



DRAFT
INDIVIDUAL ENVIRONMENTAL REPORT
LPV, LABRANCHE WETLANDS LEVEE
ST. CHARLES PARISH, LOUISIANA
IER # 1

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U.S. Army Corps of Engineers
New Orleans District
Protection and Restoration Office

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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 #1 (IER #1) to evaluate the potential impacts associated with raising approximately 9 miles of earthen levees; replacing over 3,000 feet (ft) of floodwalls; rebuilding, modifying or closing five drainage structures; and modifying one railroad gate. The proposed action is located in St. Charles Parish, Louisiana (figure 1). For the purposes of this IER, the Lake Pontchartrain and Vicinity area has been divided into numerous reaches. Every reach is identified by a project identification number (e.g., LPV 1) (figure 2).



Figure 1. LaBranche Wetlands Levee, Vicinity Map



Figure 2. The IER #1 Project Area

IER #1 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 March 13, 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 proposed actions would be located in southeastern Louisiana and would be 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.

This draft IER will be distributed for a 30-day public review and comment period. A public meeting specific to the proposed action would be held if requested by a stakeholder during the

review period. Any comments received during this public meeting would be considered part of official record. After the 30-day comment period, and public meeting if requested, the CEMVN District Commander would review all comments received during the review period and make a determination if they rise to the level of being substantive in nature. If comments are not considered to be substantive, the District Commander would make a decision on the proposed action. This decision would be documented in an IER Decision Record. If a comment(s) is determined to be substantive in nature, an Addendum to the IER would be prepared and published for an additional 30-day public review and comment period. After the expiration of the public comment period the District Commander would make a decision on the proposed action. The decision would be documented in an 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 St. Charles Parish. The term “100-year level of protection” 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. The elevations of the existing levees, floodwalls, structures, and gates within the LPV projects included in the proposed action are below the 100-year design elevation. 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 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.

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 that gave additional authority to the USACE to construct 100-year GNOHSDRRS projects.

The LPV project was authorized under the Flood Control Act of 1965 (PL 89-298, Title II, Sec. 204) which 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 (.L 106-53, Sec. 324); and 2000 (PL 106-541, Sec. 432).

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, and Flood Control and Coastal Emergencies) authorized accelerated completion of the project and restoration of project features to design elevations at full Federal

expense. 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 floodwalls; the construction of permanent closures at the outfall canals; the improvement of the Inner Harbor Navigation Canal (IHNC); 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 (5th Supplemental – PL 110-28, Title IV, Chapter 3, Flood Control and Coastal Emergencies).

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 March 14, 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 IHNC from Lake Pontchartrain and/or the Gulf Intracoastal Waterway (GIWW)-Mississippi River Gulf Outlet (MRGO)-Lake Borgne complex. A Tier 2 document discussing alignment alternatives and designs of the navigable and structural barriers, and the impacts associated with exact footprints, is being completed.
- On February 21, 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 February 14, 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 an 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 October 30, 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 October 2, 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 July 2, 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 July 2, 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 February 22, 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 September 12, 1990, the CEMVN signed a FONSI on EA #105 entitled “LPV Hurricane Protection – South Point to Gulf Intracoastal Waterway, A. V. Keeler and Company Alternative Borrow Site.” The report addresses the impacts associated with the excavation of a borrow area in Slidell, Louisiana for LPV construction.
- On August 30, 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 March 12, 1990, the CEMVN signed a FONSI on EA #102 entitled “LPV Hurricane Protection – 17th Street Canal Hurricane Protection.” The report addresses the use 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 August 4, 1989, the CEMVN signed a FONSI on EA #89 entitled “LPV Hurricane Protection, High Level Plan - Alternate Borrow Site 1C-2B.” The report addresses the impacts associated with the excavation of a borrow area along Chef Menteur Highway, Orleans Parish for LPV construction. The material was used in the construction of a levee west of the Inner Harbor Navigation Canal.

- On October 27, 1988, the CEMVN signed a FONSI on EA #79 entitled “LPV Hurricane Protection – London Avenue Outfall Canal.” The report investigates the impacts of strengthening hurricane protection at an existing London Avenue Outfall Canal.
- On July 21, 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 an existing Orleans Avenue Outfall Canal.
- Supplemental Information Report (SIR) #30 entitled “LPV Hurricane Protection Project, Jefferson Lakefront Levee” was signed by the CEMVN on October 7, 1987. The report investigates impacts associated with changes in Jefferson Parish LPV levee design.
- SIR #25 entitled “LPV Hurricane Protection – Chalmette Area Plan, Alternate Borrow Area 1C-2A” was signed by the CEMVN on June 12, 1987. The report addresses the use of an alternate contractor furnished borrow area for LPV construction.
- SIR #27 entitled “LPV Hurricane Protection – Alternate Borrow Site for Chalmette Area Plan” was signed by the CEMVN on June 12, 1987. The report addresses the use of an alternate contractor furnished borrow area for LPV construction.
- SIR #28 entitled “LPV Hurricane Protection – Alternate Borrow Site, Mayfield Pit” was signed by the CEMVN on June 12, 1987. The report addresses the use of an alternate contractor furnished borrow area for LPV construction.
- SIR #29 entitled “LPV Hurricane Protection – South Point to Gulf Intracoastal Waterway Levee Enlargement” was signed by the CEMVN on June 12, 1987. The report discusses the impacts associated with the enlargement of the GIWW.
- SIR #22 entitled “LPV Hurricane Protection – Use of 17th Street Pumping Station Material for Lake Pontchartrain Hurricane Protection Levee” was signed by the CEMVN on August 5, 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 IHNC to the London Avenue Canal.
- SIR #17 entitled “LPV Hurricane Protection – New Orleans East Alternative Borrow, North of Chef Menteur Highway” was signed by the CEMVN on April 30, 1986. The report addresses the use of an alternate contractor furnished borrow area for LPV construction.
- On February 26, 1986, the CEMVN signed a FONSI on EA #52 entitled “LPV Hurricane Protection – Geohegan Canal.” The report addresses the impacts associated with the excavation of borrow material from an extension of the Geohegan Canal for LPV construction.
- SIR #10 entitled “LPV Hurricane Protection, Bonnet Carré Spillway Borrow” was signed by the CEMVN on September 3, 1985. The report evaluates the impacts associated with using

the Bonnet Carré Spillway as a borrow source for LPV construction, and found “no significant adverse effects on the human environment” were associated with the project.

- 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 December 2, 1974. Final Supplement I to the EIS, dated July 1984, was followed by a Record of Decision (ROD), signed by the CEMVN on February 7, 1985. Final Supplement II to the EIS, dated August 1994, was followed by a ROD signed by the CEMVN on November 3, 1994.
- A report entitled “Flood Control, Mississippi River and Tributaries,” published as House Document No. 90, 70th Congress, 1st Session, submitted December 18, 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 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.

1.5 PUBLIC CONCERNS

Throughout southern Louisiana, a common area of public concern is the need for 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 St. Charles Parish, members of the public have expressed concerns regarding the effects of the MRGO on the amount of water that entered Lake Pontchartrain during Hurricane Katrina, whether there would be a pump station added in St. Charles, whether the St. Charles levees were damaged in Katrina, whether there is backflow protection on gates and pumps, what would be the final height to which the levees/floodwalls would be raised, and whether the proposed improvements would be protective if a future hurricane follows a track 20 to 30 miles west of Hurricane Katrina's. 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 completion 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 stability berms, 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 impact to the natural or human environment would be addressed in a supplemental IER.

In addition, only limited Environmental Justice (EJ) information was available for the project area and as more data become available they will be incorporated into future documents including the CED. A methodology for determining direct and indirect impact assessment would include all sections of the population. With this knowledge in hand, a comparison of the level of impact on minority and low-income populations versus all other populations can be examined in detail. Development of a community involvement plan would 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 would be held to compile data and develop mitigation strategies. Special attention would be given to data collection using quantitative methods to ensure that subjective issues are documented in a manner that influences policy development and mitigation strategies.

2.0 ALTERNATIVES

2.1 ALTERNATIVES DEVELOPMENT AND PRELIMINARY SCREENING CRITERIA

NEPA requires, in analyzing alternatives to the proposed action, a Federal agency consider an alternative of "no action." Likewise, section 73 of the Water Resources Development Act of 1974 (PL 93-251) requires Federal agencies to give consideration to non-structural measures to reduce or prevent flood damage.

In addition to these mandated alternatives, a range of reasonable alternatives was formulated, through input by the CEMVN Project Delivery Team, Value Engineering Team, engineering and

design consultants, as well as local government, the public, and resource agencies, for each of the reaches included 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, which could be utilized within that alignment.

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

Alternative Alignments:

- 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 that 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 based on the area’s specific design requirements to meet the 100-year level of protection. Designs are based on calculations that involve still water levels, storm surge, and wave run-up. These factors must be considered at each site so that the resulting levee or floodwall is built not only to the correct height, but also has the right shape, and slope for its location. 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.

The alternatives description that follows is organized by reach. Some alternatives are common among all reaches. As stated previously, each reach is identified by a project identification number (e.g., LPV 1). The alternative description 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, and associated structures would remain or be brought to the authorized heights of 12.5 ft to 13.5 ft. Routine maintenance of the levee system would continue, but no additional height would be added to the system.

Proposed Action. The proposed action (preferred alternative) would provide 100-year level of protection for St. Charles Parish. The elevations of the existing levees, floodwalls, structures, and gates within the LPV projects would be raised to a height of 16 ft to 18 ft, with the exception of the floodwall under Interstate 310 (I-310), which would be rebuilt to a height of 13.5 ft to 15.5 ft.

The following reaches would be included in the proposed action:

- LPV 03d Levee – consists of approximately 3,000 ft of levees at the northwestern end of the Louis Armstrong New Orleans International Airport. The existing elevations of the levees vary, but range from +10.5 ft to +13.5 ft as referenced to the North American Vertical Datum (NAVD88).
- LPV 04 Levee - reach 1a, 1b and 2a – consists of approximately 4.7 miles of levee. Prior to Hurricane Katrina, the levees were at an elevation of approximately +10.5 to +12 ft (NAVD88). These reaches are currently under contract to be raised to their authorized heights of approximately +13.5 ft (NAVD88).
- LPV 05 Levee - reach 2b – consists of approximately 3.3 miles of levee. Prior to Hurricane Katrina, the levee was at an elevation of approximately +9 ft (NAVD88). However, this reach was recently raised to its authorized height of approximately +13.5 ft (NAVD88).
- LPV 06a Bonnet Carré Floodwall – consists of approximately 155 ft of floodwall at an elevation of approximately +12 ft (NAVD88).
- LPV 06b Shell Pipeline Floodwall – consists of approximately 195 ft of floodwall at an elevation of approximately +12 ft (NAVD88).
- LPV 06c Good Hope Floodwall – consists of approximately 550 ft of floodwall at an elevation of approximately +11.5 ft (NAVD88).
- LPV 06d Koch -Gateway Floodwall – consists of approximately 272 ft of floodwall at an elevation of approximately +12 ft (NAVD88).
- LPV 06e Floodwall under I-310 – consists of approximately 1,760 ft of floodwall at an elevation of approximately +11 ft (NAVD88).
- LPV 06f Canadian National Railroad Gate – consists of an approximately 450 ft gate at an elevation of approximately +12 ft (NAVD88).
- LPV 07a Bayou Trepagnier Drainage Structure – consists of an approximately 310 ft structure and levee tie-ins at an elevation of approximately +12 ft (NAVD88).
- LPV 07b Cross Bayou Drainage Structure – consists of an approximately 503 ft structure and levee tie-ins at an elevation of approximately +11.5 ft (NAVD88).

- LPV 07c St. Rose Drainage Structure – consists of an approximately 640 ft structure and levee tie-ins at an elevation of approximately +11 ft (NAVD88).
- LPV 07d Almedia Drainage Structure – consists of an approximately 225 ft structure and levee tie-ins at an elevation of approximately +11 ft (NAVD88).
- LPV 07e Walker Drainage Structure – consists of an approximately 248 ft structure and levee tie-ins at an elevation of approximately +11 ft (NAVD88).

2.3 PROPOSED ACTION

LPV 03d Levee

The proposed action for this reach would consist of a flood side enlargement of the existing levee. The existing levee would be raised from its present elevation of approximately 14 ft to 16 ft plus 1 ft overbuild. A short reach of reinforced concrete retaining wall would be required to maintain an existing landing approach light, which is located at the flood side toe of the existing levee, for the east-west runway of Louis Armstrong New Orleans International Airport. This retaining wall would be incorporated into the flood side slope of the levee embankment and is necessary to maintain the approach light in its present position, as required by the Federal Aviation Administration and the New Orleans Aviation Authority.

The centerline of the new levee crown would shift approximately 15 ft flood side of the existing levee centerline. The landside slope would remain intact and the levee footprint (the ground surface area that would be covered by the alternative structure and associated right-of-way [ROW]) would increase by up to 50 ft on the flood side. East Jefferson Levee District's access road, located on the flood side of the existing levee, would be rebuilt as part of the levee enlargement contract. Tie-ins to the T-wall constructed as part of the Canadian National Railroad Gate (LPV 06f) and the floodwalls of the IER #2 project area would also be incorporated. Construction would begin in 2009 and construction activities could be expected to last approximately 9 months. Table 1 provides information on the approximate volumes of materials that would be required for the construction of this reach. At least one staging area for the project would be established within the ROW owned by the New Orleans Aviation Authority or the East Jefferson Levee District.

LPV 04 Levee (Reach LPV 04 1a, LPV 04 1b, and LPV 04 2a) and LPV 05 Levee (Reach LPV 05 2b)

The proposed action for these reaches (see figure 3 for photographic illustration of existing conditions) would consist of raising the levee reaches from their authorized height of 12.5 ft to 13.5 ft (after completion of Phase I) to 18 ft plus 1 ft overbuild for reach 1a; 16 ft plus 1 ft overbuild for reach 1b; and 18 ft plus 1 ft overbuild for reach 2a and 2b. Levee alignments would not be changed; however, the centerline of the levees could shift slightly, as necessary, to accommodate the levee footprint expansions of 100 ft to 250 ft on both the flood and protected side.

Construction of the proposed action would begin in 2009, and the construction activities could be expected to last for 26 to 29 months (approximately 2.3 to 2.5 years). Table 1 provides information on the approximate volumes of materials that would be required for construction of these reaches. Currently there are three staging areas/access roads that have been previously established on the protected side of the levee. From west to east, these areas are located (1) at the Trepagnier Pump Station, (2) off of U.S. 61 across from Ormond Boulevard, and (3) off of the temporary road constructed near Fox Lane. Three additional access roads could be temporarily established as part of this project. These new access roads would be located (4) at the Shell Pipeline crossing, (5) off of U.S. 61 in the vicinity of the northbound I-310 exit ramp, and (6) from the northwest corner of the business park to the Walker Structure. At completion of construction, the three temporary access roads would be returned to their original condition. The conceptual designs for the new roads as well as the locations of all the potential access roads are illustrated in figures 4a – 4e.



Figure 3. LPV 04, Reach 1A Facing Westward towards Bayou Trepagnier Pump Station

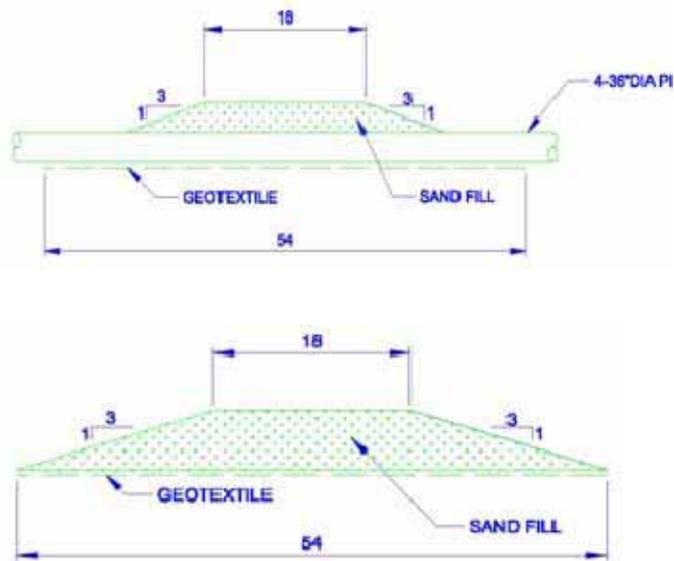


Figure 4a. Conceptual Design for New Access Roads, including piping to maintain the hydrology of the area during construction



Figure 4d. Construction Material Staging Areas and Access Roads – Middle Area 2

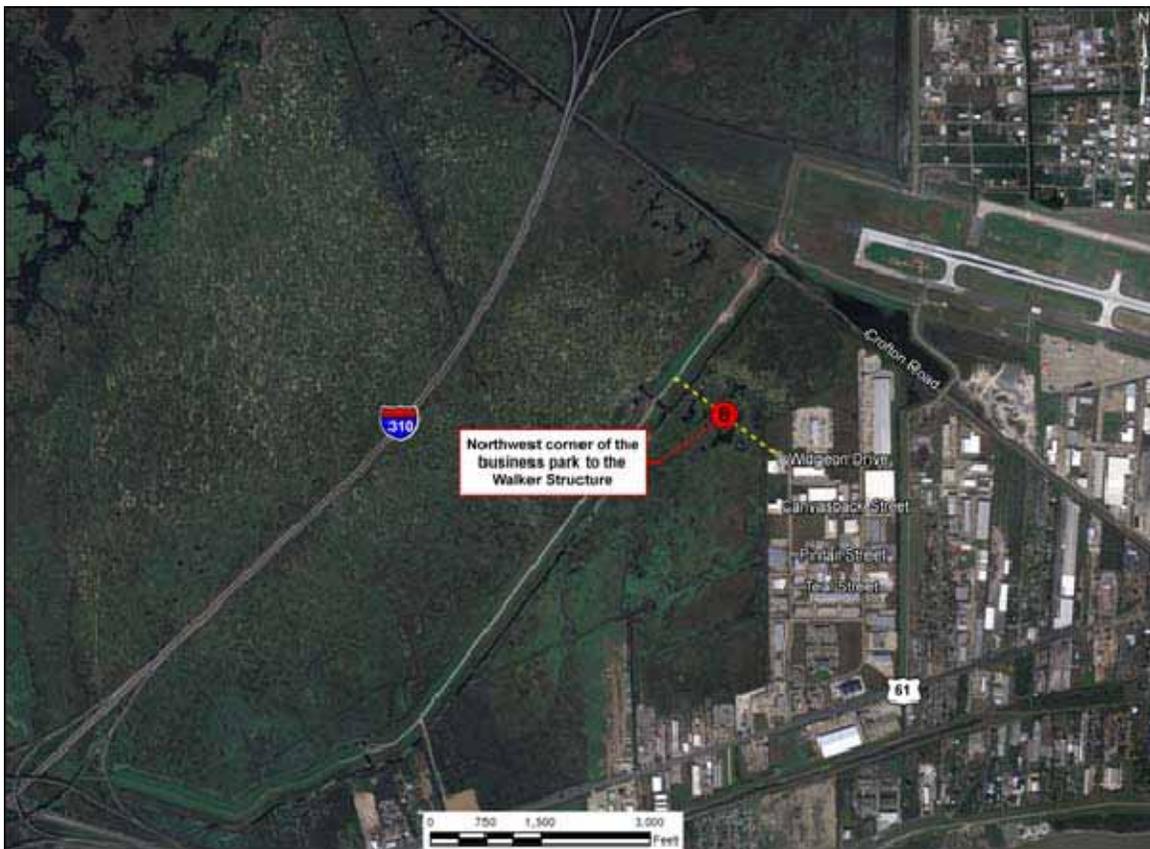


Figure 4e. Construction Material Staging Areas and Access Roads – Eastern Area

LPV 06 – Floodwalls and Gate (Reaches LPV 06a - LPV 06f)

LPV 06a Bonnet Carré Floodwall, LPV 06b Shell Pipeline Floodwall, LPV 06c Good Hope Floodwall, and LPV 06d Koch -Gateway Floodwall

The proposed action for these four floodwalls (see figure 5 for photographic illustration of existing conditions) would consist of demolishing the existing walls and rebuilding the new T-walls to approximately 17 ft to 18.5 ft. Based on the proposed action for LPV 04 and 05 (levees), the new walls would remain in their current alignment with minimal footprint expansion. However, the Bonnet Carré Floodwall would be increased from 155 ft in length to 465 ft to accommodate replacement of the existing structure at LPV 07a (near Bayou Trepagnier). During the construction phase, temporary structures (sheet piling) would be installed on the flood side to protect the existing levee system and would be removed once construction is complete.



Figure 5. Shell Pipeline Floodwall

Construction of the proposed action would begin in 2009, and the construction activities could be expected to last for approximately 16 to 19 months (1.3 to 1.5 years) per floodwall. Table 1 provides information on the approximate volumes of materials that would be required for construction of the four floodwalls.

LPV 06e Floodwall Under I-310

The proposed action for this area (see figure 6 for photographic illustration of existing conditions) would consist of demolishing the existing I-wall and replacing it with a new T-wall to approximately the same height (13.5 ft) due to height restrictions under the I-310 spans and under the onramp from Westbound Airline Drive to northbound I-310. All other sections of the wall would be rebuilt to an elevation of 15.5 ft. In addition, concrete scour protection would be incorporated under the bridges, extending approximately to the limit of the ROW on the protected side of the floodwall and extending approximately 50 ft on either side of the bridges (figure 7). The small gate located about mid-way down the length of the floodwall and located east of the main I-310 spans would also



Figure 6. LPV 06e, Floodwall Under I-310

be replaced. The existing sheet pile would be driven down approximately 5 ft (to elevation - 10.7 ft) for seepage cutoff and new steel H-piles would be driven down approximately 90 ft as a base for support of the new wall.

Construction of the proposed action would begin in 2009, and the construction activities could be expected to last for approximately 19 months (1.5 years). Table 1 provides information on the approximate volumes of materials that would be required for construction of the LPV 06e I-310 floodwall.



Figure 7. I-310 Wall Scour Protection

LPV 06f Canadian National Railroad Gate

The proposed action for this gate would consist of adding approximately 4 ft to 5 ft of height to the existing gate, bringing it to an approximate height of 15.5 ft. The tie-in floodwalls on each side of the existing gate would be demolished and new T-walls would be constructed to tie-in with the levee reach at approximately 16 ft. Construction of the proposed action would begin in 2009, and could be expected to last for approximately 19 months (1.5 years). Table 1 provides information on the approximate volumes of materials that would be required for construction of the LPV 06f Canadian National Railroad Gate.

LPV 07 - Drainage Structures (LPV 07a Bayou Trepagnier Drainage Structure, LPV 07b Cross Bayou Drainage Structure, LPV 07c St. Rose Drainage Structure, LPV 07d Almedia Drainage Structure, and LPV 07e Walker Drainage Structure)

The existing drainage structure (LPV 07a) on the canal west of Bayou Trepagnier would be retrofitted with new T-wall to a height of approximately 18 ft and a stability berm. The existing drainage structure would be closed to allow for construction of a stability berm that would be required to balance the T-wall. The closure of the existing drainage structure would also maintain a minimum water elevation within the intake basin for the operation of the existing pump station west of Bayou Trepagnier. Therefore, no changes to the current operation would be required under the proposed action. The existing structure is normally closed, so replacement of this structure with the T-wall would be similar to current conditions.

The proposed action for the Cross Bayou Drainage Structure and the St. Rose Drainage Structure (see figure 8 for photographic illustration of existing conditions) would consist of demolishing and rebuilding the structures to approximately 15.5 ft to 18.5 ft, adjacent to the existing structures. The new structures would remain in alignment with the levee system; however, the current structures would remain in place during construction of the new structures. The new structures would be built adjacent to the existing structures and the drainage canals would be realigned to flow through the new structures after completion. Following completion of the new structures, the existing structures would be demolished and replaced with an extension to the adjacent levee and a levee tie-in system.

The proposed action for the Almedia Drainage Structure and the Walker Drainage Structure would be to modify the existing structures (using additional pilings and thicker walls to add height) to approximately 16 ft.

Construction of the proposed action would begin in 2009, and the construction activities could be expected to last for approximately 16 to 19 months (1.3 to 1.5 years) per structure. Table 1 provides information on the approximate volumes of materials that would be required for construction of the LPV 07 structures.



Figure 8. LPV 07b, Cress Bayou Drainage Structure and LPV 15, Reach 2b

Armoring of Levees and Floodwalls

As an additional feature of floodwalls and levees, armoring could be incorporated to protect against erosion and scour on the protected, flood, or both sides 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.

Construction Related Information for Proposed Alternatives

Clearing and grubbing activities would be completed before construction of the proposed action could begin. Clearing would consist of the complete removal above the ground surface 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 pilings, 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 crown surfacing from the site would be disposed of in compliance with all applicable Federal, state, and local laws.

Construction of the proposed action for all reaches of the levee would require a significant amount of construction equipment to conduct the work, including hydraulic cranes and excavators, mechanical cranes, dump trucks, bulldozers, rollers, graders, tractors, front end loaders, water trucks, flatbed trucks, and pickup trucks. Significant amounts of earthen fill, concrete, piling and surfacing materials would also be needed to complete construction. Table 1 summarizes the estimated totals of construction material quantities that would be required to complete the proposed action for each project area.

Table 1 Estimated Construction Material Quantities Required to Complete the Proposed Action						
	LPV 03d	LPV 04 and LPV 05	LPV 06a-d	LPV 06e (I-310)	LPV 06f (Gate)	LPV 07
Concrete Cubic Yard (CY)	NA	NA	4,845	14,300	1,022	5,161
Sheet Piling square feet (Sq Ft)	500	NA	127,149	54,792	36,615	280,979
H-Piling Linear Feet (LFT)	NA	NA	72,326	41,570	11,957	105,226
Pipe Piling (LFT)	NA	NA	NA	2,220	NA	7,770
Earthen Fill (CY)	50,000	3,245,600	3,200	NA	NA	NA
Surfacing (CY)	NA	NA	300	NA	NA	NA

NA – Not applicable (Material not required for completion of proposed action)

For all construction under the proposed action, earthen fill material would be obtained from the Bonnet Carré Spillway, which is located approximately 1.9 miles from the IER #1 project area. If additional borrow material is needed from a source other than the Bonnet Carré Spillway, an additional IER would be prepared to analyze the impacts associated with potential borrow sources. Borrow material would be stockpiled, as needed, along the protected-side of the new levee alignment for each reach included in the proposed action. 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 or by barge into the city from the manufacturer. Other materials would be shipped via railways and transloaded to trucks at a terminal near the project site or barged down the Mississippi River and transloaded to trucks at a terminal near the project site. Surfacing would likely be provided by a local supplier and transported via truck to the project site.

Existing access routes and staging areas are located within a radius of approximately 5 to 10 miles of the project site. However, additional access routes/staging areas could be developed as part of the proposed action (see figures 4a-e). Nearly all of the truck traffic transporting construction materials to the project site would occur on U.S. 61 (Airline Highway). A more detailed description of how construction materials would be delivered to each project site under the proposed action is included in the transportation section of this document (section 3.2.12).

2.4 ALTERNATIVES TO THE PROPOSED ACTION

Based on the individual levee reach, a number of alternatives to the proposed action were considered in detail. Although not applied to every reach, these alternatives included no action, incorporation of wave breaks, flood-side shift of the levees, incorporation of geotextile fabric, construction of a new T-wall or earthen levee with a T-wall cap, replacement of floodwalls with earthen levees, demolition and construction of new structures, and modifications of existing structures.

No Action Alternative

For each levee reach, floodwall, flood gate, and structure within IER #1, 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, floodwalls, and associated structures would remain or be brought to the authorized heights of 12.5 ft to 13.5 ft. Routine maintenance of the levee system would continue, but no height would be added to the system.

Alternatives for LPV 03d

Alternative 1 LPV 03d - Incorporation of Breakwater

Under this alternative, the entire levee reach would remain at its current height and a breakwater (constructed of rock) would be constructed approximately 100 ft parallel to the existing levee on the flood side. The breakwater would be approximately 10 ft in elevation and would be approximately 70 ft wide.

Alternative 2 LPV 03d - T-Wall Floodwall

Under this alternative, a new alignment with a new T-wall would be constructed approximately 350 ft to the flood side. The T-wall would be built to a height of approximately 16 ft and tied in to the Canadian National Railroad Gate (LPV 06f) and the floodwalls of IER #2.

Alternative 3 LPV 03d - Earthen Levee with T-wall Floodwall Cap

Under this alternative, a new alignment with an earthen levee and T-wall cap would be constructed approximately 350 ft to the flood side. The earthen levee would be constructed to a height of approximately 10 ft, and a 6 ft T-wall cap would be incorporated for an approximate total height of 16 ft. The earthen levee with T-wall cap would be tied in to the Canadian National Railroad Gate (LPV 06f) and the floodwalls of IER #2.

Alternative 4 LPV 03d - Levee Realignment

Under this alternative, the levee would be realigned approximately 350 ft to the flood side. The new levee would be built to a height of approximately 16 ft with tie-ins to the Canadian National Railroad Gate (LPV 06f) and the floodwalls of IER #2.

Alternatives for LPV 04 and LPV 05

Alternative 1 LPV 04 and 05 - Existing Alignment with a Flood-Side Shift

Under this alternative, the levee reaches would be raised from their authorized height of 12.5 ft to 13.5 ft (after completion of Phase I) to 18 ft for reach 1a; 16 ft for reach 1b; and 18 ft for reach 2a and 2b. The centerline of the levees would be shifted to the flood side and all footprint expansion would take place on the flood side of the levee.

Alternative 2 LPV 04 and 05 - Incorporation of Wavebreaks

Under this alternative, the levee reaches would remain or be brought to their authorized height of 12.5 ft to 13.5 ft (after completion of Phase I). No additional height would be added to the levees. Instead, wavebreaks (constructed of rock or earthen fill) would be incorporated into the wave berm on the flood side of the levee. The wavebreaks would be approximately 4 ft to 5 ft higher than the base of the wave berm and would be up to 40 ft wide.

Alternative 3 LPV 04 and 05 – Incorporation of a Geotextile Fabric

Under this alternative, the levee reaches would be raised from their authorized height of 12.5 ft to 13.5 ft (after completion of Phase I) to 18 ft for reach 1a; 16 ft for reach 1b; and 18 ft for reach 2a and 2b. The existing levees would be degraded to approximately 3 to 4+ ft in elevation, a geotextile fabric would be placed on the degraded levee, and the levee then would be rebuilt to the 100-year protection level. The utilization of the geotextile fabric would allow for the levees to be rebuilt to the 100-year protection level without altering the alignments and without noticeable footprint expansion. Approximately 25 percent less earthen fill would be required for this alternative than the proposed action.

Alternatives for LPV 06 Floodwalls

Alternative 1 LPV 06a-d – Replace with Earthen Levees

Under this alternative, the floodwalls would be demolished and replaced with earthen levees as continuations of LPV 04 and LPV 05. The new levee sections would be constructed to a height of approximately 16 ft to 18 ft. Any pipeline crossings would be rebuilt and constructed up and over the new earthen levee.

Alternatives for LPV 06e Floodwall Under I-310

Alternative 1 LPV 06e I-310 – Construction of Wavebreaks

Under this alternative, a rock breakwater would be constructed on a geotextile fabric and located 100 ft to 300 ft northeast and northwest of the new T-wall (proposed action). The wavebreaks would be approximately 12 ft to 14 ft high, with a footprint of approximately 100 ft, and would be approximately 1,000 ft long on the northwest side of I-310 and approximately 700 ft long on the northeast side of I-310 in a “V” shape formation.

Alternatives for LPV 06f Canadian National Railroad Gate

Alternative 1 LPV 06f Gate - Demolition and Construction of a New Gate in Current Location

Under this alternative, the railroad gate would be demolished and rebuilt to approximately 15.5 ft.

Alternatives for LPV 07 Structures

LPV 07a (Bayou Trepagnier Drainage Structure)

No additional alternatives, other than retrofitting this reach with a new T-wall and a stability berm (i.e., the proposed action), were considered.

Alternative 1 LPV 07b and 07c Structures - Replacement of Existing Structures

Under this alternative, the structures would be demolished and rebuilt in their current location to a height of approximately 15.5 ft to 18.5 ft.

Alternative 1 LPV 07d and 07e Structures– Replacement of Existing Structures in an Adjacent Location

Under this alternative, new structures would be rebuilt to approximately 16 ft adjacent to the existing structures. The new structures would remain in alignment with the levee system; however, the current structures would remain in place during construction of the new structures. The new structures would be built adjacent to the existing structures and the drainage canals would be realigned to flow through the new structures after completion. Following completion of the new structures, the existing structures would be demolished and replaced with an extension to the adjacent levee and a levee tie-in system.

Alternative 2 LPV 07d and 07e Structures– Replacement of Existing Structures

Under this alternative, the structures would be demolished and rebuilt in their current location to a height of approximately 16 ft.

2.5 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

The following alternatives were eliminated from further consideration because they did not adequately meet the screening criteria.

Earthen Lakefront Levee

The construction of an earthen lakefront levee to protect St. Charles Parish against flooding from Lake Pontchartrain has been considered in the past and was considered again as part of this IER evaluation. However, as in previous reviews, the lakefront alignment was eliminated from further consideration because it would enclose approximately 29,000 acres of undeveloped wetlands and, although provisions would be made for drainage structures to allow tidal exchange, the natural regime of tidal sheet flow interchange would be reduced, tending to reduce the biological productivity of the enclosed wetlands.

