environmental resources associated with Projects TE-0052 and TE-0143/0118 in association with implementation of the Preferred Alternative under Project TE-0176 would be expected. TE-0118 was designed to renourish sand and supplement beach, dune and marsh habitats developed and restored in association with Project TE-0052. TE-0118 was approximately 80 percent completed when Hurricane Zeta destroyed progress and added additional damage to the WBH Project Area. TE-0176 will create and restore beach, dune and marsh habitats that were created in association with Project TE-0052 and TE-0143/0118. The cumulative effects of the three projects will be beneficial in that the goals of the three projects to create and stabilize coastal headland habit, provide for adjacent coastal stabilization, and provide fish and wildlife habitat will be met.

Short term, minor, adverse cumulative effects associated with mining of sand from the borrow areas along with disturbance of associated habitats which would affect fisheries that are dependent on benthic organisms would be expected. Cumulative effects on the Ship Shoal sand resources would be minor, even in combination with other planned Federal and State utilization of Ship Shoal for restoration efforts. Approximately 80 percent of Project TE-0143/0118 was completed when Hurricane Zeta occurred. It was determined that the volumetric loss of sediment placed in the TE-0143/0118 project area prior to Hurricane Zeta was approximately 2.61 MCY (CECI 2022). TE-0176 will utilize 2.61 MCY of sediment to replace sediment that was lost from the TE-0143/0118 Restoration Project. As a result, TE-0143/0118 and TE-0176 will result in a cumulative

use of 5.22 MCY of sand from the borrow areas. Ship Shoal encompasses approximately 76,600 acres and contains an estimated 1.57 billion cubic yards of very fine- to medium-grained sand (DOI-MMS 2004; USACE 2012). Removal of sand from the borrow areas for TE-0052, TE-0143/0118 and TE-0176 is considered minor in the context of various Ship Shoal modeling studies (Stone 2000; Stone et al. 2004, 2009). Previous projects have dredged sand resources from Ship Shoal and the quantity of sediment removed is less than 4 percent of the available resource (Stantec 2019). The area impacted by dredging is approximately 2 percent (Stantec 2019). In general, benthic habitat recovery times from dredging of six to eight months are characteristic for many estuarine muds, two to three years for sand and gravel, and five to ten years as the deposits become coarser (Coastline Surveys Limited 1998; Newell et al. 1998). The locations of dredge areas for different projects would be expected to change to previously un-dredged locations in the borrow areas and disturbed benthic habitats in previously dredged areas would be expected to reestablish over time, so impacts to benthic habitats and associated fisheries would be expected to be short term and minor to negligible.

Long term, indirect, minor beneficial cumulative effects to environmental resources associated with projects included in the 2023 Coastal Master Plan and implementation of the Preferred Alternative under TE-0176 would be expected. Ongoing and future planned coastal restoration, structural protection and nonstructural risk reduction projects included in the 2023 Coastal Master Plan would in combination and over time be expected to result in increased stability in the WBH and adjacent coastal areas. This would be expected to result in long term, beneficial effects to coastal beach, dune and marsh habitats that provide habitat for fish and wildlife resources associated with, or affected by, these habitats.

No cumulative effects associated with the Oil and Gas Lease Sale 261 are be expected. Over time, vessel traffic in proximity to the TE-0176 Project could increase if the oil and gas resources were developed. Vessel traffic would be expected to use existing navigation channels where warranted. The potential increase in vessel traffic would not have a cumulative affect associated with the established WBH and WBH would not be expected to have any effect on the vessel traffic.

## 5.3 Irreversible and Irretrievable Commitment of Resources

Ship Shoal is the largest of a series of inner shelf sand shoals off the Louisiana coast. The use of the sand from PL12 and SS88 is unlikely to deplete the supply of sand suitable for future restoration projects. sufficient sand would remain in the dredged areas for re-colonization of benthic organisms. Use of the sand from this area is not an irreversible irretrievable commitment of resources (Stantec 2019).

