

FINDING OF NO SIGNIFICANT IMPACT

To All Interested Agencies and Public Groups:

In accordance with the environmental review guidelines of the Council on Environmental Quality at 40 Code of Federal Regulations Part 1500, the U. S. Environmental Protection Agency (EPA) has performed an Environmental Assessment (EA) of the following proposed action under the authority of the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) of November 1990, House Document 646, 101st Congress (Public Law 101-646).

Project Name: Lake Borgne Shoreline Protection Project (PO-30)

Sponsors: U. S. Environmental Protection Agency, Region 6
Louisiana Department of Natural Resources

<u>Total estimated funding</u>	\$21,294,512
Phase 1 (Engineering and Design) funding	\$ 1,764,954
Phase 2 (Construction) funding	\$19,529.558

Location: The proposed project is divided into two sections, Bayou Dupre' and Shell Beach, of the southern shoreline of Lake Borgne, in Pontchartrain Basin, St. Bernard Parish, Louisiana

Introduction: Phase 1 funding for the Shell Beach portion of the project was approved for funding on January 10, 2001, and included on the CWPPRA 10th Priority Project List. Phase 1 funding for the Bayou Dupre' portion of the project was approved for funding on January 16, 2002, and included on the CWPPRA 11th Priority Project List. The Task Force approved combining these projects at the April 2002 Task Force Meeting.

Proposed Action (*Combination Rock Breakwaters and Back-to-Back Steel Sheet Pile Structure*):

The objective of project PO-30 is to maintain the integrity of the narrow strip of marsh that separates Lake Borgne from the Mississippi River Gulf Outlet (MRGO), halt direct marsh loss, restore saline marsh habitat, re-establish a sustainable lake rim; and, enhance fish and wildlife habitat. A continuous rock breakwater would be constructed along the designated shoreline section of Lake Borgne at Bayou Dupre' and Shell Beach. At the mouth of Bayou Dupre', maintenance dredging within the MRGO has created an unnatural water depth. Therefore, a steel sheet pile structure will tie the proposed shoreline breakwater into the existing offshore U.S. Army Corps of Engineers rock breakwater along the MRGO. At Shell Beach, the proposed rock breakwater will tie into the existing rock breakwater, which surrounds the perimeter of Fort Beauregard and the only opening in the breakwater will occur along the mouth of Bayou Ysclokey and across the Tennessee Gas Pipeline right-of-way. End-on-construction, which does not require flotation access because all activities will be performed within the footprint of the breakwater, will be constructed along the former naval base at Shell Beach in order to avoid the vast debris that exists in the area. The design life for the proposed project is 20 years.

A temporary flotation channel will also be excavated along the shoreline in order to facilitate construction and maintenance of the rock breakwater. The spoil (approximately 281,461 cy) will be deposited on the lakeside of the flotation channel and degraded back into the flotation channel after construction or maintenance of the rock breakwater is complete.

The proposed PO-30 project is part of and consistent with the Louisiana Coastal Wetlands Conservation and Restoration Task Force, and the Wetlands Conservation and Restoration Authority ecosystem strategy to maintain shoreline integrity, dedicated dredging and beneficial use of dredged material. CWPPRA provides Federal funds for planning and implementing projects that create, protect, restore and enhance wetlands in coastal Louisiana. Under CWPPRA, the project cost must be shared between the Federal sponsoring agency and the State of Louisiana. The Federal government provides 85 percent of the project cost and the Louisiana Department of Natural Resources (LDNR) will provide the remaining 15 percent non-Federal share.

Finding. On the basis of the EA performed by the EPA of the proposed project, and other findings and available information, the Regional Administrator has determined that the proposed project is not a major Federal action significantly adversely affecting the quality of the human environment, and that the preparation of an Environmental Impact Statement (EIS) is not warranted. This preliminary Finding of No Significant Impact (FNSI) will become final 30 days after the issuance of the public notice if no new information is received to alter this finding. No administrative action will be taken on this decision during the 30-day comment period. Comments regarding this preliminary decision not to prepare an EIS, requests for copies of the EA, or review of the Administrative Record containing the information supporting this decision, may be submitted to the U.S. Environmental Protection Agency; Office of Planning and Coordination (6EN-XP); 1445 Ross Avenue, Suite 1200; Dallas, Texas 75202-2733, or by telephone at (214) 665-8150.

Responsible Official,

John Blevins
Director, Compliance Enforcement
and Assurance Division

ENVIRONMENTAL ASSESSMENT
for the
LAKE BORGNE SHORELINE PROTECTION PROJECT (PO-30)
ST. BERNARD PARISH, LOUISIANA

1.0 Summary

1.1 Summary of Environmental Assessment

Project Name: Lake Borgne Shoreline Protection Project (PO-30)

Location: The proposed project is divided into two sections, Bayou Dupre' and Shell Beach, on the southern shoreline of Lake Borgne located in the Pontchartrain Basin, St. Bernard Parish, Louisiana. The section at Shell Beach extends approximately 3.2 miles between Fort Bayou and Doulluts Canal, and the section at Bayou Dupre' extends approximately 1.3 miles to the west and 0.8 miles to the southeast of Bayou Dupre (Figure 1).

Sponsors: U.S. Environmental Protection Agency (EPA), Region 6
Louisiana Department of Natural Resources (LDNR).

<u>Total estimated funding</u>	\$21,294,512
Phase 1 (Engineering and Design) funding	\$ 1,764,954
Phase 2 (Construction) funding	\$19,529,558

Land rights: 26 landowners are located within 14 tracts

Project Purpose: Maintain the integrity of the narrow strip of marsh that separates Lake Borgne from the Mississippi River Gulf Outlet (MRGO), halt direct marsh loss, restore saline marsh habitat, re-establish a sustainable lake rim; and, enhance fish and wildlife habitat. The project as proposed is consistent with the 1998 Coast 2050 Plan, Region 1 ecosystem strategy to maintain shoreline integrity, dedicated dredging and beneficial use of dredged material. The proposed project is not expected to cause adverse environmental impacts requiring compensatory mitigation.

Dredged Material: Approximately 281,461 cubic yards (cy) of material would be dredged to create a flotation channel for the placement of the structure.

Wetlands: Shell Beach: Saline marsh
Bayou Dupre': Brackish and saline marsh

Threatened and Endangered Species: The endangered West Indian manatee (*Trichechus nanatus*) and the threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*) may occur in the proposed project vicinity. The proposed project is not expected to adversely impact these species.

Cultural Resources: There are no known cultural or historic sites eligible to be listed on the National Register of Historic Places (NRHP) in the Bayou Dupre' project's Area of Potential Effects (APE). For the Shell Beach portion of the project, Fort Proctor also known as Fort Beauregard, 16SB83, is listed on the NRHP. The project is not expected to adversely impact this site.

Permits and Compliance:

Construction¹ of the project is authorized to begin as soon as all applicable environmental laws and regulations are met, project plans finalized, necessary land rights acquired, permits issued² and approval of the Louisiana Coastal Wetlands Conservation and Restoration Task Force established by Title III of Public Law 101-646, CWPPRA, and consisting of the Natural Resources Conservation Service (NRCS); the U.S. Army Corps of Engineers (ACE), National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS); the U.S. Fish and Wildlife Service (FWS); and the EPA. The Governor represents the State of Louisiana, with the LDNR providing the primary source of the non-Federal share of funding. The proposed project is not expected to cause adverse environmental impacts requiring compensatory mitigation.

1.2 Preferred Option (*Combination Rock Breakwaters and Back-to-Back Steel Sheet Pile Structure*). The proposed Lake Borgne Shoreline Protection (PO-30) project is to construct a nearly continuous rock breakwater along the +0.5 foot North American Vertical Datum (NAVD88) contour on designated shoreline sections of Lake Borgne at Bayou Dupre' and Shell Beach, extending approximately 17,000 feet from Doulluts Canal to Fort Bayou, and approximately 6,643 feet to the west of Bayou Dupre' and 4,418 feet to the southeast of Bayou Dupre' (Figures 2 and 3). At the mouth of Bayou Dupre', maintenance dredging within the MRGO has created an unnatural water depth. Therefore, a steel sheet pile structure will tie the proposed shoreline breakwater into the existing offshore ACE rock breakwater along the MRGO. At Shell Beach, the proposed rock breakwater will tie into the existing rock breakwater, which surrounds the perimeter of Fort Beauregard and the only opening in the breakwater will occur along the mouth of Bayou Yslockey and across the Tennessee Gas Pipeline right-of-way. End-on-construction, which does not require flotation access because all activities will be performed within the footprint of the breakwater, will be constructed along the former naval base at Shell Beach in order to avoid the vast debris that exists in the area. The design life for the proposed project is 20 years.

A temporary flotation channel will also be excavated along the shoreline in order to facilitate construction and maintenance of the rock breakwater. The spoil (approximately

¹ Construction is Phase 2 of the project and includes project and contract management, supervision and inspection, post-construction biological monitoring, operation, maintenance, repair, replacement, and rehabilitation (OMRRR) and the purchase of real estate.

² U.S. Army Corps of Engineers 404 permit for construction activities on Lake Borgne.

281,461 cy) will be deposited on the lakeside of the flotation channel and degraded back into the flotation channel after construction or maintenance of the rock breakwater is complete.

1.3 Purposes and Need for Action. The purpose and need for the proposed project is to halt Lake Borgne shoreline retreat and direct marsh loss in the vicinity of Shell Beach and Bayou Dupre', and enhance fish and wildlife habitat. Specifically, in the Shell Beach and Bayou Dupre' area, the marshes separating the MRGO from Lake Borgne are broken by many ponds and are suffering from both shoreline and bank erosion. This narrow marsh rim along the south Lake Borgne shoreline protects the communities of Shell Beach, Yscloskey, and Hopedale from direct exposure to lake wave energies and storm surge. The MRGO, with its direct connection to the Gulf of Mexico, brings high salinity water and increased tidal amplitudes (astronomic and meteorologic "tide"; also storm surge) far into interior wetlands.

According to Louisiana Geological Survey data cited in the CWPPRA Restoration Plan, Lake Borgne shoreline retreat rates at Shell Beach are estimated at 15 feet per year (ft/yr). Assuming the shoreline continues to erode at this historical rate, and additional 300 feet will be lost along the rim of Lake Borgne in 20 years. For Bayou Dupre', this is the only area in which Lake Borgne and the MRGO have coalesced. The opening between the lake and the MRGO is estimated to be approximately 550 feet wide as measured on the 1998 DOQQ (Digital Orthophoto Quarter-Quadrangle) of the area. Assuming the shoreline continues to erode at this historical rate, the opening at Bayou Dupre' will be 2,300 feet across in 20 years.

