DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

July 24, 2008

REPLY TO
ATTENTION OF:
Planning, Programs, and
Project Management Division
Environmental Planning
And Compliance Branch

Decision Record

Individual Environmental Report #3
Lake Pontchartrain and Vicinity, Lakefront Levee,
Jefferson Parish, Louisiana

IER #3

Description of Proposed Action. The New Orleans District, US Army Corps of Engineers (CEMVN) proposes to rebuild earthen levees, upgrade foreshore protection, replace floodgates, construct fronting protection for four pumping stations, and construct or modify breakwaters at four pumping stations in Jefferson Parish, Louisiana. The elevations of the existing levees, floodwalls, structures, and gates within the Lake Pontchartrain and Vicinity hurricane protection system in Jefferson Parish would be raised to a height of 16.5-17.5 ft NAVD88, with the exception of the breakwaters at the pumping stations, which would be modified and/or constructed to a height of 10 to 14 ft NAVD88.

Draft IER #3, which detailed the impacts of the proposed actions, was released for public review on June 16, 2008. Stakeholders had until July 16, 2008 to comment on the document. Comments were received from one governmental agency and two citizens. Public meetings pertaining to IER 3 occurred on June 7, July 26, September 27, and December 6, 2007; and February 28, April 9, and June 17, 2008.

Factors Considered in Determination. CEMVN has assessed the impacts of the proposed action on significant resources in the proposed project area, including Lake Pontchartrain, wetlands, fisheries, essential fish habitat, wildlife, threatened and endangered species, cultural resources, recreational resources, aesthetic resources, air quality, noise, and transportation.

All jurisdictional wetlands and non-jurisdictional bottomland hardwood forest impacts were assessed in cooperation with the US Fish and Wildlife Service (USFWS) and CEMVN under NEPA, Fish and Wildlife Coordination Act, and Section 906 (b) WRDA 1986 requirements. The impacts for the proposed action are as follows:

Lake Pontchartrain

- Reaches LPV 00, 01, 02, 19, and 20 (levee reaches) – 22 acres of lake lost to hard fill.
- Reaches LPV 09, 10, 11, and 12 (pumping stations) – 4.4 acres of lake lost to hard fill.
- Reaches LPV 16, 17, and 18 (boat launches and Causeway bridge) – No habitat loss.

Wetlands

- Reaches LPV 00, 01, 02, 19, and 20 (levee reaches) – No wetlands impacted.
- Reaches LPV 09, 10, 11, 12, 16, 17, and 18 (pumping stations, boat launches, and
- Causeway bridge) – No wetland loss.

Fisheries

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 19, and 20 (levee reaches and pumping stations) temporary impacts to 116 acres and permanent loss 27 acres of lake and wetland.
- Reaches LPV 16, 17, and 18 (boat launches and Causeway bridge) – very limited, temporary construction related impacts.

EFH

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 19, and 20 (levee reaches and pumping stations) 27 acres of lake (shell/silty-sand/mud bottom and water column) lost to hard fill.
- Reaches LPV 16, 17, and 18 (boat launches and Causeway bridge) – very limited, temporary construction related impacts.

Wildlife

- Reaches LPV 00, 01, 02, 19, and 20 (levee reaches) – reduction in lake habitat, utilized primarily by avian species and temporary impacts to wildlife within the vicinity of the project area during construction.
- Reaches LPV 09, 10, 11, 12, 16, 17, and 18 (pumping stations, boat launches, and Causeway bridge) – temporary impacts to wildlife within the vicinity of the project area during construction.

Endangered or Threatened Species

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 16, 17, 18, 19, and 20 (levee reaches, pumping stations, boat launches, and Causeway bridge) – unlikely to have adverse impacts.
- Access channel construction at Bonnabel pumping station would result in temporary impacts to Gulf sturgeon critical habitat of 29 acres; construction of the fronting protection and breakwater would result in permanent impacts to 1.7 acres.

Cultural Resources

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 16, 17, 18, 19, and 20 (levee reaches, pumping stations, boat launches, and Causeway bridge) – SHPO consultation concluded that no cultural resources would be impacted.

Recreation

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 19, and 20 (levee reaches and pumping stations) - Beneficial: Additional protection from storm surge damage and enhanced access to lake fishing.

- Reaches LPV 16, 17, and 18 (boat launches and Causeway bridge) – Temporary Adverse: temporary impacts during construction due to closure of recreation facilities at reaches
- LPV 16 and 18 and impacts to fishing at reach LPV 17.

Aesthetics (Visual) Resources

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 16, 17, 18, 19, and 20 (levee reaches, pumping stations, boat launches, and Causeway bridge) – temporary impact by construction activities at the project sites and the addition man-made features (breakwaters) to the shoreline adjacent to pumping stations # 1 and # 4.

Air Quality

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 16, 17, 18, 19, and 20 (levee reaches, pumping stations, boat launches, and Causeway bridge) – temporary site-specific construction effects including exhaust and dust emissions.

Noise

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 16, 17, 18, 19, and 20 (levee reaches, pumping stations, boat launches, and Causeway bridge) – temporary impacts to receptors within 1,000 ft of the project area during construction and to receptors living near the lakefront during access channel dredging.

Transportation

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 16, 17, 18, 19, and 20 (levee reaches, pumping stations, boat launches, and Causeway bridge) – worker and truck traffic resulting from the project would temporarily impact traffic on highways within the vicinity of the project area.

Mitigation IERs will be prepared documenting and compiling the unavoidable impacts discussed in each IER. The mitigation IERs will implement compensatory mitigation as early as possible. All mitigation activities will be consistent with standards and policies established in the Clean Water Act Section 404 and the appropriate USACE policies and regulations governing this activity.

Environmental Design Commitments.

1.) In order to minimize the potential for construction activities under the proposed action to cause adverse impacts to manatees during the construction period (approximately 2 to 2.5 years), standard manatee protection measures would be implemented.

2.) In order to minimize the potential for construction activities under the proposed action to cause adverse impacts to Gulf sturgeon and their critical habitat, the CEMVN would adhere to a dredging/construction window for the project on the eastern side of the Lake Pontchartrain Causeway that would allow construction in the project area to occur during the months of May through September. The bucket drop procedure developed by the USFWS also would be employed to encourage any Gulf sturgeon in the vicinity to leave the project area.

3.) If the proposed action is changed significantly or is not implemented within one year, CEMVN will reinitiate coordination with the USFWS to ensure that the proposed action would not adversely affect any Federally listed threatened or endangered species, or their habitat.

4.) If any unrecorded cultural resources are determined to exist within the proposed project boundaries, then no work will proceed in the area containing these cultural resources until a CEMVN-PM-RN archeologist has been notified and final coordination with the State Historic Preservation Officer (SHPO) and Tribal Historic Preservation Officer (THPO) has been completed. [CEMVN-PM-RN/SHPO Standard Operating Procedure]

Agency & Public Involvement. Various governmental agencies, non-governmental organizations, and citizens were engaged throughout the preparation of IER #3. Agency staff from US Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), US Environmental Protection Agency (EPA), US Geologic Survey (USGS), National Park Service (NPS), Louisiana Department of Natural Resources (LDNR), and Louisiana Department of Wildlife and Fisheries (LDWF) were part of an interagency team that has and will continue to have input throughout the Greater New Orleans Hurricane and Storm Damage Risk Reduction System (GNOHSDRRS) planning process (Appendix D).

There have been over 70 public meetings since March 2007 about proposed GNOHSDRRS work. Issues relating to draft IER #3 have been discussed at seven of these meetings. CEMVN sends out public notices in local and national newspapers, news releases (routinely picked up by television and newspapers in stories and scrolls), and mail notifications to stakeholders for each public meeting. In addition, www.nolaenvironmental.gov was set up to provide information to the public regarding proposed GNOHSDRRS work. CEMVN has recently started sending out e-mail notifications of the meetings to approximately 300 stakeholders who requested to be notified by this method. Public meetings will continue throughout the planning process.

Draft IER #3 Public Review Period

1. Agency Comments (found in Appendix D)
    a. EPA: Comment email dated July 14, 2008

2. Public Comments (found in Appendix B)
    a. NuShore LLC and Strategic Planning Associates: Comment email dated July 9, 2008.
    b. Chehardy, Sherman, Ellis, Murray, Recile, Griffith, Stakelum and Hayes, LLP Comment letter dated June 30, 2008. Additional information provided by the commenter during a June 24, 2008 meeting is being maintained in the PM-R project folder and is available for review upon request.

Decision. The CEMVN Environmental Planning and Compliance Branch has assessed the potential environmental impacts of the proposed action described in this IER, and performed a review of the comments received during the public review period for Draft IER #3. Furthermore, all practicable means to avoid or minimize adverse environmental effects have been incorporated into the recommended plan. No jurisdictional wetland impacts would be incurred with construction of the proposed action.

The public interest will be best served by implementing the selected plan as described in IER #3 in accordance with the environmental considerations discussed above.

CEMVN will prepare a Comprehensive Environmental Document (CED) that may contain additional information related to IER #3 that becomes available after the execution of the Final IER. The CED will provide a final mitigation plan, comprehensive cumulative impacts analysis, and any additional information that addresses outstanding data gaps in any of the IERs.

I have reviewed IER #3, and have considered agency recommendations and comments received from the public during the scoping phase and comment periods. I find the recommended plan fully addresses the objectives as set forth by the Administration and Congress in the 3rd, 4th, and 5th Supplemental Appropriations.

The plan is justified, in accordance with environmental statutes, and it is in the public interest to construct the actions as described in this document.

7-25-08
Date

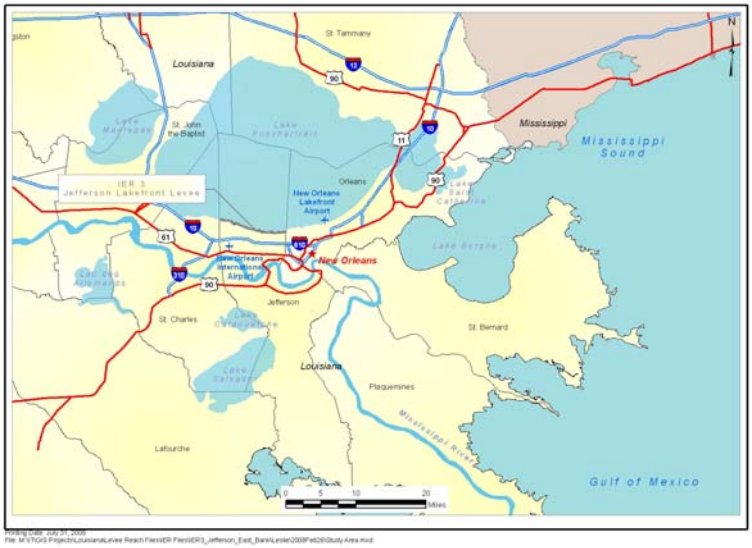
Alvin B. Lee
Alvin Lee
Colonel, U.S. Army
District Commander

FINAL INDIVIDUAL ENVIRONMENTAL REPORT

LPV, JEFFERSON EAST BANK

JEFFERSON PARISH

IER # 3



US Army Corps of Engineers®

July 2008

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1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Mississippi Valley Division, New Orleans District (CEMVN), has prepared this Individual Environmental Report (IER) # 3 to evaluate the potential impacts associated with the proposed rebuilding of 9.5 miles of earthen levees, upgrading of the foreshore protection, the replacement of two floodgates, and the construction of fronting protection and construction or modification of breakwaters at four pumping stations as part of the Lake Pontchartrain and Vicinity (LPV) Hurricane Protection Project. The proposed action is located in Jefferson Parish, Louisiana (figure 1). For the purposes of this IER, the LPV area has been divided into numerous reaches, and each reach is identified by a project identification number (e.g., LPV 00) (figure 2).

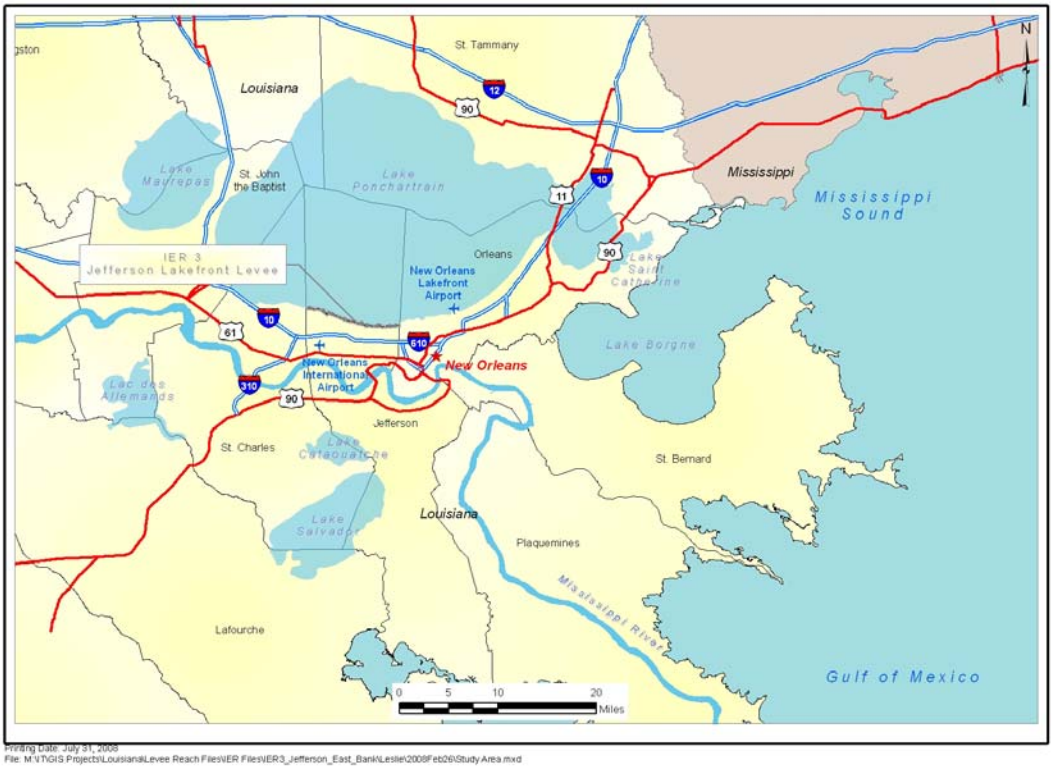


Figure 1. Jefferson Lakefront Levee, Vicinity Map

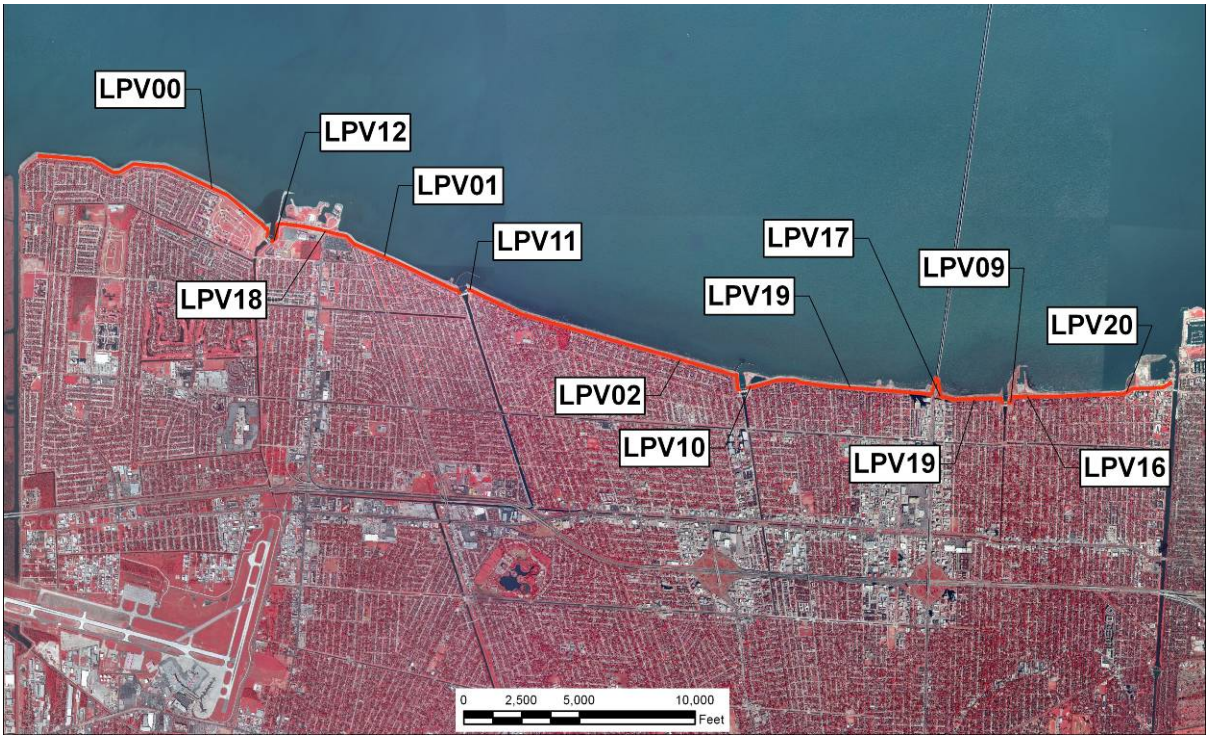


Figure 2. IER # 3 Jefferson East Bank Reaches

IER # 3 has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality's Regulations (40 Code of Federal Regulations [CFR] 1500-1508), as reflected in the USACE Engineering Regulation (ER) 200-2-2. The execution of an IER, in lieu of a traditional Environmental Assessment (EA) or Environmental Impact Statement (EIS), is provided for in ER 200-2-2, Environmental Quality (33 CFR 230), Procedures for Implementing the NEPA, and pursuant to the Council on Environmental Quality (CEQ) NEPA Implementation Regulations (40 CFR 1506.11).

The CEMVN implemented Alternative Arrangements on 13 March 2007, under the provisions of the CEQ Regulations for Implementing the NEPA (40 CFR 1506.11). This process was implemented in order to expeditiously complete environmental analysis for any changes to the authorized system and the 100-year level of the Greater New Orleans Hurricane and Storm Damage Risk Reduction System (GNOHSDRRS), formerly known as the Hurricane Protection System, authorized and funded by Congress and the Administration. The reaches included in the proposed action are located in southeastern Louisiana and are part of the Federal effort to rebuild and complete construction of the GNOHSDRRS in the New Orleans Metropolitan area as a result of Hurricanes Katrina and Rita. The Alternative Arrangements can be found at www.nolaenvironmental.gov and are herein incorporated by reference.

The draft IER was distributed for a 30-day public review and comment period on 16 June 2008. Comments were received during the public review and comment period from two citizens (appendix B) and a Federal agency (appendix D). A public meeting discussing the draft IER was held on 17 June 2008. The CEMVN District Commander reviewed public and agency comments

and interagency correspondence. The District Commander's decision on the proposed action is documented in the IER Decision Record.

1.1 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is to provide 100-year level of protection for Jefferson Parish East Bank. The proposed action results from the need to reduce flood risk and storm damage to residences, businesses, and other infrastructure from storm-induced and tidally-driven 100-year storm events in Lake Pontchartrain. The elevations of the existing floodwall tie-ins, gates, and levees within five reaches of the LPV project area (reaches 00, 01, 02, 19, 20) are below the 100-year design elevation. The completed GNOHSDRRS would lower the risk of harm to citizens, and damage to infrastructure during a storm event. The safety of people in the region is the highest priority of the CEMVN.

The term "100-year level of protection" as used throughout this document refers to a level of protection that reduces the risk of hurricane surge and wave-driven flooding that the New Orleans metropolitan area has a 1 percent chance of experiencing in any given year.

1.2 AUTHORITY FOR THE PROPOSED ACTION

The authority for the proposed action was provided as part of a number of hurricane protection projects spanning southeastern Louisiana, including the LPV Hurricane Protection Project and the West Bank and Vicinity (WBV) Hurricane Protection Project. Congress and the Administration granted a series of supplemental appropriations acts following Hurricanes Katrina and Rita to repair and upgrade the project systems damaged by the storms, which gave additional authority to the USACE to construct 100-year GNOHSDRRS projects.

The LPV project was authorized under the Flood Control Act of 1965 (Public Law [PL] 89-298, Title II, Sec. 204) which amended, authorized a "project for hurricane protection on Lake Pontchartrain, Louisiana … substantially in accordance with the recommendations of the Chief of Engineers in House Document 231, Eighty-ninth Congress." The original statutory authorization for the LPV project was amended by the Water Resources Development Acts (WRDA) of 1974 (PL 93-251, Title I, Sec. 92); 1986 (PL 99-662, Title VIII, Sec. 805); 1990 (PL 101-640, Sec. 116); 1992 (PL 102-580, Sec. 102); 1996 (PL 104-303, Sec. 325); 1999 (PL 106-53, Sec. 324); and 2000 (PL 106-541, Sec. 432); Energy and Water Development Appropriations Acts of 1992 (PL 102-104, Title I, Construction, General), 1993 (PL 102-377, Title I Construction, General), and 1994 (PL 103-126, Title I Construction, General).

The Department of Defense Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act of 2006 (3rd Supplemental – PL 109-148, Chapter 3, Construction, Flood Control and Coastal Emergencies) authorized accelerated completion of the project and restoration of project features to design elevations at 100 percent Federal cost. The Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery of 2006 (4th Supplemental – PL 109-234, Title II, Chapter 3, Construction, and Flood Control and Coastal Emergencies) authorizes construction of a 100-year level of protection, the replacement or reinforcement of flood walls, and the construction of levee

armoring at critical locations. Additional Supplemental Appropriations include the U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act of 2007 H. R. 2206 (pg. 41-44) Title IV, Chapter 3, Flood Control and Coastal Emergencies, (5th Supplemental), General Provisions, Sec. 4302.

1.3 PRIOR REPORTS

A number of studies and reports on water resources development in the proposed project area have been prepared by the USACE, other Federal, state, and local agencies, research institutes, and individuals. A brief description of pertinent studies, reports and projects follows.

- On 18 July 2008, the CEMVN signed a Decision Record on IER # 2, entitled "LPV West Return Floodwall, Jefferson and St. Charles Parishes, Louisiana." The proposed action includes replacing 3.4 miles of floodwall in Jefferson and St. Charles Parishes, Louisiana.

- On 12 June 2008, the CEMVN signed a Decision Record on IER # 15, entitled "Lake Cataouatche Levee, Jefferson and Plaquemines Parishes, Louisiana." The proposed action includes constructing and maintaining a 100-year level of protection along the project area in Jefferson Parish, Louisiana.

- On 9 June 2008, the CEMVN signed a Decision Record on IER # 1, entitled "Lake Pontchartrain and Vicinity, La BrancheWetlands Levee, St. Charles Parish, Louisiana." The proposed action includes raising approximately 9 miles of earthen levees, replacing over 3,000 feet of floodwalls, rebuilding or modifying four drainage structures, closing one drainage structure, and modifying one railroad gate in St. Charles Parish, Louisiana.

- On 30 May 2008, the CEMVN signed a Decision Record on IER # 22 entitled "Government Furnished Borrow Material # 2, Jefferson and Plaquemines Parishes, Louisiana." The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE while excavating borrow areas for use in construction of the GNOHSDRRS.

- On 5 May 2008, the CEMVN signed a Decision Record on IER # 23 entitled "Pre-Approved Contractor Furnished Borrow Material # 2, St. Bernard, St. Charles, Plaquemines Parishes, Louisiana, and Hancock County, Mississippi." The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors as a result of excavating borrow areas for use in construction of the GNOHSDRRS.

- On 14 March 2008, the CEMVN signed a Decision Record on IER # 11 (Tier 1) entitled "Improved Protection on the Inner Harbor Navigation Canal, Orleans and St. Bernard Parishes, Louisiana." The document was prepared to evaluate potential impacts associated with building navigable and structural barriers to prevent storm surge from entering the Inner Harbor Navigational Canal (IHNC) from Lake Pontchartrain and/or the Gulf Intracoastal Waterway (GIWW)-Mississippi River Gulf Outlet (MRGO)-Lake Borgne complex. Two Tier 2 documents discussing alignment alternatives and designs of the navigable and structural barriers, and the impacts associated with exact footprints, are being completed.

- On 21 February 2008, the CEMVN signed a Decision Record on IER # 18 entitled "Government Furnished Borrow Material, Jefferson, Orleans, Plaquemines, St. Charles, and St. Bernard Parishes, Louisiana." The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE as a result of excavating borrow areas for use in construction of the GNOHSDRRS.

- On 14 February 2008, the CEMVN signed a Decision Record on IER # 19 entitled "Pre-Approved Contractor Furnished Borrow Material, Jefferson, Orleans, St. Bernard, Iberville, and Plaquemines Parishes, Louisiana, and Hancock County, Mississippi." The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors as a result of excavating borrow areas for use in construction of the GNOHSDRRS.

- In July 2006, the CEMVN signed a Finding of No Significant Impact (FONSI) on EA # 433 entitled, "USACE Response to Hurricanes Katrina & Rita in Louisiana." The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE as a result of Hurricanes Katrina and Rita.

- On 30 October 1998, the CEMVN signed a FONSI on EA # 279 entitled "Lake Pontchartrain Lakefront, Breakwaters, Pump Stations 2 and 3." The report evaluates the impacts associated with providing fronting protection for outfall canals and pump stations. It was determined that the action would not significantly impact resources in the immediate area.

- On 2 October 1998, the CEMVN signed a FONSI on EA # 282 entitled "LPV, Jefferson Parish Lakefront Levee, Landside Runoff Control: Alternate Borrow." The report investigates the impacts of obtaining borrow material from an urban area in Jefferson Parish. No significant impacts to resources in the immediate area were expected.

- On 2 July 1992, the CEMVN signed a FONSI on EA # 169 entitled "LPV, Hurricane Protection Project, East Jefferson Parish Levee System, Jefferson Parish, Louisiana, Gap Closure." The report addresses the construction of a floodwall in Jefferson Parish to close a "gap" in the levee system. The area was previously leveed and under forced drainage, and it was determined that the action would not significantly impact the already disturbed area.

- On 22 February 1991, the CEMVN signed a FONSI on EA # 164 entitled "LPV Hurricane Protection – Alternate Borrow Area for the St. Charles Parish Reach." The report addresses the impacts associated with the use of borrow material from the Mississippi River on the left descending back in front of the Bonnet Carré Spillway Forebay for LPV construction.

- On 30 August 1990, the CEMVN signed a FONSI on EA # 163 entitled "LPV Hurricane Protection – Alternate Borrow Area for Jefferson Parish Lakefront Levee, Reach III." The report addresses the impacts associated with the use of a borrow area in Jefferson Parish for LPV construction.

- On 2 July 1991, the CEMVN signed a FONSI on EA # 133 entitled "LPV Hurricane Protection – Alternate Borrow at Highway 433, Slidell, Louisiana." The report addresses-the

impacts associated with the excavation of a borrow area in Slidell, Louisiana for LPV construction.

- On 12 March 1990, the CEMVN signed a FONSI on EA # 102 entitled "LPV Hurricane Protection – 17th Street Canal Hurricane Protection." The report addresses the use of alternative methods of providing flood protection for the 17th Street Outfall Canal in association with LPV activity. Impacts to resources were found to be minimal.

- On 21 July 1988, the CEMVN signed a FONSI on EA # 76 entitled "LPV Hurricane Protection – Orleans Avenue Outfall Canal." The report investigates the impacts of strengthening hurricane protection at the Orleans Avenue Outfall Canal.

- Supplemental Information Report (SIR) # 30 entitled "LPV Hurricane Protection Project, Jefferson Lakefront Levee" was signed by the CEMVN on 7 October 1987. The report investigates impacts associated with changes in Jefferson Parish LPV levee design.

- SIR # 22 entitled "LPV Hurricane Protection – Use of 17th Street Pumping Station Material for LPHP Levee" was signed by the CEMVN on 5 August 1986. The report investigates the impacts of moving suitable borrow material from a levee at the 17th Street Canal in the construction of a stretch of levee from the Inner Harbor Navigation Canal to the London Avenue Canal.

- SIR # 10 entitled "LPV Hurricane Protection, Bonnet Carré Spillway Borrow" was signed by the CEMVN on 3 September 1985. The report evaluated the impacts associated with using the Bonnet Carré Spillway as a borrow source for LPV construction, and found that "no significant adverse effect on the human environment."

- In December 1984, an SIR to complement the Supplement to final EIS on the LPV Hurricane Protection project was filed with the U. S. Environmental Protection Agency (USEPA).

- The final EIS for the LPV Hurricane Protection Project, dated August 1974. A Statement of Findings was signed by the CEMVN on 2 December 1974. Final Supplement I to the EIS, dated July 1984, was followed by a Record of Decision (ROD), signed by the CEMVN on 7 February 1985. Final Supplement II to the EIS, dated August 1994, was followed by a ROD signed by CEMVN on 3 November 1994.

- A report entitled "Flood Control, Mississippi River and Tributaries," published as House Document No. 90, 70th Congress, 1st Session, submitted 18 December 1927, resulted in authorization of a project by the Flood Control Act of 1928. The project provided comprehensive flood control for the lower Mississippi Valley below Cairo, Illinois. The Flood Control Act of 1944 authorized the USACE to construct, operate, and maintain water resources development projects. The Flood Control Acts have had an important impact on water and land resources in the proposed project area.

1.4 INTEGRATION WITH OTHER INDIVIDUAL ENVIRONMENTAL REPORTS

In addition to this IER, the CEMVN is preparing a draft Comprehensive Environmental Document (CED) that will describe the work completed and the work remaining to be constructed. The purpose of the draft CED will be to document the work completed by the CEMVN on a system-wide scale. The draft CED will describe the integration of individual IERs into a systematic planning effort. Overall cumulative impacts, a finalized mitigation plan, and future operations and maintenance requirements will also be included. Additionally, the draft CED will contain updated information for any IER that had incomplete or unavailable data at the time it was posted for public review.

The draft CED will be available for a 60-day public review period. The document will be posted on www.nolaenvironmental.gov, or can be requested by contacting the CEMVN. A notice of availability will be mailed/e-mailed to interested parties advising them of the availability of the draft CED for review. Additionally, a notice will be placed in national and local newspapers. Upon completion of the 60-day review period all comments will be compiled and appropriately addressed. Upon resolution of any comments received, a final CED will be prepared, signed by the District Commander, and made available to any stakeholders requesting a copy.

Mitigation for unavoidable impacts to the human and natural environment described in this and other IERs will be addressed in separate mitigation IERs. The CEMVN has partnered with Federal and state resource agencies to form an interagency mitigation team that is working to assess and verify these impacts, and to look for potential mitigation sites in the appropriate hydrologic basin. This effort is occurring concurrently with the IER planning process in an effort to complete mitigation work and construct mitigation projects expeditiously. As with the planning process of all other IERs, the public will have the opportunity to give input about the proposed work. These mitigation IERs will, as described in section 1 of this IER, be available for a 30-day public review and comment period.

1.5 PUBLIC CONCERNS

Throughout southern Louisiana, one of the greatest areas of public concern is providing hurricane, storm, and flood damage reduction for businesses and residences, and providing for public safety during major storm events. Hurricane Katrina forced residents from their homes and temporarily closed businesses, and, due to extensive flooding, made returning to their homes in a timely manner unsafe.

Specific to Jefferson Parish, members of the public have expressed concerns regarding:

- the amount of water that entered Lake Pontchartrain during Katrina;
- the provision for safe-houses for pump station operators during hurricanes;
- to what extent the Jefferson Parish levees were damaged in Katrina;
- whether or not there is backflow protection on gates and pumps;

- the potential for a perceived funneling effect of a MRGO type of a tidal surge down the St. Charles – Jefferson Parish Line Canal (with or without new structures being built along the canal) and other canals in Jefferson Parish;
- the installation of surge barriers (rock breakwater) at the mouth of the Parish Line Canal;
- what would be the option of installing sloped earthen levees rather than a wall along the Parish Line Canal;
- the depth of the sheet piles along the West Return Wall;
- the type of earthen construction materials that would be used and whether the geotechnical test results of those materials would be available for public review;
- the need for parallel protection, the incorporation of redundancy and safety factors in all USACE projects; and
- the consideration of various interior approaches to drainage (such as Hoey's Basin) to the Mississippi River.
- the USACE define "temporary" structures, and explain what measures are taken to protect the east side of West End Park and Lake Avenue from the perceived "MRGO" effect of the New Basin Canal and to identify what additional measures would be taken to protect the west side of West End Park, besides the existing floodgate on wheels.

Additionally, the public has requested that the USACE notify the homeowners and business owners regarding alternatives that would take real estate, prior to having them read about these issues in the newspapers; the effect of the USACE projects on the residences and businesses near Bucktown; the timing of the selection of a proposed action relative to the public's rebuilding efforts; the time required to complete the environmental studies, levee repairs and upgrades; the presence of barges in the canals and damage they could cause to levees and floodwalls; and the untimely construction of coastal and wetland restoration projects. The public is also concerned about the potential damage to the crown of the levee by maintenance equipment and contractors, the final height to which the levees/floodwalls would be raised, whether the proposed improvements would be protective if a future hurricane follows a different track than that of Hurricane Katrina, and the contents of the USACE report to Congress relative to the selection of the best and safest flood protection alternatives for the citizens of Jefferson Parish.

Public comments received during the preparation of this IER and responses to those comments are included in appendix B of this document.

1.6 DATA GAPS AND UNCERTAINTY

At the time of submission of this report, engineering evaluations had not been completed for all of the proposed actions and alternatives. Final selection and engineering details (e.g., location and height of wavebreaks, actual footprint expansion, if any) of the proposed action could vary based on the final engineering report. Substantial changes to the proposed action resulting in further impacts to the natural or human environment would be addressed in a supplemental IER.

The estimated environmental impacts have been developed to create an envelope of effects within which design may proceed without compromising the integrity of the assessment. As such, the description of the features does not represent any formal commitment to final design, equipment for use, vendors for supply of materials, or methods of construction, but gives an

approximation of how the features could be constructed and the associated impacts thereof. Uncertainty in the final engineering design and construction as well as slight changes to existing conditions in the future could change the impact assessments as discussed in this document. For example, access routes to the construction areas are dependent upon many variables that frequently change (weather, traffic conditions, road conditions, construction materials used, fuel prices, etc.) However, new data will be reviewed as they become available. These data and any changes to the conclusions provided in this document will be incorporated into future documents (including the draft CED).

In addition, only limited Environmental Justice (EJ) information including racial, ethnic, or socioeconomic data was available for the project area. New data will be incorporated into future documents (including the draft CED) as they become available. A methodology for determining direct and indirect impact assessment will include all sections of the population. With this knowledge, a comparison of the level of impact on minority and low-income populations versus all other populations will be examined in detail. Development of a community involvement plan will contain elements of an effective marketing plan with the goal of engaging members of the targeted community by demographic and trending methods to ensure a statistically defensible sampling of the populations, while serving as an information source for that same community. Meetings with key stakeholders will be held to compile data and develop mitigation strategies. Special attention will be given to data collection using quantitative methods to ensure that subjective issues are documented in a manner that ensures policy development and mitigation strategies.

2.0 ALTERNATIVES

2.1 ALTERNATIVES DEVELOPMENT AND PRELIMINARY SCREENING CRITERIA

NEPA requires that in analyzing alternatives to a proposed action a Federal agency consider an alternative of “No Action.” Likewise, Section 73 of the WRDA of 1974 (PL 93-251) requires Federal agencies to give consideration to non-structural measures to reduce or prevent flood damage. The CEMVN Project Delivery Team (PDT) considered a No Action alternative and non-structural measures in this IER, discussed in sections 2.4 and 2.5, respectively.

In addition to these mandated alternatives, a range of reasonable alternatives was formulated through input by the CEMVN PDT, Value Engineering Team, engineering and design consultants, as well as local government, the public, and resource agencies, for each of the reaches described in this IER. The “action” alternatives formulated are comprised of alternative alignments for each flood protection corridor. Within each of these alignment alternatives, several scales were considered to encompass various flood protection design alternatives that could be utilized within that alignment.

The following standard set of alignment alternatives and scales within these alignments were initially considered for each reach:

Alternatives:

- Existing alignment with straddle
- Flood-side shift (all toe-to-toe growth occurs on flood-side of levee)
- Protected-side shift (all toe-to-toe growth occurs on protected side of levee)

Alternative Scales:

- Earthen Levee
- T-wall Floodwall
- Earthen Levee with T-wall Floodwall Cap
- Earthen Levee using Deep Soil Mixing

In addition to this standard set of action alternatives common to all reaches, other alternatives were formulated to address reach-specific opportunities and constraints, all of which are described in detail in the following section. Once a full range of alternatives was established for each reach, a preliminary screening was conducted to identify alternatives that would proceed through further analysis. The criteria used to make this determination included engineering effectiveness, economic efficiency, and environmental and social acceptability. Those alternatives which did not adequately meet these criteria were considered infeasible and therefore were eliminated from further study in this IER.

2.2 DESCRIPTION OF THE ALTERNATIVES

Although it is the CEMVN's intent to employ an integrated, comprehensive, and systems-based approach to hurricane and storm damage reduction in raising the GNOHSDRRS to the 100-year level of protection, each reach has its own range of alternatives. This approach allows for individual reach alternative decisions to be made in a manner cognizant of unique local circumstances. At the same time, the alternatives analysis and selection remain integrated and comprehensive, considering reaches in relation to one another and other past, current, and reasonably foreseeable actions by the CEMVN and other entities within the project study area.

As such, the alternatives descriptions below are organized by reach, noting those alternatives that are common among all reaches. As stated previously, each reach is identified by a project identification number (e.g., LPV 00). The alternative descriptions also states how each alternative relates to the range of alternatives for adjacent reaches, to insure awareness of the GNOHSDRRS as a whole.

No Action. Under the no action alternative, the current levee reaches, floodwalls, floodgates, and associated structures would remain at or be brought to the authorized height of approximately 16.5 feet (ft). Routine maintenance of the levee system would continue, but no additional height would be added to the system.

Proposed Action. The proposed action would provide 100-year level of protection for Jefferson Parish. The elevations of the existing levees, floodwalls, structures, and gates within the LPV

projects would be raised to a height of 16.5-17.5 ft, with the exception of the breakwaters at the pumping stations, which would be modified and/or constructed to a height of 10 to 14 ft.

The following reaches would be included in the proposed action (see figure 2). All levee elevations as described in this report are in the North American Vertical Datum 1988 projection (NAVD88).

- LPV 00 Reach 1 Lakefront Levee – consists of approximately 10,560 ft of levees starting at LPV 13 (Recurve I-wall in Northwest Kenner) running to Duncan Pumping Station (LPV 12). LPV 00 is currently at a height of 16.8 ft.

- LPV 01 Reach 2 Lakefront Levee – consists of approximately 7,825 ft of levees, starting at the Duncan Pumping Station, running to Elmwood Canal. LPV 01 is currently at a height of 14.5 ft.

- LPV 02 Reach 3 Lakefront Levee – consists of approximately 11,960 ft of levees, starting at Elmwood Canal, running to Suburban Canal. LPV 02 is currently at a height of 17.2 ft.

- LPV 09 Pumping Station # 1 (Bonnabel) and associated Fronting Protection and Floodwall Tie-ins – currently there are no breakwaters associated with LPV 09. However, there is back flow protection (air suppression and valves) in place for the station. The current elevation ranges from 16.0 at the tie-ins to 22 ft at the pump station.

- LPV 10 Pumping Station # 2 (Suburban) and associated Fronting Protection and Floodwall Tie-ins. Currently there is back flow protection (air suppression and valves) in place for the station as well as an existing breakwater at an elevation of approximately 6.5 ft. The current elevation ranges from 16.0 at the tie-ins to 13.5 ft at the pump station.

- LPV 11 Pumping Station # 3 (Elmwood) and associated Fronting Protection and Floodwall Tie-ins. Currently there is back flow protection (air suppression and valves) in place for the station as well as an existing breakwater at an elevation of approximately 6.5 ft. The current elevation ranges from 16.0 at the tie-ins to and average elevation of 16.5 ft at the pump station.

- LPV 12 Pumping Station # 4 (Duncan) and associated Fronting Protection and Floodwall Tie-ins – currently there are no breakwaters associated with LPV 12. However, there is back flow protection (air suppression and valves) in place for the station. The current elevation ranges from 16.0 to 22.0 ft at the tie-ins to 22 ft at the pump station.

- LPV 16 Floodwall and Gate at Bonnabel Boat Launch – consists of I-Wall levee tie-ins (and a swing gate with a 22 ft opening (with a top elevation for the closure structure of 15.5 ft).

- LPV 17 Bridge Abutment and Floodwall Tie-ins at Causeway Bridge – consists of I-Wall levee tie-ins with an elevation of approximately 15.5 ft.

- LPV 18 Floodwall and Gate at Williams Boulevard (Blvd) Boat Launch - consists of I-Wall levee tie-ins at an elevation of 14.25 ft and a rolling gate closure with a 60 ft opening.

- LPV 19 Reach 4 Lakefront Levee – consists of approximately 10,285 ft of levees, starting at Suburban Canal, and running to Bonnabel Canal. LPV 19 is currently at a height of 16.8 ft.

- LPV 20 Reach 5 Lakefront Levee – consists of approximately 6,820 ft of levees, starting at Bonnabel Canal, and running to the 17th Street Canal. LPV 20 is currently at a height of 15.5 ft.

2.3 PROPOSED ACTION

The proposed action (preferred alternative) consists of rebuilding earthen levees, upgrading foreshore protection, replacing floodgates, and constructing fronting protection for pumping stations. The 100-year level of protection for the New Orleans Metropolitan area would be achieved. The following is a detailed description, by reach, of the actions that would take place with the proposed action.

LPV 00 Levee Reach 1, LPV 01 Levee Reach 2, LPV 02 Levee Reach 3, LPV 19 Levee Reach 4, and LPV 20 Levee Reach 5

The proposed action for these reaches would consist of raising the levee from its current heights to 17.5 ft, modifying the levee to widen the crown from 7 ft to 10 ft in a straddle configuration to the extent possible (a slight flood-side shift could be incorporated as needed), and adding rock foreshore protection to 6 ft at 150 ft from the centerline on the flood-side of the existing breakwater (figure 3). The actual location of the foreshore protection could be greater than 150 ft but, in general, would follow the shoreline. Additional rock foreshore protection would not be added to the existing riprap along the portion of LPV 19 Levee Reach 4 east of the Lake Pontchartrain Causeway or to LPV 20 Levee Reach 5.

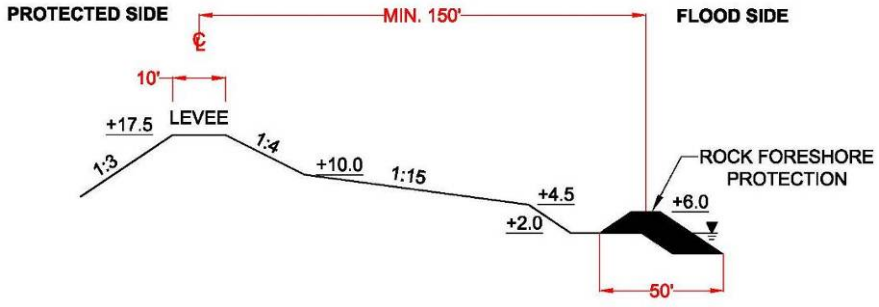


Figure 3. Proposed Action for Levee Reaches

As an additional feature, armoring may be incorporated to protect against erosion and scour on the protected side of critical portions of levees and floodwalls. These critical areas include: transition points (where levees and floodwalls transition into any hardened feature such as other levees, floodwalls, pump stations, etc.), utility pipeline crossings, floodwall protected side slopes, and earthen levees that are exposed to wave and surge overtopping during a 500-year hurricane storm event. The proposed method of armoring could be one of the following: articulated concrete blocks (ACB) covered with soil and grass; turf reinforcement mattress (TRM); ACB/TRM; TRM/grass; or good grass cover. The armoring would be incorporated into the existing levee or floodwall footprint and no additional environmental impacts would be anticipated.

LPV 09 – 12, Pumping Stations # 1 (Bonnabel), # 2 (Suburban), # 3 (Elmwood), and # 4 (Duncan) and associated Fronting Protection, Breakwaters and Floodwall Tie-ins

The proposed action for the four lakefront pumping stations would consist of adding fronting protection to each of the stations. The fronting protection would be similar to a concrete T-wall, with a sluice or vertical-lift gate to allow discharge from the pumping station. The fronting protection would be constructed to an approximate height of 17 ft, and new T-wall tie-ins would be constructed to connect the new fronting protection to the adjacent levee reaches at a height of 17.5 ft. However, the fronting protection at pumping station #3 (Elmwood) would be constructed to 21 ft at the pumping station with tie-in walls constructed to an elevation 19 ft if modification of its breakwater does not occur.

In addition, modifications and/or construction of breakwaters would be incorporated at pumping stations # 1 (Bonnabel), # 2 (Suburban), # 3 (Elmwood), and # 4 (Duncan). The breakwaters would be constructed out of concrete and steel, with a 2-foot rock layer at the lake bottom, and would be located near where the drainage canals meet Lake Pontchartrain.

- At pumping station # 1 (Bonnabel), a new breakwater would be added at a height of 14 ft and it would extend from onshore into the lake (figure 4a). The length of the breakwater footprint on the lake bottom would be approximately 500 ft at pumping station # 1. With the rock riprap that would be placed along the toe of the breakwaters to provide erosion protection, the total width of the footprint of the breakwater would be approximately 130 ft. The area of the footprint of the breakwater on the lake bottom would be approximately 1.5 acres at pumping station # 1. Additional lake bottom could be temporarily impacted through the creation of a flotation channel (see figure 5a) required for construction of the breakwater and the stockpiling of dredged sediment adjacent to the channel until its use in backfilling the channel once construction is complete. The proposed pile test sites for pumping station # 1 are shown in figure 4b.

- At pumping station # 2 (Suburban), the existing breakwater would be modified to increase its strength. Concrete piles, concrete, and rock would be added to reinforce the existing breakwater. The additional rock would extend 50 ft from the centerline of the sheet pile, increasing the breakwater footprint by approximately 20 ft on both the lake and the discharge basin sides. The area of the footprint of the breakwater on the lake bottom would be approximately 0.5 acre at pumping station # 2. Additional lake bottom

could be temporarily impacted through the creation of a flotation channel (see figure 5a) required for construction of the breakwater and the stockpiling of dredged sediment adjacent to the channel until its use in backfilling the channel once construction is complete. The proposed pile test sites for pumping station # 2 are shown in figure 5b.

- At pumping station # 3 (Elmwood), the existing breakwater would be modified to increase its height from 6.5 ft to approximately 10 ft and to increase its strength. Concrete piles, concrete, and rock would be added to modify and reinforce the existing breakwater. The additional rock would extend 50 ft from the centerline of the sheet pile, increasing the breakwater footprint by approximately 20 ft on both the lake and the discharge basin sides. The area of the footprint of the breakwater on the lake bottom would be approximately 0.6 acre at pumping station # 3. Additional lake bottom could be temporarily impacted through the creation of a flotation channel (see figure 5a) required for construction of the breakwater and the stockpiling of dredged sediment adjacent to the channel until its use in backfilling the channel once construction is complete. The results from the pile test sites from pumping station # 2 will be used for pumping station # 3 based on similar soil characteristics.

- At pumping station # 4 (Duncan), a new breakwater would be added at a height of 14 ft. It would begin approximately 150 ft offshore and would be connected to the shore by a bridge (figure 6a). The length of the breakwater footprint on the lake bottom would be approximately 250 ft at pumping station # 4. With the rock riprap that would be placed along the toe of the breakwater to provide erosion protection, the total width of the footprint of the breakwater would be approximately 110 ft. The additional breakwater footprint on the lake bottom would be approximately 0.6 acre at pumping station # 4. Additional lake bottom could be temporarily impacted through the creation of a flotation channel (see figure 5a) required for construction of the breakwater and the stockpiling of dredged sediment adjacent to the channel until its use in backfilling the channel once construction is complete. The proposed pile test sites for pumping station # 4 are shown in figure 6b. In addition, the existing bridge in the discharge channel of pumping station # 4, which is used for operations and maintenance of the levee system, would be demolished (due to construction of new fronting protection), and a replacement bridge would be constructed approximately 450 ft north of its present location on the discharge channel.