## 5.4 Unavoidable Adverse Environmental Effects

Unavoidable adverse effects are impacts that cannot be fully mitigated or avoided. Unavoidable adverse effects would result from implementation of the No Action Alternative and the Preferred Alternative. The effects to each resource area are discussed in Section 4 of this SEA. Most effects of implementing the No Action Alternative would be negative and would occur to the headland and adjacent shoreline habitats as a result of continued erosion over time. Adverse effects of implementing the Preferred Alternative are negligible to minor. While some aspects of the

Preferred Alternative would result in adverse effects, most of the anticipated environmental effects are associated with reconstruction of the WBH and are short-term in nature. Construction activities would comply with Federal and State laws, regulations, and EOs and would include implementation of BMPs, as presented in Section 6.2. Implementation of the BMPs would reduce the potential for and intensity of adverse effects.

### 5.5 Compatibility with Federal, State and Local Objectives

The Project is compatible with Federal, state, and local objectives of restoring the WBH and adjacent barrier island system.

## 6.0 PERMITS, CONDITIONS AND MITIGATION MEASURES

### 6.1 Permits

TE-0176 involves dredging sediment from jurisdictional waters of the United States, and discharge (fill placement) of that dredged material into waters of the United States and the State of Louisiana. Those project activities trigger the requirement to comply with two federally administered permits from the USACE. Section 10 of the RHA requires USACE permitting to excavate, or place fill in navigable waters. Section 404 of the CWA requires a permit for the discharge of dredge or fill material into waters of the U.S. including wetlands. In addition, TE-0176 will require a CWA Section 401 WQS from LDEQ.

The following permits were required and obtained in association with the implementation of the Preferred Alternative:

- Louisiana Department of Natural Resources Office of Coastal Management (LDNR OCM), CZMA Consistency Determination/Coastal Use Permit No. P20230206.

- USACE Section 10/404 Permit, MVN 2015-00895-CQ

- USACE Section 408 Permit, incorporated by Memorandum of Record into MVN 2015-00895-CQ, P20230206.

- Louisiana Department of Environmental Quality (LDEQ) 401 Water Quality Certification, blanket authorization incorporated into MVN 2015-00895-CQ.

- Louisiana Department of Wildlife and Fisheries (LDWF), Invoice # 23071305

All the requisite permits were obtained in conjunction with the submission of the Joint Coastal Use and Section 10/Section 404 Permit Application that was filed on June 6, 2023. As part of the review process, USACE received comments from CPRA, LDWF, USFWS, and NOAA/NMFS Fisheries and authorized TE-0176 on November 8, 2023. These permits and associated documents are included in Appendix B.

## 6.2 Conservation and Mitigation Measures, Conditions, and Best Management Practices

Based upon the studies, agency consultations and permitting conducted as part of TE-0176, several conservation and mitigation measures, conditions and BMPs must be implemented by the Grantee prior to, during and following project implementation. NOAA/NMFS Fisheries Southeast Regional Office has provided published guidance and conditions in the form of Critical Habitat Consultation Framework Documents for Sea Turtles, Giant Manta Rays as well as Vessel Strike Avoidance Measures and Protected Species Construction Conditions (Appendix B). Additional Conservation and Mitigation Measures, Conditions and BMPs that are identified in agency consultations and permitting associated with TE-0176 and not included in the bulleted list below must also be implemented/enforced. Failure to comply with the conservation measures and conditions may jeopardize federal funds. The Grantee is also required to comply with all applicable federal, state, and local laws and regulations and applicable EOs.

The following Conservation and Mitigation Measures, Conditions and BMPs are included as part of this SEA and will be implemented as components of TE-0176:

- Access to the OCS borrow areas for the purpose of sand mining is dependent upon issuance of a NNA by BOEM which will include stipulations required to be implemented as part of the terms of that agreement.

- Grantees are required to obtain and comply with all applicable local, state, and federal permits, laws, regulations, approvals, and requirements prior to initiating work on this project.

- Grantees shall ensure that all contractors and workers on this project are made fully aware of the limits of the authorized work, adhere to and comply with all state and regional conditions. Grantees shall also ensure that all contractors .and workers comply with all general conditions listed in the attached PGP Special Conditions, as well as the permit's special conditions. Non-compliance with permit terms and conditions may result in permit suspension or revocation**.**

- Grantees shall limit clearing, excavation and the placement of fill material to areas essential to the project. The jurisdictional remainder of the property shall be left in its natural state. If the authorized project requires any additional work not expressly permitted herein, the Grantees must obtain an amendment to this authorization prior to commencement of work.