In August 2005, USGS revised estimates of shoreline erosion rates using the latest methodologies currently being utilized for all CWPPRA shoreline protection projects. The new shoreline erosion rates at Shell Beach are estimated at 5-7 ft/yr, and 7-9 ft ft/yr at Bayou Dupre'. Much of this shoreline loss is associated with cold fronts. Revised shoreline erosion rates were based on 1990 and 2004 imagery, so the effects of hurricanes Katrina and Rita are not reflected in these rates.

1.4 Project Benefits and Potential Adverse Impacts. This narrow marsh rim between MRGO and Lake Borgne shoreline protects numerous communities from direct exposure to lake wave energies and storm surge; and, provide habitat for fish and wildlife. The proposed project would protect 95 acres along the Shell Beach portion of the project and protect approximately 70 acres along the Bayou Dupre' portion. This acreage represents that loss due to 20 years of shoreline retreat that is estimated to be about 10 feet per year.³ The proposed project will beneficially affect about 285 acres of wetlands and shallow water bottoms directly, of which 165 acres of wetlands would be protected from loss due to Lake Borgne shoreline retreat from Doulluts Canal to Fort Bayou, and on the Lake Borgne shorelines northwest and southeast of Bayou Dupre'. Estimate of loss rate reduction over the life of the project is 100 percent (Table 1). The area used to excavate the flotation access and channels (footprint of flotation dredging) is (59.8 acres)⁴ and the area used to temporarily store the flotation-dredged materials (footprint

³ November 2005 - Wetland Value Assessment (WVA)

⁴ Acres excavated for flotation access and channels (footprint of flotation dredging) = 23.1 Bayou Dupre' (BD)+36.7 Shell Beach (SB)=59.8 acres

of spoil) is (29.5 acres)⁵. The dredged flotation channel would be back-filled to its natural state upon completion of construction and maintenance events. The breakwater rock structure (footprint of rock dike in water) would permanently replace 2.4 acres of existing bottom habitat and the steel sheet structure (footprint of the structure in water) would replace 0.85 acres of existing bottom habitat⁶. Placement of the stone rock dike on land/marsh will permanently disturb 15.8 acres⁷. Additional details can be found in the 30 percent Design Report; the 95 percent Design Report; final plans and specifications; and, the Wetlands Value Assessment (WVA) are incorporated into this document by reference.

2.0 Alternatives

An analysis of the present physical forms, vegetation, wildlife, and fisheries within proposed project area compared with historic conditions indicates that there have been major physical alterations, such as a shift in marsh zone distribution, increased salinities, and land loss, that are neither desirable nor conducive to the long-term production of renewable resources in the area. Therefore, with the premise that management is necessary to restore and/or enhance the wetlands, a plan was devised for consideration. Three alternatives were considered, No Action, Nonstructural (such as laws, restrictions, and moratoriums), and Structural (such as siphons, weirs and dams, creative use of spoil, introduction of sediment, hydraulic filling, fixed structures, variable structures, levees, flood gates, drainage canal, and pumps). Nonstructural measures are not adequate by themselves to achieve the goals to restore an area and halt shoreline retreat along the stretch of Lake Borgne.⁸ Therefore, they were not considered for further consideration. Structural measures are geared to abate or reverse the present trends in wetland deterioration that can be carried out in St. Bernard Parish.⁹ Overall, similar structural projects¹⁰ have been successful to protect shoreline erosion and create marsh.

2.1 No Action Alternative. Under the no action alternative, the project would not be built. This would allow the shoreline at Shell Beach and Bayou Dupre' to continue to retreat and facilitates the continued fragmentation of the marshes separating the MRGO from Lake Borgne from both the lakeside and the ship channel side. There will be a continued loss of wetlands

⁵ Acres used for storage of flotation dredged materials (footprint of spoil) = 8.97 (BD) +20.5 (SB) = 29.5 acres

⁶ Acres waterbottoms permanently disturbed by stone structure (footprint of rock dike in water) = 1.1 (BD)+1.3 (SB)=2.4 acres

Acres waterbottoms permanently disturbed by fiberglass structure (footprint of structure in water) = 0.85 acres

⁷ Acres land permanently disturbed by stone structure (footprint of rock dike on land/marsh) = 6.1(BD)+9.7(SB)=15.8 acres

⁸ Wicker, K.M. et al. 1982 (St. Bernard Parish: A Study in Wetland Management)

⁹ Wicker, K.M. et al. 1982 (St. Bernard Parish: A Study in Wetland Management)

¹⁰ *Freshwater Bayou (ME-04); Cameron Prairie Refuge (ME-09); Boston Canal (TV-09); Turtle Cove (PO-10); Freshwater Bayou Bank Protection (TV-11); Bayou Segnette Wetlands (BA-16); Baie De Chactas (BA-05c); Lake Salvador Phase II (BA-15); Old Fort Beauregard Ruins Protection Project; Bayou LaBranch; West Belle Pass Headland; Lake Chaupeau Marsh Creation and Hydrologic restoration; and, Queen Bess Island.*

and wildlife habitat at both of these sites, thus changing conditions from marsh species to open water species.

2.2 Design Alternatives. The original project design called for an offshore breakwater. Benefits of the original project design included protection of existing marsh, marsh creation from sediment dredged from the flotation channel, and marsh formed from sediment accretion behind the offshore breakwater. However, geotechnical investigation revealed that rock could not be placed at the initially preferred alignment along the –5 foot contour, nor would the soils along the –2-foot contour (secondary alignment) support the weight of rock, with the exception of a few stretches due to high settlement rates. A second geotechnical investigation recommended that the riprap material be placed at the marsh edge where the soil bearing capacities were more suitable and minimal settlement would occur.

Four design alternatives were evaluated for use as protection along the shoreline of Lake Borgne at Shell Beach and Bayou Dupre; rock breakwaters, segmented concrete panels, steel sheet piles, and a combination of rock breakwaters and a back-to-back fiberglass sheet pile structure. Similar criteria were utilized in the preliminary design of the alternatives in order to maintain a consistent comparison of the cost estimates. All of the design alternatives used the same alignment along the approximate +0.5 foot NAVD88 contour except at the mouth of Bayou Dupre' where it traverses along the shallowest route and connects to the existing ACE breakwaters on either side. The top elevations of the design alternative features were all set at the optimum design height of +2.0 foot NAVD88 at a minimum. At the mouth of Bayou Dupre', the top elevation was set at the deep-water wave height of 2.5 foot NAVD88 due to the fact that the bathymetry actually deepens as it approaches the MRGO. For those design alternatives, which included rock breakwaters, the crown elevations for the initial and maintenance lifts were adjusted for the bearing load of the rock profile, allowable bearing capacity of the existing soil, and preliminary settlement predictions.

Segmented Concrete Panel Alternative is 16 inch (in) by 16 in by 30 feet (ft) piles and 21 ft. long panels with varying lengths based on the existing topography and bathymetry utilized in the design. The total construction cost for segmented concrete panels is estimated to be approximately \$17.3 million with a 15 percent (%) contingency. This estimate includes flotation, geotextile, scour berm, and maintenance costs.

Steel Sheet Pile Alternative is a standard PZ-27 pile with varying lengths based on the existing topography and bathymetry utilized in the design. The total construction cost for steel sheeting is estimated to be approximately \$32 million with a 15% contingency. This estimate includes 35-foot soldier piles; scour protection, flotation, and maintenance costs.

Rock Breakwater Alternative are two lifts (three at the mouth of Bayou Dupre) set at a crown elevation of +4.0 foot NAVD88 and crown width of 4 ft with 2 to 1 side slopes in order to maintain adequate protection against the deep water wave and consolidation settlement. The volume of rock required to construct the two lifts was nearly 300,000 tons. The total construction cost for the rock breakwater is estimated to be approximately \$14.3 million with a 15% contingency. This estimate includes flotation, geotextile fabric and maintenance lifts.

Combination Rock Breakwaters and Back-to-Back Fiberglass Sheet Pile Structure Alternative is where the crown elevation of the breakwater was set at the optimum design elevation of +2.0 foot NAVD88. The structure consisted of a back-to-back fiberglass sheet pile structure set at a crown elevation of 2.5 foot NAVD88, interconnected by tie rods, backfilled with sand to mean water level, and capped with geogrid composite and 250 pounds (lb) class stone. Fiberglass was initially chosen for the sheet pile material because it is stronger than vinyl and more economical than steel, rock or concrete. However, the structural limitations for fiberglass sheet pile may have become exceeded due to changes in bathymetry from Hurricane Katrina on August 29, 2005. This alternative was selected for modification in order to increase the stability of the structure; therefore, steel sheet pile was substituted in place of fiberglass sheet pile.

2.3 Combination Rock and Steel Sheeting Alternative. The total construction cost for the rock breakwaters and steel sheeting is estimated to be approximately \$11.6 million, which includes a 15% contingency. This estimate includes scour protection, flotation, geogrid composite, settlement plates, warning signs, walers, tie rods, and sand backfill. Due to the expected longevity and relatively lower construction costs, the combination rock breakwaters and back-to-back steel sheet pile structure was judged to be the preferred option.

2.3.1 End-On-Construction. End-on-construction does not require flotation access because all activities will be performed within the footprint of the breakwater. Equipment and materials access will be provided to the shore from flotation channels on adjacent construction reaches. Approximately 1,534 ft of rock breakwater along the former naval base located at Shell Beach will be constructed using end-on-construction in order to avoid the vast debris, which exists in the area.

2.3.2 Additive Alternative #1. In order to avoid any adverse impacts to cultural resources located in the Bayou Dupre' area, the additive alternate #1 (approximately 2,000 ft of onshore breakwater) originally presented at the 30% design level, was removed from the eastern-most end of the reach (Figure 4).

This EA is based on a comprehensive review of relevant literature, site-specific data, and project engineering and environmental reports. This EA concludes that there are no significant adverse environmental impacts anticipated by the implementation of this project as proposed. This finding supports the recommendations of the CWPPRA Task Force, the EPA and LDNR. The long-term protection and enhancement of the project area is expected to be beneficial to wetlands, fisheries, wildlife, recreational, and cultural resources as well as restoration of natural structural framework of the narrow strip of marsh that separates Lake Borgne from the Mississippi River Gulf Outlet.