Figure 4a. New Breakwater and Staging Areas at Pumping Station # 1 (Bonnabel)

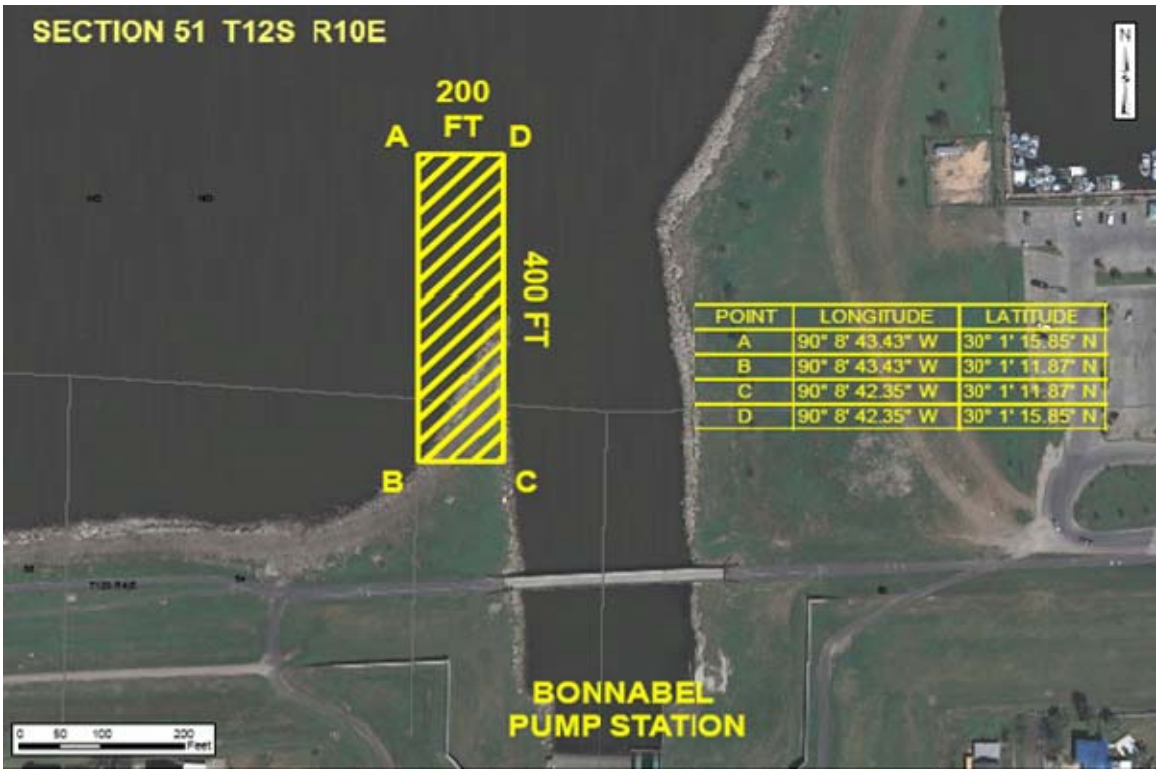


Figure 4b. Proposed Pile Test Sites for Pumping Station # 1 (Bonnabel)

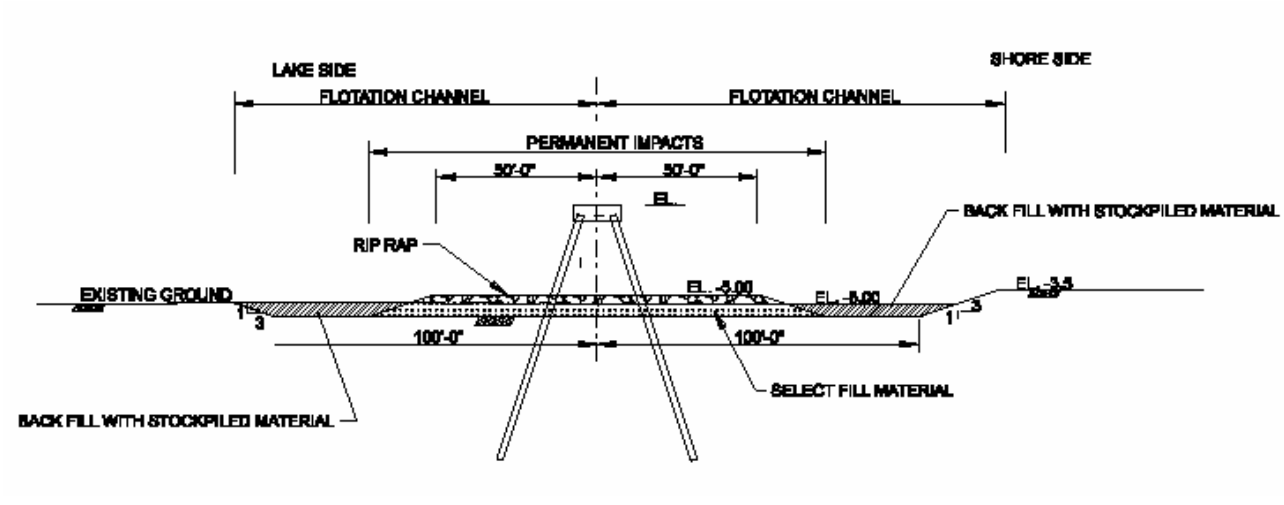
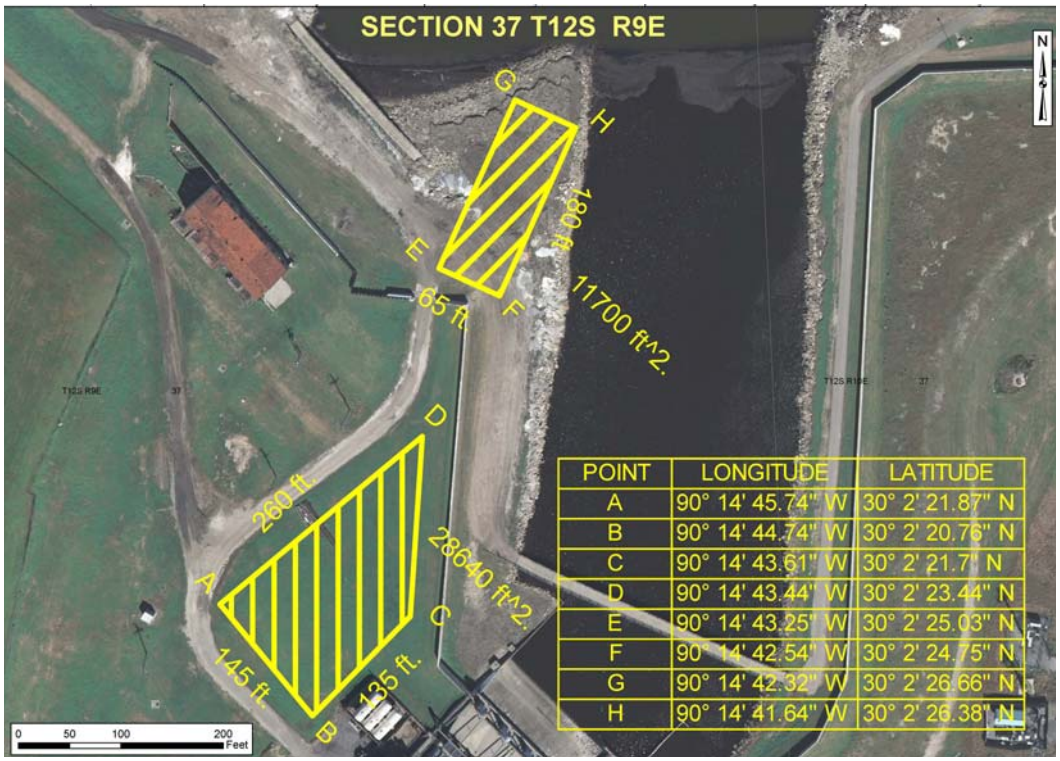


Figure 5a. Typical Breakwater Modification (existing conditions at breakwaters #2 and #3 not shown) (Suburban and Elmwood)

Figure 5b. Proposed Pile Test Sites for Pumping Station # 2 (Suburban)

Figure 6a. New Breakwater at Pumping Station # 4 (Duncan)



POINT	LONGITUDE	LATITUDE
A	90° 14' 45.74" W	30° 2' 21.87" N
B	90° 14' 44.74" W	30° 2' 20.76" N
C	90° 14' 43.61" W	30° 2' 21.7" N
D	90° 14' 43.44" W	30° 2' 23.44" N
E	90° 14' 43.25" W	30° 2' 25.03" N
F	90° 14' 42.54" W	30° 2' 24.75" N
G	90° 14' 42.32" W	30° 2' 26.66" N
H	90° 14' 41.64" W	30° 2' 26.38" N

Figure 6b. Proposed Pile Test Sites for Pumping Station # 4 (Duncan)

LPV 16 Floodwall and Gate at Bonnabel Boat Launch and LPV 18 Floodwall and Gate at Williams Blvd Boat Launch

The proposed action for these gates consists of demolition of the existing floodwalls and gates and construction of new T-walls, I-wall transitions, and gates. The new T-walls and I-walls and transitions would be constructed to a height of 16.5 ft. The new gate structures would be rolling gate closures constructed to a height of 16.5 ft. The proposed pile test sites for the Bonnabel Boat Launch and Williams Blvd Boat Launch are shown in Figures 7a and 7b.

LPV 17 Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

The proposed action for this reach consists of extending the existing levee system across Causeway Blvd. The new levee would have a crown/crest height of 16.5 ft. Causeway Blvd would be modified, beginning at 6th Street, and would slope up to the crest elevation of the levee. The roadway would then slope back down to the elevation of the bridge abutment. The new road would be supported by vertical and mechanically stabilized earth walls to minimize the impact at the base and allow construction of sidewalks and accesses to existing buildings and streets.

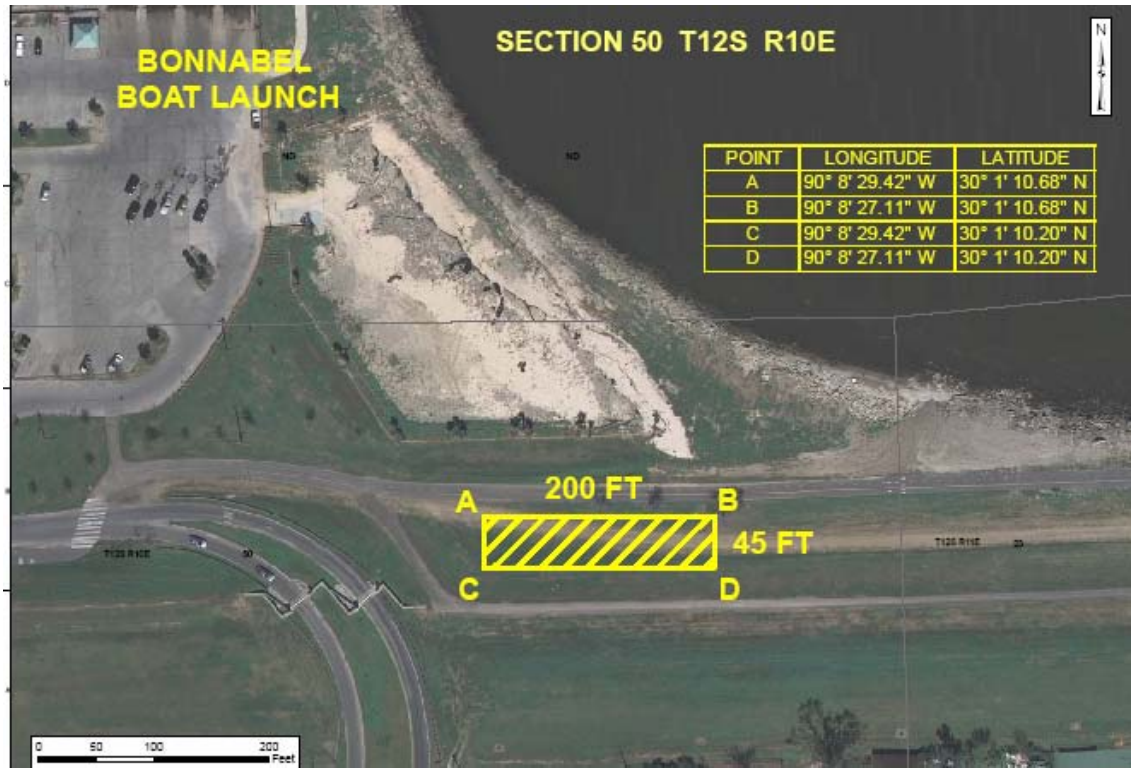


Figure 7a. Proposed Pile Test Sites for Bonnabel Boat Launch

Figure 7b. Proposed Pile Test Sites for Williams Blvd Boat Launch

Construction-Related Information for Proposed Action

Construction of the proposed action could begin in the fall of 2008 and the construction activities would be expected to last for 18 to 36 months (approximately 3 years). A significant amount of construction equipment would be required to conduct the work; including barges, bulldozers, hydraulic cranes, mechanical cranes, hydraulic excavators, welders, 45,000-pound (lb) trucks, concrete pump trucks, rollers, pile hammers, graders, tractors, front-end loaders, flatbed trucks, and pickup trucks.

Clearing and grubbing activities would be completed before construction of the proposed action could begin. Clearing would consist of the complete removal above ground of all trees, stumps, down timber snags, brush, vegetation, loose stone, abandoned structures, fencing, and similar debris. Trees would be felled in such a manner as to avoid damage to trees to be left standing or to existing structures. Grubbing would consist of the removal of all stumps, roots, buried logs, old piling, old paving, old foundations, pipes, drains, and other unsuitable matter. All holes caused by grubbing operations shall be backfilled with suitable material in 12-inch layers to the elevation of the adjacent ground surface, and each layer compacted to a density at least equal to that of the adjoining undisturbed material. All debris resulting from clearing and grubbing operations at the construction site would be disposed of by removal from the site. Reasonable efforts would be made to channel merchantable material into the commercial market to make beneficial use of materials resulting from clearing and grubbing operations. Remaining debris

including asphalt and crown surfacing from the site would be disposed of in compliance with all applicable Federal, state, and local laws.

Table 1 provides information on the approximate volumes of materials that would be required for construction of the proposed action at each LPV reach.

Table 1. Approximate Volumes of Construction Materials for Proposed Action

	Earthen Fill cubic yard (CY)	Concrete (CY)	Sheet Piling square Feet (Sq FT)	H-Piling linear Feet (LF)	Pipe Pile (LF)	Pre-Cast Concrete Pile (LF)	Timber Pile (LF)	Rock (Tons)
LPV 00	375,000	N/A	N/A	N/A	N/A	N/A	N/A	75,000
LPV 01	435,000	N/A	N/A	N/A	N/A	N/A	N/A	52,000
LPV 02	432,000	N/A	N/A	N/A	N/A	N/A	N/A	75,000
LPV 19	292,000	N/A	N/A	N/A	N/A	N/A	N/A	35,000
LPV 20	278,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LPV 16	N/A	575	7,230	N/A	N/A	6,200	N/A	N/A
LPV 17	37,500	2,306	66,619	N/A	N/A	30,080	N/A	13,760
LPV 18	N/A	498	7,591	N/A	N/A	4,060	N/A	N/A
LPV 09	N/A	5,097	100,777	18,156	71,070	27,880	N/A	6,233
LPV 10	N/A	5,100	69,156	25,759	N/A	5,500	N/A	1,300
LPV 11	N/A	7,355	41,050	161,550	N/A	5,500	N/A	1,300
LPV 12	N/A	11,828	102,928	32,373	N/A	9,840	2,880	2,200

Truck access to the project sites would be via I-10 to Loyola Dr to Vintage Dr, to Bonnabel Blvd, to Causeway Blvd, Clearview Blvd, or Williams Blvd. Barges could also be used during construction and would access the project area via Lake Pontchartrain.

The earthen fill (borrow) material would be obtained from the Bonnet Carré Spillway, off Airline Highway (U.S. 61) approximately 13-21 miles from the project area. The use of borrow material obtained from the Bonnet Carré Spillway was evaluated in IER # 18 (see section 1.3). Concrete would likely be transported to the site via mixing trucks and pumped on-site. Steel sheet piling and H-piling would likely be shipped by rail into the city from the manufacturer. The materials would be shipped via railways and transloaded to trucks at a terminal near the project site. The bulk of the truck traffic would occur on Airline Highway, I-310, I-10, Williams Blvd, Bonnabel Blvd, and a number of other local roads exiting off of I-10 and leading toward the lakefront.

Rock used in the construction of foreshore protection and/or wave breaks would be shipped by barge to the project area. Either staging/stockpile areas or flotation channels along the lakefront would be required to handle the rock delivery and storage. Potential staging/stockpile areas could include the boat ramp at Williams Blvd, the Bonnabel boat launch, or the old Coast Guard Station off of Lakeshore Drive. Flotation channels for breakwater construction could also be utilized for material delivery and would be created via bucket dredge to provide barge access to the pumping stations from deeper water (figure 8).

The channel dimensions required for tug boat and barge access would be approximately 10 ft deep and 130 ft wide, with one to three slopes for a total impact of 160 ft wide. The flotation channels would be dredged perpendicular to the shoreline, beginning where depths are greater than 10 ft within Lake Pontchartrain. Sediment excavated from these channels would be temporarily stockpiled adjacent to the channels. Assuming an approximate channel length of 2,400 ft, each channel would impact about 9 acres for the channel and an additional 20 acres for the excavated sediment that would be stockpiled near the channel. Thus, each dredged channel and associated stockpile area would encompass approximately 29 acres, and the four channels required for the proposed project would temporarily impact a total of approximately 116 acres. Occasional re-dredging of the channels due to natural siltation could be necessary during the course of construction. Lighted marine buoys would be placed in the project area to delineate the hazard of the stockpiled dredged sediment. The channels would be backfilled with the stockpiled sediment after construction is complete.

2.4 ALTERNATIVES TO THE PROPOSED ACTION

Alternatives that were considered in addition to the proposed action include:

- "no action";
- levee modification with a rock breakwater and rock foreshore protection for the levee reaches (LPV 00 Reach 1, LPV 01 Reach 2, LPV 02 Reach 3, LPV 19 Reach 4, and LPV 20 Reach 5);
- construction of breakwaters with floodwall modifications or a new perimeter wall for LPV 17 Bridge Abutment and Floodwall Tie-ins at Causeway Bridge; and
- no additional alternatives were considered for LPV 09 – 12, Pumping Stations # 1 (Bonnabel), # 2 (Suburban), # 3 (Elmwood), and # 4 (Duncan) and associated Fronting Protection and Floodwall Tie-ins; LPV 16 Floodwall and Gate at Bonnabel Boat Launch or LPV 18 Floodwall and Gate at Williams Blvd Boat Launch because alternatives for these LPV reaches failed to meet the preliminary screening criterion of engineering effectiveness, economic efficiency, and environmental and social acceptability.

No Action Alternative

For each levee reach, floodwall, floodgate, and structure within IER # 3, the no action alternative was evaluated. Under the no action alternative, the proposed action would not be constructed by the CEMVN. The current levee reaches and associated structures would remain or be brought to the authorized heights of approximately 16.5 ft. Routine maintenance of the levees would continue, but no height would be added to the system.

Figure 8. Estimated Extent of Dredge and Spoil Area for Proposed Flotation Channels (Bonnabel Pumping Station Example)

Alternative 1 for LPV 00 Reach 1, LPV 01 Reach 2, LPV 02 Reach 3, LPV 19 Reach 4, and LPV 20 Reach 5 – Levee Modification (16.5 ft) with Rock Breakwater (10 ft) and Rock Foreshore Protection

In addition to the no action alternative, levee modification (16.5 ft) with rock breakwater (10 ft) and rock foreshore protection was also considered in detail for LPV 00 Reach 1, LPV 01 Reach 2, LPV 02 Reach 3, LPV 19 Reach 4, and LPV 20 Reach 5. Under this alternative, the existing levee would remain at its current height of 16.5 ft; the levee crown would be modified from 7 ft to 10 ft in a straddle configuration, to the extent possible (a slight flood-side shift could be incorporated as needed); a 1 on 15 side slope from 10 ft to 4.5 ft would be incorporated into the flood-side of the levee, with a rock breakwater to 10 ft placed on the wave berm. Additionally, foreshore protection would be constructed to a height of approximately 6 ft at a minimum of 150 ft from the centerline on the flood-side of the levee (figure 9).

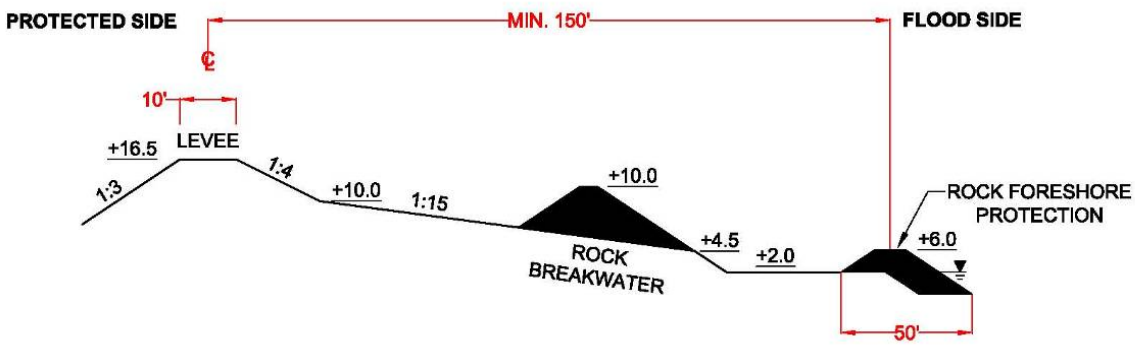


Figure 9. Alternative 1 – Levee Modification with Rock Breakwater (10 ft) and Rock Foreshore Protection

Alternative 1 for LPV 17 Bridge Abutment and Floodwall Tie-ins at Causeway Bridge – Construction of Breakwater with Floodwall Modifications or Using a New Perimeter Wall

In addition to the no action alternative, construction of a breakwater and floodwall modification were considered for reach LPV 17. Under this alternative, a rock breakwater would be incorporated into the new flood protection system. The breakwater would be in a semicircular arch around the Causeway peninsula. The breakwater would consist of rock placed on a geotextile fabric and would be approximately 17 ft high. It would have a footprint approximately 450 ft long, 122 ft wide, and covering approximately 1.3 acres of lake bottom. The breakwater crown would be approximately 9.5 ft wide and the centerline would be approximately 170 ft from the crib wall. In association with the addition of the breakwater, the existing crib walls would either be extended or modified to 16 ft, or a new concrete I-wall (16.5 ft) would be placed approximately 10 ft to the lake side of the existing crib wall to serve as armoring (figure 10).

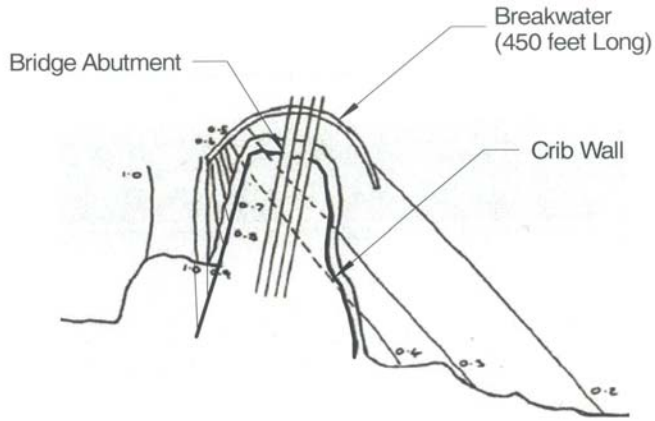


Figure 10. Alternative 1 for LPV 17 Bridge Abutment and Floodwall Tie-ins at Causeway Bridge – Construction of Breakwater with Floodwall Modifications

2.5 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

Alternatives for LPV 00 Reach 1, LPV 01 Reach 2, LPV 02 Reach 3, LPV 19 Reach 4, and LPV 20 Reach 5

As part of the initial evaluation of levee reaches LPV 00, 01, 02, 19, and 20, four alternatives were considered, but eliminated from detailed impact analysis: T-wall floodwall, earthen levee with T-wall floodwall cap, earthen levee using deep soil mixing, and a protected-side or full flood-side shift of the existing levee alignment. Since a stable earthen levee is already in place on these reaches, replacement with floodwalls, floodwall caps, or the use of deep zone mixing was eliminated due to engineering inferiority and practicality. Based on the presence of a substantial number of residential neighborhoods and commercial establishments, a protected-side shift of the existing levee was also eliminated from detailed consideration. A full flood-side shift was eliminated from detailed consideration, as well, because of the impact it would have on the aquatic resources of Lake Pontchartrain and the higher engineering and construction costs that would be associated with a full flood-side shift.

Levee modification (16.5 ft) with rock foreshore protection at approximately 350 ft from the centerline of the levee was also considered. Under this alternative, the existing levee would remain at its current height of 16.5 ft; the levee crown would be modified from 7 ft to 10 ft in a straddle configuration, to the extent possible (a slight flood-side shift could be incorporated as needed); a 1 on 15 side slope from 10 ft to 4.5 ft would be incorporated into the flood-side of the levee, followed by a 1 on 3 slope to 2 ft; and a rock foreshore protection would be constructed to approximately 6 ft at approximately 350 ft from the centerline on the flood-side of the levee (figure 11). This alternative was eliminated from further consideration because it was prohibited by the associated costs and resource requirements.

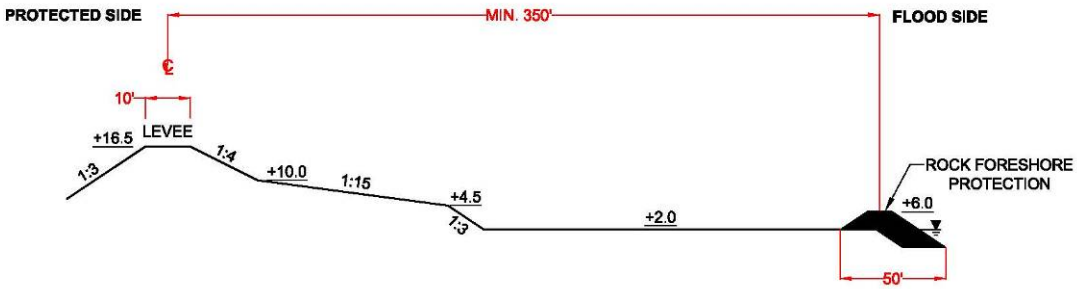


Figure 11. Levee Modification with Rock Foreshore Protection at Approximately 350 ft from the Centerline of the Levee

In addition, a modification of the foreshore protection to better accommodate recreational activities was evaluated. This alternative would incorporate a more stable wall structure (sheet pile filled with riprap) in place of the foreshore protection and then backfilling behind the wall with earthen fill to allow for recreational activities (e.g., bike path and fishing). Based on the increased costs associated with this alternative, it was eliminated from detailed consideration.

Alternatives for LPV 09 – 12, Pumping Stations # 1 (Bonnabel), # 2 (Suburban), # 3 (Elmwood), and # 4 (Duncan) and associated Fronting Protection and Floodwall Tie-ins

Variations on the configurations and heights of the fronting protection and breakwaters were evaluated, including higher fronting protection and lower breakwaters as well as lower fronting protection and higher breakwaters. However, the proposed action was determined to provide the best engineering value to the overall flood protection system and these potential alternatives were eliminated from further consideration. The other configurations were discarded because they either did not provide adequate protection or were too costly based on environmental, social, or economic costs. For example, higher fronting protection would be more costly than the selected alternative because it would be more difficult to engineer and construct and it would also have greater aesthetic impacts. The alternative for a taller breakwater would require a larger footprint that would have higher associated recreational, environmental, and engineering/ construction costs. A protected-side shift for breakwaters and fronting protection would have also required movement of the existing pumping stations, which would have been a much higher economic and environmental cost.

Alternatives for LPV 16 – Floodwall and Gate at Bonnabel Boat Launch and LPV 18 Floodwall and Gate at Williams Blvd Boat Launch

As part of the initial evaluation, modification of the existing floodwalls and gates (addition of approximately 2 ft of height) was considered. However, a stability analysis was performed on this alternative, and it was determined that the sheet pile support in the existing I-walls is not deep enough to adequately support a modified structure. Therefore, it was eliminated from detailed evaluation. In addition, an earthen ramp was also considered but eliminated from further consideration due to land restrictions that would require the acquisition of private property and possibly not allow for the required ROW.

Alternatives for LPV 17 Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

As part of the initial evaluation, an alternative was considered that involved demolition of the existing bridge abutment and floodwall tie-ins and their reconstruction to a height of 16.5 ft along with a rolling gate closure (double closure gap) across Causeway Blvd. Although this is a feasible alternative, it was eliminated from detailed evaluation because a gate closure across the Causeway Bridge would restrict potential evacuation activities, causing increased complexity to the flood fighting efforts in the area.

Hollow Core Levee

For each of the levee reaches that include the potential for a new levee, a hollow core levee was considered and eliminated from further consideration. The concept of the hollow concrete levee system is such that the section fills with water from the bottom as the storm surge rises. The combined weight of the concrete frame and its water filled voids inside the frame result in a gravity structure that is designed to resist hydrostatic forces and impact forces from vessel collision.

The hollow concrete levees would be comprised of trapezoidal shapes similar to that of earthen levees. The levee superstructure sections would be comprised of sloped side walls with a flat bottom slab with access to the interior via steel grating or manholes in the crest. Water inlets or ports would be incorporated into the cross section near the levee base on the flood side to allow the section to flood with water to contribute to the overall weight for stability purposes. Shear keys in the base were designed to protect against sliding under design loading conditions. The substructure consists of a concrete base slab or pad that would be supported by steel pipe piles. It is anticipated that excavation and granular backfill would be required to construct the pile supported concrete pad. The concrete base slab serves a two-fold purpose. It distributes loads to the pile foundations as well as serves as a “roadway” for cast-in-place construction. A typical section is shown in figure 12.

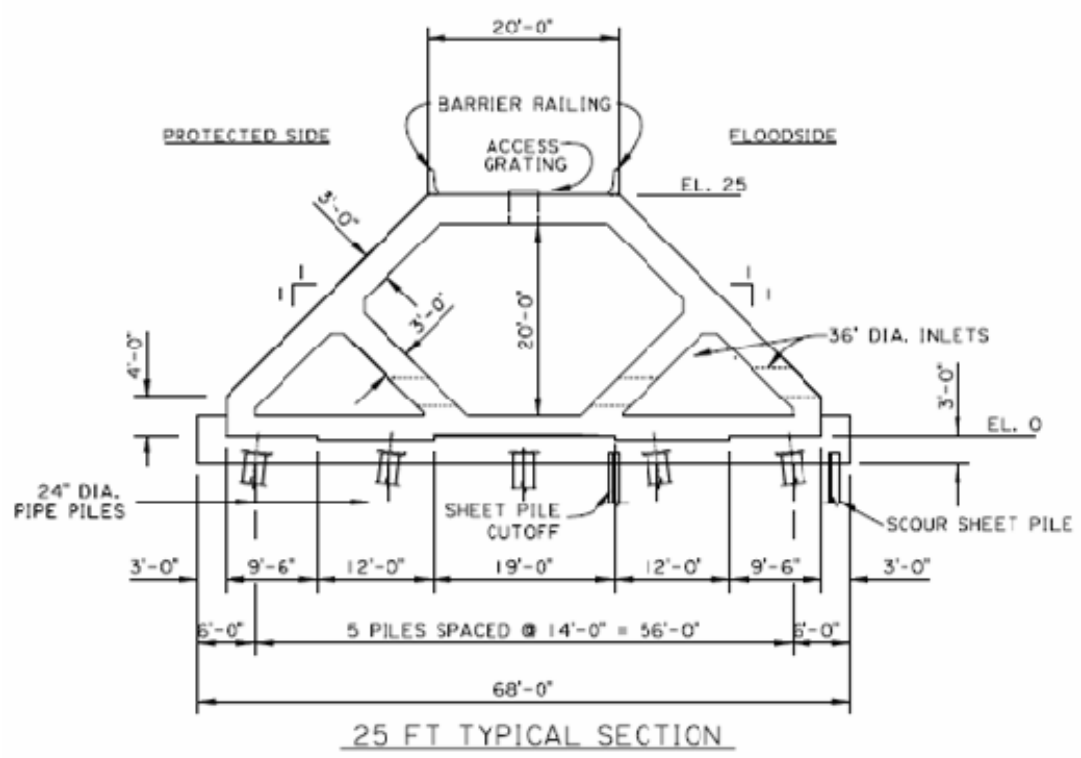


Figure 12. Hollow Core Levee – Typical Section

The incorporation of a hollow core levee was eliminated from further consideration because it would not be advantageous to use in lieu of a traditional reinforced levee section. The existing levees in Jefferson Parish are only deficient by 0.5 ft to 2 ft. Therefore, degrading an existing levee and replacing it with a concrete levee section would not be cost effective. A concrete levee section would be considered in areas in which obtaining borrow material is a concern. However, for Jefferson Parish, borrow material could be easily obtained from the nearby Bonnet Carre' Spillway in the adjacent St. Charles Parish. A concrete levee would also be more beneficial in areas in which the levee height (25 ft to 40 ft) and wave/stability berms produce a very large footprint.

Non-Structural Alternatives

Section 73 of the Water Resources Development Act of 1974 requires consideration of nonstructural alternatives in flood damage reduction studies. ER 1105-2-100 provides the following planning guidance on applicable nonstructural measures. Nonstructural measures can be considered independently or in combination with structural measures (USACE 2000). Nonstructural measures reduce flood damages without significantly altering the nature or extent of flooding. Damage reduction from nonstructural measures is accomplished by changing the use made of the floodplains, or by accommodating existing uses to the flood hazard. Examples are flood proofing, relocation of structures, flood warning and preparedness systems (including associated emergency measures), and regulation of floodplain uses. Jefferson Parish already has a flood warning system and evacuation plan in place and regulation of floodplain uses is addressed by the National Flood Insurance Program; therefore, only flood proofing and

relocation were considered as nonstructural measures. The flood proofing nonstructural measure evaluated in this analysis are to raise, in place, existing structures and the relocation of structures, which is defined as a buyout or permanent physical relocation.

Raise in Place

Flood proofing would require elevating all residential and commercial properties subject to flooding in the study area above the expected levels of flooding. This alternative would also have to consider elevating roadways, public buildings, and some forms of public infrastructure that need to continue operations during and after a storm event. Some facilities such as roadways, railroads, and runways might remain at grade when repair from storm damage would be less costly than the construction, operation, and maintenance of them on elevated structures. The average cost of elevating residential structures in the study area has been estimated at approximately $95 per square foot (USACE 2007a). This includes the cost of administration, design, inspection, costing, project management, and all other associated costs of elevating the structures, as well as the costs of the occupants of the residential structures being relocated to temporary housing during the time period that the structures are being elevated. There were 30,737 homes in Jefferson Parish that were damaged by flooding from Hurricane Katrina (U.S. Department of Housing and Urban Development 2006). The $95 per square foot average cost results in a cost of approximately $153,000 to raise a 1,600 square-foot residence above the expected level of flooding. Using these assumptions, the costs to elevate all of the residences in the parish damaged from flooding by Hurricane Katrina would be approximately $4.7 billion.

Other costs associated with flood proofing would include elevating non-residential buildings, roads, railroads, and other infrastructure. No information is available on the cost of elevating commercial, industrial, and public buildings because these buildings are so different from one another that information would have to be developed for each individual building. However, it can reasonably be assumed that it would equal the costs associated with elevating the residential structures, bringing the total estimated costs to more than $9 billion.

Elevating the roadways would be equivalent to converting all roadways and railroads to bridges. The costs for repairing all roads and railroads would be much more reasonable, and these costs were estimated based on highway design assumptions and current unit prices. A nonstructural alternative that left roads and railroads at existing elevations would mean they would have to be repaired after each storm event. Costs for repairing two-lane asphalt roads with shoulders were estimated at $400,000 per mile. There are approximately 97 miles of two-lane roads in Jefferson Parish. Therefore, repair costs would be $38.8 million for each storm event that exceeded the level of protection. Repair costs were estimated at $800,000 per mile for four-lane divided roadways with shoulders. There are approximately 48 miles of four-lane roadways in Jefferson Parish. The cost of repairs to the four-lane roadways would be $38.4 million for each storm event that compromised hurricane protection. Repair costs to railroads were calculated for the 93 miles of railroad in Jefferson Parish. Railroad repair costs were estimated at $100 per linear foot. This resulted in railroad repair costs of approximately $49.1 million for the parish.

No information is available on the costs for elevating other infrastructure such as airport facilities, electrical distribution and transmission grids, gas distribution lines, drainage, sewage and water distribution facilities, communication networks, public transit, and waterborne navigation facilities. However, the estimated costs of elevating all flood-prone infrastructure in the study area would likely exceed $14 billion, which would be much more than the costs of other structural alternatives. Therefore, this alternative was eliminated from further consideration.

Real Estate Acquisition and Relocation Assistance

Public acquisition of properties in areas subject to flooding can also reduce damages from storms and hurricanes. Acquisition of these properties as part of a Federal project and for projects where there is Federal financial assistance in any part of project costs would be subject to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, 42 United States Code (USC) Section 4601, et seq., as amended (the Relocation Assistance Act). Accordingly, the displacement of individuals, families, businesses, farms, and non-profit organizations would have to be organized and a system established to minimize the adverse impacts on displaced persons.

There are several options that could be offered for the acquisition and relocation alternative: sale of the site and home or commercial structure to the local sponsor for demolition, sale of the site to the local sponsor and relocation of the structure to a comparable site outside the area of flooding, or relocation of the displaced persons to a comparable home or business outside the area of flooding. In addition to compensation for real property, displaced persons could be eligible for expenses for moving themselves and their personal or business-related property, costs of property lost as a result of moving or discontinuing a business, expenses in searching for a replacement business or farm, and necessary expenses for reestablishment of a displaced farm, nonprofit organization, or small business at its new location. However, the estimated costs for real estate acquisition and relocation assistance for all flood-prone infrastructures in the study area would exceed the costs of structural alternatives. Therefore, this alternative was eliminated from further consideration.

2.6 SUMMARY TABLE

Table 2 provides a summary of the preliminary alternative screening results.

Table 2. Preliminary Alternative Screening Results				
Alternative	**LPV 00, 01, 02, 19, & 20**	**LPV 09, 10, 11, & 12**	**LPV 16 & 18**	**LPV 17**
No Action	☑	☑	☑	☑
Non-Structural	X	X	X	X
Existing Alignment (with a Sight Flood-side Shift)				
▪Earthen Levee	X	n/a	n/a	☑
▪Earthen Levee with Foreshore Protection	☑	n/a	n/a	n/a
▪T-wall Floodwall	X	n/a	n/a	n/a
▪Earthen Levee with T-wall Floodwall cap	X	n/a	n/a	n/a
▪Earthen Levee with Deep Soil Mixing	X	n/a	n/a	n/a
▪Addition of Breakwaters	☑	☑	n/a	☑
▪Addition of Fronting Protection	n/a	☑	n/a	n/a
▪Replacement (structures)	n/a	n/a	☑	n/a
▪Modification of existing structure or Floodwall	n/a	n/a	X	☑
Protected-side Shift				
▪ Earthen Levee	X	n/a	n/a	n/a
Flood-side Shift				
▪ Earthen Levee	X	n/a	n/a	n/a

X = eliminated from further study
☑ = considered in detail
n/a = not applicable; this alternative was not formulated for this reach

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 ENVIRONMENTAL SETTING

General

The IER # 3 project area is on the south shore of Lake Pontchartrain in the northeastern portion of the Mississippi River deltaic plain. The project area and existing levee system runs along the south shore of Lake Pontchartrain within Jefferson Parish. The existing levee proposed for amendment as part of the IER # 3 project begins immediately east of the LaBranche Wetlands and continues eastward under the Lake Pontchartrain Causeway bridge and terminates on the western side of the 17th St. Canal.

Climate

Jefferson Parish is located within a subtropical latitude. The climate is influenced by the many water surfaces of the nearby wetlands, rivers, lakes, streams, and the Gulf of Mexico. Throughout the year, these water areas modify the relative humidity and temperature conditions, decreasing the range between the extremes. Summers are long and hot, with an average daily temperature of 82° Fahrenheit (°F), average daily maximum of 91°F, and high average humidity. Winters are influenced by cold, dry polar air masses moving southward from Canada, with an average daily temperature of 54°F and an average daily minimum of 44°F. Annual precipitation averages 54 inches.

Geology and Soils

Dominant physiographic features in the vicinity include Lake Pontchartrain and the Jefferson Lakefront Levee. The natural surface environment of marsh and swamp has been altered by filling and drainage for development.

The shallow subsurface beneath, and immediately adjacent to, the Jefferson Lakefront Levee is composed of up to 15 ft of fill material. Fill deposits are predominantly clay and silty clay. Fill deposits overlie swamp/marsh deposits, which are approximately 5 ft to 10 ft thick. Swamp/marsh deposits are composed of very soft to medium organic clay, clay, silty clay, and silt, with peat and wood. Interdistributary deposits underlie swamp/marsh deposits and are characterized by soft to medium clays with some silt and sand layers, and shells.

Interdistributary deposits are approximately 25 ft thick. Bay-sound deposits are located beneath interdistributary deposits. Bay-sound deposits are mainly soft to medium clays and silty clays with some silt, silty sand, and shells. These deposits are approximately 10 ft to 15 ft thick. Pleistocene deposits composed of oxidized, stiff to very stiff clays and silty clays with silty sand and sand underlie bay-sound deposits. The top of the Pleistocene deposits is approximately -50 ft NAVD88 in elevation.

The study site contains Kenner drained soils, which are level, poorly drained soils that have a thick or moderately thick mucky surface layer and mucky and clayey underlying material, in former freshwater marshes (US Soil Conservation Service, 1983).

Groundwater is artificially lowered south of the protection levee by forced drainage and is at or near the surface north of the levee.

Long-term relative subsidence resulting mainly from compaction of Holocene sediments, and possibly from movement on the downthrown side of growth faults, is estimated at 0.5 ft per century. Eustatic sea level is predicted to rise an additional 1.3 ft over the next century (Intergovernmental Panel on Climate Change, 2001). Therefore, the natural, long-term, relative subsidence rate at the project site is estimated to be 1.8 ft per century. Ground subsidence related to artificial lowering of the water table far exceeds the natural rate of subsidence and could reach several feet in areas south of the project site.

Hydrology

The proposed project area occurs within the Lake Pontchartrain Basin, a 12,173 square kilometers (km^2) (4,700 square miles [mi^2]) watershed in southeast Louisiana and southwest Mississippi. The basin is within the coastal zone delineation and, therefore, regulated under the Louisiana State and Local Coastal Resources Management Act of 1978. The areas potentially affected by the IER # 3 project are near or immediately adjacent to the current levees, floodwalls, gates, and pumping stations along 9.5 miles of the Lake Pontchartrain shoreline in Jefferson Parish. Project activities for the alternatives considered would occur at the current locations of the levees and other components of the flood protection system within the IER # 3 project area and along the shoreline and inshore area of Lake Pontchartrain (on the flood side of the current levees).

The project area is bound by the Parish Line Canal and the La Branche Wetlands on the west, urban development and the Mississippi River to the south, the 17th Street Canal on the east, and by Lake Pontchartrain to the north. Lake Pontchartrain is an oval-shaped, low-salinity estuary approximately 12 ft deep with a water surface area of 640 mi^2. Water depths within 350 ft of the shoreline are less than 3 ft [U.S. Geological Survey (USGS) 1998], and depths 2,700 to 4,000 ft from the shoreline are less than 10 ft. Hydrology for the area has been altered from its original state and currently is influenced by several drainage canals that move water (via pumping stations) from the urban areas located south of the lake. Pumping stations are required within the project area to pump water into the lake from the developed areas to the south. Two small wetland areas occur on the flood side of the existing levee between the lake and the levee. These wetlands and the other primary hydrological features within the IER # 3 project area are shown in figure 13.

Lake Pontchartrain connects to Lake Borgne and the Mississippi Sound via two natural tidal passes, the Rigolets and the Chef Menteur Pass. Lake Pontchartrain also connects to Lake Borgne via man-made waterways, the IHNC, GIWW, and MRGO. Lake Pontchartrain receives freshwater drainage from Lake Maurepas to the west via Pass Manchac and from rivers and bayous along its northern shore, including the Tangipahoa River, Tchefuncte River, Bayou Lacombe, Bayou Liberty, and Bayou Bonfouca.

Figure 13. Hydrologic Features of the IER #3 Project Area

Hurricane Katrina and On-going Construction Activities

On 29 August 2005, Hurricane Katrina made landfall near Buras on the Louisiana Coast, southeast of New Orleans. The water level of Lake Pontchartrain rose to 7 ft, affecting all of the surrounding coastal areas. The storm crossed southeastern Louisiana, approximately 20 miles east of Jefferson Parish, with wind gusts reaching 100 to 125 mph. Despite the fact that there were no failures of the hurricane protection system in East Jefferson, substantial flooding did occur there. The flooding that occurred in the "Hoey's Basin" portion of the Parish (some 2500 acres) was an extension of the flooding that occurred in Orleans Parish. This flooding persisted until this section was isolated from Orleans Parish by constructing earth and rock barriers at the parish line, and temporary dewatering pumps were installed. The northern portion of the Parish (the lowest part) was flooded by a combination of rainfall runoff and water from Lake Pontchartrain that back-siphoned through the lakefront pump stations. This flooding was quickly removed when the pump station operators, who had been evacuated for the storm, returned and restarted the pumps. Though some water entered the protected area as a result of wave runover at a few points along the lakefront levee alignment, its volume was inconsequential compared to the other sources.

On 27 September 2005, Hurricane Rita hit the western part of Louisiana, bringing sustained winds of 45 miles per hour (mph) to Jefferson Parish. Storm surges again flooded areas of southern Jefferson Parish and utilities were disrupted throughout the parish. Many businesses were closed for several weeks. High winds damaged more than 26,700 residential roofs throughout the parish. As part of the USACE GNOHSDRRS Program, 29 contracts have been created for Jefferson Parish for work to repair, construct, and raise levees and flood control structures as currently authorized. Ten of these contracts have been awarded and eight of those have been completed.

3.2 SIGNIFICANT RESOURCES

This section contains a list of the significant resources located in the vicinity of the proposed action, and describes in detail those resources that would be impacted, directly or indirectly, by the alternatives. Direct impacts are those that are caused by the action taken and occur at the same time and place (40 CFR 1508.8(a)). Indirect impacts are those that are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable (40 CFR 1508.8(b)). Cumulative impacts are discussed in section 4.

Table 3. Significant Resources in Project Study Area

Significant Resource	Impacted	Not Impacted
Water	X	
Lake Pontchartrain/ Canals/Drainageways	X	
Wetlands	X	
Fisheries	X	
Essential Fish Habitat	X	
Wildlife	X	
Endangered or Threatened Species		X
Cultural		X
Recreational	X	
Aesthetic (Visual)	X	
Air Quality	X	
Noise	X	
Transportation	X	
Socioeconomic		
Land Use, Population, Employment	X	
Environmental Justice		X*
Using presently available data on racial, ethnic, or socioeconomic status in the area Some data insufficiencies were identified and are discussed in section 1.6, data gaps and uncertainty.		

The resources described in this section are those recognized as significant by laws, executive orders, regulations, and other standards of national, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public. Further detail on the significance of each of these resources can be found by contacting the CEMVN, or on www.nolaenvironmental.gov, which offers information on the ecological and human value of these resources, as well as the laws and regulations governing each resource. Search for "Significant Resources Background Material" in the website's digital library for additional information. Table 3 shows those significant resources found within the project area, and notes whether they would be impacted by the proposed action.

The assumption should be made that under the no action alternative, the LPV reaches would be raised to the originally authorized grade rather than the 100-year level of protection.

3.2.1 Lake Pontchartrain/Canals/Drainageways

Existing Conditions

As discussed previously in the Hydrology discussion (section 3.1) and shown in figure 13, several canals are part of the IER # 3 project area or border the project area. These canals are man-made canals that provide drainage from the urban areas south of the project area into Lake Pontchartrain. The alternatives evaluated within this IER would occur where these canals enter Lake Pontchartrain. Therefore, these resources would be evaluated as part of Lake Pontchartrain. Lake Pontchartrain and the canals are Waters of the United States (as defined by 33 CFR 329.4) and are under the jurisdiction of the USACE. Dredge and fill activities in the lake or canals require compliance with Section 404 of the Clean Water Act (33 USC 1344).

The lakeshore in the project area is currently protected with riprap of rock and concrete rubble. This armoring of the shoreline was done to reduce erosion and to help protect the levee system which protects the population and infrastructure of Jefferson Parish. Armored shorelines do not allow for a transitional wetland area that would provide many ecological functions such as production of detritus, reduction of turbidity, filtration of nutrients/contaminants, and fisheries nursery habitat. Hard armoring of shorelines can contribute to the erosion of adjacent water bottoms by altering the magnitude and direction of sediment transport (National Research Council [NRC] 2007).

Water circulation and lake levels are controlled by tidal action at the tidal passes, freshwater inflows from upstream drainage areas, and wind. The greatest volume of water entering the lake is from the Rigolets (USACE 1984). The salinity of the lake varies from one end of the lake to the other with an average salinity of 4.9 parts per thousand (ppt) (Georgiou and McCorquodale 2002).

The water quality in the project area is impacted by storm water runoff from Jefferson and Orleans Parishes. Storm water could contain elevated levels of pathogens, heavy metals, and soil-derived suspended sediments. Additionally, communities discharging treated and untreated wastewater into the Lake Pontchartrain Basin and tens of thousands of individual septic systems as well as past oil and gas production have contributed to water quality problems in the lake. Proposed freshwater diversions from the Mississippi River to benefit wetlands adjacent to the

lake and salinity levels in the lake also could potentially introduce toxic chemicals, pesticides, herbicides, excess nutrients, and sediments (Penland et al. 2002).

Since an initial biological inventory published in 1954, submerged aquatic vegetation (SAV) in Lake Pontchartrain had declined by more than 50 percent by 2000. Observations by University of New Orleans researchers found no grass beds along the south shore from 1996 to 1998. The absence of SAV was attributed to high nutrient input from urban runoff and the armoring of the shoreline. Turbid water can limit the growth of aquatic plants by decreasing the amount of light they receive. Nutrients can induce this shading effect by stimulating the growth of phytoplankton and algae (Penland et al. 2002). The dominant species of SAV that occur in the lake include widgeon grass (*Ruppia maritime*) and American eelgrass/wild celery *(Vallisneria americana)* (Cho and Poirrier 2002). The lake bottom in the project area is composed of fine grained materials with abundant shell hash and some intact clams (Flocks et al. 2002) with a clay substrate (Gulf of Mexico Fishery Management Council [GMFMC] 2006).

Discussion of Impacts

Future Conditions with No Action

Without implementation of the proposed action, there would be no actions involving construction or modification of the levee reaches, floodwalls, floodgates, and pumping station fronting protection at the 12 LPV reaches included in the IER # 3 project area. However, maintenance of the GNOHSDRRS to its authorized heights would occur. Effects on the water and habitat of Lake Pontchartrain would not differ substantially from those discussed in the Final EIS for the LPV Hurricane Protection Project (dated August 1974) and its supplemental documents (Final Supplement I, dated July 1984, and Final Supplement II, dated August 1994).

LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5

Future Conditions with Proposed Action

Direct Impacts

The proposed action for the levee reaches would increase the height and width of the levees within the existing levee right-of-way (ROW). The addition of rock foreshore protection at least 150 ft to the flood-side of the existing levee centerline would entail the placement of rock along the already riprap-covered shoreline. The footprint of the foreshore protection would mainly coincide with the existing zone of riprap lining the shoreline. The additional rock could extend up to 25 ft out from the current shoreline, thereby permanently covering approximately 22 acres of shallow-water lake bottom along the shoreline west of the Lake Pontchartrain Causeway. The area of this inshore, lake bottom habitat that would be filled is very small relative to the extent of similar aquatic habitat within the expanse of Lake Pontchartrain.