Initially, in the early 1970s, consideration was given to the construction of an earthen lakefront levee that was to extend from the Jefferson Parish lakefront levee on the east to the Bonnet Carré Spillway east guide levee on the west. It would be built to a net grade of 12.5 ft, with a gravity drainage structure located at its approximate midpoint. After conducting detailed studies of the proposed lakefront levee, the CEMVN decided to indefinitely defer its construction based on environmental considerations. It was determined that the levee would have altered the existing hydrology of a large area of wetlands (the LaBranche Wetlands) and thereby reduce their biological productivity. Following this decision, Bayou LaBranche and Bayou Trepagnier, which would have been blocked by the levee, were designated as Louisiana Natural and Scenic Streams under the State and Local Coastal Resources Management Act of 1978 (USACE 1984).

When the reevaluation study was conducted for the LPV Hurricane Protection project in the early 1980s, the authorized lakefront levee alignment was retained for further evaluation along with an alignment just north of U.S. 61 (Airline Highway) and a third alignment that veered south of U.S. 61, as well as the no action alternative. The lakefront alignment was eliminated from further consideration because it would enclose approximately 29,000 acres of undeveloped wetlands and, although provisions would be made for drainage structures to allow tidal exchange, the natural regime of tidal sheet flow interchange would be reduced, tending to reduce the biological productivity of the enclosed wetlands. The alignment just north of U.S. 61 was chosen for detailed study (USACE 1984) and eventually constructed.

Hollow Core Levee

For each of the levee reaches that include an existing 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. 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 9.

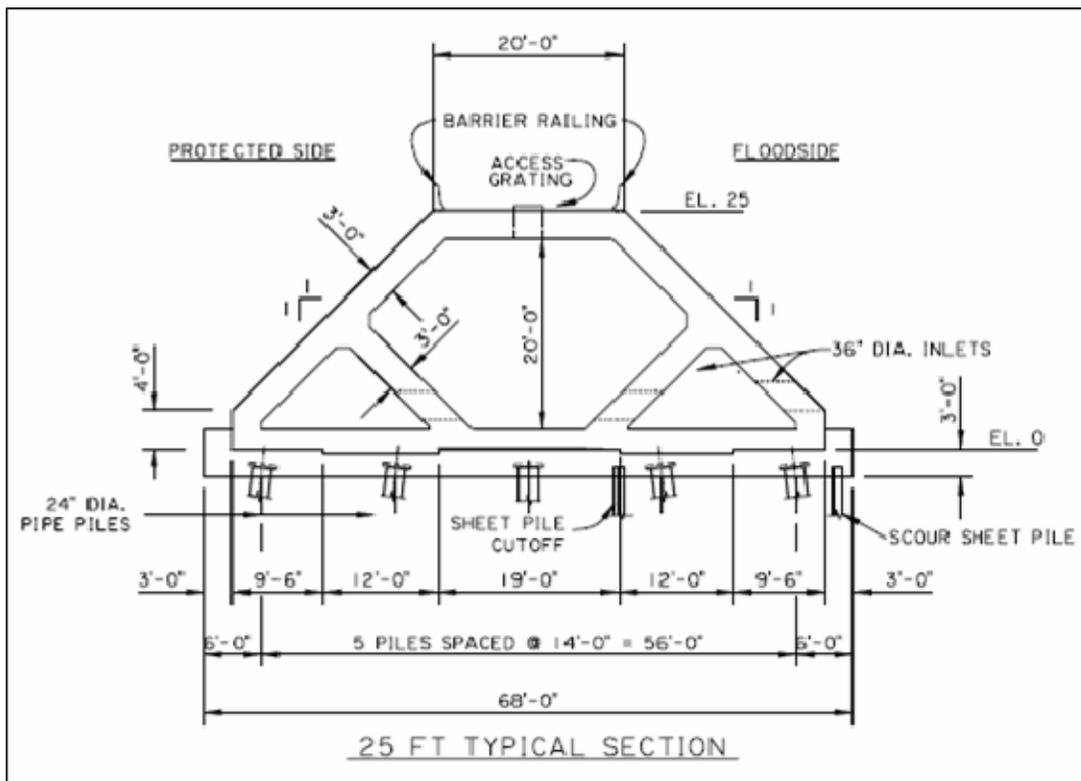


Figure 9. Hollow Core Levee – Typical Section

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 St. Charles Parish are only deficient by 1.5 ft to 2.5 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, in St. Charles Parish, borrow material could be easily obtained from the Bonnet Carre’ Spillway. 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.

Alternatives for LPV 03d

As part of the initial evaluation of levee reach LPV 03d, any form (earthen levees or floodwall combinations) of a protected side shift of the existing levee was eliminated from further consideration due to the proximity of the airport runway. In addition, expansion of the current alignment incorporating a T-wall was also eliminated from further consideration due to the proximity of the airport runway. Furthermore, the use of deep soil mixing (a soil stabilization process) was considered, but eliminated from detailed impact analysis due to engineering infeasibility resulting from the presence of cypress logs in the subsurface surrounding the existing levee system.

Alternatives for LPV 04 and LPV 05

As part of the initial evaluation of levee reach LPV 04 and LPV 05, three additional alternatives were considered, but eliminated from detailed impact analysis: T-wall floodwall, earthen levee with T-wall floodwall cap, and earthen levee using deep soil mixing. Since a stable earthen levee is already in place on these reaches and land is available for expansion of the levee, replacement with floodwalls and floodwall caps was eliminated due to engineering inferiority. In addition, expansion of the earthen levee using deep soil mixing was eliminated from consideration due to engineering infeasibility resulting from the presence of cypress logs in the subsurface surrounding the existing levee system.

A full protected-side shift of the levee centerline alignment was also eliminated from further evaluation. Implementation of a protected-side shift of the alignment throughout the project area would be unlikely due to the location of the Shell Oil Refinery, U.S. 61 (Airline Highway), a drainage canal, and segments of pipelines that run south of the existing levee alignment. In addition, a protected-side shift would be infeasible due to the geotechnical instability of the land between the drainage canal and the stability berm associated with the existing levee structure.

Alternatives for LPV 06 and LPV 07

As part of the initial evaluation of the Bonnet Carré Floodwall, Shell Pipeline Floodwall, Good Hope Floodwall, Koch-Gateway Floodwall, Canadian National Railroad Gate, Cross Bayou Drainage Structure, St. Rose Drainage Structure, Almedia Drainage Structure, and Walker Drainage Structure, flood side and protected-side shifts were eliminated from detailed analysis. Significant shifts in the floodwall and gate alignments were considered impractical from an engineering perspective. For the four drainage structures and the Canadian National Railroad Gate, all forms of earthen levees were also eliminated from detailed impact analysis. In each of these cases, there were physical factors (i.e., drainage area or railroad crossing) that would prevent the construction of an earthen levee. In addition, modification of existing LPV 06 floodwalls and the Cross Bayou and St. Rose drainage structures (adding height) was eliminated from further analysis because it was determined that the existing floodwalls and drainage structures are not structurally designed to handle the increased hydrostatic load.

Alternatives for LPV 06e Floodwall Under I-310

As part of the initial evaluation of the floodwall under I-310, all forms of earthen levees and replacement floodwall caps were eliminated from further consideration based on the proximity to I-310 structural members. It would not be feasible from an engineering perspective to place earthen fill for a levee onto bridge structural supports. In addition, any form of deep zone mixing was eliminated from consideration due to the potential of hazardous wastes in the immediate vicinity.

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. St. Charles 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 measures evaluated in this analysis would be to raise in place existing structures and the acquisition and 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 would 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 sq ft (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 are approximately 8,247 homes in St. Charles Parish East Bank (based on the 2000 Census) that would be protected by the LPV Hurricane Protection Project, as authorized (USACE 2006, USCB 2007a). The \$95 per sq ft average cost results in a cost of approximately \$153,000 to raise a 1,600 sq ft residence above the expected level of flooding. Using these assumptions, the costs to elevate all of the residences in the St. Charles Parish study area that could be damaged from flooding by hurricanes would be approximately \$1.3 billion.

Other costs associated with flood proofing would include elevating non-residential buildings, roads and 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 expected that evaluating each building individually would double the cost associated with elevation of the residential structures; with an estimated cost of over \$2.5 billion.

Elevating the roadways would be equivalent to converting all roadways and railroads to bridges. Repairing all roads and railroads would be a much more reasonable alternative. 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 77 miles of two-lane roads in St. Charles Parish. Therefore, repair cost would be \$30.8 million for each storm event that exceeded the level of flood protection. Repair costs were estimated at \$800,000 per mile for four-lane divided roadways. There are approximately 48 miles of four-lane roadways in St. Charles 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 76 miles of railroad in St. Charles Parish. Railroad repair costs were estimated at \$100 per ft. This resulted in a railroad repair cost of \$40.1 million for the study area.

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 cost of elevating all flood-prone infrastructure in the study area would likely be close to \$4 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 could also reduce the 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 alternatives screening results.

Table 2 Summary of the Preliminary Alternatives Screening Results								
Alternative	LPV 03d	LPV 04 - 05 ¹	LPV 06 ²	LPV 06e	LPV 06f	LPV 07 ³	LPV 07 ⁴	LPV 07 ⁵
No Action	<input checked="" type="checkbox"/>							
Non-Structural	X	X	X	X	X	X	X	X
Existing Alignment								
▪ Earthen Levee	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	X	n/a	X	X
▪ Earthen Levee with Geotextile Fabric	n/a	<input checked="" type="checkbox"/>	n/a	X	X	n/a	X	X
▪ T-wall Floodwall	X	X	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	<input checked="" type="checkbox"/>	X	X
▪ Earthen Levee with T-wall Floodwall cap	X	X	n/a	X	X	n/a	X	X
▪ Earthen Levee with Deep Soil Mixing	X	X	n/a	X	X	n/a	X	X
▪ Hollow Core Levee	X	X	n/a	n/a	n/a	n/a	n/a	n/a
▪ Wavebreaks/Breakwater	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n/a	<input checked="" type="checkbox"/>	n/a	n/a	n/a	n/a
▪ Replacement (structures)	n/a	n/a	n/a	n/a	<input checked="" type="checkbox"/>	n/a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
▪ Modification of existing structure	n/a	n/a	X	n/a	<input checked="" type="checkbox"/>	n/a	X	<input checked="" type="checkbox"/>
Flood-side Shift								
▪ Earthen Levee	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	n/a	n/a	n/a	n/a	n/a	n/a
▪ T-wall Floodwall	<input checked="" type="checkbox"/>	X	n/a	n/a	n/a	n/a	n/a	n/a
▪ Earthen Levee with T-wall Floodwall cap	<input checked="" type="checkbox"/>	X	n/a	n/a	n/a	n/a	n/a	n/a
▪ Earthen Levee with Deep Soil Mixing	X	X	n/a	n/a	n/a	n/a	n/a	n/a
▪ Hollow Core Levee	X	X	n/a	n/a	n/a	n/a	n/a	n/a
▪ Wavebreaks/Breakwater	n/a							
▪ Replacement (structures)	n/a	n/a	X	n/a	X	n/a	X	X
▪ Modification of existing structure	n/a	n/a	X	n/a	X	n/a	X	X
Protected-side Shift								
▪ Earthen Levee	X	X	n/a	n/a	n/a	n/a	n/a	n/a
▪ T-wall Floodwall	X	X	n/a	n/a	n/a	n/a	n/a	n/a
▪ Earthen Levee with T-wall Floodwall cap	X	X	n/a	n/a	n/a	n/a	n/a	n/a
▪ Earthen Levee with Deep Soil Mixing	X	X	n/a	n/a	n/a	n/a	n/a	n/a
▪ Hollow Core Levee	X	X	n/a	n/a	n/a	n/a	n/a	n/a
▪ Wavebreaks/Breakwater	n/a							
▪ Replacement (structures)	n/a	n/a	X	n/a	X	n/a	X	X
▪ Modification of existing structure	n/a	n/a	X	n/a	X	n/a	X	X
Alternate Alignment								
▪ Earthen Levee	<input checked="" type="checkbox"/>	n/a						
▪ T-wall Floodwall	n/a							
▪ Earthen Levee with T-wall Floodwall cap	n/a							
▪ Earthen Levee with Deep Soil Mixing	X	n/a						
▪ Hollow Core Levee	X	n/a						
▪ Wavebreaks/Breakwater	n/a							
▪ Replacement (structures)	n/a	n/a	n/a	n/a	n/a	n/a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
▪ Modification of existing structure	n/a							

**Table 2 (Continued)
Summary of the Preliminary Alternatives Screening Results**

Alternative	LPV 03d	LPV 04 - 05 ¹	LPV 06 ²	LPV 06e	LPV 06f	LPV 07 ³	LPV 07 ⁴	LPV 07 ⁵
▪ Realignment of Canal	n/a	n/a	n/a	n/a	n/a	n/a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
▪ Earthen Lakefront Levee	X	X	X	X	X	X	X	X

1 - LPV 04 reaches 1a, 1b, and 2a and LPV 05 reach 2b
 2 - LPV 06a, 06b, 06c, and 06d
 3 - LPV 07a
 4 - LPV 07b and 07c
 5 - LPV 07d and 07e
 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 #1 project area is located within the Lower Mississippi Delta Alluvial Plain and the East Central Louisiana Coastal watershed. The project area runs along the existing levee system on the north side of U.S. 61 (Airline Highway). The existing levee, floodwalls, and floodgates proposed for amendment as part of the IER #1 project begin immediately north of the Shell New Orleans Refining Company (NORCO) complex adjacent to the Bonnet Carré Guide Levee, which is east of the Bonnet Carré Spillway (used to divert floodwaters from the Mississippi River to Lake Pontchartrain). The existing levee system wraps around the Shell-NORCO complex and runs approximately 0.1 mile north of and parallel to U.S. 61 (Airline Highway). Approximately 0.5 mile east of the I-310 interchange with U.S. 61, the levee system turns to a northeasterly direction. The IER #1 project area terminates at LPV 03d (levee around the northwest end of the Louis Armstrong New Orleans International Airport) near the St. Charles/Jefferson Parish line (figure 2).

Climate

St. Charles 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 bodies 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 degrees 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 the Mississippi River and its associated natural levees, Bonnet Carré Spillway, U.S. 61 (Airline Highway), swamp, and intermediate marsh. Soil borings have been taken throughout the project area to characterize the soils for stability and to design levees and floodwalls that meet USACE Engineering Design Guidelines (guidelines can be found at <http://www.mvn.usace.army.mil/ED/edsp/index.htm>).

The project area is intermittently overlain by fill that varies in thickness but averages 4 ft to 6 ft thick. At the surface and underlying the fill are swamp deposits, which consist of very soft to stiff, organic, fat clays with high moisture content, wood, and lenses and layers of very soft to medium peat, very soft to stiff lean clay, and lenses of silt. Swamp deposits average 14 ft thick and range in elevation from +2 ft to -22 ft. Intertributary deposits underlie swamp deposits and consist of interbedded, very soft to medium, fat and lean clays with occasional layers and lenses of silt and lenses of silty sand. These deposits average 29 ft thick and range in elevation from -10 ft to -50 ft. Lacustrine deposits underlie intertributary deposits and consist of very soft to stiff, fat clays with occasional shells, shell fragments, lenses of shells, and soft to medium lean clays, and silt. Lacustrine deposits average 10 ft thick and range in elevation from -36 ft to -63 ft. Another layer of swamp deposits intermittently underlies the lacustrine deposits and consists of very soft to stiff, organic, fat clay with high moisture content and wood. These swamp deposits average 2 ft thick and range in elevation from -51 ft to -58 ft. Pleistocene deposits underlie lacustrine and swamp deposits and consist of interbedded, stiff to very stiff, fat and lean clays, silt, and silty sand. The surface of Pleistocene deposits averages -55 ft in elevation, and these deposits extend to an unknown depth.

The project area contains Barbary-Fausse and Sharkey-Commerce soils. Barbary-Fausse soils are level, very poorly drained soils that have a mucky or clayey surface layer and clayey underlying material. Sharkey-Commerce soils are level, poorly drained and somewhat poorly drained soils that are clayey and loamy throughout. Based on USACE data, relative sea level change in the region ranges from less than 0.5 ft per century to 1.0 to 4.0 ft per century (Penland et al. 2002).

Hydrology

The project area is bound to the north by the LaBranche Wetlands, and to the north of these wetlands Lake Ponchartrain, an oval-shaped, low-salinity estuary approximately 12 ft deep with a water surface area of 640 square miles (mi²). On the west side of the project area, near Shell-NORCO, open water within the wetlands is approximately 1.4 miles north of the existing levee. Open water within the wetlands is approximately 0.6 mile north of the Koch Gateway Floodwall that occurs in the center of the IER #1 project area. Lake Pontchartrain is approximately 4.9 miles north of this floodwall. The Mississippi River is south of the project area.

The proposed project area occurs within the Lake Pontchartrain Basin, a watershed encompassing 4,700 mi² in southeast Louisiana and southwest Mississippi. The basin is within the coastal zone delineation and, therefore, is regulated under the Louisiana State and Local Coastal Resources Management Act of 1978.

Surface water in the project area includes:

- Lake Pontchartrain
- LaBranche Wetlands (including Bayou LaBranche, Bayou Traverse, and Bayou Trepagnier)
- Two excavated ponds associated with the Good Hope Oil Field (LPV 06b and LPV 06c)
- Bonnet Carré Spillway (LPV 06a)
- Cross Bayou Canal (LPV 07b)
- Canals connecting to Bayou Traverse (near and between LPV 06d, LPV 04, LPV 07c, LPV 06e)
- Walker Canal (LPV 07e Walker Drainage Structure)
- Almedia Drainage (LPV 07d Almedia Drainage Structure)

All of these surface water features are considered to be Waters of the United States (WoUS; as defined by 33 USC 328) and Navigable Waters of the United States (NWUS; as defined by 33 CFR 329) and would be under the jurisdiction of the USACE. Dredge and fill activities in these waters require compliance with Section 404 of the Clean Water Act (33 USC 1344) and Section 10 of the Rivers and Harbors Act.

Hurricane Katrina and On-going Construction Activities

On August 29, 2005, Hurricane Katrina made landfall near Buras on the Louisiana Coast east of New Orleans. At landfall, Katrina was at the upper end of Category 3 intensity range with maximum sustained winds estimated at 123 miles per hour (mph). Sustained wind strength of 76 mph was recorded along the Pontchartrain Causeway. The water level of Lake Pontchartrain in the vicinity of the St. Charles Parish levee system rose 8 ft to 9 ft. St. Charles Parish was flooded through a gap in the GNOHSDRRS at the Canadian National Railway tracks near the Louis Armstrong New Orleans International Airport, affecting an estimated 500 homes and 125 businesses. St. Charles Parish also suffered high winds that resulted in roof and structural damage throughout the parish. Loss of power caused manufacturers to lose production and there were instances of fires initiated by downed power lines. The Port of South Louisiana reported approximately \$6,165,500 in damage to the Kinder Morgan Dock, General Cargo Dock, Kinder Morgan building, and other warehouse/building structures. While St. Charles Parish ports and plants experienced minimal damage in this disaster, they are extremely vulnerable to future disasters. The Bollinger Port facility on the MRGO was destroyed and plans are underway to relocate this facility. A potential site has been identified on the west bank of the Mississippi River in St. Charles Parish.

The Lake Pontchartrain Levee System in St. Charles Parish came within 18 inches of being overtopped by surge waters. The west bank of St. Charles Parish is without hurricane protection. As such, this area is vulnerable to catastrophic damages from tidal flooding, hurricane surges, and heavy rainfall events. As part of the USACE GNOHSDRRS Program, 18 contracts for construction work to repair, construct, and raise levees and flood control structures in St. Charles Parish are being proposed. Four of these contracts have been awarded for projects that would take the existing levees to pre-Katrina authorized elevations.

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 would be caused by the action taken and occur at the same time and place (40 CFR 1508.8(a)). Indirect impacts are those that would be caused by the action and would be later in time or farther removed in distance, but are still reasonably foreseeable (40 CFR 1508.8(b)).

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. Table 3 shows those significant resources found within the project area, and notes whether they would be impacted by any of the alternatives analyzed in this IER.

Table 3		
Significant Resources in Project Study Area		
Significant Resource	Impacted	Not Impacted
Wetlands/Drainageways/Canals	X	
Fisheries	X	
Essential Fish Habitat		X
Wildlife	X	
Threatened or Endangered Species		X
Non-wet Uplands		X*
Cultural Resources		X
Recreational Resources	X	
Aesthetic (Visual) Resources	X	
Air Quality		X
Noise	X	
Transportation	X	
Socioeconomic Resources		
Land Use, Population, Employment	X	
Environmental Justice		X
* - Not a significant resource in the project study area.		

3.2.1 Wetlands/Drainageways/Canals

Existing Conditions

The LaBranche Wetlands are within the area delineated as the coastal zone and, therefore, are regulated under Louisiana’s State and Local Coastal Resources Management Act of 1978. Waterways within the south portion of the LaBranche Wetlands include natural features such as Bayou LaBranche, Bayou Trepagnier, and Bayou Traverse, as well as man-made features such as the Cross Bayou Canal and Walker Canal (figure 10).

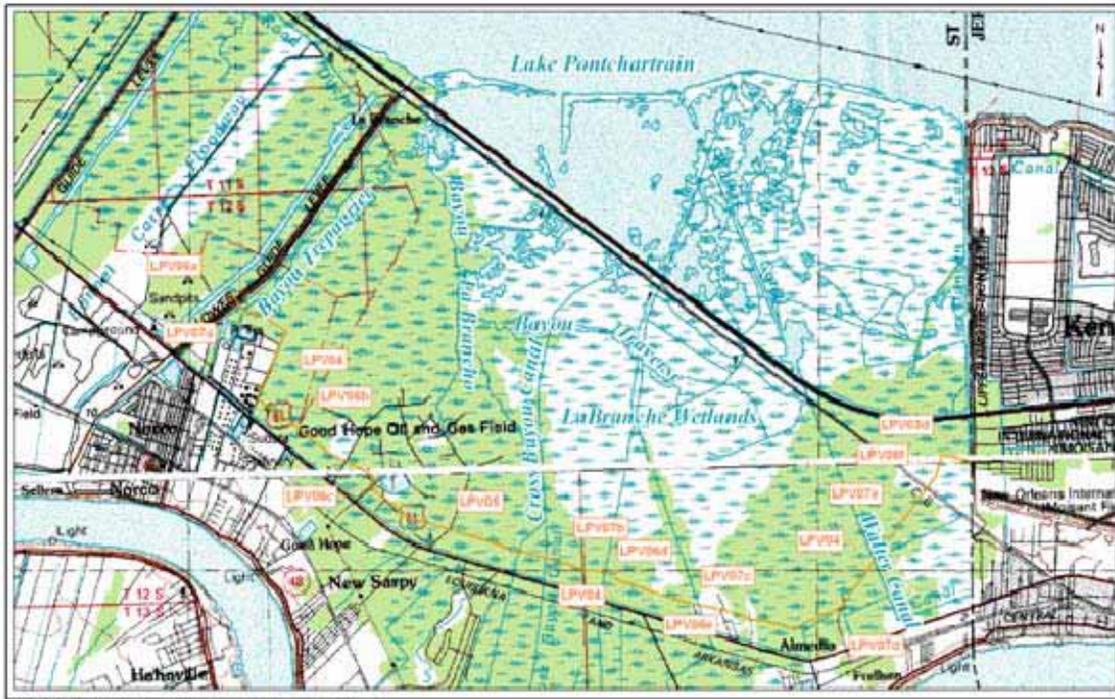


Figure 10. Hydrological Features of the IER #1 Project Area

Bayous LaBranche and Trepagnier are the major natural water features occurring within the project area. Bayou LaBranche originates north of U.S. 61 (Airline Highway) and the IER #1 project corridor and flows north for 4 miles to its confluence with Lake Pontchartrain. Bayou Trepagnier flows northeast for 4 miles from the Shell-NORCO oil refinery to its confluence with Bayou LaBranche. These reaches of Bayou Trepagnier and Bayou LaBranche have been designated as Louisiana Natural and Scenic Rivers. Sediments in the initial segment of Bayou Trepagnier, located immediately north of the oil refinery and the IER #1 project area, are contaminated due to the historical disposal of oil refinery waste in the bayou (Maygarden 2004). The Louisiana Department of Environmental Quality has established a “no-work zone” in that area pending remediation of the contaminated sediments.

The network of man-made canals and drainageways were created to provide access, for control of storm water run-off, or during construction of the existing levees. These features illustrate the highly manipulated hydrology of the project area. Cross Bayou Canal starts north of the Mississippi River, crosses the existing flood control levee at LPV 07b, flows north to cross Bayou Traverse, and terminates in the LaBranche Wetlands near Interstate 10. Another drainage runs parallel to the Cross Bayou Canal to the east, crossing the existing levee near LPV 06d and flowing north across Bayou Traverse to its confluence with Lake Pontchartrain. Walker Canal begins south of the levee near U.S. 61 (Airline Highway) and flows north across the levee to its confluence with Lake Pontchartrain. Lastly, a borrow canal runs parallel to the south side of the levee from the eastern side of the I-310 interchange to the Canadian National Railroad Gate.

These drainage features provide suitable habitat for many aquatic species and could provide a conduit for species to move between the south side of the levees and the LaBranche Wetlands on the north side of the levees and between the wetlands and Lake Pontchartrain. These canals and drainageways support submerged and floating aquatic vegetation such as coontail (*Ceratophyllum demersum*), wild celery (*Vallisneria americana*), alligatorweed (*Alternanthera philoxeroides*), pennywort (*Hydrocotyle* spp.), and pondweeds (*Potamogeton* spp.). In some areas of the borrow canal, the vegetation is very dense, limiting the value of this aquatic habitat (Breux 2008).

The LaBranche Wetlands consist primarily of cypress swamp (Maygarden 2004) in the southern areas, grading to intermediate and brackish marshes and shallow open water ponds farther north (Louisiana Coastal Wetlands Conservation and Restoration Task Force [LCWCRTF] and Wetlands Conservation and Restoration Authority [WCRA] 1999). The majority of the area adjacent to the levee reaches in the IER #1 project area (figure 10) is cypress swamp, with some hardwood forested wetland, forested upland, and developed land. Some marsh area is present near LPV 03d around the airport. Two areas of ponded water exist within LPV 04 between reach 2a and 2b (figure 10). These pond/lake features have unconsolidated bottoms and were artificially created during oil and gas exploration. The eastern-most of these features is a diked pond at the LPV 06c Good Hope Floodwall.

Healthy cypress swamps occur only in freshwater areas experiencing minimal daily tidal action and where the salinity range does not normally exceed two parts per thousand (ppt) (USACE and State of Louisiana 2004). The soils are inundated or saturated by water on a nearly permanent basis. The swamp habitat in the project area consists predominantly of bald cypress (*Taxodium distichum*), tupelo gum (*Nyssa aquatica*), and red maple (*Acer rubrum* var. *drummondii*). Other tree species in the swamps of the project area included Chinese tallow-tree (*Triadica sebifera*), pumpkin and green ash (*Fraxinus* spp.), swamp blackgum (*Nyssa sylvatica* var. *biflora*), and black willow (*Salix nigra*) (Breux 2008). Other vegetation occurring in the swamp of the project area included Walter's millet (*Echinochloa walteri*), spikerush (*Eleocharis* spp.), alligatorweed, pennywort, aster (*Aster* spp.), goldenrod (*Solidago* sp.), marshmallow (*Hibiscus* spp.), cattail (*Typha* spp.), rattlebox (*Sesbania drummondii*), frogbit (*Limnobium spongia*), dogfennel (*Eupatorium capillifolium*), eastern baccharis (*Baccharis halimifolia*), smartweed (*Polygonum* spp.), deer pea (*Vigna luteola*), panicum (*Panicum* sp.), coastal water hyssop (*Bacopa monnieri*), frogfruit (*Phyla nodiflora*), buttonbush (*Cephalanthus occidentalis*), palmetto (*Sabal minor*), and delta duckpotato (*Sagittaria platyphylla*) (Breux 2008).

Bottomland hardwood forests are normally found in broad floodplain areas flanking large river systems. They occur in areas where the natural hydrologic regime alternates between wet and dry periods. Vegetation associations include mixtures of broadleaf deciduous, needleleaf deciduous, and evergreen trees and shrubs. The hardwood community that occurs in the project area exists primarily on areas of higher elevation associated with former landfills near the project area. The hardwood forests associated with IER #1 are not pristine and have been frequently disturbed, so that they do not represent a true bottomland hardwood forest habitat. Common species found in bottomland hardwood forests are oak (*Quercus* spp.), green ash (*Fraxinus pennsylvanica*), water hickory (*Carya aquatica*), hackberry/sugarberry (*Celtis laevigata*), swamp dogwood (*Cornus foemina*), hawthorn (*Crataegus* spp.), and many vines and herbaceous species

(Louisiana Natural Heritage Program [LNHP] 2004). The predominant species identified in the hardwood habitat of the project area were hackberry/sugarberry, red maple, green ash, and American elm (*Ulmus americana*) (Breux 2008). Other species of vegetation identified in this community type within the project area included Chinese tallow-tree, eastern cottonwood (*Populus deltoides*), alligatorweed, smartweed, lizard's tail (*Saururus cernuus*), eastern baccharis, Virginia creeper (*Parathenocissus quinquefolia*), brambles (*Rubus* spp.), elderberry (*Sambucus canadensis*), goldenrod, and mulberry (*Morus* spp.) (Breux 2008).

Emergent marsh habitat is present near some portions the LPV 03d project area. The vegetation identified in this area includes marshhay cordgrass (*Spartina patens*), smooth cordgrass (*Spartina alterniflora*), bullwhip, eastern baccharis, alligatorweed, deer pea, Walter's millet, spikerush, pennywort, marshmallow, cattail, rattlebox, frogbit, smartweed, panicum, water hyssop, frogfruit, and spikerush (Breux 2008).

Future Conditions with No Action

Without implementation of the proposed action, there would be no actions above and beyond what is already authorized involving construction or modification of levees, floodwalls, gates, or drainage structures in the project area. Consequently, direct, indirect, and cumulative impacts on wetlands would not differ from those under existing conditions, as described previously.

Future Conditions for LPV 03d

Proposed Action LPV 03d (Increase in Levee Height with a Flood-side Shift)

Direct Impacts

Under this alternative, an expansion of up to 50 ft from the current levee footprint (the area of ground surface covered by levee and associated ROW) would likely be along the 2,540 ft of the existing levee reach. Assuming a 50 ft corridor, approximately 1.4 acres of wetland habitat would occur. Most of the expansion occurs within the existing levee ROW and road. Damage could also occur to adjacent wetland vegetation during the construction period (estimated to be approximately 9 months). The habitat adjacent to this reach has previously been disturbed for the construction of the airport and is maintained to prevent overstory growth that would create a hazard for air traffic. The presence of the airport, its associated ROWs, and management activities has degraded the value of the wetland habitat in this area. Therefore, this area does not represent a pristine or high quality example of wetland habitat. If this action were selected and constructed, the adjacent wetlands would stabilize following construction, allowing sediment to settle and vegetation to recolonize the area.

Indirect Impacts

Potential indirect impacts from the proposed action would primarily consist of effects from increased turbidity on the adjacent wetland habitat. Construction-related runoff into the wetlands would be managed through best management practices, minimizing the potential indirect adverse impacts from the proposed action on wetlands.

Cumulative Impacts

Potential cumulative impacts from the proposed action would involve the combined effects on the surrounding wetlands from the multiple LPV flood control projects in the St. Charles Parish and Jefferson Parish area. Wetlands within the LPV 03d reach would experience only temporary indirect impacts during the construction period.

Alternative 1 LPV 03d (Incorporation of Breakwater)

Direct Impacts

The breakwater would be constructed approximately 100 ft parallel to the current levee on the flood side. This action would result in a loss of an additional 4 acres (based on a 70 ft wide breakwater for the 2,540 ft length of the reach) of wetlands that would be replaced by rock. Damage to adjacent wetland vegetation during the construction period (estimated to be approximately 9 months) is also possible. As previously discussed, the quality of these wetland areas has been affected by past development and airport management activities. If this action were selected and constructed, the adjacent wetlands would stabilize following construction, allowing sediment to settle and vegetation to recolonize the area.

Indirect Impacts

Potential indirect impacts from this alternative would primarily consist of effects from increased turbidity on the adjacent wetland habitat during the construction period. Construction-related runoff into the wetlands would be managed through best management practices, which would minimize the potential indirect adverse impacts from this alternative on wetlands.

Cumulative Impacts

Potential cumulative impacts from this alternative would involve the combined effects from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. The cumulative impacts from flood-control-related actions possibly occurring in the area would mostly result from construction activities, resulting in temporary impacts. For most projects, the permanent replacement of wetlands would be minimized if economically and practically feasible. The project area would be modified very slightly relative to the extent of similar habitat in the LPV area. Other projects, such as freshwater diversion from the Bonnet Carré Spillway (as authorized by Section 3 of the Water Resources Development Act of 1988 [PL 100-676] and addressed in EA #192), would improve the existing wetlands within the region.