3.0 AFFECTED ENVIRONMENT

3.1 Salinity. Historically, salinities in the project area were such that brackish marsh was the dominant habitat type. Since construction of the MRGO, these marshes have been subject to increased salinities, due to the channel's direct connection to saline marine waters. An average annual salinity of 10 part per trillion (ppt) was utilized in the 1997 and 1999 WVAs for this project. Measurements taken at the project site in June 2000 indicated a salinity of 19 ppt. As

project features of this project do not propose any salinity attenuation effect, here should be no change from the baseline condition with or without the project.

3.2 Soils. Based on information in the Soil Survey of St. Bernard Parish, Louisiana, soil types present in the Shell Beach proposed project area include Clovelly muck between Bayou Yscloskey and Fort Bayou and Fausse clay primarily along the shore between Bayou Yscloskey and Doulluts Canal. For the Bayou Dupre' proposed project area, the soil type is Clovelly muck. The Clovelly muck is characteristic of brackish marshes and shallow open water areas, which are, flooded most of the time and wet throughout the year. Clovelly muck is an organic soil that is very poorly drained, very fluid, and slightly saline. Clovelly muck soil is neutral to moderately alkaline with a pH ranging from 6.6 to 8.4. Typically, the surface layer is dark brown, very fluid muck extending about 50 inches and the underlying layer is about 70 inches thick consisting of very fluid gray clay. Clovelly muck soil is well suited for wetland wildlife habitat and combined with the brackish marshes and shallow open water areas they serve to support marine life of the Gulf of Mexico. Fausse clay is a mineral soil that is very poorly drained and firm. Fausse clay soil is neutral to strongly alkaline with a pH ranging from 6.1 to 9.0. It is found in swamps on subsided natural levees of distributaries of the Mississippi River. Typically, the surface layer is about 5 inches thick; consisting of dark grayish brown, very fluid clay in the upper part and dark gray, firm clay in the lower part. The underlying material extends about 60 inches and is gray, firm clay. Fausse clay is used as habitat for wetland wildlife. None of the alternatives would have an impact on soils.

3.3 Water Quality. Lake Borgne is located in the Eastern Louisiana Coastal U.S. Geological Survey (USGS) Cataloging Unit 0809023. The overall Index of Watershed Indicators (IWI) score for this watershed is based on the indicators of current conditions and future vulnerability. Condition indicators are designed to show existing watershed health across the country. These indicators include such things as water meeting state or tribal designated uses, contaminated sediments, ambient water quality, and wetland loss. Vulnerability indicators are designed to indicate where pollution discharges and other activities put pressure on the watershed. These could cause future problems to occur. Activities in this category include such things as pollutant loads discharged in excess of permitted levels; pollution potential from urban and agricultural lands; and changes in human population levels. The IWI score for this watershed is 3, which indicates Less Serious Water Quality Problems – Low Vulnerability to stressors such as pollutant loadings.¹¹ Watersheds with Less Serious Water Quality Problems are watersheds with aquatic conditions below State or Tribal water quality goals that have problems revealed by other indicators. Watersheds with Lower Vulnerability to Stressors are watersheds where data suggest pollutants or other stressors are low, and, therefore there exists a lower potential for future declines in aquatic health. Actions to prevent declines in aquatic conditions in these watersheds are appropriate but at a lower priority than in watersheds with higher vulnerability.

303(d) Listed Waters - Under Section 303(d) of the Clean Water Act, each State must prepare a list of waters that are not meeting their water quality standards. These lists are

¹¹ The more serious Condition Indicator for this watershed is the Wetland Loss Index. The three Vulnerability Indicators identified as more serious are Wetland Aquatic Species at Risk, Urban Runoff Potential, and Estuarine Pollution Susceptibility Index.

required to be submitted to EPA for review and approval every April of even years (e.g. 1996, 1998). Total Maximum Daily Loads (TMDLs) are then established from the most recently approved list. For Lake Borgne, ID LA-042001-1998, the parameter of concern is pathogens. The priority for TMDL development is 5.

3.3.1 No-action Alternative. Without the project, the present conditions would continue, resulting in increase wave energies, greater erosion, and eventual breaching. This continued deterioration of the existing marshes could potentially contribute to an increase in turbidity and high-energy tidal surges allowing higher salinity waters into interior bay waters. The entire project area would eventually be converted to open water.

3.3.2 Combination Rock Breakwater and Steel Sheet Piling Alternative. This option would have no long-term adverse impact on present conditions. However, short-term adverse temporary impact due to increased turbidity from the placement of the rock structure and dredging the floatation channel could occur during project construction. It is expected that turbidity levels would return to normal shortly after construction ended. It is unlikely that this option would have any effect on pathogens.

3.4 Climate and Air Quality. The area climate of St. Bernard Parish is subtropical. This climate is influenced by the water surfaces of nearby lakes, streams, and the Gulf of Mexico. Throughout the year, these water bodies modify the relative humidity and temperature conditions, decreasing the range between the extremes. Summers are long and hot with high humidity. The average daily temperatures range from 81 degree Fahrenheit (°F) to the average daily maximum of 90 °F. Winters are influenced by cold, dry polar air masses moving southward from Canada, with the average daily temperature of 53 °F, and the average daily minimum of 43 °F. Annual precipitation averages 55 inches. The area is frequented with tropical storms and hurricanes. National and state ambient air quality standards were developed for specific (criteria) pollutants to protect public health, safety, and welfare as a result of the Federal Clean Air Act of 1970. The Clean Air Act Amendments of 1990 mandated a program by which air quality must be improved and maintained so as to meet the National Ambient Air Quality Standards (NAAQS), with frameworks for state and regional agency jurisdictions, accountability, and an established time schedule. This program involves ongoing monitoring and reporting, from which regions are classified as to their attainment status with regard to each criteria pollutant. St. Bernard Parish is currently classified in attainment of all NAAQS and the air quality is good (Figure 5).

3.4.1 No-action Alternative. This alternative would have no impact on present air quality conditions.

3.4.2 Combination Rock Breakwater and Steel Sheet Piling Alternative. This alternative would have no long-term adverse impact on present conditions. Minor temporary impacts due to emissions from dredging equipment could occur during project construction. It is expected that exhaust emissions from dredging equipment should be quickly dissipated by prevailing winds and be limited to the construction phase of the project. The total volatile organic compound emissions for this project during construction is anticipated to be well below the de minimis

level of 100 tons per year. Therefore, this option conforms to the Louisiana State Implementation Plan.

3.5 Wetland Loss. Between 1932 and 1990, approximately 7,300 acres of wetlands were lost in the South Lake Borgne mapping unit. From 1983-1990, land loss data from the Coast 2050 Plan for the South Lake Borgne mapping unit indicates a wetland loss rate of approximately 0.33 percent per year (7,300 acres) and from 1974-1990, approximately 0.51 percent per year. However, this loss rate not only includes a natural loss, but also loss due to shoreline and canal erosion, etc. In 1990, this mapping unit consisted of 16,600 acres of marsh. Subsidence in the area is estimated at 1.1-2.0 ft per century. It is projected that about 3,310 acres of wetlands will be lost by 2050 for this mapping unit.

Lake Borgne shoreline retreat rates at Shell Beach are estimated at 15 feet per year (ft/yr) according to Louisiana Geological Survey data cited in the CWPPRA Restoration Plan. The narrow strip of marsh between Lake Borgne and the MRGO in the vicinity of Bayou Dupre' is disappearing. In fact, this is the only area in which Lake Borgne and the MRGO have coalesced. The opening between the Lake and the MRGO is estimated to be approximately 550 feet wide as measured on the 1998 DOQQ of the area. Assuming the shoreline continues to erode at the historical rate, the opening at Bayou Dupre' will be 2,300 feet across in 20 years.

In August 2005, USGS revised estimates of shoreline erosion rates using the latest methodologies currently being utilized for all CWPPRA shoreline protection projects. The new shoreline erosion rates at Shell Beach are estimated at 5-7 ft/yr, and 7-9 ft ft/yr at Bayou Dupre'. Much of this shoreline loss is associated with cold fronts. Revised shoreline erosion rates were based on 1990 and 2004 imagery, so the effects of hurricanes Katrina and Rita are not reflected in these rates.

3.5.1 No-action Alternative. Common plant species observed in the area include: *Spartina alterniflora*, *Spartina patens*, *Spartina cynosuroides*, *Phragmites australis*, *Distichlis spicata*, and *Iva frutescens*. Without the protection of the breakwaters, these vegetated marshes will be converted to open water.

3.5.2 Combination Rock Breakwater and Steel Sheet piling Alternative. With implementation of the proposed action, shoreline erosion and wetland loss would be halted and 165 acres of vegetated marsh will be protected over the 20-year life of the project.

3.6 Wildlife and Fisheries. The proposed project sites border two mapping units in Region 1 of the 1998 Coast 2050 Plan, South Lake Borgne mapping unit and the Lake Borgne mapping unit. For the South Lake Borgne mapping unit, the area covered in this unit is important to many species of wildlife and fishes, including migratory and resident waterfowl, wading and water birds, furbearers, shellfish, and many recreational and commercial species of fish. The Federally endangered brown pelican can be commonly found foraging and resting throughout this unit. Populations of red drum, black drum, spotted seatrout, Gulf menhaden, southern flounder, American oyster, white shrimp, brown shrimp, blue crab, and Spanish mackerel have been steady for the last 10-20 years. Gulf menhaden and Spanish mackerel populations are expected to remain steady through 2050, while the others are expected to decline. Populations of seabirds, wading birds, shorebirds, raptors, and marsh resident and migrant birds have been

steady for the last 10-20 years but are projected to decline through the year 2050. Furbearer and American alligator populations have declined over the last 10-20 years and are expected to do so through 2050. Brown pelican populations have increased in the recent past and are expected to do so through 2050.

The Lake Borgne mapping unit, the lake supports an estuarine assemblage of fishes. Red drum, spotted seatrout, blue crab, brown shrimp, and white shrimp are commercially important species found in the lake. Lake Borgne is particularly important as the site of some of Louisiana's prime oyster grounds. The Federally listed Gulf of Mexico sturgeon has been reported in Lake Borgne, and the Federally endangered brown pelican can commonly be found foraging and resting throughout this unit. For the last 10-20 years, populations of red drum, black drum, spotted seatrout, Gulf menhaden, southern flounder, American oyster, white shrimp, brown shrimp, blue crabs, and Spanish mackerel have been steady. These populations are projected to remain steady through 2050. Seabird, waterfowl, and marsh resident and migrant bird populations have been steady for the last 10-20 years and should remain so through 2050. The population of brown pelican in the area has increased in the last 10-20 years and is expected to continue this trend through 2050.