Rock and fill required for the levee improvements would be brought to three land-based staging/stockpile areas by truck, or by barge utilizing flotation channels. Potential staging/stockpile areas could include the boat ramp at Williams Blvd, the Bonnabel boat launch,

or the old Coast Guard Station off of Lakeshore Drive. Flotation channels for breakwater construction could also be utilized for material delivery and would be created via bucket dredge to provide barge access to the pumping stations from deeper water. The dimensions required for a tug boat and barge to access the shoreline would be approximately 10 ft deep and 160 ft wide. Access channels would be dredged perpendicular to the shoreline and would be dredged from a distance of approximately 2,400 ft from the shore. Sediment excavated from these channels would be temporarily stockpiled adjacent to the channels. Each dredged channel and its associated sediment stockpile site would encompass approximately 29 acres for a total of 116 acres for the 4 access channels. The access channels would be backfilled with the adjacently stockpiled material and the stockpile sites brought to pre-construction lake bottom elevations upon project completion. Occasional re-dredging of the channels due to natural siltation would likely be necessary during the course of construction.

Dredging could cause increased turbidity which could immediately reduce water quality in the project area. However, turbidity would be minimized by the use of a bucket dredge, and be reduced by the movement of the tides. Flotation channels would be evaluated for SAV prior to dredging, so impacts would be minimized. Impacts to the waters and substrate of the lake from the proposed action would be temporary. The impacts of dredging, material delivery, and construction would occur primarily during the construction period of 1.5 to 2.5 years, with some effects potentially lasting until the areas have stabilized.

Indirect Impacts

Potential indirect impacts from the proposed action for LPV 00, 01, 02, 19, and 20 (lakefront levee reaches 1 through 5) would primarily consist of effects from increased turbidity to the wetland and lake areas surrounding the project area from construction related runoff. However, these impacts would be minimized through the use of best management practices and adherence to regulations governing stormwater runoff at construction sites. The potential indirect adverse impacts to the lake from the proposed action would be minimized by the small area affected relative to the size of the lake and the temporary nature of these impacts.

Cumulative Impacts

Potential cumulative impacts on the lake from the proposed action for lakefront levee reaches LPV 00, 01, 02, 19, and 20 would involve the combined effects to the lake from the multiple LPV flood control projects in the New Orleans area. However, several projects, such as the proposed MRGO deep-draft deauthorization and several proposed or recently approved wetland restoration projects, would positively impact the habitat within Lake Pontchartrain. The actions along the lake would be mainly temporary during the construction period. The project area would be modified very slightly relative to the size of the lake and the magnitude of historical changes to the shoreline.

Future Conditions with Alternative 1 – Levee Modification (16.5 ft) with Rock Breakwater (10 ft) and Rock Foreshore Protection

Direct, Indirect, and Cumulative Impacts

All impacts for this alternative for the levee reaches would be very similar to those for the proposed action.

LPV 09 – 12, Pumping Stations # 1 (Bonnabel), # 2 (Suburban), # 3 (Elmwood), and # 4 (Duncan) and associated Fronting Protection, Breakwaters, and Floodwall Tie-ins

Future Conditions with Proposed Action

Direct Impacts

The proposed action for the pumping stations involves the construction of fronting protection for each station, the construction of new breakwaters at pumping stations # 1 (LPV 09) and # 4 (LPV 12) and modifications to the existing breakwaters at pumping stations # 2 (LPV 10) and # 3 (LPV 11). The addition of fronting protection at the four stations would permanently cover a total of approximately 1.2 acres of shallow-water lake/canal bottom at the confluence of the pumping station outfall channels with Lake Pontchartrain. A T-wall type structure, approximately 200 to 370 ft long (depending on the width of the channel) and 50 ft wide would be constructed.

The addition of breakwaters would permanently replace 1.5 acres of lake bottom at pumping station # 1 (assuming a 130 ft wide base and length of 500 ft) and 0.6 acre at pumping station # 4 (assuming a 110 ft wide base and length of 250 ft). The demolition and replacement of the operation and maintenance bridge across Duncan Canal, 450 ft to the north of the current bridge, would occur along the ROW of the pumping station and existing flood protection system. The new bridge would have a footprint similar to the existing bridge and would be constructed in an area that consists primarily of armored shoreline and turf grass, so no permanent impact to the waters or substrate of Lake Pontchartrain or the canal would be expected.

The modification of existing breakwaters would replace approximately 0.5 acre of lake bottom at pumping station # 2 and 0.6 acre at pumping station # 3 (assuming an additional 20 ft footprint would be required to raise the breakwater height at each location). These protective features would be placed near the canals on the flood-side of the pumping stations to help protect against wave action and high currents, creating a calmer and less turbid area in front of the station. The lake habitat removed as a result of construction at the pumping stations is proportionately a very small area relative to the extent of similar habitat within the expanse of Lake Pontchartrain.

Additionally, flotation channels (for shoreline access) would be dredged into the breakwater construction locations to allow transport and placement of concrete pile, concrete sheet pile, and rock. One flotation channel would be dredged for each of the four pumping stations in the project area. Rock and fill required for the levee reaches would be handled and consolidated with the rock for pumping station improvements and breakwater construction when possible.

Impacts from these channels were discussed previously for the levee reaches.

Blocking, diverting, or damming water flow (if required) during the construction of the fronting protection structures could be required. These types of actions could cause increased turbidity and reduced water quality in the project area. Impacts to the waters and substrate of the lake from the proposed action would be mostly temporary. The majority of impacts would be related to construction activities that would be expected to last 1.5 to 2.5 years, with some effects potentially lasting until the areas have stabilized.

Indirect Impacts

Potential, indirect adverse impacts from the proposed action for pumping stations # 1 through # 4 would be similar to the impacts from the proposed action for the levee reaches but smaller due to the smaller acreages affected.

Cumulative Impacts

Potential cumulative impacts on the lake from the proposed action for pumping stations # 1 through # 4 would be similar to the proposed action for the levee reaches but smaller due to the smaller acreages affected.

LPV 16 – Floodwall and Gate at Bonnabel Boat Launch, and LPV 18 – Floodwall and Gate at Williams Blvd Boat Launch

Future Conditions with Proposed Action

Direct Impacts

The proposed action for the floodwalls and gates at the Bonnabel and Williams Blvd Boat Launches requires demolition of the existing structures and rebuilding of new T-wall structures with I-wall transitions in approximately the same locations as the existing structures. The primary impacts from these actions would be related to demolition and construction. The structures would have similar footprints and placements as the existing structures.

Materials required for the floodwall and gate improvements would be handled and consolidated with the other reaches within this IER # 3 project area and no additional flotation channels would be required. Demolition and construction of the floodwalls and gates could cause increased turbidity and reduced water quality in the project area. Impacts to the waters and substrate of the lake from the proposed action would be mostly temporary; lasting approximately 1.5 to 2.5 years, with some effects lasting until the areas have stabilized.

Indirect Impacts

Potential indirect impacts from the proposed action for reaches LPV 16 and LPV 18 would primarily consist of effects from increased turbidity to the wetland and lake areas surrounding the project area from construction related runoff. However, these impacts would be minimized

by the use of best management practices and adherence to regulations governing stormwater runoff at construction sites.

Cumulative Impacts

The actions along the lake would be primarily temporary during the construction period. The project area would be modified very slightly relative to the size of the lake and magnitude of the historical changes to the shoreline.

LPV17 – Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

Future Conditions with Proposed Action

Direct, Indirect, and Cumulative Impacts

The proposed action for the Causeway bridge abutment would modify the existing levee and floodwall tie-ins. These modifications would occur within a developed, high-traffic area within the existing levee ROW. The most likely impacts would be indirect impacts from construction equipment and stormwater runoff during construction. These impacts would be managed to the extent possible through the use of best management practices and adherence to regulations governing stormwater runoff at construction sites.

Future Conditions with Alternative 1 – Construction of Breakwater with Floodwall Modifications or Using a New Perimeter Wall

Direct Impacts

This alternative for reach LPV 17 would incorporate a rock breakwater into the flood protection system. This breakwater would cover approximately 1.3 acres (450 ft long, 122 ft wide) of shallow-water lake bottom approximately 170 ft from the crib wall (the I-wall that encloses the Causeway) around the Causeway peninsula. The area of Lake Pontchartrain impacted by this alternative would be slightly smaller than the area of the breakwater at pumping station # 1 but over two times the area of the breakwaters at pumping stations # 2, 3, and 4. As for each of the four pumping stations, this alternative would require dredging of a flotation channel for access to build the breakwater, and this temporary access channel and adjacent dredge spoils deposition area could temporarily impact up to 29 acres of lake bottom. The channel would be refilled with spoils after completion of construction, and impacts to the waters and substrate of the lake from this alternative would be mostly temporary. Thus, the long-term impact on the lake involve the filling of about 1.3 acres with riprap and would be minimal in its effect given the expanse of the lake.

Indirect Impacts

Indirect impacts from this alternative would be similar to those discussed for the creation of breakwaters for the pumping stations.

Cumulative Impacts

Cumulative impacts from this alternative would be similar to those discussed for the creation of breakwaters for the pumping stations.

3.2.2 Wetlands

Existing Conditions

The shoreline habitat in the IER # 3 project area occurs in a narrow zone between the mowed grass areas and the water. The shoreline is covered almost continuously by riprap, consisting of large rocks and broken pieces of concrete piled to approximately 5 ft high along the waterline. The vegetation community within the shoreline habitat consists principally of a narrow zone of marsh grasses, such as salt grass (*Distichlis spicata*) and bulrush (*Scirpus* spp.), that grow along or among the riprap in some segments of the shoreline. Although wetland vegetation grows in places along the shoreline, most of the shoreline is not considered wetland because it is armored and, therefore, does not meet the criteria for hydric soils, and it does not have the hydrological properties necessary for it to be classified as wetland habitat.

Isolated, larger areas of marsh habitat that do meet the definition of a wetland occur in two areas along the IER # 3 project area shoreline (figure 14). One wetland is adjacent to reach LPV 10 (pumping station # 2) on the east side of the mouth of the Suburban Canal, and the other is immediately west of the peninsula where the Bucktown Marina and Coast Guard Station are located, within reach 5 (LPV 20) near the east end of the IER # 3 project area. These wetlands

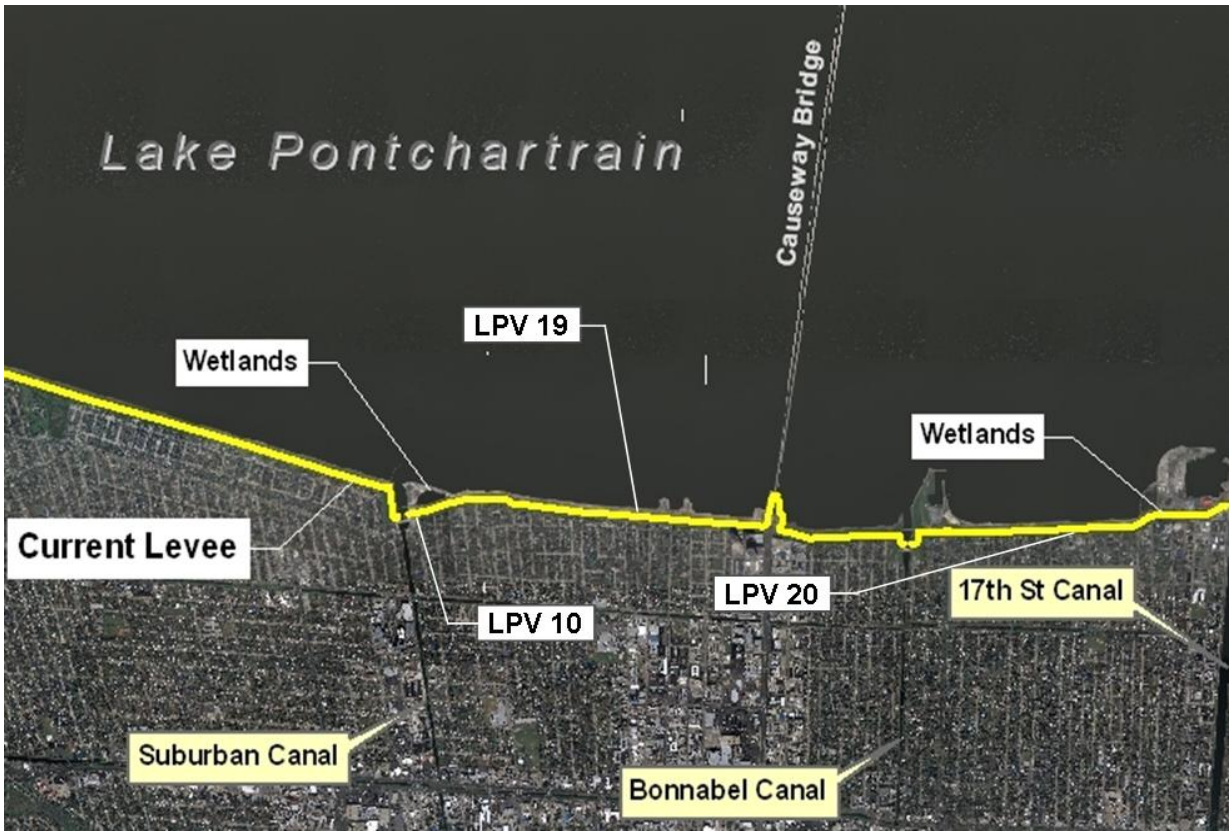


Figure 14. Wetlands within the IER # 3 Project Area

are under the jurisdiction of the USACE (i.e., are jurisdictional wetlands) because of their connection to Lake Pontchartrain.

The wetland area in reach LPV 19 is immediately to the east of reach LPV 10 and appears to have been formed by the deposition of dredge spoils at the canal entrance, resulting in a triangular area of fill surrounding a small pond occupying approximately 3 acres. The pond is shallow and bordered by marsh grasses, such as salt meadow cordgrass (*Spartina patens*) and common reed (*Phragmites australis*), and small trees and shrubs, such as willow (*Salix* sp.) and rattlebush (*Sesbania drummondii*). The somewhat pie-shaped wetland within reach 5 (LPV 20) is a brackish marsh community of approximately 4 acres along the shoreline of the lake that was developed as a mitigation area. It is dominated by marsh grasses, such as cordgrass and salt grass, and bordered along its upper margin by shrubs, such as rattlebush and wax myrtle (*Myrica cerifera*).

Discussion of Impacts

Future Conditions with No Action

Without implementation of the proposed action, there would be no actions involving construction or modification of the levee reaches, floodwalls, floodgates, and pumping station fronting protection at the 12 LPV reaches included in the IER # 3 project area. However, maintenance of the GNOHSDRRS to its authorized heights would continue to occur and effects on the water and habitat of the two wetland areas would not differ substantially from those discussed under the 1974 EIS for the LPV hurricane protection system and its supplemental documents.

LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5

Future Conditions with Proposed Action

Direct Impacts

The proposed action for the levee reaches would increase the height and width of the levees within the existing levee ROW, and would not encroach on the wetland areas. The addition of rock foreshore protection at least 150 ft to the flood-side of the existing levee centerline would entail the placement of rock along the already riprap-covered shoreline. The footprint of the foreshore protection would mainly coincide with the existing zone of riprap lining the shoreline and would not impact wetland areas.

Indirect Impacts

Potential indirect impacts on wetlands from the proposed action for LPV 00, 01, 02, 19, and 20 (lakefront levee reaches 1 through 5) would consist mainly of effects from increased turbidity on the wetland and lakeshore areas in the project area from construction-related runoff. However, potential impacts from runoff into the wetlands would be minimized by the use of best

management practices and adherence to regulations governing stormwater runoff at construction sites.

Cumulative Impacts

Potential cumulative impacts on wetlands from the proposed action for lakefront levee reaches LPV 00, 01, 02, 19, and 20 would involve the combined effects to the Lake Pontchartrain and associated wetlands from the multiple LPV flood control projects in the New Orleans area. However, several projects, such as the MRGO deep-draft deauthorization and several wetland restoration projects, are proposed or recently approved that would positively impact the habitat within Lake Pontchartrain.

Future Conditions with Alternative 1 – Levee Modification (16.5 ft) with Rock Breakwater (10 ft) and Rock Foreshore Protection

Direct, Indirect, and Cumulative Impacts

All impacts for this alternative to the levee reaches would be very similar to those for the proposed action.

LPV 09 – 12, Pumping Stations # 1 (Bonnabel), # 2 (Suburban), # 3 (Elmwood), and # 4 (Duncan) and associated Fronting Protection, Breakwaters, and Floodwall Tie-ins

Future Conditions with Proposed Action

Direct Impacts

The proposed action for the pumping stations involves the construction of fronting protection for each station, new breakwaters at pumping stations # 1 (LPV 09) and # 4 (LPV 12), and modifications to the existing breakwaters at pumping stations # 2 (LPV 10) and # 3 (LPV 11). No wetlands in the project area would be directly impacted by the proposed action for these facilities.

Indirect Impacts

The proposed action for these pumping facilities would not indirectly impact wetlands in the project area.

Cumulative Impacts

The proposed action for these pumping facilities would not contribute to cumulative adverse effects on wetlands in the Lake Pontchartrain vicinity.

LPV 16 – Floodwall and Gate at Bonnabel Boat Launch, and LPV 18 – Floodwall and Gate at Williams Blvd Boat Launch

Future Conditions with Proposed Action

Direct Impacts

The proposed action for the floodwalls and gates at the Bonnabel and Williams Blvd Boat Launches requires demolition of the existing structures and building, in approximately the same locations, new T-wall structures with I-wall transitions. The primary impacts from these actions would be related to demolition and construction. The new structures would have similar footprints and placements as the existing structures and would not directly impact wetlands.

Indirect Impacts

The proposed action for these floodwalls and gates would not indirectly impact wetlands in the project area.

Cumulative Impacts

The proposed action for these floodwalls and gates would not contribute to cumulative adverse effects on wetlands in the Lake Pontchartrain vicinity.

LPV 17 – Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

Future Conditions with Proposed Action

Direct, Indirect, and Cumulative Impacts

With the use of best management practices, wetlands in the project area would not be adversely affected by direct or indirect impacts from the proposed action at this location. This action would not contribute to cumulative adverse impacts on wetlands in the Lake Pontchartrain vicinity.

Future Conditions with Alternative 1 – Construction of Breakwater with Floodwall Modifications or Use of a New Perimeter Wall

Direct, Indirect, and Cumulative Impacts

Impacts on the wetlands under this alternative would be essentially the same as described for the proposed action at LPV 17.

3.2.3 Fisheries

Existing Conditions

Lake Pontchartrain and surrounding wetlands provide habitat for freshwater fish. Freshwater fishes that might inhabit areas near the project area are presented by season in table 4. Lake Pontchartrain and surrounding wetlands also provide nursery and foraging habitat for marine fish and shellfish. Marine fish that might inhabit areas near the project area are presented by season in table 5.

Rangia clams (*Rangia cuneata*) have historically been prevalent in Lake Pontchartrain and have contributed to the unique ecology of the lake. The clams provide clarity to the lake required for SAV to grow and are a favorite food item for many fish species including the red drum and blue crab. Dredging of the clams and the hypoxic/anoxic effects of the high salinity plume from the MRGO have impacted the density of this indicator species within the lake. Clam dredging was halted in 1990, but reduced populations of rangia clams have been recorded immediately east of the project area (Abadie and Poirrier 2000).

Table 4. Freshwater Fish of Lake Pontchartrain

Common Name	Scientific Name	Seasonality			
		Spring	Summer	Fall	Winter
Gizzard shad	*Dorosoma cepedianum*	B	B	P	P
Largemouth bass	*Micropterus salmoides*	B	P	P	P
Black crappie	*Pomoxis nigromaculatus*	P	P	P	P
Bluegill	*Lepomis macrochirus*	P	P	P	P
Blue catfish	*Ictalurus furcatus*	B	B	P	P
Channel catfish	*Ictalurus punctatus*	B	B	P	P
White crappie	*Pomoxis annularis*	P	P	P	P
Warmouth	*Chaenobryttus gulosus*	P	P	P	P
Redear sunfish	*Lepomis microlophus*	P	P	P	P
Freshwater drum	*Aplodinotus grunniens*	P	P	P	P
Spotted sunfish	*Lepomis punctatus miniatus*	P	P	P	P

P = present
B = breeding season
(Table compiled from Milanes [2002] and Frierson [2002]).

Table 5. Marine Fish/Shellfish of Lake Pontchartrain					
		Seasonality			
Common Name	**Scientific Name**	**Spring**	**Summer**	**Fall**	**Winter**
Spotted seatrout	*Cynoscion nebulosus*	P	P	P	P
Red drum	*Sciaenops ocellatus*	P	P	B	B
Southern flounder	*Paraichthys lethostigma*	P	P	P	B
Bay anchovy	*Anchoa mitchilli*	B	B	B	B
Spot	*Leiostomus xanthurus*	P	P	P	B
Black drum	*Pogonias cromis*	P	P	P	B
Atlantic croaker	*Micropogonias undulatus*	P	P	P	B
Southern kingfish	*Menticirrhus americanus*	P	P	P	P
Sheepshead	*Coryphaena hippurus*	B	P	P	P
Gulf menhaden	*Brevoortia patronus*	P	P	P	B
Gulf kingfish	*Menticirrhus littoralis*	P	P	P	P
Blue crab	*Callinectes sapidus*	B	B	P	P
White shrimp	*Penaeus setileus*	B	P	P	P
Brown shrimp	*Penaeus aztecus*	B	P	P	P
Brackish-water clam	*Macomia* sp.	B	P	P	P
P = present B = breeding season (Table compiled from Milanes [2002]; Frierson [2002]; and Nelson [1992]).					

Discussion of Impacts

Future Conditions with No Action

Without implementation of the proposed action, there would be no actions involving construction or modification of the levee reaches, floodwalls, floodgates, and pumping station fronting protection at the 12 reaches included in the IER # 3 project area. However, maintenance of the GNOHSDRRS to its authorized heights would continue to occur and effects on the fisheries habitat would not differ substantially from those discussed under the 1974 EIS for the LPV hurricane protection system and its supplemental documents.

LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5

Future Conditions with Proposed Action

Direct Impacts

The addition of rock foreshore protection at least 150 ft to the flood-side of the existing levee centerline could permanently cover approximately 22 acres (assuming that the additional rock would extend up to 25 ft out from the current shoreline) of shallow-water habitat along the shoreline west of the Causeway. The removal of this habitat represents proportionately a very small area of similar aquatic habitat within the expanse of Lake Pontchartrain, which has an area

of over 400,000 acres. The dredging of four channels to provide access to the pumping stations would temporarily displace and possibly destroy the benthic organisms (including clams) within a total area of approximately 116 acres (29 acres per channel) where the four dredged access channels and associated sediment stockpile areas would be located. Increased turbidity from access dredging could affect fish and other organisms by clogging gills, reducing growth rates, and adversely affecting egg and larval development (USEPA, 2003). Most mobile species would avoid the areas temporarily impacted by dredging as well as shoreline areas that would be permanently lost due to filling. Stockpile areas would be brought to pre-construction lake bottom elevations upon project completion, which would minimize impacts to the lake bottom and reestablish fish habitat in the area. Impacts to less mobile benthic species from these activities likely would occur but would be temporary, approximately 1.5 to 2.5 years in duration, with effects lasting until the areas have stabilized. Once the proposed action is complete, sediment would settle, benthos would repopulate, and fish and other mobile aquatic species would return.

Indirect Impacts

Potential indirect impacts on fisheries from construction of the proposed action for LPV 00, 01, 02, 19, and 20 (lakefront levee reaches 1 through 5) would consist mainly of effects from siltation and suspended sediment in adjacent areas of the lake which could affect fish and other organisms by clogging gills, reducing growth rates, and adversely affecting egg and larval development (USEPA, 2003). Effects such as these from levee construction and foreshore protection placement would be minimized by the use of best management practices to control sediment transport. In addition, reductions in habitat associated with the proposed action could incrementally reduce available prey for some species. However, the area of permanently lost habitat would be very small in comparison to the remaining similar habitat in the lake and most indirect impacts would be temporary, approximately 1.5 to 2.5 years in duration, with effects lasting until the areas have stabilized.

Cumulative Impacts

Potential cumulative impacts on fisheries in the lake from the proposed action for lakefront levee reaches LPV 00, 01, 02, 19, and 20 would involve the combined effects from the multiple LPV flood control projects in the New Orleans area. The total area of the lake potentially affected would be small and most areas would be affected only temporarily, as discussed above. Some projects, such as the proposed de-authorization of the MRGO and several proposed or recently approved wetland restoration projects would reduce potential adverse cumulative impacts by positively affecting the fish habitat within Lake Pontchartrain.

Future Conditions with Alternative 1 – Levee Modification (16.5 ft) with Rock Breakwater (10 ft) and Rock Foreshore Protection

Direct, Indirect, and Cumulative Impacts

All impacts on fisheries from this alternative for the levee reaches would be very similar to those for the proposed action.

LPV 09 – 12, Pumping Stations # 1 (Bonnabel), # 2 (Suburban), # 3 (Elmwood), and # 4 (Duncan) and associated Fronting Protection, Breakwaters, and Floodwall Tie-ins

Future Conditions with Proposed Action

Direct Impacts

The proposed action for the pumping stations involves the construction of fronting protection for each station, the construction of new breakwaters at pumping stations # 1 (LPV 09) and # 4 (LPV 12) and modifications to the existing breakwaters at pumping stations # 2 (LPV 10) and # 3 (LPV 11). The addition of fronting protection at the four stations would permanently cover a total of approximately 1.2 acres of shallow-water lake/canal bottom at the confluence of the pumping station outfall channels with Lake Pontchartrain. A T-wall type structure, approximately 200 to 370 ft long (depending on the width of the channel) and 50 ft wide would be constructed.

The addition of breakwaters would permanently replace 1.5 acres of lake bottom at pumping station # 1 (assuming a 130 ft wide base and length of 500 ft) and 0.6 acre at pumping station # 4 (assuming a 110 ft wide base and length of 250 ft). The demolition and replacement of the operations and maintenance bridge across Duncan Canal, 450 ft to the north of the current bridge, would occur along the ROW of the pumping station and existing flood protection system. The new bridge would have a footprint similar to the existing bridge and would be constructed in an area that consists primarily of armored shoreline and turf grass, so no permanent impacts to fisheries would occur.

The modification of existing breakwaters would replace approximately 0.5 acre of lake bottom at pumping station # 2 and 0.6 acre at pumping station # 3 (assuming an additional 20 ft footprint would be required to raise the breakwater height at each location). These protective features would be placed near the outfall channels on the flood-side of the pumping stations to help protect against wave action and high currents, creating a calmer and less turbid area in front of the station. The fish habitat of water and water bottoms that would be removed as a result of the construction at the pumping stations is proportionately a very small area relative to the extent of similar habitat within the expanse of Lake Pontchartrain.

Additionally, flotation channels (for shoreline access) would be dredged into the breakwater construction locations to allow transport and placement of concrete pile, concrete sheet pile, and rock. One flotation channel would be dredged for each of the four pumping stations in the project area. Rock and fill required for the levee reaches would be handled and consolidated with the rock for pumping station improvements and breakwater construction when possible. The impacts of the flotation channels would be the same as those discussed for the levee reaches.

Indirect Impacts

Potential indirect impacts on fisheries from the proposed action for pumping stations # 1 through # 4 would be essentially the same those discussed above for the levee reaches under the proposed action.

Cumulative Impacts

Potential cumulative impacts on fisheries associated with the proposed action for pumping stations # 1 through # 4 would be essentially the same as those discussed above for the levee reaches under the proposed action.

LPV 16 – Floodwall and Gate at Bonnabel Boat Launch, and LPV 18 – Floodwall and Gate at Williams Blvd Boat Launch

Future Conditions with Proposed Action

Direct Impacts

The proposed action for the floodwalls and gates at the Bonnabel and Williams Blvd Boat Launches requires demolition of the existing structures and building, in approximately the same locations, new T-wall structures with I-wall transitions. The primary impacts from this alternative would be related to demolition and construction. Little to no adverse impacts would be expected for the proposed action compared to current conditions because the structures would have similar footprints and placements as the existing structures. Therefore, impacts to the fisheries of the lake from the proposed action would be mostly temporary.

Indirect Impacts

Potential indirect impacts on fisheries from the proposed action for reaches LPV 16 and LPV 18 would primarily consist of effects from increased turbidity and reduced water quality on the wetland and lake areas surrounding the project area from construction related runoff. However, these impacts would be minimized by use of best management practices and adherence to regulations governing stormwater runoff at construction sites.

Cumulative Impacts

Potential cumulative impacts on fisheries in the lake from the proposed action for LPV 16 and LPV 18 would involve the combined effects from the multiple LPV flood control projects in the New Orleans area. The actions along the lake associated with the proposed action for LPV 16 and LPV 18 would be primarily temporary during the construction period, and the fish habitat in the Lake Pontchartrain vicinity would be modified very slightly relative to the size of the lake and extent of available habitat. Some projects, such as the proposed de-authorization of the MRGO and several proposed or recently approved wetland restoration projects would reduce potential adverse cumulative impacts by positively affecting the fish habitat within Lake Pontchartrain.

LPV17 – Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

Future Conditions with Proposed Action

Direct, Indirect, and Cumulative Impacts

The proposed action for the Causeway bridge abutment would modify the existing levee and floodwall tie-ins. These modifications would occur within a developed, high-traffic area within the existing levee ROW. The most likely impacts would be indirect impacts from construction equipment and stormwater runoff during construction. These impacts would be minimized through the use of best management practices and adherence to regulations governing stormwater runoff at construction sites.

Future Conditions with Alternative 1 – Construction of a Breakwater with Floodwall Modifications or Using a New Perimeter Wall

Direct, Indirect, and Cumulative Impacts

The direct and indirect impacts on fish habitat from this alternative would be similar to those described for the breakwaters at the pumping stations. This breakwater would permanently impact an area of 1.3 acres, which is slightly smaller than the area of the breakwater at pumping station # 1 but over two times the area of the breakwaters at pumping stations # 2, 3, and 4. As for each of the four pumping stations, this alternative would require dredging of a flotation channel for access to build the breakwater, and this temporary access channel and adjacent dredge spoils deposition area could temporarily impact up to 29 acres of lake bottom. Thus, cumulative impacts on fish habitat from this alternative in conjunction with similar activities at other LPV projects on Lake Pontchartrain would cause permanent loss of a relatively small area of lake bottom. However, the crevices and stable substrate of the breakwater riprap could increase habitat diversity and support additional populations. The cumulative impacts of dredging for flotation channels at multiple points along the south shore of the lake would be temporary and would be limited mainly to the construction period. Overall, the direct, indirect, and cumulative impacts on fisheries from this alternative would be minor.

3.2.4 Essential Fish Habitat

Existing Conditions

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) (50 CFR 600) states that Essential Fish Habitat (EFH) is ‘those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity.’ (16 United States Code [USC] 1802(10); 50 CFR 600.10). The 1996 amendments to the MSA set forth a mandate for the National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration (NOAA), regional Fishery Management Councils (FMC), and other Federal agencies to identify and protect EFH of economically important marine and estuarine fisheries. A provision of the MSA requires that FMCs identify and protect EFH for every species managed by a Fishery Management Plan ([FMP] 16 USC 1853).

EFH is separated into estuarine and marine components. Lake Pontchartrain and associated wetlands are designated EFH under the provisions of the MSA. Table 6 presents the three managed species likely to occur in the project area and their occurrence in the project area by life stage as indicated by relative abundance maps from the NMFS Galveston Laboratory (NMFS 1998).

Table 6. Summary of Essential Fish Habitat Species for Lake Pontchartrain

Species		Occurrence in Project Area	
Common Name	**Scientific Name**	**Juveniles**	**Adults**
Brown shrimp	*Penaeus aztecus*	common- highly abundant	rare
White shrimp	*Penaeus setiferus*	common-abundant	rare
Red drum	*Scianops ocellatus*	common	common

Source: *NMFS 1998*

Discussion of Impacts

Impacts to EFH and managed fish species from each alternative are similar to the impacts discussed above for fisheries. However, the consultation requirements in the MSA direct Federal agencies to consult with the NMFS when any of their activities could have an *adverse effect* on EFH. The NMFS defines *adverse effec*t as "any impact that reduces quality and/or quantity of EFH... [and] could include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions." Impacts to EFH can result from the removal or disturbance of wetland and aquatic habitat.

Future Conditions with No Action

Without implementation of the proposed action, there would be no actions involving construction or modification of the levee reaches, floodwalls, floodgates, and pumping station fronting protection at the 12 LPV reaches included in the IER # 3 project area. However, maintenance of the GNOHSDRRS to its authorized heights would continue to occur, and effects on the EFH in the project area would not differ substantially from those discussed under the 1974 EIS for the LPV hurricane protection system and its supplemental documents.

LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5

Future Conditions with Proposed Action

Direct Impacts

The direct impacts on EFH from the proposed action at levee reaches 1 through 5 would be essentially the same as described above for fisheries. Limited areas of existing EFH would be impacted temporarily (approximately 116 acres) for dredged access channels and smaller areas (approximately 22 acres) would be permanently lost from the placement of foreshore protection. Existing EFH that would be destroyed under the proposed action would be replaced by a rocky

foreshore that would be suitable for colonization by periphyton and sessile organisms. The crevices in the riprap would provide protective cover for various species of shellfish and small finfish. Thus, the proposed action would create a new habitat that is uncommon in Lake Pontchartrain and potentially more productive than the very common mud bottoms.

Indirect Impacts

The indirect impacts on EFH from the proposed action at levee reaches 1 through 5 would be essentially the same as described above for fisheries.

Cumulative Impacts

The cumulative impacts on EFH from the proposed action at levee reaches 1 through 5 would be essentially the same as described above for fisheries.

Future Conditions with Alternative 1 – Levee Modification (16.5 ft) with Rock Breakwater (10 ft) and Rock Foreshore Protection

Direct, Indirect, and Cumulative Impacts

All impacts for this alternative for the levee reaches would be very similar to those for the proposed action.

LPV 09 – 12, Pumping Stations # 1 (Bonnabel), # 2 (Suburban), # 3 (Elmwood), and # 4 (Duncan) and associated Fronting Protection, Breakwaters, and Floodwall Tie-ins

Future Conditions with Proposed Action

Direct, Indirect, and Cumulative Impacts

Impacts on EFH from this proposed action would be essentially the same as those described above for fisheries. As addressed for the levee reaches, approximately 116 acres of existing EFH mud bottoms and additional water column would be impacted temporarily for access channels. Approximately 4.4 acres would be permanently lost from construction of the breakwaters and fronting protection for the pumping stations. Most (3.2 acres) of the existing EFH that would be destroyed under the proposed action would be replaced by a rock breakwater that would be suitable for colonization by periphyton and sessile organisms. The new habitat would provide protective cover for various species of shellfish and finfish. Thus, the proposed action would create a new habitat that is uncommon in Lake Pontchartrain and potentially more productive than the very common mud bottoms. The 1.2 acres of EFH that would be destroyed for the fronting protection structures would be mitigated for through implementation of a mitigation plan coordinated with NMFS. Consultation with NMFS is discussed in section 6.2, Agency Coordination, and mitigation measures are discussed in section 7.0, Mitigation.

LPV 16 – Floodwall and Gate at Bonnabel Boat Launch, and LPV 18 – Floodwall and Gate at Williams Blvd Boat Launch

Future Conditions with Proposed Action

Direct, Indirect, and Cumulative Impacts

Impacts to the EFH of the lake from this action would be similar to those for fisheries. No permanent loss of existing EFH would be expected. Most impacts would result from construction activities and would be temporary.

LPV17 – Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

Future Conditions with Proposed Action

Direct, Indirect, and Cumulative Impacts

Impacts to the EFH of the lake from this action would be similar to those for fisheries. No permanent loss of existing EFH would be expected. Most impacts would result from construction activities and would be temporary.

Future Conditions with Alternative 1 – Construction of a Breakwater with Floodwall Modifications or Using a New Perimeter Wall

Direct, Indirect, and Cumulative Impacts

The direct, indirect, and cumulative impacts to EFH from this alternative would be similar to those described for fisheries, would be mostly temporary during the construction period, and would be minor.

3.2.5 Wildlife

Existing Conditions

The diversity and abundance of wildlife inhabiting the project area are dependent on the quality and extent of suitable habitat present. Construction-related activities for the alternatives considered would occur at the current locations of the levees and other components of the protection system within IER # 3, and along the shoreline and inshore area of the lake (on the flood-side of the current levees). The terrestrial wildlife habitats potentially affected would occur principally along the shoreline of the lake and on the levees and their associated ROW on both the protected-side and flood-side.

Terrestrial wildlife habitat in the project corridor along Lake Pontchartrain consists principally of open expanses of turf grass lawn that extend from the lakeshore to the levee, over the levee, and south to the developed residential areas that adjoin the levee ROW on the protected side. The grass in these areas is kept short by regular mowing in conjunction with the maintenance of the

levees and ROW. A few trees and shrubs have been planted as landscape specimens in some areas of IER # 3; however, this habitat provides minimal cover or other habitat components to support wildlife. The wildlife most likely to occur here are birds that commonly forage on lawns and other open grassy areas, including the northern mockingbird (*Mimus polyglottos*), American robin (*Turdus migratorius*), common grackle (*Quiscalus quiscula*), boat-tailed grackle (*Quiscalus major*), and American crow (*Corvus brachyrhynchos*). Some of these birds could potentially nest in the few trees and shrubs present in this habitat.

The shoreline habitat in IER # 3 occurs in a narrow zone between the mowed grass areas and the water. The shoreline is covered almost continuously by riprap, consisting of large rocks and broken pieces of concrete piled to approximately 5 ft high along the waterline. The riprap provides minimal habitat for wildlife and is likely to be utilized mainly as a resting and foraging area for wading birds. The vegetation community within the shoreline habitat consists principally of a narrow zone of marsh grasses, such as salt grass (*Distichlis spicata*) and bulrush (*Scirpus* spp.), that grow along or among the riprap in some segments of the shoreline. Isolated, larger areas of marsh habitat occur in two wetlands along the IER # 3 shoreline (see figure 9).

The wildlife utilizing the narrow zone of shoreline and wetland areas in the IER # 3 project area as habitat include birds, small mammals, reptiles and amphibians. Birds that could occur in the shoreline and wetland habitats of the IER # 3 project area include both nonmigratory residents of the region and migratory species that are present only part of the year. Nonmigratory species that could use these habitats include the anhinga (*Anhinga anhinga*), double-crested cormorant (*Phalacrocorax auritus*), laughing gull (*Larus atricilla*), Forster's tern (*Sterna forsteri*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), tricolored heron (*Egretta tricolor*), snowy egret (*Egretta thula*), black-crowned night heron (*Nycticorax nycticorax*), green heron (*Butorides virescens*), white ibis (*Eudocimus albus*), fish crow (*Corvus ossifragus*), killdeer (*Charadrius vociferus*), mallard (*Anas platyrhynchos*), and red-winged blackbird (*Agelaius phoeniceus*). Migrant birds that occur in the area only during the spring/summer breeding season include the purple martin (*Progne subis*) and barn swallow (*Hirundo rustica*). Migrant birds that could occur in the area only during winter include the ring-billed gull (*Larus delawarensis*), American white pelican (*Pelecanus erythrorhynchos*), canvasback (*Aythya valisineria*), ruddy duck (*Oxyura jamaicensis*), lesser scaup (*Aythya affinis*), blue-winged teal (*Anas discors*), redhead (*Aythya americana*), and song sparrow (*Melospiza melodia*) (Dunn and Alderfer 2006). Wildlife that forage in the inshore habitat within the lake include the pelicans, gulls, ducks, and other waterbirds described above, and could include rare species such as the manatee and sea turtles, which are discussed in section 3.2.6.

The two wetland areas within IER # 3 potentially could provide habitat for a greater diversity of taxa than the open shoreline. Species that inhabit terrestrial and brackish aquatic habitats that could occur in these wetland areas include the Gulf coast toad (*Bufo valliceps*), Mississippi diamondback terrapin (*Malaclemys terrapin pileata*), common snapping turtle (*Chelydra serpentina*), green anole (*Anolis carolinensis*), Gulf salt marsh snake (*Nerodia clarkii clarkii*), marsh brown snake (*Storeria dekayi limnetes*), and rough green snake (*Opheodrys aestivus*) (Conant and Collins 1998, Moore 1992), muskrat (*Ondatra zibethicus*), nutria (*Myocastor coypus*), swamp rabbit (*Sylvilagus aquaticus*), marsh rice rat (*Oryzomys palustris*), cotton mouse (*Peromyscus gossypinus*), and raccoon (Whitaker 1998, Moore 1992).

Discussion of Impacts

Future Conditions with No Action

Without implementation of the proposed action, there would be no actions involving construction or modification of the levee reaches, floodwalls, floodgates, and pumping station fronting protection at the 12 LPV reaches included in the IER # 3 project area. However, maintenance of the GNOHSDRRS to its authorized heights would continue to occur and effects on the wildlife in the project area would not differ substantially from those discussed under the 1974 EIS for the LPV hurricane protection system and its supplemental documents.

LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5

Future Conditions with Proposed Action

For the levee reaches, the proposed action is to increase the levee height by 1 foot, widen the levee crown by 3 ft, while widening the levee footprint accordingly in a straddle configuration, and add rock foreshore protection along the shoreline at 150 ft or more from the levee centerline. Construction could last for approximately 1.5 to 2.5 years.

Direct Impacts

The increase in the height and width of the levees under the proposed action for lakefront levee reaches LPV 00, 01, 02, 19, and 20 would not result in the loss of quality wildlife habitat because the footprint of the modified levee would remain within the existing levee ROW which is mowed grass lawn of limited habitat value for wildlife. In addition, after construction, the expanded levee would be seeded with turf grass and the existing habitat type would be restored. Therefore, the greatest potential for effects on terrestrial wildlife associated with the levee expansion component of the proposed action would occur during the construction period (approximately 1.5 to 2.5 years). The presence of construction-related activity, machinery, and noise would be expected to cause most wildlife to avoid the terrestrial habitat of the project area, as well as nearby shoreline habitats, during the construction period.

The addition of rock foreshore protection at least 150 ft to the flood-side of the existing levee centerline would entail the placement of rock along the shoreline where there currently is a cover of riprap. Thus, the narrow corridor of lake shoreline habitat, which already is dominated by riprap, would be impacted by the addition of rock to enhance the foreshore protection. The expanded footprint of the foreshore protection would impact approximately 22 acres of shallow water habitat adjacent to the shoreline. As discussed for existing conditions, the wildlife (other than fish) that utilize the shoreline and inshore aquatic habitat immediately adjacent to the shoreline principally are birds. Adverse effects on birds from construction of the rock foreshore protection under the proposed action would be limited by the large area of similar lake habitat within the shallow expanse of Lake Pontchartrain where birds avoiding the shoreline construction area could forage. Also, impacts to birds or other wildlife would be limited because the footprint of the foreshore protection would mainly coincide with the existing zone of riprap lining the shoreline.

Rock used in the construction of the foreshore protection along the five levee reaches would be shipped to the project area by barge on Lake Pontchartrain. Staging/stockpile areas on land and flotation channels along the lakefront would be utilized in delivery and storage of the rock. Potential rock staging/stockpile areas include open, grassy areas near the Williams Blvd boat launch, the Bonnabel boat launch, and the old Coast Guard Station off of Lakeshore Drive. Flotation channels dredged in to the pumping stations for breakwater construction could also be utilized for material delivery. As discussed previously, regarding levee construction, the greatest potential for effects on terrestrial wildlife associated with the stockpiling of rock would occur during the construction period (approximately 1.5 to 2.5 years). The presence of rock stockpiles and construction-related activity, machinery, and noise would cause wildlife to avoid the terrestrial habitat of the stockpile areas during construction. Similarly, dredging activities to provide barge access to the pumping stations, placement of rock for breakwaters, and associated noise likely would cause wildlife to temporarily avoid the aquatic habitat in the dredging and breakwater areas while these activities are occurring. Excavated sediment from the access channels would be stockpiled near the channels and used to backfill the channels after completion of the project. As a result, these areas could be re-colonized after construction by benthic invertebrates and fish that are prey for waterfowl and other birds. Effects on wildlife would be predominantly temporary, occurring during and immediately after the construction period.

In summary, impacts from construction of the proposed action for this reach on wildlife would be limited by the ability of the principal wildlife present (birds) to move to adjacent terrestrial habitats during construction, and the low quality of the terrestrial habitat that would be temporarily avoided during construction but utilized again after completion and re-vegetation. Other, less-mobile wildlife that may occur in the area (e.g., common species of mice, lizards, and toads) could become casualties of the construction. However, their current populations are likely to be small given the marginal habitat present, and these species would be free to recolonize the area after construction is complete. Direct adverse impacts on aquatic wildlife from the proposed action would be limited by the relatively small areas of shoreline and aquatic habitat that would be covered by the addition of rock foreshore protection and breakwaters, the temporary nature of the effects from dredging of access channels, the more diverse aquatic habitat that would be created within the rock riprap, and the mobility of these species, which would allow them to avoid these areas during construction.

Indirect Impacts

Potential indirect impacts on wildlife from the proposed action for lakefront levee reaches LPV 00, 01, 02, 19, and 20 mainly would involve the displacement of wildlife populations, predominantly birds, from the project area. Movement of the limited numbers of wildlife that currently inhabit this corridor into nearby, unimpacted habitats would not be expected to result in exceedances of the carrying capacity of the extensive, similar terrestrial and aquatic habitats in the vicinity. Thus, the potential indirect impacts on wildlife from the proposed action would be minimized by the small populations and habitat areas affected and the capacity of adjacent, extensive habitats to support the immigrants.

Cumulative Impacts

Potential cumulative impacts on wildlife from the proposed action for lakefront levee reaches LPV 00, 01, 02, 19, and 20 would mainly involve the combined effects on wildlife of habitat loss and displacement of wildlife populations from the multiple LPV flood control projects in the New Orleans area. The displacement of the majority of wildlife would be temporary during the construction period, and the displaced individuals likely would return following project completion. The terrestrial habitat that would be affected is not a high-quality or unique habitat, but a frequently mowed turf grass habitat similar to that which covers extensive areas in the New Orleans region, such as ROWs along levees and floodwalls, residential lawns, parks, and pastures. Maintenance of the GNOHSDRRS to its authorized heights would continue to occur and effects on the wildlife in the project area would not differ substantially from those discussed under the 1974 EIS for the LPV hurricane protection system and its supplemental documents.

The potentially impacted aquatic habitat is a relatively narrow corridor of inshore, brackish lake habitat where rock foreshore protection would be added along the shoreline in lakefront levee reaches LPV 00, 01, 02, 19, and 20 on the south shore of Lake Pontchartrain. This corridor occupies a very small area in the context of similar habitat within the expanse of the lake. If the area impacted by this foreshore protection were added to the areas of similar aquatic habitats potentially impacted by other LPV projects along Lake Pontchartrain, the loss of this type of wildlife habitat would be still be a fraction of the available habitat remaining around Lake Pontchartrain, which has over 640 mi^2 of available surface area.

Movement of the limited numbers of wildlife, principally birds, which currently inhabit these terrestrial and aquatic habitat areas into surrounding, unimpacted habitats would not be expected to result in exceedances of the carrying capacity of the extensive, adjacent habitats. Thus, the potential cumulative impacts on wildlife from the proposed action for lakefront levee reaches LPV 00, 01, 02, 19, and 20 in conjunction with other flood control projects in the region would be limited given the relatively small populations and habitat areas affected and the capacity of the extensive habitats remaining in the region.

Future Conditions with Alternative 1 – Levee Modification (16.5 ft) with Rock Breakwater (10 ft) and Rock Foreshore Protection

Direct Impacts

The direct adverse effects on wildlife from alternative 1 for lakefront levee reaches LPV 00, 01, 02, 19, and 20 would be essentially the same as those described for the proposed action. Although the levee would not be increased in height, it would be widened, resulting in construction-related impacts the same as those under the proposed action. The main difference between this alternative and the proposed action would involve the loss of terrestrial mowed-grass habitat as a result of the addition of a rock breakwater between the shoreline and the levee. This would result in the piling of rock into a breakwater approximately 6 ft higher than the surrounding land surface, approximately 50 ft wide, and running parallel to the levee and shoreline. As discussed for the proposed action, the existing habitat in the area where the breakwater would be built is covered by mowed grass of limited habitat value for wildlife. After

construction, the expanded levee would be re-vegetated with turf grass and the existing habitat type restored, but the strip of turf grass habitat within the footprint of the breakwater would be permanently converted to rock. The loss of this area as grassy habitat would be lessened by the low-quality terrestrial habitat that it provides, the amount of similar habitat in the project area, and the potential of this piled rock to become habitat for small mammals, reptiles, and birds.

Indirect Impacts

Potential indirect impacts on wildlife from alternative 1 for lakefront levee reaches LPV 00, 01, 02, 19, and 20 would be essentially the same as those described previously for the proposed action.

Cumulative Impacts

Potential cumulative impacts on wildlife from alternative 1 for lakefront levee reaches LPV 00, 01, 02, 19, and 20 would be essentially the same as those described previously for the proposed action.

LPV 09 – 12, Pumping Stations # 1 (Bonnabel), # 2 (Suburban), # 3 (Elmwood), and # 4 (Duncan) and associated Fronting Protection, Breakwaters, and Floodwall Tie-ins

Future Conditions with Proposed Action

Direct, Indirect, and Cumulative Impacts

The proposed action involving pumping stations # 1, # 2, # 3, and # 4 would occur at the locations of the existing facilities within the discharge channel at each station. These facilities are developed areas that provide negligible habitat for wildlife. The terrestrial areas surrounding the facilities currently are covered by lawn habitat of limited value for wildlife, and few birds or other wildlife are likely to forage in these relatively small, developed areas.

Inshore aquatic habitat also would be affected by the construction of the proposed action at all four of the pumping stations. Footprints of the new breakwaters on the lake bottom would be approximately 1.5 acres at pumping station # 1 and approximately 0.6 acre at pumping station # 4. The demolition and replacement of the operations and maintenance bridge across Duncan Canal, 450 ft to the north of the current bridge, would occur along the ROW of the pumping station and existing flood protection system. The new bridge would have a footprint similar to the existing bridge and would be constructed in an area that consists primarily of armored shoreline and turf grass.

The additional footprints of the modified breakwaters on the lake bottom would be approximately 0.5 acre at pumping station # 2 (LPV 10) and approximately 0.6 acre at pumping station # 3 (LPV 11). The footprint of the fronting protection associated with each pumping station would impact approximately 1.2 acres, for a total of 4.4 acres of lake bottom impacted from fronting protection and breakwater construction/modification.