- Grantees shall assure that all material used during construction shall be pollutant free in accordance with the EPA Guidelines for Discharge of Dredged or Fill Material, found in 40 CFR 230. The material may be obtained offsite or from site preparation. Offsite material shall not be obtained from wetlands or from areas that may adversely affect adjacent wetlands. Any excess material shall be placed in an upland area and property contained or stabilized to prevent entry into adjacent wetlands of other waters.

- Grantees that discover any previously unknown historic, cultural, or archeological remains and artifacts while accomplishing the permitted activity must immediately notify the USACE, New Orleans District Regulatory Division (CEMVN-RG), and their PA contacts at FEMA, who will

in turn contact FEMA EHP staff, halt all construction activity at the location of discovery, and avoid construction activities within a fifty 50-ft buffer zone of the location of discovery until the required coordination has been completed. FEMA and CEMVN-RG will initiate the Federal, Tribal, and state (SHPO) coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places. Grantees will not proceed with work until the SHPO completes review and all consultation as appropriate (Inadvertent Discovery Clause).

- If abandoned cemeteries, unmarked graves, or human remains are discovered during the permitted activity, the Grantees will stop work immediately and comply with the Louisiana Unmarked Human Burial Sites Preservation Act (La. R.S. 8:671 et seq.). The Grantees will notify local law enforcement, CEMVN-RG, their PA contacts at FEMA, who will in turn contact FEMA EHP, and the Louisiana Division of Archaeology (LDOA), within the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development, by telephone at 225-342-8170 to assess the nature and age of the human skeletal remains within twenty-four (24) hours of the discovery of unmarked human remains and will accompany local law enforcement personnel during all field investigations. If the appropriate local law enforcement official determines that the remains are not a crime scene, and the remains are more than 50 years old, LDOA has jurisdiction over the remains. In no instance will human remains be removed from the discovery site until jurisdiction is established. In cases where the LDOA assumes jurisdiction and the remains are determined to be American Indian, LDOA will consult with Tribes, FEMA, CEMVN-RG, and the Grantees to determine the appropriate course of action.

- Any changes in the project configuration as a result of local approvals must be documented and appropriate drawings provided to FEMA and CEMVN-RG for incorporation into the permit file.

- Grantees are aware that future site visits and inspections of the project site may be conducted by personnel of CEMVN-RG and/or other resource agencies in order to assess project compliance with the requirements of this authorization.

- Grantees shall adhere to the special conditions contained in the enclosed USFWS document, titled "*Standard Manatee Conditions for In-Water Activities*," to help avoid and/or minimize project related adverse effects to the West Indian manatee. As part of the USACE and USFWS compliance, all personnel conducting any work in or near water in areas that potentially contain manatees will observe the *"Standard Manatee Conditions for In-Water Activities"* as described in USACE Permit MVN 2015-00895-CQ, November 8, 2023. Specifics of these activities are included in Appendix B.

- This project is in waters known to be utilized by Sea Turtles and Giant Manta Ray, which are protected species under the jurisdiction of NOAA Fisheries Southeast Regional Office (SERO). The Grantees shall adhere to the enclosed "*Protected Species Construction Conditions and Vessel Strike Avoidance Measures*" as required by the SERO Protected Resources Division for these species. *"Vessel Strike Avoidance Measures"* will be observed for all species protected under the Endangered Species Act (ESA). The measures are published by the NOAA Fisheries Southeast Regional Office and specifics can be found in USACE Permit MVN 2015-00895-CQ, November 8, 2023, located in Appendix B.

- Any damage to the channels and/or banks resulting from the Grantees' activities will be repaired at the Grantees' expense and to the satisfaction of the USACE.

- The USACE contract to repair the east and west jetties at Belle Pass is expected to be awarded in September 2023. The estimated time to construction completion is 9 months. The Grantees' proposed conveyance channel lies along the Government's proposed flotation channel. The Grantees' sediment pipeline crosses the western jetty. The Grantee shall not interfere with the Government Contractor's repair operations. Any damage to the west jetty must be repaired by the Grantees.