Most of the estuarine species spawn offshore, and the larvae migrate either freely or by currents into the estuarine marshes. Once inshore, the larvae reside in the saline, intermediate, or brackish marshes, depending on the species' salinity tolerance and food availability. The interface between the marsh and the water's edge creates a habitat where larval and juvenile fishes can find cover, food, and favorable environmental conditions (water depth, temperature, dissolved oxygen, current speed, and turbidity). The interior marsh provides a stable habitat that resists fluctuating water levels, salinity, temperature, and water movement.

This stable nursery habitat allows species to maintain their position in the estuary until they become adults. The larvae of many species that spawn during the fall and winter months remain in the estuary throughout the spring and summer months. During the warmer months, larval and juvenile fish and shellfish species experience the most rapid growth. The marshes are critical to the successful completion of the life cycle of these species. Additionally, the detritus provided by these marshes forms the basis of the food chain for many fish and shellfish species. The shallow estuarine open water habitat along Lake Borgne and the MRGO provide an interior habitat essential to fish, shellfish, and wildlife species. This area represents the nursery habitat for estuarine-dependent species, which utilize shallow open water for nursery grounds. Fish species such as menhaden favor shallow open water to flooded marsh for nursery grounds in their larval and juvenile life stages. Much of the shallow estuarine open water offers refuge to fish, crabs, and shrimp when the water level drops causing these species to retreat from the flooded marsh to the remaining open water.

Many of the shallow estuarine ponds are isolated from adjacent water bodies. These ponds resist the fluctuating water levels, salinity, and temperature reflected in the adjacent water body. The salinity and temperature extremes experienced in isolated ponds, due to evaporation, rainfall, and sun radiation, however, may be much greater than those experienced by ponds which are connected to the adjacent water bodies by small natural marsh channels.

The MRGO channel has created an increase in the number of access points into the marshes for estuarine species. The access increase into the salt marsh habitat has benefited estuarine species, but the conversion of brackish and saline marsh to open water has reduced the amount of estuarine nursery habitat. Many larval fish and shellfish species travel this corridor from the Gulf of Mexico to the interior marsh habitats.

Water movement, from tidal fluctuation and ship wakes, has caused erosion along the banks of the MRGO. Bank erosion along the north bank of the MRGO has increased the number of shallow estuarine marsh ponds, further increasing the width of the channel. Interior marsh breakup is a result of increased water movement and subsidence. As the interior marsh breaks up, the amount of edge habitat available to estuarine species increases. However, as the breakup converts the interior marsh to open water, estuarine marsh habitat declines.

3.6.1 The No-action Alternative. The No-action alternative may not pose an eminent danger to the fish and wildlife resources in the area, as construction would not take place. There is a continual prolonged risk as the shoreline continues to recede and the marsh and wetland habitat continues to degrade. As interior marsh habitat decreases to open water over time, species would change.

3.6.2 Combination Rock Breakwater and Steel Sheet piling Alternative. The shoreline protection is expected to preserve the marshland and areas of intertidal emergent vegetation. The wetlands protected would provide a diversity of habitat foraging, breeding, spawning, and cover habitat for a greater variety of adult and juvenile fisheries. Nutrients and detritus would be added to the existing food web, providing a positive benefit to local area fisheries. According to NOAA¹², access features such as fish dips would not be necessary even though a revetment would change the type of edge habitat, it would not necessarily restrict fish access behind it

3.7 Essential Fish Habitat (EFH).¹³ This resource is institutionally significant because of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) of 1996. Essential Fish Habitat (EFH) is technically significant because, EFH are “those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity.” EFH is publicly significant because of the high value that the public places on the seafood and the recreational and commercial opportunities EFH provides.

3.7.1 Existing Conditions. All portions of the proposed project area have been identified as EFH for various life stages of white and brown shrimp and red drum. Project evaluation included examination of habitat considered to be essential for fisheries as established under the provisions of the MSFCMA. Primary categories of EFH in the project vicinity include marsh edge, inner marsh, mud bottoms and oyster reef in Lake Borgne. Specifically, brown and white shrimps in the postlarvae, juvenile and sub-adult life stage, as well as the white shrimp adults,

¹² E-Mail dated August 16, 2005.

¹³ Detailed information on Federally managed fisheries and their EFH are identified in the 1998 generic amendment of the Fishery Management Plans for the Gulf of Mexico prepared by the Gulf of Mexico Fishery Management Council. The 1998 generic amendment was prepared as required by the Magnuson-Stevens Fishery Conservation and Management Act (P.L. 94-265).

inhabit marsh edge, submerged aquatic vegetation (SAV), marsh ponds, and inner marsh. The brown shrimp sub-adults live in estuarine mud bottoms and marsh edge. Red drum in the post-larvae/juvenile life stage inhabits SAV, estuarine mud bottoms and the interface between marsh and water. The sub-adults of the species live in estuarine mud bottoms and oyster reefs. Refer to Table 2, Summary of EFH Requirements or Species Managed by the Gulf of Mexico Management Council.

3.7.2 The No-Action Alternative. Under the No-action alternative, the proposed action would not be built. Without the protection of the breakwaters, the salt marsh would continue to erode. Essential fish habitat will decrease over time, resulting in fisheries decline.

3.7.3 Combination Rock Breakwater and Steel Sheet Pile Alternative. The shoreline protection is expected to preserve the marshland and areas of inter-tidal emergent vegetation by 100%. The wetlands protected would provide a diversity of habitat foraging, breeding, spawning, and cover habitat for a greater variety of adult and juvenile fisheries. Nutrients and detritus would be added to the existing food web, providing a positive benefit to local area fisheries. As mentioned in Section 3.62 above, inclusions of fish dip openings will not be needed to facilitate fish access and water exchange.

3.8 Threatened and Endangered Species. Two species of concern are the endangered West Indian manatee (*Trichechus nanatus*) and the threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*). Manatees have been sighted within the MRGO, and are known to travel long distances up coastal waterways from the Gulf of Mexico. On July 9, 2001, a manatee was observed passing safely through the Inner Harbor Canal Navigation Lock and into the Mississippi River. Manatees are usually within Louisiana coastal waterways only during the warm weather/warm water months. Biological Assessment (BA), “*Impacts of Navigational Channel Dredging on the Gulf Sturgeon*”, dated March 15, 2001, report that no recent catches or sightings of Gulf sturgeon within the MRGO have been found in available resources. The Louisiana Department of Wildlife and Fisheries conducted studies in Louisiana coastal waters from 1990 to 1993. Reports of incidental catches and sightings of sturgeon show that Gulf sturgeon exists within several coastal waterways in southeast Louisiana, including Lake Borgne.

On March 19, 2003, the FWS and NOAA Fisheries published a final rule in the Federal Register (Volume 68, No. 53) designating critical habitat for the Gulf sturgeon in Louisiana, Mississippi, Alabama, and Florida. Portions of the Pearl and Bogue Chitto Rivers, Lake Pontchartrain east of the Lake Pontchartrain Causeway, all of Little Lake, The Rigolets, Lake St. Catherine, and Lake Borgne within Louisiana were included in that designation. The primary constituent elements essential for the conservation of Gulf sturgeon are those habitat components that support feeding, resting, sheltering, reproduction, migration, and physical features necessary for maintaining the natural processes that support those habitat components; those elements should be considered when determining potential project impacts.

The primary constituent elements for Gulf sturgeon critical habitat include:

- abundant prey items within riverine habitats for larval and juvenile life stages, and within estuarine and marine habitats for juvenile, sub-adult, and adult life stages;

- riverine spawning sites with substrates suitable for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay;
- riverine aggregation areas, also referred to as resting, holding and staging areas, used by adult, sub-adult, and/or juveniles, generally, but not always, located in holes below normal river bend depths, believed necessary for minimizing energy expenditures during freshwater residency and possibly for osmoregulatory functions;
- a flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of fresh water discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging; and necessary for maintaining spawning sites in suitable condition for egg attachment, egg sheltering, resting, and larvae staging;
- water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages;
- sediment quality, including texture and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages; and
- safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (e.g., a river unobstructed by a permanent structure, or a dammed river that still allows for passage).

The manatee population has declined in number due to collisions with boats and barges, entrapment in flood control structures, poaching, habitat loss, and pollution. Cold weather and outbreaks of red tide may also adversely affect these mammals. For the gulf sturgeon, habitat alterations caused by water control structures that limit and sometimes prevent spawning, create poor quality water, and lead to over-fishing have negatively affected the population of this species. There is potential for manatees and sturgeon to be within the vicinity of the proposed project.

3.8.1 The No-action Alternative. Under the No-action alternative, the proposed action would not be built. Without the protection of the breakwaters the vegetative marsh would continue to erode. Habitat will decrease over time.

3.8.2 Combination Rock Breakwater and Steel Sheet piling Alternative . Implementation of the proposed project is not likely to adversely impact the West Indian manatee or the Gulf sturgeon. Halting the loss of vegetative marsh would likely protect the available habitat for these species. Construction will be done within the guidelines set forth by the FWS and the LDWF to insure protection of critical habitat and protection of these species.

West Indian Manatee. The primary potential impact to the West Indian manatees would include possible collision with service vessels and noise in the water from the dredge operation or service vessels. The dredge and service vessels would be required to have a qualified observer on board to sight the manatees while in transit so the manatees or other marine mammals could be avoided. The proposed project is expected to have negligible effect on the West Indian

manatee. No collision fatalities are expected. It is possible that the proposed construction might affect manatee behavior if in the unlikely event that any are ever present in the area during the construction period by causing them to avoid the area when rock placement takes place. Therefore, the West Indian manatees are not likely to be adversely affected.

Gulf sturgeon. To keep risk to the Gulf sturgeon at a minimum, habitat alteration during project construction should be minimized to the greatest extent possible. The shoreline protection project is expected to preserve the marshland and areas of intertidal emergent vegetation. The wetlands protected would continue to provide a diversity of habitat. This alternative will not impact enough habitat to adversely modify critical habitat to the extent it would jeopardize the gulf sturgeon.

4.0 PROPOSED MITIGATIONS

4.1 Mitigation Criteria. Mitigation criteria for the project includes avoiding vegetated areas to the greatest extent practicable, maintaining a 100-yard buffer zone of the active work zone to protect manatees, and observing a summer dredging windows by only dredging from May 1st through September 30th to protect the Gulf sturgeon. The following mitigations will be necessary to ensure environmental protection, consistent environmental policy, and safety as required by the NEPA, or are recommended measures needed for compliance with 40 CFR 1500.2(f) regarding the requirement for Federal agencies to avoid or minimize adverse effects of their actions upon the quality of the human environment.