Impacts from dredging the four flotation channels for breakwater construction were discussed for the levee reaches.

The presence of construction-related activity, machinery, and noise would be expected to cause most wildlife to avoid the terrestrial, shoreline, and inshore habitats of the project area during the construction period. After construction, the existing habitat types would be restored except where permanent features such as breakwaters would be constructed, and wildlife could return to the area. Only small numbers of wildlife would be temporarily displaced. The incremental contribution of this action to cumulative adverse impacts in conjunction with other projects in the region would be limited by the existing wildlife habitat, project scope and impact, and by proposed wetland restoration projects that would benefit wildlife habitat in the region.

LPV 16 – Floodwall and Gate at Bonnabel Boat Launch, and LPV 18 – Floodwall and Gate at Williams Blvd Boat Launch

Future Conditions with Proposed Action

Direct, Indirect, and Cumulative Impacts

The proposed action involving the demolition and replacement of the floodwalls and gates at the Bonnabel and Williams Blvd boat launches would occur at the locations of the existing structures within developed, high-traffic areas that provide negligible habitat for wildlife. The areas surrounding these facilities currently are covered by mowed grass habitat of limited value for wildlife, and few birds or other wildlife are likely to forage in these relatively small, developed areas. The presence of construction-related activity, machinery, and noise would be expected to cause most wildlife to avoid the terrestrial habitat of the project area during the construction period. After construction, the expanded levee would be vegetated with turf grass, and the existing habitat type would be restored. Only, small numbers of wildlife would be temporarily displaced for the duration of this project. Incremental adverse impacts of this action to wildlife in conjunction with other projects in the region would be tempered by wetland restoration projects in the vicinity that would provide a beneficial impact to wildlife.

LPV 17 – Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

Future Conditions with Proposed Action

Direct, Indirect, and Cumulative Impacts

The proposed action at the Causeway bridge abutment would involve modifications to the existing levee and floodwall tie-ins within a developed, high-traffic area that provides negligible habitat for wildlife. The modifications would occur within the existing levee ROW, which is covered by mowed grass habitat of limited value for wildlife, and few birds or other wildlife are likely to forage in this relatively small, developed area. The presence of construction-related activity, machinery, and noise would be expected to cause wildlife to avoid the terrestrial habitat of the project area, as well as nearby shoreline habitats, during the construction period. After construction, the expanded levee would be vegetated with turf grass, and the existing habitat type

would be restored. Small numbers of wildlife would be temporarily displaced during the duration of construction. Incremental adverse impacts of this action to wildlife in conjunction with other actions in the region would be tempered by wetland restoration projects in the vicinity that would provide a beneficial impact to wildlife.

Future Conditions with Alternative 1 – Construction of a Breakwater with Floodwall Modifications or Using a New Perimeter Wall

Direct, Indirect, and Cumulative Impacts

The construction of a breakwater under this alternative would result in effects on aquatic wildlife habitat within the lake essentially the same as those described above for fisheries and EFH and, similarly, the impacts on wildlife would be minimal. Other modifications under this alternative would occur in the terrestrial environment of the bridge abutment within an existing developed area of minimal wildlife habitat, and the impacts on terrestrial wildlife from this alternative would be negligible.

3.2.6 Endangered or Threatened Species

Existing Conditions

In accordance with the consultation provisions of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 USC 1531 et seq.), the CEMVN submitted a letter on 10 July 2007, to the U.S. Fish and Wildlife Service (USFWS) office in Lafayette, Louisiana, requesting information on protected, proposed, and candidate species and critical habitat that could occur in the vicinity of the proposed IER # 3 project (USACE 2007b). In response and in accordance with the provisions of the ESA and the Migratory Bird Treaty Act of 1918 (40 Stat. 755, as amended; 16 USC 703 et seq.), the USFWS responded in a letter on 6 August 2007 (USFWS 2007a), and in a followup letter on 22 February 2008 (USFWS 2008) identifying two Federally listed species that potentially could occur in the project area: the endangered West Indian manatee (*Trichechus manatus*) and the threatened Gulf sturgeon (*Acipenser oxyrhynchus desotoi*).

CEMVN also submitted a letter on 10 July 2007, to the NMFS representative in St. Petersburg, FLorida, requesting information on Federally protected species under NMFS jurisdiction that could occur in the vicinity of the proposed project (USACE 2007c). NMFS responded in a letter dated 26 July 2007 (NMFS 2007), which provided a table of the Federally listed endangered and threatened species under NMFS jurisdiction for the state of Louisiana. These species included the Gulf sturgeon and sea turtles (as well as whales that would not be expected to occur in Lake Pontchartrain). Subsequently, NMFS identified the federally listed endangered and threatened species under NMFS jurisdiction that potentially could occur in Lake Pontchartrain as the threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*), the endangered Kemp's ridley sea turtle (*Lepidochelys kempii*), the threatened loggerhead sea turtle (*Caretta caretta*), and the threatened green sea turtle (*Chelonia mydas*). Because the Gulf sturgeon and these sea turtles occur in Lake Pontchartrain, there is a potential that they could occur in the inshore area of the lake along the IER # 3 project area on the south shore.

Two other wildlife species that are Federally listed as endangered or threatened in Louisiana have been reported as occurring in Jefferson Parish by the Louisiana Department of Wildlife and Fisheries (LDWF) and the Louisiana Natural Heritage Program (LNHP): the endangered brown pelican (*Pelecanus occidentalis*) and the threatened piping plover (*Charadrius melodus*). The brown pelican forages for fish in Lake Pontchartrain, including the inshore waters along the south shore, but there is no suitable nesting habitat for the brown pelican in the vicinity of the project area. Habitats used by the piping plover in Jefferson Parish, including designated critical habitat, are on islands and shoreline in the Gulf of Mexico at the south end of the parish, approximately 60 miles south of the project area (USFWS 2001a). Such habitats are not present in the project area or its vicinity on Lake Pontchartrain, and the piping plover would not be expected to occur in the project area. Accordingly, the plover is not evaluated further.

Brown Pelican

The brown pelican, Federally and state-listed as endangered in Louisiana, is a large, gray-brown to silver-brown waterbird with a white head and a long, flat bill with a large throat pouch that can be distended when feeding. During the breeding season, the nape and hind neck are cinnamon-brown in color. Adults can weigh up to 8 pounds and have a wingspan of over 7 ft. Brown pelican populations throughout the United States seriously declined in the 1950s and 1960s as a result of the toxic effects of organochlorine pesticides such as dichloro-diphenyl-trichloroethane (DDT) and endrin. Populations along the Atlantic Coast and on the Gulf Coast in Florida and Alabama have recovered and the species has been delisted in these areas. The species remains listed as endangered in Louisiana, Texas, and the West Coast. Critical habitat has not been designated for the brown pelican (USFWS 2007b).

The brown pelican feeds mainly on fish captured by diving in bays, tidal estuaries, and along the coast. It typically uses sand spits or offshore sandbars as daily resting and nocturnal roosting areas. It nests in colonies on small coastal islands, typically among the dunes of barrier islands, locations that provide protection from mammalian predators such as raccoons and sufficient elevation to avoid flooding of nests. The nests could be on the ground or in shrub thickets, such as mangroves (LDWF 2005a). Major colonies nest in St. Bernard Parish on islands of the Breton National Wildlife Refuge, such as North Island and East Breton Island (USFWS 2007c), which are located more than 75 miles east and southeast of the IER # 3 area. However, there is no suitable nesting habitat for the brown pelican at or in the vicinity of the IER # 3 project area.

The brown pelican forages in Lake Pontchartrain, including the inshore waters along IER # 3. However, there is extensive open water in the vicinity that is at least as conducive to fishing as these waters near shore. Thus, brown pelicans in the Lake Pontchartrain area are not dependent on the inshore waters of the IER # 3 project area for foraging, though they could forage regularly in this area.

West Indian Manatee

The West Indian manatee is Federally and state-listed as endangered and also is protected under the Marine Mammal Protection Act of 1972, under which it is considered depleted (USFWS 2001b). Critical habitat for the manatee has been designated in Florida, but not in Louisiana

(USFWS 1977). The manatee is a large gray or brown aquatic mammal that could reach a length of 13 ft and a weight of over 2,200 pounds. It occurs in both freshwater and saltwater habitats within tropical and subtropical regions and includes two subspecies, the Florida manatee (*T. manatus latirostris*) and the Antillean manatee (*T. manatus manatus*). The primary human-related threats to the manatee include watercraft-related strikes (impacts and/or propeller strikes), crushing and/or entrapment in water control structures (flood gates, navigation locks), and entanglement in fishing gear (discarded fishing line, crab traps) (USFWS 2007d).

The Florida manatee can occur throughout the coastal regions of the southeastern United States and could disperse greater distances during warmer months; it has been sighted as far north as Massachusetts and as far west as Texas. However, the manatee is a subtropical species with little tolerance for cold, and it returns to and remains in the vicinity of warm-water sites in peninsular Florida during the winter (USFWS 2007d, USFWS 2007e). Thus, the manatee is not a year-round resident in Louisiana, but it could migrate there during warmer months. Manatees prefer access to natural springs or man-made warm water and waters with dense beds of submerged aquatic or floating vegetation. Manatees prefer to forage in shallow grass beds that are adjacent to deeper channels. They seek out quiet areas in canals, creeks, lagoons, or rivers, using deeper channels as migratory routes (USFWS 1999).

There have been 110 reported sightings of manatees in Louisiana since 1975 (LDWF 2005b). Sightings in Louisiana, which have been uncommon and sporadic, have included occurrences in Lake Pontchartrain and vicinity. Between 1997 and 2000, there were approximately 16 sightings in the Lake Pontchartrain area and a general increase in the number of manatees per sighting (Abadie et al. 2000). Sightings of the manatee in the Lake Pontchartrain Basin have increased in recent years, and in late July 2005, 20 to 30 manatees were observed in the lake from the air (Powell and Taylor 2005). Substantial food sources (submerged or floating aquatic vegetation) have not been observed within the project area, and occurrence of the manatee has not been recorded in Jefferson Parish. Given the extensive areas of relatively undisturbed wetlands in the region and the paucity of food sources in the IER # 3 project area, it is considered unlikely for the manatee to frequent and utilize, as habitat, the inshore waters of Lake Pontchartrain along the project area, though manatees could pass through this area while transiting the lake.

Gulf Sturgeon

The Gulf sturgeon is Federally-listed as threatened throughout its range and is state-listed as threatened in Louisiana. The Gulf sturgeon supported an important commercial fishing industry during the late 19th and early 20th centuries. A minor commercial fishery was reported to exist for Gulf sturgeon in Lake Pontchartrain and its tributaries during the late 1960s (USFWS and NMFS 2003). Throughout most of the 20th century, Gulf sturgeon suffered population declines due to overfishing, habitat loss, water quality deterioration, and barriers to historic migration routes and spawning areas (dams). In 1991, the Gulf sturgeon was listed as a threatened species under the ESA. The present range of the species extends from Lake Pontchartrain and the Pearl River system in Louisiana and Mississippi east to the Suwannee River in Florida (USFWS and NMFS 2003).

The Gulf sturgeon is characterized by a sub-cylindrical body imbedded with bony plates and an extended snout. It is an anadromous fish that migrates from salt water into large coastal rivers to spawn and spend the warm summer months. Subadults and adults typically spend the three to four coolest months of the year in estuaries or gulf waters foraging before migrating into the rivers. This migration typically occurs from mid-February through April. Most adults arrive in the rivers when temperatures reach 21 Celsius (°C) and will spend eight to nine months each year in the rivers before returning to estuaries or the Gulf of Mexico by the beginning of October. Thus, the Gulf sturgeon spends the majority of its life in fresh water (USFWS and Gulf States Marine Fisheries Commission [GSMFC] 1995).

Subadult and adult Gulf sturgeon do not feed significantly in freshwater; instead, they rely almost entirely on estuarine and marine areas for feeding. Young-of-the-year and juveniles feed mostly in the riverine environment (USFWS and NMFS 2003). The diet of the Gulf sturgeon consists predominantly of invertebrates. The types and sizes of invertebrates consumed varies according to life history stage and annual migration. Soft-bodied prey appear to be preferred over armored or spiny organisms. Juveniles consume amphipods, isopods, annelid worms, chironomid larvae and other aquatic insects, small bivalves, and small shrimp. Subadults also consume ghost or mud shrimp. Adults in estuaries and coastal waters consume mainly amphipods, isopods, gastropods, brachiopods, polychaete worms, lancelets, and shrimp. Detritus is consumed incidentally while foraging in sediment, while bony fish are seldom eaten (USACE 2006a).

Critical habitat identifies specific areas that are essential to the conservation of a listed species. Various activities in or adjacent to each of the critical habitat units could affect certain physical and biological features necessary to the preservation of the species and, therefore, could require special management considerations or protection. Critical habitat designated for the Gulf sturgeon in Louisiana includes the Lake Pontchartrain east of the Lake Pontchartrain Causeway, all of Little Lake, the Rigolets, Lake Catherine, Lake Borgne, and the Mississippi Sound.

Studies conducted by the LDWF have shown the presence of Gulf sturgeon in Lake Pontchartrain during the winter and during periods of migration to and from marine environments. Sturgeon migrations to rivers that enter Lake Pontchartrain follow routes through Lake Borgne and the Rigolets. Most records of Gulf sturgeon from Lake Pontchartrain have been located east of the Causeway, particularly on the eastern north shore. Gulf sturgeon have also been documented west of the Causeway, typically near the mouths of small rivers on the north shore. However, critical habitat was not designated for the western half of the lake because the sturgeon there were believed to have come from western tributaries and not the Pearl River (USFWS and NMFS 2003). In addition, observations of Gulf sturgeon in marine and estuarine habitats have been associated with sand and mud bottoms (USFWS and GSMFC 1995), and sediment data from Lake Pontchartrain indicate that sediments from the eastern half of the lake have a greater sand content than those from the western half (Barrett 1976, as cited in USFWS and NMFS 2003). Therefore, only the half of Lake Pontchartrain east of the Causeway was designated as critical habitat for the Gulf sturgeon.

The east end of the project area, from the causeway to the boundary between Jefferson and Orleans Parishes, a distance of approximately 9,300 ft, is adjacent to critical habitat. Thus,

slightly less than 2 miles of the 9.5-mile length of the project area adjoins designated critical habitat for the Gulf sturgeon in Lake Pontchartrain. Gulf sturgeon may pass through or forage in the inshore waters along the project area, principally during the three to four coolest, winter months and periods of migration between marine environments (Lake Borgne and the Mississippi Sound) and rivers that drain into Lake Pontchartrain. However, since Gulf sturgeon prefer to forage over sandy substrates (Harris 2003), and the substrate of the portion of Lake Pontchartrain that lies within the IER # 3 project area is characterized by high concentrations of silts and mud and is typically comprised of less than 10% sand (USGS 2002), it is not expected that the substrates in the project area would constitute preferred foraging habitat for Gulf sturgeon. In addition, the area along the south shore of the lake is unlikely to be used as a migratory route by Gulf sturgeon since the rivers they are migrating to are on the north shore of Lake Ponchartrain,. Gulf sturgeon would be much less likely to occur in the project area during the five warmest months of the year (May through September). Thus, although the Gulf sturgeon could potentially forage in the relatively narrow area of shallow, inshore habitat along the project area in winter, they would not be expected to utilize this area as an important migratory route to the rivers on the north shore.

Kemp's Ridley, Loggerhead, and Green Sea Turtles

Sea turtles are air-breathing reptiles with large flippers and streamlined bodies. They inhabit tropical and subtropical marine and estuarine waters around the world. Of the seven species in the world, six occur in waters of the U.S., and all are listed as threatened or endangered. The three species identified by NMFS as potentially occurring in Lake Pontchartrain in the vicinity of the project area have a similar appearance, though they differ in maximum size and coloration. The Kemp's ridley is the smallest sea turtle – adults average about 100 pounds with a carapace length of 24 to 28 inches and a shell color that varies from gray in young individuals to olive green in adults. The loggerhead is the next largest of these three species – adults average about 250 pounds with a carapace length of 36 inches and a reddish brown shell color. The green is the largest of these three species – adults average 300 to 350 pounds with a length of more than 3 feet and brown coloration (its name comes from its greenish colored fat). The Kemp's ridley has a carnivorous diet that includes fish, jellyfish, and mollusks. The loggerhead has an omnivorous diet that includes fish, jellyfish, mollusks, crustaceans, and aquatic plants. The green has a herbivorous diet of aquatic plants, mainly seagrasses and algae, which is unique among sea turtles. All three species nest on sandy beaches, which are not present near Lake Pontchartrain. The life stages that may occur in Lake Pontchartrain range from older juveniles to adults (NMFS 2008b).

Discussion of Impacts

Future Conditions with No Action

Without implementation of the proposed action, there would be no actions involving construction or modification of the levee reaches, floodwalls, floodgates, and pumping station fronting protection at the 12 LPV reaches included in the IER # 3 project area. However, maintenance of the GNOHSDRRS to its authorized heights would continue to occur and effects on threatened or endangered species in the project area would not differ substantially from those

discussed under the 1974 EIS for the LPV hurricane protection system and its supplemental documents.

LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5

Future Conditions with Proposed Action

For the levee reaches, the proposed action is to increase the levee height by 1 foot, widen the levee crown by 3 ft, while widening the levee footprint accordingly in a straddle configuration, and add rock foreshore protection at 150 ft or more from the levee centerline along a portion of the shoreline west of the Causeway. Construction could last for approximately 1.5 to 2.5 years.

Direct Impacts

Rock foreshore protection would be placed along the shoreline west of the Lake Pontchartrain Causeway where there currently is a cover of riprap, which may result in the foreshore protection expanding out into the lake up to 25 ft from the existing shoreline. Thus, a narrow corridor of shoreline habitat west of the Causeway, in waters less than 2 ft deep and totaling about 22 acres, would be impacted by the addition of foreshore protection.

The presence of construction-related activity, machinery, and noise would be expected to cause the brown pelican, manatee, Gulf sturgeon, and Kemp's ridley, loggerhead, and green sea turtles to avoid the shoreline habitats in the project area during the construction period. In addition, due to the shallowness of the water where the foreshore protection will be placed (less than 2 ft deep), neither manatees, Gulf sturgeon, nor sea turtles are anticipated to utilize these areas. Within the portion of the project area that adjoins the critical habitat for the Gulf sturgeon, additional rock foreshore protection would not be added to the existing riprap, so there would be no permanent loss of lake bottom habitat associated with levee construction in this critical habitat area. Brown pelicans forage for fish in the waters along the project area throughout the year. However, extensive, similar aquatic and benthic habitat exists where the brown pelican, manatee, Gulf sturgeon, and sea turtles could forage or swim during and after construction within the expanse of Lake Pontchartrain.

Rock and fill required for the levee improvements would be brought to three land-based staging/stockpile areas by truck or by barge utilizing flotation channels. Potential staging/stockpile areas could include the boat ramp at Williams Blvd, the Bonnabel boat launch, or the old Coast Guard Station off of Lakeshore Drive. Flotation channels for breakwater construction could also be utilized for material delivery and would be created via bucket dredge to provide barge access to the pumping stations from deeper water. The dimensions required for a tug boat and barge to access the shoreline would be approximately 10 ft deep and 130 ft wide with one to three slopes for a total width of 160 ft. Access channels would be dredged perpendicular to the shoreline and would be dredged from a distance of approximately 2,400 ft from the shore. Sediment excavated from these channels would be temporarily stockpiled adjacent to the channels. Each dredged channel and its associated sediment stockpile site would encompass approximately 29 acres for a total of 116 acres for the four access channels. The access channels would be backfilled using the dredged material stockpiled adjacent to the

channels, and these would be brought to pre-construction lake bottom elevations upon project completion.

Brown pelicans forage for fish in the waters along the project area throughout the year. However, the ability of the pelican to avoid the area during construction and the presence of extensive habitat for foraging in other parts of Lake Pontchartrain minimize the possibility of adverse impacts on this species. Thus, the potential short-term or long-term direct effects on the brown pelican resulting from the proposed action within the IER # 3 project area would be negligible.

Manatees prefer to forage in shallow grass beds in quiet areas of canals, creeks, lagoons, or rivers, using deeper channels as migratory routes (USFWS 1999). Substantial food sources (submerged or floating aquatic vegetation) have not been observed in the vicinity of the project area in the open waters of Lake Pontchartrain, and occurrence of the manatee has not been recorded in Jefferson Parish. Given the extensive areas of relatively undisturbed wetlands in the region and the lack of food sources in the IER # 3 project area, it is unlikely that the manatee would occur in the inshore waters along the project area other than sporadically while transiting the lake.

In order to minimize the potential for construction activities under the proposed action to cause adverse impacts to manatees during the construction period (approximately 2 to 2.5 years), and in accordance with recommendations from the USFWS in their consultation letter of 22 February 2008 regarding IER # 3, the following standard manatee protection measures would be implemented:

All contract personnel associated with the project would be informed of the potential presence of manatees and the need to avoid collisions with manatees. All construction personnel would be responsible for observing water-related activities for the presence of manatees. Temporary signs would 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., the work area), and at least one sign would be placed where it is visible to the vessel operator. Siltation barriers, if used, would be made of material in which manatees could not become entangled and would be properly secured and monitored. If a manatee is sighted within 100 yards of the active work zone, special operating conditions would be implemented, including: moving equipment would not operate within 50 feet of a manatee; all vessels would operate at no wake/idle speeds within 100 yards of the work area; and siltation barriers, if used, would be re-secured and monitored. Once the manatee has left the 100-yard buffer zone around the work area of its own accord, special operating conditions would no longer be necessary, but careful observations would be resumed. Any manatee sighting would 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). These procedures have been recommended by the USFWS (2007c) and adopted by the USACE (2005) for use in situations where in-water construction activities potentially could occur when manatees may be present.

These procedures have been adopted by the USACE (2005) for use in situations where in-water construction activities potentially could occur when manatees may be present. Assuming these procedures for preventing disturbance or injury to manatees are employed, the potential for short-term or long-term direct effects during the period of construction of the proposed action at LPV 00, 01, 02, 19, and 20 (lakefront levee reaches 1 through 5) would be minimal and unlikely to adversely affect the manatee.

As described under existing conditions, Gulf sturgeon potentially could forage in the waters adjacent to the IER # 3 project area principally during the three to four coolest, winter months and periods of migration between marine environments (Lake Borgne and the Mississippi Sound) and rivers that drain into Lake Pontchartrain. The proposed action would temporarily decrease the prey available to the Gulf sturgeon in the areas that are being dredged for the project's access and flotation channels, as well as the adjacent areas used as temporary stockpile sites for the dredged material. However, since Gulf sturgeon prefer to forage over sandy substrates (Harris 2003), and the substrate of the portion of Lake Pontchartrain that lies within the IER # 3 project area is characterized by high concentrations of silts and mud and typically contains less than 10% sand (USGS 2002), it is not expected that the substrates in the project area would constitute preferred foraging habitat for Gulf sturgeon. In addition, the sediments stockpiled during the dredging of the access channels would be returned to their original location and used to fill the channels upon project completion, thereby allowing for any benthic prey species utilized by Gulf sturgeon to quickly re-colonize these areas. Dredging activities would result in localized and temporary increases in turbidity. However, these effects would be reduced by the use of silt curtains and by the movement of the tides. Any Gulf sturgeon in the area would be able to relocate during construction since the project area encompasses only a small segment of the shoreline of the over 403,000-acre lake. There would be no changes in the temperature, salinity, pH, hardness, oxygen content, or other chemical characteristics of the waters of Lake Pontchartrain as a result of the proposed action. The type of sediment presently occurring in the project area would not change with the depth of the material being removed; thus, the removal of sediments from the dredged channels would not alter the existing texture and other chemical characteristics of the sediment supportive of Gulf sturgeon and their prey. The proposed action would not hinder the migratory movements of Gulf sturgeon between their riverine, estuarine, and marine habitats since the rivers they are migrating to are on the opposite side of Lake Pontchartrain from the proposed action.

In an effort to avoid direct impacts on individual Gulf sturgeon in the critical habitat during the winter months, the CEMVN would adhere to a dredging window for the project on the eastern side of the causeway that would allow construction in the project area to occur during the months of May through September. The bucket drop procedure developed by the USFWS also would be employed to encourage any Gulf sturgeon in the vicinity to leave the project area. Due to the location of the project area, depths in the project area, the type of substrate in the project area, the use of silt curtains and dredging windows, and the ability of the benthic organisms on which the sturgeon feeds to rapidly re-colonize disturbed areas, the CEMVN believes that the proposed action is not likely to adversely affect the Gulf sturgeon or its critical habitat.

Sea turtles potentially could forage in the waters of Lake Pontchartrain along the IER # 3 project area, principally during the warmer months. Due to their mobility, sea turtles could avoid

equipment and noise in the project area during the construction period. The bottom substrate does not support submerged aquatic vegetation, and it is unlikely to provide substantial invertebrate populations that would attract sea turtles to the area. In addition, the adjacent areas of the lake provide extensive, alternative areas for sea turtle foraging and refuge.

In summary, the potential for direct, adverse impacts on threatened or endangered species (brown pelican; manatee; Gulf sturgeon; and Kemp's ridley, loggerhead, and green sea turtles) from the proposed action at the LPV 00, 01, 02, 19, and 20 levee reaches would be influenced by the following factors: the mobility of these species; their minimal dependence on the project area for habitat; their ability to avoid the project area during construction; the temporary nature of many of the effects of construction activity and dredging on this limited area of inshore habitat; the use of procedures to avoid manatee injury, and the extensive, adjacent habitat available for use. As a result, direct effects from the proposed action on threatened or endangered species would be unlikely to adversely affect these species or Gulf sturgeon critical habitat.

Indirect Impacts

Indirect impacts on endangered or threatened species are effects that could occur later in time than direct impacts but still are reasonably certain to occur (NMFS 2006). Potential indirect impacts on endangered or threatened species from the proposed action for lakefront levee reaches LPV 00, 01, 02, 19, and 20 would mainly consist of effects from siltation and suspended sediment in adjacent areas of the lake. Effects such as these from levee construction and foreshore protection placement would be minimized by best management practices to control sediment transport, adherence to regulations governing stormwater runoff at construction sites, and by the movement of the tides. Thus, indirect impacts on endangered or threatened species from the proposed action in the IER # 3 project area at the LPV 00, 01, 02, 19, and 20 levee reaches would be unlikely to adversely affect these species.

Cumulative Impacts

Potential cumulative impacts on endangered or threatened species from the proposed action for lakefront levee reaches LPV 00, 01, 02, 19, and 20 mainly would involve the combined adverse effects on the brown pelican, manatee, Gulf sturgeon, and sea turtles from the multiple LPV flood control projects in the New Orleans area. These species are mobile and could avoid project areas during the construction period, and the displaced individuals could return to the temporarily impacted areas following project completion. The permanently impacted aquatic habitat is a relatively small corridor of inshore, brackish lake habitat where rock foreshore protection would be added along the shoreline in lakefront levee reaches LPV 00, 01, 02, and part of 19 on the south shore of Lake Pontchartrain. Neither manatees nor Gulf sturgeon are anticipated to utilize the shallow water areas where the foreshore protection will be placed, and extensive, similar aquatic and benthic habitat exists where the brown pelican, manatee, Gulf sturgeon, and sea turtles could forage or swim. If the area impacted by this foreshore protection were added to the areas of similar aquatic habitats potentially impacted by other LPV projects along Lake Pontchartrain, the loss of this type of wildlife habitat would still be a small fraction of the available habitat remaining, and use of these adjacent similar habitats by these six species

would not result in exceedances of the carrying capacity of these habitats for these species. Additionally, dredging in the project area during the summer months (May through September) when sturgeon are absent from the lake (USACE 2006a) and the use of silt curtains would help prevent any adverse impacts to the Gulf Sturgeon. Thus, cumulative impacts on endangered or threatened species from the proposed action in the IER # 3 project area would be unlikely to adversely affect these species.

Future Conditions with Alternative 1 – Levee Modification (16.5 ft) with Rock Breakwater (10 ft) and Rock Foreshore Protection

Direct Impacts

The direct adverse impacts on endangered or threatened species from alternative 1 at LPV 00, 01, 02, 19, and 20 would be essentially the same as those described for the proposed action. Although the levee would not be increased in height, it would be widened, resulting in construction-related impacts the same as those under the proposed action. The main difference between this alternative and the proposed action would involve the loss of terrestrial mowed-grass habitat as a result of the addition of a rock breakwater on land between the shoreline and the levee. Because the endangered or threatened species of concern (the brown pelican, manatee, Gulf sturgeon, and Kemp's ridley, loggerhead, and green sea turtles) utilize the lake habitat rather than terrestrial habitats, they would not be directly affected by the breakwater. The potential effects on these species from the addition of rock foreshore protection and the dredging of channels for transport of rock to the site on barges would be the same as those described for the proposed action. Accordingly, direct effects from alternative 1 on endangered or threatened species would be unlikely to adversely affect these species.

Indirect Impacts

Potential indirect impacts on endangered or threatened species from alternative 1 at LPV 00, 01, 02, 19, and 20 would be essentially the same as those described previously for the proposed action.

Cumulative Impacts

Potential cumulative impacts on endangered or threatened species from alternative 1 at LPV 00, 01, 02, 19, and 20 would be essentially the same as those described previously for the proposed action.

LPV 09 – 12, Pumping Stations # 1 (Bonnabel), # 2 (Suburban), # 3 (Elmwood), and # 4 (Duncan) and associated Fronting Protection, Breakwaters, and Floodwall Tie-ins

Future Conditions with Proposed Action

Direct Impacts

The proposed action for the pumping stations involves the construction of fronting protection for

each station, the construction of new breakwaters at pumping stations # 1 (LPV 09) and # 4 (LPV 12), a demolition and construction of a new bridge at pumping station # 4, and modifications to the existing breakwaters at pumping stations # 2 (LPV 10) and # 3 (LPV 11). Construction would occur at the locations of the existing facilities within the discharge channel at each station. Inshore aquatic habitat where endangered or threatened species could occur would be affected by the proposed action at these stations. The addition of fronting protection at the four stations would permanently cover a total of approximately 1.2 acres of shallow-water lake/canal bottom at the mouths of the pumping station outfall channels at Lake Pontchartrain. The addition of breakwaters would permanently replace 1.5 acres of lake bottom at pumping station # 1 (assuming a 130 ft wide base and length of 500 ft) and 0.6 acres at pumping station # 4 (assuming a 110 ft wide base and length of 250 ft). The demolition and replacement of the existing operations and maintenance bridge at pumping station # 4 would occur along the shoreline of the Duncan Canal north of the pumping station within the existing ROW and would not impact habitat of endangered or threatened species. The modification of existing breakwaters would replace approximately 0.5 acres of lake bottom at pumping station # 2 and 0.6 acres at pumping station # 3 (assuming an additional 20 ft footprint would be required to raise the height of the breakwater at each location). The total impacted area impacted by breakwater construction/modification would be approximately 4.4 acres.

Four flotation channels would be dredged into the pumping stations to allow for breakwater construction. The impacts for these channels were discussed under impacts for the levee reaches.

The presence of construction-related activity, machinery, and noise would be expected to cause the endangered or threatened species of concern (the brown pelican, manatee, Gulf sturgeon, and Kemp's ridley, loggerhead, and green sea turtles) to avoid the inshore habitat of the project area during the construction period. Brown pelicans forage for fish in the waters along the project area throughout the year. However, the ability of the pelican to avoid the area during construction and the presence of extensive habitat for foraging in other parts of Lake Pontchartrain minimize the possibility of adverse impacts on this species. In order to minimize the potential for construction activities under the proposed action to cause impacts to the manatee, standard manatee protection measures, as described previously for impacts from the proposed action at the levee reaches, would be followed. Pumping station #1 is within Gulf sturgeon critical habitat and approximately 1.7 acres of lake bottom habitat would be permanently lost due to construction of its breakwater (1.5 acres) and fronting protection (0.2 acre). In an effort to avoid direct impacts to Gulf sturgeon critical habitat and to individual Gulf sturgeon during the winter months, the CEMVN would adhere to a work window for the project on the eastern side of the causeway that would allow construction in the project area to occur during the months of May through September. The bucket drop procedure developed by the USFWS also would be employed throughout the project area to encourage any Gulf sturgeon (as well as sea turtles) in the vicinity to leave the project area. Accordingly, direct effects from the proposed action at LPV 09, 10, 11, and 12 on endangered or threatened species would be unlikely to adversely affect these species.

Indirect Impacts

Potential indirect impacts on endangered or threatened species from the proposed action for the pumping stations would mainly consist of effects from increased turbidity, siltation, and suspended sediment in adjacent areas of the lake from construction-related runoff. However, these impacts would be minimized by use of best management practices to control sediment transport, adherence to regulations governing stormwater runoff at construction sites, and by the movement of the tides. Thus, indirect impacts on endangered or threatened species from the proposed action in the IER # 3 project area at LPV 09 – 12 would be unlikely to adversely affect these species.

Cumulative Impacts

Potential cumulative impacts on endangered or threatened species from the proposed action for pumping station reaches LPV 09, 10, 11, and 12 mainly would involve the combined adverse effects on the brown pelican, manatee, Gulf sturgeon, and Kemp's ridley, loggerhead, and green sea turtles from the multiple LPV flood control projects in the New Orleans area. These species are mobile and could avoid project areas during the construction period, and the displaced individuals could return to the temporarily impacted areas following project completion. The permanently impacted aquatic habitat is a relatively small area of inshore, brackish lake habitat. Neither manatees, Gulf sturgeon, nor sea turtles are anticipated to utilize the shallow water areas where the fronting protection and breakwaters would be placed, and extensive, similar aquatic and benthic habitat exists where the brown pelican, manatee, Gulf sturgeon, and sea turtles could forage or swim. If the area permanently impacted by the proposed action were added to the areas of similar aquatic habitats potentially impacted by other LPV projects along Lake Pontchartrain, the loss of this type of wildlife habitat would still be a small fraction of the available habitat remaining, and use of these adjacent similar habitats by these species would not result in exceedances of the carrying capacity of these habitats for these species. Thus, cumulative impacts on endangered or threatened species from the proposed action in the IER # 3 project area at LPV 09 – 12 would be unlikely to adversely affect these species.

LPV 16 – Floodwall and Gate at Bonnabel Boat Launch, and LPV 18 – Floodwall and Gate at Williams Blvd Boat Launch

Future Conditions with Proposed Action

Direct, Indirect, and Cumulative Impacts

The proposed action involving the demolition and replacement of the floodwalls and gates at the Bonnabel and Williams Blvd boat launches would occur at the locations of the existing structures within developed, high-traffic areas that provide no aquatic habitat for the endangered or threatened species of concern (the brown pelican, manatee, Gulf sturgeon, and Kemp's ridley, loggerhead, and green sea turtles). The modifications would take place on land within the existing levee ROW, and impacts on endangered or threatened species would not occur. Accordingly, direct, indirect, and cumulative effects from the proposed action at LPV 16 and 18

on endangered or threatened species would be insignificant and would not adversely affect these species.

LPV 17 – Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

Future Conditions with Proposed Action

Direct, Indirect, and Cumulative Impacts

The proposed action at the Causeway bridge abutment would involve modifications to the existing levee and floodwall tie-ins within a developed, high-traffic area that provides no aquatic habitat for the endangered or threatened species of concern (the brown pelican, manatee, Gulf sturgeon, and Kemp's ridley, loggerhead, and green sea turtles). The modifications would take place within the existing levee ROW, and direct impacts on endangered or threatened species would not occur. Accordingly, direct, indirect, and cumulative effects from the proposed action at LPV 17 on endangered or threatened species would not adversely affect these species.

Future Conditions with Alternative 1 – Construction of a Breakwater with Floodwall Modifications or Using a New Perimeter Wall

Direct, Indirect, and Cumulative Impacts

The direct, indirect, and cumulative impacts from the construction of a breakwater and other modifications under this alternative at LPV 17 would occur at the existing location and were described above for fisheries and EFH. This location does not provide attractive aquatic habitat with abundant food sources for the endangered or threatened species of concern (the brown pelican, manatee, Gulf sturgeon, and Kemp's ridley, loggerhead, and green sea turtles). Indirect impacts from sediment would be minimized by use of best management practices to control sediment transport and adherence to regulations governing stormwater runoff at construction sites. Accordingly, direct, indirect, and cumulative effects from alternative 1 at LPV 17 on endangered or threatened species would not adversely affect these species.

3.2.7 Cultural Resources

Existing Conditions

Records on file at the Louisiana Division of Archaeology and the CEMVN indicate previously recorded archaeological and historic properties are located within the IER # 3 project area and its vicinity. Known prehistoric shell midden sites are primarily located on the relatively high shoreline ridges adjacent to Lake Pontchartrain, natural levee areas adjacent to the Mississippi River, and along smaller waterways such as Bayou St. John to the east and the higher ground along Bayou Metairie to the south. Similarly, historic period structures and associated archaeological sites including forts, plantations, farmsteads, and cemeteries; residential, commercial, and industrial districts; and river and lake port facilities, were initially developed in these same areas. Later development expanded into drained backswamp and land-filled locations and along canal waterways and railroad terminals in the city. Historic period

watercraft are recorded in Lake Pontchartrain as well as bayou and river channels in the region. The following reports, summarized below, provide specific historical information on the IER # 3 project area.

Four previously recorded archaeological sites are documented in the IER # 3 project area and include: 1) Site 16JE04 (Indian Beach), 2) Site 16JE05 (Bayou Tchoupitoulas), 3) Site 16JE40 (West End Site), and 4) Unnamed Shipwreck (NOAA Chart No. 11369-1). Site 16JE04 (Indian Beach) was originally recorded in 1952 as a linear prehistoric shell midden. Archaeologists describe the site 31 years later as a much smaller and badly eroded surface beach deposit with very light artifact density exposed primarily at low tide (New World Research 1983). Because the site was severely impacted by shell dredging in 1934, possibly impacted by seawall construction in 1952, and continuously subjected to severe wave erosion, researchers at that time determined the site was not eligible for listing on the National Register of Historic Places.

Site 16JE05 (Bayou Tchoupitoulas) was initially recorded as a small prehistoric shell midden located on both sides of a distributary canal of Bayou Metairie. No objects other than shell were reported from the site. Records indicate Site 16JE05 was destroyed by grading and filling during subsequent road construction. Site 16JE40 (West End Site) was initially documented in 1952 as an accumulation of shell and artifacts on a mud flat located 200 ft north of the Lake Pontchartrain shoreline. Based on the poor preservation of archaeological deposits noted by researchers in 1983, the site was considered not eligible for listing on the National Register of Historic Places (New World Research 1983).

One previously recorded shipwreck site is plotted on the NOAA Chart No. 11369-1 *Lake Ponchartrain and Maurepas* approximately 500 ft directly north of the proposed Bonnabel flotation channel (Nowak and Ryberg 2008). No other information on this shipwreck is available.

Three archaeological surveys have been conducted in the IER # 3 project area. In the first study, archaeologists conducted a cultural resources survey of the entire Lake Pontchartrain and Vicinity Hurricane Protection Project (New World Research 1983). In the IER # 3 reach, this work included a terrestrial survey of the project corridor along the lake side of the levee between the northern levee toe and the water's edge. Researchers identified the previously recorded archaeological site 16JE04 (Indian Beach). No historic structures were identified in the IER # 3 reach.

The CEMVN contracted R. Christopher Goodwin & Associates, Inc. to conduct reconnaissance, Phase 1 terrestrial, and Phase 1 submerged remote sensing surveys of the IER # 3 project area (Heller et al. 2007). The entire 9.5 mile long reach of IER # 3 was investigated within an area measuring 500 ft south and 1250 ft north of the levee centerline. Researchers utilized background research, previous cultural resource investigations review, soil and topographic analyses, field reconnaissance and survey data, and submerged remote sensing data to locate cultural resources, assess historic structures, identify high potential areas for archaeological resources, and record targets exhibiting cultural resource characteristics in the submerged portions of the project area in Lake Pontchartrain. The results of this research are summarized below.

The shoreline area located between the north levee toe and the water's edge was surveyed a second time by Heller and others (Heller et al. 2007). One single locus, designated Locus IER 3-01, was identified. Although prehistoric and historic period artifacts have been collected from this locus in the recent past, researchers found no artifacts on the surface. They suggest that the origin of the previously collected material could have been the reported location of Site 16JE04. Attempts to relocate sites 16JE04 (Indian Beach), 16JE05 (Bayou Tchoupitoulas) and 16JE40 (West End Site) were unsuccessful. These recorded site locations have been subjected to severe wave erosion, past shoreline construction activities, and basin dredging.

Researchers conducted two Phase 1 marine remote sensing surveys in the Lake Pontchartrain portion of the project area (Heller et al. 2007 and Nowak and Ryberg 2008). These surveys were designed to identify specific magnetic, acoustic, and sub-bottom anomalies within a 1,250 foot-wide corridor adjacent to the lake shoreline and four perpendicular flotation channels, each measuring 600 ft wide and 3000 ft long. Only one magnetic anomaly (Target 16-1) was identified that exhibited cultural resources characteristics. Initially recorded as a potential cultural resource during the remote sensing survey along the shoreline, Target 15-1 was resurveyed as part of the Bonnabel Canal flotation channel investigation and was subsequently identified as a modern structure, possibly a well head. No acoustic signatures were identified. Sub-bottom profiler data revealed no submerged geographic features adjacent to the reported site locations for 16JE04, 16JE05 and 16JE40.

Researchers utilized background research and reconnaissance field data to identify high probability areas for archaeological sites and to conduct preliminary historic building and potential historic district assessments within the 500-foot wide study area on the protected side of the levee. Sixty-six high probability areas for archaeological sites and several historic structures were identified. No historic district areas were identified.

The CEMVN held meetings with State Historic Preservation Office (SHPO) staff and tribal governments to discuss the emergency alternative arrangements approved for NEPA project review and the development of a Programmatic Agreement (PA) to tailor the Section 106 consultation process under the alternative arrangements. The CEMVN formally initiated Section 106 consultation for the Lake Pontchartrain and Vicinity Hurricane Protection Project (100-year), which includes IER # 3, in a letter dated 9 April 2007, and emphasized that standard Section 106 consultation procedures would be implemented during PA development. A public meeting was held on 18 July 2007, to discuss the working draft PA. It is anticipated that the PA will be executed in June 2008.

In letters to the SHPO and indian tribes dated 3 December 2007, the CEMVN provided project documentation, evaluated cultural resources potential in the project area, and found that the proposed action would have no adverse impact on cultural resources. The SHPO concurred with the "no adverse effect" finding in a letter dated 7 January 2008. The Choctaw Nation of Oklahoma and the Chitimacha Tribe of Louisiana concurred with this effect determination in letters dated 26 December 2007 and 27 December 2007, respectively. No other indian tribes responded to the CEMVN request for comments. Additional project documentation regarding the four proposed flotation channels was submitted to SHPO and Indian Tribes in letters dated 3 March 2008. The SHPO concurred with the CEMVN "no historic properties affected" finding in

a letter dated 20 March 2008. The Quapaw Tribe of Oklahoma and the Choctaw Nation of Oklahoma concurred with this effect determination in an email dated 4 March 2008, and a letter dated 3 April 2008, respectively. No other indian tribes responded to the CEMVN second request for comments.

Section 106 consultation for the proposed project actions is concluded. However, if any unrecorded cultural resources are determined to exist within the proposed project boundaries, then no work will proceed in the area containing these cultural resources until a CEMVN archaeologist has been notified and final coordination with the SHPO and indian tribes has been completed. The following discussion of impacts is based on the preliminary information summarized above.

Discussion of Impacts

Future Conditions with No Action

Without implementation of the proposed action, all proposed activities associated with raising the existing levees and floodwalls up to the originally authorized grade would be conducted within the existing project ROW and would have no impact on significant cultural resources. This reach of the existing authorized project ROW was investigated for cultural resources in 1983. No significant cultural resources were identified. Subsequent ground disturbing activities associated with levee, floodwall, and pumping station construction have severely impacted subsurface deposits in the ROW. Recent research has shown that the likelihood for intact and undisturbed cultural resources in the existing project ROW is extremely minimal.

LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5

Future Conditions with Proposed Action

Direct Impacts

The proposed action (preferred alternative) for these reaches consists of raising the levee 1 ft, widening the levee crown 3 ft, and adding rock foreshore protection out into Lake Pontchartrain 150 ft from the levee centerline. Construction activities on the protected side of the levee would remain within the existing authorized project ROW. The proposed action will have no direct impact on cultural resources. Recent background research and field investigations conducted by R. Christopher Goodwin & Associates, Inc. indicate several prehistoric archaeological site locations that were previously recorded along the shoreline in LPV 19 (Reach 4) and LPV 20 (Reach 5), including sites 16JE04 (Indian Beach), 16JE05 (Bayou Tchoupitoulas), and 16JE40 (West End Site), and one single locus designated Locus IER 3-01, could not be relocated (Heller et al. 2007). No cultural resources were identified in any of the proposed action reaches. Researchers found that previous ground disturbing activities associated with levee, floodwall, and pumping station construction, as well as extensive shoreline erosion and re-deposition, had severely impacted subsurface deposits in the project ROW. The likelihood for intact and undisturbed cultural resources in the existing project ROW is considered extremely minimal.

Sixty-six land parcels exhibiting a high potential for archaeological cultural resources and several historic properties were identified on the protected side of the levee immediately south of the project ROW (Heller et al. 2007). These areas would not be directly impacted by proposed construction.

Remote sensing survey of project areas in Lake Pontchartrain identified one anomaly (Target 16-1) exhibiting cultural resources characteristics. This target is located well north of the proposed rock foreshore placement area and east of the proposed Bonnabel Canal flotation channel and would not be directly impacted by proposed construction. However, a 350-foot radius "no work area" would be placed around the center of the target to ensure avoidance during construction. No further cultural resources investigations are recommended.

Indirect Impacts

Implementation of the proposed action would provide an added level of flood protection to known and unknown cultural resources located on the protected side of the levee by reducing the damage caused by flood events.

Cumulative Impacts

Implementation of the proposed action would have beneficial cumulative impacts on cultural resources in the New Orleans metropolitan area. This proposed action is part of the ongoing Federal effort to reduce the threat to property posed by flooding. The combined effects from construction of the multiple projects underway and planned for the GNOHSDRRS would reduce flood risk and storm damage to archaeological sites, individual historic properties, engineering structures and historic districts.

Future Conditions with Alternative 1 – Levee Modification (16.5 ft) with Rock Breakwater (10 ft) and Rock Foreshore Protection

Direct, Indirect, and Cumulative Impacts

All impacts from this alternative would be very similar to those from the proposed action.

LPV 09 – 12, Pumping Stations # 1 (Bonnabel), # 2 (Suburban), # 3 (Elmwood), and # 4 (Duncan) and associated Fronting Protection, Breakwaters, and Floodwall Tie-ins

Future Conditions with Proposed Action

Direct Impacts

The proposed action would have no direct impact on cultural resources. Recent investigations found no terrestrial or submerged cultural resources in the proposed action project areas (Heller et al. 2007). Researchers found that previous ground disturbing activities associated with levee, pumping station and canal construction, as well as severe lake erosion and re-deposition, had

severely impacted subsurface deposits. The likelihood for intact and undisturbed cultural resources in the proposed action project areas is considered extremely minimal.

Indirect and Cumulative Impacts

Implementation of the proposed action would have indirect and cumulative impacts similar to those described for the proposed action for LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5.

LPV 16 – Floodwall and Gate at Bonnabel Boat Launch, and LPV 18 - Floodwall and Gate at Williams Blvd Boat Launch

Future Conditions with Proposed Action

Direct Impacts

The proposed action would have no direct impact on cultural resources. Recent investigations found no cultural resources in this project reach (Heller et al. 2007). Researchers found that previous ground disturbing activities associated with levee, gate and boat launch construction, as well as severe lake erosion and re-deposition, had severely impacted subsurface deposits. The likelihood for intact and undisturbed cultural resources in the proposed action project areas is considered extremely minimal.

Indirect and Cumulative Impacts

Implementation of the proposed action would have indirect and cumulative impacts similar to those described for the proposed action for LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5.

LPV 17 Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

Future Conditions with Proposed Action

Direct Impacts

The proposed action would have no direct impact on cultural resources. Recent investigations found no cultural resources in this project reach (Heller et al. 2007). Researchers found that previous ground disturbing activities associated with levee, floodwall, and Causeway Blvd construction had severely impacted subsurface deposits. The likelihood for intact and undisturbed cultural resources in the proposed action project area is considered extremely minimal.

Indirect and Cumulative Impacts

Implementation of the proposed action would have indirect and cumulative impacts similar to those described for the proposed action for LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5.

Future Conditions with Alternative 1 – Construction of Breakwaters with Floodwall Modifications or Using a New Perimeter Wall

Direct, Indirect, and Cumulative Impacts

All impacts for this alternative would be very similar to those for the proposed action.

3.2.8 Recreational Resources

Existing Conditions

The Jefferson Parish lakefront area receives a high level of recreational usage. Recreational features include boat ramps, bike/multi-purpose paths, picnic tables and benches, wildlife viewing and fishing opportunities. In the vicinity of the project area, on the protected side, there are numerous city and parish recreation facilities.

A recreational path is occurs within LPV 00 that is used by bikers, runners, and walkers. Other recreational opportunities within LPV 00 include fishing and bird watching along the shoreline of Lake Pontchartrain.

Along LPV 01, 02, 19, and 20 (levee reaches 2 through 5), there are bike/multi-purpose paths, approximately 12.5 miles total, running parallel and between the lakeshore and the existing levee, from the Orleans Parish line to Duncan canal. There are approximately 28 benches and 17 tables placed along the pathway. Wildlife viewing and fishing opportunities are similar to Reach 1.

At pumping station # 1 (Bonnabel/LPV 09), pumping station # 2 (Suburban/LPV 10), pumping station # 3 (Elmwood/LPV 11), and pumping station # 4 (Duncan/LPV 12), there is limited recreational opportunity. At each canal, there are bridges that connect the bike/multi-purpose paths. At pumping stations # 2 (Suburban) and # 3 (Elmwood), breakwater structures also provided opportunities for pier fishing prior to Hurricane Katrina. These remain closed due to storm damage. A bird sanctuary is located just east of pumping station # 2 (Suburban).