Alternative 2 LPV 03d (T-Wall Floodwall)

Direct Impacts

Impacts from this alternative would be similar in nature to alternative 1, but the magnitude of the impacts would be less. The footprint required for a T-wall is much smaller than required for the

breakwater, so any associated effects on wetland habitats would be smaller. A T-wall built 350 ft to the flood side of the current levee centerline would displace approximately 1.5 acres (based on a footprint 20 ft wide for the length of the floodwall) of emergent freshwater/intermediate wetland.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for LPV 03d would be similar to, but slightly less than, those for alternative 1.

Alternative 3 LPV 03d (Earthen Levee with T-wall Floodwall Cap)

Direct Impacts

This alternative would have similar, but greater impacts than the proposed action because it would move the existing levee alignment 350 ft to the flood side of the existing levee centerline, would have an increased construction time to add the T-wall cap, and could require a larger footprint (up to 500 ft wide). Assuming that the entire length of LPV 03d would be affected by this alternative, a loss of approximately 35 acres of mostly emergent wetland habitat would occur. Damage could also occur to adjacent wetland vegetation during the construction period (estimated to be approximately 3.5 years). As previously discussed, the quality of these wetland areas has been affected by past development and airport management activities. If this action were selected and constructed, the adjacent wetlands would stabilize following construction, allowing sediment to settle and vegetation to recolonize the area.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for LPV 03d would be similar to, but slightly greater than, those described for alternative 1.

Alternative 4 LPV 03d (Levee Realignment)

Direct Impacts

The footprint for this alternative would be the same as that for alternative 3. Therefore, the impacts on wetlands from this alternative would be very similar to those for alternative 3, with the exception that they likely would be smaller because, under this alternative, less time for construction (approximately 2.3 to 2.5 years versus 3.5 years) would be required.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for LPV 03d would be similar to, but slightly greater than, those described for alternative 1.

Future Conditions for LPV 04 and LPV 05

Proposed Action LPV 04 and LPV 05 (Existing Alignment with Straddle)

Direct Impacts

The proposed action for these reaches consists of raising the levee reaches from their authorized height of 12.5 ft to 13.5 ft (after completion of Phase I) to 17 ft to 19 ft. Levee alignments would not be changed; however, the centerline of the levees could shift slightly, as necessary, to accommodate the levee footprint expansions of 100 ft to 250 ft on both the flood side and protected side. For the purpose of this IER, impacts were conservatively evaluated based on the potential for the new levee height to require up to 250 ft of area adjacent to each side of the levee. The levee system currently reaches approximately 100 ft beyond the levee centerline, so the actual change would effectively encompass about 150 additional feet on either side of the existing levee. Construction time for the proposed action would be approximately 2.3 to 2.5 years.

This action would impact approximately 3 acres of forested wetland for the creation of construction access roads and would result in a loss of wetland habitat where the levee is expanded. Additionally, damage to adjacent wetland vegetation during the construction period could occur. Approximately 276 acres of cypress swamp, 11 acres of bottomland hardwood forest, and 17 acres of open water could be affected within the straddle corridor of 250 ft on each side of the current levee centerline. The existing habitat would be replaced with earthen fill, resulting in the complete loss of these habitat types. Most of the open water that would be replaced is a borrow canal that exists from the construction of the current levee. This canal does not represent a flowing channel or a conduit to the bayous of the LaBranche Wetlands or Lake Pontchartrain and is so congested with vegetation that it limits aquatic habitat. If this action were selected and constructed, the adjacent wetlands would stabilize following construction, allowing sediment to settle and vegetation to recolonize the area.

Indirect Impacts

Potential indirect impacts from the proposed action would consist primarily of effects from increased turbidity on the wetlands and open water surrounding the project area. However, because construction-related runoff into the wetlands and open water would be managed through best management practices, the potential, indirect, adverse impacts from the proposed action would be minimized.

Cumulative Impacts

Potential cumulative impacts from the proposed action would involve the combined effects on the surrounding wetlands from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. However, the project area would be modified very slightly relative to the extent of similar available habitat in the LPV area. Proposed and approved projects, such as freshwater diversion from the Bonnet Carré Spillway [as authorized by Section 3 of the Water

Resources Development Act of 1988 (PL 100-676) and addressed in EA #192], would have beneficial cumulative impacts on the region.

Alternative 1 LPV 04 and LPV 05 (Existing Alignment with Flood-Side Shift)

Direct Impacts

This action would result in a loss of wetland habitat where the levee is built and possible damage to adjacent wetland vegetation during the construction period (estimated to be approximately 2.5 years). Approximately 380 acres of cypress swamp, 14 acres of bottomland hardwood, and 3 acres of open water could possibly be affected within the flood-side shift corridor of 500 ft from the current levee centerline. This habitat would be replaced with earthen fill, resulting in the complete loss of these habitat types. Most of the open water that would be replaced is within the Cross Bayou Drainage Canal, which would not be filled in with levee but could be affected during construction.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for these levee reaches would be similar to, but slightly greater than, those for the proposed action.

Alternative 2 LPV 04 and LPV 05 (Incorporation of Wavebreaks)

Direct Impacts

Alternative 2 would require the construction of wavebreaks of earthen fill and rock in the wetlands approximately 100 ft to 300 ft north of the existing levee. This action would result in a loss of cypress swamp and hardwood wetland habitat where the wavebreaks would be built and possible damage to adjacent wetland vegetation during the construction period (estimated to be approximately 1.5 years). Impacts from construction of the wavebreaks have been accounted for during the assessment of the straddle and flood-side alignment alternatives, if the wavebreaks were built within the 250 ft to 500 ft corridor evaluated for these alternatives. If the wavebreaks were built outside of the 250 ft straddle corridor or 500 ft flood side shift corridor, it would represent up to an additional 52 acres of wetlands that would be replaced by earthen fill and rock, resulting in the complete loss of these habitat types. If this action were selected and constructed, the adjacent wetlands would stabilize following construction, allowing sediment to settle and vegetation to recolonize the area. The amount of wetland that could be lost with this alternative represents a small fraction of similar wetlands within the LPV area, which would help minimize adverse impacts from this alternative.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for these levee reaches would be similar to, but less than, those for the proposed action.

Alternative 3 LPV 04 and LPV 05 (Incorporation of a Geotextile Fabric)

Direct Impacts

Alternative 3 would not require a noticeable footprint expansion and, therefore, would result in limited disturbance of the wetlands adjacent to the existing levees. There would be temporary disturbance of the wetlands adjacent to reaches 1a, 1b, 2a, and 2b during construction, which is estimated to take 2.3 to 2.5 years. If this action were selected and constructed, the adjacent wetlands would stabilize following construction, allowing sediment to settle and vegetation to recolonize the area.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for these levee reaches would be similar to, but less than, those for the proposed action.

Future Conditions for LPV 06 (Floodwalls and Gate)

Proposed Action LPV 06a-f (New Floodwalls and Modified Gate)

The proposed action for these five floodwalls would consist of demolishing the existing walls and rebuilding the new T-walls to approximately 17 ft to 18.5 ft (LPV 06a-d) or 13.5 ft to 15.5 ft (LPV 06e). The new walls would remain in their current alignment with minimal footprint expansion. However, the Bonnet Carré Floodwall would be increased from 155 ft in length to 465 ft to accommodate replacement of the existing structure at LPV 07a (near Bayou Trepagnier). During the construction phase, temporary structures (sheet piling) would be installed on the flood side to protect the existing levee system. The existing drainage structure (LPV 07a) on the canal west of Bayou Trepagnier would be retrofitted with a new T-wall and a stability berm. The existing drainage structure would be closed to allow for construction of a stability berm that would be required to balance the T-wall. The closure of the existing drainage structure would also maintain a minimum water elevation within the intake basin for the operation of the existing pump station west of Bayou Trepagnier. The existing structure is normally closed, so replacement of this structure with the T-wall would be similar to current conditions.

Direct Impacts

Demolition and installation of the T-walls and modification of the existing gate would be within approximately the same footprint as the existing floodwalls, drainage structure, and gate. The reaches included in LPV 06 would be much shorter, the footprint required would be much smaller, and the construction period would be shorter (approximately 1.5 years) than for the levee reaches. The floodwall under I-310 would require the addition of concrete scour protection under the bridges extending approximately to the limit of the ROW on the protected side of the floodwall and extending approximately 50 ft on either side of the bridges. Most of the areas affected by the proposed action for LPV 06 would be primarily disturbed upland areas associated with the existing floodwalls and managed ROWs. New impacts on the wetlands would involve

less than 1 acre of wetland around the I-310 bridges and a portion of the canal west of Bayou Trepagnier that would be occupied by the floodwall, which would be similar in impact to the existing structure when it is closed.

Installation of the floodwall would disturb wetland biota and sediments in the immediate vicinity of construction activities. However, those impacts would be short-term, approximately 17 months in duration, with effects lasting up to several months after completion. Closure of the canal west of Bayou Trepagnier would result in a reduction of surface water flows into the wetland downstream. However, this structure is currently left closed to provide the water required to operate the nearby pump station and maintain healthy water levels within the wetlands. If this action were selected and constructed, the adjacent wetlands would stabilize following construction, allowing sediment to settle and vegetation to recolonize the area. The new floodwall would have a similar footprint to the existing floodwall, gate, and structure.

Indirect Impacts

Potential indirect impacts from the proposed action for LPV 06a-f would primarily consist of effects from increased turbidity on the wetlands and open water surrounding the project area, but these impacts would be temporary and controlled by best management practices.

Cumulative Impacts

Potential cumulative impacts from the proposed action would involve the combined effects on the surrounding wetlands from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. However, the project area would be modified very slightly relative to the extent of similar available habitat in the LPV area. Proposed and approved projects, such as freshwater diversion from the Bonnet Carré spillway [as authorized by Section 3 of the Water Resources Development Act of 1988 (PL 100-676) and addressed in EA #192], would have beneficial cumulative impacts on the region.

Alternative 1 LPV 06a-d Floodwalls (Replace with Earthen Levees)

Direct Impacts

The types of impacts that would result from floodwall demolition and levee construction under this alternative would be similar to those for the proposed action for LPV 04 and LPV 05, but the duration of the impacts would be greater (approximately 3.5 years) because of the additional time required for demolition of the floodwalls. For the purpose of this IER, impacts were conservatively evaluated based on the potential for the new levee height to require up to 250 ft of area on each side of the existing floodwall centerline.

This action would result in a loss of wetland habitat where the levee would be placed and possible damage to adjacent wetland vegetation during the construction period. Approximately 9 acres of wetlands would be affected within the straddle corridor of 250 ft from either side of the current floodwall centerline. The existing habitat would be replaced with earthen fill, resulting in the loss of these habitat types in the filled areas. If this action were selected and constructed,

the adjacent wetlands would stabilize following construction, allowing sediment to settle and vegetation to recolonize the area.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for these LPV reaches would be similar to those for the proposed action for LPV 04 and LPV 05.

Alternative 1 LPV 06e Floodwall Under I-310 (Construction of Wavebreaks)

Direct Impacts

The alternative action for LPV 06e, Floodwall Under I-310, would require the construction of rock or earthen wavebreaks in the wetlands approximately 100 ft to 300 ft north of the existing floodwall. The wavebreaks would be approximately 12 ft to 14 ft high, with a footprint approximately 100 ft wide by 1,000 ft long on the northwest side of I-310 and 700 ft long on the northeast side of I-310. This action would result in a loss of cypress swamp and bottomland hardwood wetland where the wavebreaks would be built, and possible damage to adjacent wetland vegetation during the construction period (estimated to be approximately 1.5 years). Approximately 4 acres of wetland would be replaced with rock and earthen fill, resulting in the loss of these habitat types in the filled area. These habitats have previously been disturbed for the construction of I-310 and do not represent a pristine or high quality wetland habitat. The presence of the highway and associated ROWs also degrades the value of the wetland habitats in this area. If this action were selected and constructed, the adjacent wetlands would stabilize following construction, allowing sediment to settle and vegetation to recolonize the area.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for this LPV section would be similar to, but greater than, those for the proposed action.

Alternative 1 LPV 06f Gate (Demolition and Construction of a New Gate in Current Location)

Direct Impacts

The alternative action retained for detailed evaluation includes demolition and replacement of the existing gate. Impacts were evaluated based on the potential for the new gate and associated ROWs to require up to 50 ft of area adjacent to each side of the existing gate and up to 100 ft of area adjacent to the existing gate on the flood or protected side. Construction time for this alternative would be approximately 1.5 years. The types of impacts from gate construction would be similar to those from levee construction but the severity and duration of the impacts would be much smaller because of the gate's smaller footprint, shorter length, and shorter construction time. If this action were selected and constructed, the adjacent wetlands would stabilize following construction, allowing sediment to settle and vegetation to recolonize the area.

Demolition and installation of the new gate would have impacts on wetlands. However, the area impacted by this action would be similar to the area previously disturbed for the existing gate. Approximately 1.5 acres of open water and 1.9 acres of cypress swamp could be affected during replacement of the existing gate, but these impacts would be mostly temporary impacts resulting from construction activities. The footprint for the new gate would be similar to the current gate, so no new loss of wetland would occur.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for this LPV reach would be similar to, but slightly greater than, those for the proposed action.

Future Conditions for LPV 07 (Structures)

Proposed Action LPV 07a Bayou Trepagnier Drainage Structure (Replacement of Existing Structure with T-wall)

The existing drainage structure (LPV 07a), located on the canal west of Bayou Trepagnier, would be retrofitted with a new T-wall and a stability berm, becoming part of the LPV 06a Bonnet Carré floodwall. Therefore, impacts for this reach were discussed previously for LPV 06a.

Proposed Action LPV 07b and LPV 07c Structures (New Structures Adjacent to Existing)

Direct Impacts

The proposed action for these two structures consists of demolishing the existing walls and rebuilding new structures adjacent to the existing structures. These structures allow drainage through the levee system, so they occur within drainage channels containing water. The existing channels would be filled and new ones would be constructed adjacent to the current drainage channels. The filled channels would either become part of the levee system or would revert to the surrounding wetland habitat type. Therefore, there would be an initial loss of up to 1.5 acres of open water and some adjacent wetland habitat. The channels that are filled should revert back to swamp habitat. Therefore, the net loss of open water and wetland habitat would be close to zero, because each habitat type would be recreated.

This alternative would temporarily disrupt approximately 0.5 to 1.5 acres of water habitat within each drainage channel and adjacent wetlands during construction, which is expected to last 1.5 years. A portion of the canals and drainageways would be occupied by the water control structures, as they are currently. Installation of the water control structure would disturb wetland biota and sediments in the immediate vicinity of construction activities. However, those impacts would be short-term, approximately 17 months in duration, with effects lasting up to several months after completion. Impoundment of the streams (if required during construction) would result in a temporary reduction of surface water flows into the wetland downstream. If this action were selected and constructed, the adjacent wetlands would stabilize following

construction, allowing sediment to settle and vegetation to recolonize the area. The new structures would have a similar footprint to the existing structures.

Indirect Impacts

Construction in the wetlands and drainage channels could cause downstream increases in turbidity and sedimentation. However, those impacts would be short-term, approximately 17 months in duration, with effects lasting up to several months after completion. Impoundment of the drainage channels, if required during construction, would result in a temporary reduction of surface water flows into the wetland downstream. If the proposed action were selected and constructed, the drainage channel and adjacent wetlands would stabilize.

Cumulative Impacts

The cumulative impacts from the proposed actions for these structures would be primarily short-term, during the construction period. The project area would be modified very slightly in the context of the multiple LPV flood control projects in the St. Charles and Jefferson Parish area.

Proposed Action LPV 07d and LPV 07e Structures (Modification of Existing Structures)

Direct Impacts

The proposed action for these two structures consists of modifying the existing structures in their current location. The direct impacts resulting from this alternative would be similar to, but less than, those described for LPV 07b and LPV 07c.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for these LPV reaches would be similar to, but less than, those for the proposed action for LPV 07b and LPV 07c.

Alternative 1 LPV 07b and LPV 07c Structures (Replacement of Existing Structures)

Direct, Indirect, and Cumulative Impacts

The direct, indirect, and cumulative impacts from this alternative would be similar to those described for the proposed action for these LPV reaches, but would be slightly less adverse because the structures would be placed in the footprint of the existing structures. However, slightly more construction time would be required because demolition of the existing structures would have to occur before construction could begin.

Demolition and installation of the water control structures would disturb wetland biota and sediments in the immediate vicinity of construction activities. However, those impacts would be short-term, approximately 17 months in duration, with effects lasting up to several months after completion. Impoundment of the stream (if required during construction) would result in a temporary reduction of surface water flows into the wetland downstream. If this action were

selected and constructed, the adjacent wetlands would stabilize following construction, allowing sediment to settle and vegetation to recolonize the area. The new structures would have a similar footprint in the same approximate location as the existing structures.

Alternative 1 LPV 07d and LPV 07e Structures (Replacement of Existing Structures in an Adjacent Location)

Direct, Indirect, and Cumulative Impacts

The alternative for these structures consists of demolishing the existing walls and rebuilding new structures in new locations. The new locations would be determined based on the historical drainage channels before the existing levee system was built. Therefore, the impacts from this alternative would be very similar to those described for the proposed action for LPV 07b and LPV 07c.

Alternative 2 LPV 07d and LPV 07e Structures (Replacement of Existing Structures)

Direct, Indirect, and Cumulative Impacts

The direct, indirect, and cumulative impacts for this alternative would be similar to those described for alternative 1 for LPV 07b and LPV 07c.

3.2.2 Fisheries

Existing Conditions

Lake Pontchartrain and surrounding wetlands provide nursery habitat for larval freshwater fish such as largemouth bass (*Micropterus salmoides*), crappie (*Pomoxis* spp.), various other sunfish species, and catfish (*Ictalurus* spp.) (USACE and State of Louisiana 2004). Freshwater fishes that might inhabit areas near the project area are presented, by season, in table 4.

In addition to these species, crawfish (*Procambarus* spp.) are an important commercial species throughout Louisiana; and the LaBranche Wetlands provide suitable habitat for crawfish. The commercial crawfish harvests in Louisiana are predominately farmed crawfish. However, recreational harvests of wild crawfish are common in Louisiana. Red swamp crawfish (*Procambarus clarkii*) and white river crawfish (*Procambarus zonangulus*) are the primary species harvested.

The drainage and borrow canals in the project area do not support significant fishery resources because of dense vegetation, poor water quality, and inadequate depth (Breux 2008). However, the LaBranche Wetlands, particularly the emergent marsh areas, provide functions that are important to the adjacent estuarine waters of Lake Pontchartrain and its fisheries.

Table 4 Freshwater Fish of Lake Pontchartrain					
Common Name	Scientific Name	Seasonality			
		Spring	Summer	Fall	Winter
Gizzard shad	<i>Dorosoma cepedianum</i>	B	B	P	P
Largemouth bass	<i>Micropterus salmoides</i>	B	P	P	P
Black crappie	<i>Pomoxis nigromaculatus</i>	P	P	P	P
Bluegill	<i>Lepomis macrochirus</i>	P	P	P	P
Blue catfish	<i>Ictalurus furcatus</i>	B	B	P	P
Channel catfish	<i>Ictalurus punctatus</i>	B	B	P	P
White crappie	<i>Pomoxis annularis</i>	P	P	P	P
Warmouth	<i>Chaenobryttus gulosus</i>	P	P	P	P
Redear sunfish	<i>Lepomis microlophus</i>	P	P	P	P
Freshwater drum	<i>Aplodinotus grunniens</i>	P	P	P	P
Spotted sunfish	<i>Lepomis punctatus miniatus</i>	P	P	P	P
P = present B = breeding season (Table compiled from Milanes [2002] and Frierson [2002].)					

Future Conditions with No Action

Without implementation of the proposed action, there would be no actions above and beyond what is already authorized involving construction or modification of levees, floodwalls, gates, or drainage structures in the project area. Consequently, direct, indirect, and cumulative impacts on fisheries would not differ from those under existing conditions, as described previously.

Future Conditions for LPV 03d

Proposed Action LPV 03d (Increase in Levee Height with a Flood-side Shift)

Direct Impacts

Under this alternative, an expansion of up to 50 ft from the current levee footprint (the area of ground surface covered by levee and associated ROW) would be likely along the 2,540 ft length of the existing levee reach. Approximately 1.4 acres of wetland and associated fish habitat would be present within that 50 ft corridor. Most of the expansion would occur within the existing levee ROW and the area occupied by the levee access road. The majority of the wetland areas in the vicinity of LPV 03d are more than 100 ft away from the footprint expansion. Damage could also occur to those adjacent wetlands and associated habitat during the construction period (estimated to be approximately 9 months).

Indirect Impacts

Potential indirect impacts from the proposed action would consist primarily of effects from increased turbidity on the wetland and open water areas surrounding the project area. Such effects are unlikely because of the distance of these fish habitats from the area of the proposed action.

Cumulative Impacts

Potential cumulative impacts from the proposed action would involve the combined effects from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. The cumulative impacts from flood control-related actions possibly occurring in the area would mostly result from construction activities, resulting in temporary impacts. However, the distance of fish habitat from the area of the proposed action would limit its effects on fisheries.

Alternative 1 LPV 03d (Incorporation of Breakwater)

Direct Impacts

A breakwater would be constructed approximately 100 ft parallel to the current levee on the flood side. This action would result in a loss of an additional 4 acres of wetlands and any associated fish habitat (based on a 70 ft wide breakwater for the 2,540 ft length of the reach). The existing wetland habitat would be replaced by rock, which would eliminate any fish habitat. As previously discussed, the quality of the fish habitat in this area has been affected by past development and airport management activities. If this action were selected and constructed, the adjacent wetlands would stabilize following construction (estimated to last about 9 months), allowing sediment to settle, benthos to repopulate, and fish to return.

Indirect Impacts

Potential indirect impacts from alternative 1 would primarily consist of effects from increased turbidity on the wetland and open water areas surrounding the project area. The numbers of fish maturing to adults would be reduced by the increased turbidity and decreased water quality. However, those impacts would be short-term, approximately 9 months in duration, with effects lasting up to several months after completion.

Cumulative Impacts

Potential cumulative impacts from alternative 1 would involve the combined effects from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. The cumulative impacts from flood control-related actions possibly occurring in the area would mostly result from construction activities, resulting in temporary impacts. For most projects, the permanent replacement of aquatic habitats would be minimized if economically and practically feasible.

Adverse impacts to fisheries from the proposed action would be temporary and the project area would be small relative to the extent of similar available fish habitat in the LPV area. Other projects have been proposed or approved for the region may improve fish habitat within the project area.

Alternative 2 LPV 03d (T-Wall Floodwall)

Direct Impacts

The footprint required is much smaller than required for the breakwater discussed for alternative 1, so any associated effects on fish habitat would be smaller. A T-wall built 350 ft to the flood side of the current levee centerline would displace approximately 1.5 acres (based on a footprint of 20 ft) of emergent wetland and associated fish habitat, with impacts being similar in nature but less severe than those for alternative 1, because there would be no additional or minimal additional acreage of wetlands impacted.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for LPV 03d would be similar to, but slightly less than, those for alternative 1.

Alternative 3 LPV 03d (Earthen Levee with T-wall Floodwall Cap)

Direct Impacts

This alternative would have similar but greater impacts than alternatives 1 or 2 because it moves the existing levee alignment 350 ft flood side of the existing levee centerline, would have an increased construction time to add the T-wall cap, and could require a larger footprint (up to 500 ft). Assuming that the entire length of LPV 03d would be affected by this alternative, a loss of approximately 35 acres of mostly emergent wetland and associated fish habitat would occur. Damage also could occur to adjacent fish habitat during the construction period (estimated to be approximately 3.5 years). As previously discussed, the quality of these wetland areas and associated fish habitat have been affected by past development and airport management activities.

Construction of the levee would disturb wetland biota and sediments in the immediate vicinity of construction activities and could cause downstream increases in turbidity and sedimentation. Suspended materials could clog fish gills, lower growth rates, and affect egg and larval development (USEPA August 2003). Most of the mobile species would avoid the areas impacted by construction. Impact to less mobile species would be short-term, approximately 3.5 years in duration, with effects lasting up to several months after completion. If this action were selected and constructed, the adjacent wetlands would stabilize following construction, allowing sediment to settle, benthos to repopulate, and fish to return.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for LPV 03d would be similar to, but greater than, those for alternatives 1 and 2.

Alternative 4 LPV 03d (Levee Realignment)

Direct, Indirect, and Cumulative Impacts

The footprint for this alternative would be the same as that for alternative 3. Therefore, the impacts to wetlands from this alternative would be very similar to those for alternative 3 with the exception that they would be somewhat smaller, because under this alternative less time for construction would be required (approximately 2.3 to 2.5 years versus 3.5 years).

Future Conditions for LPV 04 and LPV 05

Proposed Action LPV 04 and LPV 05 (Existing Alignment with Straddle)

Direct Impacts

Approximately 276 acres of cypress swamp, 11 acres of bottomland hardwood forest, and approximately 17 acres of open water could be affected within the straddle corridor of 250 ft on each side of the current levee centerline, and another 3 acres of forested wetland would be temporarily disturbed during the construction period. The existing habitat would be replaced with earthen fill, resulting in the complete loss of these wetlands and associated fish habitat. Most of the open water that would be impacted is a borrow canal that was dug to construct the current levee. This canal does not represent a flowing channel or a conduit to the bayous of the LaBranche Wetlands or Lake Pontchartrain. The wetland habitat being impacted represents a small fraction of habitat available for fisheries in the LPV area.

Levee construction would disturb wetland biota and sediments in the immediate vicinity of construction activities and could cause downstream increases in turbidity and sedimentation. Suspended materials could clog fish gills, lower growth rates, and affect egg and larval development (USEPA 2003). Most of the mobile species could avoid the areas impacted by construction. Impacts on less mobile species could be short-term, approximately 17 months in duration, with effects lasting up to several months after completion. If this action were selected and constructed, the adjacent wetlands would stabilize following construction, allowing sediment to settle, benthos to repopulate, and fish to return.

Indirect Impacts

Potential indirect impacts would primarily consist of effects from increased turbidity on fish habitat in and surrounding the project area. A small reduction in detritus production would accompany the loss of the wetlands, but this loss would be minor in the context of the production

generated within all the wetlands around Lake Pontchartrain. The numbers of fish maturing to adults would be reduced by the increased turbidity and decreased water quality. However, those impacts would be short-term, approximately 17 months in duration, with effects lasting up to several months after completion.

Cumulative Impacts

Potential cumulative impacts would involve the combined effects on the fisheries of Lake Pontchartrain and associated wetlands from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. These impacts would be mainly temporary, occurring largely during the construction period, with the impact to fish habitat minimized through the use of best management practices to help control stormwater runoff, sediment transport, and turbidity. The project area that would be modified is very small in the context of the size of the multiple LPV projects, and several proposed and authorized projects in the region may increase the amount and quality of fish habitat and provide beneficial cumulative impacts.

Alternative 1 LPV 04 and LPV 05 (Existing Alignment with Flood-Side Shift)

Direct Impacts

Impacts would be similar to those for the proposed action. Approximately 380 acres of cypress swamp, 14 acres of hardwood-forested wetland, and 3 acres of open water and associated fish habitat could be affected within the flood-side shift corridor of 500 ft from the current levee centerline. This habitat would be replaced with earthen fill, resulting in the loss of these wetlands and associated fish habitat in the filled area. Most of the 3 acres of open water impacted by this alternative are within the Cross Bayou Drainage Canal, which would not be filled in with levee but potentially could be affected during construction.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts would be similar to, but slightly more than, those for the proposed action.

Alternative 2 LPV 04 and LPV 05 (Incorporation of Wavebreaks)

Direct Impacts

This alternative would require the construction of wavebreaks of rock and earthen fill in the wetlands approximately 100 ft to 300 ft north of the existing levee. This action would result in a loss of a limited amount of fisheries habitat available in the swamp where the wavebreaks would be built. It also would disturb wetland biota and sediments in the immediate vicinity of the construction activities and could cause nearby increases in turbidity and sedimentation during the construction period (estimated to be approximately 1.5 years). Impacts from construction of the wavebreaks have been accounted for during the assessment of the straddle and flood-side alignment alternatives, assuming the wavebreaks occur within the 250 ft to 500 ft corridor evaluated for these alternatives. If the wavebreaks were to be built outside of the 250 ft straddle

corridor or 500 ft flood side shift corridor, it would represent up to an additional 52 acres of forested wetlands that would be replaced by sheet pile and concrete, resulting in the loss of the associated fish habitat in those areas.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts would be similar to, but slightly less than, those for the proposed action.

Alternative 3 LPV 04 and LPV 05 (Incorporation of a Geotextile Fabric)

Direct Impacts

Alternative 3 would not require a noticeable footprint expansion and, therefore, would result in a limited disturbance of the wetlands and associated fish habitat adjacent to the existing levees. There would be a temporary disturbance of the wetlands adjacent to reaches 1a, 1b, 2a, and 2b during construction. If the proposed action were selected and constructed, the adjacent wetlands would stabilize allowing sediment to settle, benthos to repopulate, and other aquatic species to return. No long-term impacts from this action would be expected.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative would be similar to, but less than, those for the proposed action.

Future Conditions for LPV 06 (Floodwalls and Gate)

Proposed Action LPV 06a-f (New Floodwalls and Modified Gate)

The proposed action for these five floodwalls would consist of demolishing the existing walls and rebuilding the new T-walls to approximately 17 ft to 18.5 ft (LPV 06a-d) or 13.5 ft to 15.5 ft (LPV 06e). The new walls would remain in their current alignment with minimal footprint expansion. However, the Bonnet Carré Floodwall would be increased from 155 ft in length to 465 ft to accommodate replacement of the existing structure at LPV 07a (near Bayou Trepagnier). During the construction phase, temporary structures (sheet piling) would be installed on the flood side to protect the existing levee system. The existing drainage structure (LPV 07a) on the canal west of Bayou Trepagnier would be retrofitted with new T-wall and a stability berm. The existing drainage structure would be closed to allow for construction of a stability berm that would be required to balance the T-wall. The closure of the existing drainage structure would also maintain a minimum water elevation within the intake basin for the operation of the existing pump station west of Bayou Trepagnier. The existing structure is normally closed, so replacement of this structure with the T-wall would be similar to current conditions.

Direct Impacts

Demolition and installation of the T-walls and modification of the existing gate could possibly have short- and long-term impacts to fisheries, because the new floodwalls and gate would be approximately the same footprint as the existing floodwalls and gate. The reaches included in this LPV would be much shorter, the footprint would be much smaller, and the construction period would be shorter (approximately 1.5 years) than required for the levee reaches. The floodwall under I-310 would require the addition of concrete scour protection under the bridges extending approximately to the limit of the ROW on the protected side of the floodwall and extending approximately 50 ft on either side of the bridges. Most of the areas affected by the proposed action for LPV 06 would be primarily disturbed upland areas associated with the existing floodwalls and managed ROWs. New impacts to fish habitat would involve less than 1 acre of wetland around the I-310 bridges and a portion of the canal west of Bayou Trepagnier that would be occupied by the floodwall. The impacts of this floodwall would be similar in impact to the existing structure when it is closed. It would prevent the movement of fish south past the structure, but suitable habitat beyond the location of the existing or proposed structure is limited, consisting primarily of a man-made channel that wraps around the Shell NORCO facility and the pump station. Adjacent fish habitat impacted (if this alternative was constructed) would stabilize after completion of construction activities.

Indirect Impacts

Potential indirect impacts from the proposed action for LPV 06a-f would primarily consist of effects from increased turbidity on the fish habitats surrounding the project area, but these impacts would be controlled by best management practices. The numbers of fish maturing to adults could be reduced by increased turbidity and decreased water quality during construction. However, those impacts would be short-term, approximately 17 months in duration, with effects lasting up to several months after completion.

Cumulative Impacts

Potential cumulative impacts from the proposed action would involve the combined effects on fisheries resources from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. However, the project area is being modified very slightly in the context of the similar available habitat in the LPV area. Also, proposed and approved projects, such as freshwater diversion from the Bonnet Carré [as authorized by Section 3 of the Water Resources Development Act of 1988 (PL 100-676) and addressed in EA #192], could have beneficial cumulative impacts to fisheries in the region.

Alternative 1 LPV 06a-d Floodwalls (Replace with Earthen Levees)

Direct Impacts

The type of impacts from floodwall demolition and levee construction would be similar to that for the proposed action for LPV 04 and LPV 05, but the duration of the impacts would be greater

(approximately 3.5 years) because of the additional time required for demolition of the floodwalls. For the purpose of this IER, impacts were conservatively evaluated based on the potential for the new levee height to require up to 250 ft of area out on each side of the existing floodwall centerline.

This action would result in a loss of fish habitat within the wetlands where the levee is placed and possible impacts to adjacent fish habitat during the construction period. Approximately 9 acres of wetlands and associated fish habitat would be affected within the straddle corridor of 250 ft from either side of the current floodwall centerline. The existing habitat would be replaced with earthen fill resulting in the complete loss of these habitat types. Construction of the levees would disturb wetland biota and sediments in the immediate vicinity of construction activities and could cause downstream increases in turbidity and sedimentation. Suspended materials could clog fish gills, lower growth rates, and affect egg and larval development (USEPA 2003). Most of the mobile species could avoid the areas impacted by construction. Impacts on less mobile species could be short-term, approximately 3.5 years in duration, with effects lasting up to several months after completion. If this action were selected and constructed, the adjacent wetlands would stabilize following construction, allowing sediment to settle, benthos to repopulate, and fish to return.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for these LPV reaches would be similar to those for the proposed action for LPV 04 and LPV 05.