- There shall be no unreasonable interference with navigation by the existence or use of the activity authorized herein.

- The Grantees will, at its expense, install and maintain any safety light, signals, and signs prescribed by the USCG, through regulations or otherwise, on authorized facilities or on equipment used in performing work under the authorization.

- If the proposed project involves the use of floating construction equipment (barge mounted cranes, barge mounted pile driving equipment, floating dredge equipment, dredge discharge pipelines, etc.,) in the waterway, the Grantees are advised to notify the appropriate Captain of the Port so that a Notice to Mariners, if required, may be provided about one month before you plan to start work. Contact information for the local Captain of the Port's offices may be located at: https://homeport.uscg.mil under "port directory". In addition, a copy of your permit approval and drawings should be mailed to the Commander, Eight Coast Guard District, Hale Boggs Federal Building, 500 Poydras Street, Room 1230, New Orleans, Louisiana 70130, or emailed to D08-DG-District-DPW@uscg.mil. Telephone inquiries can be directed to the Eighth Coast Guard District, Waterways Management at (504) 671-2330.

- Grantees will coordinate their schedule with the USACE to limit overlapping with our Bayou Lafourche-Port Fourchon East and West Jetty Repair contract. The POC is Operations Manager Ray Newman, (504) 862-2050.

- USACE has the right to require the applicant remove equipment from the west jetty if critical maintenance is required for emergency repair.

- The above Section 408 special conditions and standard conditions enclosed are enforceable by the USACE Navigation Manager for the Bayou Lafourche as per Appendix G, EC 1165-2-220.

- Grantees shall conduct construction monitoring which will begin with a pre-construction meeting and continue with bi-weekly meetings through the duration of construction.

- Construction activities shall be monitored to ensure that the activities stay within the Project footprint and activities are completed in accordance with all permit conditions and stipulations. Emphasis will be placed on the several cultural resource avoidance buffers along the corridors, including pipeline crossings, and in the borrow areas.

- Pre-construction hazard surveys shall be conducted to verify and mark the location of hazards prior to construction.

- Pre- and post-construction and dredging bathymetric and topographic progress surveys shall be conducted to monitor the borrow areas, conveyance corridors, and fill areas.

- A Bird Monitoring and Abatement Plan will be developed cooperatively by the CPRA and USFWS and shall be implemented to avoid or minimize impacts to the avifauna that use the WBH. This effort will be in place prior to start of any construction activity on the Headland and it will be in effect throughout construction.

- Entry into or disturbance of active waterbird breeding/nesting colonies is prohibited by the LDWF. A field visit to the TE-0176 Project Area to look for evidence of nesting colonies of waterbirds should be conducted no more than two weeks before project work begins if work will occur during the nesting season. If no nesting colonies are found within 1000 ft (2000 ft for brown pelicans [*Pelecanus occidentalis*]) of the proposed project, no further consultation with LDWF will be necessary. If active nesting colonies are found in this area, further consultation with LDWF will be required. If present, colonies should be surveyed by a qualified biologist to document species present and the extent of the colonies. A survey report prepared consistent with the guidelines included in Appendix B of this SEA should be prepared and submitted to the LDWF Wildlife Diversity Program (WDP) at the address provided in Appendix B (LDWF WDP 2023).

  To minimize disturbance to colonial nesting birds, the following restrictions on activity should be observed:

  - For colonies containing nesting wading birds (e.g., herons [Ardeidae spp.], egrets [Ardeidae spp.], night herons [*Nyctanassa* spp.], ibis [Threskiornithidae spp.], roseate spoonbills [*Platalea ajaja*]), anhingas (*Anhinga anhinga*), or cormorants (*Nannopterum* spp.), all project activity occurring within 1000 ft of an active nesting colony should be restricted to the non-nesting period (i.e., September 1 through February 15) (LDWF WDP 2023).

  - For colonies containing nesting gulls (Laridae spp.), terns (Laridae spp.), or black skimmers (*Rynchops niger*), all project activity occurring within 650 ft (2000 ft for brown pelicans) of an active nesting colony should be restricted to the non-nesting period (i.e., September 16 through April 1) (LDWF WDP 2023).