In the vicinity of reach LPV 16, there is a well developed recreation area. This area consists of at least eight boat launching lanes, a large pavilion, playground equipment, docking facilities, and fishing pier. The area is reopened with the exception of the fishing pier, which is still undergoing repair.

In the vicinity of reach LPV 17, the existing bike/multi-purpose paths are interrupted. Due to storm damage, the Causeway underpass for the path remains closed.

In the vicinity of reach LPV 18, there is a well developed recreation area. This area consists of at least eight boat launching lanes, seven shelters and one large pavilion, playground equipment, docking facilities, and fishing pier. The area is reopened with the exception of the fishing pier, which is still undergoing repair.

Discussion of Impacts

Future Conditions with No Action

Without implementation of the proposed action, the levee reaches and associated structures would remain at or be brought to authorized heights. However, maintenance of the GNOHSDRRS to its authorized heights would continue to occur and effects on the recreational resources in the project area would not differ substantially from those discussed under the 1974 EIS for the LPV hurricane protection system and its supplemental documents. City and parish recreation facilities on the protected side would remain at the same level of protection from storm surge damage as provided by current authorization.

LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5

Future Conditions with Proposed Action

Direct Impacts

The proposed action for lakefront levee reaches 1 through 5 would increase the height and width of the existing levee ROW, providing 100-year level of protection. Recreational features associated with biking, walking/jogging, bird-watching, boating, fishing, and wildlife viewing do occur within this ROW. Design modifications would be made to avoid the boat ramp/day use features at Williams Blvd and Bonnabel Blvd. Sections of the bike/multi-purpose path located along the shoreline of the project area between the lakeshore and existing levee would be impacted during construction of the proposed action (portions of the path would be damaged or would need to be removed). Restoration of the bike/multi-purpose paths would be the responsibility of the local sponsor and would possibly occur on the protected-side, once construction is completed. City and parish recreation facilities on the protected side would benefit from additional protection from storm surge damage provided by the proposed action.

Indirect Impacts

Potential indirect impacts from the proposed action for lakefront levee reaches LPV 00, 01, 02, 19, and 20 would primarily consist of effects from increased turbidity to the wetland and lake areas surrounding the project area when access channels are dug for the rock foreshore protection construction. These effects could indirectly impact the fishing opportunities in the project vicinity; however, these impacts would be temporary. Temporary stockpiled access channel material could pose a hazard to boaters operating in the vicinity of dredging and stock piled material; however, lighted marine buoys would be deployed in the area to delineate the hazard(s) present to boat operators.

Cumulative Impacts

Potential cumulative impacts on recreation resources from the proposed action for lakefront levee reaches LPV 00, 01, 02, 19, and 20 would involve the combined effects to Lake Pontchartrain and associated wetlands from the multiple LPV flood control projects in the New Orleans area. Adverse cumulative impacts for these actions would be primarily along the Lake Pontchartrain shoreline and linear park, with some impacts to state and Federal parks. Other hurricane protection projects along Lake Pontchartrain could close access to other recreation facilities along the lakefront. Although considered temporary, the potential loss of access to Lake Pontchartrain recreation resources for several years would be a substantial loss to the New Orleans metropolitan area.

In addition, work to raise the levees along the Mississippi River to authorized heights could adversely and permanently impact the Mississippi River bike/multi-purpose paths. With the loss of many local, state, and Federal parks due to damage from Hurricane Katrina, the additional loss of existing recreation resources from ongoing and future projects could be substantial. Local, state, and Federal areas, within the protected areas, would benefit from additional protection from tropical storm damage provided by the GNOHSDRRS, as well as from flooding from the Mississippi River.

Future Conditions with Alternative 1 – Levee Modification (16.5 ft) with Rock Breakwater (10 ft) and Rock Foreshore Protection

Direct, Indirect, and Cumulative Impacts

All impacts on the levee reaches from this alternative would be similar to those for the proposed action.

LPV 09 – 12, Pumping Stations # 1 (Bonnabel), # 2 (Suburban), # 3 (Elmwood), and # 4 (Duncan) and associated Fronting Protection, Breakwaters, and Floodwall Tie-ins

Future Conditions with Proposed Action

Direct Impacts

The proposed action for the pumping stations involves the construction of fronting protection for each station and new breakwaters at pumping stations # 1 (LPV 09) and # 4 (LPV 12) and modifications to the existing breakwaters at pumping stations # 2 (LPV 10) and # 3 (LPV 11). Modifications of breakwaters to allow for pier fishing, as was available prior to Hurricane Katrina at LPV 10 (Suburban) and LPV 11 (Elmwood), would benefit recreational fishing, providing access to lake fishing to those residents and visitors without access to boats. Depending on the scope of design, bridges connecting sections of bike/multi-purpose paths, could be impacted. Sections of bike/multi-purpose paths that run parallel to the shoreline of the lake, specifically in and around pumping stations 1 through 4, would be temporarily impacted by the construction of breakwaters at stations #1 and # 4, as well as by the placement of temporary material staging areas at all locations. Restoration of the bike/multi-purpose paths would be the responsibility of the local sponsor. The demolition and replacement of the

operations and maintenance bridge across Duncan Canal, 450 ft to the north of the current bridge, would occur along the ROW of the pumping station and existing flood protection system and would be completed as part of the proposed action.

Indirect Impacts

Potential indirect impacts from the proposed action for pumping stations would primarily consist of effects from increased turbidity to the wetland and lake areas surrounding the project area. These impacts could indirectly impact the fishing opportunities in the project vicinity; however, these impacts would be temporary and managed through best management practices.

Cumulative Impacts

Potential cumulative impacts on recreation resources would be similar to those from the proposed action for reaches LPV 00, 01, 02, 19 and 20 (levee reaches 1 through 5).

LPV 16 – Floodwall and Gate at Bonnabel Boat Launch, and LPV 18 – Floodwall and Gate at Williams Blvd Boat Launch

Future Conditions with Proposed Action

Direct Impacts

The proposed action for the floodwalls and gates at the Bonnabel and Williams Blvd Boat Launches requires demolition of the existing structures and rebuilding, in approximately the same locations, new T-wall structures with I-wall transitions. The primary impacts from these actions would be related to demolition and construction. Little to no adverse impacts would be seen on the current conditions because the proposed action's structures would have similar footprints and placements as the existing structures and would not directly impact the recreation resources.

Staging related to construction materials and equipment at reaches LPV 16 and LPV 18 could impact the availability of the area for recreational activities. This impact, while temporary, could last the entire duration of project construction activities, 18 to 36 months. The total closure of these areas for three years would result in a considerable loss of recreation resources for Jefferson Parish.

Indirect Impacts

Potential indirect impacts from the proposed action for LPV 16 and 18 could include effects from increased turbidity to the wetland and lake areas surrounding the project area. These impacts could indirectly impact the fishing opportunities in the project vicinity; however, these impacts would be temporary and managed through best management practices. Access to the boat ramps and other recreation facilities in the vicinity of the project area could be temporarily unavailable due to construction activities, thereby possibly resulting in the reduction of

recreation fishing occurring in the area. However, the loss of access to these recreation resources would be temporary.

Cumulative Impacts

Potential cumulative impacts on recreation resources would be similar to those from the proposed action for reaches LPV 00, 01, 02, 19, and 20 (levee reaches 1 through 5).

LPV 17 – Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

Future Conditions with Proposed Action

Direct, Indirect, and Cumulative Impacts

The most likely impacts from the proposed action would be indirect impacts from construction equipment and stormwater runoff during construction. These potential impacts to Lake Pontchartrain from this action could impact fishing opportunities in the vicinity. However, these impacts would be minimized through the use of best management practices and adherence to regulations governing stormwater runoff at construction sites.

Future Conditions with Alternative 1 – Construction of Breakwaters with Floodwall Modifications or Using a New Perimeter Wall

Direct, Indirect, and Cumulative Impacts

Potential impacts on recreation resources would be similar to those from the proposed action for reach LPV 17.

3.2.9 Aesthetic (Visual) Resources

Existing Conditions

The project corridor includes the entire Jefferson Parish shoreline along Lake Pontchartrain, extending for 9.5 miles from the St. Charles Parish boundary on the west to the Orleans Parish line on the east. It is an armored shoreline that has been modified from its natural state by the construction of levees, floodwalls and gates, pumping stations, and breakwaters and the installation of riprap as foreshore protection. The Lake Pontchartrain Causeway and its associated facilities on the shoreline, including support buildings, parking, and shoreline protection structures, are a major component of the man-made character of the shoreline.

The visual resources of the area include open vistas of the lake and shoreline. A linear park, composed of an extensive lakefront pedestrian/bicycle path system between the levees and the shoreline, takes advantage of these vistas. The landward view from the shoreline is dominated by the earthen levees and stone and concrete riprap at the water's edge. The levee system is relatively unobtrusive in that it has low relief with gradual slopes on both sides, and the surfaces of the levees are planted with grass that blends with the landscaping of adjacent developed areas and is mowed regularly. The four pumping stations along with their associated fronting

protection, floodwalls, and related structures are readily visible, rising above the level terrain. Other interruptions of the open vistas are the boat launch, shoreline casino, and high-voltage electrical transmission line towers that cross the lake near the end of Williams Blvd, the Bonnabel boat launch, and the Bucktown marina, as well as the Lake Pontchartrain Causeway.

Inland from the levees, the land area is developed. Adjacent areas are primarily dominated by single-family residential buildings. The non-residential areas, concentrated near Williams Blvd in the western portion of the project corridor and at North Causeway Blvd and Bucktown in the eastern portion, include larger and taller buildings that are more visually intrusive than the residences. The lakefront levee system partially obscures views of the lake from the low-lying protected areas, in particular from buildings that are not multi-story.

Discussion of Impacts

Future Conditions with No Action

Under the no action alternative, the proposed action would not be constructed by the CEMVN. The current levee reaches and associated structures would remain or be brought to the authorized heights of approximately 16 ft. Visual resources would change from existing conditions as impacted by the area's future land use and its maintenance requirements. Maintenance of the GNOHSDRRS to its authorized heights would continue to occur and effects on the visual resources in the project area would not differ substantially from those discussed under the 1974 EIS for the LPV hurricane protection system and its supplemental documents.

LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5; LPV 09, 10, 11, and 12 – Pumping Stations # 1, # 2, # 3, and # 4 and associated Fronting Protection, Breakwaters, and Floodwall Tie-ins; LPV 16 – Floodwall and Gate at Bonnabel Boat Launch, and LPV 18 – Floodwall and Gate at Williams Blvd Boat Launch; LPV 17 – Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

Future Condition with Proposed Actions

Direct and Indirect Impacts

Raising the levee height, addition of fronting protection and modification or construction of new breakwaters at the four pumping stations, replacement of floodwalls and gates, and extending the existing levee system across Causeway Blvd could have adverse impacts on visual resources. The visual attributes of the project corridor would be temporarily impacted by construction activities at the project site and by transport activities needed to move equipment and materials to and from the site. The levees and floodwall structures would be similar in design and scale to the existing conditions. The major differences would be an increase in levee height of 1 ft and a potential expansion of the levee footprint. Turf grass would be re-established on the levees after construction, and the appearance of the levees and associated structures would remain similar to the existing conditions. The additional rock foreshore protection would be placed in the same general vicinity as the existing riprap. The proposed action involving the addition of frontage protection at pumping stations # 1, # 2, # 3, and # 4 would occur at the locations of the existing

facilities within the discharge channel at each station and the extension of the levee system across Causeway Blvd would take place within the Causeway approach corridor, so the visual character would not be greatly different than the current conditions. However, breakwaters would be added offshore of two of the pumping stations (# 1 and # 4), which would add another man-made element to the shoreline adjacent to these two pumping stations.

Cumulative Impacts

Cumulative impacts to visual resources from the proposed action for reaches LPV 00, 01, 02, 19, and 20 (lakefront levee reaches 1 through 5) are similar to the cumulative impacts to recreation resources, which provide the public visual access into many areas containing flood protection measures.

Future Conditions with All Alternative Actions

Direct and Indirect Impacts

Alternative actions have been identified for the five levee reaches (LPV 00, 01, 02, 19, and 20) and for the Causeway bridge (LPV 17). Alternative 1 for the levee reaches includes the addition of a rock breakwater between the Lake Pontchartrain shoreline and the levee. This would result in the piling of rock into a breakwater approximately 6 ft higher than the surrounding land surface and running parallel to the levee and shoreline, which could adversely affect the visual resources along the shoreline. Under alternative 1, at the Causeway bridge abutment, a rock breakwater would be constructed in a semicircular arch around the Causeway peninsula. This change would occur adjacent to the existing Causeway corridor limiting the impact on the visual character of this area.

Cumulative Impacts

Cumulative impacts for all alternatives would be similar to those for the proposed action.

3.2.10 Air Quality

Existing Conditions

The USEPA, under the requirements of the Clean Air Act of 1963 (CAA), has established National Ambient Air Quality Standards (NAAQS) for seven contaminants, referred to as criteria pollutants (40 CFR 50). These are carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), lead (Pb), and sulfur dioxide (SO_2). The NAAQS standards include primary and secondary standards. The primary standards were established at levels sufficient to protect public health with an adequate margin of safety. The secondary standards were established to protect the public welfare from the adverse effects associated with pollutants in the ambient air. The primary and secondary standards are presented in table 7.

Table 7. National Ambient Air Quality Standards				
Pollutant and Averaging Time	**Primary Standard**		**Secondary Standard**	
	μg/m³	**parts per million (ppm)**	**μg/m³**	**ppm**
carbon monoxide				
8-hour concentration	10,000[1]	9[1]	-	
1-hour concentration	40,000[1]	35[1]	-	
Nitrogen dioxide				
annual arithmetic mean	100	0.053	Same as primary	
Ozone				
8-hour concentration	147	0.075[2]	Same as primary	
Particulate matter				
$PM_{2.5}$:				
annual arithmetic mean	15[3]	-		
24-hour maximum	35[4]	-	Same as primary	
PM_{10}:				
24-hour concentration	150[1]	-		
Lead				
Quarterly arithmetic mean	1.5	-	Same as primary	
Sulfur Dioxide				
annual arithmetic mean	80	0.03	-	-
24-hour concentration	365[1]	0.14[1]	-	-
3-hour concentration	-	-	1300[1]	0.50[1]

Notes:
[1] Not to be exceeded more than once per year.
[2] 3-year average of the fourth-highest daily maximum 8-hour concentration must not exceed 0.075 ppm, effective as of 27 May 2008.
[3] Based on 3-year average of annual averages.
[4] Based on 3-year average of annual 98th percentile values.

Source: 40 CFR 50.

National Ambient Air Quality Standard Attainment Status

Areas that meet the NAAQS for a criteria pollutant are designated as being "in attainment" and areas where a criteria pollutant level exceeds the NAAQS are designated as being "in nonattainment." The proposed levee demolition and levee, floodwall, and structure construction activities would occur in Jefferson Parish, Louisiana, an area that is currently designated as in attainment for all criteria pollutants. Therefore, further requirements required by the CAA, general conformity rule (Section 176(c)) would not apply for the proposed Federal action.

Discussion of Impacts

Future Conditions with No Action

There would be no adverse direct, indirect, or cumulative impacts to air quality within the project area under the no action alternative. Maintenance of the GNOHSDRRS to its authorized heights would continue to occur and effects on the air quality in the project area would not differ substantially from those discussed under the 1974 EIS for the LPV hurricane protection system and its supplemental documents.

LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5; LPV 09, 10, 11, and 12 – Pumping Stations # 1, # 2, # 3, and # 4 and associated Fronting Protection, Breakwaters, and Floodwall Tie-ins; LPV 16 – Floodwall and Gate at Bonnabel Boat Launch, and LPV 18 – Floodwall and Gate at Williams Blvd Boat Launch; LPV 17 – Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

Future Conditions with Proposed Actions

Direct Impacts

During the construction of the proposed action, increase in air emissions along the levee/flood wall alignment area could be expected during the demolition and construction years. These emissions could include 1) exhaust emissions from operations of material delivery/dump trucks and various types of non-road construction equipment such as loaders, excavators, cranes, etc., and 2) fugitive dust due to earth disturbance. These emissions are from mobile sources for which emissions performance standards are applicable to source manufacturers and they are not regulated under the CAA air permit regulations. Therefore, it is not necessary to quantify these emissions given the lack of ambient emissions thresholds that could be used to make the determination of air quality impact significance from these mobile sources.

The principal air quality concern associated with the proposed activities would be emission of fugitive dust near demolition and construction areas. The on-road trucks and private autos used to access the work area could also contribute to construction phase air pollution in the project neighborhood when traveling along local roads.

However, site-specific construction effects are temporary and dust emissions would be controlled using standard best management practices. For instance, application of water to control dust and periodic street sweeping and/or wetting down of paved surfaces could aid in preventing fugitive dust from becoming airborne. Construction activities related to the proposed action would not all occur at once, but would occur in increments through the estimated construction period. Construction activities would be similar to those activities that have already occurred in the area since Hurricane Katrina and would not be cause the current attainment status for the parish to change.

Indirect Impacts

There would be no adverse indirect impacts to air quality within the project area under the proposed action.

Cumulative Impacts

It would be assumed that other activities creating dust emissions and occurring within the vicinity of the IER # 3 project area would be using standard best management practices. For instance, application of water to control dust and periodic street sweeping and/or wetting down of paved surfaces would aid in preventing fugitive dust from becoming airborne. Construction activities occurring during and within the vicinity of the IER # 3 project area would likely occur in increments through the estimated construction period. Construction activities would be similar to those activities that have already occurred in the area since Hurricane Katrina. Therefore, cumulative impacts to air quality in the project area due to the proposed action and other construction activities within the area that could be occurring concurrently would be temporary. Incremental contribution to cumulative air quality impacts due to the proposed action would not be expected after the construction period.

Future Conditions with All Alternative Actions

Direct, Indirect, and Cumulative Impacts

The direct, indirect, and cumulative impacts to air quality for the alternative actions would be the same as those described under the proposed action.

3.2.11 Noise

Existing Conditions

Noise is generally described as unwanted sound, which can be based either on objective effects (hearing loss, damage to structures, etc.) or subjective judgments (such as community annoyance). Sound is usually represented on a logarithmic scale with a unit called the decibel (dB). Sound on the decibel scale is referred to as sound level. The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 dB.

Noise levels are computed over a 24-hour period and adjusted for nighttime annoyances to produce the day-night average sound level (DNL). DNL is the community noise metric recommended by the USEPA and has been adopted by most Federal agencies (USEPA 1974). A DNL of 65 weighted decibels (dBA) is the level most commonly used for noise planning purposes and represents a compromise between community impact and the need for activities like construction. Areas exposed to a DNL above 65 dBA are generally not considered suitable for residential use. A DNL of 55 dBA was identified by the USEPA as a level below which there is no adverse impact (USEPA 1974).

Noise levels occurring at night generally produce a greater annoyance than do the same levels occurring during the day. It is generally agreed that people perceive intrusive noise at night as being 10 dBA louder than the same level of noise during the day. This perception is largely because background environmental sound levels at night in most areas are also about 10 dBA lower than those during the day.

Noise levels surrounding the project area are variable depending on the time of day and climatic conditions. Land use in this part of the Jefferson Parish East Bank is predominantly single-family residential, with some multi-family, commercial, and institutional/government development. Non-residential land uses are concentrated near Williams Blvd east of pumping station # 4 (Duncan), along North Causeway Blvd near the Lake Pontchartrain Causeway, and along Hammond Highway near the Jefferson-Orleans Parish boundary line at the eastern end of reach 5 (LPV 20).

Discussion of Impacts

Future Conditions with No Action

Under the no action alternative, noise receptors near the project corridor would not experience additional noise associated with construction activities such as pile driving and vehicles; however, along selected areas of the project area, they would continue to experience ambient noise disturbances exceeding 65 dBA from trucks and cars traveling in the area, and normal operational noise disturbances from the commercial areas within the project area. Maintenance of the GNOHSDRRS to its authorized heights would continue to occur and effects on noise in the project area would not differ substantially from those discussed under the 1974 EIS for the LPV hurricane protection system and its supplemental documents.

LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5; LPV 09, 10, 11, and 12 – Pumping Stations # 1, # 2, # 3, and # 4 and associated Fronting Protection, Breakwaters, and Floodwall Tie-ins; LPV 16 – Floodwall and Gate at Bonnabel Boat Launch, and LPV 18 – Floodwall and Gate at Williams Blvd Boat Launch; LPV 17 – Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

Future Conditions with Proposed Actions

Direct Impacts

Table 8 describes noise emission levels for construction equipment that would be expected to be used during the proposed construction activities. As can be seen from this table, the anticipated noise levels at 50 ft range from 76 dBA to 101 dBA based on data from the Federal Highway Administration ([FHWA] (2006).

Table 8. Weighted (dBA) Sound Levels of Construction Equipment and Modeled Attenuation at Various Distances[1]					
Noise Source	**50 ft**	**100 ft**	**200 ft**	**500 ft**	**1,000 ft**
Crane	81	75	69	61	55
Dump Truck	76	70	64	56	50
Compactor/Roller	83	77	71	63	57
Tractor	84	78	72	64	58
Excavator	81	75	69	61	55
Front end loader	79	73	67	59	53
Concrete mixer/pump truck	79	73	67	59	53
Dozer	82	76	70	62	56
Pile driver	101	95	89	81	75

1. The dBA at 50 ft is a measured noise emission. The 100-to 1,000-foot results are modeled estimates.
Source: FHWA (2006), *Highway Construction Noise Handbook.*

Because of the proximity of the project area to developed areas, there are a number of residential and commercial properties that could be exposed to adverse impacts from construction noise. One construction activity, pile driving, would be expected to create temporary noise impacts above 65 dBA to sensitive receptors within 1,000 ft of the project corridor. Assuming the worst case scenario of 101 dBA, as would be the case during pile driving for fronting protection and floodwall tie-in construction along the project corridor, all areas within 1,000 ft of the pile driving would experience noise levels exceeding 65 dBA. The use of pile drivers and other high-level noise sources would likely be limited to daylight hours, which would reduce the adverse impact of noise on surrounding land uses. Pile driving is also limited in extent because it will only occur in the non-levee LPV reaches. However, pile driving would occur within 300 to 800 ft of residential homes and approximately 500 residences within 1,000 ft of these areas would experience noise disturbances greater than 65 dBA.

The remaining construction activities that do not include pile driving would not create noise impacts above 65 dBA outside of 500 ft from the project area. Approximately, 1050 residences could be within 500 ft of construction activities and would experience sound impacts from general construction above 65 dBA. The opportunities for noise mitigation are limited because much of the construction activity would occur on top of the existing levee, which is the highest point in elevation in the area, or at floodwall and drainage structure locations. However, noise emission from construction activities on the flood-side would be attenuated to some degree by the existing levee. In addition to noise created by construction equipment, there would also be impacts from noise generated by construction vehicles and personal vehicles for laborers that could use public roads and highways for access to constructions sites. Following construction, noise levels would return to existing conditions.

Another source of construction-related noise would be operation of a bucket dredge in Lake Pontchartrain. The dredge would be used to excavate access channels that could be needed to deliver rock for the construction of foreshore protection and/or breakwaters at pumping stations # 1 through # 4 (reaches LPV 09, 10, 11, and 12). Use of the bucket dredge would likely be

limited to daylight hours, which would reduce the adverse impact of noise on residents living near the lakefront. Dredging would occur perpendicular to the shoreline, so only noise closest to the shoreline would be transmitted to business and residential areas along the shoreline. Households within 500 ft of the existing pumping stations (approximately 100) would likely have the highest level of noise disturbance from dredging activities.

Indirect Impacts

Indirect impacts from noise could be those related to avoidance of the area by wildlife, residents, traffic, fishermen, and emotional and mental stress that could result from the noise levels in the area during construction. Most of these impacts, with the exception of the emotional and mental stress, are discussed in other sections of this document corresponding to the resource being impacted by the construction related noise levels. Emotional and mental stresses from increased noise levels are difficult to assess and are out of the scope of this document. However, it is reasonable to assume that the emotional and mental stress created by noise levels would be compensated by the relief from the hurricane protection provided by the project.

Cumulative Impacts

Noise resulting from ongoing and planned construction activities in the IER # 3 project area as a result of GNOHSDRRS projects and rebuilding and restoration following Hurricanes Katrina and Rita would not likely cause levels in the project area to surpass the maximum levels of noise described previously under the direct impacts. However, concurrent projects would likely extend the amount of time people would be exposed to the increased noise levels resulting from construction activities.

Future Conditions with All Alternative Actions

Direct, Indirect, and Cumulative Impacts

Future conditions for the alternative actions would be similar to those described for the proposed action.

3.2.12 Transportation

Existing Conditions

The project lies on the southern shore of Lake Pontchartrain. The shoreline is fully developed with residential, recreational, and commercial land uses. Orleans Parish (east of the project area) and northern Jefferson Parish are densely developed with residential, commercial, and light to medium industrial land uses. Adjacent to the west side of the project is St. Charles Parish. This area of St. Charles Parish is mostly marshlands that have few roads and developed lands. To the east, the Port of New Orleans is one of the world's busiest ports with many transportation modes intersecting: river and sea vessels, rail, and highway (Port of New Orleans 2007). To the northwest is Baton Rouge, the state capital and second largest city in Louisiana. Baton Rouge is a major traffic generator to the west of the project area. The Louis Armstrong New Orleans International Airport is south of the project. The airport is the primary commercial airport for

the New Orleans metropolitan area and southeast Louisiana. The Mississippi River is 4 to 6 miles to the south.

I-10 is the only major east-west highway that crosses this area. I-10 is a multi-lane divided freeway. It connects the New Orleans metropolitan area with Baton Rouge. In addition, along with I-610 to the east, I-10 is a major east-west route along the northern Gulf Coast. U.S. 61 is a multi-lane highway that has either limited or no control of access. It is functionally classified as a "principal arterial" in Jefferson Parish. U.S. 61 runs parallel to I-10; it primarily serves local travel, while I-10 serves regional travel. I-310 provides regional access to the west side of the Mississippi River. Other principal arterials in the project vicinity are U.S. 90 to the south along the Mississippi River, Causeway Blvd (4-lane to 6-lane median-divided urban expressway), Veterans Memorial Blvd, Clearview Parkway, and Williams Blvd (6-lane median-divided urban street). Minor arterials in the project vicinity are Esplanade Avenue, Loyola Drive (6-lane median-divided urban street), Vintage Drive (4-lane median-divided urban street), Power Blvd, and Bonnabel Blvd (4-lane median-divided urban street). There are local streets throughout the project area (Louisiana Department of Transportation and Development [LADOTD] 2006).

There are several rail lines in the project vicinity. There is a major rail line that runs parallel to I-10 in St. Charles Parish, and then runs along U.S. 61 in Jefferson Parish. There are several rail spurs in the area. There are several dock facilities on the east side of the Mississippi River that are capable of handling ocean vessels.

Operational conditions on a highway can be described with "level-of-service" (LOS). LOS is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. The "Highway Capacity Manual" (Transportation Research Board [TRB] 2000) defines six LOS, designating each level with the letters A to F. LOS "A" represents the best operating condition, and LOS "F" represents the worst operating condition. LOS "C" or "D" is generally considered acceptable. Heavy trucks adversely affect the LOS of a highway. "Heavy trucks" are vehicles that have more than four tires touching the pavement. Heavy vehicles adversely affect traffic in two ways: (1) they are larger than passenger cars and occupy more roadway space; and (2) they have poorer operating capabilities than passenger cars, particularly in respect to acceleration, deceleration, and the ability to maintain speed on grades. The second impact is more critical. The inability of heavy vehicles to keep pace with passenger cars in many situations creates large gaps in the traffic stream, which are difficult to fill by passing maneuvers. The resulting inefficiencies in the use of roadway space cannot be completely overcome.

The most recent traffic volumes available from the LADOTD are from 2005 (LADOTD 2007). At most traffic count stations in Jefferson Parish east of the Mississippi River, 2005 traffic counts are lower than prior years. This traffic reduction is probably due to the population shifts caused by Hurricanes Katrina and Rita (2005). The project lies north of I-10. There is only one traffic count station north of I-10, on Williams Blvd between I-10 and Esplanade Avenue. The 2005 average daily traffic (ADT) on I-10 ranged between 128,000 and 140,000 vehicles per day (vpd). The 2005 ADT on Williams Blvd was 48,000 vpd.

Based on field observations (Schrohenloher 2007), the LOS on highways and streets in the project area is very poor during morning, noon, and evening peak hours, while vehicles are able to travel at the posted speed limits during off-peak times. In Jefferson Parish from 2002 through 2006 there were 11 fatalities involving large trucks. In 2006 there were 3 fatalities involving a large truck, a rate of 0.70 fatalities per 100,000 people, which ranks the parish 41 in the state (1 being the highest rate of fatalities) (National Highway Traffic Safety Administration [NHTSA] 2007).

Discussion of Impacts

Future Conditions with No Action

Under the no action alternative, there would be no direct, indirect, or cumulative adverse impacts to transportation within the project area. However, maintenance of the GNOHSDRRS to its authorized heights would continue to occur and effects on transportation in the project area would not differ substantially from those discussed under the 1974 EIS for the LPV hurricane protection system and its supplemental documents.

LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5; LPV 09, 10, 11, and 12 – Pumping Stations # 1, # 2, # 3, and # 4 and associated Fronting Protection, Breakwaters, and Floodwall Tie-ins; LPV 16 – Floodwall and Gate at Bonnabel Boat Launch, and LPV 18 – Floodwall and Gate at Williams Blvd Boat Launch; LPV 17 – Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

Future Conditions with Proposed Action

Direct Impacts

Additional traffic to the roadway network would include the mobilization of construction equipment, construction workers traveling to and from construction sites, construction materials being shipped to construction sites, and construction debris being removed from construction sites. Construction materials being shipped to construction sites would be the bulk of the additional traffic.

Truck access to the project sites would be via I-10 to Loyola Drive to Vintage Drive, to Bonnabel Blvd, to Causeway Blvd, or Williams Blvd. Barges could also be used during construction and would access the project area via Lake Pontchartrain.

The earthen fill material would be obtained from the Bonnet Carre Spillway, off U.S. 61 in St. Charles Parish. Concrete would likely be transported to the site via mixing truck and pumped on-site. Steel sheet piling and H-piling would likely be shipped by rail into the city from the manufacturer. The materials would be shipped via railways and transloaded to trucks at a terminal near the project site. The bulk of the truck traffic would occur on U.S. 61, I-310, I-10, Williams Blvd, and Bonnabel Blvd and a number of other local roads exiting off I-10 and leading toward the lake front.

Pile and concrete reinforcement materials would likely be shipped to construction sites during off-peak traffic times; therefore, it would have minimal LOS impacts to the roadway network. Earthen fill shipments would likely be spread throughout the workday and life of the project. Concrete shipments would likely be concentrated into short time periods.

Most of the earthen fill truck traffic associated with the proposed project would use U.S. 61 and I-10. U.S. 61 is assumed to be the worst case. Impacts to highway capacity can be predicted using the methodology from the Highway Capacity Manual for multilane highways. Two models were built—Base and Additional Trucks—to evaluate the highway capacity impacts that additional trucks would have to U.S. 61. The "Base" model looked at future conditions with no action, which serves as a comparison. The "Additional Trucks" model looked at the future conditions and calculated the number of trucks were operating in addition to the "Base" traffic stream during the peak hour. It was assumed that there are 30,000 vehicles per day in the "Base" condition, 10 percent of which are operating in the peak hour, 5 percent of the base vehicles are trucks, and base free-flow speed is 50 miles per hour. For the "Additional Trucks" condition, 21 trucks per hour in each direction were added to the "Base condition". For the "Base" and "Additional Trucks" conditions U.S. 61 would operate at LOS "C" with an average vehicle speed of 49 miles per hour. The additional truck traffic would have a temporary impact on the LOS for U.S. 61. After construction is complete, the proposed action would have no long-term impact on transportation.

For concrete shipments, it was assumed that LPV 12 would be the worst case. The maximum number of concrete trucks per hour was assumed to be 12 (1 truck every 5 minutes). This could effect the LOS on an arterial during peak traffic hours. Concrete pours could be done during non-peak traffic hours to ensure consistent concrete delivery and minimization of traffic impacts.

Local streets would be used to access work sites from the arterials. These access roads (e.g., work site access, staging areas) used by the trucks could have substantial changes in their LOS. It should be noted that without a detailed transportation routing plan, a more detailed impact evaluation to the LOS of minor highways and roads cannot be done, but will be addressed in more detail in the draft CED. Additionally, it can only be presumed that the increased traffic in the area could potentially increase traffic accidents and related traffic fatalities. However, a slow down in traffic due to the construction related traffic could also reduce speeds and thereby reduce traffic accident related fatalities.

Indirect Impacts

Heavy trucks are the primary loading source of pavement degradation. The additional trucks associated with the proposed action would contribute to additional wear-and-tear of pavement on the area arterials and local streets.

Cumulative Impacts

As discussed previously, additional wear-and-tear of pavement on roads within the project's vicinity could occur due to increased truck traffic under the proposed action. On-going construction related

to other reconstruction projects in the project vicinity could also contribute to the increase of truck traffic and could therefore increase the wear-and-tear on the pavement of the roads.

Future Conditions with Alternative Actions

Direct, Indirect, and Cumulative Impacts

Direct, indirect, and cumulative impacts for the alternative actions would be similar to those described under the proposed action.

3.3 SOCIOECONOMIC RESOURCES

3.3.1 Land Use, Population, and Employment

Existing Conditions

The project area is located in Jefferson Parish on the southern shore of Lake Pontchartrain, extending from the Jefferson-St. Charles Parish boundary line on the west to the Jefferson-Orleans Parish boundary line on the east. Land use in this part of the Jefferson Parish East Bank is predominantly single-family residential, with some multi-family, commercial, and institutional/government development. Non-residential land uses are concentrated near Williams Blvd (Pontchartrain Center and Treasure Chest Casino) east of pumping station # 4 (Duncan), along North Causeway Blvd (offices, hotels, retail) near the Lake Pontchartrain Causeway, and along Hammond Highway (restaurants, retail, offices) near the Jefferson-Orleans Parish boundary line at the eastern end of reach 5 (LPV 20). Other non-residential land uses include a fitness club, middle school, and religious retreat facility located between the levee and Avron Blvd within reach 3 (LPV 02) and U.S. Coast Guard Station New Orleans at the Bucktown Marina north of the levee at the eastern end of reach 5 (LPV 20). Recreational land uses north of the levee, along the Lake Pontchartrain shoreline, include the boat launches at the end of Williams Blvd (east of pumping station # 4) and Bonnabel Blvd (east of pumping station # 1) as well as the linear park (walking/bicycling trail) that runs along the levee corridor.

I-10 crosses Jefferson Parish in an east-west direction, parallel to and approximately 1.5 to 2 miles south of the Lake Pontchartrain shoreline. Access to the project area is provided by major north-south roads that have interchanges with I-10, including Williams Blvd, Clearview Parkway, North Causeway Blvd, and Bonnabel Blvd, as well as by numerous local streets.

Jefferson Parish encompassed 306.5 square miles of land plus 336 square miles of water in the year 2000 (U.S. Census Bureau [USCB] 2007a). With a population of 455,466 reported in the 2000 Census, the parish had a population density of 1,484 persons per square mile, compared to 103 persons per square mile for the state of Louisiana (USCB 2007b). The parish population is almost equally divided between the East and West Banks. A total of 257,501 residents in the Jefferson Parish East Bank (based on the 2000 Census) were protected by the Lake Pontchartrain and Vicinity Hurricane Protection Project, as authorized (USACE 2006b). The population had declined slightly to an estimated 452,824 in July 2005 (prior to Hurricane Katrina). Following

Katrina, the population declined further to an estimated 431,361 in July 2006, which represents a 5.3 percent decrease from 2000 (USCB 2006 and 2007b).

According to the 2000 Census, 69.8 percent of the population of Jefferson Parish was white, 22.9 percent was African American, and the remaining 7.3 percent was primarily Asian, "some other race", and persons identified as two or more races. The median household income was $38,435 and approximately 13.7 percent of individuals residing in Jefferson Parish were identified as living below the Federal poverty level (USCB 2007c). In 2004, the median household income had declined slightly to $38,234 while persons below the poverty level increased to 16.5 percent, compared to $35,216 and 19.2 percent for Louisiana (USCB 2007b).

Jefferson Parish is included in the New Orleans-Metairie-Kenner, Louisiana Metropolitan Statistical Area. Between 2000 and 2004, employment in Jefferson Parish declined slightly from 214,647 to 213,303 representing a decrease of 0.6 percent. In 2005, employment declined by 6.9 percent to 198,491. In 2004 and 2005, retail trade represented the largest sector of employment followed by health care/social assistance, accommodation/food services, and manufacturing (Louisiana Department of Labor [LDOL] 2002, 2005, 2006). In 2006, the annual average unemployment rate in Jefferson Parish was 5.0 percent, which is higher than the annual average unemployment rate of 4.0 percent for Louisiana (LDOL 2007).

Discussion of Impacts

Future Conditions with No Action

Direct Impacts

Without implementation of the proposed action for 100-year level of protection, the levees, floodwalls, floodgates, and pumping station fronting protection included in the Jefferson East Bank lakefront project area would be maintained at the authorized height. This could present an increased risk of storm-related flooding in the low-lying portions of the area and the associated damage to buildings and infrastructure, disruption of economic activity, and displacement of residents. Costs could be incurred for such items as evacuation, clean-up, debris removal, building and infrastructure repair, damaged vehicles, and re-occupation of homes and businesses. Maintenance of the GNOHSDRRS to its authorized heights would continue to occur and effects on socioeconomics in the project area would not differ substantially from those discussed under the 1974 EIS for the LPV hurricane protection system and its supplemental documents.

Indirect Impacts

The no action alternative could have an adverse impact on the number of businesses and industries, land use patterns, employment, and population levels in the Jefferson Parish area. Without implementation of the proposed action, the flood protection necessary for recovery and economic prosperity in the parish would not be provided.

Cumulative Impacts

The no action alternative could contribute to adverse cumulative impacts on socioeconomic resources in the New Orleans metropolitan area. Without improvement of the Jefferson East Bank flood protection system, there could be a gap in the GNOHSDRRS for 100-year level of protection that could leave parts of Jefferson Parish more vulnerable to flooding.

LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5

Future Conditions with Proposed Action

Direct Impacts

The increase in the height and width of the levees under the proposed action would take place within the existing levee corridor. At the eastern end of LPV 20 (reach 5), however, the widening of the levee footprint could potentially extend onto the U.S. Coast Guard Station New Orleans property at the Bucktown Marina. The added rock foreshore protection would be installed along the Lake Pontchartrain shoreline where there is currently a cover of riprap. Therefore, with the possible exception of the Bucktown Marina area, land use would not be directly impacted by the construction activities associated with the proposed action. However, the proposed action would provide 100-year level of flood protection for the area within the Jefferson East Bank protected area. This would allow for Federal Emergency Management Agency (FEMA) certification of that level of protection, and would have a beneficial impact on social and economic resources in Jefferson Parish East Bank.

There would be temporary beneficial economic impacts from construction activities associated with the proposed action, including purchase of materials, equipment, and services and a temporary increase in employment and income. This increase could be local or regional, depending on where the goods, services, and workers are obtained, and some beneficial impacts on socioeconomic resources would occur.

Indirect Impacts

Following completion of the proposed action, land use patterns in Jefferson Parish East Bank are not expected to change since raising the lakefront levee reaches LPV 00, 01, 02, 19, and 20 to the 100-year level of flood protection would not encourage one type of land use over another. However, the potential exists for an increase in the rate of urban development, given the increased protection from flooding provided by the raised levees. Additionally, the proposed action would allow for FEMA certification of the 100-year level of protection. A reduction in insurance rates and the potential costs resulting from flood damage could be expected after the proposed action is complete. Population and long-term employment and income levels in Jefferson Parish are expected to increase if the raised levees stimulate growth in urban developments in the protected area. Although the proposed action would reduce but not eliminate the risk of flooding, it could have a beneficial impact on population and long-term employment and income levels in the parish.

Cumulative Impacts

The proposed action would have beneficial cumulative impacts on socioeconomic resources in the New Orleans metropolitan area. It is part of the ongoing Federal effort to reduce the threat to life, health, and property posed by flooding. The combined effects from construction of the multiple projects underway and planned to rebuild the GNOHSDRRS in the area would reduce flood risk and storm damage to residences, businesses, and other infrastructure from storm-induced and tidally-driven flood events and, thereby, encourage recovery. All segments of the Jefferson East Bank lakefront GNOHSDRRS need to be brought to 100-year level of flood protection in order to obtain FEMA certification of the system. Potential cumulative beneficial impacts of the proposed action would occur particularly when considered in conjunction with potential effects from other flood control projects in the region.

Future Conditions with Alternative 1 – Levee Modification (16.5 ft) with Rock Breakwater (10 ft) and Rock Foreshore Protection

Direct Impacts

The direct beneficial impacts on socioeconomic resources and land use from alternative 1 for lakefront levee reaches LPV 00, 01, 02, 19, and 20 are essentially the same as those described for the proposed action. The main difference between this alternative and the proposed action involves the addition of a rock breakwater between the lake shoreline and the levee, which would result in essentially the same effects on land use, population, and employment as the proposed action.

Indirect Impacts

Potential indirect impacts on socioeconomic resources and land use from alternative 1 for lakefront levee reaches LPV 00, 01, 02, 19, and 20 are essentially the same as those described for the proposed action.

Cumulative Impacts

Potential cumulative impacts on socioeconomic resources and land use from alternative 1 for lakefront levee reaches LPV 00, 01, 02, 19, and 20 are essentially the same as those described for the proposed action.

LPV 09 – 12, Pumping Stations # 1 (Bonnabel), # 2 (Suburban), # 3 (Elmwood), and # 4 (Duncan) and associated Fronting Protection, Breakwaters, and Floodwall Tie-ins

Future Conditions with Proposed Action

Direct Impacts

Land use would not be directly impacted by the construction activities associated with the proposed action because the proposed fronting protection would be constructed at the locations

of the four existing facilities, and the proposed modification of the existing breakwaters at pumping stations # 2 (LPV 10), # 3 (LPV 11) and proposed construction of breakwaters at pumping stations # 1 (LPV 9) and # 4 (LPV 12) would occur offshore in Lake Pontchartrain. The demolition and replacement of the operations and maintenance bridge across Duncan Canal, 450 ft to the north of the current bridge, would occur along the ROW of the pumping station and existing flood protection system. The proposed action would provide 100-year level of flood protection for the area within the Jefferson East Bank protected area. This would allow for FEMA certification of that level of protection, and would have a substantial beneficial impact on social and economic resources in Jefferson Parish East Bank. There would be temporary beneficial economic impacts from construction activities associated with the proposed action, including purchase of materials, equipment, and services and a temporary increase in employment and income. This increase could be local or regional, depending on where the goods, services, and workers are obtained.

Indirect and Cumulative Impacts

Potential indirect and cumulative impacts on socioeconomic resources and land use from the proposed action for reaches LPV 09, 10, 11, and 12 are essentially the same as those described for the proposed action for reaches LPV 00, 01, 02, 19, and 20 (lakefront levee reaches 1 through 5).

LPV 16 – Floodwall and Gate at Bonnabel Boat Launch, and LPV 18 – Floodwall and Gate at Williams Blvd Boat Launch

Future Conditions with Proposed Action

Direct Impacts

The demolition and replacement of the floodwalls and gates at the Bonnabel and Williams Blvd boat launches under the proposed action would take place at the same locations as the existing structures. Therefore, land use would not be directly impacted. The proposed action would provide 100-year level of protection for the area within the Jefferson East Bank protected area. This would allow for FEMA certification of that level of protection, and would have a substantial beneficial impact on social and economic resources in Jefferson Parish East Bank. There would be temporary beneficial economic impacts from construction activities associated with the proposed action, including purchase of materials, equipment, and services and a temporary increase in employment and income. This increase could be local or regional, depending on where the goods, services, and workers are obtained.

Indirect and Cumulative Impacts

Potential indirect and cumulative impacts on socioeconomic resources and land use from the proposed action for reaches LPV 16 and 18 are essentially the same as those described for the proposed action for reaches LPV 00, 01, 02, 19, and 20 – lakefront levee reaches LPV 00, 01, 02, 19, and 20.

LPV 17 – Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

Future Conditions with Proposed Action

Direct Impacts

Construction of the new levee and floodwall tie-ins and modification of North Causeway Blvd as it crosses the levee would take place within the existing levee and roadway corridors. It is not anticipated to require the taking of existing structures. Therefore, land use would not be directly impacted by the proposed action. However, the proposed action would provide 100-year level of protection for the area within the Jefferson East Bank protected area. This would allow for FEMA certification of that level of protection, which would have a beneficial impact on social and economic resources in Jefferson Parish East Bank.

There would be temporary beneficial economic impacts from construction activities associated with the proposed action, including purchase of materials, equipment, and services and a temporary increase in employment and income. This increase could be local or regional, depending on where the goods, services, and workers are obtained.

Indirect and Cumulative Impacts

Potential indirect and cumulative impacts on socioeconomic resources and land use from the proposed action for LPV 17 are essentially the same as those described for the proposed action for reaches LPV 00, 01, 02, 19, and 20 – lakefront levee reaches LPV 00, 01, 02, 19, and 20.

Future Conditions with Alternative 1 – Construction of Breakwaters with Floodwall Modifications or Using a New Perimeter Wall

Direct Impacts

The construction of breakwaters and other modifications under this alternative at LPV 17 would occur in the nearshore area of Lake Pontchartrain and would not directly impact land use. This alternative would also provide 100-year level of protection within the Jefferson East Bank protected area, allowing for FEMA certification of that level of protection. This would have a substantial beneficial impact on social and economic resources in Jefferson Parish East Bank. There would be direct, temporary beneficial economic impacts from construction activities, as described for the proposed action.

Indirect and Cumulative Impacts

Potential indirect and cumulative impacts on socioeconomic resources and land use for alternative 1 for LPV 17 are essentially the same as those described for the proposed action for reaches LPV 00, 01, 02, 19, and 20 – lakefront levee reaches LPV 00, 01, 02, 19, and 20.

3.4 ENVIRONMENTAL JUSTICE

The USEPA defines EJ as "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. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, state, local, and tribal programs and policies." Meaningful involvement means that people have an opportunity to participate in decisions about activities that may affect their environment and/or health, the public's contribution can influence the regulatory agency's decision, the public's concerns will be considered in the decision-making process, and the decision makers seek out and facilitate the involvement of those potentially affected. The goal of this "fair treatment" is not to shift risks among populations, but to identify potential disproportionately high or adverse effects and alternatives that may mitigate these impacts.

This EJ analysis identifies and addresses, as appropriate, potential disproportionate adverse human health and/or environmental effects of the proposed action on minority and/or low-income populations. The methodology to accomplish this includes identifying low-income and minority populations within the study area. Census block group statistics from the 2000 US Census (the latest and most detailed census) and Environmental Systems Research Institute (ESRI) estimates, as shown in table 9, were utilized for data analysis. In addition, community meetings targeted at minority and low-income populations have and will continue to take place throughout the planning process.

Detailed discussion of demographic and income data, along with pertinent maps, tables and photographs, are available by request and will be included in the CED.

Existing Conditions

Based on the 2000 US Census, the population in the vicinity of the project area (i.e., located within 1 mile from the IER # 3 proposed action footprint) was 18.7 percent minority. This is substantially less than the minority percentage within Jefferson Parish (35.2 percent), or the state (37.8 percent). In terms of income, the poverty rate was substantially lower than state or parish figures, with 6.9 percent of the population living below the poverty line, compared to 13.7 percent and 19.6 percent for the parish and state, respectively. Therefore, based on 2000 data, the area within the vicinity (1-mile radius) of the project area was not a minority or low-income community.

According to the ESRI 2007 estimates, the area within the vicinity of the project area has not changed significantly from 2000. The low-income population within a 1-mile radius of the proposed action footprint has not increased significantly from 2000 to 2007, with the percentage of households earning below $15,000 per year (9.8 percent) substantially lower than parish and state figures (15.2 percent and 21.4 percent, respectively). Similarly, the estimated minority population in 2007 is comparable to 2000 figures, with 21.2 percent of the population categorized as minority, compared to 44.1 percent and 39.8 percent for the parish and state,

respectively. Based on the 2007 estimates, the area within a 1-mile radius of the proposed action footprint is currently not a low-income or minority community.

Using the EJ guidelines established by Executive Order 12898 and the USEPA, the area in the vicinity of the project area is not a potential EJ community.

Table 9. Minority and Poverty Data for the Environmental Justice Analysis

	IER #3 1-Mile Radius		Jefferson Parish		Louisiana	
	Number	Percentage	Number	Percentage	Number	Percentage
Minority population, 2000	18,467	18.7%	160,643	35.2%	1,689,422	37.8%
Estimated minority population, 2007	18,367	21.2%	193,331	44.1%	1,741,453	39.8%
Persons living below the poverty line, 2000	6,774	6.9%	61,608	13.7%	851,113	19.6%
Estimated households earning less than $15,000 per year, 2007*	3.449	9.8%	25,751	15.2%	351,703	21.4%

*Poverty data not available for census block groups in 2007. Analysis used $15,000 household income as poverty threshold, which is comparable to the poverty thresholds reported by the U.S. Dept. of Health and Human Services for 2007, factoring average household size.

Discussion of Impacts

The proposed action and alternatives were evaluated for potential disproportionately high environmental effects on minority or low-income populations. Aerial photos were utilized to confirm the presence of habitation in the project area, and are utilized in EJ analysis.

Future Conditions with No Action

Without implementation of the proposed action, there would be no activity involving construction or modification of the existing hurricane and storm damage risk reduction system (the GNOHSDRRS). Areas in low-income and minority communities subject to flooding would continue to be threatened by flooding under the no action alternative. Maintenance of the GNOHSDRRS to its authorized heights would continue to occur, and effects on low-income and minority communities in the project area would not differ substantially from those discussed under the 1974 EIS for the LPV hurricane protection system and its supplemental documents.

LPV 00, 01, 02, 19, and 20 – Lakefront Levee Reaches 1 through 5; LPV 09, 10, 11, and 12 – Pumping Stations # 1, # 2, # 3, and # 4 and associated Fronting Protection, Breakwaters, and Floodwall Tie-ins; LPV 16 – Floodwall and Gate at Bonnabel Boat Launch, and LPV 18 – Floodwall and Gate at Williams Blvd Boat Launch; LPV 17 – Bridge Abutment and Floodwall Tie-ins at Causeway Bridge

Future Conditions with Proposed Action

Direct Impacts

Because the proposed action is not within or adjacent to a low-income or minority community, there would not be a direct disproportionate impact on low-income or minority residents.