Alternative 1 LPV 06e Floodwall Under I-310 (Construction of Wavebreaks)

Direct Impacts

The alternative action for LPV 06e, Floodwall Under I-310, would require the construction of rock or earthen wavebreaks in the wetlands approximately 100 ft to 300 ft north of the existing floodwall. This action would result in a loss of wetland and any associated fish habitat where the wavebreaks would be built and possible damage to adjacent wetland vegetation during the construction period (estimated to be approximately 1.5 years). Approximately four acres of wetland would be replaced with rock and earthen fill resulting in the complete loss of these habitat types. These habitats have previously been disturbed for the construction of I-310 and do not represent a pristine or high quality example of fish habitat. Construction of the wavebreaks would disturb wetland biota and sediments in the immediate vicinity of construction activities and could cause downstream increases in turbidity and sedimentation. Suspended materials would clog fish gills, lower growth rates, and affect egg and larval development (USEPA 2003). Most of the mobile species would avoid the areas impacted by construction. Impact to less mobile benthic species would be short-term, approximately 1.5 years in duration, with effects lasting up to several months after completion. If this action were selected and constructed, the adjacent wetlands would stabilize following construction, allowing sediment to settle, benthos to repopulate, and fish to return.

Indirect Impacts

Potential indirect impacts would primarily consist of effects from increased turbidity on fish habitat in and surrounding the project area. A small reduction in detritus production would accompany the loss of the wetlands, but this loss would be minor in the context of the production generated within all the wetlands around Lake Pontchartrain. The numbers of fish maturing to adults could be reduced by the increased turbidity and decreased water quality. However, those impacts would be short-term, approximately 1.5 years in duration, with effects lasting up to several months after completion.

Cumulative Impacts

Potential cumulative impacts would involve the combined effects to the fisheries of Lake Pontchartrain and surrounding wetlands from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. These impacts would be primarily temporary, occurring largely during the construction period, with the impact to fish habitat minimized through the use of best management practices that can help control stormwater runoff and substrate damage, if possible. The project area would be very small in the context of the extent of fish habitat in the overall LPV habitat area, and several proposed and authorized projects could increase the amount and quality of existing fish habitat, providing beneficial effects.

Alternative 1 LPV 06f Gate (Demolition and Construction of a New Gate in Current Location)

Direct Impacts

The alternative action retained for detailed evaluation includes demolition and replacement of the existing gate. Impacts were evaluated based on the potential for the new gate and associated ROWs to require up to 50 ft of area adjacent to each side of the existing gate and up to 100 ft of area adjacent to the existing gate on the flood or protected side. Construction time for this alternative would be approximately 1.5 years. The type of impacts from gate construction would be similar to those from levee construction, but the severity and duration of the impacts would be much smaller because of the gate's smaller footprint, shorter length, and shorter construction time. About 1.5 acres of open water and about 1.9 acres of forested wetland and associated fish habitat would be impacted by this alternative. However, the footprint for the new gate would be similar to the current gate, so no new loss of habitat would occur. If this action were selected and constructed, the adjacent habitat impacted during construction would stabilize following construction, allowing sediment to settle, benthos to repopulate, and other mobile aquatic species to return.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for this reach would be similar to, but slightly greater than, those for the proposed action.

Future Conditions for LPV 07 (Structures)

Proposed Action LPV 07a Bayou Trepagnier Drainage Structure (Replacement of Existing Structure with T-wall)

The existing drainage structure (LPV 07a), located on the canal west of Bayou Trepagnier, would be retrofitted with a new T-wall and a stability berm, becoming part of the LPV 06a Bonnet Carré floodwall. Therefore, impacts for this reach were discussed above for LPV 06a.

Proposed Action LPV 07b and LPV 07c Structures (New Structures Adjacent to Existing)

Direct Impacts

The proposed action for these two structures consists of demolishing the existing walls and rebuilding new structures adjacent to the existing structures. These structures allow drainage through the levee system, so they occur within drainage channels containing water. The existing channels would be filled and a new one would be constructed adjacent to the current drainage channel. The filled channels would either become part of the levee system or would revert to the surrounding wetland habitat type. Up to 1.5 acres of open water and some adjacent wetland habitat would be lost, and less mobile benthic organisms and fish in these areas could be killed. The canals that are filled would be expected to revert back to swamp habitat. Therefore, the net loss of open water and wetland habitat would be close to zero, because each habitat type would be recreated.

This alternative would temporarily disrupt approximately 0.5 acre to 1.5 acres of fish habitat within each drainage channel and adjacent wetlands during construction, which is expected to last 1.5 years. A portion of the canals and drainageways would be occupied by the water control structures, as they are currently. Installation of the water control structure would disturb wetland biota and sediments in the immediate vicinity of construction activities. However, those impacts would be short-term, approximately 17 months in duration, with effects lasting up to several months after completion. In the long term, the new structures would have a similar footprint to the existing structures. Impoundment of the stream (if required during construction) would result in a temporary reduction of surface water flows into the wetland downstream. If this action were selected and constructed, the adjacent habitat impacted during construction would stabilize the following construction, allowing sediment to settle, benthos to repopulate, and fish to return.

Indirect Impacts

Construction in the wetlands and drainage channels could cause downstream increases in turbidity and sedimentation, which could affect fishery resources. However, those impacts would be temporary, approximately 17 months in duration, with effects lasting up to several months after completion. Impoundment of the drainage channels, if required during construction, would result in a temporary reduction of surface water flows into the wetland downstream. If this action were selected and constructed, the adjacent habitat impacted during construction would stabilize following construction, allowing sediment to settle, benthos to repopulate, and fish to return.

Cumulative Impacts

The cumulative impacts for the proposed actions for these structures would be mainly temporary, occurring during the construction period. The project area would be very small in the context of the extent of fish habitat in the overall LPV habitat area.

Proposed Action LPV 07d and LPV 07e Structures (Modification of Existing Structures)

Direct Impacts

The proposed action for these two structures consists of modifying the existing structures in their current location. The direct impacts resulting from this alternative would be similar to, but less than, those described for the proposed action for LPV 07b and LPV 07c.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for these LPV reaches would be similar to, but greater than, those for the proposed action for LPV 07b and LPV 07c.

Alternative 1 LPV 07b and LPV 07c Structures (Replacement of Existing Structures)

Direct, Indirect, and Cumulative Impacts

The direct, indirect, and cumulative impacts on fishery resources for this alternative would be similar to those described for the proposed action for this LPV reach, but would be slightly less adverse because the structures would be placed in the footprint of the existing structures. However, slightly more construction time would be required because demolition of the existing structure would have to occur before construction could begin.

Demolition and installation of the water control structures would disturb wetland biota and sediments in the immediate vicinity of construction activities. However, those impacts would be short-term, approximately 17 months in duration, with effects lasting up to several months after completion. Impoundment of the stream (if required during construction) would result in a temporary reduction of surface water flows into the wetland downstream. If this action were selected and constructed, the adjacent habitat impacted during construction would stabilize following construction, allowing sediment to settle, benthos to repopulate, and fish to return. The new structures would have a similar footprint, in approximately the same location as the existing structures.

Alternative 1 LPV 07d and LPV 07e Structures (Replacement of Existing Structures in an Adjacent Location)

Direct, Indirect, and Cumulative Impacts

The alternative for these structures consists of demolishing the existing walls and rebuilding new structures in a new location. The new location would be determined based on the historical drainage channel before the existing levee system was built. Therefore, the impacts from this

alternative would be very similar to those described for the proposed action for LPV 07b and LPV 07c.

Alternative 2 LPV 07d and LPV 07e Structures (Replacement of Existing Structures)

Direct, Indirect, and Cumulative Impacts

The direct, indirect, and cumulative impacts for this alternative would be similar to those described for alternative 1 for LPV 07b and LPV 07c.

3.2.3 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 USC 1802). 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 (FMCs), 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 includes all waters and substrates within estuarine boundaries, including the sub-tidal vegetation (seagrasses and algae) and adjacent tidal vegetation (marshes).

The forested wetland areas adjacent to the project area are hydrologically connected to the EFH of the Lake Pontchartrain Estuary. However, the wetland areas (primarily cypress swamp) that would be affected by the proposed action are not likely to be suitable habitat for any of the Lake Pontchartrain Estuary managed species (shrimp and red drum) (NMFS 2007) and impacts from the proposed action to EFH of Lake Pontchartrain would be unlikely. Therefore, EFH is not evaluated further as a potentially impacted resource.

3.2.4 Wildlife

Existing Conditions

The diversity and abundance of wildlife inhabiting the project area is dependent on the quality and extent of suitable habitat present. The majority of the project area is covered by a natural community of forested wetlands or floodplain swamp, with slightly more elevated, upland, forested habitats present in limited areas. As discussed in the description of wetland resources, the north (flood) side of the IER #1 levee adjoins the southern perimeter of the LaBranche Wetlands, and the vegetation community in this area consists mainly of cypress swamp. Farther north, the cypress swamp grades into intermediate and brackish marshes and shallow open-water ponds. There are several man-made canals that traverse the project corridor. In addition, in an area of oil and gas wells within the swamp adjacent to levee reaches 2a and 2b, two shallow, man-made lakes have been excavated and impounded by dikes (figure 10).

Wildlife that typically inhabit cypress swamp and aquatic habitats such as those in the project area include a diverse assemblage of amphibians, reptiles, birds, and mammals. Species from each of these classes that may occur in the habitats within the project area can be identified based on the geographical ranges and habitat preferences of each species. Amphibians likely to occur in these habitats include the southern dusky salamander (*Desmognathus auriculatus*), dwarf salamander (*Eurycea quadridigitata*), central newt (*Notophthalmus viridescens louisianensis*), three-toed amphiuma (*Amphiuma tridactylum*), western lesser siren (*Siren intermedia nettingi*), gulf coast toad (*Bufo valliceps*), northern cricket frog (*Acris crepitans crepitans*), green treefrog (*Hyla cinerea*), squirrel treefrog (*Hyla squirella*), spring peeper (*Pseudacris crucifer*), bullfrog (*Rana catesbeiana*), pig frog (*Rana grylio*), bronze frog (*Rana clamitans clamitans*), and southern leopard frog (*Rana utricularia*) (Conant and Collins 1998, Felley 1992, Wigley and Lancia 1998).

Reptiles that typically utilize habitats such as those of the project area include the American alligator (*Alligator mississippiensis*), Mississippi mud turtle (*Kinosternon subrubrum hippocrepsis*), red-eared slider (*Trachemys scripta elegans*), western chicken turtle (*Deirochelys reticularia miaria*), common snapping turtle (*Chelydra serpentina*), green anole (*Anolis carolinensis*), broadhead skink (*Eumeces laticeps*), Mississippi green water snake (*Nerodia cyclopion*), yellowbelly water snake (*Nerodia erythrogaster flavigaster*), broad-banded water snake (*Nerodia fasciata confluens*), eastern garter snake (*Thamnophis sirtalis sirtalis*), western mud snake (*Farancia abacura reinwardtii*), rough green snake (*Opheodrys aestivus*), speckled kingsnake (*Lampropeltis getula holbrooki*), Texas rat snake (*Elaphe obsoleta lindheimerii*), western massasauga (*Sistrurus miliarius streckeri*), and western cottonmouth (*Agkistrodon piscivorus leucostoma*) (Conant and Collins 1998, Felley 1992, Wigley and Lancia 1998).

Mammals that may occur in the habitats of the project corridor include the nutria (*Myocastor coypus*), muskrat (*Ondatra zibethicus*), river otter (*Lutra canadensis*), mink (*Mustela vison*), swamp rabbit (*Sylvilagus aquaticus*), marsh rice rat (*Oryzomys palustris*), cotton mouse (*Peromyscus gossypinus*), fox squirrel (*Sciurus niger*), golden mouse (*Ochrotomys nuttalli*), least shrew (*Cryptotis parva*), raccoon (*Procyon lotor*), and white-tailed deer (*Odocoileus virginianus*) (Whitaker 1998, Wigley and Lancia 1998).

Birds that may utilize the habitats of the project corridor include both nonmigratory residents of the region and migratory species that are present only part of the year. Nonmigratory species include the anhinga (*Anhinga anhinga*), wood duck (*Aix sponsa*), purple gallinule (*Porphyryla martinica*), great blue heron (*Ardea herodias*), little blue heron (*Florida caerulea*), tricolor heron (*Hydranassa tricolor*), snowy egret (*Egretta thula*), cattle egret (*Bubulcus ibis*), yellow-crowned night heron (*Nyctanassa violacea*), green heron (*Butorides virescens*), white ibis (*Eudocimus albus*), red-shouldered hawk (*Buteo lineatus*), barred owl (*Strix varia*), pileated woodpecker (*Dryocopus pileatus*), red-bellied woodpecker (*Melanerpes carolinus*), downy woodpecker (*Picoides pubescens*), common crow (*Corvus brachyrhynchos*), blue jay (*Cyanocitta cristata*), Carolina chickadee (*Parus carolinensis*), tufted titmouse (*Parus bicolor*), Carolina wren (*Thryothorus ludovicianus*), common yellowthroat (*Geothlypis trichas*), red-winged blackbird (*Agelaius phoeniceus*), and northern cardinal (*Cardinalis cardinalis*). Migratory birds that may occur in the area only during the spring/summer breeding season include the Mississippi kite

(*Ictinia mississippiensis*), great crested flycatcher (*Myiarchus crinitus*), acadian flycatcher (*Empidonax virescens*), barn swallow (*Hirundo rustica*), and northern parula warbler (*Parula americana*). Migrant birds that may occur in the area only during winter include the mallard (*Anas platyrhynchos*), northern shoveler (*Anas clypeata*), blue-winged teal (*Anas discors*), hooded merganser (*Lophodytes cucullatus*), American woodcock (*Scolopax minor*), red-breasted nuthatch (*Sitta canadensis*), gray catbird (*Dumetella carolinensis*), hermit thrush (*Catharus guttatus*), yellow-rumped warbler (*Dendroica coronata*), rusty blackbird (*Euphagus carolinus*), swamp sparrow (*Melospiza georgiana*), and song sparrow (*Melospiza melodia*) (Dunn and Alderfer 2006, Wigley and Lancia 1998).

Although the bald eagle was recently delisted as a Federally threatened species (August 2007), it continues to be protected under the Bald and Golden Eagle Protection Act, as well as the Migratory Bird Treaty Act. In Louisiana, the bald eagle typically nests from October to mid-May (U.S. Fish and Wildlife [USFWS] 2007a). Following nesting activities in autumn, egg laying/incubation and hatching/rearing of young typically occur between fall and spring, with fledging of young as early as January and typically by mid-May (USFWS 2007a, USFWS 2007b, USFWS 2007c). Bald eagle nests typically are in bald cypress trees near fresh and intermediate marshes or open water in St. Charles and other southeastern parishes. Areas with high numbers of nests in Louisiana include the Lake Verret Basin south to Houma, the marsh/ridge complex from south of Houma to Bayou Vista, the Lake Salvador area, and the north shore of Lake Pontchartrain. Bald eagles also frequently winter and infrequently nest near large lakes in central and northern Louisiana (USFWS 2007a). Bald eagles forage and nest within the LaBranche Wetlands in the vicinity of the IER #1 project area. In its consultation letter (USFWS 2007a), the USFWS stated that there are several known bald eagle nests located within the vicinity of the proposed project area. A map included with the letter indicated the presence of nine nest sites within approximately 1 mile of the existing IER #1 levee system. The closest nest site was approximately 670 ft from the levee.

On the south (protected) side of the IER #1 project corridor, the wildlife habitat present is predominantly bottomland hardwood forested wetland, which potentially provides habitat for many of the species listed above. However, the extent of this habitat is limited to the south by U.S. 61 (Airline Highway), which parallels much of the project corridor at a distance of approximately 500 ft, associated businesses and residences, and several large tracts of developed industrial property, such as the Shell-NORCO petrochemical complex. These developed areas provide minimal wildlife habitat. The limited extent of the wildlife habitat on the protected side of the levee and its proximity to human activity likely reduce its utilization by wildlife relative to habitats on the northern, flood side.

Future Conditions with No Action

Without implementation of the proposed action, there would be no actions above and beyond what is already authorized involving construction or modification of levees, floodwalls, gates, or drainage structures in the project area. Consequently, direct, indirect, and cumulative impacts on wildlife would not differ from those under existing conditions, as described previously.

Future Conditions for LPV 03d

Proposed Action LPV 03d (Increase in Levee Height with a Flood-side Shift)

Direct Impacts

Under this alternative, an expansion of up to 50 ft from the current levee footprint (the area of ground surface covered by levee and associated ROW) is likely along the 2,540 ft of the existing levee reach. Assuming a 50 ft corridor, the existing habitat type would remain essentially the same, turf grass that is mowed and maintained as part of the ROW for the levee and the airport. However, approximately 1.4 acres of wetland habitat would be destroyed by the levee expansion. A small number of less mobile species (i.e., mice, reptiles, or nesting birds) would be lost during construction; however, most wildlife species would likely avoid the vicinity of the proposed action during the construction period (estimated to be approximately 9 months) and those that are not wetland dependent would return following the completion of construction. Mobile wetland species could move into adjacent wetland habitats.

Although bald eagles currently nest in the southern part of the LaBranche Wetlands and in the vicinity of other reaches of IER #1, there are no known nests in the vicinity of the LPV 03d project area (USFWS 2007a), and none would be expected under future conditions due to the proximity to airport operations. Much of the habitat along this LPV reach previously has been disturbed for the construction of the airport runway, and the vegetation in the area under the runway approach is maintained to prevent growth of an overstory that would create a hazard for air traffic. The presence of the airport with its associated noise and vegetation management activities limits the value of the wildlife habitat in this area and precludes nesting of the bald eagle as well as colonial-nesting wading or waterbirds. Thus, this project area does not provide high quality wetland habitat for wildlife. The LaBranche Wetlands to the north and west of LPV 03d provide approximately 50 mi² of high quality wetland habitat within which wildlife displaced from the proposed project area could survive. Therefore, the proposed action at LPV 03d would reduce marginal wildlife habitat in the adjacent wetland corridor.

Indirect Impacts

Potential indirect impacts on wildlife from the proposed action include the potential movement of displaced wildlife currently inhabiting the project area into nearby habitats that would not be directly impacted by this alternative. This migration would not be expected to result in exceedances of the carrying capacity of the extensive, similar terrestrial and aquatic habitats in the vicinity. Relatively small populations and habitat areas would be affected and the extensive adjacent habitats should be able to support the immigrants.

Cumulative Impacts

Potential cumulative impacts on wildlife from the proposed action would involve the combined effects on wildlife of habitat loss and displacement of wildlife populations from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. The displacement of the majority of wildlife would be short-term during the construction period, and the displaced

individuals likely would return following project completion. The majority of 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 St. Charles and Jefferson Parish region, such as ROWs along levees and floodwalls.

Movement of the limited numbers of wildlife, principally birds and small mammals, which currently inhabit the terrestrial habitat areas into surrounding, unimpacted habitats, would not be expected to result in exceedances of the carrying capacity of the extensive, adjacent habitats. Also, the project area would be modified very slightly in context of the similar available habitat in the LPV area and proposed and approved projects, such as freshwater diversion from the Bonnet Carré [as authorized by Section 3 of the Water Resources Development Act of 1988 (PL 100-676) and addressed in EA #192], would have beneficial cumulative impacts to the wildlife of the LaBranche Wetlands.

Alternative 1 LPV 03d (Incorporation of Breakwater)

Direct Impacts

Under this alternative, the levee reach would remain at its current height, and a breakwater of rock would be constructed on the flood side of the levee. The breakwater would be approximately 10 ft high and 70 ft wide. This action would result in a loss of an additional 4 acres (based on a 70 ft wide breakwater for the 2,540 ft length of the reach) of wetlands and associated wildlife habitat. The existing wetland habitat would be replaced by rock, which would create new terrestrial habitat. A small number of less mobile and wetland dependent species (i.e., mice, reptiles, amphibians) would be lost during construction; however, most wildlife species would likely avoid the vicinity of the proposed action during the construction period (estimated to be approximately 9 months) but return following the completion of construction.

Although bald eagles currently nest in the southern part of the LaBranche Wetlands and in the vicinity of other reaches of IER #1, there are no known nests in the vicinity of the LPV 03d project area (USFWS 2007a), and none would be expected under future conditions due to the proximity to airport operations. Much of the habitat along this LPV previously has been disturbed for the construction of the airport runway, and the vegetation in the area under the runway approach is maintained to prevent growth of an overstory that would create a hazard for air traffic. The presence of the airport with its associated noise and vegetation management activities limits the value of the wildlife habitat in this area and precludes nesting of the bald eagle as well as colonial-nesting wading or waterbirds. Thus, this project area does not provide high quality wetland habitat for wildlife. The LaBranche Wetlands to the north and west of LPV 03d provides approximately 50 mi² of high quality wetland habitat within which wildlife displaced from the proposed project area could survive. Therefore, this alternative at LPV 03d would reduce marginal wildlife habitat in the adjacent wetland corridor.

Indirect Impacts

Potential indirect impacts on wildlife from the proposed action include the potential movement of displaced wildlife currently inhabiting the project area into nearby habitats that would not be directly impacted by this alternative. This migration would not be expected to result in exceedances of the carrying capacity of the extensive, similar terrestrial and aquatic habitats in the vicinity.

Cumulative Impacts

Potential cumulative impacts on wildlife from the proposed action would involve the combined effects on wildlife of habitat loss and displacement of wildlife populations from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. The displacement of the majority of wildlife would be short-term during the construction period, and the displaced individuals likely would return following project completion. The majority of 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 St. Charles and Jefferson Parish region, such as ROWs along levees and floodwalls. The conversion of approximately 4 acres of wetland habitat would displace, and could possibly destroy, some smaller and less mobile species of amphibians, reptiles, mammals, and birds, particularly the young or nesting.

Movement of the limited numbers of wildlife, principally birds and small mammals, 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. Also, the project area would be modified very slightly in context of the similar available habitat in the LPV area, and proposed and approved projects, such as freshwater diversion from the Bonnet Carré [as authorized by Section 3 of the Water Resources Development Act of 1988 (PL 100-676) and addressed in EA #192], would have beneficial cumulative impacts to the wildlife of the LaBranche Wetlands.

Alternative 2 LPV 03d (T-Wall Floodwall)

Direct Impacts

Under this alternative, a new alignment with a T-wall floodwall would be constructed approximately 350 ft to the flood side of the footprint of the existing levee. A T-wall built 350 ft flood side of the current levee centerline would replace approximately 1.5 acres (based on a footprint of 20 ft) of emergent wetland and associated wildlife habitat with impacts being similar in nature but less severe than those for alternative 1.

Indirect and Cumulative Impacts

Indirect and cumulative impacts for this alternative would be similar to those for alternative 1.

Alternative 3 LPV 03d (Earthen Levee with T-wall Floodwall Cap)

Direct Impacts

This alternative would have similar, but somewhat greater impacts than alternatives 1 or 2, because it would move the existing levee alignment 350 ft flood side of the existing levee centerline, would have an increased construction time to add the T-wall cap and would require a larger footprint (up to 500 ft). Assuming that the entire length of LPV 03d would be affected by this alternative, a loss of approximately 35 acres of mostly emergent wetland and associated wildlife habitat would occur. This project area does not provide high quality wetland habitat for wildlife. Similar higher quality habitat is available nearby for any wildlife displaced from the proposed project area.

Indirect and Cumulative Impacts

Indirect and cumulative impacts for this alternative would be similar to those for alternative 1.

Alternative 4 LPV 03d (Levee Realignment)

Direct Impacts

The footprint for this alternative would be the same as that for alternative 3. Therefore, the impacts to wildlife from this alternative would be very similar to those for alternatives 1 and 3. Impacts would be somewhat smaller than alternative 3, because under this alternative less time for construction (approximately 2.3 to 2.5 years versus 3.5 years) would be required. Therefore, the impacts on wildlife under this alternative would be similar to those described for alternative 1.

Indirect and Cumulative Impacts

Indirect and cumulative impacts for this alternative would be similar to those for the proposed action.

Future Conditions for LPV 04 and LPV 05

Proposed Action LPV 04 and LPV 05 (Existing Alignment with Straddle)

Direct Impacts

Approximately 276 acres of cypress swamp, 11 acres of bottomland hardwood forest, and approximately 17 acres of open water could be affected within the straddle corridor of 250 ft on each side of the current levee centerline, and another 3 acres of forested wetlands would be required for construction access roads. The existing habitat would be replaced with earthen fill resulting in the complete loss of these wetland habitats. This action potentially would result in construction activity within the 1,000-ft buffer around one wading-bird nesting colony recorded

as occurring historically near levee reach 2b. The amount of wetland habitat that would be lost to levee construction under this alternative along the entire length of the IER #1 project area would total approximately 300 acres, less than one percent of the approximately 50 mi² of wetland habitat in the LaBranche Wetlands.

The greatest potential for effects on wildlife associated with the implementation of the proposed action would occur during the construction period (approximately 2.5 years). The presence of construction-related activity, machinery, and noise would be expected to cause most wildlife to avoid the area during the construction period. Although birds are highly mobile and able to move to other habitats in the vicinity, local populations of species that nest in colonies could be adversely affected if construction activities caused abandonment of nesting sites. The reproductive capacity of local or regional populations of one or more species may depend on a given nesting colony, so disturbance of a colony could adversely effect these populations. The area of the LaBranche Wetlands Levee is known to be inhabited by colonial-nesting wading birds, including herons, egrets, ibises, and the roseate spoonbill (*Platalea ajaja*), as well as waterbirds such as the anhinga (*Anhinga anhinga*) and double-crested cormorant (*Phalacrocorax auritus*) (USFWS 2007a). These birds nest in trees and potentially could nest in the cypress swamp habitat adjacent to the levee corridor. A wading-bird colony has been recorded as occurring historically near levee reach 2b (USFWS 2007a).

In order to minimize the potential for construction under the proposed action to disturb colonial-nesting wading birds, procedures recommended by the USFWS would be followed (USFWS 2007a). Prior to construction, the project area would be inspected by the USFWS or other qualified personnel for the presence of nesting colonies during the nesting season. Construction-related activities that would occur within 1,000 ft of a colony would be restricted to the non-nesting period, which in this region generally extends from September 1 to February 15, depending on the species present. This 1,000-ft buffer would be maintained unless coordination with the USFWS indicates that the buffer zone may be reduced based on the species present and other specifics of the situation (USFWS 2007a).

Bald eagles also currently nest in the southern part of the LaBranche Wetlands and in the vicinity of the IER #1 project area (USFWS 2007a). On the flood side of the levee, where most bald eagle nests occur, this alternative would result in the loss of approximately 150 ft of mainly wetland habitat along the length of the levee reaches. This alternative would not be expected to result in construction activity within the 660-ft buffer around any of the recorded eagle nests. However, in order to minimize the potential for construction activities under the proposed action to disturb nesting bald eagles, procedures recommended by the USFWS (USFWS 2007a) based on the National Bald Eagle Management Guidelines (USFWS 2007b) would be followed. The recommended guidelines include (1) distance buffers – keeping a distance between the activity and the nest, (2) landscape buffers – maintaining forested (preferably) or natural areas between the activity and nest trees, and (3) avoiding certain activities during the breeding season (USFWS 2007b). Prior to construction, the project area would be inspected by the USFWS or other qualified personnel for the presence of nest trees, including both active and alternate nests. Construction-related activities that would occur within 660 ft of a nest would be performed outside the bald eagle nesting season, which in this region generally extends from October 1 to

May 15 (USFWS 2007a). This 660-ft buffer would be maintained unless coordination with USFWS indicates that the buffer zone may be reduced based on the specifics of the situation (USFWS 2007b). Damage to nest trees would be avoided, including damage to their root systems through soil disturbance or compaction (USFWS 2007a).

A small number of less mobile and wetland dependent species (i.e., mice, reptiles, amphibians) could be lost during construction; however, most wildlife species would likely avoid the vicinity of the proposed action during the construction period (estimated to be approximately 2.5 years) and some that are not dependent on the swamp or bottomland hardwood habitats would return following the completion of construction. The proposed action would occur within the existing levee corridor, where relatively low-quality wildlife habitat would be destroyed during the construction period but would be restored following construction and within approximately 300 acres of wetland habitat that would be permanently replaced by levee and levee ROW.

Indirect Impacts

Potential indirect impacts on wildlife from the proposed action include the potential movement of displaced wildlife currently inhabiting the project area into nearby habitats that would not be directly impacted by this alternative. This migration would not be expected to result in exceedances of the carrying capacity of the extensive, similar terrestrial and aquatic habitats in the vicinity. The relatively small wildlife populations and habitat areas affected and the capacity of adjacent, extensive habitats to support wildlife displaced by the proposed action would minimize any potential adverse impacts.

Cumulative Impacts

Potential cumulative impacts on wildlife from the proposed action would involve the combined effects on wildlife of habitat loss and displacement of wildlife populations from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. The displacement of the majority of wildlife would be short-term during the construction period, and the displaced individuals likely would return following project completion. The majority of 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 St. Charles and Jefferson Parish region, such as ROWs along levees and floodwalls.

Movement of the limited numbers of wildlife, which currently inhabit these terrestrial and wetland habitat areas into surrounding, unimpacted habitats would not be expected to result in exceedances of the carrying capacity of the extensive, adjacent habitats. Also, the project area would be modified very slightly in context of the similar available habitat in the LPV area and proposed and approved projects, such as freshwater diversion from the Bonnet Carré [as authorized by Section 3 of the Water Resources Development Act of 1988 (PL 100-676) and addressed in EA #192], would have beneficial cumulative impacts to the wildlife of the LaBranche Wetlands.

Alternative 1 LPV 04 and LPV 05 (Existing Alignment with Flood-Side Shift)

Direct Impacts

The impacts to wildlife from the construction of levees under this alternative would be greater than those described for the proposed action. Approximately 380 acres of cypress swamp, 14 acres of hardwood-forested wetland, and three acres of open water habitats could be affected within the flood side shift corridor of 500 ft from the current levee centerline. Thus, the effects of this alternative on wetland wildlife habitats would continue after the completion of construction. This alternative potentially would result in construction activity within the 1,000-ft buffer around one wading-bird nesting colony recorded as occurring historically near levee reach 2b and within the 660-ft buffer around at least one of the recorded eagle nest sites. The amount of wetland habitat that would be lost to levee construction under this alternative along the entire length of IER #1 would total approximately 400 acres, around one percent of the approximately 50 mi² of wetland habitat in the LaBranche Wetlands. This loss of habitat along the margin of the current levee corridor under this alternative would result in a reduction in potential future nesting area for birds and foraging area for birds and other wildlife. However, the procedures discussed above for preventing disturbance of colonial wading-bird and bald eagle nesting sites would be employed.

Indirect and Cumulative Impacts

Indirect and cumulative impacts for this alternative for the levee reaches would be very similar to those for the proposed action at LPV 04 and LPV 05.

Alternative 2 LPV 04 and LPV 05 (Incorporation of Wavebreaks)

Direct Impacts

The impacts to wildlife from the incorporation of wavebreaks into the existing levees under this alternative would be similar to those described for the proposed action, with most effects occurring during the construction period. Under this alternative, the footprint of the levee along the existing alignment would remain the same, but wavebreaks would be added to the wave berm on the flood side within the existing levee corridor. Thus, this alternative would not result in the loss of additional wetland wildlife habitat and would not cause a reduction in potential future nesting and foraging area for birds and other wildlife.

Indirect and Cumulative Impacts

Indirect and cumulative impacts for this alternative for the levee reaches would be very similar to those for the proposed action at LPV 04 and LPV 05, but adverse impacts would be less because this alternative occurs within the existing levee footprint and would not require reduction in wetland habitat.

Alternative 3 LPV 04 and LPV 05 (Incorporation of a Geotextile Fabric)

Direct Impacts

Alternative 3 would not require a noticeable footprint expansion, and therefore would not appreciably disturb the adjacent wetland wildlife habitat and would not cause a reduction in potential future nesting area for birds and foraging area for birds and other wildlife. There would be temporary disturbance of the wetlands adjacent to reaches 1a, 1b, 2a, and 2b and to the existing levee habitat (mostly turf grass) during construction.

Indirect and Cumulative Impacts

Indirect and cumulative impacts from this alternative for the levee reaches would be very similar to those for the proposed action at LPV 04 and LPV 05, but adverse impacts would be less because this alternative would occur within the existing levee footprint and would not require reduction in wetland habitat.

Future Conditions for LPV 06 (Floodwalls and Gate)

The proposed action for these five floodwalls would consist of demolishing the existing walls and rebuilding the new T-walls to approximately 17 ft to 18.5 ft (LPV 06a-d) or 13.5 ft to 15.5 ft (LPV 06e). The new walls would remain in their current alignment with minimal footprint expansion. However, the Bonnet Carré Floodwall would be increased from 155 ft in length to 465 ft to accommodate replacement of the existing structure at LPV 07a (near Bayou Trepagnier). During the construction phase, temporary structures (sheet piling) would be installed on the flood shift to protect the existing levee system. The existing drainage structure (LPV 07a) on the canal west of Bayou Trepagnier would be retrofitted with new T-wall and a stability berm. The existing drainage structure would be closed to allow for construction of a stability berm that would be required to balance the T-wall. The closure of the existing drainage structure would also maintain a minimum water elevation within the intake basin for the operation of the existing pump station west of Bayou Trepagnier. The existing structure is normally closed, so replacement of this structure with the T-wall would be similar to current conditions.