4.1.1 Protection vegetation. For protection of existing vegetation, access to or movement across the strip of marsh outside of the defined project area shall generally be prohibited within vegetated areas for all personnel and equipment. Vegetated areas shall not be used for equipment, personnel or material access or storage. The dredged fill shall be discharged within the designated areas in a manner that will minimize overflow of the dredged material from the bounds of its placement area.

4.1.2 FWS 100-yard buffer zone. All contract personnel associated with the project will be informed of the potential presence of manatees and the need to avoid collisions with manatees, which are protected under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973. All construction personnel are responsible for observing water-related activities for the presence of manatee(s). Temporary signs will be posted prior to and during all construction/dredging activities to remind personnel to be observant for manatees during active construction/dredging operations or within vessel movement zones (i.e., work area), and at least one sign will be placed where it is visible to the vessel operator. Siltation barriers, if used, will be made of material in which manatees could not become entangled, and will be properly secured and monitored. If a manatee is sighted within 100 yards of the active work zone, special operating conditions will be implemented, including: no operation of moving equipment within 50 feet of a manatee; all vessels will operate at no wake/idle speeds within 100 yards of the work area; and siltation barriers, if used, will be re-secured and monitored. Once the manatee has left the 100-yard buffer zone around the work area on its own accord, special operating conditions are no longer necessary, but careful observations would be resumed. Any manatee sighting will be immediately reported to the U.S. Fish and Wildlife Service (337/291-

3100) and the Louisiana Department of Wildlife and Fisheries, Natural Heritage Program (225/765-2821).

4.1.3 Summer dredging windows. All contract personnel associated with the project will be informed of the potential presence of the Gulf sturgeon and take actions to induce them to leave the immediate work area prior to dredging regardless of water depth or time of year. At the commencement of dredging, the bucket will be dropped into the water and retrieved empty one time. After the bucket is dropped and retrieved, a one-minute no dredging period will be observed. During this no dredging period, personnel will carefully observe the work area in an effort to visually detect Gulf sturgeon. If Gulf sturgeons are sighted, no dredging will be initiated until they have left the work area. If the water turbidity makes such visual observations impossible, dredging work will proceed after the one-minute no dredging period. If, at any time, more than fifteen minutes elapses without dredging, then the empty bucket drop/retrieval process will be performed again prior to initiating dredging.

During the winter, juvenile and adult Gulf sturgeon use estuarine and marine habitats for foraging activities. In spring sturgeon migrate to river mouths and upstream areas in search of spawning and resting habitat. In fall, after fasting all summer in the rivers, sturgeon migrate back into the estuaries and marine habitats in search of suitable benthic prey species, which constitute their primary food source. To avoid impacts to the sturgeon during the fall and spring migrations all contract personnel will observe summer dredging windows and dredge from May 1st through September 30th only.

5.0 OTHER ENVIRONMENTAL CONSIDERATIONS

5.1 Oyster Leases. There are 6 oyster leases in the project area, which encompasses 338 acres (Figures 2 and 3). The leases have a lease value of \$91,200 and a standing crop value of \$147,959 for a total value of \$239,159. The state is currently evaluating its oyster lease policy. No construction will take place until there is a resolution between the State and lease owners.

5.2 Cultural Resources. Letters dated June 25, 2001, and June 19, 2002, were received from the State of Louisiana, Department of Culture, Recreation & Tourism, Office of Cultural Development, Division of Archaeology, State Historic Preservation Officer (SHPO), identifying three recorded archaeological sites (16SB83, 16SB43 and 16SB44) located in the Shell Beach area and six sites (SB85, SB71, SB148, SB40, SB39, and SB140) located in the Bayou Dupre' area, respectively. Site 16SB83, Fort Proctor, also known as Fort Beauregard is listed on the National Register of Historic Places (NRHP). The NRHP eligibility of sites 16SB43 (located outside of the APE) and 16SB44 were unknown. Martello Castle, SB85, was not assessed for NRHP eligibility (after hurricane Katrina, it is now a pile of rubble based on aerial photographs). Sites SB71 and SB148 were determined to be ineligible for NRHP listing. Sites SB39, SB40 and SB140 were identified as eligible for listing on the NRHP. However, site SB140 is located outside of the APE. Human remains had been encountered at site SB39.

A Phase I Terrestrial and Submerged Cultural Resources Survey was conducted to document and assess cultural resources (archaeological sites and standing structures) within the project's APE. The investigation located a single new archaeological site (SB154) and documented standing structures at site SB44. Because of this survey, two sites SB40 and SB44

were assessed as not meeting the eligibility criteria for listing on the NHRP. Sites SB39 and SB154, however, were assessed as meeting the NHRP eligibility criteria. SHPO agreed with the survey findings in their letter of August 20, 2004, to LDNR. In order to meet the intent and requirements of the National Environmental Policy Act of 1969 and the Section 106 of the National Historic Preservation Act, EPA requested LDNR to remove the additive alternate presented at the August 2005 30% design conference and as shown on the 30% level plans. By maintaining a sufficient buffer distance from these areas (SB39 and SB154), any impacts due to the construction of this project will be avoided.

5.3 Recreation. Recreational access into Lake Borgne is limited to those in boats launching from the Shell Beach, Yscloskey, and Hopedale areas. Recreation is generally hunting and fishing oriented. The natural and recreational resources of the project area provide wide and varied opportunities for outdoor enjoyment. Recreational activities taking place in the MRGO, Lake Borgne and adjacent marshes, may include boating, hunting, fishing and natural and cultural study. The project area is an area of vital importance as a fishery nursery ground, waterfowl wintering and hunting area. Recreational fishing is by far the most popular activity in the management area because of the access to water bodies, bayous, and the marsh. Small game hunting is also popular due to the abundance of habitat and the wide range of species available to the hunter.

5.3.1 No-action Alternative. Recreational use within the project area would continue at its present level. The marshes surrounding the project area provide numerous areas for hunting and fishing opportunities; however, over time these marshes would erode and subside, converting to open-water areas. Continued marsh loss translates into less edge and estuarine marsh habitat available to fish. Lost nursery and breeding grounds translate into less productive fishing in the future.

5.3.2 Combination Rock Breakwater and Steel Sheet Piling Alternative. The recreational environment in and around the project area would experience limited short-term disruption imposed by the physical size and working activities of the floating dredge facility and barge traffic. Dredging activities associated with construction of the flotation channels would increase turbidity in the area of work and in the vicinity of the discharge pipes. This turbidity will disrupt water-oriented recreational activity occurring within the vicinity; however, these adverse impacts would be temporary and short-lived. Positive long-term benefits would be the sustainability of the marsh. This marsh and vegetation would provide shelter and habitat for wildlife. The rock dike construction will reduce further bank erosion, and, at the same time create areas for fish habitat, breeding and feeding areas.

5.4 Infrastructure. The US Army Corps of Engineers has two infrastructure projects inside or bordering the South Lake Borgne mapping unit. Bayous La Loutre, St. Malo, and Yscloskey were improved to provide a navigation channel from Bayou St. Malo to Hopedale. The MRGO, a navigation channel from New Orleans to the Gulf of Mexico, was constructed as well. There are no roads or railroads, about 17 miles of pipelines, and 12 oil and/or gas wells in this unit. The Lake Borgne mapping unit, there are no major Federal, State, or parish infrastructure or any roads, railroads, or pipelines. There are 61 oil and/or natural gas wells and one industrial groundwater intake in this unit.

5.5 Socioeconomics and Environmental Justice. In accordance with Executive Order 12898 on Environmental Justice (EJ), a basic EJ analysis was performed to develop an EJ index for the proposed project. The analysis is based on the percentage of minority people, the percentage of economically distressed households earning less than \$15,000 per year, and the population within a one-half and four mile radius of the site in comparison with the percentage from the state. The EJ index indicators range from 1 where the factors affecting minorities are considered to be in balance when compared to the state average, to 100 where the minorities are considered to be grossly unbalanced when compared to the state average. For Shell Beach (Figure 6), the index for the 1 square mile area was calculated to be “0” and for the 50 square mile area calculated to be “6”. For Bayou Dupre’ (Figure 7), the index for the 1 square mile area was calculated to be “0” and for the 50 square mile area calculated to be “1”. This analysis was conducted prior to hurricanes Katrina and Rita.

5.5.1 Minority Status – For Shell Beach, approximately 35.8 percent, and for Bayou Dupre’, approximately 14.6 percent, of the population within a 50 mile radius of the proposed project sites are minorities, ranging from less than or equal to the state percentage to greater than two times the state percentage for both Shell Beach and Bayou Dupre’. The Minority Status Degree of Vulnerability is 2 for Shell Beach and 1 for Bayou Dupre’.

5.5.2 Economic Status. For Shell Beach, approximately 52.3 percent, and for Bayou Dupre’, approximately 17.5 percent, of the population within a 50 mile radius of the proposed project sites are considered economically stressed ranging for Shell Beach from greater than 1.33 times to less than or equal to 1.66 times the state percentage to less than or equal to 1.66 times the state percentage and for Bayou Dupre’ ranging from less than to equal the state percentage to greater than 2 times the state percentage. The Economic Status Degree of Vulnerability is 3 for Shell Beach and 1 for Bayou Dupre’.

5.5.3 Potential Environmental Justice Index. The Potential Environmental Justice Index (EJ) for the population within 50 miles of the proposed site is 6 for Shell Beach and 1 for Bayou Dupre’, ranging from one to 25 criteria ranked by the census block for Shell Beach and ranging from one to 100 criteria for Bayou Dupre’.

People that live within a 50 mile radius of the proposed project sites are approximately 528 people for Shell Beach and approximately 2,766 people for Bayou Dupre’.

5.6 Coastal Zone Management, Prime Farmlands, and Floodplains

5.6.1 Coastal Zone Management (CZM). The EPA Region 6 and the LDNR are co-sponsors of the project. In order to comply with CZM requirements, the project will need a Coastal Use Permit (CUP) prior to construction, which is issued by the LDNR. Applications for the CUP and ACE 404 permits have been submitted. A Joint Public Notice for both permits will be issued upon completion of this EA.

5.6.2 Floodplains. The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps delineate the 100-year Special Flood Hazard Areas, designated “A” or “V” zones. A-zone Special Flood Hazard Areas are areas that have a 1 percent chance of experiencing a 100-year level flood in any given year. Coastal zone areas are designated “V” zones in which

structures are subject to damage from both flooding and significant wave action. According to FEMA, the proposed project is designated to be in a “V” zone area. This area is subject to wind and wave action along with flooding. It does not appear that the proposed project would have a negative affect on the floodplain.