Indirect Impacts

Because the proposed action, is not within or adjacent to a low-income or minority community, there would not be an indirect disproportionate impact on low-income or minority residents.

Cumulative Impacts

Cumulative EJ impacts will be analyzed at the conclusion of small neighborhood focus meetings, and will be included in the CED.

Future Conditions with All Alternative Actions

Direct, Indirect, and Cumulative Impacts

The direct, indirect, and cumulative EJ impacts for the alternative actions would be the same as those described under the proposed action.

3.5 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

Under ER 1165-2-132 the reasonable identification and evaluation of Hazardous, Toxic, and Radioactive Waste (HTRW) contamination within a proposed area of construction is required. ER 1165-2-132 identifies the CEMVN HTRW policy to avoid the use of project funds for HTRW removal and remediation activities. Costs for necessary special handling or remediation of wastes (e.g., Resource Conservation and Recovery Act [RCRA] regulated), pollutants, and other contaminants, which are not regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), are treated as project costs if the requirement is the result of a validly promulgated Federal, state, or local regulation.

An American Society for Testing and Materials (ASTM) E 1527-05 Phase I Environmental Site Assessment was completed for the proposed IER # 3 project and for the proposed borrow areas that may be used for construction fill material. The Phase I Environmental Site Assessment documented the Recognized Environmental Conditions (RECs) for the proposed project/borrow areas. If a REC cannot be avoided, due to the necessity of construction requirements, the

CEMVN may further investigate the REC to confirm presence or absence of contaminants, and actions to avoid possible contaminants. Federal, state, or local coordination may be required. Because the CEMVN plans to avoid RECs the probability of encountering HTRW in the project area is low.

A copy of the Phase I Environmental Site Assessment for the IER 3 project area and borrow areas will be maintained on file at the CEMVN office in New Orleans and is incorporated herein by reference. Copies of the reports are available by requesting them from the CEMVN, or accessing them at www.nolaenvironemtal.gov.

The following Suspected RECs were identified at the following facilities outside of the Jefferson Lakefront Levee, but within the 1,000-foot footprint:

- One former industrial facility (former underground storage tanks [USTs] and/or above-ground storage tanks [ASTs]);
- Four industrial facilities and one construction site (managing large quantities of petroleum products);
- Unsecured 55-gallon drums (potential releases of hydraulic oil, petroleum products);
- Dry cleaners (dry cleaning operations, chlorinated volatile organic compounds)
- Gasoline station (current USTs, petroleum products);
- REC # 1: old pumping station # 4 (former USTs and/or ASTs);
- REC # 2, # 3, # 4, # 5: Jefferson Parish pumping stations # 1, # 2, # 3, # 4 (management of large quantity of petroleum products, petroleum products);
- REC # 6: USACE 17th Street Canal pumping station and construction site;
- REC # 7: nine 55-gallon drums (potential releases of hydraulic oil, petroleum products) between Jefferson Lakefront Levee and Metairie Hammond Highway;
- REC # 8, # 9, # 10: three dry cleaners (dry cleaning operations, chlorinated volatile organic compounds); and
- REC # 11: active gasoline station (current USTs, petroleum products).

Historical Known or Suspected RECS within the 1,000-foot footprint include:

- One industrial commercial facility (former USTs, petroleum products);
- Four commercial facilities (former USTs, petroleum products);
- Hydraulic oil release to soils from levee maintenance equipment hose rupture;
- REC # 12: Jefferson Parish pumping station # 2 (former USTs, petroleum products);
- REC # 13: U-Haul (former UST, petroleum products);
- REC # 14: Pelican Pool and Patio (former USTs, petroleum products);
- REC # 15: South Shore toll plaza (former USTs, petroleum products);
- REC # 16: Bernard's Car Care (former USTs, petroleum products – gasoline and service station since at least 1965);
- REC # 17: Old pumping station # 1 (likely former presence of ASTs or historical USTs or management of relatively high volume and movement of fuels or other hazardous materials);

- REC # 18: Old pumping station # 2 (likely former presence of ASTs or historical USTs or management of relatively high volume and movement of fuels or other hazardous materials);
- REC # 19: Old pumping station # 3 (likely former presence of ASTs or historical USTs or management of relatively high volume and movement of fuels or other hazardous materials); and
- REC # 20: hydraulic oil release to soils, immediately west of Williams Blvd at Gate L-4, south of and at the base of the levee from a wing-mower maintenance tractor hose rupture.

Because the CEMVN plans to avoid RECs, the probability of encountering HTRW in the project area is low. In the event of an unplanned discovery of HTRW materials during construction, work that could affect the contaminated materials would be stopped, and appropriate notification and coordination would be completed. Investigations would be conducted to characterize the nature and extent of the contamination and establish appropriate resolution.

4.0 CUMULATIVE IMPACTS

NEPA requires a Federal agency to consider not only the direct and indirect impacts of a proposed action, but also the cumulative impacts of the action. Direct, indirect and cumulative impacts of the proposed action are evaluated specifically for each IER, but will also be addressed within the draft CED that is being prepared by the CEMVN. A cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7)." Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Cumulative impacts were addressed for each alternative and resource in the preceding sections.

As indicated previously, in addition to this IER, the CEMVN is preparing a draft CED that will describe the work completed and the work remaining to be constructed. The purpose of the draft CED will be to document the work completed by the USACE on a system-wide scale. The draft CED will describe the integration of individual IERs into a systematic planning effort. Overall cumulative impacts, a finalized mitigation plan, and future operations and maintenance requirements will also be included. The discussion provided below provides an overview of other actions, projects, and occurrences that may contribute to the cumulative impacts previously discussed.

Rebuilding efforts as a result of Hurricane Katrina are taking place throughout southeast Louisiana, and along the Mississippi and Alabama Gulf Coast. The Insurance Information Institute (III) has estimated that the total insured losses from Hurricane Katrina were $40.6 billion in six states, and in Louisiana the insured losses are estimated at $25.3 billion (III 2007); much of those insured losses would be a component of the regional rebuilding effort. Although the full extent of construction in Jefferson Parish and throughout the Gulf Coast over the next 5 to 10 years is unknown, a large-scale rebuilding effort is underway.

The GNOHSDRRS is divided into three USACE authorized projects: 1) LPV; 2) WBV; and 3) New Orleans to Venice (NOV). The NOV and WBV projects, with the exception of the WBV Lake Cataouatche Levee (see Table 10), are not discussed in this IER because their alignments are not located within the project region and, with the exception of some positive cumulative impacts to socioeconomics, these projects would not greatly increase cumulative impacts. The various projects that make up the GNOHSDRRS have resulted in the construction of 125 miles of levees, concrete floodwalls and other structures for the LPV project, 66 miles for the WBV project, and 87 miles for the NOV project.

In addition to on-going construction in association with raising floodwall and levee elevations to authorized levels within various reaches of the LPV project, the CEMVN is proposing to raise levees, floodwalls, and floodgates, and to construct new structures within all reaches of the LPV to provide 100-year level of protection. In addition, many of the ongoing and proposed construction projects require significant volumes of borrow material. Completion of all the GNOHSDRRS projects to a 100-year level of protection would require in excess of an estimated 100,000,000 CY of borrow material. Borrow material will also be needed to perform levee lifts and maintenance for at least 50 years after construction is completed. The construction of the proposed borrow areas and the transfer of these materials would have resource impacts. Construction related impacts for the borrow areas are reviewed in IER #18 and IER # 19.

Table 10 provides a summary of the cumulative impacts to be mitigated for the GNOHSDRRS projects completed (draft or final) to date. In addition to the impacts shown in Table 10, approximately 170.5 acres of impacts, requiring mitigation, would occur as part of borrow material requirements for projects for the Mississippi River Levee. Also, three new outfall canal closure structures are proposed at the 17th Street, Orleans Avenue, and London Avenue Outfall Canals in the Orleans East Bank Basin and a new closure structure is proposed for within the IHNC area. These projects all occur within the greater New Orleans area, within the Lake Pontchartrain Basin, and within the designated coastal zone for Louisiana, so these projects are considered collectively (as appropriate) for the evaluation of cumulative impacts. All of the100-year level of protection projects are currently in the planning and design stages and impacts from these component projects would be addressed in separate IERs.

The CEMVN and other Federal agencies participate in coastal restoration projects through the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA; also known as the Breaux Act). These are specific prioritized restoration projects implemented coast-wide by the Louisiana Department of Natural Resources (LDNR), Coastal Restoration Division in cooperation with Federal agencies. Within the Lake Pontchartrain Basin, there are 16 projects proposed or constructed under CWPPRA designed to restore, enhance, or build marsh habitat and prevent erosion of marsh habitat. The projects involve numerous protection and restoration methods, including rock armored shoreline protection breakwaters, dredged material marsh construction, marsh terracing and planting, fresh water and sediment diversion projects, and modification or management of existing structures. Collectively these projects are expected to significantly reduce the continued loss of wetlands within coastal Louisiana. There are also many other wetland restoration projects that are funded by state, local or private interests in the region.

Table 10: GNOHSDRRS Impacts and Compensatory Mitigation to be Completed											
IER	**Parish**		**Non-wet BLH (acres)**	**Non-wet BLH AAHUs**	**BLH (acres)**	**BLH AAHUs**	**Swamp (acres)**	**Swamp AAHUs**	**Marsh (acres)**	**Marsh AAHUs**	**EFH (acres)**
1 LPV, LaBranche Wetlands Levee	St. Charles	Protected Side	-	-	-	-	137	74	-	-	-
		Flood Side	-	-	11	8	144	111	-	-	-
2 LPV, West Return Floodwall	St. Charles, Jefferson	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	33	9	33
3 LPV, Lakefront Levee	Jefferson	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	26
15 WBV, Lake Cataouatche Levee	Jefferson	Protected Side	-	-	24	6	-	-	-	-	-
		Flood Side	-	-	4	1	-	-	-	-	-
18 GFBM	Jefferson, Plaquemines, St. Charles	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
18 GFBM	Orleans	Protected Side	226	69	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
18 GFBM	St. Bernard	Protected Side	74	44	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
19 CFBM	Hancock County, MS; Iberville; Orleans; Plaquemines; St. Bernard	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
19 CFBM	Jefferson	Protected Side	7*	N/A	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
22 GFBM	Jefferson	Protected Side	158	90	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
22 GFBM	Plaquemines	Protected Side	87	29	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
23 CFBM	Hancock County, MS; Plaquemines; St. Bernard; St. Charles	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
Totals		Protected Side	552	232	24	6	137	74	-	-	-
		Flood Side	-	-	15	9	144	111	-	-	26
		Both	552	232	39	15	281	185	-	-	26

* Impacts not related to Federal action – already mitigated for through the 404 program (Section 404 of the Clean Water Act [33 USC 1344]).
- Not applicable to the IER or number impacted is 0.
AAHU – average annual habitat unit, BLH – bottomland hardwood, CFBM – contractor-furnished borrow material, GFBM – government-furnished borrow material

The Water Resources Development Act of 2007 (WRDA 07) became law in November 2007. This bill authorized several additional projects and studies in the general vicinity of the IER # 3 project area, including the LPV and WBV GNOHSDRRS projects to raise protection levels to 100-year levels, as well as coastal restoration projects, Morganza-to-the-Gulf hurricane protection, hurricane protection in Jean Lafitte and lower Jefferson Parish, a study of coastal area damage that could be attributable to the ACE, the MRGO deep-draft deauthorization, an EIS for the IHNC lock, and the formation of a Coastal Louisiana Ecosystem Protection and Restoration Task Force (Alpert 2007). The majority of these projects or studies still require specific appropriations. The WRDA does not guarantee financing of these projects, but does allow Congress to allocate money for them in future spending bills (Alpert 2007). These additional projects could contribute to resource impacts, either adversely or with long-term positive impacts. All of these projects are in the general area of the IER # 3 project area and could contribute to cumulative impacts to resources.

In addition, local sponsors are initiating or considering initiating other actions related to the proposed actions. The East Jefferson Levee District is placing more than 1,000 3-ton highway traffic barriers along the Lake Pontchartrain shoreline to help slow the rate of erosion in East Jefferson Parish. The Southeast Louisiana Flood Protection Authority-East is planning on constructing a new breakwater along portions of the IER # 3 project area. Over 100,000 tons of rock will be used, primarily along reaches 1 and 4, with another 8,000 tons of rock used along the remaining reaches in the IER # 3 project area. The Greater New Orleans Expressway Commission (GNOEC) is also considering additional Causeway improvements associated with the USACE GNOHSDRRS project at the Causeway. These improvements could include roadway modification to maintain the new ramp height of 16.5 ft from the GNOHSDRRS levee out onto the Causeway itself as well as additional roadway modifications. Since these projects are in the IER # 3 project area, they could contribute to resource impacts. Although some of them could contribute to adverse impacts for some of the resources, several of them would have long-term positive impacts, including improved hurricane, storm, and flood damage protection.

The proposed action would have cumulative beneficial impacts to socioeconomic resources in the New Orleans Metropolitan area. It is part of the ongoing Federal effort to reduce the threat to life, health, and property posed by flooding. The LPV project would be improved to provide additional hurricane, storm, and flood damage protection, reducing the threat of inundation of infrastructure due to severe tropical storm events. The combined effects from construction of the multiple projects underway and planned to rebuild the GNOHSDRRS in the area would reduce flood risk and storm damage to residences, businesses, and other infrastructure from storm-induced and tidally-driven flood events and, thereby, encourage recovery. Providing 100-year level of protection within all reaches of the LPV allows for FEMA certification of that level of protection. Improved hurricane, storm, and flood damage protection would benefit all residents, regardless of income or race, increase confidence, reduce insurance rates, and allow for development and redevelopment of existing urban areas.

In conclusion, although there are many ongoing and planned projects that would similarly impact resources in the Lake Pontchartrain Basin portion of Louisiana most of the resulting impacts would be temporary. Those adverse impacts that would not be temporary in nature would be directly mitigated or would be indirectly mitigated by other projects in the region that would

provide positive long-term impacts to the same resource (e.g., wetlands or EFH). Cumulative impacts to social and economic resources would not only be beneficial, but are considered essential.

5.0 SELECTION RATIONALE

The proposed action (preferred alternative) consists of rebuilding earthen levees, upgrading foreshore protection, replacing floodgates, and constructing fronting protection and modifying or adding breakwaters for pumping stations. The proposed action was selected because it provides adequate structural measures to meet the 100-year level of flood protection for Jefferson Parish, does not disturb existing commercial, industrial or public complexes, minimizes the encroachment on existing transportation infrastructure, and would be possible within the time constraints and technology available, while minimizing impacts to natural resources like wetlands, fisheries, wildlife, and threatened or endangered species.

6.0 COORDINATION AND CONSULTATION

6.1 PUBLIC INVOLVEMENT

Extensive public involvement has been sought in preparing this IER. The projects analyzed in this IER were publicly disclosed and described in the Federal Register on 13 March 2007, and on the website www.nolaenvironmental.gov. Scoping for this project was initiated on 12 March 2007, through placing advertisements and public notices in USA Today and The New Orleans Times-Picayune. Nine public scoping meetings were held throughout the New Orleans Metropolitan area to explain the scope and process of the Alternative Arrangements for implementing NEPA between 27 March and 12 April 2007, after which a 30-day scoping period was open for public comment submission. Additionally, the CEMVN is hosting monthly public meetings to keep the stakeholders advised of project status. Specific public meetings discussing IER # 3 were held on 7 May 2007; 7 June 2007; 27 September 2007; 6 December 2007; 28 February 2008; and 9 April 2008. The public is able to provide verbal comments during the meetings and written comments after each meeting in person, by mail, and via www.nolaenvironmental.gov.

The draft IER was made available for a 30-day public review and comment period. The document was posted on www.nolaenvironmental.gov. A notice of availability was mailed/e-mailed to interested parties advising them of the availability of the draft IER for review. Additionally, a notice was placed in national and local newspapers. Upon completion of the 30-day review period, all comments were compiled and appropriately addressed. Upon resolution of comments received, this final IER was prepared, signed by the District Commander, and made available to any stakeholders requesting a copy.

6.2 AGENCY COORDINATION

The following agencies, as well as other interested parties, received copies of the draft IER:

U.S. Department of the Interior, Fish and Wildlife Service
U.S. Department of the Interior, National Park Service
U.S. Environmental Protection Agency, Region VI
U.S. Department of Commerce, NOAA National Marine Fisheries Service
U.S. Natural Resources Conservation Service
Governor's Executive Assistant for Coastal Activities
Louisiana Department of Wildlife and Fisheries
Louisiana Department of Natural Resources, Coastal Management Division
Louisiana Department of Natural Resources, Coastal Restoration Division
Louisiana Department of Environmental Quality
Louisiana State Historic Preservation Officer

Water quality certification for the proposed project was received from LDEQ on 27 May 2008.

The USFWS reviewed the proposed action to see if it would affect any threatened or endangered species, or their critical habitat. The USFWS concurred with the CEMVN in a letter dated 5 May 2008, that the proposed action would not have adverse impacts on threatened or endangered species (appendix D).

The NMFS reviewed the proposed action to see if it would affect any threatened or endangered species, or their critical habitat. The NMFS concurred with the CEMVN in a letter dated 28 May 2008, that the proposed action would not have adverse impacts on threatened or endangered species or their critical habitat (appendix D).

The LDNR reviewed the proposed action for consistency with the Louisiana Coastal Resources Program (LCRP). The proposed actions were found to be consistent with the LCRP, as per a letter dated 22 May 2008 (appendix D).

Section 106 of the National Historic Preservation Act, as amended, requires consultation with the Louisiana SHPO and Native American tribes. Eleven Federally-recognized tribes that have an interest in the region were given the opportunity to review the proposed action. The SHPO concurred with the CEMVN “no historic properties affected” finding in a letter dated 7 January 2008, and the Choctaw Nation of Oklahoma and the Chitimacha Tribe of Louisiana concurred with the effect determination in letters dated 26 December 2007 and 27 December 2007, respectively. Subsequently, the SHPO and the Quapaw Tribe of Oklahoma and the Choctaw Nation of Oklahoma concurred with the CEMVN "no historic properties affected" finding for the four proposed flotation channels in a letter dated 20 March 2008, email dated 4 March 2008, and a letter dated 3 April 2008, respectively (appendix D). No other indian tribes responded to the requests for comment.

Coordination with the USFWS on the Alternative Arrangements process was initiated by letter on 13 March 2007, and concluded on 6 August 2007. A draft Fish and Wildlife Coordination

Act Report (CAR) was provided by the USFWS on 11 January 2008. This report concludes that there would be no habitat impacted as a result of the proposed action. The draft CAR provides fish and wildlife conservation recommendations that would be implemented concurrently with project implementation. Additional project documentation regarding dredging of access channels in Lake Pontchartrain perpendicular to each of the four pumping stations was subsequently provided to the USFWS. The USFWS responded with a supplemental letter on 17 January 2008, which recommends backfilling all access channels in the lake and the use of silt curtains. In addition, as discussed previously in section 3.2.6, measures recommended by the USFWS in their letter dated 22 February 2008, for protection of the manatee would be followed during construction of the proposed action. A copy of the CAR and supplemental letters are provided in appendix D.

The USFWS' programmatic recommendations applicable to this project will be incorporated into project design studies to the extent practicable, consistent with engineering and public safety requirements. The USFWS' programmatic recommendations, and the CEMVN's response to them, are listed below:

> Recommendation 1: To the greatest extent possible, situate flood protection so that destruction of wetlands and non-wet bottomland hardwoods are avoided or minimized.
>
> CEMVN Response 1: The project will utilize the authorized level of protection footprint and minimize impacts to wetlands.
>
> Recommendation 2: Minimize enclosure of wetlands with new levee alignments. When enclosing wetlands is unavoidable, acquire non-development easements on those wetlands, or maintain hydrologic connections with adjacent, un-enclosed wetlands to minimize secondary impacts from development and hydrologic alteration.
>
> CEMVN Response 2: The proposed action does not enclose any additional wetlands and its alignment remains along the same route as the existing alignment.
>
> Recommendation 3: Avoid adverse impacts to bald eagle nesting locations and wading bird colonies through careful design project features and timing of construction.
>
> CEMVN Response 3: Concur. No bald eagle nests have been recorded in or near the project area.
>
> Recommendation 4: Forest clearing associated with project features should be conducted during the fall or winter to minimize impacts to nesting migratory birds, when practicable.
>
> CEMVN Response 4: No forest clearing will occur with implementation of the proposed action.

Recommendation 5: The project's first Project Cooperation Agreement (or similar document) should include language that includes the responsibility of the local-cost sharer to provide operational, monitoring, and maintenance funds for mitigation features.

CEMVN Response 5: Corps Project Partnering Agreements (PPA) do not contain language mandating the availability of funds for specific project features, but require the non-Federal Sponsor to provide certification of sufficient funding for the entire project. Further, mitigation components are considered a feature of the entire project. The non-Federal Sponsor is responsible for Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) of all project features in accordance with the OMRR&R manual that the Corps provides upon completion of the project.

Recommendation 6: Further detailed planning of project features (e.g., Design Documentation Report, Engineering Documentation Report, Plans and Specifications, or other similar documents) should be coordinated with the USFWS, NMFS, LDWF, USEPA, and LDNR. The USFWS shall be provided an opportunity to review and submit recommendations on all the work addressed in those reports.

CEMVN Response 6: Concur.

Recommendation 7: The CEMVN should avoid impacts to public lands, if feasible. If not feasible, the CEMVN should establish and continue coordination with agencies managing public lands that may be impacted by a project feature until construction of that feature is complete and prior to any subsequent maintenance. Points of contacts for the agencies overseeing public lands potentially impacted by project features are: Kenneth Litzenberger, Project Leader for the USFWS' Southeast National Wildlife Refuges, and Jack Bohannan (985) 822-2000, Refuge Manager for the Bayou Sauvage National Wildlife Refuge (NWR), Office of State Parks contact Mr. John Lavin at 1-888-677-1400, National Park Service (NPS) contact Superintendent David Luchsinger, (504) 589-3882, extension 137 (david_luchsinger@nps.gov), or Chief of Resource Management David Muth (504) 589-3882, extension 128 (david_muth@nps.gov) and for the 404(c) area contact the previously mentioned NPS personnel and Ms. Barbara Keeler (214) 665-6698 with the USEPA.

CEMVN Response 7: Concur.

Recommendation 8: If applicable, a General Plan should be developed by the CEMVN, the USFWS, and the managing natural resource agency in accordance with Section 3(b) of the FWCA for mitigation lands.

CEMVN Response 8: Concur.

Recommendation 9: If mitigation lands are purchased for inclusion within a NWR, those lands must meet certain requirements; a summary of some of those requirements is provided in Appendix A (to the draft Fish and Wildlife Coordination Act Report.) Other land-managing natural resource agencies may have similar requirements that must be met prior

to accepting mitigation lands; therefore, if they are proposed as a manager of a mitigation site, they should be contacted early in the planning phase regarding such requirements.

CEMVN Response 9: Concur.

Recommendation 10: If a proposed project feature is changed significantly or is not implemented within one year of the date of the Endangered Species Act consultation letter, the USFWS recommended that the Corps reinitiate coordination to ensure that the proposed project would not adversely affect any Federally-listed threatened or endangered species or their habitat.

CEMVN Response 10: Concur.

Recommendation 11: In general, larger and more numerous openings in a protection levee better maintain estuarine-dependent fishery migration. Therefore, as many openings as practicable, in number, size, and diversity of locations should be incorporated into project levees.

CEMVN Response 11: This recommendation will be considered in the design of the project to the greatest extent practicable. However, the project primarily addresses modifications in height to the levee system, not the construction of new levees.

Recommendation 12: Flood protection water control structures in any watercourse should maintain pre-project cross-sections in width and depth to the maximum extent practicable, especially structures located in tidal passes.

CEMVN Response 12: Acknowledged.

Recommendation 13: Flood protection water control structures should remain completely open except during storm events. Management of those structures should be developed in coordination with the USFWS, NMFS, LDWF, and LDNR.

CEMVN Response 13: Acknowledged.

Recommendation 14: Any flood protection water control structure sited in canals, bayous, or a navigation channel which does not maintain the pre-project cross-section should be designed and operated with multiple openings within the structure. This should include openings near both sides of the channel as well as an opening in the center of the channel that extends to the bottom.

CEMVN Response 14: This recommendation will be considered in the design of the project to the greatest extent practicable.

Recommendation 15: The number and siting of openings in flood protection levees should be optimized to minimize the migratory distance from the opening to enclosed wetland habitats.

CEMVN Response 15: Not applicable.

Recommendation 16: Flood protection structures within a waterway should include shoreline baffles and/or ramps (e.g., rock rubble, articulated concrete mat) that slope up to the structure invert to enhance organism passage. Various ramp designs should be considered.

CEMVN Response 16: Not applicable.

Recommendation 17: To the maximum extent practicable, structures should be designed and/or selected and installed such that average flow velocities during peak flood or ebb tides do not exceed 2.6 ft per second. However, this may not necessarily be applicable to tidal passes or other similar major exchange points.

CEMVN Response 17: Not applicable.

Recommendation 18: To the maximum extent practicable, culverts (round or box) should be designed, selected, and installed such that the invert elevation is equal to the existing water depth. The size of the culverts selected should maintain sufficient flow to prevent siltation.

CEMVN Response 18: Concur.

Recommendation 19: Culverts should be installed in construction access roads unless otherwise recommended by the natural resource agencies. At a minimum, there should be one 24-inch culvert placed every 500 ft and one at natural stream crossings. If the depth of water crossings allow, larger-sized culverts should be used. Culvert spacing should be optimized on a case-by-case basis. A culvert may be necessary if the road is less than 500 ft long and an area would hydrologically be isolated without that culvert.

CEMVN Response 19: Concur.

Recommendation 20: Water control structures should be designed to allow rapid opening in the absence of an offsite power source after a storm passes and water levels return to normal.

CEMVN Response 20: Acknowledged.

Recommendation 21: Levee alignments and water control structure alternatives should be selected to avoid the need for fishery organisms to pass through multiple structures (i.e., structures behind structures) to access an area.

CEMVN Response 21: Not applicable.

Recommendation 22: Operational plans for water control structures should be developed to maximize the cross-sectional area open for as long as possible. Operations to maximize freshwater retention or redirect freshwater flows could be considered if hydraulic modeling demonstrates that is possible and such actions are recommended by the natural resource agencies.

CEMVN Response 22: Not applicable.

Recommendation 23: The CEMVN shall fully compensate for any unavoidable losses of wetland habitat or non-wet bottomland hardwoods caused by project features.

CEMVN Response 23: Concur.

Recommendation 24: Acquisition, habitat development, maintenance and management of mitigation lands should be allocated as first-cost expenses of the project, and the local project-sponsor should be responsible for operational costs. If the local project-sponsor is unable to fulfill the financial mitigation requirements for operation, then the CEMVN shall provide the necessary funding to ensure mitigation obligations are met on behalf of the public interest.

CEMVN Response 24: Construction of the project features are cost shared between the Government and the non-Federal sponsor. However, costs for operation, maintenance, repair, replacement, and rehabilitation will be the responsibility of the non-Federal sponsor.

Recommendation 25: Any proposed change in mitigation features or plans should be coordinated in advance with the USFWS, NMFS, LDWF, USEPA, and LDNR.

CEMVN Response 25: Mitigation for the impacts caused by this project will be coordinated through a mitigation IER. Any material changes to the mitigation plan in this IER would be coordinated in advance.

Recommendation 26: A report documenting the status of mitigation implementation and maintenance should be prepared every three years by the managing agency and provided to the CEMVN, USFWS, NMFS, USEPA, LDNR, and LDWF. That report should also describe future management activities, and identify any proposed changes to the existing management plan.

CEMVN Response 26: Concur.

The USFWS project-specific recommendations for the IER # 3 proposed action are listed below. Each recommendation is followed by the CEMVN response.

Recommendation 1: All gates and/or culverts being replaced or modified should be operated according to previously developed operational plans to avoid further degradation of the project area.

CEMVN Response 1: Concur.

Recommendation 2: The Service shall be provided an opportunity to review and submit recommendations on the draft plans and specifications for all levee work addressed in this report.

CEMVN Response 2: Concur.

Recommendation 3: Any proposed change in levee, floodwall, or drainage structure features, locations or plans shall be coordinated in advance with the Service, NMFS, LDWF, and Louisiana Department of Natural Resources.

CEMVN Response 3: Concur.

Recommendation 4: If the proposed project has not been constructed within one year or if changes are made to the proposed project, the Corps should re-initiate ESA consultation with the Service to ensure that the proposed project would not adversely affect any Federally listed threatened or endangered species or their habitat.

CEMVN Response 4: Concur.

Recommendation 5: The Service recommends backfilling all access channels in Lake Pontchartrain after construction is complete. In order to have sufficient material to backfill the access channels and minimize turbidity in the lake, the Service also recommends the use of silt curtains.

CEMVN Response 5: Concur.

7.0 MITIGATION

Quantitative analysis utilizing existing methodologies for water resource planning has identified the acreages and habitat type for the direct or indirect impacts of implementing the proposed action. Although the proposed actions were selected because they would minimize impacts to the surrounding environment, approximately 116 acres of lake habitat could be temporarily impacted, and approximately 26 acres could be permanently impacted (lost to hard fill). However, those 26 acres would be mitigated for in coordination with NMFS.

Best management practices to reduce sediment loading to the surface water of Lake Pontchartrain canals and wetland areas would be used and would reduce effects on water quality and aquatic life, specifically EFH. Other temporary impacts on the lake bottom that could result from dredging to provide access to the shoreline for delivery of fill and riprap could be limited by accessing areas by land when feasible. Dredging pathways would avoid SAV, emergent vegetation, and any areas known to have sediment contamination. Any EFH-related impacts from the proposed actions would be compensated based on the agreed terms between the CEMVN and NMFS.

A complementary comprehensive mitigation IER will be prepared documenting and compiling these unavoidable impacts and those for all other proposed actions within the Lake Pontchartrain and Vicinity Hurricane Protection Project that are being analyzed through other IERs. Mitigation planning is being carried out for groups of IERs, rather than within each IER, so that large mitigation efforts could be taken rather than several smaller efforts, increasing the relative economic and ecological benefits of the mitigation effort.

Mitigation for unavoidable impacts to the human and natural environment described in this and other IERs will be addressed in separate mitigation IERs. The CEMVN has partnered with Federal and state resource agencies to form an interagency mitigation team that is working to assess and verify these impacts, and to look for potential mitigation sites in the appropriate hydrologic basin. This effort is occurring concurrently with the IER planning process in an effort to complete mitigation work and construct mitigation projects expeditiously. As with the planning process of all other IERs, the public will have the opportunity to give input about the proposed work. These mitigation IERs will, as described in section 1 of this IER, be available for a 30-day public review and comment period.

These forthcoming mitigation IERs would implement compensatory mitigation as early as possible. All mitigation activities would be consistent with standards and policies established in the Clean Water Act Section 404 and the appropriate USACE policies and regulations governing this activity.

8.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

Construction of the proposed action would not commence until the proposed action achieves environmental compliance with all applicable laws and regulations, as described below.

Environmental compliance for the proposed action would be achieved upon coordination of this IER with appropriate agencies, organizations, and individuals for their review and comments; the USFWS and NMFS confirmation that the proposed action would not be likely to adversely affect any endangered or threatened species or completion of ESA Section 7 consultation; the LDNR concurrence with the determination that the proposed action is consistent, to the maximum extent practicable, with the Louisiana Coastal Resources Program; receipt of a Water Quality Certificate from the state of Louisiana; public review of the Section 404(b)(1) Public Notice and signature of the Section 404(b)(1) Evaluation; coordination with the Louisiana SHPO; receipt and acceptance or resolution of all Fish and Wildlife Coordination Act recommendations; receipt and acceptance or resolution of all Louisiana Department of Environmental Quality (LDEQ) comments on the air quality impact analysis documented in the IER; and receipt and acceptance or resolution of all EFH recommendations.

9.0 CONCLUSIONS

9.1 FINAL DECISION

The proposed action for reaches LPV 00, 01, 02, 19, and 20 consists of raising the levee from its current height of 16.5 ft to 17.5 ft, modifying the levee to widen the levee crown from 7 ft to 10 ft in a straddle configuration to the extent possible (a slight flood-side shift could be incorporated as needed), and adding rock foreshore protection to 6 ft at 150 ft from the centerline on the flood- side of the existing breakwater.

The proposed action for reaches LPV 9, 10, 11, and 12 consists of adding fronting protection to each of the pumping stations. The fronting protection is similar to a concrete T-wall, with a sluice or vertical-lift gate to allow discharge from the pumping station. The fronting protection would be constructed to an approximate height of 17 ft, and new T-wall tie-ins would be constructed to connect the new fronting protection to the adjacent levee reaches at a height of 17 ft. However, the fronting protection at pumping station #3 (Elmwood) would be constructed to 21 ft at the pumping station with tie-in walls constructed to an elevation 19 ft if modification of its breakwater does not occur.

In addition, modifications and/or construction of breakwaters would be incorporated at pumping stations # 1 (LPV 9), #2 (LPV 10), # 3 (LPV 11), and # 4 (LPV12). The breakwaters would be constructed out of concrete and steel, with a 2-foot rock layer at the lake bottom, and would be located where the drainage canals meet Lake Pontchartrain. At pumping station # 1, a new breakwater would be added at a height of 14 ft and would extend from onshore into the lake. At pumping stations # 2 (Suburban) and # 3 (Elmwood), the existing breakwaters would be modified to increase their height from 6.5 ft to approximately 10 ft. At pumping station # 4 (Duncan), a new breakwater would be added at a height of 14 ft and would begin approximately 150 ft offshore; it would be connected to shore by a bridge. In addition, the existing bridge in the discharge channel of pumping station # 4 would be demolished and replaced with a bridge approximately 450 ft north of its present location.

The proposed action for reaches LPV 16 and 18 (gate structures at Bonnabel and Williams Blvd boat launches) consists of demolition of the existing floodwalls and gates and construction of new T-walls, I-wall transitions, and gates. The new gate structure would include a rolling gate closure at a height of 16.5 ft.

The proposed action for LPV 17 (bridge abutment and floodwall tie-ins for Causeway Bridge) consists of extending the existing levee system across Causeway Blvd. The new levee would have a crown/crest height of 16.5 ft. Causeway Blvd would be modified, beginning at 6th Street, and would slope up to the crest elevation of the levee. The roadway would then slope back down to the elevation of the bridge abutment. The new road would be supported by vertically mechanically stabilized earth walls to minimize the impact at the base and allow construction of sidewalks and accesses to existing buildings and streets.

Staging areas would be required for the materials used in construction of these alternatives and several channels would be dredged in Lake Pontchartrain to provide barge access to the

shoreline. Staging areas and channel access would be placed in areas that minimize impacts to sensitive habitats.

The CEMVN has assessed the environmental impacts of the proposed action and has determined that the proposed action would have the following impacts:

Lake Pontchartrain

- Reaches LPV 00, 01, 02, 19, and 20 (levee reaches) – 22 acres of lake lost to hard fill and mitigated.
- Reaches LPV 09, 10, 11, and 12 (pumping stations) – 4.4 acres of lake lost to hard fill and mitigated.
- Reaches LPV 16, 17, and 18 (boat launches and Causeway bridge) – No habitat loss.

Wetlands

- Reaches LPV 00, 01, 02, 19, and 20 (levee reaches) – No wetlands impacted.
- Reaches LPV 09, 10, 11, 12, 16, 17, and 18 (pumping stations, boat launches, and Causeway bridge) – No wetland loss.

Fisheries

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 19, and 20 (levee reaches and pumping stations) – temporary impacts to 116 acres and permanent loss 26 acres of lake.
- Reaches LPV 16, 17, and 18 (boat launches and Causeway bridge) – very limited, temporary construction related impacts.

EFH

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 19, and 20 (levee reaches and pumping stations) – 26 acres of lake (shell/silty-sand/mud bottom and water column) lost to hard fill and mitigated.
- Reaches LPV 16, 17, and 18 (boat launches and Causeway bridge) – very limited, temporary construction related impacts.

Wildlife

- Reaches LPV 00, 01, 02, 19, and 20 (levee reaches) – reduction in lake habitat, utilized primarily by avian species and temporary impacts to wildlife within the vicinity of the project area during construction.
- Reaches LPV 09, 10, 11, 12, 16, 17, and 18 (pumping stations, boat launches, and Causeway bridge) – temporary impacts to wildlife within the vicinity of the project area during construction.

Endangered or Threatened Species

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 16, 17, 18, 19, and 20 (levee reaches, pumping stations, boat launches, and Causeway bridge) – unlikely to have adverse impacts. Access channel construction at Bonnabel pumping station would result in temporary impacts to Gulf sturgeon critical habitat of 29 acres; construction of the fronting protection and breakwater would result in permanent impacts to 1.7 acres. The NMFS concurred with CEMVN's determination that the proposed action would not have adverse impacts on threatened or endangered species or their critical habitat in a letter dated 28 May 2008.

Cultural Resources

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 16, 17, 18, 19, and 20 (levee reaches, pumping stations, boat launches, and Causeway bridge) – SHPO consultation concluded that no cultural resources would be impacted.

Recreation

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 19, and 20 (levee reaches and pumping stations) – Temporary adverse impacts from closure of the bike/multi-purpose path during construction and potential damage to path that would presumably be rebuilt by the local sponsor. Beneficial impacts include the protection of recreational resources from storm surge damage and enhanced access to lake fishing.
- Reaches LPV 16, 17, and 18 (boat launches and Causeway bridge) – Temporary adverse impacts may occur during construction due to closure of recreation facilities at reaches LPV 16 and 18 and impacts to fishing at reach LPV 17.

Aesthetics (Visual) Resources

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 16, 17, 18, 19, and 20 (levee reaches, pumping stations, boat launches, and Causeway bridge) – temporary impact by construction activities at the project sites and the addition man-made features (breakwaters) to the shoreline adjacent to pumping stations # 1 and # 4.

Air Quality

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 16, 17, 18, 19, and 20 (levee reaches, pumping stations, boat launches, and Causeway bridge) – temporary site-specific construction effects including exhaust and dust emissions.

Noise

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 16, 17, 18, 19, and 20 (levee reaches, pumping stations, boat launches, and Causeway bridge) – temporary impacts to receptors within 1,000 ft of the project area during construction and to receptors living near the lakefront during access channel dredging.

Transportation

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 16, 17, 18, 19, and 20 (levee reaches, pumping stations, boat launches, and Causeway bridge) – worker and truck traffic resulting from the project would temporarily impact traffic on highways within the vicinity of the project area.

Socioeconomic Resources

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 16, 17, 18, 19, and 20 (levee reaches, pumping stations, boat launches, and Causeway bridge) – beneficial impacts on population, land use and employment due to heightened protection and construction-generated expenditures.

Environmental Justice

- Reaches LPV 00, 01, 02, 09, 10, 11, 12, 16, 17, 18, 19, and 20 (levee reaches, pumping stations, boat launches, and Causeway bridge) – no disproportionate impact on low-income or minority residents.

9.2 PREPARED BY

The point of contact for this IER is Elizabeth Behrens, USACE, CEMVN-PM-RS. Table 11 lists the preparers of relevant sections of this report. Ms. Behrens can be reached at the U.S. Army Corps of Engineers, New Orleans District; Protection and Restoration Office, P.O. Box 60267, 7400 Leake Avenue; New Orleans, Louisiana 70118.

Table 11. Environmental Assessment Preparation Team	
EA Section	**Team Member**
Environmental Project Manager	Elizabeth Behrens, USACE
Task Manager/Proposed Action/alternatives	Roberta Hurley, Earth Tech
Aquatic Resources/Wetlands	Leslie Howard, Earth Tech
Terrestrial Resources/Threatened or Endangered Species	Stephen Dillard, Earth Tech
Land Use, Population, Employment/ Noise	Susan Provenzano, AICP, Earth Tech
Transportation	John Schrohenloher, PE, Earth Tech
Air Quality	Fang Yang, Earth Tech
Environmental Justice	Edwin Lyon, USACE
Cultural Resources	Michael Swanda, USACE
Recreation	Andrew Perez, USACE
Aesthetics (Visual)	Richard Radford, USACE
HTRW	Darlene Venable, PG, Earth Tech
Administrative Support	Bonnie Freeman, Earth Tech

9.3 LITERATURE CITED

REFERENCES

16 USC 703. United States Code, Title 16, *Conservation*, Chapter 7, "Protection of Migratory Game and Insectivorous Birds," Subchapter II, Migratory Bird Treaty.

16 USC 1531. United States Code, Title 16, *Conservation*, Chapter 35, "Endangered Species."

16 USC 1802. United States Code, Title 16, *Conservation*, Chapter 38, "Fishery Conservation and Management," Section 1802, Definitions.

16 USC 1853. United States Code, Title 16, *Conservation*, Chapter 38, "Fishery Conservation and Management," Section 1853, Contents of Fishery Management Plans.

33 USC 1344. United States Code, Title 33, *Navigation and Navigable Waters*, Chapter 26, "Water Pollution Prevention and Control," Section 1344, Permits for Dredged or Fill Material.

33 CFR 230. Code of Federal Regulations, Title 33, *Navigation and Navigable Waters*, Chapter II – "Corps of Engineers, Department of the Army, Department of Defense," Part 230, Procedures for Implementing NEPA.

33 CFR 328. Code of Federal Regulations, Title 33, *Navigation and Navigable Waters*, Chapter II - "Corps of Engineers, Department of the Army, Department of Defense," Part 328, Definition of Waters of the United States.

33 CFR 329. Code of Federal Regulations, Title 33, *Navigation and Navigable Waters*, Chapter II - "Corps of Engineers, Department of the Army, Department of Defense," Part 329, Definition of Navigable Waters of the United States.

40 CFR 50. Code of Federal Regulations, Title 40, *Protection of Environment*, Part 50, "National Ambient Air Quality Standards."

40 CFR 1500-1508. Code of Federal Regulations, Title 40, *Protection of Environment*, Chapter V – "Council on Environmental Quality," Parts 1500-1508, National Environmental Policy Act.

50 CFR 600. Code of Federal Regulations, Title 50, *Wildlife and Fisheries*, Part 600, "Magnuson-Stevens Act Provisions."

Abadie, S.W., C.G. Brantley, S. Mickal, and S. Shively. 2000. Distribution of the Manatee (*Trichechus manatus*) In the Lake Pontchartrain Estuarine System. Basics of the Basin Research Symposium.

Abadie, S.W., and M.A. Poirrier. 2000. "Increased Density of Large Rangia Clams in Lake Pontchartrain after the Cessation of Shell Dredging." *Journal of Shellfish Research*, Vol. 19(1), pp. 481-485.

Alpert, Bruce. 2007. "Congress overrides Bush water bill veto" *The Times-Picayune*, November 8, 2007. Accessed from http://blog.nola.com/times-picayune/2007/11/congress_overrides_bush_veto_o.html.

Barrett, B.B. 1976. *An Inventory and Study of the Lake Pontchartrain-Lake Maurepas Estuarine Complex*. Louisiana Wildlife and Fisheries Commission. Technical Bulletin No. 19, pp. 145-157.

Benson, N.G., ed. 1982. "White Shrimp *Penaeus setiferus*." Page 7-9 in *Life History Requirements of Selected Finfish and Shellfish in Mississippi Sound and Adjacent Areas*. U.S. Fish and Wildlife Service (USFWS), Biological Service Program. FWS/OBS-81/51. 97 pp.

Cho, H. and M. Poirrier. 2002. "Biological Resources - Submersed Aquatic Vegetation." In *Environmental Atlas of the Lake Pontchartrain Basin*, Lake Pontchartrain Basin Foundation, eds. S. Penland, A. Beall and J. Kindinger. New Orleans, Louisiana: U.S. Geological Survey Open File Report 02-206. Accessed from http://coastal.er.usgs.gov/pontchartrain/atlas.

Conant, R. and J. T. Collins. 1998. *A Field Guide to Reptiles and Amphibians of Eastern and Central North America*, third edition, expanded. Houghton Mifflin Company, New York.

Dunn, J. L. and J. Alderfer. 2006. *National Geographic Field Guide to the Birds of North America*, fifth edition. National Geographic, Washington, D.C.

Federal Highway Administration (FHWA). 2006. "Highway Construction Noise Handbook." Final Report. FHWA, U.S. Department of Transportation. August 2006. Accessed 20 September, 2007 from http://www.fhwa.dot.gov/environment/noise/handbook/index.htm.

Felley, J. D. 1992. "Medium – Low-Gradient Streams of the Gulf Coastal Plain." Chapter 6 in *Biodiversity of the Southeastern United States: Aquatic Communities*, eds. C. T. Hackney, S. M. Adams, and W. H. Martin. New York: John Wiley & Sons.

Flocks, J., F. Manheim, M. Marot, and D. Willard. 2002. "Basin Geology – Quarternary Framework." In *Environmental Atlas of the Lake Pontchartrain Basin*, Lake Pontchartrain Basin Foundation, eds. S. Penland, A. Beall and J. Kindinger. New Orleans, Louisiana: U.S. Geological Survey Open File Report 02-206. Accessed from http://coastal.er.usgs.gov/pontchartrain/atlas.

Frierson, G. 2002. "Biological Resources by Region; Bayou La Branche and New Orleans Lakefront Regions" maps. In *Environmental Atlas of the Lake Pontchartrain Basin*, Lake Pontchartrain Basin Foundation, eds. S. Penland, A. Beall and J. Kindinger. New Orleans, Louisiana: U.S. Geological Survey Open File Report 02-206. Accessed from http://coastal.er.usgs.gov/pontchartrain/atlas.

Georgiou, I.Y., and J.A. McCorquodale. 2002. "Stratification and Circulation Patterns in Lake Pontchartrain," in *Estuarine and Coastal Modeling*. M.L. Spaulding and B. Lee H., eds., ASCE, New York, pp. 875-887.

Gulf of Mexico Fishery Management Council (GMFMC). 1998a. Generic Amendment for Addressing Essential Fish Habitat Requirements in the following Fishery Management Plans of the Gulf of Mexico: Shrimp Fishery of the Gulf of Mexico, United States Waters, Red Drum Fishery of the Gulf of Mexico, Reef Fish Fishery of the Gulf of Mexico, Coastal Migratory Pelagic Resources (Mackerels) in the Gulf of Mexico and South Atlantic, Stone Crab Fishery of the Gulf of Mexico, Spiny Lobster in the Gulf of Mexico and South Atlantic, Coral and Coral Reefs of the Gulf of Mexico. National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS). October 1998.

---. 1998b. "Habitat Association Tables, Summary from the Generic Amendment for Addressing EFH Requirements." National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS). Accessed 7 July, 2007 from http://www.nmfs.noaa.gov/habitat/habitatprotection/profile/gulfcouncil.htm.

---. 2006. "Gulf of Mexico, Habitat Areas of Particular Concern" poster. National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS). Southeast Regional Office, St. Petersburg, Florida. Accessed 15 October, 2007 from http://sero.nmfs.noaa.gov/dhc/pdfs/gom_efhhapc_poster.pdf .

Harris, J.E. 2003. "Distribution of Gulf of Mexico sturgeon (*Acipenser oxyrinchus desotoi*) in relation to environmental parameters and the distribution of benthic invertebrates in the Suwannee River Estuary, Florida." Masters Thesis, University of Florida, Gainesville, FL, USA.

Heller, N., T. Nowack, R. Lackowicz, and A. Ivas. 2007. "Management Summary: Phase 1A Cultural Resources Records Review, Field Reconnaissance and Remote Sensing Program Performed for Lake Pontchartrain and Vicinity Project, Individual Environmental Report Area 3 (IER #3): Jefferson Parish, Louisiana." R. Christopher Goodwin & Associates, Inc. Prepared for the U.S. Army Corps of Engineers, New Orleans District.

Huff, J.A. 1975. "Life History of Gulf of Mexico Sturgeon, *Acipenser oxyrhynchus desotoi*, in Suwannee River, Florida." Florida Marine Research Publications, Number 16.

Intergovernmental Panel on Climate Change. 2001. "Climate Change 2001: The Scientific Basis." Contribution of Working Group I to the *Third Assessment Report of the Intergovernmental Panel on Climate Change*, eds. J.T. Houghton, Y. Ding, D.J. Griggs, M. Noguer, P.J. van der Linden, X. Dai, K. Maskell, and C.A. Johnson. Cambridge, United Kingdom and New York: Cambridge University Press, 881 pp.

Klima, E.F., K.N. Baxter, and F.J. Patella, Jr. 1982. "A review of the offshore shrimp fishery and the 1981 Texas closure." *Marine Fisheries Review*, 44(2-10):16-30.

LaCoast. 1993. "Lake Pontchartrain Basin: Summary of Basin Plan." Accessed September 2007 from http://www.lacoast.gov/landchange/basins/bs/bretsum.htm.

Lester, G. D., S.G. Sorensen, P.L. Faulkner, C.S. Reid, and I.E. Maxit. 2005. Louisiana Comprehensive Wildlife Conservation Strategy. Louisiana Department of Wildlife and Fisheries (LDWF). December 2005.

Louisiana Department of Environmental Quality (LDEQ), Louisiana Department of Natural Resources (LDNR), Louisiana Department of Wildlife and Fisheries (LDWF), Louisiana Oil Spill Coordinator's Office, Office of the Governor, National Oceanic and Atmospheric Administration (NOAA), and U.S. Department of the Interior. 2007. "The Louisiana Regional Restoration Planning Program, Final Regional Restoration Plan; Region 2." January 2007. Accessed at http://losco.state.la.us/LOSCOuploads/Newsflash/FRRP_Region2.pdf.

Louisiana Department of Labor (LDOL). 2002. "Louisiana Employment and Wages 2001." October 2002. Accessed from http://www.laworks.net/Downloads/LMI/2001pub.pdf.

---. 2005. "Louisiana Employment and Wages 2004." November 2005. Accessed from http://www.laworks.net/Downloads/LMI/2004pub.pdf.

---. 2006. "Louisiana Employment and Wages 2005." November 2006. Accessed from http://www.laworks.net/Downloads/LMI/2005pub.pdf.