Proposed Action LPV 06a-f Floodwalls and Gate

Direct Impacts

Demolition and installation of the T-walls and modification of the existing gate could have short- and long-term impacts to wildlife, because the new floodwalls and gate would be approximately the same footprint as the existing floodwalls and gate. The reaches included in LPV 06 would be much shorter, the footprint required would be much smaller and the construction period would be shorter (approximately 1.5 years) than required for the levee reaches, so any associated effects on wildlife and habitat would be smaller than for the levees. Most of the areas affected by the proposed action for LPV 06 would be primarily disturbed upland areas associated with the existing floodwalls and managed ROWs. New impacts to the wetlands would involve less than

one acre of wetland around the I-310 bridges and a portion of the canal west of Bayou Trepagnier would be occupied by the floodwall, which would be similar in impact to the existing structure when it is closed. The new floodwall would have a similar footprint to the existing floodwall, gate, and structure.

Indirect Impacts

Potential indirect impacts on wildlife from the proposed action include the potential movement of displaced wildlife currently inhabiting the project area into nearby habitats that would not be directly impacted by this alternative. This migration would not be expected to result in exceedances of the carrying capacity of the extensive, similar terrestrial and aquatic habitats in the vicinity.

Cumulative Impacts

Potential cumulative impacts on wildlife from the proposed action would involve the combined effects on wildlife of habitat loss and displacement of wildlife populations from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. The displacement of the majority of wildlife would be short-term during the construction period, and the displaced individuals likely would return following project completion. The majority of 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 St. Charles and Jefferson Parish region, such as ROWs along levees and floodwalls.

Movement of the limited numbers of wildlife, which currently inhabit terrestrial habitat of and around the floodwalls and gate into surrounding, unimpacted habitats would not be expected to result in exceedances of the carrying capacity of the extensive, adjacent habitats. Also, the project area would be modified very slightly in context of the similar available habitat in the LPV area and proposed and approved projects, such as freshwater diversion from the Bonnet Carré [as authorized by Section 3 of the Water Resources Development Act of 1988 (PL 100-676) and addressed in EA #192], would have beneficial cumulative impacts to the wildlife of the LaBranche Wetlands.

Alternative 1 LPV 06a-d Floodwalls (Replace with Earthen Levees)

Direct Impacts

Under this alternative, the existing floodwalls would be demolished and replaced with an earthen levee that would be a continuation of the LPV 04 and LPV 05 levees. Therefore, the impacts to wildlife from implementation of this alternative would be similar to those described for the proposed action for the LPV 04 and LPV 05 levees. Any pipeline crossings would be rebuilt up and over the new earthen levee. These crossings would not present a substantial barrier to wildlife movement. One of the floodwall reaches is within the 1,000-ft buffer around the historical location of a wading-bird nesting colony. This colony would be protected during construction assuming the procedures discussed above for preventing disturbance of colonial wading-bird nesting sites would be employed. Should previously undetected nesting colonies

occur in the vicinity of these floodwalls, they would be similarly protected. Avoidance of the area by wildlife due to construction-related activity and noise would be temporary.

Indirect and Cumulative Impacts

Indirect and cumulative impacts for this alternative for the levee reaches would be very similar to those for the proposed action at LPV 04 and LPV 05.

Alternative 1 LPV 06e Floodwall Under I-310 (Construction of Wavebreaks)

Direct Impacts

The alternative action for LPV 06e, Floodwall under I-310, would require the construction of rock or earthen wavebreaks in the wetlands approximately 100 ft to 300 ft north of the existing floodwall. The wavebreaks would be approximately 12-14 ft high, with a footprint approximately 100 ft wide by 1,000 ft long on the northwest side of I-310 and 700 ft long on the northeast side of I-310. This action would result in a loss of cypress swamp and bottomland hardwood wetland where the wavebreaks would be built and possible damage to adjacent wetland areas during the construction period (estimated to be approximately 1.5 years). Approximately four acres of wetland would be replaced with rock and earthen fill resulting in the complete loss of these habitat types. This would reduce the extent of wetland habitat for wildlife in this area under the I-310 interchange. However, the affected area would be small compared to the extensive wetland habitat available in the vicinity.

The presence of construction-related activity, machinery, and noise would be expected to cause most wildlife to avoid the project area as well as nearby habitats during the construction period. The addition of breakwaters would provide additional perching, resting, and foraging areas for a variety of wildlife, particularly wading birds and waterbirds. There are no recorded colonial nesting wading birds or waterbirds in the vicinity of LPV 06e within the 1,000 ft recommended buffer for avoiding disturbance of nesting colonies. The nearest recorded bald eagle nest is approximately 5,000 ft from the I-310 interchange, well beyond the 660-ft buffer recommended for avoidance of disturbance to nesting eagles.

Indirect Impacts

Potential indirect impacts on wildlife from this alternative include the potential movement of displaced wildlife currently inhabiting the project area into nearby habitats that would not be directly impacted by this alternative. This migration would not be expected to result in exceedances of the carrying capacity of the extensive, similar terrestrial and aquatic habitats in the vicinity.

Cumulative Impacts

Potential cumulative impacts on wildlife from this action would involve the combined effects on wildlife of habitat loss and displacement of wildlife populations from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. The small amount of wetland

habitat that would be replaced for this alternative has previously been disturbed for the construction of I-310 and does not represent a pristine or high quality example of wildlife habitat. The presence of the interstate and associated ROWs also degrades the value of the wildlife habitat in this area. Most impacts would be temporary, occurring during the construction period, and some displaced individuals could return following project completion.

Movement of the limited numbers of wildlife, which currently inhabit the wetland habitat that would be removed with the construction of the wavebreaks into surrounding, unimpacted habitats would not be expected to result in exceedances of the carrying capacity of the extensive, adjacent habitats. Also, the project area is being modified very slightly in context of the similar available habitat in the LPV area and proposed and approved projects, such as freshwater diversion from the Bonnet Carré [as authorized by Section 3 of the Water Resources Development Act of 1988 (PL 100-676) and addressed in EA #192], would have beneficial cumulative impacts to the wildlife of the LaBranche Wetlands.

Alternative 1 LPV 06f Gate (Demolition and Construction of a New Gate in Current Location)

Direct Impacts

The impacts to wildlife from construction of a new railroad flood gate under this alternative would be short-term during the period of demolition and construction. The modifications would occur within the footprint of the existing flood gate, so there would be no permanent loss of wetland or other habitats. Avoidance of the area by wildlife due to construction-related activity and noise would be temporary.

Indirect and Cumulative Impacts

Indirect and cumulative impacts for this alternative would be very similar, but slightly greater than, those described for the proposed action.

Future Conditions for LPV 07 (Structures)

Proposed Action LPV 07a Bayou Trepagnier Drainage Structure (Replacement of Existing Structure with T-wall)

The existing drainage structure (LPV 07a), located on the canal west of Bayou Trepagnier, would be retrofitted with a new T-wall and a stability berm, becoming part of the LPV 06a Bonnet Carré floodwall. Therefore, impacts for this reach were discussed above for LPV 06a.

Proposed Action LPV 07b and LPV 07c Structures (New Structures Adjacent to Existing)

Direct Impacts

The proposed action for these structures consists of demolishing the existing walls and rebuilding new structures adjacent to the existing structures. These structures allow drainage through the levee system, so they occur within drainage channels containing water. The existing

channels would be filled and a new one would be constructed adjacent to the current drainage channel. The filled channels would either become part of the levee system or would revert to the surrounding wetland habitat type. Therefore, there would be an initial loss of wetland habitat that could result in a small number of less mobile and wetland dependent species (i.e., mice, reptiles, amphibians) being lost during construction; however, most wildlife species would likely avoid the vicinity of the proposed action during the construction period (estimated to be approximately 1.5 years). The canals that are filled would be expected to revert back to swamp habitat. Therefore, the net loss of open water and wetland habitat and associated habitat would be close to zero, because each habitat type would be recreated.

This alternative would temporarily disrupt approximately 0.5 acres to 1.5 acres of aquatic habitat within each drainage channel and adjacent wetlands during construction, which would be expected to last 1.5 years. A portion of the canals and drainageways would be occupied by the water control structures, as they are currently. This alternative would not result in construction activity within the 1,000-ft buffer around a wading-bird nesting colony recorded as occurring historically near levee reach 2b.

Indirect Impacts

Construction in the wetlands and drainage channels would increase the activity and noise in the area, which could keep wildlife from using areas near the structures. However, those impacts would be temporary, approximately 17 months in duration, with effects lasting up to several months after completion. If this action were selected and constructed, the adjacent habitat impacted during construction would stabilize following construction, allowing most mobile wildlife species to return.

Cumulative Impacts

The cumulative impacts for the proposed actions for these structures would be primarily temporary, occurring during the construction period. The project area would be modified very slightly in context of the multiple LPV projects.

Proposed Action LPV 07d and LPV 07e Structures (Modification of Existing Structures)

Direct Impacts

The proposed action for these two structures consists of modifying the existing structures in their current location. The nature of the direct impacts resulting from this alternative would be similar to, but less than, those described for LPV 07b and LPV 07c.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for these LPV reaches would be similar to, but less than, those for the proposed action for LPV 07b and LPV 07c.

Alternative 1 LPV 07b and LPV 07c Structures (Replacement of Existing Structures)

Direct, Indirect, and Cumulative Impacts

The direct, indirect, and cumulative impacts on wildlife resources for this alternative would be similar to those described for the proposed action for these LPV reaches, but would be slightly less adverse because the structures would be placed in the footprint of the existing structures. However, slightly more construction time would be required, because demolition of the existing structure would have to occur before construction could begin.

Demolition and installation of the water control structures would disturb wetland biota and sediments in the immediate vicinity of construction activities. However, those impacts would be temporary, approximately 17 months in duration, with effects lasting up to several months after completion. If this action were selected and constructed, the adjacent habitat impacted during construction would stabilize following construction. The new structures would have a similar footprint and be in approximately the same location as the existing structures.

Alternative 1 LPV 07d and 07e Structures (Replacement of Existing Structures in an Adjacent Location)

Direct, Indirect, and Cumulative Impacts

The alternative for these structures consists of demolishing the existing walls and rebuilding new structures in a new location. The new location would be determined based on the historical drainage channel before the existing levee system was built. Therefore, the impacts from this alternative would be very similar to those described for the proposed action for LPV 07b and LPV 07c.

Alternative 2 LPV 07d and LPV 07e Structures (Replacement of Existing Structures)

Direct, Indirect, and Cumulative Impacts

The direct, indirect, and cumulative impacts for this alternative would be similar to those described for alternative 1 for LPV 07b and LPV 07c.

3.2.5 Threatened or Endangered Species

Existing Conditions

In accordance with the 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 July 10, 2007, to the USFWS office in Lafayette, Louisiana, requesting information on protected, proposed, and candidate species and critical habitat that may occur in the vicinity of the proposed IER #1 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.), USFWS responded in a letter on August 6, 2007 (USFWS 2007a). The USFWS identified only the West

Indian manatee (*Trichechus manatus*) as a federally listed species that may occur within the aquatic habitat associated with the IER #1 project area and that potentially could be affected by the project.

West Indian Manatee

The West Indian manatee is a large gray or brown aquatic mammal that may reach a length of 13 ft and a weight of over 2,200 pounds. 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 may migrate there during warmer months. There have been 110 reported sightings of manatees in Louisiana since 1975 (Louisiana Department of Wildlife and Fisheries [LDWF] 2005). Sightings in Louisiana, which have been uncommon and sporadic, have included occurrences in Lake Pontchartrain and vicinity. 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). Although the manatee can enter the canals, bayous, or drainageways within the LaBranche Wetlands from Lake Pontchartrain, it has not been sighted in these areas historically. The drainage structures in the IER #1 project area are 3 to 5 miles from Lake Pontchartrain on small canals and bayous at the southern margin of the wetland. Manatees are considered unlikely to occur in the shallow, upper reaches of these channels where the IER #1 project area is located.

Future Conditions with No Action

Without implementation of the proposed action, there would be no actions above and beyond what is already authorized involving construction or modification of levees, floodwalls, gates, or drainage structures in the project area. Consequently, effects on threatened and endangered (T&E) species would not differ from those under existing conditions, as described previously.

Future Conditions for LPV 03d, LPV 04, LPV 05, and LPV 06

Direct, Indirect, and Cumulative Impacts

The only species federally listed as endangered or threatened that may occur in the vicinity of the IER #1 project area is the West Indian manatee. Although unlikely, there is a potential that the manatee may enter the open channels (canals and bayous) of the LaBranche Wetlands from Lake Pontchartrain. The proposed actions for the levee reaches at LPV 03d, 04, and 05, and for the floodwalls and gate at LPV 06 are not expected to affect the canals and bayous in which a manatee could approach the IER #1 project area. Thus, there would be no direct, indirect and cumulative impacts from this alternative on the manatee.

Future Conditions for LPV 07 (Structures)

Proposed Action LPV 07a Bayou Trepagnier Drainage Structure (Replacement of Existing Structure with T-wall)

The existing drainage structure (LPV 07a), located on the canal west of Bayou Trepagnier, would be retrofitted with a new T-wall and a stability berm, becoming part of the LPV 06a Bonnet Carré floodwall. Therefore, impacts for this reach were discussed previously for LPV 06a.

Proposed Action LPV 07b and LPV 07c Structures (New Structures Adjacent to Existing)

Direct Impacts

Direct impacts on T&E species are immediate effects that could occur during the construction period (approximately 1.5 years). The only species federally listed as endangered or threatened that may occur in the vicinity of the LPV 07 project area is the manatee. The proposed action consists of demolishing the existing structures and rebuilding new structures adjacent to the existing ones, which would temporarily disrupt approximately 0.5 acres to 1.5 acres of water habitat within each drainage channel and adjacent wetlands during the construction period. There is the potential for the manatee to enter open canals and bayous of the LaBranche Wetlands from Lake Pontchartrain. However, a manatee would be very unlikely to enter the IER #1 project area because the drainage structures are located 3 to 5 miles from Lake Pontchartrain in the upper reaches of small canals and bayous at the margin of the wetlands. Thus, there would be no direct impacts on the manatee from the proposed action at LPV 07b and LPV 07c in the IER #1 project area.

Indirect and Cumulative Impacts

Indirect impacts on T&E species are effects that could occur later in time than direct impacts but still would be reasonably certain to occur (NMFS 2006). Potential cumulative impacts on T&E species from the proposed action would involve the combined adverse effects on the manatee from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. If the proposed action is completed, the drainage channels and adjacent wetlands would stabilize to pre-construction conditions following the construction period, and there would be no direct impacts on T&E species in the IER #1 project area. Following project completion, a manatee that entered the vicinity of an LPV 07 structure would not be affected. Indirect and cumulative impacts from the proposed action would be essentially the same as impacts under current conditions. Thus, there would be no indirect or cumulative impacts on the manatee from the proposed action in the IER #1 project area.

Proposed Action LPV 07d and LPV 07e Structures (Modification of Existing Structures)

Direct, Indirect, and Cumulative Impacts

As discussed previously for the proposed action at the LPV 07b and LPV 07c structures, there would be no direct, indirect, or cumulative impacts on the manatee from the proposed action at LPV 07d and LPV 07e.

Alternative 1 LPV 07b and LPV 07c Structures (Replacement of Existing Structures)

Direct, Indirect, and Cumulative Impacts

As discussed previously for the proposed action at the LPV 07b and LPV 07c structures, there would be no direct, indirect, or cumulative impacts on the manatee from this alternative.

Alternative 1 LPV 07d and LPV 07e Structures (Replacement of Existing Structures in an Adjacent Location)

Direct, Indirect, and Cumulative Impacts

As discussed previously for the proposed action at the LPV 07b and LPV 07c structures, there would be no direct, indirect, or cumulative impacts on the manatee from this alternative at LPV 07d and LPV 07e.

Alternative 2 LPV 07d and 07e Structures (Replacement of Existing Structures)

Direct, Indirect, and Cumulative Impacts

As discussed previously for the proposed action at the LPV 07b and LPV 07c structures, there would be no direct, indirect, or cumulative impacts on the manatee from this alternative at LPV 07d and LPV 07e.

3.2.6 Non-Wet Uplands

Existing Conditions

There are no naturally occurring uplands in the IER #1 project area. Those limited areas that are not wetlands are the result of the deposition of soil fill for construction of levees, roads, railways, and the airfield; spoil from excavation of waterways; and landfill material. Therefore, non-wet uplands are not a significant resource in this area and are not evaluated further with regard to potential impacts.

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 general vicinity of the IER #1 project area. Known prehistoric midden sites would be primarily located on natural levee deposits, major beach ridges and other stable portions of the delta adjacent to marsh, river and lake environments. Due to recent geologic development of the Mississippi delta and the age of the deposits within the project area, the earliest known archaeological sites in the region date to the Poverty Point period (1700 – 500 B.C.). Similarly, historic period sites and structures, such as forts, plantations, farmsteads, residential and commercial areas, and industrial facilities were initially located on relatively high natural levee areas adjacent to waterways and later developed in drained backswamp and land-filled locations. Historic period watercraft are recorded in bayou and river channels and lakes in the region. The reports summarized below provide specific historical information on the IER #1 project area.

Portions of the project area, including five sections of levee alignment, were investigated by Coastal Environment, Inc. in 1988 (Hahn and Pearson 1988). Researchers identified three historic sites exhibiting remnants of nineteenth to twentieth century drainage structures (16SC065, 16SC066, and 16SC067). These structural remnants were evaluated and found ineligible for listing on the National Register of Historic Places. On the western end of the project area, crew members excavated a series of subsurface cores along the natural levee on both banks of Bayou Trepagnier with negative results.

In the second study, conducted in 2001 by T.R. Kidder (2001), researchers completed a visual survey along the banks of Bayou Trepagnier and identified one archaeological site within a spoil bank just north of the area investigated by Hahn and Pearson (1988). The site (16SC080) is located north of the project area and contains a significant amount of Rangia shell and prehistoric ceramics.

The CEMVN contracted R. Christopher Goodwin & Associates, Inc. to conduct a Phase 1a cultural resources records review and field reconnaissance of the IER #1 project area (Lackowicz 2007). The area investigated follows approximately 9.9 miles of existing earthen levee extending east from the Bonnet Carré Spillway East Guide Levee in St. Charles Parish to the Jefferson-St. Charles Parish boundary line and extends 1,000 ft on the flooded (lake) side and 500 ft on the protected (river) side from the levee centerline. Researchers utilized background research, cultural resources investigations review, historic map analysis, topographic analysis, and reconnaissance level field data to assess project impacts on known historic properties and to identify high potential areas for cultural resources.

Researchers confirmed the locations of previously recorded sites 16SC065, 16SC067, and 16SC080 and determined that proposed project activities would have no impact on those site locations. Site 16SC066 could not be relocated and is thought to have been destroyed by previous canal dredging activities.

Researchers also evaluated the potential for undiscovered historic properties and found that a very low archaeological potential exists throughout the project area for the following reasons. A

significant amount of the project area has been disturbed by previous borrow and levee construction. Soil data shows that raised landforms adjacent to U.S. 61 (Airline Highway) are composed of sanitary landfill. The potential for cultural resources in the flat, low-lying, often flooded bayou/swamp areas throughout the project area is considered extremely minimal. The subsided natural levee area located along Bayou Trepagnier was investigated by Hahn and Pearson (1988) and no cultural resources were identified. No additional cultural resources investigations are recommended.

The CEMVN held meetings with State Historic Preservation Office 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 Ponchartrain and Vicinity Hurricane Protection Project (100-year), which includes IER #1, in a letter dated April 9, 2007, and emphasized that standard Section 106 consultation procedures are implemented during PA development. A public meeting was held on July 18, 2007, to discuss the working draft PA. It is anticipated that the PA will be executed in May 2008.

In letters to the State Historic Preservation Officer (SHPO) and Indian Tribes dated June 25, 2007, the CEMVN provided project documentation, evaluated cultural resources potential in the project area, and found that the proposed actions would have no impact on cultural resources. The SHPO concurred with the CEMVN "no historic properties affected" finding in a letter dated August 3, 2007. The Mississippi Band of Choctaw Indians concurred with the effect determination in an email dated August 23, 2007. Additional project documentation regarding LPV 03d was provided to the SHPO and Indian Tribes on October 31, 2007. The SHPO and Mississippi Band of Choctaw Indians concurred with the CEMVN "no historic properties affected" finding for LPV 03d in a letter and email dated December 13, 2007, and November 29, 2007, respectively. No other Indian Tribes responded to the requests for comment. 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 would 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 previously.

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. The existing project ROW has been subjected to severe ground disturbing activities associated with previous levee, floodwall, and pump station construction, and canal and borrow excavation. Recent research has shown that the likelihood for intact and undisturbed cultural resources in the existing project ROW is extremely minimal. No further cultural resources investigations are recommended.

Future Conditions with Proposed Action All Reaches within IER #1 Project Area

Direct Impacts

The impacts for this action were evaluated for a corridor measuring 1,000 ft flood side and 500 ft protected side from the existing levee centerline along all reaches within the IER #1 project area. Based on a review of state records, previous cultural resources studies, and recent Phase 1a cultural resources investigations in the project area, implementation of the proposed action would have no effect on historic properties. The likelihood for significant cultural resources or areas exhibiting a high potential for archaeological sites in the project corridor is considered extremely minimal.

The historic field drainage structure at site 16SC065 is located outside, or on the very edge, of the project corridor. Hahn and Pearson (1988) and Lackowicz (2007) both evaluated site 16SC065 and found it was not eligible for listing in the National Register of Historic Places. Field investigations confirmed that Site 16SC067 is actually located well outside of the project corridor and would not be impacted by the proposed action. Site 16SC066 could not be relocated and is thought to be destroyed. Although Site 16SC080 was considered to be potentially eligible for listing on the National Register of Historic Places by Kidder (2001), the site is located north of the project corridor and would not be impacted by proposed construction.

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 erosion during flood events. Erosion of ground deposits during flood events could result in severe damage and destruction of cultural resources.

Cumulative Impacts

Implementation of the proposed action would have beneficial cumulative impacts on historic properties 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 significant archaeological sites, individual historic properties, engineering structures and 19 listed historic districts.

Future Conditions with Alternative Actions All Reaches within IER #1 Project Area

Direct, Indirect, and Cumulative Impacts

The direct, indirect, and cumulative impacts on cultural resources are similar to those described previously for the proposed action.

3.2.8 Recreational Resources

Existing Conditions

Recreational resources are technically significant because of the high economic value of recreational activities and their contribution to local, state, and national economies. Recreational resources are publicly significant because of the high value that the public places on fishing, hunting, and boating, as measured by the large number of fishing and hunting licenses sold in Louisiana, and the large per-capita number of recreational boat registrations in Louisiana.

After inspection of the project area in St. Charles Parish, only two areas of recreation access were identified. Two private boat ramps are located on the flood side of the existing levee. One of the ramps (figure 11) is more substantial. The other ramp (figure 12) is much smaller and does not seem to be used by as many boaters. There are no other recreational facilities in the entire project area.



Figure 11. More Substantial Boat Ramp



Figure 12. Small Boat Ramp

Future Conditions with No Action

Without implementation of the proposed action, there would be no adverse impacts on existing recreational resources in the project area.

Future Conditions for LPV 03d

Proposed Action LPV 03d (Increase in Levee Height with a Flood-side Shift)

Direct Impacts

Construction of the proposed action would disturb wetland biota and sediments in the immediate vicinity of construction activities and would cause downstream increases in turbidity and sedimentation. Recreational fishing in the vicinity could be temporarily impacted during construction. The adjacent wetlands would stabilize following construction of the proposed action, allowing sediment to settle, and recreational fishing opportunities would be expected to return.

Indirect Impacts

Potential indirect impacts from the proposed action would primarily consist of effects from increased turbidity to the wetland and open water areas surrounding the project area that could affect recreational fishing. The numbers of fish maturing to adults could be reduced by the increased turbidity and decreased water quality. However, those impacts would be short-term, approximately 9 months in duration, with effects lasting up to several months after completion.

Cumulative Impacts

Potential cumulative impacts from the proposed action would involve the combined effects from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. The actions in the area would be primarily short-term during the construction period with the replacement or impact to wetland habitat minimized, if possible. The project area would be modified very slightly in context of the quantity of similar habitat in the LPV area and other projects are proposed or approved that would improve the existing recreational fishing opportunities within the project area.

Alternative 1 LPV 03d (Incorporation of Breakwater)

Direct, Indirect, and Cumulative Impacts

Direct, indirect, and cumulative, adverse impacts from this alternative for LPV 03d would be similar to those for the proposed action.

Alternative 2 LPV 03d (T-Wall Floodwall)

Direct, Indirect, and Cumulative Impacts

Direct, indirect, and cumulative, adverse impacts from this alternative for LPV 03d would be similar to but slightly less than those for the proposed action based upon the amount of habitat that could be disturbed.

Alternative 3 LPV 03d (Earthen Levee with T-wall Floodwall Cap)

The footprint for this alternative would be the same as that for alternative 2. Direct, indirect, and cumulative, adverse impacts from this alternative for LPV 03d would be similar to the proposed action based on the amount of habitat disturbed.

Alternative 4 LPV 03d – Levee Realignment

Direct, Indirect, and Cumulative Impacts

The footprint for this alternative would be the same as that for alternative 3. Therefore, direct, indirect, and cumulative, adverse impacts from this alternative for LPV 03d would be similar to those for alternative 3, but somewhat smaller because construction time would be shorter.

Future Conditions for LP04 and LPV 05

Proposed Action LPV 04 and LPV 05 (Existing Alignment with Straddle)

Direct Impacts

Under the proposed alternative, approximately 276 acres of cypress swamp, 11 acres of hardwood-forested wetland, and 12 acres of open water would be affected within the straddle corridor of 250 ft on each side from the current levee centerline, and another 3 acres of forested wetland would be required for temporary access roads. Recreational fishing in this area could be impacted in the immediate vicinity of construction activities, which would cause downstream increases in turbidity and sedimentation. Following construction of the proposed action, the adjacent fish habitat would stabilize allowing for recreational fishing opportunities.

Two boat launches are located in this area, one in each reach. Both ramps are in the existing ROW for the current levee and would be impacted if construction were to extend out from the existing levee centerline by 100 ft to 250 ft. Both of the launches are about 100 feet or more from the centerline on the flood side.

Indirect Impacts

Potential indirect impacts from the proposed action would primarily consist of effects from increased turbidity on fish habitat in and surrounding the project area. However, those impacts to recreational fishing could be short-term, approximately 17 months in duration, with effects lasting up to several months after completion.

Cumulative Impacts

Potential cumulative impacts from the proposed action would involve the combined effects to the lake from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. These impacts would be primarily short-term during the construction period with the replacement or impact on aquatic habitat minimized, if possible. The project area would be modified very slightly in context of the size of the multiple LPV projects, and several proposed and authorized projects could increase the amount and quality of existing fish habitat providing beneficial cumulative impacts to recreational fishing opportunities.

Alternative 1 LPV 04 and LPV 05 (Existing Alignment with Flood-Side Shift)

Direct, Indirect, and Cumulative Impacts

Direct, indirect, and cumulative, adverse impacts from this alternative for LPVs 04 and 05 would be similar to those for the proposed action.

Alternative 2 LPV 04 and LPV 05 (Incorporation of Wavebreaks)

Direct, Indirect, and Cumulative Impacts

Direct, indirect, and cumulative impacts from this alternative for LPVs 04 and 05 would be similar to, but slightly less than, those for the proposed action

Alternative 3 LPV 04 and LPV 05 (Incorporation of a Geotextile Fabric)

Direct Impacts

The proposed action would not require a noticeable footprint expansion and, therefore, would disturb a limited area of the wetlands and associated fish habitat adjacent to the existing levees. No long-term impacts from this action would be expected.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for LPV 04 and LPV 05 would be similar to, but less than, those for the proposed action

Future Conditions for LPV 06 (Floodwalls and Gate)

Proposed Action LPV 06a-f (New Floodwalls and Modified Gate)

Direct Impacts

The new floodwalls and gate would have approximately the same footprint as the existing floodwalls and gate. Therefore, the demolition and installation of the T-walls and modification of the existing gate could have impacts to recreational fishing that would be similar to, but less than, impacts from the proposed action at LPV 03d.

Indirect Impacts

Potential indirect impacts from the proposed action for LPVs 06a-f would primarily consist of effects from increased turbidity on the wetlands and open water surrounding the project area. However, most of the increased sediment and turbidity would be controlled by best management practices.

Cumulative Impacts

Potential cumulative impacts from the proposed action would involve the combined effects to the surrounding wetlands from the multiple LPV flood control projects in the St. Charles and Jefferson Parish area. However, the project area would be modified very slightly in context of the similar available habitat in the LPV area and proposed and approved projects, such as freshwater diversion from the Bonnet Carré spillway [as authorized by Section 3 of the Water

Resources Development Act of 1988 (PL 100-676) and addressed in EA #192], would have beneficial cumulative impacts to the LaBranche Wetlands and to recreational fishing in the area.

Alternative 1 LPV 06a-d Floodwalls (Replace with Earthen Levees)

Direct Impacts

The type of impacts from replacing floodwalls with earthen levees would be similar to those for the proposed action (demolition and reconstruction) but the severity and duration of the impacts would be greater because of the larger footprint, longer length and greater construction time required for the levee construction. Following construction of this alternative, the adjacent fish habitat would stabilize allowing for recreational fishing opportunities.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for these LPV reaches would be similar to, but much greater than, those for the proposed action.

Alternative 1 LPV 06e Floodwall Under I-310 (Construction of Wavebreaks)

Direct Impacts

The alternative action for LPV 06e, Floodwall Under I-310, would require the construction of wavebreaks of rock or earthen fill with a footprint of approximately 100 ft to 300 ft. This alternative would have impacts to fish habitat and on recreational fishing; however, this area was previously disturbed for the construction of I-310 and does not represent a pristine or high quality example of fish habitat.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for this LPV reach would be similar to, but greater than, those for the proposed action.

Alternative 1 LPV 06f Gate (Demolition and Construction of a New Gate in Current Location)

Direct Impacts

This alternative includes demolition and replacement of the existing gate in-place. The type of impacts from gate construction would be similar to that for levee construction, but the severity and duration of the impacts would be smaller because of a smaller footprint and shorter length and because less construction time would be required for this gate. Following construction of this alternative, the adjacent fish habitat would stabilize.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for this LPV reach would be similar to, but slightly greater than, those for the proposed action.

Future Conditions for LPV 07 (Structures)

Proposed Action LPV 07a Bayou Trepagnier Drainage Structure (Replacement of Existing Structure with T-wall)

The existing drainage structure (LPV 07a), located on the canal west of Bayou Trepagnier, would be retrofitted with a new T-wall and a stability berm, becoming part of the LPV 06a Bonnet Carré floodwall. Therefore, impacts for this reach were discussed above for LPV 06a.

Proposed Action LPV 07b and LPV 07c Structures (New Structures Adjacent to Existing)

Direct Impacts

The proposed action for these two structures consists of demolishing the existing walls and rebuilding new structures. These structures allow drainage through the levee system, so they occur within drainage channels containing water. Installation of the water control structures would have short-term effects on recreational fishing. Impoundment of the stream (if required during construction) would result in a temporary reduction of surface water flows into the wetland downstream. Following construction of the proposed action, the drainage channel and adjacent wetlands would stabilize allowing sediment to settle, benthos to repopulate and other aquatic species to return.

Indirect Impacts

Construction in the wetlands and drainage channels could cause downstream increases in turbidity and sedimentation. However, those impacts would be short-term, approximately 17 months in duration, with effects lasting up to several months after completion. Impoundment of the drainage channels, if required during construction, could result in a temporary reduction of surface water flows into the wetland downstream. Following construction of the proposed action, the aquatic habitat would stabilize allowing for recreational fishing opportunities.

Cumulative Impacts

Cumulative impacts from the proposed action for these structures would be similar to those from the proposed action for LPV 03d.

Proposed Action LPV 07d and LPV 07e Structures (Modification of Existing Structures)

Direct Impacts

The proposed action for these two structures consists of modifying the existing structures in their current location. The direct impacts resulting from this alternative would be similar to, but less than, those described for LPV 07b and LPV 07c.

Indirect and Cumulative Impacts

Indirect and cumulative, adverse impacts from this alternative for these LPV reaches would be similar to, but less than, those for the proposed action for LPV 07b and LPV 07c.

Alternative 1 LPV 07b and LPV 07c Structures (Replacement of Existing Structures)

Direct, Indirect, and Cumulative Impacts

The direct, indirect, and cumulative impacts for this alternative would be the same as those for the proposed action for LPV 07d and LPV 07e.

Alternative 1 LPV 07d and LPV 07e Structures (Replacement of Existing Structures in an Adjacent Location)

Direct Impacts

This alternative for these structures consists of demolishing the existing walls and rebuilding new structures in a new location. In regard to impacts on fishing opportunities, the net loss of open water and aquatic habitat would likely be close to zero, because each habitat type would be re-created.

Construction in the channels and installation of the water control structures would result in a temporary reduction of surface water flows into the wetland downstream. In regard to long-term impacts, the new structures would have a similar footprint to the existing structures.

Indirect and Cumulative Impacts

Indirect and cumulative impacts from this alternative for the structures would be similar to those from the proposed action for LPV 07b and LPV 07c.

Alternative 2 LPV 07d and LPV 07e Structures (Replacement of Existing Structures)

Direct, Indirect, and Cumulative Impacts

The direct, indirect, and cumulative impacts from this alternative would be similar to those described for alternative 1 for LPV 07b and LPV 07c.