5.6.3 Prime Farmland/Overgrazing. According to the Natural Resources Conservation Service (NRCS), it does not appear that this proposed project will impact any of their work in the vicinity. Further, it is not believed that the project will have an adverse effect on the surrounding environment when completed if appropriate erosion control measures are taken during construction. No prime, unique, or statewide important farmlands will be impacted. NRCS also states that there are no livestock currently grazing in the area, nor a potential for grazing once the project is installed. Therefore, it is their opinion, overgrazing is not a problem in this project area.

5.7 Hazardous, Toxic, and Radioactive Waste (HTRW). HTRW activities include those activities undertaken for the EPA’s Superfund program, the Defense Environmental Restoration Program, including Formerly Used Defense Sites (FUDS) and Installation Restoration Program sites at active Department of Defense facilities, HTRW actions associated with Civil Works projects, and any other mission or non-mission work performed for others at HTRW sites. (EP¹⁴ 1110-1-18) For the purposes of Unexploded Ordnance (UXO) support, HTRW activities during the investigative/design phase of HTRW project on a site with known or UXO with unknown fillers require anomaly avoidance procedures. HTRW activities during the remedial action phase (construction) of HTRW project on a site with known or UXO with unknown fillers may require either standby support or subsurface removal.

Shell Beach was an anti-aircraft gunnery range used during World War II (Figure 8).¹⁵ The inventory property report for this property lists it as an eligible FUDS property (Number A06LA0323), but no hazards were found and the site is considered complete, no further actions to be taken.¹⁶ These ranges were oriented to fire out over the water at aerial targets towed by a tow aircraft. The limit for an eligible ordnance project along a shoreline is 100 years from the high tide line. Any ordnance at this property would be located in the water beyond the current limit of 100 years, which makes any project ineligible. The location is generally at: 29° 52’ 01” north latitude and 89° 40’ 01” west longitude. End-on-construction along this former naval base will ensure avoidance of the vast debris, which exists in the area.

5.8 Cumulative Impacts. Potential cumulative impacts would be the aggregate impacts to the environment resulting from the proposed action in combination with other ongoing actions, and actions being considered within the reasonably foreseeable future. The proposed action is part of an effort under CWPPRA to create, protect, restore and enhance wetlands in coastal Louisiana. CWPPRA provides Federal funds for planning and implementing of such projects.

¹⁴ EP = Engineer Pamphlet

¹⁵ <http://www.history.navy.mil/faqs/faq104-1.htm>

¹⁶ The U.S. Army Corps of Engineers, Fort Worth District, conducted an investigation. <http://www.hq.environmental.usace.army.mil/programs/fuds/fla/fla.html>

The MRGO, constructed in 1963, has drastically changed the landscape of the St. Bernard Parish wetlands not only by its large foot print, which eliminated thousands of acres of wetlands, but also by altering salinity and tidal regimes. For now, relatively little is being done to address the ongoing degradation caused by the MRGO. Future MRGO closure/modification decision will take years. A limited amount of rock-buttressed dredged spoil has been used in the past to protect small portions of the highly vulnerable channel shore, and speed restrictions have been proposed to reduce wake erosion. The proposed action is expected to have long-term beneficial cumulative impacts. Protecting wetlands within the proposed project areas benefits the significant resources described in the EA. Protecting the shorelines and wetlands between Lake Borgne and the MRGO would sustain valuable breeding, nesting, foraging, and cover habitat for a variety of fisheries and wildlife species. The new result would be sustaining biodiversity and productivity. No new projects are anticipated in the near future.

5.9 Unavoidable Adverse Effects. The primary unavoidable adverse effects are the immediate impacts from construction related sediment excavation and deposition on the non-mobile benthic organisms in areas adjacent to specific project features; minor and temporary disturbance to adjacent wetlands, water and air quality. The effects on air quality and the noise generated by the proposed project will be of a temporary nature.

5.10 Relationship between Local, Short Term Use of the Environment and the Maintenance/Enhancement of Long Term Beneficial Uses. All structural and non-structural alternatives have short-term localized impacts during construction; yet offer highly significant long-term environmental benefits. Since the proposed project is a protection of shoreline action, the social and environmental benefits of the proposed project over the long term are considerably greater than the environmental impacts and irretrievable commitment of resources identified in this document. The proposed Shell Beach proposed project would protect approximately 95 acres of emergent marsh from direct loss due to Lake Borgne shoreline retreat from Doulluts Canal to Fort Bayou. For Bayou Durpe', the proposed project would protect 70 acres of existing emergent marsh and prevent further coalescence of Lake Borgne with the MRGO resulting from the shoreline erosion of Lake Borgne.

5.11 Irreversible and Irretrievable Commitment of Resources. The irreversible and irretrievable committed resources would be labor, materials, wear on machinery, monies spent, and energy expended for implementation of the restoration action.

6.0 CONSULTATION AND PUBLIC PARTICIPATION

Public involvement including input from the public, local, State, Tribal and Federal agencies is achieved through the Citizen Participation Group, and public meetings conducted during the project development and selection stages under CWPPRA. The project concept was originally proposed to the public at a nomination meeting held in 2000. An overview of the selected project was presented to the public in 2001. St. Bernard Parish was kept updated as project engineering and design progressed.

The public recognizes that the continued loss of coastal wetlands can ultimately result in the displacement of entire communities, the loss of occupational and recreational opportunities, and ultimately, the forfeiture of a unique culture and way of life. Passage of the Louisiana

constitutional amendment establishing the Coastal Wetlands Conservation and Restoration Fund clearly overwhelmingly demonstrated public's overwhelming support to effectively address the State's coastal land loss problem. This statutorily dedicated fund has provided a State funding mechanism for cost sharing this project.

Coordination has been maintained with each of the CWPPRA Task Force agencies and the LDNR. Consultation has been conducted with the FWS and LDWF, in accordance with the Endangered Species Act of 1973 and Fish and Wildlife Coordination Act. The EA has been prepared in coordination with the NMFS in determining categories of EFH and associated fisheries species within the project vicinity. Submittal of the EA is provided to initiate formal Federal consultation requirements pertaining to EFH under the MSFCMA. Federal, State, Tribal and local agencies, as well as other interested stakeholders, will receive a copy of this EA. Consultation has also been conducted with the Louisiana Department of Culture, Recreation and Tourism, State Historic Preservation Officer (SHPO) in accordance with the National Historic Preservation Act of 1966, and Archaeological and Historic Preservation Act of 1974. Since 2003, consultation has been conducted with the Chitimacha Tribe of Louisiana and the Mississippi Band of Choctaw tribes concerning two archeological sites, SB39 and SB154, known to contain human remains of the Mississippi Band of Choctaw and/or Chitimacha Tribe of Louisiana. Responses from the respective agencies with regard to the proposed action are included in Section 7.0.

U.S. Department of Agriculture, Natural Resources Conservation Service
U.S. Army Corps of Engineers
U.S. National Marine Fisheries Service
U.S. Fish and Wildlife Service
Federal Emergency Management Agency
State Historic Preservation Officer
Louisiana Department of Environmental Quality
Louisiana Department of Natural Resources
Louisiana Department of Wildlife and Fisheries
National Audubon Society
St. Bernard Parish Consolidated Government
Chitimacha Tribe of Louisiana
Mississippi Band of Choctaw

7.0 TABLES, MAPS, FIGURES, COMMENT LETTERS AND E-MAILS

Table 1: Lake Borgne Shoreline Projection orject (PO-30) Habitat Analysis at FY0 and FY20

	Bayou Dupre West	Bayou Dupre - East	Shell Beach	Total	Bayou Dupre' and Shell Beach
	Area - Acres FY0	Area – Acres FY0	Area – Acres TY0	Area – Acres FY0	Area – Acres FY20
Aquatic Vegetation	47	23	94	164	0
wetland shrub scrub			1	1	0
open water	29	21	70	120	0
Total	76	44	165	285	0

Table 2: Summary of EFH Requirements or Species Managed by the Gulf of Mexico Management Council

Species	Life Stage	System	EFH
Brown shrimp EFH identified from Apalachicola Bay to Mexico	eggs larvae postlarvae/juvenile subadults adults	Marine (M) M Estuarine (E) E M	<110 m, demersal <110 m, planktonic marsh edge, SAV, tidal creeks, inner marsh mud bottoms, marsh edge <110 m, silt sand, muddy sand
White shrimp EFH identified from Suwannee River to Mexico	eggs larvae postlarvae/juvenile subadults adults	M M E E M	<40 m, demersal <40 m, planktonic marsh edge, SAV, marsh ponds, inner marsh, oyster reefs same as above <33 m, silt, soft mud
Pink shrimp EFH identified from Florida	eggs larvae postlarvae/juvenile subadults adults	M M E E M	<65 m, demersal <65 m, planktonic SAV, sand/shell substrate SAV, sand/shell substrate <65 m, sand/shell substrate
Royal red shrimp EFH identified from NE Gulf of Mexico	adults	M	250 – 500m, terrigenous silt and silty sand & calcareous mud
Red drum EFH identified from Florida through Texas	eggs larvae postlarvae/juvenile subadults adults	M M M/E E M/E	planktonic planktonic SAV, estuarine mud bottoms, marsh/water interface mud bottoms, oyster reefs Gulf of Mexico & estuarine mud bottoms, oyster reef
Red grouper EFH identified form	eggs juvenile	M M	planktonic, 25 – 50 m hard bottoms, SAV, reefs