- The Agreement Components and Special Conditions included in the LDNR OCM, Coastal Use Permit (CUP)/Consistency Determination (C.U.P. No. P20230206) must be met in order for the TE-0176 Project to meet the requirements of the Louisiana Coastal Resources Program CUP Permit. The CUP Permit including the Agreement Components and Special Conditions is included in Appendix B of this SEA.

- Project construction would involve the use of potentially hazardous materials (e.g., petroleum products, potentially including but not limited to gasoline, diesel, brake and hydraulic fluid, cement, caustics, acids, solvents, paint, electronic components, pesticides, herbicides, fertilizers,

and/or treated timber) and may result in the generation of small volumes of hazardous wastes. Appropriate measures to prevent, minimize, and control spills of hazardous materials must be taken and generated hazardous or non-hazardous wastes are required to be disposed in accordance with applicable federal, state, and local regulations. The Grantees' Construction Contractor shall implement a spill contingency plan for hazardous, toxic, or petroleum materials for the construction, transport and borrow areas. Equipment necessary to quickly contain any spills will be present on or in close proximity to project equipment. Construction contractors will be responsible for the management of hazardous materials and wastes, which will be handled in accordance with federal and state regulations. All wastes and refuse generated by project construction will be removed and properly disposed of and compliance with USEPA VGP associated with the Vessel Incidental Discharge Act (VIDA) will be ensured, as applicable.

- The Grantees' Construction Contractor shall comply with the maritime Rules of the Road and the USCG regulations regarding vessel operation and obstruction to navigation.

- Grantees shall establish and adhere to a maintenance program involving periodic renourishment of the WBH with imported sand to preserve the original design or a specific engineered design that is justified and clearly stated in the maintenance program.

- To reduce potential short-term effects to air quality from construction-related activities, the Grantees' Construction Contractor shall be responsible for implementing BMPs to reduce fugitive dust generation and diesel emissions. To reduce these emissions, running times for fuel-burning equipment should be kept to a minimum and engines should be properly maintained.

- Grantees are required to coordinate with the local floodplain administrator, obtain required permits prior to initiating work, and comply with any conditions of the permit to ensure harm to and from the floodplain is minimized. All coordination pertaining to these activities and Grantees' compliance with any conditions must be documented and copies forwarded to the GOHSEP and FEMA for inclusion in the permanent project files.

- Per 44 CFR 9.11(d), mitigation or minimization standards to offset impacts to floodplains or wetlands must be applied, where possible.

- Should the site plans (including drainage design) change, the Grantees shall submit changes to their PA contacts at FEMA, who will in turn contact FEMA EHP staff for review and approval prior to the start of construction.

- All applicable BMPs should be implemented as identified to control and reduce nonpoint source pollution associated with construction activities. LDEQ has stormwater general permits for construction areas greater than or equal to one acre. The Grantees must contact the LDEQ Water Permits Division to determine if the proposed project requires a permit.

- Unusable equipment, debris and material will be disposed of in an approved manner and at a permitted disposal site. If petroleum products, hazardous materials, toxic waste, or soils and/or groundwater contaminated with hazardous constituents (or evidence thereof) are discovered during implementation of the project, notification to LDEQ's Single-Point-of-Contact (SPOC) at (225)

219-3640 is required. Any handling, managing, and disposal of those items shall occur in accordance with LDEQ requirements and OSHA worker exposure regulations covered within 29 CFR 1910 and 1926. All coordination with LDEQ pertaining to these activities should be documented and copies forwarded to GOHSEP and FEMA as part of the permanent project files.

- Upon completion of construction, the Grantees shall document construction activities in a construction completion report.

- All coordination pertaining to project activities and Grantees' compliance with the conditions, conservation measures and BMPs should be documented, and copies forwarded to FEMA for inclusion in the permanent project files.

- Due to the length of coastal restoration project development, implementation, and construction processes, the USACE (or CPRA acting as the USACE's designed representative) will re-initiate consultation with the USFWS and SERO on an annual basis until construction begins, or at any time if there are changes in the scope or location of the proposed action that would produce project effects not considered in the USACE's determination.