3.2.9 Aesthetic (Visual) Resources

Existing Conditions

Visually, the project area's landscape is dominated by flood control development that includes earthen levees, unimproved access roads, drainage canals, and borrow areas. Also found within the project area is petroleum related infrastructure such as storage tanks and piping. Swamps dominate the project's natural setting. The project area is located on private land and visually inaccessible to most except those able to travel along the Louisiana Natural and Scenic River System's Bayou Trepagnier. The Louisiana Natural and Scenic River System was proposed in the late 1960's and was brought into existence in the 1970's with the passage of the Louisiana Natural and Scenic River Act; Bayou Trepagnier is included in the system based on scenic and other qualities. Bayou Trepagnier's river corridor is largely undeveloped and provides open vistas of solid and broken marshes interspersed with natural levees and spoil banks which support woody vegetation. The relatively unobstructed panoramas contribute to the river's wilderness quality and high scenic value.

Future Conditions with No Action

St Charles Parish has zoned the project area as a batture district with the following allowable land uses:

1. Barge Mooring.
2. Those activities not related to other manufacturing or industrial activity.
3. Recreation facilities.
4. Restaurants.
5. Riverboat docks
6. Site-built hunting or fishing camps
7. Aids to navigation.
8. Logging activities.

Without implementation of the proposed action, visual resources would either change from what currently exists there now over time by natural processes, or change as dictated by future land-use maintenance requirements. Regardless of what the future holds for the project area, visual access to the proposed project site is minimal as no public access roads are available.

Future Conditions with Proposed Action All Reaches within IER #1 Project

Direct Impacts

Expansion of the levee footprints, raising the levee heights, and modification or replacement of floodwalls, flood gates and drainage structures would have minimal 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 long-term impacts on visual resources would be minimal. The levees and structures would be similar in design and scale to the existing conditions. The major differences would be an increase in height of up to 6 ft, and a potential expansion of the levee footprint by up to 500 ft. With construction of the proposed action, the appearance of the levees and associated structures would remain similar to what currently exists there now.

The Louisiana Natural and Scenic River Act established a regulatory program and empowered the Secretary of the Louisiana Department of Wildlife and Fisheries to administer the System through regulations and permits. Impoundments, channelization, clearing and snagging and channel realignment are prohibited by the Act. Therefore, flood control projects on all scenic streams, with a few exceptions, are not permissible. Currently, Bayou Trepagnier is diverted from its original path through a water control structure close to the project area (figure 2) and the surrounding area has lost much of its natural qualities. A Scenic River permit is not required for this project since modification of the levees will occur within the GNOHSDRRS right of way.

Indirect Impacts

Other impacts to the project area's visual character may occur as the result of enhanced flood protection. Currently, the project area on the protected side of the levee has a vegetative buffer that screens flood control measures from the view-shed found along U.S. 61 (Airline Highway). Industrial, commercial and associated infrastructure development along U.S. 61 (Airline Highway) (and adjacent to the project area) is sparse as zoning measures have reduced development along this corridor. Enhanced flood protection measures may facilitate additional development along U.S. 61 (Airline Highway) (and within the project area) which could affectively denude the natural areas that provide visual screening of the flood control development; this impact would be long term and may be irreversible.

Cumulative Impacts

Cumulatively, the visual impacts caused by flood protection measures regionally and nationwide may be considered significant. Flood prone natural landscapes protected by unnatural visual conditions similar to the project area's existing conditions may be increasingly converted to developable land, which may be considered visually distressful depending on the natural quality of the landscape lost.

Future Conditions with Alternative Actions All Reaches within IER #1 Project Area

Direct, Indirect, and Cumulative Impacts

Future conditions with the alternative actions would be similar to those described with 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 (NO₂), ozone (O₃), particulate matter less than 10 microns in diameter (PM₁₀), particulate matter less than 2.5 microns in diameter (PM_{2.5}), lead (Pb), and sulfur dioxide (SO₂). 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 5.

Table 5 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	157	0.08 ²	Same as primary	
Particulate Matter				
<u>PM_{2.5}</u> :				
Annual Arithmetic Mean	15 ³	-	Same as primary	
24-hour Maximum	35 ⁴	-		
<u>PM₁₀</u> :				
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

Table 5 (Continued)				
National Ambient Air Quality Standards				
Pollutant and Averaging Time	Primary Standard		Secondary Standard	
	µg/m³	parts per million (ppm)	µg/m³	ppm
Notes:				
¹ Not to be exceeded more than once per year.				
² 3-year average of the 4th highest daily maximum 8-hour concentration may not exceed 0.08 ppm.				
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;” areas where a criteria pollutant level exceeds the NAAQS are designated as being “in nonattainment.” The proposed levee, floodwall, flood gate, and drainage structure demolition and construction activities would occur in St. Charles Parish, Louisiana, an area that is currently designated as in attainment for all criteria pollutants. Therefore, further analysis required by the CAA general conformity rule (Section 176(c)) would not apply for the proposed Federal action.

Future Conditions with No Action

Without implementation of the proposed action, there would be no adverse direct, indirect, or cumulative impacts to air quality within the project area.

Future Conditions with Proposed Action All Reaches within IER #1 Project Area

Direct Impacts

During construction of the proposed action, increase in air emissions along the levee/floodwall 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 would be from mobile sources for which emissions performance standards would be 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 level of effect 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 would also contribute to construction phase air pollution in the project neighborhood when traveling along local roads.

However, site-specific construction effects would be 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 would aid in preventing fugitive dust from becoming airborne. Construction activities related to the proposed action would not occur all 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.

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 IER #1 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 project area would unlikely 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. 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. After the construction period, there would be no incremental contribution to cumulative air quality impacts due to the proposed action.

Future Conditions with Alternative Actions All Reaches within IER #1 Project Area

Direct, Indirect, and Cumulative Impacts

The direct, indirect, and cumulative impacts to air quality under 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 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. (The A-weighted sound level, used extensively in this country for the measurement of community and transportation noise, represents the approximate frequency response characteristic of the average young human ear.) Areas exposed to a DNL above 65 dBA are generally not considered suitable for residential use. A DNL of 55 dBA was identified by 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 about 10 dBA lower than those during the day.

Noise levels surrounding the project corridor would be variable depending on the time of day and climatic conditions. Areas to the north of the project corridor are primarily undeveloped wetlands with minimal noise generated by recreational users. Areas to the south are mostly residential and commercial, with industrial at the west end (Shell-NORCO facility) and the Louis Armstrong New Orleans International Airport at the east end. Due to airplane take-off and landings, it is highly likely that the DNLs exceed 65 dBA for the eastern portion of the project corridor. In the western portion of the project corridor, industrial activities generate noise during normal operation hours. Additionally, vehicles along U.S. 61 (Airline Highway) and I-310 and trains utilizing the railroad tracks in the vicinity contribute to noise levels in the area.

Future Conditions with No Action

Without implementation of the proposed action, noise receptors near the project corridor would not experience additional noise associated with construction activities such as pile driving and vehicle traffic. However, along selected portions of the project area, they would continue to experience ambient noise disturbances exceeding 65 dBA from airplanes at Louis Armstrong New Orleans International Airport, trucks and cars traveling along U.S. 61 (Airline Highway) and I-310, and normal operational noise disturbances from the industrial facilities along the project area. There would be no direct, indirect, or cumulative impacts on noise levels under the no action alternative.

Future Conditions with Proposed Action All Reaches within IER #1 Project Area

Direct Impacts

Table 6 describes noise emission levels for construction equipment 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).

Noise Source	50 ft	100 ft	200 ft	500 ft	1,000 ft
Backhoe	78	72	68	58	52
Crane	81	75	69	61	55
Dump Truck	76	70	64	56	50
Excavator	81	75	69	61	55
Front end loader	79	73	67	59	53
Concrete mixer truck	79	73	67	59	53
Auger drill rig	84	78	72	64	58
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-ft results are modeled estimates.
Source: FHWA 2006. "Highway Construction Noise Handbook".

Assuming the worst case scenario of 101 dBA (pile driver), as would be the case during the construction of floodwalls along the project corridor, all areas within 1,000 ft of the project corridor would experience noise levels exceeding 65 dBA. There are a few scattered residences within 1,000 ft of the project corridor; however, the closest residential subdivision (along Ormond Blvd) is more than 1,000 ft away. 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.

The construction activities would be expected to create temporary noise impacts above 65 dBA on the limited number of sensitive receptors within 1,000 ft of the project corridor. The opportunities for noise mitigation would be 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 may use public roads and highways for access to construction sites. Following construction, noise levels would return to existing conditions.

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 potentially 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 associated with the hurricane protection provided by the project.

Cumulative Impacts

Noise resulting from ongoing and planned construction activities in the IER #1 study 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 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 Alternative Actions All Reaches within IER #1 Project Area

Direct, Indirect, and Cumulative Impacts

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

3.2.12 Transportation

Existing Conditions

The project lies in a wetland area between Lake Pontchartrain to the north and the Mississippi River to the south. East of the project lies Jefferson and Orleans Parishes. Northern Jefferson and Orleans Parishes are densely developed with residential, commercial, and light to medium industrial land uses. 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). The Bonnet Carré Spillway lies to the west of the project. Further west is Baton Rouge, the state capital and second largest city in Louisiana. Baton Rouge is a major traffic generator to the west. The Louis Armstrong New Orleans International Airport lies on the east side of the project. The airport is the primary commercial airport for the New Orleans metropolitan area and southeast Louisiana. Light to heavy industrial land uses are located along the Mississippi River south of U.S. 61 (Airline Highway). In addition, there is some residential development along the south side of U.S. 61.

There are several rail lines in the project vicinity. There is a major rail line that runs parallel to I-10 and another rail line that runs parallel to U.S. 61. There is a third line that runs between U.S. 61 and SR-48. Several rail spurs are located in the area. There are several dock facilities on the east side of the Mississippi River that would be capable of handling ocean vessels.

Few roads and developed lands are north of the project area, because of the wetlands and Lake Pontchartrain. I-10 is the only major east-west highway that crosses this area. I-10 is a 4-lane divided freeway. It connects the New Orleans metropolitan area with Baton Rouge. In addition, I-10 is a major east-west route along the northern Gulf Coast. U.S. 61 is a 4-lane divided highway that has either limited or no control of access. It is functionally classified as a

“principal arterial” to the east of I-310, and a “minor arterial” to the west of I-310. 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. SR-48 (minor arterial) runs along the Mississippi River, connecting into U.S. 61 next to the Bonnet Carré Spillway. SR-48 is a 2-lane road with no access control. It primarily serves local travel (Louisiana Department of Transportation and Development [LADOTD] 2006).

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 LOSs, 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 2004 (LADOTD 2007). Due to population shift and additional construction activity that occurred in the aftermath of Hurricane Katrina in 2005, these traffic volumes may not be suitable for finitely determining the existing level of service of area highways. However, they provide an order-of-magnitude baseline for comparison when trucks associated with the levee construction are added.

Based on field observations (Schrohenloher 2007), the LOS on highways in the project area is poor during morning and evening peak hours, while vehicles are able to travel at the posted speed limits during off-peak times. The area does have a large amount of truck traffic due to nearby shipping and manufacturing industries. In addition, additional truck traffic is associated with rebuilding efforts from the destruction caused by Hurricane Katrina.

In St. Charles Parish from 2001 through 2005, there were 3 fatalities involving large trucks. In 2005, there was 1 fatality involving a large truck—a rate of 1.97 fatalities per 100,000 people, which ranks the parish 36 in the state (1 being the highest rate of fatalities) (National Highway Traffic and Safety Administration [NHTSA] 2007).

Future Conditions with No Action

Without implementation of the proposed action, there would be no direct, indirect, or cumulative adverse impacts on transportation within the project area.

Future Conditions with Proposed Action All Reaches within IER #1 Project Area

Direct, Indirect, and Cumulative Impacts

Most of the truck traffic associated with the proposed action would use U.S. 61 (Airline Highway). Impacts to highway capacity can be predicted using the methodology from the “Highway Capacity Manual” for multilane highways (TRB 2000). Two models were built for this project - Base and Additional Truck - to evaluate the highway capacity impacts that additional trucks would have to U.S. 61 (Airline Highway). The “Base” model looked at future conditions with no action, which serves as a comparison. The “Additional Trucks” model looked at the future conditions where the calculated number of trucks supporting project construction would be operating (based on the amount and types of construction materials that would need to be transported) in addition to the “Base” traffic stream during the peak hour.

It was assumed that there would be 30,000 vehicles per day in the “Base” condition, 10 percent of which would be operating in the peak hour, 5 percent of the base vehicles would be trucks, and base free-flow speed is 50 mph. For the “Additional Trucks” condition, 62 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 mph. The additional truck traffic could have a temporary impact on the LOS for U.S. 61 (Airline Highway). After construction is complete, the proposed action would have no long-term impact on transportation.

Access roads (e.g., terminal access, staging areas) used by the trucks could have substantial changes in their LOS. Without a detailed transportation routing plan, a more detailed impact evaluation of the LOS on minor highways and roads cannot be completed.

Indirect Impacts

Heavy trucks would be the primary loading source of pavement degradation. The additional truck traffic resulting from the proposed action could contribute to additional wear-and-tear of pavement on roads within the project’s vicinity. Depending on whether or not construction efforts would be considered during hurricane evacuation planning, the increased level of truck traffic within the project vicinity could contribute to delays experienced during hurricane evacuations, since the roads within the vicinity of the project would be used for hurricane evacuation routes.

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 an increase of truck traffic and would therefore increase the wear-and-tear on the pavement of the roads.

Future Conditions with Alternative Actions All Reaches within IER #1 Project Area

Direct, Indirect, and Cumulative Impacts

Direct, indirect, and cumulative transportation impacts from 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 IER #1 project area is located in St. Charles Parish on the East Bank of the Mississippi River. This land use discussion is focused on the East Bank area between the Mississippi River on the south, LaBranche wetlands on the north, the Bonnet Carré Spillway East Guide Levee on the west, and the St. Charles-Jefferson Parish boundary line on the east.

A large portion of the St. Charles Parish East Bank is located on the north side of the LaBranche Wetlands Levee. This area generally consists of undeveloped wetlands extending to Lake Pontchartrain. It is traversed by I-10 in an east-west direction and I-310 extends south from I-10 near the Jefferson Parish boundary.

The part of the St. Charles Parish East Bank located between the Mississippi River and the LaBranche Wetlands Levee (that is, the protected area) contains a mixture of land uses ranging from industrial to residential. There are several petrochemical facilities concentrated in the western part of this area, near the Bonnet Carré Spillway. A large residential development, including Ormond Country Club, is located in the central portion of this area near Destrehan. To the east, along the river, is another large petrochemical facility as well as residential areas, and there are industrial/commercial facilities near the New Orleans airport.

The area immediately adjacent to both sides of the LaBranche Wetlands Levee is primarily undeveloped for most of its length. Exceptions are the Shell-NORCO petrochemical complex on the protected side of the levee adjacent to levee reach 2a at the western end and the nearby Good Hope oil and gas field on the flood side of the levee. Also, on the protected side of the levee, there are a truck/trailer storage facility (levee reach 2b) and commercial/industrial facilities near the Almedia Drainage Structure (levee reach 1b), and the western end of the New Orleans International Airport runway is adjacent to LPV 03d. There are three inactive landfills, Old Kenner, Pelican State, and Sixty Acres, Inc., located near the levee in reach 1a.

St. Charles Parish has zoning authority for the lands within its borders. The land adjacent to the LaBranche Wetlands Levee on the protected side is zoned M-2 Heavy Manufacturing, M-1 Light Manufacturing, C-3 Unlimited Commercial, or C-2 Neighborhood Business, while the land on the flood side of the levee is zoned primarily B1-Buffer Strip with some C-3 and M-1 areas at the eastern end near the airport (St. Charles Parish 2007).

The protected area of St. Charles Parish East Bank is located in three Federal Emergency Management Agency (FEMA) flood zones: Zone AE (high risk area – one percent annual chance of flooding) adjacent to the LaBranche Wetlands Levee and in the large undeveloped area in the center of the East Bank; Zone A99 (high risk area – one percent annual chance of flooding, protected by a federal flood control system) south of Zone AE, toward the Mississippi River; and Zone X (moderate to low risk area – protected from the one percent annual chance flood by levees) along the Mississippi River (St. Charles Parish 2007). Currently developed portions of the St. Charles Parish East Bank are generally located within the A-99 and X flood zones.

St. Charles Parish encompasses 284 mi² of land area plus 126.5 mi² of water (U.S. Census Bureau [USCB] 2007b). With a population of 48,072 reported in the 2000 Census, the parish had a population density of 169 persons per square mile (compared to 103 persons per square mile for the state of Louisiana). Residents in the St. Charles Parish East Bank, totaling 24,081 (based on the 2000 Census), are protected by the Lake Pontchartrain and Vicinity Hurricane Protection Project, as authorized (USACE 2006). The estimated July 2005 population (prior to Hurricane Katrina) is 50,633. The estimated July 2006 population is 52,761, which represents a 4.2 percent increase from 2005 and a 9.8 percent increase from 2000 (USCB 2006 and 2007c). The parish population is concentrated near the Mississippi River on both the West and East banks.

According to the 2000 Census, 72.4 percent of the population of St. Charles Parish is white, 25.2 percent is African American, and the remaining 2.4 percent is distributed among other races. The median household income was \$45,139 and approximately 11.4 percent of individuals residing in St. Charles Parish were identified as living below the federal poverty level (USCB 2007d). In 2004, median household income had risen to \$46,009 while persons below the poverty level increased to 13.3 percent (USCB 2007c).

St. Charles Parish is included in the New Orleans-Metairie-Kenner, Louisiana Metropolitan Statistical Area. Between 2000 and 2004, employment in St. Charles Parish grew from 19,600 to 22,643, representing an increase of 15.5 percent. In 2005, employment declined by 0.5 percent to 22,524. In 2004 and 2005, manufacturing represented the largest sector of employment followed by construction, wholesale trade, administrative services, and waste services (Louisiana Department of Labor [LDOL] 2002, 2005, 2006). In 2006, the annual unemployment average in St. Charles Parish was 5.2 percent, which was higher than the annual unemployment average of 4.0 percent for Louisiana (LDOL 2007).

Future Conditions with No Action

Direct Impacts

Without implementation of the proposed action for 100-year level of protection, the levee reaches and associated structures included in the LaBranche Wetlands levee system would be maintained at the authorized heights. This would present an increased risk of storm-related flooding in the low-lying portions of the St. Charles East Bank area and the associated damage to buildings and infrastructure, disruption of economic activity and displacement of residents.

Costs would be incurred for such items as evacuation, clean up, debris removal, building and infrastructure repair, damaged vehicles, and reoccupation of homes and businesses.

Indirect Impacts

The no action alternative would be expected to have an adverse impact on the number of businesses and industries, land use patterns, employment, and population levels in the St. Charles Parish East Bank 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 would contribute to adverse cumulative impacts on socioeconomic resources in the New Orleans metropolitan area. Without improvements to the LaBranche Wetlands levee system, there would be a gap in the GNOHSDRRS for 100-year level of protection that could possibly leave parts of St. Charles Parish East Bank more vulnerable to flooding and the associated damage to buildings and infrastructure, disruption of economic activity, and displacement of residents.

Future Condition for LPV 03d, LPV 04, and LPV 05

Proposed Action LPV 03d, LPV 04, and LPV 05

Direct Impacts

Implementation of the proposed action would take place within the existing levee ROW, up to 250 ft on each side of the current centerline for LPV 04 and LPV 05 and up to 100 ft on the undeveloped flood side of the existing levee for LPV 03d. Therefore, adjacent land uses would not be directly impacted by construction activities because of the lack of development within this wider corridor. The proposed action would provide 100-year level of flood protection for the area within the St. Charles 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 socioeconomic 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 impact could be local or regional, depending on where the goods, services, and workers would be obtained.

Indirect Impacts

Following completion of the proposed action, land use patterns in St. Charles Parish East Bank would not be expected to change since raising the LaBranche Wetlands levee system to the 100-year level of 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 if the proposed action were implemented. Population and long-term employment and income levels in St. Charles Parish would be expected to increase if the raised levees stimulated growth in urban development in the protected area. Although the proposed action would reduce but not eliminate the risk of flooding, it would have beneficial impacts on population, 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 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 St. Charles Parish East Bank GNOHSDRRS need to be brought to 100-year level of protection in order to obtain FEMA certification of the system. When considered in conjunction with potential effects from other flood control projects in the region, beneficial cumulative impacts would be likely.

Alternative Actions LPV 03d

Direct, Indirect, and Cumulative Impacts

The direct impacts on land use and socioeconomic resources under all four of the alternatives for LPV 03d would be similar to those described for the proposed action. Although alternatives 2, 3, and 4 would be constructed approximately 350 ft to the flood side, adjacent land uses would not be impacted by construction activities because of the lack of development within this corridor. Potential indirect and cumulative impacts would be the same as those described for the proposed action. In summary, the four alternatives would most likely result in beneficial impacts on socioeconomic resources and land use.

Alternative 1 LPV 04 and LPV 05 (Existing Alignment with Flood-Side Shift)

Direct, Indirect, and Cumulative Impacts

The direct impacts on land use and socioeconomic resources from the construction of levees under this alternative would be similar to those described for the proposed action for LPV 04 and LPV 05. Although the area directly impacted by construction activities would be shifted more to the flood side under this alternative, adjacent land uses would still not be impacted because of the lack of development on the flood side of the levees within this shifted corridor. Potential indirect and cumulative impacts would be the same as those described for the proposed action. In summary, this alternative would most likely result in beneficial impacts on socioeconomic resources and land use.

Alternative 2 LPV 04 and LPV 05 (Incorporation of Wavebreaks)

Direct, Indirect, and Cumulative Impacts

The direct impacts on land use and socioeconomic resources from the incorporation of wavebreaks into the existing levees under this alternative would be similar to those described for the proposed action. Under this alternative, the footprint of the levee along the existing alignment would remain the same, but wavebreaks would be added to the wave berm on the flood side within the existing levee corridor. Adjacent land uses would not be impacted by construction activities because of the lack of development within this corridor. Potential indirect and cumulative impacts would be the same as those described for the proposed action. In summary, this alternative would most likely result in beneficial impacts on socioeconomic resources and land use.

Alternative 3 LPV 04 and LPV 05 (Incorporation of a Geotextile Fabric)

Direct, Indirect, and Cumulative Impacts

The direct impacts on land use and socioeconomic resources from the incorporation of a geotextile fabric into the levee construction under this alternative would be similar, but slightly less, than those described for the proposed action. Under this alternative, the footprint of the levee along the existing alignment would remain the same. Adjacent land uses would not be impacted by construction activities because of the lack of development within this corridor. Potential indirect and cumulative impacts would be the same as those described for the proposed action. In summary, this alternative would most likely result in beneficial impacts on socioeconomic resources and land use.

Future Conditions for LPV 06 (Floodwalls and Gate)

Proposed Action LPV 06a-f Floodwalls and Gate

Direct, Indirect, and Cumulative Impacts

The direct impacts on land use and socioeconomic resources from the construction of the LPV 06 floodwalls and modification of the LPV 06f railroad gate under the proposed action would be similar to those described for the LPV 03d, LPV 04, and LPV 05 levees. A greater amount of equipment and a wider variety of materials would be required for construction of the LPV 06 floodwalls and flood gates, with a correspondingly greater temporary beneficial socioeconomic impact. Potential indirect and cumulative impacts would also be the same as those described for the proposed action for the LPV 03d, LPV 04, and LPV 05 levees. In summary, the LPV 06 proposed action would most likely result in beneficial impacts on socioeconomic resources and land use.

Alternative 1 LPV 06a-d Floodwalls

Direct, Indirect, and Cumulative Impacts

Under this alternative, the existing floodwalls at LPV 06a-d would be demolished and replaced with levees that form a continuation of the proposed action for LPV 04 and LPV 05. As a result, the impacts to land use and socioeconomic resources from this alternative would be the same as those described for the proposed action for LPV 04 and LPV 05.

Alternative Actions LPV 06e Floodwall and LPV 06f Gate

Direct, Indirect, and Cumulative Impacts

Under these alternatives, a rock breakwater would be constructed on the flood side of the floodwall under I-310 (LPV 06e) and the railroad gate would be demolished and replaced (LPV 06f). The impacts to socioeconomic resources and land use from this alternative would be the same as those described for rebuilding floodwalls and gates under the proposed action for LPV 06.

Future Conditions for LPV 07 (Structures)

Proposed Action LPV 07 Structures

Direct, Indirect, and Cumulative Impacts

Potential direct, indirect, and cumulative impacts on socioeconomic resources and land use from the construction or modification of drainage structures under the proposed action would be similar to those described for the proposed action for LPV 06 (floodwalls and gate).

Alternatives 1 and 2 LPV 07 Structures

Direct, Indirect, and Cumulative Impacts

Potential direct, indirect, and cumulative impacts on socioeconomic resources and land use from the construction or modification of drainage structures under alternatives 1 and 2 would be similar to those described for the proposed for LPV 06.

3.3.2 Environmental Justice

Existing Conditions

Consideration of Environmental Justice is required for any Federal action under Executive Order 12898. It is defined specifically as the fair treatment 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.

The existing hurricane protection project on the east side of the Mississippi River in St. Charles Parish, covered in IER #1, is located on the northern side of U.S. 61 (Airline Highway). The levee is 8.7 miles long encompassing 6,400 ft of floodwalls, and fronting protection modifications to five existing drainage structures. The project is made up of 13 separate and distinct levee sections and drainage structures. These structures front the developed areas on the East Bank of the Mississippi River in St. Charles Parish including several municipalities located adjacent to the Mississippi River levee. The CEMVN has held 37 public meetings since March of 2007, concerning the GNOHSDRRS in the New Orleans metropolitan area. These meetings were designed to encourage all stakeholders to participate in the decision making process.

At the northwestern end of the St. Charles Parish East Bank levee alignment, there are two major industrial complexes, which include Motiva Enterprises and Resolution Resins facilities. These entities surround the community of Norco, Louisiana. Slightly south and east of Norco are the communities of New Sarpy and Destrehan. Both New Sarpy and Destrehan occupy the lands from the Mississippi River levee to U.S. 61 (Airline Highway). New Sarpy has a significant minority population. There is also a large residential and commercial component on the southeastern end of the parish near St. Rose. In addition, there is a large area of open land in the central portion of the Parish that is sparsely populated.

As one of Louisiana's fastest growing parishes, St. Charles has blossomed from a traditionally rural area into one of the New Orleans metropolitan area's more prosperous regions. The parish's primary economic engines, including Dow Chemicals, Valero, Port of South Louisiana, Cytec, Shell/Motiva, and First American Bank, offer higher than average wages which have successfully attracted many new families to the local area in recent years. The parish's median income is almost 40 percent above the state's median income, and the poverty rate (11.9 percent) is substantially below the poverty rates of the New Orleans metropolitan area (18.4 percent), the state (19.6 percent) and the U.S. (12.4 percent). However, it is estimated that almost 2,000 households are categorized as Extremely Low Income, or households that earn less than 30 percent of the area's median income, and more than 5,000 residents lived below the poverty line as of 2000 based on U.S. Census data (USCB 2007e). These households are extremely vulnerable to change and rely on their social networks and local institutions as a means of survival.

Analysis of All the Alternatives including the Proposed Action

The flood protection structures in St. Charles Parish received minor damage and were not over topped by the storm surge from Lake Pontchartrain during Hurricane Katrina.

Minority and low income populations located on the protected side of the levee would be protected by hurricane protection because the design of the flood control system does not compartmentalize flood control inside of the levee.

All populations, including minority and low income populations, located outside of the flood protection system would be exposed to storm surges as they are now.

Additional information about Environmental Justice will be included in future environmental documents including the CED [Comprehensive Environmental Document].

3.4 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

The USACE is obligated under Engineer Regulation 1165-2-132 to assume responsibility for the reasonable identification and evaluation of all Hazardous, Toxic, and Radioactive Waste (HTRW) contamination within the proposed project area. ER 1165-2-132 identifies the 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), would be 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 (ESA) was completed for the project area. A copy of the Phase I ESA is maintained on file at the CEMVN. The Phase I ESA documented the Recognized Environmental Conditions (RECs) for the project area. If a REC cannot be avoided, due to the necessity of construction requirements, the CEMVN could further investigate the REC in order to confirm presence or absence of contaminants, to take actions to avoid possible contaminants, and to determine if local, state, or Federal coordination is required.

The Phase I ESA revealed the presence of dumped materials and abandoned vehicles and the presence of an oil or gas refining plant and pipeline adjacent to the IER #1 project area. Furthermore, the records review revealed that there was one site (Motiva Enterprises Norco Refinery) near the IER #1 project area that could have impacted the project area, based on site history and proximity. This refinery has been in operation since 1916 and, as noted in the discussion of wetlands in section 3.2.1, has contributed to sediment contamination in Bayou Trepagnier.

The Louisiana Department of Environmental Quality (LDEQ) and Motiva Enterprises have reached a cooperative agreement to clean up the sediment contamination in the portion of Bayou Trepagnier that would be impacted by the proposed project (LDEQ 2008). This clean up process has not begun and is not expected to be complete before the project begins. Therefore, a "No-Work Zone" would be designated for this area (figure 13). No work should be done within that zone until the site remediation process has been completed.



Figure 13. No Work Zone for Bayou Trepagnier

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. 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 and include both beneficial and adverse impacts depending on the resource. This section 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 St. Charles Parish and throughout the Gulf Coast over the next 5 to 10 years is unknown, a large-scale rebuilding effort is underway.

Federal hurricane protection for the greater New Orleans area is referred to as the GNOHSDRRS and is divided into three USACE authorized projects: 1) LPV; 2) WBV; and 3) New Orleans to Venice. The New Orleans to Venice and WBV projects 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 LPV projects have resulted in the construction of 125 miles of levees, concrete floodwalls, and other structures.

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 flood protection. All of these 100-year level of flood protection projects are currently in the planning and design stages and impacts from these component projects would be addressed in separate IERs. 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.

The CEMVN and other Federal agencies participate in coastal restoration projects through the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA). These would be 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 14 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. Additionally, the pending decision on the proposed MRGO deauthorization plan could decrease the levels of salinity in some wetlands within the region.

The Water Resources Development Act of 2007 (WRDA 07) was approved by a congressional override of a presidential veto in September of 2007. This bill would help allocate financing for several Louisiana projects. These projects include 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, an EIS for the IHNC lock, and the formation of a Coastal Louisiana Ecosystem Protection and Restoration Task Force (Alpert 2007). The WRDA does not guarantee financing of these projects, but does allow Congress to allocate money for them in future spending bills (Alpert 2007). All of these projects are in the general area of the IER #1 project area and 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.

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 of severe economic loss and to life, health, and property posed by flooding. The LPV project would be improved to provide additional hurricane, storm, and flood damage protection, thus 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.

5.0 SELECTION RATIONALE

The proposed action consists of increasing levee height with a flood-side shift at LPV 03d, raising levee reaches with centerline shift to accommodate new expansion of 100 ft to 250 ft on both flood and protected sides at LPV 04 and LPV 05, demolishing and rebuilding new T-walls at LPV 06a-e, adding scour protection at LPV 06e, retrofitting LPV 07a with the LPV06a floodwall, replacing structures at LPV 07b and LPV 07c, and modifying structures at LPV 07d and 07e. The proposed action was selected because it provides adequate structural measures to meet the 100-year level of flood protection for St. Charles Parish, does not disturb existing industrial complexes, and 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 T&E 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 March 13, 2007, and on the website www.nolaenvironmental.gov. Scoping for this project was initiated on March 12, 2007, through placing advertisements and public notices in *USA Today* and the *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 March 27th and April 12, 2008, 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. The public is able to provide verbal comments during the meetings and written comments after each meeting in person, by mail, and via the www.nolaenvironmental.gov website.

6.2 AGENCY COORDINATION

Preparation of this IER has been coordinated with appropriate Congressional, Federal, state, and local interests, as well as environmental groups and other interested parties. An interagency environmental team was established for this project in which Federal and state agency staff played an integral part in the project planning and alternative analysis phases of the project (members of this team are listed in appendix C). This interagency environmental team was integrated with the CEMVN Project Delivery Team (PDT) to assist in the planning of this project and to complete a mitigation determination of the potential direct and indirect impacts of the proposed action. Monthly meetings with resource agencies were also held concerning this and other CEMVN IER projects. The following agencies, as well as other interested parties, are receiving copies of this 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
- Louisiana Advisory Council on Historic Preservation
- 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

The U.S. Fish and Wildlife Service (USFWS) reviewed the proposed action to see if it would affect any T&E species, or their critical habitat. The USFWS concurred with the CEMVN in a letter dated April 8, 2008, that the proposed action would not have adverse impacts on T&E species (appendix D).

NOAA National Marine Fisheries Service (NMFS) was sent the CEMVN's determination on the effects the proposed action would have on T&E species on March 24, 2008. No T&E species, or their critical habitat under NMFS jurisdiction would be impacted with construction of the proposed action.

The LDNR reviewed the proposed action for consistency with the Louisiana Coastal Resources Program (LCRP). The proposed action was found to be consistent with the LCRP, as per a letter dated April 21, 2008 (appendix D).