Eastern Gulf of Mexico (W. FL Shelf)	adults	M	reefs, ledges, outcrops
Black grouper EFH identified from Eastern Gulf of Mexico	juvenile Adults	M/E M	FL estuaries & Gulf of Mexico rocky coral reefs to 150 m
Gag grouper EFH identified from Eastern Gulf of Mexico	eggs juvenile adults	M M/E M	planktonic SAV & oyster beds in coastal lagoons and estuaries hard bottoms, reefs, coral; 10 – 100 m
Scamp EFH identified from Eastern Gulf of Mexico	juvenile adults	M M	hard bottoms, reefs; 12 – 33 m hard bottoms; 12 – 189 m
Red snapper EFH identified from Florida through Texas	larvae postlarvae/juvenile adults	M M M	structure, sand/mud; 17-183 m structure, sand/mud; 17-1183 m reefs, rock outcrops, gravel; 7 – 146 m
Vermilion snapper EFH identified from Florida through Texas	juvenile	M	reefs, hard bottom, 20 – 200 m
Gray snapper EFH identified from Eastern Gulf of Mexico	larvae postlarvae/juvenile adults	M E M/E	planktonic SAV, mangrove, mud SAV, mangrove, sand, mud
Yellowtail snapper EFH identified from Eastern Gulf of Mexico	juvenile adults	M/E M	SAV, mangrove, sand, mud reefs
Lane snapper EFH identified from Florida & Texas	juvenile adults	M/E M	SAV, mangrove, sand, mud reefs, sand, 40 132 m
Greater amberjack EFH identified from Florida through Texas	juvenile adults	M M	floating plants (Sargassum), debris pelagic over reefs/wrecks
Lesser amberjack EFH identified from Florida through Texas	juvenile adults	M M	floating plants (Sargassum), debris oil rigs, irregular bottom features
Tilefish EFH identified from Florida through Texas	Juvenile Adults	M M	burrows rough bottom, 250 – 350 m
Gray triggerfish EFH identified from Fl & LA/TX Shelves	eggs larvae postlarvae/juvenile adults	M M M M	sand floating plants (Sargassum), debris floating plants (Sargassum), debris, mangrove reefs, >10 m
King mackerel EFH identified from Fl & LA/TX Shelves	juvenile adults	M M	pelagic pelagic
Spanish mackerel EFH identified from Florida through Texas	larvae juvenile adults	M M/E M	<50 m isobath offshore, beach, estuarine pelagic
Cobia EFH identified from Florida through Texas	eggs larvae postlarvae/juvenile adults	M M/E M M	pelagic estuarine & shelf estuarine & shelf estuarine & shelf
Dolphin EFH identified from Florida through Texas	larvae postlarvae/juvenile adults	M M M	epipelagic epipelagic epipelagic
Bluefish	postlarvae/juvenile	M/E	beaches, estuaries, inlets

EFH identified from Florida through Texas	adults	M/E	gulf and estuaries, pelagic
Little tunny EFH identified from Florida through Texas	postlarvae/juvenile adults	M M	coastal & shelf, pelagic coastal & shelf, pelagic
Stone crab EFH identified from Florida estuaries and nearshore waters	larvae juvenile adults	M/E M/E M/E	planktonic, moderate-high salinity shell, SAV shell, FAV, coal
Spiny lobster EFH identified from Eastern Gulf of Mexico	larvae juvenile adults	M M M	algae, SAV sponge, coral hard bottoms, crevices
Coral Flower Gardens FL Middle Grounds	All stages	M	

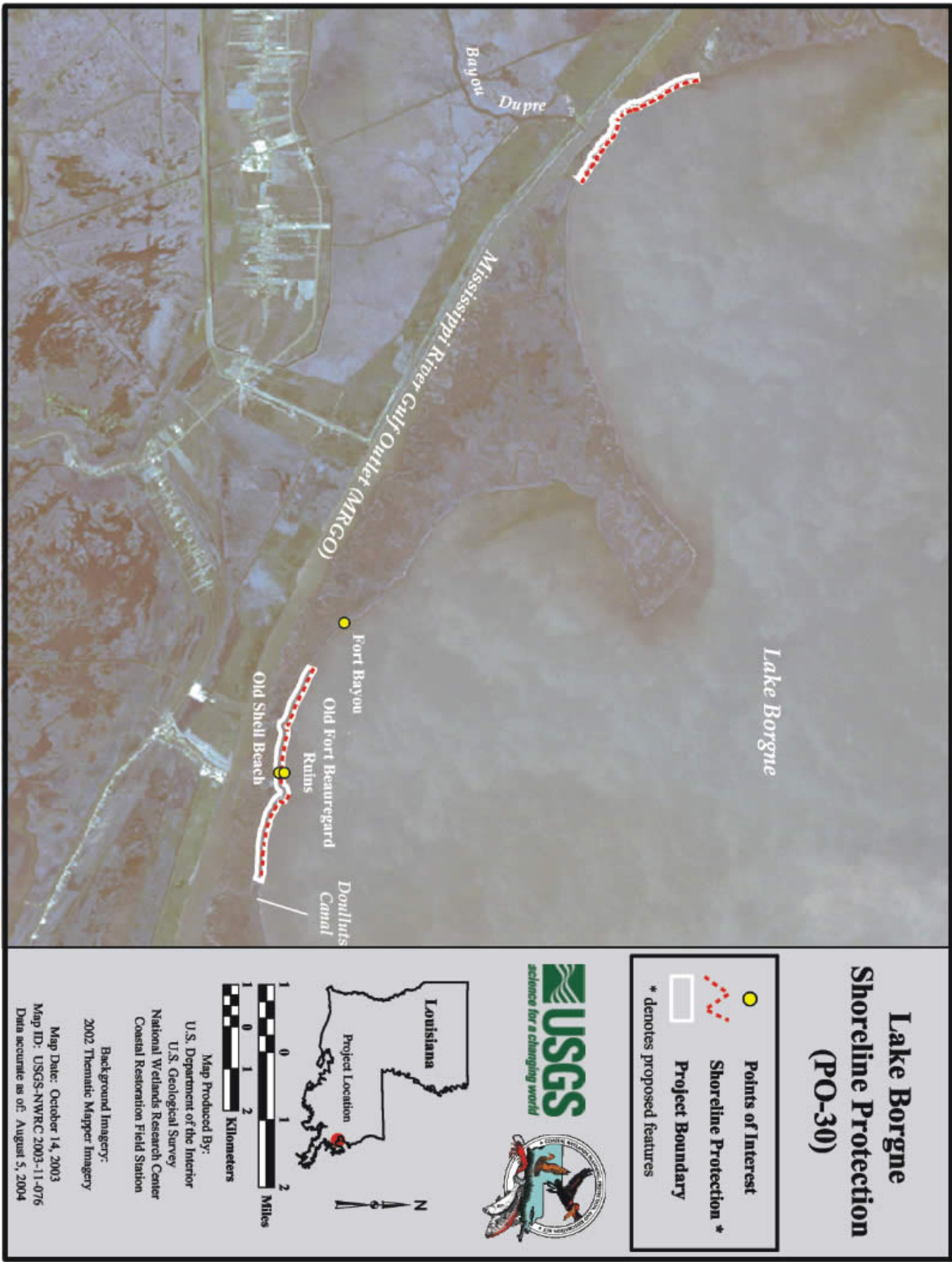


Figure 1: Project Location Map

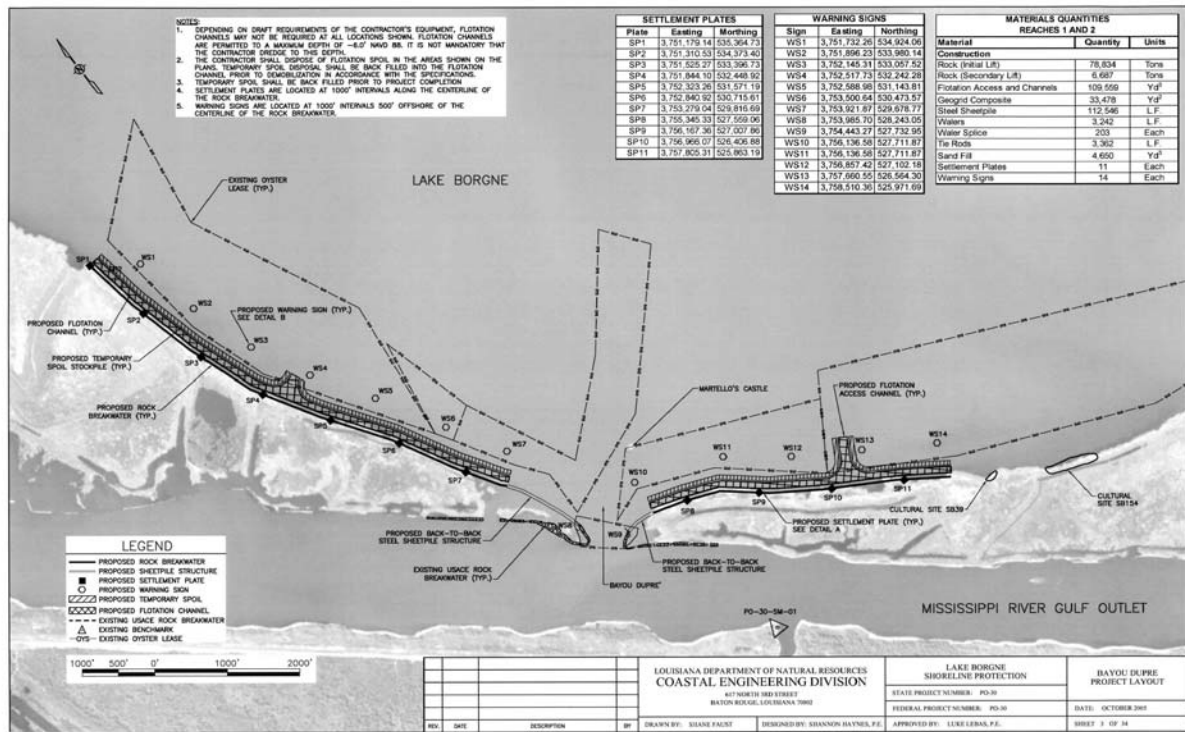


Figure 2: Bayou Dupre' Project Layout and Breakwater Alignment

Air Quality

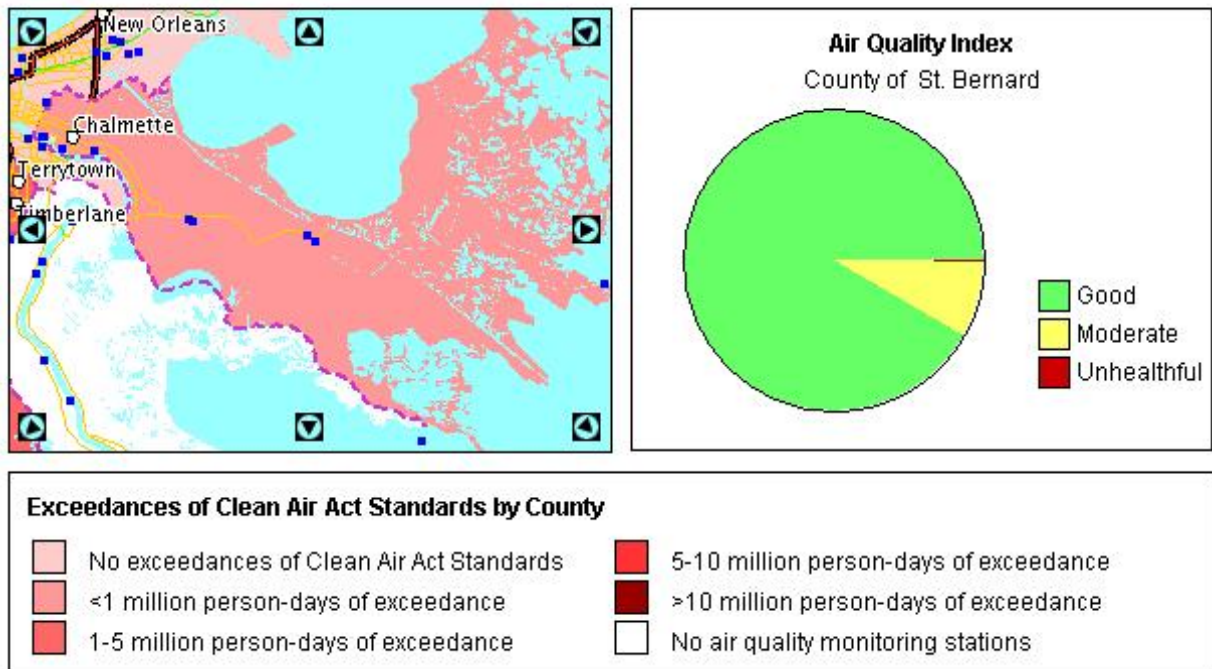


Figure 5: St. Bernard Air Quality Index

Lake Borgne, Shell Beach, LA Potential Environmental Justice Index (EJ)