---. 2007. "Annual Non-Rounded Not Seasonally Adjusted Labor Force, Employment, and Unemployment Data, Jefferson Parish and Louisiana." Louisiana Occupational Information System. March 2007. Accessed from http://www.voshost.com/analyzer/default.asp.

Louisiana Department of Transportation and Development (LADOTD). 2006. Functional Systems, based on 2000 Census. A map published by LADOTD, Office of Planning and Programming.

---. 2007. "LADOTD Estimated Annual Average Daily Traffic Sites." Accessed 14 December, 2007 from http://www.dotd.la.gov/highways/tatv/.

Louisiana Department of Wildlife and Fisheries (LDWF). 2005a. "Brown Pelican." Accessed August 2007 from http://www.wlf.louisiana.gov/experience/threatened/brownpelican.cfm.

---. 2005b. "Manatee." Accessed August 2007 from http://www.wlf.louisiana.gov/experience/threatened/manatee.cfm.

Louisiana Department of Wildlife and Fisheries and Louisiana Natural Heritage Program (LDWF and LNHP). 2007. "Rare Species & Habitats by Parish." Accessed October 2007 from http://www.wlf.state.la.us/experience/naturalheritage/rarespeciesandparishhabitats/.

Mayer, G.N. 1986. "The submerged aquatic vegetation of the Lake Pontchartrain estuarine system, Louisiana," M.S. Thesis, University of New Orleans.

Milanes, A. 2002. "Biological Resources at Risk" table. In *Environmental Atlas of the Lake Pontchartrain Basin*, Lake Pontchartrain Basin Foundation, eds. S. Penland, A. Beall and J. Kindinger. New Orleans, Louisiana: U.S. Geological Survey Open File Report 02-206. Accessed from http://coastal.er.usgs.gov/pontchartrain/atlas.

Milanes, A. and A. Peters. 2002. "Spatial distribution and relative abundance of estuarine living marine resources (ELMR) species in Mississippi Sound, Lake Borgne and Lake Pontchartrain" table. In *Environmental Atlas of the Lake Pontchartrain Basin*, Lake Pontchartrain Basin Foundation, eds. S. Penland, A. Beall and J. Kindinger. New Orleans, Louisiana: U.S. Geological Survey Open File Report 02-206. Accessed from http://coastal.er.usgs.gov/pontchartrain/atlas.

Moore, R. H. 1992. "Low-Salinity Backbays and Lagoons." Chapter 13 in *Biodiversity of the Southeastern United States: Aquatic Communities*, eds. C. T. Hackney, S. M. Adams, and W. H. Martin. New York: John Wiley & Sons.

National Highway Traffic Safety Administration (NHTSA). 2007. "Motor Vehicle Traffic Safety Facts, Jefferson Parish, Louisiana." NHTSA, U.S. Department of Transportation. Accessed 14 December, 2007 from http://www-nrd.nhtsa.dot.gov/departments/nrd30/ncsa/STSI/22_LA/2006/Counties/Louisiana_Jefferson%20Parish_2006.HTM.

National Marine Fisheries Service (NMFS) Galveston Laboratory. 1998. "Lake Pontchartrain and Lake Borgne Estuary Relative Abundance Map." National Oceanic and Atmospheric Administration (NOAA). Accessed 7 July, 2007 from http://galveston.ssp.nmfs.gov/research/fisheryecology/EFH/Relative/php/estuaries.asp.

National Marine Fisheries Service (NMFS). 2006. "Recommendations for the Contents of Biological Assessments and Biological Evaluations." Protected Resources Division, St. Petersburg, Florida. January.

---. 2007. Letter from D. M. Bernhart, Assistant Regional Administrator, Protected Resources Division, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Regional Office, St. Petersburg, Florida, to Elizabeth Behrens, Environmental Planning and Compliance Branch, U.S. Army Corps of Engineers, CEMVN, New Orleans, Louisiana, regarding federally protected species under the jurisdiction of the National Marine Fisheries Service for the state of Louisiana. July 26.

---. 2008. Electronic Mail from R. Hartman, Team Leader, Habitat Conservation Division, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Baton Rouge Field Office, to Elizabeth Behrens, Environmental Planning and Compliance Branch, U.S. Army Corps of Engineers, CEMVN, New Orleans, Louisiana, regarding IER 3 EFH coordination request. May 1.

Nelson, D.M. (editor). 1992. *Distribution and Abundance of Fisheries and Invertebrates in Gulf of Mexico Estuaries*, Volume 1: Data Summaries. Estuarine Living Marine Resources (ELMR) Report No. 10. National Oceanic and Atmospheric Administration (NOAA)/National Ocean Service (NOS) Strategic Environmental Assessments Division, Rockwell, MD. 273 pp. September 1992.

New World Research. 1983. "Cultural Resources Survey of Terrestrial and Off-Shore Locations, Lake Pontchartrain and Vicinity Hurricane Protection Project, Louisiana." Report on File, Louisiana Division of Archaeology, Baton Rouge.

National Oceanic and Atmospheric Administration Coastal Data Development (NCDD). 2007. "Coastal Ecosystems Program – Gulf of Mexico." Accessed 10 July, 2007 from http://www.ncddc.noaa.gov/website/CHP/viewer.htm.

National Research Council (NRC). 2007. *Mitigating Shore Erosion Along Sheltered Coasts*. National Academies Press. Washington, DC.

Nowak, T.J. and K. Ryberg. 2008. "Supplemental Management Summary: Submerged Cultural Resources Investigations of Four Access Channels in the Vicinity of the Bonnabel, Duncan, Elmwood and Suburban Canals for the Lake Pontchartrain and Vicinity Project, IER #3, Jefferson Parish, Louisiana." R. Christopher Goodwin & Associates, Inc. Prepared for the U.S. Army Corps of Engineers, New Orleans District.

Pearson, J.C. 1929. "Natural history and conservation of the redfish and other commercial sciaenids on the Texas coast." U.S. Bureau of Fisheries, Bulletin 64:178-194.

Penland, S., P. McCarty, A. Beall, and D. Maygarden. 2002. "Environmental Overview – Regional Description of the Lake Pontchartrain Basin." In *Environmental Atlas of the Lake Pontchartrain Basin*, Lake Pontchartrain Basin Foundation, eds. S. Penland, A. Beall and J. Kindinger. New Orleans, Louisiana: U.S. Geological Survey Open File Report 02-206. Accessed at http://coastal.er.usgs.gov/pontchartrain/atlas.

Pèrez-Farfante, I. 1969. "Western Atlantic shrimps of the genus *Penaeus*." U.S. Fisheries Bulletin 67(3):461-591.

Port of New Orleans. 2007. "Port of New Orleans Overview." Accessed 28 August, 2007 at http://www.portno.com/pno_pages/about_overview.html.

Powell, J.A. and C.R. Taylor, eds. 2005. "Sirenews: Newsletter of the IUCN/SSC Sirenia Specialist Group." Number 44. October.

Schrohenloher, J. 2007. Field observations of traffic in vicinity of Jefferson East Bank by John Schrohenloher from 3 January, 2007 to 26 July, 2007.

Sulak, K.J. and J.P. Clugston. 1998. "Early Life History Stages of Gulf Sturgeon in the Suwannee River, Florida." *Transactions of the American Fisheries Society* 127(5): 758-771.

Transportation Research Board. 2000. *Highway Capacity Manual 2000*, third edition.

U.S. Army Corps of Engineers (USACE). 1984. Lake Pontchartrain, Louisiana, and Vicinity Hurricane Protection Project, Reevaluation Study; Main Report and Final Supplement I to the Environmental Impact Statement. New Orleans District. July.

---. 2000. *Planning Guidance Notebook*. ER 1105-2-100. April 22.

---. 2005. "Standard Manatee Conditions for In-Water Work." Jacksonville District, Florida. July. Accessed October 2007 from http://www.saj.usace.army.mil/regulatory/what/species/manatee.htm..

---. 2006a. "Draft Biological Assessment: Impacts of USACE Navigational Projects on the Gulf Sturgeon in Louisiana." Mississippi Valley Division, New Orleans District. 45 pp.

---. 2006b. "Louisiana Coastal Protection and Restoration, Preliminary Technical Report to Congress, Enclosure C: Louisiana Economy and 2005 Hurricane Damage." June 2006. Accessed from http://lacpr.usace.army.mil.

---. 2007a. "Summary Report. Gulf Coast Flood Proofing." Uncopyrighted report prepared by Donald Whitmore, P.E. July 18.

---. 2007b. Request for List of Protected Species, Proposed Levee and Floodwall Replacement Projects, Louisiana. Letter from E. Wiggins, Chief, Environmental Planning and Compliance Branch, U.S. Army Corps of Engineers, New Orleans District, New Orleans, Louisiana, to J.F. Boggs, Acting Supervisor, Louisiana Field Office, Fish and Wildlife Service, Lafayette, Louisiana. July 10.

---. 2007c. Request for List of Protected Species and Essential Fish Habitat, Proposed Levee and Floodwall Replacement Projects, Louisiana. Letter from E. Wiggins, Chief, Environmental Planning and Compliance Branch, U.S. Army Corps of Engineers, New Orleans District, New Orleans, Louisiana, to R. Harman, National Marine Fisheries Service, c/o Louisiana State University, Baton Rouge, Louisiana. July 10.

U.S. Army Corps of Engineers (USACE), U.S. Environmental Protection Agency, Minerals Management Service, Natural Resources Conservation Service, National Marine Fisheries Service, U. S. Geologic Survey, and the U. S. Fish and Wildlife Service. 2004. Louisiana Coastal Area (LCA). "Ecosystem Restoration Study." Final, Volume 2: Programmatic Environmental Impact Statement. November.

U.S. Census Bureau (USCB). 2006. "Table 1: Annual Estimates of the Population for Counties of Louisiana: April 1, 2000 to July 1, 2005 (CO-EST2005-01-22)." March 16, 2006. Accessed from http://www.census.gov/popest/counties.

---. 2007a. "USA Counties, Land Area, Jefferson, Louisiana." [No date.] Accessed 2 August, 2007 from http://censtats.census.gov/usa/usa.shtml.

---. 2007b. "State & County QuickFacts, Jefferson Parish, Louisiana and Louisiana State." May 7, 2007. Accessed from http://quickfacts.census.gov.

---. 2007c. "Fact Sheet – American FactFinder, Jefferson Parish, Louisiana." [No date.] Accessed 23 July, 2007 from http://factfinder.census.gov.

U.S. Department of Housing and Urban Development. 2006. "Current Housing Unit Damage Estimates, Hurricanes Katrina, Rita, and Wilma, February 12, 2006." Revised April 7, 2006. Accessed from http://www.huduser.org/publications/destech/GulfCoast HsngDmgEst.html.

U.S. Environmental Protection Agency (USEPA). 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Report 550/9-47-004.

---. 2003. "The Biological Effects of Suspended and Bedded Sediment (SABS) in Aquatic Systems: A Review." Internal Report. Office of Research and Development, National Health and Environmental Effects Laboratories. Narragansett, Rhode Island and Duluth, Minnesota.

U.S. Fish and Wildlife Service (USFWS). 1977. "Endangered and Threatened Wildlife and Plants; Final Rule, Correction and Augmentation of Published Rulemaking on Critical Habitats." *Federal Register*, 50 CFR Part 17, Volume 42, No. 184, pgs. 44840 - 47845. September 22.

---. 1999. "South Florida Multi-Species Recovery Plan." Southeast Region, Atlanta, Georgia.

---. 2001a. "Final Rule: Endangered and Threatened Wildlife and Plants, Final Determination of Critical Habitat for Wintering Piping Plovers." *Federal Register*, 50 CFR Part 17, Volume 66, pgs. 36038 - 36136. July 10. Washington, DC.

---. 2001b. "Florida Manatee Recovery Plan (*Trichechus manatus latirostris*)," third revision. FWS Southeast Region. October 30.

---. 2007a. Letter from J.F. Boggs, Acting Supervisor, Louisiana Field Office, Fish and Wildlife Service, Lafayette, Louisiana, to B. Wiggins, Chief, Environmental Planning and Compliance Branch, U.S. Army Corps of Engineers, New Orleans District, New Orleans, Louisiana. August 6.

---. 2007b. "Threatened and Endangered Species System (TESS)." Accessed from http://ecos.fws.gov/tess_public/StateListingAndOccurrence.do?state=LA.

---. 2007c. "Listed Distinct Population Segment of the Brown Pelican (*Pelecanus occidentalis*) 5-Year Review: Summary and Evaluation." FWS Southeast Region. February 7.

---. 2007d. "West Indian Manatee (*Trichechus manatus*) 5-Year Review: Summary and Evaluation." FWS Southeast Region. April.

---. 2007e. "Species Information, Threatened and Endangered Species System (TESS), Species Profiles." Accessed August 2007 at http://ecos.fws.gov/tess_public/StartTESS.do.

---. 2008. Letter from J.F. Boggs, Acting Supervisor, Louisiana Field Office, Fish and Wildlife Service, Lafayette, Louisiana, to Col. Alvin B. Lee, District Engineer, U.S. Army Corps of Engineers, New Orleans, Louisiana. February 22.

U.S. Fish and Wildlife Service (USFWS) and Gulf States Marine Fisheries Commission (GSMFC). 1995. *Gulf Sturgeon Recovery Plan*. Atlanta, Georgia. 170 pp.

U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). 2003. :Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Gulf Sturgeon." *Federal Register*. Vol. 68, No. 53, pp. 13370-13418. Washington, D.C. March 19, 2003.

U.S. Geological Survey (USGS). 1998. "Lake Pontchartrain bathymetry" ArcView file. Accessed from http://pubs.usgs.gov/of/1998/of98-805/html/gismeta.htm.

--. 2002. "Environmental Geochemistry and Sediment Quality in Lake Pontchartrain: Sediment Texture and Bathymetry." Accessed online at http://pubs.usgs.gov/of/1998/of98-805/html/fm_sand.htm.

---. 2006. "Land Area Change in Coastal Louisiana After the 2005 Hurricanes: Overview" poster. Open File Report 2006-1274. Accessed from http://pubs.usgs.gov/of/2006/1274/overview/poster.pdf.

U.S. Soil Conservation Service. 1983. *Soil Survey of Jefferson Parish, Louisiana*. U.S. Department of Agriculture in cooperation with Louisiana Agricultural Experiment Station and Louisiana State Soil and Water Conservation Committee.

Wagner, P.R. 1982. "Biological Resources." In *Mississippi Deltaic Plain Region Ecological Characterization: An Ecological Atlas, Map Narratives*, ed. D. Garofalo. U.S. Fish and Wildlife Service, Office of Biological Services. FWS/OBS-81/16.

Whitaker, J. O. 1998. *The Audubon Society Field Guide to North American Mammals*, revised edition. New York: Alfred A. Knopf.

White, C.J. and C.J. Bordeaux. 1977. "Development of an areal management concept for Gulf *Penaeid* shrimp." Louisiana Wildlife and Fisheries Commission Technical Bulletin 22. 77 pp.

Wigley, T. B. and R. A. Lancia. 1998. "Wildlife Communities." Chapter 9 in *Southern Forested Wetlands: Ecology and Management*, eds. M. G. Messina and W. H. Conner. Boca Raton, Florida: Lewis Publishers.

APPENDIX A
LIST OF ACRONYMS AND DEFINITIONS OF COMMON TERMS

AAHU	average annual habitat unit
ACB	articulated concrete blocks
ADT	average daily traffic
AST	above-ground storage tank
ASTM	American Society for Testing and Materials
BLH	bottomland hardwood
Blvd	Boulevard
°C	Celsius
CAA	Clean Air Act of 1963
CAR	Coordination Act Report
CED	Comprehensive Environmental Document
CEMVN	Corps of Engineers, Mississippi Valley Division, New Orleans District
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFBM	contractor-furnished borrow material
CFR	Code of Federal Regulations
CO	carbon monoxide
CWPPRA	Coastal Wetlands Planning, Protection, and Restoration Act
CY	cubic yard
dB	decibel
dBA	A-weighted decibel
DDT	dichloro-diphenyl-trichloroethane
DNL	day-night average sound level
EA	Environmental Assessment
EJ	Environmental Justice
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ER	Engineering Regulation
ESA	Endangered Species Act
ESRI	Environmental Systems Research Institute, Inc.
°F	Fahrenheit
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FMC	Fishery Management Council
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
ft	feet
FWCA	Fish and Wildlife Coordination Act
GFBM	government-furnished borrow material
GIWW	Gulf Intracoastal Waterway
GMFMC	Gulf of Mexico Fishery Management Council
GNOEC	Greater New Orleans Expressway Commission

GNOHSDRRS	Greater New Orleans Hurricane and Storm Damage Risk Reduction System
GSMFC	Gulf States Marine Fisheries Commission
HPO	Hurricane Protection Office
HTRW	hazardous, toxic, and radioactive waste
IER	Individual Environmental Report
IHNC	Inner Harbor Navigation Canal
III	Insurance Information Institute
km^2	square kilometer(s)
LADOTD	Louisiana Department of Transportation and Development
lb	pound
LCA	Louisiana Coastal Area
LCRP	Louisiana Coastal Resources Program
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LDOL	Louisiana Department of Labor
LDWF	Louisiana Department of Wildlife and Fisheries
LF	linear feet
LNHP	Louisiana Natural Heritage Program
LOS	level of service
LPV	Lake Pontchartrain and Vicinity
$\mu g/m^3$	microgram(s) per cubic meter
mi^2	square mile(s)
mph	miles per hour
MRGO	Mississippi River Gulf Outlet
MSA	Magnuson-Stevens Fishery Conservation & Management Act
NAAQS	National Ambient Air Quality Standards
NAVD88	North American Vertical Datum 1988
NEPA	National Environmental Policy Act
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOV	New Orleans to Venice
NPS	National Park Service
NRC	National Research Council
NWR	National Wildlife Refuge
O_3	ozone
OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
PA	Programmatic Agreement
Pb	lead
PDT	Project Delivery Team
PL	Public Law
PM	particulate matter
PPA	Project Partnering Agreements
ppm	parts per million

ppt	parts per thousand
RCRA	Resource Conservation and Recovery Act
REC	recognized environmental condition
ROD	Record of Decision
ROW	right-of-way
SAV	submerged aquatic vegetation
SIR	Supplemental Information Report
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
sq ft	square feet
TRB	Transportation Research Board
TRM	turf reinforcement mattress
U.S.	United States
U.S. 61	Airline Highway
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCB	U.S. Census Bureau
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
vpd	vehicles per day
WBV	West Bank and Vicinity
WRDA	Water Resources Development Act

APPENDIX B
PUBLIC COMMENTS

- Jay S. Tiedeberg - NuShore LLC
- Alvin A. LeBlanc, Jr. of Chéhardy, Sherman, Ellis, Murray, Recile, Griffith, Stakelum & Hayes, L.L.P. representing Yacht Homes of Gabriel and Mr. Bryan Krantz

-----Original Message-----
From: JTiedeberg@nushore.com [mailto:JTiedeberg@nushore.com]
Sent: Friday, July 11, 2008 11:19 AM
To: Behrens, Elizabeth H MVN
Subject: public comment on IER#3

Elizabeth:

Thank you for taking the time to call me regarding our public comment on IER#3. Attached is a paper concerning the comment. Please review the paper and then call me to discuss it. I can be reached on my cell phone 850-443-1910.

Thank you for your time.

Sincerely

Jay

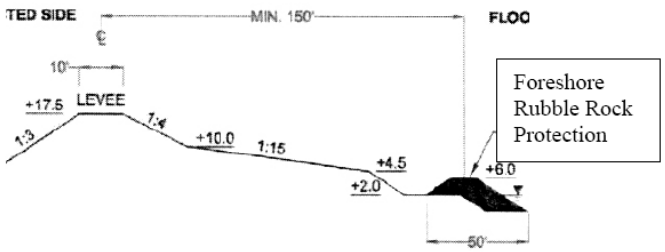
To: NOLA Environmental Team

From: NuShore LLC and Strategic Planning Associates a local WOB 8(a)

Subject: Public Comment regarding the New Foreshore Protection design in the IER 3 and the cost comparison and implementation considerations of using customized marine concrete structures in lieu of typical rubble rock.

According to the Draft IER#3 for the protection of Jefferson Parish along Lake Pontchartrain, the recommended design includes adding a Foreshore Rubble Rock mound 150 feet seaward of the levee, parallel to the shoreline and extending 50 feet seaward. The height of this mound is to be approximately 6 feet.

Though the foreshore protection criteria did not spell out the size or cost of the rubble rock alternative being considered for placement along the Reach 1, Reach 2 and Reach 3 nearshore parallel to the shoreline the draft document did specify a minimum distance from the center of the levee of 150 feet and a proposed height of +6 feet and a width of 50 feet. The distance, parallel to the shore is approximately 30,345 feet encompassing Reach 1, Reach 2 and Reach 3.



This foreshore design creates the following concerns:

- The rubble rock needs to be of a size and stature to be able to withstand the wave action of the 100 year return storm. (Smaller rocks may move or be completely removed from the project area during a severe storm.)
- The +6 feet height must be maintained during the storm in order to provide the breakwater characteristics necessary to protect the levees. (Typically, during storms, if base rocks are not substantial enough they may shift and the rocks they are supporting may fall and the +6 feet height is then compromised.)
- Selecting uniform sized rocks is typically a problem.
- The rubble rock needs to be mined and transported to the staging area.

A cost effective solution to these concerns is to construct and deploy a series of marine concrete wave attenuation devices built to the scale and weight specified in the IER 3 foreshore protection design.

- These wave attenuation devices can be constructed to a size and stature to be able to withstand the wave action of the 100 year return storm.
- These wave attenuation devices will be constructed at the staging areas minimizing transportation cost.
- The weight and size of the wave attenuation devices will be uniform from structure to structure.
- There will be one layer of wave attenuation devices eliminating malfunctions due to shifting of rocks.
- The wave attenuation devices can be deployed from land eliminating the expense of a barge.
- The cost to construct these structures depends on the size and the wall thickness specified. The cost of marine concrete and steel rebar (delivered and poured) is less expensive than the cost of mining, transporting and installing limestone rip rap and WADs are much easier to handle. Each WAD would weigh in excess of 14,000 lbs. A 3 ft by 3ft by 3 ft limestone boulder weighs approximately 4,050 lbs.

Each structure should have a base dimension of 10 feet and a height of 6 feet. The wall thickness would depend on the weight requirement of the overall structure. Alternating rows 5 structures deep would create the 50 feet width in the IER3 design. This would require approximately 5,280 structures for Reach 1 (LPV 00). If each structure weighed 14,377 lbs (3.55 yards of marine concrete) the total weight of all the structures for Reach 1 is approximately 37,956 tons. This compares very favorably to the 75,000 tons of limestone estimated for Reach 1.

A cost of $850 per WAD structure installed totals $4,488,000 for Reach 1. The cost of 75,000 tons of limestone at $.035 per pound installed equals $5,200,000.

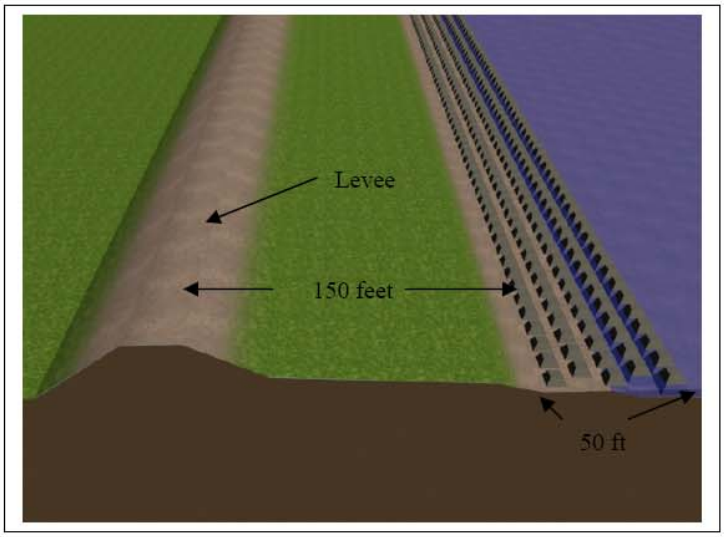
Table 1. Approximate Volumes of Construction Materials for Proposed Action

	Earthen Fill cubic yard (CY)	Concrete (CY)	Sheet Piling square Feet (Sq FT)	H-Piling linear Feet (LF)	Pipe Pile (LF)	Pre-Cast Concrete Pile (LF)	Timber Pile (LF)	Rock (Tons)
LPV 00	375,000	N/A	N/A	N/A	N/A	N/A	N/A	75,000
LPV 01	435,000	N/A	N/A	N/A	N/A	N/A	N/A	52,000
LPV 02	432,000	N/A	N/A	N/A	N/A	N/A	N/A	75,000

Wave Attenuation Devices total weight versus Rock

	Wave Attenuation	Rubble Rock
LPV 00	37,956 tons	75,000 tons
LPV 01	28,143 tons	52,000 tons
LPV 02	42,989 tons	75,000 tons
Totals	109,089 tons	202,000 tons
Savings using NuShore WADs:		92,011 tons of material
		$1,241,250

Placing 5 rows of structures beginning at 150 feet seaward of the levee and extending 50 feet seaward creates the following template:



Structural Stability

Wave attenuation devices were placed in Pensacola Bay at Project Greenshores prior to hurricanes Katrina and Rita. These structures showed no signs of deterioration and did not move or shift from their initial position. Similar wave attenuation devices were placed on Dauphin Island in June 2005. Hurricanes Cindy, Dennis and Katrina made landfall within 100 miles of Dauphin Island. The wave attenuation devices showed no signs of deterioration or movement. These structures are still in use and available for inspection.

These structures offer greater stability at substantially lower cost than a comparable template of rubble rock.

Estimated dimensions of a suitable structure would incorporate a square base of 10 feet, height of 6 feet and a top dimension of 26.7 inches. The structure having an inner slope of 27 degrees and an outer slope of 32 degrees creates a wall thickness of 12 inches at the base and 4 inches at the top. The center of gravity is approximately 23.85 inches from the bottom of the structure.

The total weight of the structure is approximately 14,377 lbs or 7.188 tons. Individual limestone rocks of this density would be very difficult to transport and place.

For more information on the NuShore Wave Attenuation Devices please contact:

Jay S. Tiedeberg
General Manager
NuShore LLC

3660 Hartsfield Road
Tallahassee, FL 32303

850-576-3010
850-443-1910 (cell)

jtiedeberg@nushore.com

Charlotte Burnell
President
Strategic Planning Associates

5037 Veterans Blvd #1D
Metairie, LA 70006

504-231-4150

cburnell@strategicplanning1.com

Our Website is www.nushore.com

The Use of Living Shorelines to Mitigate the Effects o Storm Events on Dauphin Island, Alabama, USA

LaDon Swann*
Mississippi–Alabama Sea Grant Consortium
Department of Fisheries and Allied Aquacultures, Auburn University
703 East Beach Drive, Ocean Springs, Mississippi 39564, USA

Abstract.—Gulf of Mexico marshes have been found to support more than 80 species of fish, 60 species of birds, and many reptile, mammal, and invertebrate species (Stout 1984). In addition to the ecological services provided by salt marshes, the 2005 hurricanes in the Gulf of Mexico raised public awareness of the ability of intertidal marshes to reduce personal property damage from storm surges. Since marshes can be destroyed through natural or anthropogenic processes, methods to protect these areas are being developed; one such method is the use of "living shorelines." Living shorelines serve multiple roles by controlling erosion, maintaining natural coastal processes, and sustaining biodiversity through land-use management, soft armoring, or combinations of soft and semihard armoring techniques. Living shorelines provide a viable alternative to common hardened structures such as bulkheads, stone revetments, and seawalls. One type of living shoreline was used at Saw Grass Point Salt Marsh on Dauphin Island, Alabama. Dauphin Island's Fort Gaines Harbor was constructed in the 1950s by removing approximately 3 ha from Saw Grass Point Salt Marsh. The harbor now serves as one of Dauphin Island's two primary access points for recreational and commercial boats to the Gulf of Mexico. Chronic erosion has resulted in the loss of 0.5 ha of the remaining marsh. This saline tidal marsh is of significant ecological importance and is one of only two on Dauphin Island. In 2004, a community-based restoration grant was used to protect and restore the marsh through the use of exposed nearshore precast concrete breakwaters called coastal havens. These structures function as detached breakwaters to minimize the effect of storm surge and boat wake through wave attenuation; they also provide suitable substrate for oyster colonization. These structures were selected over other erosion control technologies, including vertical bulkheads, rock or wooden sills, and headlands. In April 2005, 182 units were installed in two interlocking rows parallel to the east perimeter of the marsh in water approximately 1.3 m deep. Oyster density on the coastal havens, measured 19 months postinstallation, was 205 oysters/m^2. Measurements behind the breakwater indicate some sediment accretion. The project cost was approximately US$335/m to protect 162 m of shoreline. The dual function of these structures has controlled the erosion behind the breakwater and has provided habitat for a wide array of National Oceanic and Atmospheric Administration trust resources, including locally important species such as spotted seatrout (also known as speckled trout) *Cynoscion nebulosus*, blue crabs *Callinectes sapidus* and Gulf stone crabs *Menippe adina*, eastern oyster *Crassostrea virginica*, red drum *Sciaenops ocellatus*, southern flounder *Paralichthys lethostigma*, and various species of commercially important shrimp (brown shrimp *Farfantepenaeus aztecus*, pink shrimp *F. duorarum*, and white shrimp *Litopenaeus setiferus*).

Florida Tech

College of Engineering
Division of Marine and Environmental Systems
E-mail dmes@marine.fit.edu

EXECUTIVE SUMMARY OF THE WAVE TANK MODEL TESTS PERFORMED FOR THE *FISH HAVEN* ARTIFICIAL REEF UNIT

By Lee E. Harris, Ph.D., P.E., Assoc. Professor of Ocean Engineering

Physical model tests of the *Fish Haven* artificial reef unit were performed at Florida Institute of Technology during March and April 1998. Two concrete scale models were used in the wave tank tests, with various water depths and wave conditions. The units were tested on the glass tank bottom and on a sand bottom, so that their stability against sliding could be evaluated on both hard and sand bottom conditions. Wave gages were used to measure and record the wave conditions, while larger and larger waves were generated to determine the largest wave conditions for which the unit was stable. The tests were recorded on video, and the inception of movement of the units was determined and the associated wave conditions correlated.

The *Fish Haven* reef units never demonstrated any tendency for overturning, either on the solid glass or sand bottom wave tank tests. The wave heights that caused movement of the individual units were recorded, but in some cases, especially on the sand bottom, the largest waves able to be generated were not able to cause movement of the units. From the test data, the coefficients of friction between the units and the glass and sand bottom were determined, as well as the wave drag, inertia, and lift coefficients. Using the Morison equation and the methods developed by Roehl and Harris (1997), a set of graphs were generated for use in determining the minimum dry weight of individual artificial reef units that would remain stable for various water depths and wave conditions.

The *Fish Haven* artificial unit was found to be a very stable unit, due to its wide base, porous top and sides, and weight. Full scale units average 3000 lbs., with the weight varying with the thickness of the concrete comprising the unit. The units tested were comprised only of a single unit, without the addition of a base or smaller interior unit inside. The addition of a concrete base and/or interior unit (with a weight of 800 to 1000 lbs.) can greatly increase the overall weight and stability of the units.

The results of the wave tank tests and engineering analysis of the *Fish Haven* artificial reef units showed that the units are designed and can be fabricated to be very stable artificial reef units. Using the stability graphs resulting from this study, the required weight of an individual *Fish Haven* artificial reef unit can be determined. Units that are stable in water depths of 50 to 100 feet under storm conditions of 20-year to 100-year intensity can be designed, fabricated and deployed. With proper concrete mixtures, steel or fiberglass rebar, and concrete cover over any steel reinforcement, the units will have excellent strength, durability, and longevity in the marine environment.

Florida Institute of Technology
150 West University Boulevard, Melbourne, FL 32901-6975 • (407) 674-8096 or 7104 • Fax: (407) 984-8461 or 674-7212

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GRIFFITH, STAKELUM & HAYES, L.L.P.

ATTORNEYS AT LAW

LAWRENCE E. CHEHARDY*
DAVID R. SHERMAN*t°
MICHAEL H. ELLIS*
JULIAN R. MURRAY, JR.*
GEORGE B. RECILE*
JACQUELINE G. GRIFFITH*
P. J. STAKELUM III*
STEVEN E. HAYES t
ROBERT G. STASSI
ALVIN A. LEBLANC, JR.*
STEPHEN D. MARX
MICHAEL H. RASCH*
JAMES M. FANTACI ¥
JACQUELINE H. BLANKENSHIP *

SUITE 1100
ONE GALLERIA BOULEVARD
METAIRIE, LOUISIANA 70001
TELEPHONE: (504) 833-5600
FAX: (504) 833-8080

MAILING ADDRESS: POST OFFICE BOX 931
METAIRIE, LOUISIANA 70004-0931

DON M. RICHARD
ELLEN S. FANTACI
CHARLES O. TAYLOR
CARL L. ASPELUND
PAOLA PAOLI CORRADA
PRESTON L. HAYES

OF COUNSEL:
PATRICIA E. PANNELL*‡
PAULA PERRONE

*PROFESSIONAL CORPORATION
t BOARD CERTIFIED TAX ATTORNEY
°LL.M. IN TAXATION
‡ALSO ADMITTED IN SOUTH CAROLINA
¥ALSO ADMITTED IN VIRGINIA

June 30, 2008

Direct Dial (504)830-4117
Email: aal@chehardy.com

Mr. Carl Anderson
Senior Project Manager
Regional Projects Branch
Protection and Restoration Office
U. S. Army Corps of Engineers
P. O. Box 60267
New Orleans. LA 70160-0267

Re: 100 Year Protection Plan
Duncan Canal Pump Station Breakwater

Dear Mr. Anderson:

Please accept this correspondence as a follow-up to the meeting held in my offices on Tuesday, June 24, 2008. As we discussed at that time, our office represents Yacht Homes of Gabriel and Mr. Bryan Krantz. Our clients hold significant property rights along the shoreline of Lake Pontchartrain and extending out into the water bottoms of Lake Pontchartrain in the area north of the Gabriel Development in Kenner, Louisiana.

It is our understanding that the Corps of Engineers plans to undertake additional work involving the levee in the area of the Gabriel Development and also plans a breakwater for protection of the Duncan Canal Pumping Station. After reviewing the proposed plans for the breakwater, it seems that the proposed work will have significant impact upon the commercial development planned by our client for that area.

We understand that the Corps of Engineers is in the process of accepting input from concerned parties regarding the anticipated plans. By this correspondence, we would like to request that all of the materials provided to the Corps of Engineers during our meeting on June

24, 2008, together with this correspondence, be included as part of the input and comment process regarding the proposed work.

Our clients, of course, are very concerned with hurricane protection for the area in general and for the Gabriel Subdivision in particular; however, our clients must also express their concerns particularly regarding the apparent impact of the proposed breakwater on the plans that our clients have for the development of this area.

Please let us know if our office can provide any additional information that will assist the Corps of Engineers in its evaluation of the anticipated project.

Very truly yours,

Alvin A. LeBlanc, Jr.

AAL/as
cy: Mr. Bryan Krantz

I:\GABRIEL\100 Year Protection Plan\Anderson ltr 6-30-08.wpd

APPENDIX C
MEMBERS OF INTERAGENCY ENVIRONMENTAL TEAM

Kyle Balkum	Louisiana Dept. of Wildlife and Fisheries
Agaha Brass	Louisiana Department of Natural Resources
Catherine Breaux	U.S. Fish and Wildlife Service
David Castellanos	U.S. Fish and Wildlife Service
Frank Cole	Louisiana Department of Natural Resources
John Ettinger	U.S. Environmental Protection Agency
Jeffrey Harris	Louisiana Department of Natural Resources
Richard Hartman	NOAA National Marine Fisheries Service
Jeffrey Hill	NOAA National Marine Fisheries Service
Christina Hunnicutt	U.S. Geologic Survey
Barbara Keeler	U.S. Environmental Protection Agency
Kirk Kilgen	Louisiana Department of Natural Resources
Tim Killeen	Louisiana Department of Natural Resources
Brian Lezina	Louisiana Dept. of Wildlife and Fisheries
David Muth	U.S. National Park Service
Clint Padgett	U.S. Geologic Survey
Jamie Phillipe	Louisiana Dept. of Environmental Quality
Molly Reif	U.S. Geologic Survey
Manuel Ruiz	Louisiana Dept. of Wildlife and Fisheries
Renee Sanders	Louisiana Department of Natural Resources
Angela Trahan	U.S. Fish and Wildlife Service
David Walther	U.S. Fish and Wildlife Service
Patrick Williams	NOAA National Marine Fisheries Service

APPENDIX D
INTERAGENCY CORRESPONDENCE

- USFWS Threatened and Endangered Species Concurrence
- NMFS Threatened and Endangered Species Concurrence
- LDNR LCRP Consistency Determination
- LDEQ Water Quality Certification
- LSHPO Cultural Resource Concurrence
- Tribe Concurrence
- USFWS Fish and Wildlife Draft Coordination Act Report – January 11, 2008
- USEPA Comments on the Draft IER 3 Document
- USFWS Letters and Fish and Wildlife Final Coordination Act Report - July 28, 2008

United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

February 22, 2008

Colonel Alvin B. Lee
District Engineer
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Colonel Lee

Please reference your Individual Environmental Report (IER) Lake Pontchartrain and Vicinity (LPV) Jefferson East Bank, Jefferson, Louisiana (IER3). That study was conducted in response to Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4). That law authorized the Corps of Engineers (Corps) to upgrade some existing hurricane protection projects to provide protection against a 100-year hurricane event. The Corps has recently defined the IER 3 proposed plan and the U.S. Fish and Wildlife Service (Service) provided recommendations on that plan to the Corps in our January 11, 2008, Fish and Wildlife Coordination Act Report (FWCAR) and our January 17, 2008 Supplemental FWCAR. In addition the Service provided an August 7, 2006, letter addressing threatened and endangered species for the coastal parishes of the New Orleans District. This letter is submitted in accordance with provisions of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

The IER3 project area extends along the existing Jefferson east bank levee system on the north side of Jefferson Parish where it meets Lake Pontchartrain. There are 9.5 miles of existing earthen levee, foreshore protection, two floodgates, and four pump stations proposed for this project. To construct the proposed hurricane protection improvements the Corps proposes to dig four, 10-feet deep and up to 1.5 miles long, access channels in Lake Pontchartrain perpendicular to each of the four pump station sites.

The Federally listed the West Indian manatee (*Trichechus manatus*) and the Gulf sturgeon (*Acipenser oxyrhynchus desotoi*) may occur within the project area.

Federally listed as endangered, West Indian manatees occasionally enter Lakes Pontchartrain and Maurepas, and associated coastal waters and streams during the summer months (i.e., June through September). Manatees have been regularly reported in the Amite, Blind, Tchefuncte, and Tickfaw Rivers, and in canals within the adjacent coastal marshes of Louisiana. They have also been occasionally observed elsewhere along the Louisiana Gulf coast. The manatee has declined in numbers 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 animals.

We recommend the following conditions to avoid impacts to manatee during project implementation. All contract personnel associated with the project shall 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 should 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 should be placed where it is visible to the vessel operator. Siltation barriers, if used, should be made of material in which manatees could not become entangled, and should be properly secured and monitored. If a manatee is sighted within 100 yards of the active work zone, special operating conditions should be implemented, including: no operation of moving equipment within 50 feet of a manatee; all vessels shall operate at no wake/idle speeds within 100 yards of the work area; and siltation barriers, if used, should 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 should 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).

The Gulf sturgeon, Federally listed as a threatened species, is an anadromous fish that occurs in many rivers, streams, and estuarine waters along the northern Gulf coast between the Mississippi River and the Suwannee River, Florida. In Louisiana, Gulf sturgeon have been reported at Rigolets Pass, rivers and lakes of the Lake Pontchartrain basin, and adjacent estuarine areas. Habitat alterations such as those caused by water control structures that limit and prevent spawning, poor water quality, and over-fishing have negatively affected this species.

On March 19, 2003, the Service and the National Marine Fisheries Service (NMFS) 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. IER 3 lies adjacent to but just west of the Lake Pontchartrain Causeway, which is the eastern most boundary of designated critical habitat, and therefore not within critical habitat. If construction activities are planned to extend east of that causeway the Corps should contact NOAA Fisheries, which is responsible for aquatic marine threatened or endangered species including the Gulf sturgeon. Therefore, Dr. Stephania Bolden (727/824-5312) in St. Petersburg, Florida with that agency should be contacted regarding any potential impacts to Gulf sturgeon and its critical habitat.

We appreciate the opportunity to provide comments in the planning stages of the proposed project. If you or your staff have further questions, or would like to meet and discuss our recommendations, please contact Catherine Breaux of this office at (504) 862-2689.

Sincerely,

for James S. Boggs
Supervisor
Louisiana Field Office

cc: EPA, Dallas, TX
NMFS, Baton Rouge, LA
LA Dept. of Wildlife and Fisheries, Natural Heritage Program, Baton Rouge, LA
LA Dept. of Natural Resources (CMD/CRD), Baton Rouge, LA

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
(727) 824-5317, FAX 824-5309
http://sero.nmfs.noaa.gov

MAY 28 2008 F/SER31:KS

Ms. Elizabeth Behrens
New Orleans District Corps of Engineers
P.O. Box 60267
New Orleans, Louisiana 70160-0267

Re: IER 3

Dear Ms. Behrens:

This responds to your letter dated February 29, 2008, requesting section 7 consultation pursuant to the Endangered Species Act (ESA) for the Army Corps of Engineers' (COE) Individual Environmental Report (IER) 3. The report evaluates the COE's proposal to upgrade the existing hurricane protection system to protect communities and infrastructure in Jefferson Parish, Louisiana, from 100-year level storms. The proposed project includes the installation of a cement breakwater in Lake Pontchartrain at Pump Station #1 in New Orleans, Louisiana. You requested concurrence from the National Marine Fisheries Service (NMFS) with your determination the project is not likely to adversely affect Gulf sturgeon, listed as threatened under the ESA, and its designated critical habitat. A November 2007 report containing benthic surveys of the project area was provided with IER 3.

This project is located at 30.0211°N, 90.1450°W (WGS84) in Jefferson Parish, Louisiana. A cement breakwater will be installed in front of Pump Station #1, located just east of the Lake Pontchartrain Causeway, to protect the pump station from wave damage during significant storm events. The breakwater will be located along the western edge of the pump station outfall. Rock riprap will be placed along the toe of the breakwater to provide erosion protection. The total width of the breakwater, including the riprap, will be 115 feet and it will extend 420 feet beyond an existing spit of land that currently forms the western edge of the pump station outfall. Due to the shallow water depths, a 3000-foot channel, 100 feet wide and 10 feet deep, will be bucket-dredged to allow the construction barge access to the pump station. At the construction site, the channel width will be increased to 300 feet. Dredged material will be temporarily stockpiled on the western side of the access channel, in an area 290 feet wide and no more than 3 feet high, and encircled with a silt curtain (except for the side adjacent to the channel). All stockpiled material will be returned to the channel upon project completion. An additional access channel, 50 feet wide and 5 feet deep, will be dredged to access the eastern side of the breakwater to place the riprap. Dredged material will be stockpiled east of the breakwater in an area 50 feet wide to an elevation of no more than 3 feet, and will be returned to the channel upon project completion. Dredging will occur May through September in order to avoid impacts to Gulf sturgeon that may

use Lake Pontchartrain as winter foraging habitat. A total of 11,000 cubic yards of dredged material will be temporarily displaced. Approximately 9 acres of waterbottom will be dredged and 20 acres of waterbottom will be temporarily covered by the stockpiled dredged material. Bottom substrates in this portion of the project area consist of a 7-foot layer of muddy sand, underlain by a 4-foot layer of soft clay. The breakwater will permanently cover 1.5 acres of benthic habitat, consisting of hard bottom.

In addition to Gulf sturgeon, three listed species of sea turtles may occur at the project site: the endangered Kemp's ridley, the threatened/endangered[1] green, and the threatened loggerhead. The proposed project is located within designated Gulf sturgeon critical habitat Unit 8. The primary constituent elements (PCEs) essential for the conservation of Gulf sturgeon present in Unit 8 include abundant prey items, water quality, sediment quality, and safe and unobstructed migratory pathways. Of these PCEs, NMFS believes prey abundance, water quality, and sediment quality may be affected.

NMFS has analyzed the routes of potential effects from the proposed project and concluded that listed sea turtles and Gulf sturgeon, as well as designated critical habitat, are not likely to be adversely affected. We believe the potential effects could result from the following: dredging, the transit and anchoring of construction equipment and vessels at the site, water quality impacts associated with construction (i.e., turbidity and noise), temporary impacts to 29 acres of benthic habitat, and the permanent loss of 1.5 acres of benthic habitat.

Based on the type of dredge being used and the adherence to the May-September dredging window, the risk of injury to listed species from dredging will be discountable. Gulf sturgeon are not likely to be present during dredging activities because they primarily utilize Lake Pontchartrain for winter foraging. NMFS has previously determined that non-hopper-type dredging activities, such as the bucket dredging method proposed for this project, are unlikely to adversely affect sea turtles. Further, due to their mobility, the likelihood of sea turtles and Gulf sturgeon being struck by the transit and anchoring of equipment and vessels at the project site is discountable. While sea turtles and Gulf sturgeon potentially present in the project area are likely to avoid the area during construction due to noise, the effects to these species as a result of avoiding refuge and foraging habitat at the site will be insignificant, as their exclusion from the area will be temporary. NMFS considers the temporary loss of 29 acres of benthic habitat due to dredging and the permanent loss of 1.5 acres of habitat due to breakwater placement as having insignificant and/or discountable effects on sea turtles and Gulf sturgeon. The project area encompasses only a small portion of the 403,200-acre lake and there is ample available habitat in the vicinity such that impacts to foraging success, reproduction, resting, or other behaviors are expected to be minor and insignificant. The substrate bottom does not support submerged aquatic vegetation and is likely a poor source of other forage resources for sea turtle species. Due to the shallow water depth and the bottom substrate in the area where the breakwater will be constructed, the project area provides poor foraging habitat for Gulf sturgeon, as well. Gulf sturgeon are suction feeders; due to their feeding morphology, as well as their preferred prey, they typically feed over sandy substrate and are not likely to be found foraging over hard bottom.

1 Green turtles are listed as threatened, except for breeding populations in Florida and the Pacific Coast of Mexico, which are listed as endangered.

In addition, the survey showed that water depths at the site of the breakwater are less than 1 foot. Gulf sturgeon are usually found at slightly deeper depths (2 to 4 meters), where lower wave energy at the substrate, compared to the shallower swash zone, interferes less with feeding.

Impacts to all PCEs in designated critical habitat Unit 8 will be insignificant and/or discountable, and will not affect the ability of Unit 8 to provide for normal behavior, growth, and viability of Gulf sturgeon life stages. Potential effects to sediment quality resulting from dredging and stockpiling of dredged material will be insignificant. While dredging may temporarily uncover a layer of finer-grained sediment, the original material will be placed back in the channel and sediment quality will be returned to pre-project conditions. Sediment quality will be affected by the permanent conversion of waterbottom to the cement breakwater; this can impact the availability and abundance of prey and will be discussed further in this section. Prey abundance will be temporarily affected by the dredging of 9 acres of waterbottom and the placement of dredged material on 20 acres of waterbottom. However, the project area encompasses only a small portion of the 403,200-acre lake and there is ample available habitat in the vicinity supporting Gulf sturgeon prey items. Stockpiled material will be placed back into the dredged channels upon project completion and returned to pre-project contours. Benthic invertebrates utilized by Gulf sturgeon are expected to recolonize the dredged area rapidly, as they have been found to recolonize within one year when sediment composition and depth remain consistent. The permanent loss of 1.5 acres of habitat on prey abundance is also expected to be insignificant, as Gulf sturgeon prey are expected to be found in sandy substrate, while the substrate found at the site of the breakwater is mainly hard bottom. Water quality impacts related to dredging and stockpiling of dredged material will be temporary and minimized by the use of silt curtains; therefore, impacts are expected to be insignificant.

This concludes your consultation responsibilities under the ESA for species under NMFS' purview. Consultation must be reinitiated if a take occurs or new information reveals effects of the action not previously considered, or the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action. We have enclosed additional information on other statutory requirements that may apply to this action, and on NMFS' Public Consultation Tracking System (PCTS) to allow you to track the status of ESA consultations.

Thank you for your continued cooperation in the conservation of threatened and endangered species under NMFS' purview. If you have any questions on this consultation or PCTS, please contact Kelly Shotts at (225) 389-0508 x 209, or by e-mail at kelly.shotts@noaa.gov.

Sincerely,

Roy E. Crabtree, Ph.D.
Regional Administrator

Enclosure

cc: F/SER43, Hartman/Williams

File: 1514-22 F.1. LA
Ref: I/SER/2008/01387

Additional Considerations for ESA Section 7 Consultations (Revised 01-18-2008)

Marine Mammal Protection Act (MMPA) Recommendations: The Endangered Species Act (ESA) section 7 process does not authorize incidental takes of listed or non-listed marine mammals. If such takes may occur an incidental take authorization under MMPA section 101 (a)(5) is necessary. Contact Ken Hollingshead of our NMFS Headquarters' Protected Resources staff at (301) 713-2323 for more information on MMPA permitting procedures.

Essential Fish Habitat (EFH) Recommendations: In addition to its protected species/critical habitat consultation requirements with NMFS' Protected Resources Division (PRD) pursuant to section 7 of the ESA, prior to proceeding with the proposed action the action agency must also consult with NMFS' Habitat Conservation Division (HCD) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act's (MSA) requirements for essential fish habitat (EFH) consultation (16 U.S.C. 1855 (b)(2) and 50 CFR 600.905-.930, subpart K). The action agency should also ensure that the applicant understands the ESA and EFH processes; that ESA and EFH consultations are separate, distinct, and guided by different statutes, goals, and time lines for responding to the action agency; and that the action agency will (and the applicant may) receive separate consultation correspondence on NMFS letterhead from HCD regarding their concerns and/or finalizing EFH consultation.