Section 106 of the National Historic Preservation Act, as amended, requires consultation with the Louisiana SHPO [State Historic Preservation Officer] 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 August 3, 2008 and the Mississippi Band of Choctaw Indians concurred with the effect determination in an email dated August 23, 2007. Subsequently, the

SHPO and Mississippi Band of Choctaw Indians concurred with the CEMVN "no historic properties affected" finding for LPV 03d in a letter and email dated December 13, 2007, and November 29, 2007, 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 March 13, 2007, and concluded on August 6, 2007. A draft Fish and Wildlife Coordination Act Report (CAR) was provided by the USFWS on January 14, 2008. This report concludes that approximately 292 acres of wetlands would be directly impacted by the proposed action, for a total loss of 193 average annual habitat units (AAHUs). The draft CAR concluded that the USFWS does not object to the construction of the proposed project provided that fish and wildlife conservation recommendations are implemented concurrently with project implementation. A copy of the draft report is provided in appendix D.

One of the waterways within the footprint of the proposed action, Bayou Trepagnier, has been designated as a Louisiana Natural and Scenic River. A Scenic Rivers Permit is required for activities or uses that have a potential to cause direct and significant degradation to a scenic river or its tributaries. LDWF has determined that a Scenic Rivers Permit is not required for work that will be accomplished within the levee ROW at Bayou Trepagnier, based on a Louisiana revised statute specifically applicable to this location (RS 56:1855). However, LDWF requires that adequate measures must be implemented to ensure that sediment, construction debris, and other materials related to the project do not enter the bayou beyond the ROW.

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

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. These issues are addressed in Chapter 3.2.4 of the IER.

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

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 Bohannon (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 reinstate 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. With the exception of the retrofitting of the drainage structure (LPV 07a) on the canal west of Bayou Trepagnier, the openings to the flood protection levees will have minimal changes.

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

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

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. Project area does not include the utilization of multiple structures.

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

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 #1 proposed action are listed below. Each recommendation is followed by the CEMVN response.

Recommendation 1: The Corps and local sponsor shall provide 193 AAHUs to compensate for the unavoidable, project-related loss of forested wetlands. The Service, National Marine Fisheries Service (NMFS), Louisiana Department of Wildlife and Fisheries (LDWF), and Louisiana Department of Natural Resources (LDNR) should be consulted regarding the adequacy of any proposed alternative mitigation sites. The mitigation plan developed to offset project related impacts should be consistent with mitigation requirements of the Clean Water Act regulatory program, and include monitoring, success criteria, and financial assurance components.

CEMVN Response 1: Concur.

Recommendation 2: The Service recommends that any impacts to forested wetlands should be avoided or minimized to the greatest extent practicable.

CEMVN Response 2: Concur.

Recommendation 3: Three new access roads will be constructed at the Shell pipeline crossing, under I-310, and at the Walker structure. The potential for induced development is increased greatly with these new access corridors, especially in regards to the access road at the Walker structure. The Service recommends that all three access roads be only used temporarily during construction and to be degraded and replanted with appropriate bottomland hardwood forest or cypress swamp species after construction activities are complete. Restoration activities should include the use of measures to prevent nutria herbivory, and monitoring to document habitat recovery and the need for further actions. If any of the access roads are not degraded after construction activities are completed, then secondary and cumulative impacts would have to be addressed.

CEMVN Response 3: Concur.

Recommendation 4: 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 hydrology.

CEMVN Response 4: Concur.

Recommendation 5: To avoid the protected-side swamps near the Bayou Trepagnier pumps and drainage structure from becoming impounded or drained, provide assurance that once the drainage structure is replaced with a T-wall that the pumps will be operated to achieve the same hydrologic results (i.e. water levels) as in the past thus perpetuating existing conditions and minimizing secondary impacts from development and hydrologic alteration.

CEMVN Response 5: Concur.

Recommendation 6: Avoid adverse impacts to wading bird colonies through careful design project features and timing of construction. Colonies that are not currently listed in the database maintained by the Louisiana Department of Wildlife and Fisheries may be present. That database is updated primarily by monitoring the colony sites that were previously surveyed during the 1980s. Until a new, comprehensive coast-wide survey is conducted to determine the location of newly-established nesting colonies, the Service recommends that a qualified biologist inspect the proposed work site for the presence of undocumented nesting colonies during the nesting season.

CEMVN Response 6: Concur.

Recommendation 7: 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 7: Concur.

Recommendation 8: 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.

CEMVN Response 8: Concur.

Recommendation 9: The project's first Project Cooperation Agreement (or similar document) shall include language that includes the responsibility of the local-cost sharer to provide operational, monitoring, and maintenance funds for mitigation features.

CEMVN Response 9: Concur.

Recommendation 10: 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.

CEMVN Response 10: 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. Approximately 1.4 acres at LPV 03d, 307 acres at LPV 04 and LPV 05, less than 1 acre at LPV 06, and none at LPV 07 would be permanently replaced by the proposed action. These estimates are based the assumption that impacts would be from the toe of the existing levee.

A habitat evaluation was conducted by the USFWS using habitat assessment models developed by the state of Louisiana (LCWCRTF 2006) for all reaches evaluated in this IER. The wetland value assessment (WVA) was conducted independently of this IER to determine the changes in fish and wildlife habitat that would be projected to occur as a result of the proposed action. The habitat evaluation identifies the quality and quantity of available habitat for selected wildlife species under existing conditions and predicts the future habitat suitability for those species without the proposed action (without the project) and as a result of the unavoidable impacts from the proposed action (with the project).

The evaluation was performed for two habitats within the project area: bottomland hardwood and fresh swamp communities. The USFWS estimated approximately 300 acres of wetland habitat from the existing levee toe for use in the WVA. The results of the evaluation are expressed in habitat units (HUs), representing the acreage and quality of the habitat. HUs were derived by multiplying the number of acres of a particular habitat times the habitat suitability index (HSI) representing the quality of that habitat. The HSI is based on seven different variables that address both site-specific habitat quality features as well as how a site fits into the overall “landscape” (LCWCRTF 2006). HUs were calculated for the two scenarios (without the project and with the project) from the current time to 50 years into the future, the assumed life of the proposed actions.

The HUs were summed to determine the total number of HUs gained or lost without the project and as a result of the proposed action. These cumulative HU values were then divided by the life of the action (50 years) to determine the AAHU value. Finally, in order to obtain an estimate of the impact of the proposed action on the fish and wildlife habitat, the AAHU value for the future with the project was subtracted from the AAHU value for the future without the project. A positive AAHU indicates that the proposed action would result in an increase in the “value” of the wetland habitat, while a negative result indicates that the proposed action would result in a decrease in the wetland habitat “value.”

The results of the WVA indicate a decrease in the wetland habitat values for both flood side and protected side impacts from the proposed action. Bottomland hardwood communities on the flood side of the IER #1 project area would have a net change in AAHUs of -8.09, if the proposed project is constructed. No bottomland hardwood communities were projected to be impacted on the protected side, so AAHUs were not calculated for this habitat type for this side of the project area. The net change in AAHUs would be -110.97 for the flood shift fresh swamp communities and -73.35 for the protected-side fresh swamp communities. The draft USFWS CAR for the IER #1 project, which contains a detailed description of the WVA, is included in appendix D of this document.

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 in this section.

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; 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 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 INTERIM DECISION

The proposed action consists of increasing levee height with a flood-side shift at LPV 03d, raising levee reaches with centerline shift to accommodate new expansion of 100 ft to 250 ft on both the flood and protected sides at LPV 04 and LPV 05, demolishing and rebuilding new T-walls at LPV 06a-e, adding scour protection at LPV 06e, increasing the gate height at LPV 06f, retrofitting LPV 07a with a new T-wall, replacing structures at LPV 07b and LPV 07c, and modifying structures at LPV 07d and LPV 07e.

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

Wetlands/Drainageways/Canals

- LPV 03d – loss of approximately 1.4 acres of wetland.
- LPV 04 and LPV 05 – 307 acres impacted by levee construction requiring mitigation.
- LPV 06 – less than 1 acre would be replaced.

- LPV 07b and LPV 07c – no net change in wetland acreage.
- LPV 07d and LPV 07e – no wetlands impacted.

Fisheries

- LPV 03d – Possible temporary indirect impacts to fish habitat.
- LPV 04 and LPV 05 – 307 acres of wetlands, canals, and associated fish habitat impacted by levee construction.
- LPV 06 – less than 1 acre of fish habitat impacted.
- LPV 07b and LPV 07c – no net change in fish habitat.
- LPV 07d and LPV 07e – no fish habitat replaced.

Wildlife

- LPV 03d, LPV 04, LPV 05, LPV 06, and LPV 07 – Reduction in wetland habitat and temporary impacts to wildlife within the vicinity of the project area during construction.

Endangered or Threatened Species

- LPV 03d, LPV 04, LPV 05, LPV 06, and LPV 07 – No effect except at LPV 07, where effects would be unlikely to have an adverse impact.

Socioeconomic Resources

- LPV 03d, LPV 04, LPV 05, LPV 06, and LPV 07 – Beneficial: impacts to population, land use, and employment due to heightened flood protection and construction-generated employment.

Environmental Justice

- LPV 03d, LPV 04, LPV 05, LPV 06, and LPV 07 – All populations, including minority and low-income populations, outside of the flood protection system would be exposed to storm surges as they are now.

Cultural Resources

- LPV 03d, LPV 04, LPV 05, LPV 06, and LPV 07 – No Effect: SHPO consultation for this project concluded that no cultural resources would be impacted under the proposed action.

Recreation

- LPV 03d, LPV 04, LPV 05, LPV 06, and LPV 07 – Mostly temporary construction-related impacts to the wetland areas would reduce recreational opportunities and quality.

Aesthetic (Visual) Resources

- LPV 03d, LPV 04, LPV 05, LPV 06, and LPV 07 – Construction activities would temporarily reduce the visual attributes of the project corridor.

Air Quality

- LPV 03d, LPV 04, LPV 05, LPV 06, and LPV 07 – Most impacts to air quality would be temporary.

Noise

- LPV 03d, LPV 04, LPV 05, LPV 06, and LPV 07 – Temporary impacts to receptors within 1,000 ft of the project area during construction.

Transportation

- LPV 03d, LPV 04, LPV 05, LPV 06, and LPV 07 – Worker and truck traffic resulting from the project would temporarily impact traffic on highways within the vicinity of the project area.

9.2 PREPARED BY

The point of contact for this IER is Elizabeth Behrens, USACE, New Orleans District CEMVN-PM-RS. Table 7 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 P.O. Box 60267, 7400 Leake Avenue; New Orleans, Louisiana 70118.

EA Section	Team Member
Environmental Team Leader	Gib Owen, USACE
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 and Endangered Species	Stephen Dillard, Earth Tech
Socioeconomics/Land Use/ Aesthetics	Susan Provenzano, AICP, Earth Tech
Air	Fang Yang, Earth Tech
Transportation	John Schrohenloher, P.E., Earth Tech
Project Support	Erika Schreiber, Earth Tech Katie Broom, Earth Tech

Table 7 (Continued) IER Preparation Team	
EA Section	Team Member
Environmental Justice	Ed Lyon, USACE
Cultural Resources	Michael Swanda, USACE
Recreation	Andrew Perez, USACE
HTRW	Christopher Brown, USACE
Administrative Support	Bonnie Freeman, Earth Tech
Technical Editor	Jennifer Darville, USACE
Internal Technical Review	Tom Keeven, USACE

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APPENDIX A

LIST OF ACRONYMS AND DEFINITIONS OF COMMON TERMS

AAHU	average annual habitat unit
AMI	area median income
ASTM	American Society for Testing and Materials
CAA	Clean Air Act
CAR	Coordination Act Report
CED	Comprehensive Environmental Document
CEMVN	U.S. Army Corps of Engineers, Mississippi Valley Division, New Orleans District
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
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
DCED	Draft Comprehensive Environmental Document
DNL	day-night average sound level
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EJ	Environmental Justice
ER	Engineering Regulations
ESA	Endangered Species Act
F	Fahrenheit
ft	Feet
FCED	Final Comprehensive Environmental Document
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FMC	Fishery Management Council
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
GIWW	Gulf Intracoastal Waterway
GNOHSDRRS	Greater New Orleans Hurricane and Storm Damage Risk Reduction System
HTRW	hazardous, toxic, and radioactive waste
I-10	Interstate 10
I-310	Interstate 310
IER	Individual Environmental Report
IHNC	Inner Harbor Navigation Canal
III	Insurance Information Institute
LADOTD	Louisiana Department of Transportation and Development
LCWCRTF	Louisiana Coastal Wetlands Conservation and Restoration Task Force

LDNR	Louisiana Department of Natural Resources
LDOL	Louisiana Department of Labor
lft	linear feet
LNHP	Louisiana Natural Heritage Program
LDWF	Louisiana Department of Wildlife and Fisheries
LOS	level of service
LPV	Lake Pontchartrain and Vicinity
mi ²	square miles
mph	miles per hour
MRGO	Mississippi River Gulf Outlet
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NAAQS	National Ambient Air Quality Standards
NAVD88	North American Vertical Datum
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act of 1966, as Amended
NHTSA	National Highway Traffic and Safety Administration
NMFS	National Marine Fisheries Service
NO ₂	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NORCO	New Orleans Refining Company
NWR	National Wildlife Refuge
NWUS	Navigable Waters of the United States
O ₃	Ozone
OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
Pb	lead
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
SHPO	State Historic Preservation Office
SIR	Supplemental Information Report
SO ₂	sulfur dioxide
Sq Ft	square feet
T&E	Threatened and Endangered
TRB	Transportation Research Board
USC	United States Code
USACE	U.S. Army Corps of Engineers
USCB	U.S. Census Bureau
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

WBV	West Bank and Vicinity
WCRA	Wetlands Conservation and Restoration Authority
WoUS	Waters of the United States
WRDA	Water Resources Development Act
WVA	wetland value assessment

APPENDIX B

PUBLIC COMMENT AND RESPONSES SUMMARY

This section will be completed following receipt of public comments and preparation of responses.

APPENDIX C

MEMBERS OF INTERAGENCY ENVIRONMENTAL TEAM

Kyle Balkum	Louisiana Dept. of Wildlife and Fisheries
Brian Marcks	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 Department of Wildlife and Fisheries
David Muth	U.S. National Park Service
Clint Padgett	U.S. Geologic Survey
Jamie Phillippe	Louisiana Department of Environmental Quality
Molly Reif	U.S. Geologic Survey
Manuel Ruiz	Louisiana Department of Wildlife and Fisheries
Reneé 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
- LDNR LCRP Consistency Determination
- LDEQ Water Quality Certificate
- LSHPO CRM Management Summary
- LSHPO Cultural Resource Concurrence
- USFWS Fish and Wildlife Coordination Act Report
- USFWS Fish and Wildlife Supplemental Coordination Act Report


DEPARTMENT OF THE ARMY

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

 REPLY TO
 ATTENTION OF:

MAR 24 2008

 Planning, Programs, and
 Project Management
 Environmental Planning
 and Compliance Branch

 James Boggs
 Field Supervisor
 U.S. Fish and Wildlife Service
 646 Cajundome Blvd - Suite 400
 Lafayette, LA 70506

This project has been reviewed for effects to Federal trust resources under our jurisdiction and currently protected by the Endangered Species Act of 1973 (Act). The project, as proposed, () Will have no effect on those resources. (X) Is not likely to adversely affect those resources. This finding fulfills the requirements under Section 7(a)(2) of the Act.

David Warther April 1, 2008
 Acting Supervisor Date
 Louisiana Field Office
 U. S. Fish and Wildlife Service

Dear Mr. Boggs:

A project description, project location map, and determination of the effect the proposed action will have on Threatened and Endangered (T&E) species for the LPV, LaBranche Wetlands Levee, St. Charles Parish, Louisiana Project (Individual Environmental Report [IER] #1) prepared by the U.S. Army Corps of Engineers, New Orleans District (CEMVN) are enclosed for your review and comment. The IER for the project will be completed in the next few weeks and will be forwarded to you upon completion.

Project description

The proposed project would raise approximately 9 miles of earthen levees, replace over 3,000 feet (ft) of floodwalls, rebuild or modify 4 drainage structures, close 1 drainage structure and modify one railroad gate. The proposed action is located in St. Charles Parish, Louisiana. The IER #1 project area is located within the Lower Mississippi Delta Alluvial Plain and the East Central Louisiana Coastal watershed. The project area runs along the existing levee system on the north side of U.S. 61 (Airline Highway). For the purposes of this IER, the Lake Pontchartrain and Vicinity area has been divided into numerous reaches. Every reach is identified by a project identification number (e.g., LPV 04; Figure 1).

LPV 03b Levee

The proposed action for this reach would consist of a flood side enlargement of the existing levee. The existing levee would be raised from its present elevation of approximately 14 ft to 16 ft plus 1 ft overbuild. A short reach of reinforced concrete retaining wall would be required to maintain an existing landing approach light, which is located at the flood side toe of the existing levee, for the east-west runway of Louis Armstrong New Orleans International Airport. This retaining wall would be incorporated into the flood side slope of the levee embankment and is

OPTIONAL FORM 99 (7-92)		# of pages ▶ 1	
FAX TRANSMITTAL			
To <i>Libby Behrens</i>	From <i>David Warther</i>		
Dept./Agency	Phone #		
Fax #	Fax #		

BOBBY JINDAL
GOVERNOR



SCOTT A. ANGELLE
SECRETARY

State of Louisiana
DEPARTMENT OF NATURAL RESOURCES
OFFICE OF COASTAL RESTORATION AND MANAGEMENT

April 21, 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: **C20080104**, Coastal Zone Consistency
U. S. Army Corps of Engineers, New Orleans District
Direct Federal Action
IER 1: Lake Pontchartrain and Vicinity, Labranche Wetlands Hurricane Protection
Levee, **St. Charles 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 yours,

A handwritten signature in blue ink, appearing to read "Jim Rives".

Jim Rives
Administrator

JR/jdh

cc: Venise Ortego, LDWF
Elizabeth Behrens, COE-NOD

BOBBY JINDAL
GOVERNOR



HAROLD LEGGETT, PH.D.
SECRETARY

State of Louisiana
DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL SERVICES

April 18, 2008

Department of the Army- Corps of Engineers, New Orleans District
P.O. Box 60267
New Orleans, LA 70160-0267

Attention: Elizabeth Behrens

RE: Water Quality Certification (JP 080327-02/AI 156863/CER 20080001)
Corps of Engineers Individual Environmental Report (IER#1)
St. Charles Parish

Dear Ms. Behrens:

The Department has reviewed your application for the construction of the LaBranche Wetlands Levee in St. Charles 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,

A handwritten signature in cursive script that reads "Thomas R. Griggs".

Thomas R. Griggs
Engineer Manager

TRG/jjp



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

August 3, 2007

Ms. Elizabeth Wiggins
Chief, Environmental
Planning and Compliance Branch
USACE, New Orleans District
P.O. Box 60267
New Orleans, LA 70160-0267

Re: CRM Management Summary
*Phase I Cultural Resources Records Review
and Field Reconnaissance Performed for Lake
Pontchartrain and Vicinity Project, Individual
Environmental Report Area 1, (IER#1): La
Branch Wetlands Levee, St. Charles Parish, LA*
R. Christopher Goodwin & Associates, Inc.

Dear Ms. Wiggins:

We acknowledge receipt of your letter dated June 25, 2007, transmitting two copies of the above-referenced Management Summary report. The following comments are offered for your consideration.

Based on the results on the recently completed background and field investigations, we concur with the findings of the Management Summary that historic properties will not be affected as a result of construction of the proposed project. Consequently, we have no objections to its implementation from a Section 106 review and consultation standpoint.

We look forward to working to receiving two copies of the draft CRM report. Please include two copies of site record forms for previously recorded archaeological sites 16SC65, 16SC66, and 16SC67, which were investigated during the recent fieldwork. A few minor corrections are noted on the enclosed photocopied pages from the Management Summary. If we may be of further assistance, do not hesitate to contact Duke Rivet in the Division of Archaeology at (225) 342-8170.

Ms. Elizabeth Wiggins
August 3, 2007
Page 2

Sincerely,

Pam Breaux

Pam Breaux
State Historic Preservation Officer

PB:PR:s

c: Mr. Robert Lackowicz (w/copy of enclosure)
R. Christopher Goodwin & Associates, Inc.
309 Jefferson Highway, Suite A
New Orleans, LA 70121

by the coastal marshlands of the Louisiana Chenier Plain, on the east by the Gulf of Mexico, and on the north by the Mississippi River Alluvial Valley. A distinct physiographic unit, the plain is a broad, low-lying tract of alluvial land with an extensive network of distributaries that radiate largely gulfward either from an abandoned or active Mississippi River course.

The physiographic region of IER#1 is dominated by natural levee ridges and wetlands. The narrow natural levee ridges flank the present course of the Mississippi River and its numerous abandoned deltaic distributaries (Fisk 1944; Kolb and VanLopik 1958; Frazier and Osanik 1965). The wetlands consist of swamps, marshes, shallow lakes, and tidal channels that have water tables at or above the surface most of the time. Swamps are in broad depressions or basins distant from the natural levees of the Mississippi River and its distributaries, whereas marshes are adjacent to Lake Pontchartrain.

The topography of St. Charles Parish is typical of the lower Mississippi River region. The land slopes away from the Mississippi River and its natural levees, toward the lower swamps and marshes. Historically, drainage from the East Bank of the Mississippi River runs northerly through a system of open ditches and canals, into the swamps and marshes bordering Lake Pontchartrain.

Geologic History and Chronology

The period from about 18,000 to 11,000 years ago marked the waning of the Late Wisconsin glaciation, the wasting of the Laurentide ice sheet over North America, and the rapid and major rise in sea level known as the Holocene transgression. As the Mississippi River continued to transport huge volumes of meltwater and outwash to the Gulf of Mexico, the coastline retreated rapidly inland away from the Mississippi entrenchment. At first, the lower ends of the entrenchments of the smaller streams were inundated, but then the entire Pleistocene surface was submerged and overridden by shallow water marine deposits.

About 12,000 years ago, the entire region experienced a variety of dramatic changes. Within a matter of a few centuries, the Mississippi River ceased carrying large quantities of glacial outwash and it was subsequently transformed from a braided to a meandering regime. The dominant sediment load of the river changed from sands and gravels to mostly clays, silts, and fine sands. About 9,000 years ago, the first Mississippi River delta complex - the Outer Shoal complex - formed well offshore from central coastal Louisiana when sea level was perhaps about 15 m (49.2 ft) lower than at present (Penland et al. 1988). Apparently this complex was inundated and largely destroyed within a thousand years by rising sea level, but it was followed by a second one - the Maringouin complex - that formed about 7,000 years ago slightly farther inland and at a higher elevation (about 5 m [16.4 ft] lower than at present). Geological studies indicate that the trunk course of the Mississippi River associated with both delta complexes was located along the western side of the alluvial valley, i.e., along the route of the later Teche meander belt (SaucER#1994).

With sea level only slightly lower than at present, the Mississippi River began constructing the Teche meander belt and Teche delta complex about 6,000 years ago (SaucER#1994). About 4,800 years ago, the Teche delta complex had developed to the southwest into the Houma, Louisiana area. At that time and because of a major upstream diversion, the Mississippi River began forming a new meander belt along the eastern side of its valley past the Baton Rouge, Louisiana area and it began constructing a delta complex (the St. Bernard complex) eastward into and beyond the New Orleans area. Within less than a millennium, the embayment was transformed into an active deltaic plain landscape with seasonal influxes of large volumes of turbid fresh water, the rapid eastward and southeastward growth of distributaries, and the formation of broad expanses of intratidal wetlands. Sea level at this time probably was not more than a meter or so below that of the present and it was rising slowly.

Considerable subsurface geological evidence (Kolb 1962; SaucER#1963) indicates that from at least 4,000 years ago, the Mississippi River has occupied a well developed meander belt essentially along its present route from Donaldsonville, eastward past New Orleans, Louisiana, including the current project

respect to groundstone, bone, and antler implements. Middle Archaic projectile point/knife types tend to be stemmed rather than notched, and in Louisiana include such types as Morrow Mountain, Johnson, Edgewood, Evans, and possibly Calcasieu types (Campbell et al. 1990:96; Green 1991; Perino 1985, 1991; Saunders 2000). Other technological innovations include the appearance of ground, pecked, and polished stone tools and the use of celts and grooved axes for heavy woodworking. The *atlatl* or spear thrower first appeared during the Middle Archaic, as indicated by bone *atlatl* hooks and by the appearance of groundstone bannerstones. In addition, the earliest moundbuilding cultures developed in the Lower Mississippi Valley in the latter half of the Middle Archaic period. In south Louisiana, examples of Middle Archaic mound sites include the LSU Campus Mounds (16EBR6), Banana Bayou (16IB24), Hornsby (16SH21), and Monte Sano (16EBR17) (Gibson 1994; R. Saunders 1994; Saunders 1999, 2000, 2003; Saunders et al. 1994).

The Late Archaic period represents a time of population growth as demonstrated by an increased number of sites dating from this period in the United States. Hallmarks of the Late Archaic period include intensification of moundbuilding, inter-regional trade of exotic materials, the production of steatite stone vessels, and the advent of fiber-tempered pottery. Late Archaic period projectile point/knife types commonly found throughout Louisiana consist of stemmed and corner notched forms, including Bulverde, Carrollton, Delhi, Ellis, Ensor, Epps, Gary, Kent, Macon, Marcos, Palmillas, Pontchartrain, Sinner, and Yarbrough types. Groundstone objects include celts/axes, bannerstones, plummets, and steatite bowl fragments (Campbell et al. 1990; Jeter et al. 1989). Additionally, there is evidence for widespread trade in shell, copper, slate, greenstone, and jasper ornaments, including carved stone zoomorphic locust beads, during Late Archaic times (Blitz 1993; Brose 1979; Smith 1986:31; Steponaitis 1986:374).

Poverty Point Culture (1700 – 500 B.C.)

The Poverty Point culture is named after the type-site (16WC5), which is located in northeastern Louisiana. It is characterized by the construction of extensive earthworks, by the presence of baked clay balls, and by a microlithic stone tool industry (Ford and Webb 1956; Kuttruff 1975; Webb 1968). At the time of its construction, the Poverty Point site was the largest earthwork in the Americas (Gibson 1985; Muller 1978). The presence of non-utilitarian items such as lapidary work, panpipes, and animal effigies in stone and shell suggests some degree of incipient social stratification in Poverty Point culture (Gibson 1974:29). The creation of extensive intra and inter-regional trade works are also evident through the distribution of these "exotic" artifacts over the landscape. Contemporary interpretations suggest that Poverty Point Culture may represent the first chiefdom-level society to develop in the eastern United States (Gibson 1985; Muller 1978), although some more recent assessments prefer to see Poverty Point as an prosperous egalitarian society (Gibson 2000:207-215).

For the project area, the Bayou Jasmine and Garcia Phases (Gagliano and Sauer 1963; Gagliano et al. 1975; Weinstein et al. 1977b) and the Claiborne Community (Gibson 2000) represent interpretations of the local manifestation of the Poverty Point Culture based on the largest period sites identified in the area. Unfortunately, at the Bayou Jasmine Site (16SJB2) the Poverty Point component lies beyond the water table and has not been excavated (Neuman 1984), and Garcia (16OR34), Claiborne (22HA35), and Cederland Plantation (22HA30) all have been destroyed. Limited excavations at Claiborne (Bruseth 1991) and surface collections at all four sites have shown reduced evidence of a rich local manifestation of the Poverty Point Culture (Bruseth 1991; Gagliano 1963; Gagliano and Sauer 1963; Neuman 1984), but the basic issue of site chronology has yet to be resolved.

Woodland Stage

Despite the many innovations introduced during Poverty Point times, this culture typically is portrayed as either a Late Archaic period or a pre-Woodland Stage transitional manifestation. The emergence of the

Creek cultural traits into what now is recognized as the Plaquemine Culture, sometime before A.D. 1200 (Jeter et al. 1989; Williams and Brain 1983).

Coles Creek peoples developed a new ceramic complex that included the production of larger vessels and a wider range of decorative motifs, usually positioned on the upper portion of the vessel (Neuman 1984). A number of small arrow point types make their appearance during the Coles Creek period, reflecting the continuing development and diffusion of the bow and arrow.

The hierarchy of site types included multi-mound village centers, subordinate single mound villages, non-mound villages and hamlets, and resource extraction locales or seasonal camps (Jeter et al. 1989:150; Weinstein and Kelley 1992). Natural levees situated along old cutoffs and inactive channels appear to have been the most desirable locations for settlement, while beach ridges were the most desired landforms on the Louisiana Gulf Coast. It seems likely that each multi-mound village center controlled a specific natural levee system or series of levee systems along which were located the next level of sites in the overall site hierarchy (Weinstein and Kelley 1992:351). This pattern resulted in a hierarchy in which all settlements on the natural levee of a particular relict channel or backswamp were subordinated to a paramount multi-mound center (Neuman 1984; Smith et al. 1983).

Research in southern Louisiana suggests that Coles Creek Culture in this region is distinct from that in the interior, and the period has been subdivided temporally and geographically in the Lower Mississippi Valley (Brown 1984; Kidder 1995; Phillips 1970; Weinstein 1985; Weinstein and Kelley 1992). Recognized Coles Creek phases in southeastern Louisiana include Bayou Cutler, Bayou Ramos, and St. Gabriel. The Bayou Cutler phase, spanning the early Coles Creek period, is perhaps best represented by a major cluster of sites located along Bayou Barataria including Flemming (16JE36), Isle Bonne (16JE60), Bayou Cutler I (16JE3) and Chenier St. Dennis (16JE2). Later Bayou Ramos phase components overlap the Bayou Cutler phase at some of the Bayou Barataria sites, and a concentration of sites dating from this phase occur in the project area on the levees of Bayou LaLoutre (Jones et al. 1994:418). The St. Gabriel phase, representing the transition from Coles Creek to Plaquemine Culture, is based largely on data collected from the St. Gabriel Site (16JB28) south of Baton Rouge (Woodiel 1993). Contemporary components have also been found at Mulatto Bayou (16SB12) and Pump Canal (16SC27) (Jones et al. 1994).

The Mississippian Stage and Plaquemine Culture

The Mississippian Stage marks the advent of a variety of interrelated regional "Mississippian" cultures who shared common systems of sociopolitical, economic, and religious organization. The advent of the Mississippian Stage is manifested at sites in the Lower Mississippi Valley and along the northern Gulf Coast through incorporation of traits such as shell tempered ceramics, triangular arrow points, and copper-sheathed wooden ear spoons (Williams and Brain 1983). The cultural tradition prevalent in southeastern Louisiana is referred to as Plaquemine Culture, which emerged from the preceding Coles Creek Culture in the Lower Mississippi Valley by A.D. 1200 (Kidder 1995; Neuman 1984; Weinstein and Kelley 1992).

The Plaquemine Culture site type, Medora (16WBR1), was located on the Mississippi River floodplain at Manchac Point, south of Baton Rouge, and was characterized as a ceremonial center (Quimby 1951). The following traits characterize Plaquemine Culture: the construction of truncated pyramidal (platform) mounds in association with an adjacent plaza; mounds built in stages; square or circular buildings (temples) associated with mounds; and, a distinctive ceramic assemblage characterized by a comparatively high proportion of plain dishpan-shaped bowls, jars with brushed decoration, and plates with interior decoration (Quimby 1951:129). Plaquemine Culture was also marked by settlement patterns, economic organization, and religious practices that were established during the Coles Creek period.



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 BRÉAUX
ASSISTANT SECRETARY

December 13, 2007

Ms. Elizabeth Wiggins
Environmental Planning and Compliance Branch
New Orleans District, Corps of Engineers
P.O. Box 60267
New Orleans, LA 70160-0267

Re: Reconnaissance Survey Management Summary (22-2998)
*Phase IA Cultural Resources Records Review and
Field Reconnaissance Performed for Lake Pontchartrain
and Vicinity Project, Individual Environmental Report Area I
(IER#1): La Branch Wetlands Levee, St. Charles Parish*
R. Christopher Goodwin and Associates, Inc.

Dear Ms. Wiggins:

We are in receipt of your letter of October 31, 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 agree with the recommendations concerning cultural resources for the project area made by R. Christopher Goodwin and Associates, Inc. that no known historic properties will be affected by the proposed undertaking.

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

Ms. Elizabeth Wiggins
December 13, 2007
Page 2

Sincerely,

Pam Breaux

Pam Breaux
State Historic Preservation Officer

PB:DJ:s

C: Mr. Rob Lackowicz, R. Christopher Goodwin and Associates, Inc. (w/enclosures).

TECHNICAL COMMENTS

1. Page 16. Coyle et al. 2006 is not in the References Cited.
2. The figures and photographs included in the report are of generally good quality and they aid in assessing the location of the APE and the four previously reported archaeological sites.

by the coastal marshlands of the Louisiana Chenier Plain, on the east by the Gulf of Mexico, and on the north by the Mississippi River Alluvial Valley. A distinct physiographic unit, the plain is a broad, low-lying tract of alluvial land with an extensive network of distributaries that radiate largely gulfward either from an abandoned or active Mississippi River course.

The physiographic region of IER#1 is dominated by natural levee ridges and wetlands. The narrow natural levee ridges flank the present course of the Mississippi River and its numerous abandoned deltaic distributaries (Fisk 1944; Kolb and VanLopik 1958; Frazier and Osanik 1965). The wetlands consist of swamps, marshes, shallow lakes, and tidal channels that have water tables at or above the surface most of the time. Swamps are in broad depressions or basins distant from the natural levees of the Mississippi River and its distributaries, whereas marshes are adjacent to Lake Pontchartrain.