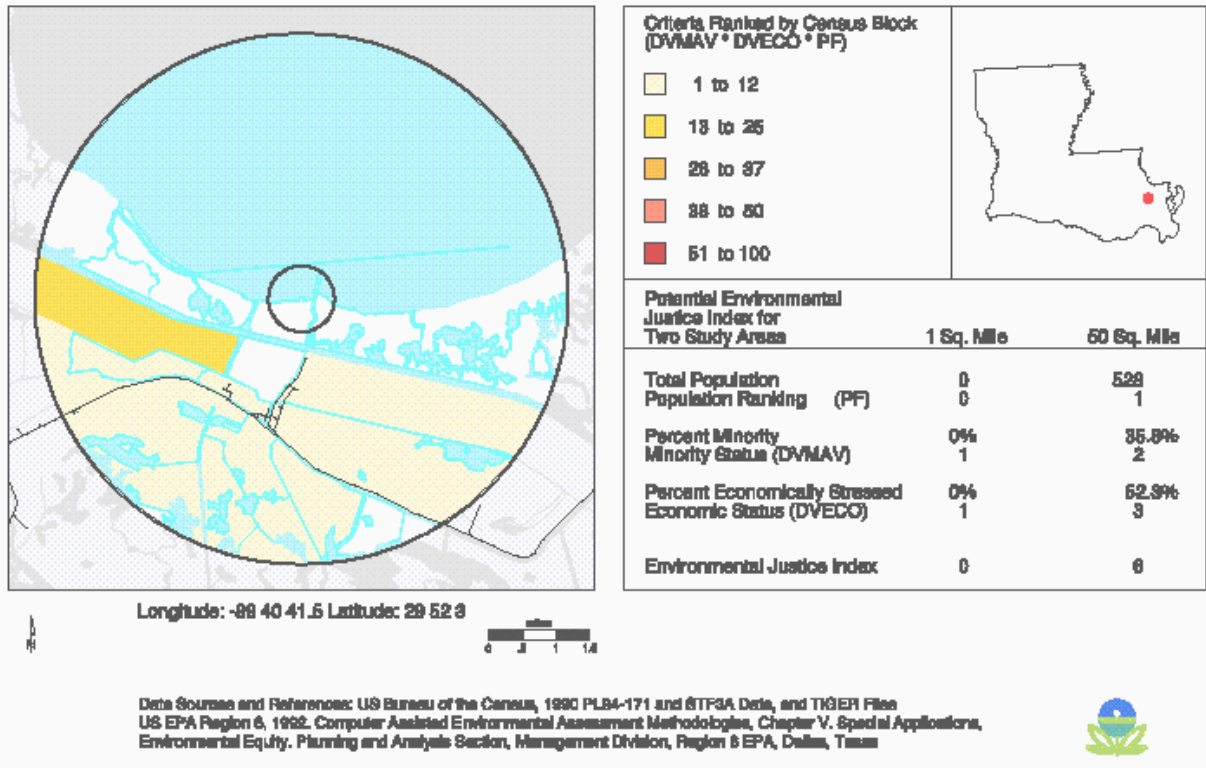
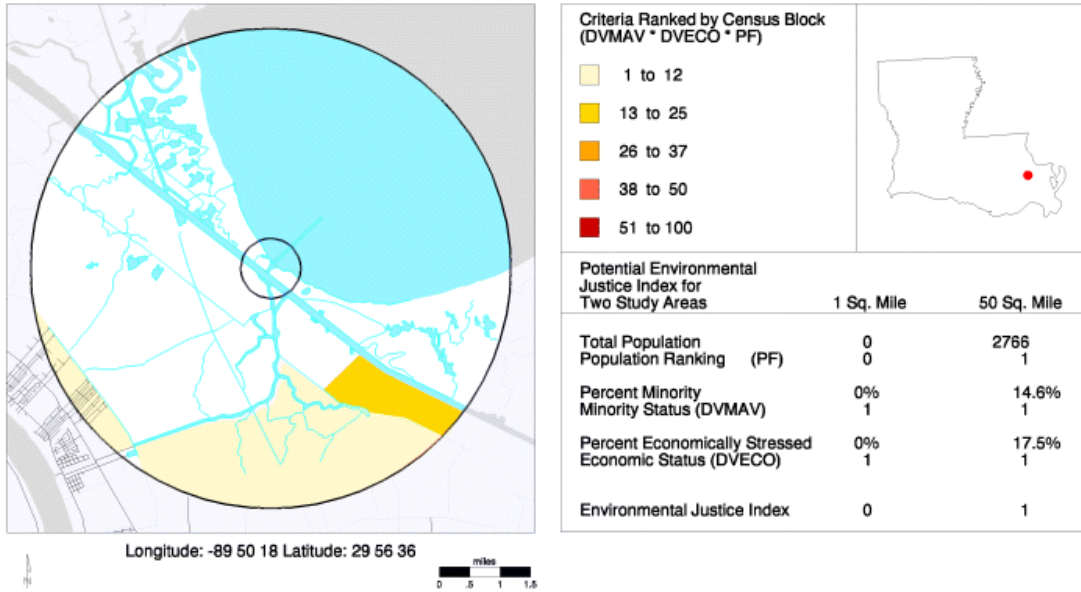


Figure 6: Potential Environmental Justice Index (EJ) – Shell Beach

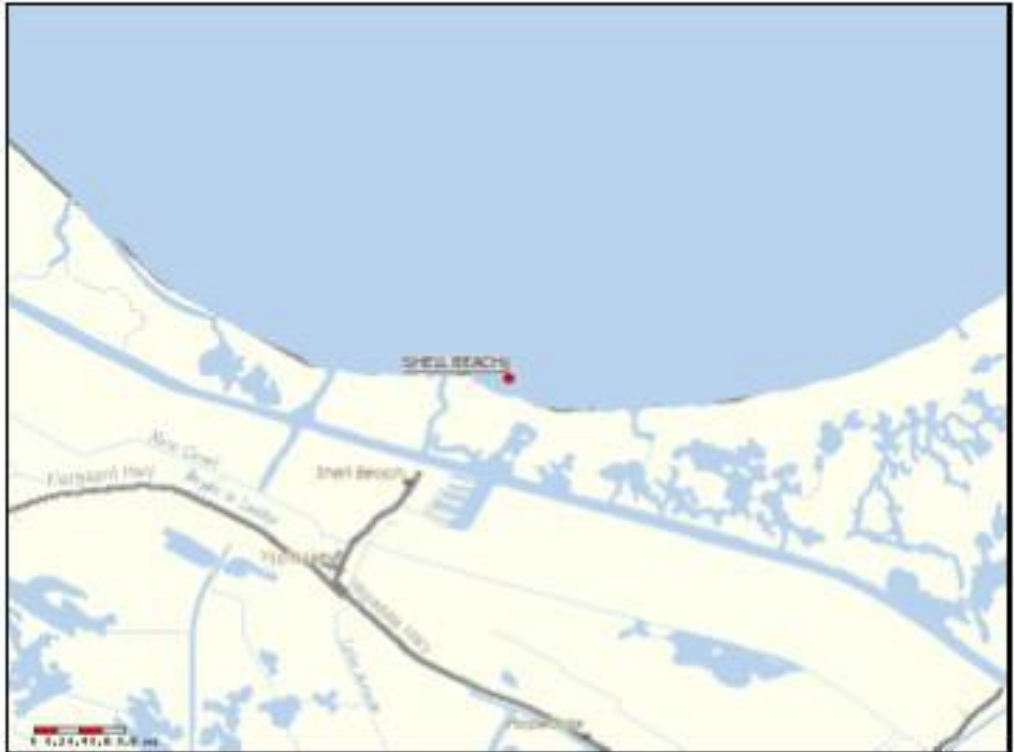
Lake Borgne, Bayou Dupre, LA Potential Environmental Justice Index (EJ)



Data Sources and References: US Bureau of the Census, 1990 PL94-171 and STF3A Data, and TIGER Files
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Figure 7: Potential Environmental Justice Index (EJ)- Bayou Dupre'



SHELL BEACH



Figure 8: Shell Beach Formerly Used Defense Site

List of Comment Letters, Memorandum and E-mails

Letters of May 15, 2001, State of Louisiana, Louisiana Department of Transportation and Development, Floodplain Insurance Manager

Letters of May 31, 2002, State of Louisiana, Louisiana Department of Transportation and Development, Floodplain Insurance Manager

Letter of May 22, 2001, U.S. Natural Resources Conservation Service

Letter of July 3, 2002, U.S. Natural Resources Conservation Service

Letter of September 27, 2002, U.S. Natural Resources Conservation Service

Letter of May 24, 2001, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service

Letter of June 12, 2002, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service

Letter of May 30, 2001, State of Louisiana Department of Natural Resources

Letter of July 23, 2002, State of Louisiana Department of Natural Resources

Letters of June 5, 2001, U.S. Fish and Wildlife Service

Letters of May 30, 2002, U.S. Fish and Wildlife Service

Letter of June 25, 2001, Louisiana Office of Cultural Development, State Historic Preservation Officer

Letter of June 19, 2002, Louisiana Office of Cultural Development, State Historic Preservation Officer

Letter of August 20, 2004, Louisiana Office of Cultural Development, State Historic Preservation Officer

Letter of June 19, 2003, Department of the Army, New Orleans District, Corps of Engineers

E-Mail of August 16, 2005, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service

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