Public Consultation Tracking System (PCTS) Guidance: PCTS is an online query system allowing federal agencies and U.S. Army Corps of Engineers' (COE) permit applicants to track the status of NMFS consultations under ESA section 7 and under MSA sections 305(b)2 and 305(b)(4): Essential Fish Habitat. Access PCTS via: www.nmfs.noaa.gov/pcts. Federal agencies are required to enter an agency-specific username and password to query the Federal Agency Site. The Corps Permit Site allows COE permit applicants the ability to check on the current status of Clean Water Act section 404 permit actions for which NMFS has conducted an ESA section 7 consultation with the COE since the beginning of the 2001 fiscal year (no password needed).

For COE-permitted projects, click on "Enter Corps Permit Site." From the "Choose Agency Subdivision (Required)" list, pick the appropriate COE district. At "Enter Agency Permit Number" type in the COE district identifier, hyphen, year, hyphen, number. The COE is in the processing of converting its permit application database to PCTS-compatible "ORM." An example permit number is: SAJ-2005-000001234-IPS-1. For the Jacksonville District, which has already converted to ORM, permit application numbers should be entered as SAJ (hyphen), followed by 4-digit year (hyphen), followed by permit application numeric identifier with no preceding zeros. E.g., SAJ-2005-123, SAJ-2005-1234, SAJ-2005-12345.

For inquiries regarding applications processed by Corps districts that have not yet made the conversion to ORM (e.g., Mobile District), enter the 9-digit numeric identifier, or convert the existing COE-assigned application number to 9 numeric digits by deleting all letters, hyphens, and commas; converting the year to 4-digit format (e.g., -04 to 2004); and adding additional zeros in front of the numeric identifier to make a total of 9 numeric digits. E.g., AL05-982-F converts to 200500982; MS05-04401-A converts to 200504401. PCTS questions should be directed to Eric Hawk at Eric.Hawk@noaa.gov. Requests for username and password should be directed to PCTS.Usersupport@noaa.gov.

BOBBY JINDAL
GOVERNOR

SCOTT A. ANGELLE
SECRETARY

State of Louisiana

DEPARTMENT OF NATURAL RESOURCES

OFFICE OF COASTAL RESTORATION AND MANAGEMENT

May 23, 2008

Elizabeth Wiggins
Chief, Environmental Planning and Compliance Branch
U. S. Army Corps of Engineers, New Orleans District
P. O. Box 60267
New Orleans, Louisiana 70160-0267

RE: **C20080227,** Coastal Zone Consistency
U. S. Army Corps of Engineers, New Orleans District
Direct Federal Action
IER 3: Lakefront Levee, Lake Pontchartrain and Vicinity Hurricane Storm Damage Risk Reduction System, **Jefferson Parish, Louisiana**

Dear Ms. Wiggins:

The above referenced project has been reviewed for consistency with the approved Louisiana Coastal Resource Program (LCRP) as required by Section 307 of the Coastal Zone Management Act of 1972, as amended. The project, as proposed in the application, is consistent with the LCRP. If you have any questions concerning this determination please contact Jeff Harris of the Consistency Section at (225) 342-7949.

Sincerely,

Jim Rives
Administrator

JR/JDH/bmv

cc: Venise Ortego, LDWF
Elizabeth Behrens, COE-NOD
Jason Smith, Jefferson Parish

Coastal Management Division • Post Office Box 44487 • Baton Rouge, Louisiana 70804-4487
(225) 342-7591 • Fax (225) 342-9439 • http://www.dnr.state.la.us
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HAROLD LEGGETT, PH.D.
SECRETARY

State of Louisiana

DEPARTMENT OF ENVIRONMENTAL QUALITY

ENVIRONMENTAL SERVICES

May 27, 2008

U.S. Army Corps of Engineers- New Orleans District
P.O. Box 60267
New Orleans, LA 70160-0267

Attention: Elizabeth Behrens

RE: Water Quality Certification (WQC 080512-01/AI 157821/CER 20080001)
Individual Environmental Report (IER #3)
Jefferson Parish

Dear Ms. Behrens:

The Department has reviewed your application for the construction of the Jefferson Lakefront levee, along Lake Pontchartrain in Jefferson Parish.

The requirements for Water Quality Certification have been met in accordance with LAC 33:IX.1507.A-E. Based on the information provided in your application, we have determined that the placement of the fill material will not violate the water quality standards of Louisiana provided for under LAC 33:IX.Chapter 11. Therefore, the Department has issued a Water Quality Certification.

Sincerely,

Thomas R. Griggs
Engineer Manager

TRG/jjp

Post Office Box 4313 • Baton Rouge, Louisiana 70821-4313 • Phone 225-219-3181 • Fax 225-219-3309
www.deq.louisiana.gov

MITCHELL J. LANDRIEU
LIEUTENANT GOVERNOR

State of Louisiana
OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT
DIVISION OF ARCHAEOLOGY

ANGÈLE DAVIS
SECRETARY

PAM BREAUX
ASSISTANT SECRETARY

January 7, 2008

Ms. Elizabeth Wiggins
Environmental Planning and Compliance Branch
New Orleans District, Corps of Engineers
P.O. Box 60267
New Orleans, LA 70160-0267

Re: Draft Reconnaissance CRM Management Summary
LA Division of Archaeology Report No. 22-3024
Management Summary: Phase IA Cultural Resource Records Review, Field Reconnaissance and Remote Sensing Program Performed for Lake Pontchartrain and Vicinity Project Individual Report Area 3 (IER#3) Jefferson Parish, Louisiana
R. Christopher Goodwin and Associates, Inc.

Dear Ms. Wiggins:

We are in receipt of your letter of December 3, 2007 transmitting a Management Summary from R. Christopher Goodwin and Associates, Inc. for the above-cited project. This management summary meets the basic guidelines for such documents set forth by the Louisiana Division of Archaeology.

We also agree with the recommendations concerning cultural resources for the project area made by R. Christopher Goodwin and Associates, Inc. Specifically, terrestrial sites 16JE04, 16JE05, and 16JE40 could not be relocated within the project area and the one previously unreported cultural resource, IER-03-01, was a redeposited portion of 16JE04. Furthermore, we agree that four remotely sensed anomalies in the nautical portion of the project area should be avoided, or evaluated further if that is not possible.

We look forward to reviewing the full reports for this and other Individual Environmental Report Areas (IERs). Technical comments of a minor nature are enclosed and should be considered with the submission of a draft report for all the IERs. If you have any questions or comments concerning this project, please feel free to contact Dennis Jones at 225 342 8170 or djones@crt.state.la.us

Sincerely,

Pam Breaux

Pam Breaux
State Historic Preservation Officer

PB:DJ:s

C: Mr. Robert Lackowicz, Project Manager, R. Christopher Goodwin and Associates, Inc. (w/enclosures).

TECHNICAL COMMENTS

1. Pages 12-16. The text for the section entitled *Previous Investigations* discusses the proximity of five previously reported archaeological sites, 16JE04, 16JE05, 16JE06, 16JE39 and16JE40, to the project area. Please add information about 16JE06 and 16JE39 to Table 4 with perhaps a note about their distance from the project area.

2. Page 17. Garvey and Widmer 1982 is not in the References Cited.

3. Page 18. Swanson 1975 and Swanson n.d. are not in the References Cited.

4. Please provide site update forms for 16JE04, 16JE06, and 16JE40 to the Louisiana Division of Archaeology.

5. Please provide a curation statement reflecting the appropriate disposition of the artifacts recovered during these investigations in the draft report.

MITCHELL J. LANDRIEU
LIEUTENANT GOVERNOR

State of Louisiana
OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT
DIVISION OF ARCHAEOLOGY

DAWN ROMERO WATSON
SECRETARY

PAM BREAUX
ASSISTANT SECRETARY

March 20, 2008

Ms. Elizabeth Wiggins
Environmental Planning and Compliance Branch
New Orleans District, Corps of Engineers
P.O. Box 60267
New Orleans, LA 70160-0267

Re: Draft Supplemental CRM Management Summary
LA Division of Archaeology Report No. 22-3024
Supplemental Management Summary:
Submerged Cultural Resources Investigations of
Four Access Channels in the Vicinity of the
Bonnabel, Duncan, Elmwood, and Suburban Canals
for the Lake Pontchartrain and Vicinity Project
Individual Report Area 3 (IER#3)
Jefferson Parish, Louisiana
R. Christopher Goodwin and Associates, Inc.

Dear Ms. Wiggins:

We are in receipt of your letter of March 3, 2008, transmitting a Supplemental Management Summary from R. Christopher Goodwin and Associates, Inc. for the above-cited project. This report meets the basic guidelines for such documents set forth by the Louisiana Division of Archaeology.

We agree with the recommendations concerning cultural resources for the project area made by R. Christopher Goodwin and Associates, Inc. that none of the remotely sensed anomalies appear to represent underwater cultural resources within the supplemental project area for IER#3.

We look forward to reviewing the full reports for this and other Individual Environmental Report Areas (IERs). Technical comments concerning minor items are also included with this letter, as are photocopied pages of the report with other comments/corrections noted. Should you have any questions concerning our comments, do not hesitate to contact Dennis Jones in the Division of Archaeology at (225) 342-8170 or by email at djones@crt.state.la.us.

Sincerely,

Pam Breaux

Pam Breaux
State Historic Preservation Officer

PB:DJ:s

C: Dr. Christopher Goodwin, Christopher Goodwin and Associates, Inc. (w/enclosures)

TECHNICAL COMMENTS

1. The maps in the report are excellent presentations of information regarding the locations of the various access channels and the remotely sensed anomalies found in their vicinities.

2. In the text acoustic anomalies are identified with the prefix "SS", while in Table 2 they are identified with only a single "S".

3. The location for "Dun 1" is unclear in Map 3.

Target Bon 1 is comprised of six magnetic anomalies, designated, M1673, M1689, M1690, M1692, M1693, and M1703, one acoustic anomaly, designated SS002, and one sub-bottom profiler anomaly, designated SB001. It is located at approximately 3656734.92, 556978.25 at a depth of 8.2 ft (2.5 m). Two of the magnetic anomalies that compose this target, designated M1690 and M1692, have unusually high amplitudes of 9915.2 and 9713.7 nT, long durations of 68.8 and 73.1 seconds, and complex, multi-component, signatures. One unidentified, but clearly anthropogenic, side scan sonar anomaly, designated SS002, measuring 28.0 x 6.0 ft (8.5 x 1.8 m) with 4.0 ft (1.2 m) relief, and one sub-bottom profiler anomaly, designated SB001, that indicates the presence of a bottom disturbances in the vicinity of Target Bon 1.

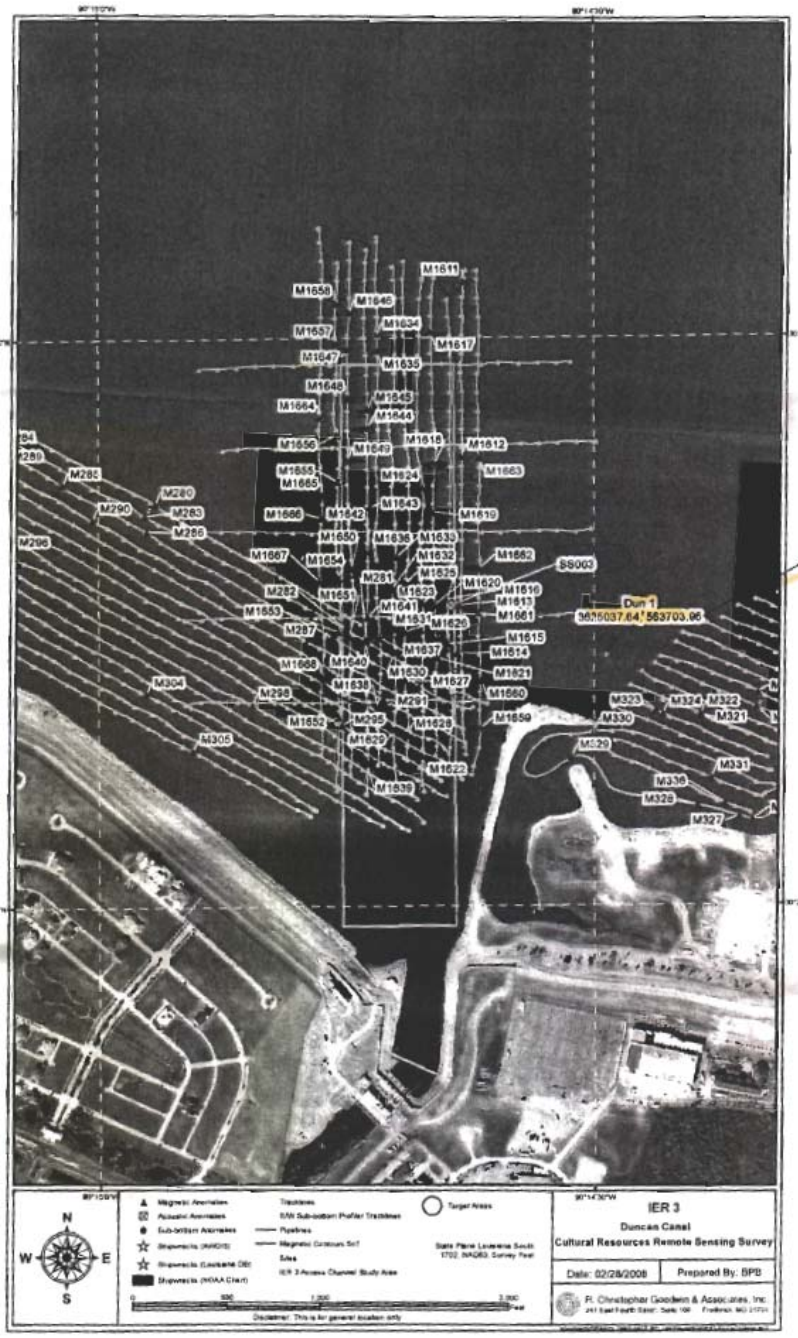
This target previously was identified as a possible submerged cultural resource and designated, Target 15_1 by the present author. New data collected during survey of the expanded study area both suggests that Target Bon 1 and Target 15_1 represent the same cluster of ferrous objects. Magnetic contour analyses suggests that these targets probably represent a single undocumented and decommissioned well or platform. Even though, this target does not appear to represent a significant submerged cultural resource, it may pose a substantial hazard to construction and dredging activities. All other magnetic anomalies recorded in the vicinity of the Bonnabel Canal appear to represent insignificant ferrous debris.

Areas of bottom disturbance related to fishing and anchoring activities, as well as isolated areas of insignificant debris were recorded by the side scan sonar. Two acoustic anomalies, designated SS001 and SS002 were identified for further scrutiny during review of side scan sonar data. Anomaly SS002 is located in the vicinity of Target Bon 1 and is discussed above. Anomaly SS001 measures 14.0 x 23.0 ft (4.3 x 7.0 m) with 2.0 ft (0.6 m) relief. This anomaly represents an insignificant scatter of non-ferrous debris and associated bottom disturbances.

Areas of bottom disturbance were recorded by the sub-bottom profiler. No clearly defined shell middens or geomorphic features that can be associated with prehistoric activity areas, or other significant submerged cultural resources were recorded by the sub-bottom profiler in the vicinity of Bonnabel Canal.

Duncan Canal

No previously recorded historic properties or shipwrecks have been reported within 1.0 mi (1.6 km) of the Duncan Canal study area. The maximum recorded water depth recorded in this area was approximately 10.8 ft (3.3 m). Fifty-eight magnetic anomalies with amplitudes ranging from 4.5 to 922.1 nT, and durations ranging from 2.5 to 83.1 seconds were recorded during remote sensing survey. Ten exhibited high amplitudes (>100 nT), and nine evinced long durations (>30 seconds). Forty-seven magnetic anomalies exhibited simple, monopolar or dipolar signatures and eleven evinced complex, multi-component, signatures. All but two, designated M1651 and M1653, of the eleven magnetic anomalies with multi-component signatures can be associated with electric lines, crab pots, or insignificant ferrous debris. Spatial and magnetic contour analyses indicate that these two magnetic anomalies, M1651 and M1653, are associated with M1637 and M1640. These anomalies were identified for further scrutiny and grouped into Target Dun 1. This target is located at approximately 3625037.64, 563703.96 at a depth of 8.0 ft (2.4 m). M1637 exhibits a high amplitude (922.1 nT), a medium duration (27.5 seconds), and a simple, dipolar, signature. M1640 exhibits a high amplitude (742.7 nT), a short duration and a simple, dipolar, signature. M1651 exhibits a high amplitude (102.6 nT), a medium duration (28.9 seconds), and a complex, multi-component, signature. M1653 exhibits a medium amplitude (51.1 nT), a short duration (10.0 seconds) and a complex, multi-component signature.
The high amplitudes and complex signatures of the magnetic anomalies recorded in the vicinity of this target undoubtedly were enhanced as a result of the close proximity of the magnetometer to each ferrous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Shipwrecks (NOAA Chart)
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SAM Sub-bottom Profiler Trackline
Pipelines
Magnetic Contours 5nT
Sites
IER 3 Access Channel Study Area
Target Areas
State Plane Louisiana South
1702 (NAD83, Survey Feet)
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Feet
Disclaimer: This is for general location only
IER 3
Duncan Canal
Cultural Resources Remote Sensing Survey
Date: 02/28/2008
Prepared By: BPB
R. Christopher Goodwin & Associates, Inc.

Map 3.

IER #3

Choctaw Nation of Oklahoma

P.O. Box 1210 • Durant, OK 74702-1210 • (580) 924-8280

Gregory E. Pyle
Chief

Gary Batton
Assistant Chief

December 26, 2007

Elizabeth Wiggins
Dept. of the Army
New Orleans District, Corps of Engineers
P.O. Box 60267
New Orleans, Louisiana 70160-0267

Dear Elizabeth Wiggins:

We have reviewed the following proposed project (s) as to its effect regarding religious and/or cultural significance to historic properties that may be affected by an undertaking of the projects area of potential effect.

Project Description: Lake Ponchartrain and Vicinity Hurricane Protection Project

County-State: Jefferson Parish, Louisiana

Comments: After further review of the above mentioned project (s), to the best of our knowledge it will have no adverse effect on any historic properties in the project's area of potential effect. However, should construction expose buried archaeological or building materials such as chipped stone, tools, pottery, bone, historic crockery, glass or metal items, this office should be contacted immediately @ 1-800-522-6170 ext. 2137.

Sincerely,

Terry D. Cole
Tribal Historic Preservation Officer
Choctaw Nation of Oklahoma

By: Caren A. Johnson
Caren A. Johnson
Administrative Assistant

CAJ: vr

IER #3

CHITIMACHA
TRIBE OF LOUISIANA

CULTURAL DEPARTMENT

December 27, 2007

Ms. Elizabeth Wiggins
Chief, Environmental Planning and Compliance Branch
U.S. Corps of Engineers
CEMVN-PM-RN
P.O. Box 60267
New Orleans, LA 70160-0267

Re: Lake Ponchartrain and Vicinity Hurricane Protection Project
Jefferson East Bank
Jefferson Parish, Louisiana

Dear Ms. Wiggins:

We are in receipt of your letter, dated December 3, 2007, concerning the above referenced project. The parish where the proposed project is to take place is part of the aboriginal Chitimacha homeland. That is, historically and prehistorically the Chitimacha Tribe of Louisiana was located near this area. This homeland contains many village sites, religious/sacred sites, and burial sites, which must be taken into account in the planning process.

Our records and oral traditions do not indicate that a specific Chitimacha archaeological site or Traditional Cultural Property is in the immediate vicinity of your project, therefore we have no objection to the implementation of the proposed activity. However, if archaeological remains representing a village site and/or burial site are discovered during the process of construction you should stop and contact the tribe and the State Historic Preservation Office immediately, in order to begin consultation regarding the encountered remains.

The Chitimacha Tribe of Louisiana appreciates your compliance with federal and state laws concerning Native American notification and consultation. Should you have any questions, do not hesitate to contact me (337) 923-9923.

Sincerely,

Kimberly S. Walden,
Director, Cultural Department

KW:JD

105 Houma Drive P.O. Box 661 Charenton, LA 70523 (337) 923-9923 FAX (337) 923-6848

Choctaw Nation of Oklahoma

P.O. Box 1210 • Durant, OK 74702-1210 • (580) 924-8280

Gregory E. Pyle
Chief

Gary Batton
Assistant Chief

April 3, 2008

Elizabeth Wiggins
Dept. of the Army
New Orleans District, Corps of Engineers
P.O. Box 60267
New Orleans, Louisiana 70160-0267

Dear Elizabeth Wiggins:

We have reviewed the following proposed project (s) as to its effect regarding religious and/or cultural significance to historic properties that may be affected by an undertaking of the projects area of potential effect.

Project Description: Lake Ponchartrain & Vicinity Hurricane Protection Project IER #3

Project Location: Jefferson East Bank

County-State: Jefferson Parish, Louisiana

Comments: After further review of the above-mentioned project (s), to the best of our knowledge, it will have no adverse effect on any historic properties in the project's area of potential effect. However, should construction expose buried archaeological or building materials such as chipped stone, tools, pottery, bone, historic crockery, glass or metal items, this office should be contacted immediately @ 1-800-522-6170 ext. 2137.

Sincerely,

Terry D. Cole
Tribal Historic Preservation Officer
Choctaw Nation of Oklahoma

TDC: vr

Swanda, Michael L MVN

From: Carrie V. Wilson [nagpra.106@earthlink.net]
Sent: Tuesday, March 04, 2008 4:08 PM
To: Swanda, Michael L MVN
Subject: Re: IER #3 - Quapaw Tribe of Oklahoma Request to Continue Consultation for Expanded APE

Just keep me informed - It is best to send any reports (hard copies) to me Chairman Berrey prefers mail being sent via pdf. files. If you need anything else just give me a call. Carrie cell 479-601-7991

-----Original Message-----
From: "Swanda, Michael L MVN"
Sent: Mar 3, 2008 1:29 PM
To: nagpra.106@earthlink.net
Subject: IER #3 - Quapaw Tribe of Oklahoma Request to Continue Consultation for Expanded APE

Dear Ms. Wilson,

The U.S. Army Corps of Engineers, New Orleans District, is providing additional project documentation for the proposed Lake Pontchartrain and Vicinity Hurricane Protection Project, Individual Environmental Report #3, Jefferson Parish, Louisiana. The project's area of potential effects (APE) is being expanded to include four additional floatation channels in Lake Ponchartrain. Recent remote sensing investigations in these floatation channels did not identify any targets or anomalies exhibiting cultural resource characteristics. A management summary of the investigation and a copy of our letter sent to Chairman Berrey is enclosed.

Please review the enclosed project information and if you would like to comment on the proposed project and/or on our "no historic properties affected" finding, we are asking that you respond within 30 days of receipt of this email. Please contact me at 504-862-2036 if you have any questions or require any additional information.

Sincerely,

Michael Swanda,
Archaeologist
Natural & Cultural Resources Analysis Section Environmental Branch New Orleans District Corps of Engineers

(504) 862-2036

<<IER #3 - Supplemental Management Summary.pdf>> <<IER #3 - December 3, 2007 Quapaw Tribe of Oklahoma Letter.pdf>> <<IER #3 - March 3, 2008 Quapaw Tribe of Oklahoma Letter Request to Continue Consultation for Expanded APE.pdf>>

Cultural Resouces

United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

January 11, 2008

Colonel Alvin B. Lee
District Engineer
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Colonel Lee

Please reference the Individual Environmental Report (IER) Lake Pontchartrain and Vicinity (LPV) Jefferson East Bank, Jefferson, Louisiana (IER3). That study was conducted in response to Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4). That law authorized the Corps of Engineers (Corps) to upgrade some existing hurricane protection projects to provide protection against a 100-year hurricane event. This report contains an analysis of the impacts on fish and wildlife resources that would result from the implementation of 100-year hurricane protection for that area, and provides recommendations to minimize and/or mitigate project impacts on those resources.

The proposed project was authorized by Supplemental 4 which instructed the Corps to proceed with engineering, design, and modification (and construction where necessary) of the LPV and the West Bank and Vicinity (WBV) Hurricane Protection Projects so those projects would provide 100-year hurricane protection. Procedurally, project construction has been authorized in the absence of the report of the Secretary of the Interior that is required by Section 2(b) of the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). In this case, the authorization process has precluded the normal procedures for fully complying with the FWCA. The FWCA requires that our Section 2(b) report be made an integral part of any report supporting further project authorization or administrative approval. Therefore, to fulfill the coordination and reporting requirements of the FWCA, the Service will be providing post-authorization 2(b) reports for each IER.

This draft report incorporates and supplements our FWCA Reports that addressed impacts and mitigation features for the WBV of New Orleans (dated November 10, 1986, August 22, 1994, November 15, 1996, and June 20, 2005) and the LPV (dated July 25, 1984 and January 17, 1992) Hurricane Protection projects and the November 26, 2007 Draft Programmatic FWCA Report that addresses the hurricane protection improvements authorized in Supplemental 4. However, this report does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. This report has been provided to the Louisiana Department of Wildlife and Fisheries

and the National Marine Fisheries Service; their comments will be incorporated into our final report.

DESCRIPTION OF THE STUDY AREA

The IER3 project area runs along the existing Jefferson east bank levee system on the north side of Jefferson Parish where it meets Lake Pontchartrain (Figure 1). There are 9.5 miles of existing earthen levee, foreshore protection, two floodgates, and four pump stations.

Figure 1. Individual Environmental Report (IER) Lake Pontchartrain and Vicinity (LPV) Jefferson East Bank, Jefferson, Louisiana (IER3).

FISH AND WILDLIFE RESOURCES

The Service has provided a November 26, 2007 draft programmatic FWCA Report for the LPV project. That report contains a thorough discussion f the significant fish and wildlife resources (including those habitats) that occur within the study area. For brevity, that discussion is incorporated by reference herein.

ALTERNATIVES UNDER CONSIDERATION

No-Action Alternative

For each levee reach, floodwall, flood gate, and structure within IER3, the no-action alternative was evaluated. Under the no-action alternative, the proposed action would not be constructed. The current levee reaches and associated structures would remain or be brought to the authorized heights of approximately 16 ft. Routine maintenance of the levee system would continue, but no height would be added to the system.

Levee Alternatives

As part of the initial evaluation of Levee LPV 00, 01, 02, 19, and 20 four alternatives were considered but eliminated from detailed impact analysis: T-wall floodwall, earthen levee with T-wall floodwall cap, earthen levee using deep soil mixing, and a protected-side shift of the existing levee alignment. Since a stable earthen levee is already in place on these reaches, replacement with floodwalls, floodwall caps, or the use of deep zone mixing was eliminated due to engineering inferiority and practicality. Based on the presence of a substantial number of residential neighborhoods and commercial establishments, a protected-side shift of the existing levee was also eliminated from detailed consideration.

Levee Modification (17.5 ft) with Rock Foreshore Protection was also considered but eliminated from further consideration due to cost and the volume of fill material required for the alternative. In addition, a modification of the foreshore protection to better accommodate recreational activities was evaluated. Based on the increased costs associated with this alternative, it was eliminated from detailed consideration.

Pumping Station Alternatives

Variations on the configurations and heights of the fronting protection and breakwaters were evaluated, including higher fronting protection and lower breakwaters as well as lower fronting protection and higher breakwaters. However, the preferred alternative was determined to provide the best engineering value to the overall flood protection system and these potential alternatives were eliminated from further consideration.

Floodwalls and Gates at Bonnabel boat launch and Williams Blvd boat launch

As part of the initial evaluation, modification of the existing floodwalls and gates (addition of approximately 2 ft of height) was considered. However, a stability analysis was performed on this alternative, and it was determined that the sheet pile support in the existing I-walls is not deep enough to adequately support a modified structure. Therefore, it was eliminated from detailed evaluation.

Bridge abutment and floodwall tie-ins at Causeway Bridge

As part of the initial evaluation, demolition and reconstruction of the existing bridge abutment and floodwall tie-ins to height of 16.5 ft along with a rolling gate closure (double closure gap) across Causeway Blvd was considered. Although this is a feasible alternative, it was eliminated from detailed evaluation because it would add complexity to the flood fighting in the area and might not satisfy all stakeholders.

Non-Structural Alternatives

Non-structural alternatives included elevating all residential and commercial properties and public acquisition of properties in areas subject to flooding. Both these alternatives were eliminated due to excessive cost.

DESCRIPTION OF SELECTED PLAN

The proposed plan for the levee reaches (LPV00, LPV01, PLV02, LPV 19, and LPV 20) consists of raising the levee from its current height of 16.5 ft to 17.5 ft, modifying the levee to widen the levee crown from 7 ft to 10 ft in a straddle configuration to the extent possible (a slight flood-side shift could be incorporated as needed), and adding rock foreshore protection to 5.5 ft on the flood-side of the existing breakwater.

The proposed action for the four pumping stations (LPV09 Bonnabel, LPV10 Suburban, LPV11 Elmwood, and LPV12 Duncan) consists of adding fronting protection to each of the pumping stations. The fronting protection would be similar to a concrete T-wall, with a sluice or vertical-lift gate to allow discharge from the pumping station. The fronting protection would be constructed to an approximate height of 17 ft, and new T-wall tie-ins would be constructed to connect the new fronting protection to the adjacent levee reaches at a height of 17 ft.

In addition, modifications and/or construction of breakwaters would be incorporated at three of the pumping stations (Bonnabel, Elmwood, and Duncan) and would be located where the drainage canals meet Lake Pontchartrain. At the Bonnabel pumping station, a new breakwater would be added at a height of 14 ft and would extend from onshore into the lake (Figure 2). At the Elmwood pumping station, the existing breakwater would be modified to increase its height from 6.5 ft to approximately 10 ft. At the Duncan pumping station, a new breakwater would be added at a height of 14 ft and would begin approximately 150 feet offshore; connected to shore by a bridge (Figure 2).

Figure 2. New breakwater at the Bonnabel and Duncan pump stations.

The proposed action for LPV16 (floodwall and gate at the Bonnabel boat launch) and LPV18 (floodwall and gate at Williams Blvd boat launch) consists of demolition of the existing floodwalls and gates and construction of new T-walls, I-wall transitions, and gates. The new gate structure would include a rolling gate closure at a height of 16.5 ft.

The proposed action for LPV17 (bridge abutment and floodwall tie-ins at Causeway Bridge) consists of extending the existing levee system across Causeway Boulevard. The new levee would have a crown/crest height of 16.5 ft. Causeway Boulevard would be modified, beginning at 6th Street, and would slope up to the crest elevation of the levee. The roadway would then slope back down to the elevation of the bridge abutment. The new road would be supported by vertical and mechanically stabilized earth walls to minimize the impact at the base and allow construction of sidewalks and accesses to existing buildings and streets.

Access Roads

Truck access to the project sites will be via existing roads (I-10 to Loyola Dr., to Bonnabel Blvd., to Causeway Blvd, or Williams Blvd.). Barges may also be used during construction and would access the project area via Lake Pontchartrain.

Borrow

The earthen fill material would be obtained from the Bonnet Carré Spillway. The fill will be mined from an area of the spillway's 900-acre all-terrain vehicle (ATV) recreation area, off Airline Highway (U.S. 61), approximately 13-21 miles from the project area. Impacts from borrow are being addressed in separate IERs.

PROJECT IMPACTS

There will be no habitat impacted as a result of the proposed project. As with the future without project, fish and wildlife and their habitats, in the future with project scenario, are expected to remain relatively stable with some decline from development, subsidence, and erosion. No Federally listed threatened or endangered species presently occur within the proposed project area. Therefore, no further endangered species consultation is required unless there are changes in the scope or location of the project, or project construction has not been initiated within one year. If project construction has not been initiated within 1 year, follow-up consultation should be accomplished prior to making expenditures for construction. If the scope or location of the proposed work is changed, both threatened and endangered species and FWCA consultation should be reinitiated as soon as such changes are made.

FISH AND WILDLIFE CONSERVATION MEASURES

Coastal marshes are considered by the Service to be aquatic resources of national importance due to their increasing scarcity and high habitat value for fish and wildlife within Federal trusteeship (i.e., migratory waterfowl, wading birds, other migratory birds, threatened and endangered species, and interjurisdictional fisheries). Because of the Services' close coordination with the USACE on this project, and because the project is not expected to have any adverse impacts to wetlands, the Service has no conservation measures to offer at this time.

SERVICE POSITION AND RECOMMENDATIONS

There will be no fish and wildlife resources impacted as a result of the proposed project. The Service does not object to the construction of the proposed project provided the following fish and wildlife conservation recommendations are implemented concurrently with project implementation:

1. All gates and/or culverts being replaced or modified should be operated according t previously developed operational plans to avoid further degradation of the project area.

2. The Service shall be provided an opportunity to review and submit recommendations on the draft plans and specifications for all levee work addressed in this report.

3. Any proposed change in levee, floodwall, or drainage structure features, locations or plans shall be coordinated in advance with the Service, NMFS, LDWF, and LDNR.

4. If the proposed project has not been constructed within 1 year or if changes are made to the proposed project, the USACE should re-initiate Endangered Species Act consultation with the Service to ensure that the proposed project would not adversely affect any federally listed threatened or endangered species or their habitat.

Sincerely,

James F. Boggs
Supervisor
Louisiana Field Office

Enclosures

cc: EPA, Dallas, TX
NMFS, Baton Rouge, LA
LA Dept. of Wildlife and Fisheries, Baton Rouge, LA
LA Dept. of Natural Resources (CMD/CRD), Baton Rouge, LA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

January 17, 2008

Colonel Alvin B. Lee
District Engineer
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Colonel Lee

Please reference the Individual Environmental Report Lake Pontchartrain and Vicinity Jefferson East Bank, Jefferson, Louisiana (IER3). That study was conducted in response to Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006. That law authorized the Corps of Engineers (Corps) to upgrade some existing hurricane protection projects to provide protection against a 100-year hurricane event. The Corps has recently defined the IER 3 proposed plan and the U.S. Fish and Wildlife Service (Service) provided recommendations on that plan to the Corps in a January 11, 2008, Fish and Wildlife Coordination Act Report. This letter supplements that report and is submitted in accordance with provisions of the Fish and Wildlife Coordination Act (FWCA; 48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). This letter does not constitute the report of the Secretary of the Interior as required by Section 2(b) of that Act. This supplemental letter is being coordinated with the Louisiana Department of Wildlife and Fisheries (LDWF) and the National Marine Fisheries Service (NMFS) and their comments will be incorporated into the final FWCA report.

A description of the study area and a discussion of the significant fish and wildlife resources (including habitats) that occur within that study area are contained in our January 2008 report. For brevity, that information and discussion is incorporated by reference herein.

The Service recently became aware of an additional feature that was not included in the Corps' draft IER 3 report, to dig four 10-feet deep and up to 1.5 miles long access channels in Lake Pontchartrain perpendicular to each of the four pump station sites. With the additional feature the Service continues to believe there will be no significant fish and wildlife resources impacted as a result of the proposed project. Therefore, the Service believes that the recommendations (presented below) provided in our January 2008, FWCA Report continue to remain valid.

1. All gates and/or culverts being replaced or modified should be operated according to previously developed operational plans to avoid further degradation of the project area.

2. The Service shall be provided an opportunity to review and submit recommendations on the draft plans and specifications for all levee work addressed in this report.

3. Any proposed change in levee, floodwall, or drainage structure features, locations or plans shall be coordinated in advance with the Service, NMFS, LDWF, and Louisiana Department of Natural Resources.

4. If the proposed project has not been constructed within 1 year or if changes are made to the proposed project, the Corps should re-initiate Endangered Species Act consultation with the Service to ensure that the proposed project would not adversely affect any federally listed threatened or endangered species or their habitat.

However, based on the new information the Service would like to add the following recommendation.

1. The Service recommends backfilling all access channels in Lake Pontchartrain after construction is complete. In order to have sufficient material to backfill the access channels and minimize turbidity in the lake, the Service also recommends the use of silt curtains.

Thank you for the opportunity to review the draft IER 3 report and its proposed revision. If the project scope or design changes, the Service requests that the Corps reinitiate FWCA coordination to ensure that the above recommendations remains valid. If you or your staff has any questions regarding this matter, please have them contact Catherine Breaux (504/862-2689) of this office.

Sincerely,

James F. Boggs
Supervisor
Louisiana Field Office

Enclosures

cc: EPA, Dallas, TX
NMFS, Baton Rouge, LA
LA Dept. of Wildlife and Fisheries, Baton Rouge, LA
LA Dept. of Natural Resources (CMD/CRD), Baton Rouge, LA

-----Original Message-----
From: Ettinger.John@epamail.epa.gov [mailto:Ettinger.John@epamail.epa.gov]
Sent: Monday, July 14, 2008 8:01 AM
To: Behrens, Elizabeth H MVN
Cc: Keeler.Barbara@epamail.epa.gov
Subject: EPA Comments on Draft IER 3

EPA Comments on Draft IER 3

To: Elizabeth Behrens, Corps of Engineers, New Orleans District

The Environmental Protection Agency (EPA) has reviewed draft Individual Environmental Report (IER) 3. This IER adequately supports the conclusion that there is no less environmentally damaging practicable alternative to the proposed action. There would be no direct wetland impacts. Approximately 26 acres of lake-bottom habitat would be directly impacted. Given the absence of less damaging alternatives and the relatively minor impacts to aquatic resources, we do not object to the proposed project. We do, however, have the following comments pertaining to relative sea level rise assumptions and the analysis of non-structural alternatives. (These are the same comments we recently made on IER 2.) We do not believe that an addendum to this IER would be required to address these comments.

Non-Structural Alternatives: We agree in general that there is no viable non-structural alternative to the proposed project. However, we do not necessarily agree with the assumptions upon which this conclusion is based.
Specifically, we question the appropriateness of using the number of homes flooded by hurricane Katrina as the basis for a cost estimate of the non-structural alternative. According to the Corps, hurricane Katrina was a 400-year storm, whereas the goal of the current project is to meet 100-year hurricane standards. Thus, the Corps appears to be comparing the cost of a 400-year non-structural alternative to that of a 100-year structural alternative. In addition, we also question the assumption that flood-proofing commercial, industrial, and public buildings would be equal to the costs associated with elevating residential structures. There is no basis or rationale provided for this assumption. Again, we do not disagree with the Corps conclusion regarding non-structural alternatives. Rather, as noted in our comments on IER 11 Tier I, we view non-structural approaches as important complementary actions to levees and coastal restoration.

Relative Sea Level Rise: No source is provided for the assumption that subsidence in the study area will be 0.5 feet per century. The Corps estimates that eustatic sea level rise in the next 100 years will be approximately 1.3 ft per the 2001 report of the Intergovernmental Panel on Climate Change (IPCC). It is unclear why the Corps does not use the IPCC's
2007 report to establish the estimate for future sea level rise. Presumably, the levee and floodwall heights for this project reflect these assumptions regarding subsidence and sea level rise. Since these are critical assumptions and since they do not necessarily represent the worst case of the IPCC's estimates, we would recommend that the Corps explain how any planned "structural superiority" measures would help address uncertainties pertaining to future rates of relative sea level rise.

Thank you in advance for your consideration of these comments. Please let me know if you have any questions or would like to discuss this in further detail.

John Ettinger
U.S. EPA Region 6
(504) 862-1119
ettinger.john@epa.gov

United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

July 21, 2008

Mr. Richard Hartman
Branch Chief
Habitat Conservation Division
National Marine Fisheries Service
c/o Louisiana State University
Baton Rouge, Louisiana 70803-7535

Dear Mr. Hartman:

Attached is the Fish and Wildlife Coordination Act Report on the "Individual Environmental Report (IER) Lake Pontchartrain and Vicinity (LPV) Jefferson East Bank, Jefferson, Louisiana (IER3)". This report constitutes the 2(b) report of the Fish and Wildlife Service (Service). The Service incorporated your agency's comments into the final report prior to its submission to the U.S. Army Corps of Engineers. Should your staff have any questions regarding this report, please have them contact Catherine Breaux (504/862-2689) of this office.

Your cooperation in this matter is appreciated.

Sincerely,

James F. Boggs
Supervisor
Louisiana Field Office

Attachment

TAKE PRIDE IN AMERICA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

July 21, 2008

Bryant Hammett
Secretary
Louisiana Department of Wildlife and Fisheries
Post Office Box 98000
Baton Rouge, Louisiana 70898-9000

Dear Mr. Hammett:

Attached is the Fish and Wildlife Coordination Act Report on the "Individual Environmental Report (IER) Lake Pontchartrain and Vicinity (LPV) Jefferson East Bank, Jefferson, Louisiana (IER3)". This report constitutes the 2(b) report of the Fish and Wildlife Service (Service). The Service incorporated your agency's comments into the final report prior to its submission to the U.S. Army Corps of Engineers. Should your staff have any questions regarding this report, please have them contact Catherine Breaux (504/862-2689) of this office.

Your cooperation in this matter is appreciated.

Sincerely,

James F. Boggs
Supervisor
Louisiana Field Office

Attachment

TAKE PRIDE® IN AMERICA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

July 21, 2008

Colonel Alvin B. Lee
District Engineer
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Colonel Lee

Please reference the "Individual Environmental Report (IER) Lake Pontchartrain and Vicinity (LPV) Jefferson East Bank, Jefferson, Louisiana (IER3)". That study was conducted in response to Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4). That law authorized the Corps of Engineers (Corps) to upgrade some existing hurricane protection projects to provide protection against a 100-year hurricane event. This report contains an analysis of the impacts on fish and wildlife resources that would result from the implementation of 100-year hurricane protection for that area, and provides recommendations to minimize and/or mitigate project impacts on those resources.

The proposed project was authorized by Supplemental 4 which instructed the Corps to proceed with engineering, design, and modification (and construction where necessary) of the LPV and the West Bank and Vicinity (WBV) Hurricane Protection Projects so those projects would provide 100-year hurricane protection. Procedurally, project construction has been authorized in the absence of the report of the Secretary of the Interior that is required by Section 2(b) of the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). In this case, the authorization process has precluded the normal procedures for fully complying with the FWCA. The FWCA requires that our Section 2(b) report be made an integral part of any report supporting further project authorization or administrative approval. Therefore, to fulfill the coordination and reporting requirements of the FWCA, the Service will be providing post-authorization 2(b) reports for each IER.

This report incorporates and supplements our FWCA Reports that addressed impacts and mitigation features for the WBV of New Orleans (dated November 10, 1986, August 22, 1994, November 15, 1996, and June 20, 2005) and the LPV (dated July 25, 1984 and January 17, 1992) Hurricane Protection projects and the November 26, 2007 Draft Programmatic FWCA Report that addresses the hurricane protection improvements authorized in Supplemental 4. This report constitutes the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. The draft FWCA Report was provided to the Louisiana Department of Wildlife and Fisheries

TAKE PRIDE IN AMERICA

(LDWF) and the National Marine Fisheries Service (NMFS); their comments are incorporated into this final report.

DESCRIPTION OF THE STUDY AREA

The IER3 project area runs along the existing Jefferson east bank levee system on the north side of Jefferson Parish where it meets Lake Pontchartrain (Figure 1). There are 9.5 miles of existing earthen levee, foreshore protection, two floodgates, and four pump stations. The project area was sub-divided into 12 reaches (i.e., LPV: 00, 01, 02, 09, 10, 11, 12, 16, 17, 18, 19, and 20).

Figure 1. Individual Environmental Report (IER) Lake Pontchartrain and Vicinity (LPV) Jefferson East Bank, Jefferson, Louisiana (IER3).

FISH AND WILDLIFE RESOURCES

The Service has provided a November 26, 2007 draft programmatic FWCA Report for the Supplemental 4 project. That report contains a thorough discussion of the significant fish and wildlife resources (including those habitats) that occur within the study area. For brevity, that discussion is incorporated by reference herein.

ALTERNATIVES UNDER CONSIDERATION

No-Action Alternative
For each levee reach, floodwall, flood gate, and structure within IER3, the no-action alternative was evaluated. Under the no-action alternative, the proposed action would not be constructed. The current levee reaches and associated structures would remain or be brought to the authorized heights of approximately 16 feet (ft). Routine maintenance of the levee system would continue, but no height would be added to the system.

Levee Alternatives
As part of the initial evaluation of Levee LPV 00, 01, 02, 19, and 20 four alternatives were considered but eliminated from detailed impact analysis: T-wall floodwall, earthen levee with T-wall floodwall cap, earthen levee using deep soil mixing, and a protected-side shift of the existing levee alignment. Since a stable earthen levee is already in place on these reaches, replacement with floodwalls, floodwall caps, or the use of deep zone mixing was eliminated due to engineering inferiority and practicality. Based on the presence of a substantial number of residential neighborhoods and commercial establishments, a protected-side shift of the existing levee was also eliminated from detailed consideration.

Levee Modification (17.5 ft) with Rock Foreshore Protection was also considered but eliminated from further consideration due to cost and the volume of fill material required for the alternative. In addition, a modification of the foreshore protection to better accommodate recreational activities was evaluated. Based on the increased costs associated with this alternative, it was eliminated from detailed consideration.

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As part of the initial evaluation, modification of the existing floodwalls and gates (addition of approximately 2 ft of height) was considered. However, a stability analysis was performed on this alternative, and it was determined that the sheet pile support in the existing I-walls is not deep enough to adequately support a modified structure. Therefore, it was eliminated from detailed evaluation.

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Non-structural alternatives included elevating all residential and commercial properties and public acquisition of properties in areas subject to flooding. Both these alternatives were eliminated due to excessive cost.

DESCRIPTION OF SELECTED PLAN

The proposed plan for the levee reaches (LPV00, LPV01, PLV02, LPV 19, and LPV 20) consists of raising the levee from its current height of 16.5 ft to 17.5 ft, modifying the levee to widen the levee crown from 7 ft to 10 ft in a straddle configuration to the extent possible (a slight flood-side shift could be incorporated as needed), and adding rock foreshore protection to 5.5 ft on the flood-side of the existing breakwater.

The proposed action for the four pumping stations (LPV09 Bonnabel, LPV10 Suburban, LPV11 Elmwood, and LPV12 Duncan) consists of adding fronting protection to each of the pumping stations. The fronting protection would be similar to a concrete T-wall, with a sluice or vertical-lift gate to allow discharge from the pumping station. The fronting protection would be constructed to an approximate height of 17 ft, and new T-wall tie-ins would be constructed to connect the new fronting protection to the adjacent levee reaches at a height of 17 ft.

In addition, modifications and/or construction of breakwaters would be incorporated at three of the pumping stations (Bonnabel, Elmwood, and Duncan) and would be located where the drainage canals meet Lake Pontchartrain. At the Bonnabel pumping station, a new breakwater would be added at a height of 14 ft and would extend from onshore into the lake (Figure 2). At the Elmwood pumping station, the existing breakwater would be modified to increase its height from 6.5 ft to approximately 10 ft. At the Duncan pumping station, a new breakwater would be added at a height of 14 ft and would begin approximately 150 feet offshore; connected to shore by a bridge (Figure 2).

Figure 2. New breakwaters at the Bonnabel and Duncan pump stations.

The proposed action for LPV16 (floodwall and gate at the Bonnabel boat launch) and LPV18 (floodwall and gate at Williams Boulevard boat launch) consists of demolition of the existing floodwalls and gates and construction of new T-walls, I-wall transitions, and gates. The new gate structure would include a rolling gate closure at a height of 16.5 ft.

The proposed action for LPV17 (bridge abutment and floodwall tie-ins at Causeway Bridge) consists of extending the existing levee system across Causeway Boulevard. The new levee would have a crown/crest height of 16.5 ft. Causeway Boulevard would be modified, beginning at 6th Street, and would slope up to the crest elevation of the levee. The roadway would then slope back down to the elevation of the bridge abutment. The new road would be supported by vertical and mechanically stabilized earth walls to minimize the impact at the base and allow construction of sidewalks and accesses to existing buildings and streets.

Construction Access Roads

Construction truck access to the project sites will be via existing roads (I-10 to Loyola Drive, to Bonnabel Boulevard, to Causeway Boulevard, or Williams Boulevard.). Barges may also be used during construction and would access the project area via Lake Pontchartrain.

Borrow

The earthen fill material would be obtained from the Bonnet Carré Spillway. The fill will be mined from an area of the spillway's 900-acre all-terrain vehicle (ATV) recreation area, adjacent to Airline Highway (U.S. 61), approximately 13-21 miles from the project area. Impacts from borrow are being addressed in separate IERs.

PROJECT IMPACTS

There will only be minor adverse impacts to fish and wildlife resources as a result of the proposed project. As with the future without project, fish and wildlife and their habitats, in the future with project scenario, are expected to remain relatively stable with some decline from development, subsidence, and erosion. The Service concurred on May 5, 2008, with the Corps determination that the proposed project was not likely to adversely affect any federally listed threatened or endangered species presently occur within the proposed project area. Therefore, no further endangered species consultation is required unless there are changes in the scope or location of the project, or project construction has not been initiated within one year. If project construction has not been initiated within 1 year, follow-up consultation should be accomplished prior to making expenditures for construction. If the scope or location of the proposed work is changed, both threatened and endangered species and FWCA consultation should be reinitiated as soon as such changes are made.

FISH AND WILDLIFE CONSERVATION MEASURES

Coastal marshes are considered by the Service to be aquatic resources of national importance due to their increasing scarcity and high habitat value for fish and wildlife within Federal trusteeship (i.e., migratory waterfowl, wading birds, other migratory birds, threatened and endangered species, and interjurisdictional fisheries). Because of the Services' close coordination with the Corps on this project, and because the project is not expected to have any adverse impacts to wetlands, the Service has no conservation measures to offer at this time.

SERVICE POSITION AND RECOMMENDATIONS

There will only be minor adverse impacts to fish and wildlife resources as a result of the proposed project. The Service does not object to the construction of the proposed project provided the following fish and wildlife conservation recommendations are implemented concurrently with project implementation:

1. The Service, NMFS, and LDWF shall be provided an opportunity to review and submit recommendations on the draft plans and specifications for all levee work addressed in this report.

2. Any proposed change in levee, floodwall, or drainage structure features, locations or plans shall be coordinated in advance with the Service, NMFS, LDWF, and LDNR.

3. If the proposed project has not been constructed within 1 year or if changes are made to the proposed project, the Corps should re-initiate Endangered Species Act consultation with the Service and NMFS to ensure that the proposed project would not adversely affect any federally listed threatened or endangered species or their habitat.

Sincerely,

James F. Boggs
Supervisor
Louisiana Field Office

cc: EPA, Dallas, TX
NMFS, Baton Rouge, LA
LA Dept. of Wildlife and Fisheries, Baton Rouge, LA
LA Dept. of Natural Resources (CMD/CRD), Baton Rouge, LA