## 7.0 PUBLIC INVOLVEMENT

A public notice regarding this SEA was published in *The Baton Rouge Advocate* and *The Daily Comet* for five (5) days on Wednesday, March 20, 2024; Saturday, March 23, 2024; Tuesday, March 26, 2024; Friday, March 29, 2024; and Monday, April 1, 2024, to notify the public that the SEA and FONSI were available for review at the Coastal Protection and Restoration Authority at 150 Terrace Ave., Baton Rouge, LA 70802 on Monday through Friday from 8:00am to 4:30pm, and the Lafourche Parish Government at 4876 Hwy 1, Raceland, LA 70394 on Monday through Friday from 7:30am to 5:00pm. The SEA was also published on FEMA's website at https://www.fema.gov/emergency-managers/practitioners/environmental-historic/nepa/supplemental-environmental-23. There was a 30-day comment period beginning on Wednesday, March 20, 2024, and concluding on Thursday, April 18, 2024, at 4 p.m. A copy of the Public Notice is attached in Appendix E. Once the public comment period for the SEA is completed, comments will be addressed and incorporated into the final SEA.

## 8.0 AGENCY CONSULTATION AND COORDINATION

The following agencies were contacted by FEMA in association with the TE-0176 Project:

Bureau of Ocean Energy Management (BOEM)

Coastal Protection and Restoration Authority (CPRA)

Louisiana Department of Natural Resources Office of Coastal Management (LDNR OCM)

National Oceanic and Atmospheric Administration (NOAA)

National Resource Conservation Service (NRCS)

Louisiana Office of Risk Management (LORM)

Louisiana State Historic Preservation Office/Officer (SHPO)

U.S. Army Corps of Engineers (USACE)

U.S. Fish and Wildlife Service (USFWS)

# 9.0 CONCLUSION

Construction of the Preferred Action Alternative was analyzed based on the studies, consultations, and reviews undertaken as part of the development of this SEA. The SEA supplements the existing BOEM 2019 EA which was developed to support and analyze the environmental effects of the permitting and coordination of a Non-Competitive Negotiated Agreement with BOEM for use of an OCS sand resource located in federally owned waters and assessed the effects of implementing the East Timbalier Island Restoration Project (TE-0143/0118). This SEA assessed changes to the 2019 EA because of the removal of the East Timbalier Island restoration component from the Preferred Alternative, additionally protected natural resources, and the environmental effects of implementing TE-0176 following damages that were caused to the nearly completed TE-0143/0118 Project by Hurricane Zeta.

The findings of this SEA conclude that the Preferred Action Alternative would not result in any significant adverse impacts to physical and biological resources with the potential to be affected by implementation of the WBH Repair Project (TE-0176). This SEA also concludes that the Preferred Action Alternative would not result in significant cumulative impacts on the affected environment.

The TE-0176 Project would provide a buffer to reduce the forces and effects of wave action, saltwater intrusion, storm surge and tidal currents on the WBH as well as the adjacent wetlands and estuary. The project will also result in creation of new wetland and associated dune and intertidal habitats that will provide beneficial affects to fish and wildlife resources that utilize and depend on these habitats. TE-0176 will provide, protect, and sustain valuable and unique foraging and nesting areas for threatened, endangered and protected species and will provide foraging and nesting areas for migratory bird species.

During project construction, some minor adverse impacts to resources are anticipated, and conditions have been incorporated to mitigate and minimize the effects. Minor adverse impacts associated with project development under the Preferred Alternative would be mitigated by implementing BMPs, Conservation Measures and Conditions as discussed in Section 6.2 of this SEA. FEMA presently finds that the Preferred Action Alternative meets the requirements for a FONSI under the NEPA, and the preparation of an EIS will not be required (Appendix E). If new information is received that indicates there may be significant adverse effects, FEMA will then revise the findings and issue a second public notice, for additional comments. If there are no significant comments, new information, or design changes, this SEA will become the Final SEA.

Based upon the studies and consultations undertaken in this SEA, and given the precautionary and mitigating measures, there does not appear to be any significant detrimental environmental impacts associated with TE-0176.

## 10.0 LIST OF PREPARERS

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