The topography of St. Charles Parish is typical of the lower Mississippi River region. The land slopes away from the Mississippi River and its natural levees, toward the lower swamps and marshes. Historically, drainage from the East Bank of the Mississippi River runs northerly through a system of open ditches and canals, into the swamps and marshes bordering Lake Pontchartrain.

Geologic History and Chronology

The period from about 18,000 to 11,000 years ago marked the waning of the Late Wisconsin glaciation, the wasting of the Laurentide ice sheet over North America, and the rapid and major rise in sea level known as the Holocene transgression. As the Mississippi River continued to transport huge volumes of meltwater and outwash to the Gulf of Mexico, the coastline retreated rapidly inland away from the Mississippi entrenchment. At first, the lower ends of the entrenchments of the smaller streams were inundated, but then the entire Pleistocene surface was submerged and overridden by shallow water marine deposits.

About 12,000 years ago, the entire region experienced a variety of dramatic changes. Within a matter of a few centuries, the Mississippi River ceased carrying large quantities of glacial outwash and it was subsequently transformed from a braided to a meandering regime. The dominant sediment load of the river changed from sands and gravels to mostly clays, silts, and fine sands. About 9,000 years ago, the first Mississippi River delta complex - the Outer Shoal complex - formed well offshore from central coastal Louisiana when sea level was perhaps about 15 m (49.2 ft) lower than at present (Penland et al. 1988). Apparently this complex was inundated and largely destroyed within a thousand years by rising sea level, but it was followed by a second one - the Maringouin complex - that formed about 7,000 years ago slightly farther inland and at a higher elevation (about 5 m [16.4 ft] lower than at present). Geological studies indicate that the trunk course of the Mississippi River associated with both delta complexes was located along the western side of the alluvial valley, i.e., along the route of the later Teche meander belt (SaucIER#1994).

With sea level only slightly lower than at present, the Mississippi River began constructing the Teche meander belt and Teche delta complex about 6,000 years ago (SaucIER#1994). About 4,800 years ago, the Teche delta complex had developed to the southwest into the Houma, Louisiana area. At that time and because of a major upstream diversion, the Mississippi River began forming a new meander belt along the eastern side of its valley past the Baton Rouge, Louisiana area and it began constructing a delta complex (the St. Bernard complex) eastward into and beyond the New Orleans area. Within less than a millennium, the embayment was transformed into an active deltaic plain landscape with seasonal influxes of large volumes of turbid fresh water, the rapid eastward and southeastward growth of distributaries, and the formation of broad expanses of intratidal wetlands. Sea level at this time probably was not more than a meter or so below that of the present and it was rising slowly.

Considerable subsurface geological evidence (Kolb 1962; SaucIER#1963) indicates that from at least 4,000 years ago, the Mississippi River has occupied a well developed meander belt essentially along its present route from Donaldsonville, eastward past New Orleans, Louisiana, including the current project



United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

January 14, 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) St. Charles Parish, Louisiana (IER1). 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.

We appreciate the cooperation of your staff on this study. Should your staff have any questions regarding the enclosed report, please have them contact Ms. Catherine Breaux (504/862-2689) of this office.

Sincerely,



James F. Boggs
Supervisor
Louisiana Field Office

Enclosures

cc: EPA, Dallas, TX
National Marine Fisheries Service, Baton Rouge, LA
LA Dept. of Wildlife and Fisheries, Baton Rouge, LA
LA Dept. of Natural Resources (CMD/CRD), Baton Rouge, LA

**Draft Fish and Wildlife Coordination Act Report
for the
Individual Environmental Reports (IER)
St. Charles Parish, Louisiana
IER 1**

Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the
Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4)



PROVIDED TO
NEW ORLEANS DISTRICT
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS, LOUISIANA

PREPARED BY
CATHERINE BREAUX
FISH AND WILDLIFE BIOLOGIST

U.S. FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
LAFAYETTE, LOUISIANA
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U.S. FISH AND WILDLIFE SERVICE – SOUTHEAST REGION

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EXECUTIVE SUMMARY

The U. S. Army Corps of Engineers' New Orleans District (Corps) is preparing the Individual Environmental Report (IER) Lake Pontchartrain and Vicinity (LPV) St. Charles Parish, Louisiana (IER1). 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 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.

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Construction of the flood protection levee would result in the loss of 213 acres of swamp and bottomland hardwood wetlands for a total loss of 148 AAHUs. 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 Corps and local sponsor shall provide 148 AAHUs to compensate for the unavoidable, project-related loss of forested wetlands. The Service, National Marine Fisheries Service (NMFS), Louisiana Department of Wildlife and Fisheries (LDWF), and Louisiana Department of Natural Resources (LDNR) should be consulted regarding the adequacy of any proposed alternative mitigation sites.

2. The Service recommends that any impacts to forested wetlands should be avoided or minimized to the greatest extent practicable.
3. Three new access roads will be constructed at the Shell pipeline crossing, under I-310, and at the Walker structure. The potential for induced development is increased greatly with these new access corridors, especially in regards to the access road at the Walker structure. The Service recommends that all three access roads be only used temporarily during construction and to be degraded after construction activities are complete.
4. 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 hydrology.
5. Avoid adverse impacts to wading bird colonies through careful design project features and timing of construction. Colonies that are not currently listed in the database maintained by the Louisiana Department of Wildlife and Fisheries may be present. That database is updated primarily by monitoring the colony sites that were previously surveyed during the 1980s. Until a new, comprehensive coast-wide survey is conducted to determine the location of newly-established nesting colonies, the Service recommends that a qualified biologist inspect the proposed work site for the presence of undocumented nesting colonies during the nesting season.
6. 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.
7. 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.
8. The project's first Project Cooperation Agreement (or similar document) shall include language that includes the responsibility of the local-cost sharer to provide operational, monitoring, and maintenance funds for mitigation features.
9. 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.

INTRODUCTION

The U. S. Army Corps of Engineers' New Orleans District (Corps) is preparing the Individual Environmental Report (IER) Lake Pontchartrain and Vicinity (LPV) St. Charles Parish, Louisiana (IER1). 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 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.

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DESCRIPTION OF THE STUDY AREA

The IER1 project area runs along the existing St. Charles Parish levee system on the north side of U.S. 61 (Airline Highway) (Figure 1). The existing levee, floodwalls, and floodgates proposed for amendment as part of the IER1 project begins immediately north of the Shell-Norco complex adjacent to the Bonnet Carré Guide Levee, which is east of the Bonnet Carré Spillway. The existing levee system wraps around the Shell-Norco complex and runs approximately 0.1 mile

north of and parallel to Airline Highway. Approximately one half mile east of the Interstate-310 interchange with Airline Highway the levee system turns to a northeasterly direction. The IER1 project area terminates around the northwest end of the Louis Armstrong new Orleans International Airport near the St. Charles/Jefferson parish line.

Figure 1. Individual Environmental Report (IER) Lake Pontchartrain and Vicinity (LPV) St. Charles Parish, Louisiana (IER1). Each color represents the length of a reach.



DESCRIPTION OF SELECTED PLAN

The proposed plan for IER1 involves upgrading or rebuilding the existing flood protection levee and associated floodwalls, gates, and drainage structures on the St. Charles Parish levee system. The preferred plan will rebuild 8.7 miles of earthen levees, replace 6,400 linear feet of floodwalls, and construct fronting protection for five existing drainage structures. IER1 is subdivided into several separate reaches (figure 1). Reaches LPV 03, 1A, 1B, 2A, and 2B make up the earthen levee portions of IER1; the floodwalls and gates include the Bonnet Carre floodwall, Shell pipeline floodwall, Good Hope floodwall, Koch-Gateway floodwall, floodwall under Interstate 310 (I-310), Canadian National Railroad Gate; and the drainage structures include the Cross Bayou drainage structure, St. Rose drainage structure, Almeida drainage structure, and Walker drainage structure.

LPV03

LPV 03b consists of approximately 3,000 linear feet (lf) of levees at the northwestern end of the Louis Armstrong New Orleans International Airport. The existing elevations of the levees vary, but range from +10.5 to +13.5 feet (ft) as referenced to the North American Vertical Datum (NAVD88). The preferred alternative for this reach consists of the incorporation of wavebreaks and an increase in levee height with a flood-side shift. The levee section directly in the path of the airport runway would remain at its current height and an approximate 2,500 lf rock wavebreak would be constructed on the flood-side to a height of +10 ft (NAVD88). Along the sides of the runway, the levees would be raised by 2 ft, increasing the height to approximately 16 ft. There would be an approximate 20 ft expansion of the levee footprint (the ground surface area that would be covered by the alternative structure and associated right-of-way [ROW]) on the flood-side of the levee. Tie-ins to the Canadian National Railroad Gate and the floodwalls of IER #2 (Jefferson East Bank Levee) would also be incorporated.

Levee Reaches 1A, 1B, 2A, and 2B

LPV04 consists of approximately 8 miles of levee. Prior to hurricane Katrina, the levees were at an elevation of approximately +9 to +12 ft NAVD88. These reaches either were recently raised or are currently under contract to be raised to their authorized heights of approximately +14 ft NAVD88.

The preferred alternative for these reaches consists of raising the levee reaches from their authorized height of 12.5 to 13.5 ft to 18 ft plus 1 ft overbuild for Reach 1A; 16 ft plus 1 ft overbuild for Reach 1B; and 18 ft plus 1 ft overbuild for Reach 2A and 2B. Levee alignments would not be changed; however, the centerline of the levees could shift slightly, as necessary, to accommodate the levee footprint expansions of 100 to 250 ft on both the flood- and protected-sides.

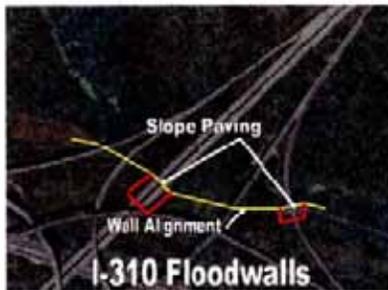
Floodwalls and Gate

The Bonnet Carré floodwall consists of approximately 155 lf of floodwall, the Shell pipeline floodwall is 195 lf, the Good Hope floodwall is 550 lf, and the Koch-Gateway floodwall is 272 lf. The preferred alternative for these four flood walls consists of demolishing the existing walls and rebuilding the new T-walls to approximately 18 ft. Based on the preferred alternative for levees, the new walls would remain in their current alignment with minimal footprint expansion. However, the Bonnet Carré Floodwall would be increased in length to 465 ft. During the construction phase, temporary structures (sheet piling) would be installed on the flood-side to protect the existing levee system.

The preferred alternative for the floodwall under I-310 (1,760 lf) consists of demolishing the existing I-wall, replacing the I-wall with a new T-wall to approximately the same height (13.5 ft) under the I-310 spans and under the onramp from Westbound Airline Drive to Northbound I-310 and to an elevation of 15.5 ft at all other sections of the wall. In addition, concrete scour protection would be incorporated under the bridges extending approximately to the limit of the ROW on the protected side of the floodwall and extending approximately 50 feet on either side of

the bridges (Figure 2). The small gate located about mid-way down the length of the floodwall and located east of the main I-310 spans would also be replaced. The existing sheet pile would be driven down and new steel H-piles would be driven approximately 90 feet on the protected side of the new wall.

Figure 2. I-310 Wall Scour Protection



The preferred alternative for the 450 lf Canadian National Railroad Gate consists of adding approximately 4-5 ft of height to the existing gate, bringing it to an approximate height of 16 ft. The tie-in floodwalls on each side of the existing gate would be demolished and new T-walls would be constructed to tie-in with the levee reach at approximately 16 ft.

Drainage Structures

The preferred alternative for the Cross Bayou drainage structure (503 lf) and the St. Rose drainage structure (640 lf) consist of demolishing and rebuilding the structures to approximately 18 ft. The new structures would remain in alignment with the levee system; however, the current structures would remain in place while the new structures are built. The new structures would be built adjacent to the existing structures and the drainage canals would be realigned to flow through the new structures after completion. Following completion of the new structures, the existing structures would be demolished and replaced with an extension to the adjacent levee and a levee tie-in system.

The proposed action for the 225 lf Almeida drainage structure and the 248 lf Walker drainage structure drainage structures would be to modify the existing structures (using additional pilings and thicker walls to add height) to approximately 16 ft.

Access Roads

Three new access roads will be constructed based on increased activities and to relieve significant congestion on the existing access roads. The access roads (figure 3) will be located at the Shell pipeline crossing (0.47 acres) in reach 2A and under I-310 (0.63 acres) in reach 1B. The access

road near the Walker structure (1.89 acres) would extend from the northwest corner of the business park to the Walker structure in reach 1B.

Figure 3. Access road at the Shell pipeline crossing in reach 2A and under I-310 and at the Walker structure in reach 1B.



Borrow

For all construction under the proposed action, earthen fill material would be obtained from the Bonnet Carre Spillway, which is located approximately 1-9 miles from the IER1 project area. The borrow material would be stock piled, as needed, along the protected side of the new levee alignment for each reach included in the proposed action. Impacts for areas stock piled and for borrow for each IER will be addressed in a separate IER document.

FISH AND WILDLIFE RESOURCES

Description of Habitats

Habitat types in the study area include forested wetlands (i.e., swamp and/or bottomland hardwoods), marsh, open water, and developed areas. Wetlands within the project area provide plant detritus to adjacent coastal waters and thereby contribute to the production of commercially and recreationally important fishes and shellfishes. Wetlands in the project area also provide valuable water quality functions such as reduction of excessive dissolved nutrient levels, filtering of waterborne contaminants, and removal of suspended sediment. In addition, coastal wetlands buffer storm surges reducing their damaging effect to man-made infrastructure within the coastal area.

Factors that will strongly influence future fish and wildlife resource conditions in the area include freshwater input and loss of coastal wetlands. In the future, depending upon the deterioration rate of marshes, the frequency of occasional short-term saltwater events may increase. Under that

scenario, tidal action in the project area may increase gradually as the buffering effect of marshes are lost, and use of that area by estuarine-dependent fishes and shellfish tolerant of freshwater conditions would likely increase. However, with a total closure structure on the MRGO there is expected to be an overall decrease in salinities throughout the Pontchartrain basin. Regardless of which of the above factors ultimately has the greatest influence, freshwater wetlands within and adjacent to the project area will probably experience losses due to development, subsidence, and erosion; however, fish and wildlife habitat quality should remain approximately at or slightly below present levels on the remaining acreage of those wetlands.

As previously mentioned, the Service has provided previous FWCA Reports for the two subject hurricane protection projects. Those reports contain a discussion of the significant fish and wildlife resources including habitats that occur within the study area. For brevity, that discussion is incorporated by reference herein, but the following brief descriptions are provided to update the previously mentioned information.

Forested Wetland Habitats

The majority of the area adjacent to the levee reaches in the IERI project area is swamp. About 350 acres of swamp habitat are located on the protected side of the existing levee and hundreds of acres of swamp extend from the flooded side of the levee. The swamp habitat in the project area is predominantly vegetated by bald cypress, tupelo, and red maple (see Appendix A for all Latin names of plants, fish, amphibians, reptiles, birds, and mammals in this report). Other tree species include Chinese tallow-tree, green ash, black willow, black gum, and pumpkin ash. Other vegetation includes Walter's millet, spikerush, alligatorweed, pennywort, Aster, goldenrod, marshmallow, cattail, rattlebox, frogbit, dogfennel, eastern baccharis, smartweed, deerpea, Panicum, waterhyssop, frogfruit, spikerush, buttonbush, palmetto, and delta duckpotato.

Only one and a half acres of bottomland hardwood (BLH) are on the flooded side near the I-I-310 interchange will be affected by this project. That BLH exist on higher elevation than the surrounding swamp because the site was a medical waste landfill. BLH habitat in the project area is predominantly sugarberry, red maple, green ash, and American elm. Other tree species include oaks, pumpkin ash, Chinese tallow-tree, cottonwood, and flowering dogwood. Other vegetation includes alligatorweed, smartweed, lizard's tail, eastern baccharis, Virginia creeper, Rubus, elderberry, goldenrod, and mulberry.

Due to the railroad through LaBranche, the St. Charles Parish levee, and Highway 61, the hydrology of the forested wetlands has been altered. Before the railroad and the levee, water levels were mostly influenced by sheet flow across the marsh and influenced from Lake Pontchartrain. Though the swamp on the flooded side of the levee is still tidally connected to Lake Pontchartrain, the exchange may be somewhat restricted (moderate flow/exchange and semi-permanently flooded) as water flows through designated openings across the railroad. The protected side is not or minimally tidally influenced (low flow/exchange and semi-permanently flooded) as the water has to pass through more culverts or gates across the levee. The bottomland

hardwood, which is higher in elevation than the swamp in the area, is seasonally flooded but has the same flow/exchange as the swamp.

In the future, the forested wetlands are expected to remain for the project life. Subsidence will continue but not to the extent that will be detrimental to this habitat.

Marshes

Some fresh marsh exists at the eastern end of the project area near the airport (LPV03 reach). The marsh vegetation of the area includes marshhay cordgrass, smooth cordgrass, bullwhip, eastern baccharis, alligatorweed, deerpea, Walter's millet, spikerush, pennywort, marshmallow, cattail, rattlebox, frogbit, smartweed, panicum, waterhyssop, frogfruit, and spikerush.

Emergent wetlands within the project area provide plant detritus to adjacent coastal waters and thereby contribute to the production of commercially and recreationally important fishes and shellfishes. Wetlands in the project area also serve valuable water quality functions such as reduction of excessive dissolved nutrient levels and removal of suspended sediment. These wetlands are expected to remain relatively stable with some decline from subsidence.

Open-Water Habitats

The project area is bound to the north by the LaBranche Wetlands and to the north of LaBranche is Lake Pontchartrain. Bayous LaBranche and Trepagnier are the major natural water features occurring in and around the project area. Bayou LaBranche originates near Highway 61 and flows northward for four miles to its confluence with Lake Pontchartrain. Bayou Trepagnier flows for four miles north from the Shell-Norco Oil Refinery to its confluence with Bayou LaBranche.

The major canals and drainage-ways within the project area are the Cross Bayou Canal that starts north of the Mississippi River and crosses the existing flood control levee flowing north to cross Bayou Traverse to terminate in the LaBranche wetlands near Interstate 10; another drainage-runs parallel to the Cross Bayou Canal on the east, crossing the existing levee and flowing north across Bayou Traverse to its confluence in Lake Pontchartrain; Walker Canal begins south of the levee near U.S. 61 (Airline Highway) flows north across the levee to its confluence in Lake Pontchartrain; and the borrow canal that runs parallel to the south side of the levee from the eastern side of the Interstate 310 interchange to the Canadian National Railroad Gate. These canals and drainage-ways are man made features created for control of storm water run-off or were created during construction of the existing levees. The network of these structures illustrates the highly manipulated hydrology of the project area.

The canals and bayous supports submerged and floating aquatic vegetation such as coontail, wild celery, alligatorweed, hydrocotle, and pondweeds. In places the borrow canal had dense vegetation reducing the value of that aquatic habitat. Bayou Trepagnier has contaminated sediment due to the historical disposal of oil refinery waste (Maygarden 2004).

Developed Areas

The Developed habitats in the project area include commercial areas (Shell-Norco petrochemical complex at the western end, facilities near the Almedia drainage structure, truck/trailer storage facility, and the western end of New Orleans International Airport runway adjacent to LPV03 on the east), the I-310 overpass, and the railroad at the eastern end of the project area (LPV03). In addition the project area has low grade (gravel or dirt) roads with intermittent use and the existing levee. Highways usually induce development and with near by Highway 61 paralleling the project area, it is expected that some additional development along the highway near the project area (on the protected side of the levee) may occur in the foreseeable future, especially with a new permanent access road near the Walker structure. Those and future developed habitats do not support significant wildlife use.

Fishery/Aquatic Resources

Drainage and borrow canals in the project area does not support significant fishery resources because of dense vegetation, poor water quality, and inadequate depth. Freshwater sport fishes present in Bayous LaBranche and Trepagnier and other wetlands outside of the levees, include largemouth bass, crappie, bluegill, redear sunfish, warmouth, channel catfish, and blue catfish. Other fishes likely to be present include yellow bullhead, freshwater drum, bowfin, carp, buffaloes, and gars. In the future fisheries of the area are expected to remain relatively stable.

Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; P.L. 104-297) set forth a new mandate for NOAA's National Marine Fisheries Service (NMFS), regional fishery management councils (FMC), and other federal agencies to identify and protect important marine and anadromous fish habitat. The Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Act support one of the nation's overall marine resource management goals- maintaining sustainable fisheries. Essential to achieving this goal is the maintenance of suitable marine fishery habitat quality and quantity. Detailed information on Federally managed fisheries and their EFH is provided in the 1999 generic amendment of the Fishery Management Plans (FMP) for the Gulf of Mexico prepared by the Gulf of Mexico Fishery Management Council (GMFMC). The generic FMP subsequently was updated and revised in 2005 and became effective in January 2006 (70 FR 76216). NMFS administers EFH regulations.

EFH includes all waters and substrates within estuarine boundaries, including the subtidal vegetation (seagrasses and algae) and adjacent tidal vegetation (marshes). The forested wetland areas adjacent to the project area are hydrologically connected to the EFH of the Lake Pontchartrain estuary. However, the primarily cypress swamp of this project area are not likely to

be suitable habitat for any of the lake Pontchartrain managed species (shrimp, red drum, and Spanish mackerel; NOAA 2007).

Wildlife Resources

Mammals known to occur in the project-area wetlands include mink, raccoon, nutria, river otter, and muskrat, armadillo, Virginia opossum, cotton mouse, hispid cotton rat, eastern cottontail rabbit, swamp rabbit, fox squirrel, grey squirrel, fox, bobcat, and white-tailed deer (Lowery, 1974 and O'Neil and Linscombe).

Those wetlands also support a variety of birds including herons and egrets. Flooded swamp within the project area provide habitat for nesting colonial wading birds. Swamp, BLH, and scrub-shrub habitats within the study area also provide habitat for many resident passerine birds and essential resting areas for many migratory songbirds including warblers, sparrows, thrushes, vireos, buntings, flycatchers, chickadees, titmouse, wrens, and swallows.

Given the extent of development and drainage, waterfowl use within the hurricane protection system is likely minimal, while adjacent wetlands outside the levees provide high quality habitat. Swamps, fresh and intermediate marshes usually receive greater waterfowl utilization than brackish and saline marshes because they generally provide more waterfowl food. Resident species expected to occur in that area include mottled duck and wood duck.

The project area also supports resident hawks and owls including the red-shouldered hawk, barn owl, common screech owl, great horned owl, and barred owl. The red-tailed hawk, marsh hawk, and American kestrel are seasonal residents which utilize habitats within the project area.

Amphibians such as the southern dusky salamander, dwarf salamander, eastern newt, three-toed amphiuma, lesser siren, Gulf coast toad, northern cricket frog, green treefrog, squirrel treefrog, spring peeper, eastern narrow-mouthed toad, bullfrog, green frog, pig frog, and southern leopard frog (Dundee and Rossman, 1989) are expected to occur in the project-area wetlands.

Reptiles such as the American alligator, eastern mud turtle, red-eared turtle, snapping turtle, green anole, broadhead skink, ground skink, mud snake, speckled kingsnake, rat snake, Gulf coast ribbon snake, cottonmouth, garter snake, and water snakes are expected to occur in the project-area wetlands (Dundee and Rossman, 1989).

In the future, wildlife in the project area is not expected to significantly change.

Endangered and Threatened Species

The bald eagle potentially may occupy habitat in the project area. Until recently the bald eagle was federally listed as threatened; however, it was determined to have recovered and was delisted on August 8, 2007 (FWS 2007). The bald eagle is still protected under the Migratory Bird Treaty

Act (MBTA) (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.), and Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d)

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, consultation should be reinitiated as soon as such changes are made.

ALTERNATIVES UNDER CONSIDERATION

The proposed plan is discussed above in the Description of Selected Plan section. Other alternatives that were considered include the following:

No-Action Alternative

For each levee reach, floodwall, flood gate, and structure within IER1, the no-action alternative was evaluated. Under the no-action alternative, the proposed action would not be constructed. The current levee reaches, floodwalls, and associated structures would remain or be brought to the authorized heights of 12.5 to 13.5 ft. Routine maintenance of the levee system would continue, but no height would be added to the system.

Levee Alternatives

Sets of alignment alternatives and scales within these alignments were initially considered for each levee reach including: alignments – existing alignment with straddle, flooded side shift (all toe-to-toe growth occurs on the flooded side of the levee), and protected-side shift (all toe-to-toe growth occurs on the protected side of the levee); scale – earthen levee, T-wall floodwall, earthen levee with T-wall floodwall cap, and earthen levee with Deep Soil Mixing.

It was determined that using the existing levee with a protected-side shift would be unlikely due to the location of the Shell Oil Refinery, U.S. 61 (Airline Highway), a drainage canal, and segments of pipelines that run south of the existing levee alignment. In addition, a protected-side shift would be infeasible due to the geotechnical instability of the land between the drainage canal and the stability berm associated with the existing levee structure. A flooded-side shift was eliminated in order to avoid and minimize the destruction of wetlands. In addition the cost for mitigation would make it infeasible. Replacement with floodwalls and floodwall caps was eliminated due to engineering inferiority. Deep Soil Mixing was eliminated due to engineering infeasibility due to the presence of cypress logs in the subsurface surrounding the existing levee system.

Floodwalls and Drainage Structure Alternatives

As part of the initial evaluation of the Bonnet Carré Floodwall, Shell Pipeline Floodwall, Good Hope Floodwall, Koch-Gateway Floodwall, Canadian National Railroad Gate, Bayou Trepagnier Drainage Structure, Cross Bayou Drainage Structure, St. Rose Drainage Structure, Almeida Drainage Structure, and Walker Drainage Structure, flood-side and protected-side shifts as well as deep zone mixing were eliminated from detailed analysis. Significant shifts in the floodwall and gate alignments were considered impractical from an engineering perspective, and deep zone mixing was eliminated due to infeasibility from obstructions (i.e., cypress logs) in the surrounding subsurface. For the four drainage structures and the Canadian National Railroad Gate, all forms of earthen levees were also eliminated from detailed impact analysis. In each of these cases, there were physical factors (i.e., drainage area or railroad crossing) that would prevent the construction of an earthen levee. In addition, modification of existing LPV 06 floodwalls (adding height) was eliminated from further analysis because it was determined that the existing floodwalls are not structurally designed to handle the increased hydrostatic load.

As part of the initial evaluation of the floodwall under I-310, all forms of earthen levees and replacement floodwall caps were eliminated from further consideration based on the proximity to I-310. In addition, any form of deep zone mixing was eliminated from consideration due to the potential of hazardous wastes in the immediate vicinity.

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.

PROJECT IMPACTS

Approximately 213 acres (Table 1) of wetlands would be directly impacted by the proposed project. Work would involve raising part of and realigning the levee and including a wavebreak in reach LPV03, raising the levees in reaches 1A, 1B, 2A, and 2B, rebuilding new T-walls, adding concrete scour protection under I-310, and rebuilding new or modify existing drainage structures.

Table 1: Impacts to Individual Environmental Report (IER) Lake Pontchartrain and Vicinity (LPV) ST. Charles Parish, Louisiana (IER1)

Levee Reaches	Acres Impacted	AAHUs lost
1A flooded side	4.4	n/a
1A protected side	1.7	n/a
1B flooded side	23	n/a
1B protected side	0	n/a
2A flooded side	46.6	n/a
2A protected side	31.2	n/a
2B flooded side	51.7	n/a
2B protected side	34.1	n/a
03B	9.2	n/a
Access roads	3	n/a
WVAs		
Swamp flooded side	141.4	-109.24
Swamp protected side	70	-37.79
BLH flooded side	1.5	-1.07
BLH protected side	0	0
Total	212.9	-148.1

To quantify anticipated project impacts to fish and wildlife resources, the Service used the Wetland Value Assessment (WVA) methodology. The WVA was developed to evaluate restoration projects proposed for funding under Section 303 of the Coastal Wetlands Planning, Protection and Restoration Act. The WVA version utilized in this evaluation was modified by the Louisiana Department of Natural Resources to better determine impacts and mitigation needs in forested wetlands. Further explanation of how impacts/benefits are assessed with WVA and an explanation of the assumptions affecting HSI values for each target year are available for review at the Fish and Wildlife Service's (Service) Lafayette, Louisiana, field office.

As indicated in Table 1, our WVA analyses indicate that project implementation would result in the direct loss of 148 AAHUs in swamp and bottomland hardwood forested wetlands. Once the proposed action is complete, the adjacent wetlands would stabilize. 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.

FISH AND WILDLIFE CONSERVATION MEASURES

The President's Council on Environmental Quality defined the term "mitigation" in the National Environmental Policy Act regulations to include:

- (a) avoiding the impact altogether by not taking a certain action or parts of an action;
- (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- (d)

reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (e) compensating for the impact by replacing or providing substitute resources or environments.

The Service supports and adopts this definition of mitigation and considers its specific elements to represent the desirable sequence of steps in the mitigation planning process. Based on current and expected future without-project conditions, the planning goal of the Service is to develop a balanced project, i.e., one that is responsive to demonstrated development needs while addressing the coequal need for fish and wildlife resource conservation.

The Service's Mitigation Policy (Federal Register, Volume 46, No. 15, January 23, 1981) identifies four resource categories that are used to ensure that the level of mitigation recommended by Service biologists will be consistent with the fish and wildlife resource values involved. Considering the high value of forested wetlands for fish and wildlife and the relative scarcity of that habitat type, those wetlands are usually designated as Resource Category 2 habitats, the mitigation goal for which is no net loss of in-kind habitat value. Because the "no action" alternative was not selected, avoiding the project impacts altogether is not feasible. Therefore, remaining project impacts should be mitigated via compensatory replacement of the habitat values lost.

To replace the project-related loss of high-quality forested wetland habitat, the Corps and the local sponsor should develop and fund mitigation actions that would produce the equivalent of 148 AAHUs within the Pontchartrain basin. The estimated costs for achieving that mitigation via timber stand improvement and management, in addition to any mitigation area fixed costs, should be borne as a project expense, and should be provided to the agency implementing the mitigation.

SERVICE POSITION AND RECOMMENDATIONS

Construction of the flood protection levee would result in the loss of 213 acres of swamp and bottomland hardwood wetlands for a total loss of 148 AAHUs. 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 Corps and local sponsor shall provide 148 AAHUs to compensate for the unavoidable, project-related loss of forested wetlands. The Service, National Marine Fisheries Service (NMFS), Louisiana Department of Wildlife and Fisheries (LDWF), and Louisiana Department of Natural Resources (LDNR) should be consulted regarding the adequacy of any proposed alternative mitigation sites.
2. The Service recommends that any impacts to forested wetlands should be avoided or minimized to the greatest extent practicable.

3. Three new access roads will be constructed at the Shell pipeline crossing, under I-310, and at the Walker structure. The potential for induced development is increased greatly with these new access corridors, especially in regards to the access road at the Walker structure. The Service recommends that all three access roads be only used temporarily during construction and to be degraded after construction activities are complete.
4. 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 hydrology.
5. Avoid adverse impacts to wading bird colonies through careful design project features and timing of construction. Colonies that are not currently listed in the database maintained by the Louisiana Department of Wildlife and Fisheries may be present. That database is updated primarily by monitoring the colony sites that were previously surveyed during the 1980s. Until a new, comprehensive coast-wide survey is conducted to determine the location of newly-established nesting colonies, the Service recommends that a qualified biologist inspect the proposed work site for the presence of undocumented nesting colonies during the nesting season.
6. 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.
7. 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.
8. The project's first Project Cooperation Agreement (or similar document) shall include language that includes the responsibility of the local-cost sharer to provide operational, monitoring, and maintenance funds for mitigation features.
9. 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.

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APPENDIX A
LATIN NAMES FOR SPECIES DISCUSSED IN REPORT

PLANTS

Alligatorweed	<i>Alternanthera philoxeroides</i>
American elm	<i>Ulmus americana</i>
Aster	<i>Aster</i> spp.
Bald cypress	<i>Taxodium distichum</i>
Black gum	<i>Nyssa sylvatica</i>
Black willow	<i>Salix nigra</i>
Bullwhip	<i>Scirpus californicus</i>
Buttonbush	<i>Cephalanthus occidentalis</i>
Cattail	<i>Typha</i> spp.
Chinese tallow-tree	<i>Triadica sebifera</i>
Deerpea	<i>Vigna luteola</i>
Delta duckpotato	<i>Sagittaria platyphylla</i>
Dogfennel	<i>Eupatorium capillifolium</i>
Eastern baccharis	<i>Baccharis halimifolia</i>
Eastern cottonwood	<i>Populus deltoides</i>
Elderberry	<i>Sambucus canadensis</i>
Frogbit	<i>Limnobium spongia</i>
Frogfruit	<i>Phyla nodiflora</i>
Goldenrod	<i>Solidago</i> sp.
Green ash	<i>Fraxinus pennsylvanica</i>
Lizard's tail	<i>Saururus cernuus</i>
Marshhay cordgrass	<i>Spartina patens</i>
Marshmallow	<i>Hibiscus</i> spp.
Mulberry	<i>Morus</i> spp.
Overcup oak	<i>Quercus lyrata</i>
Palmetto	<i>Sabal minor</i>
Panicum	<i>Panicum</i> sp.
Pennywort	<i>Hydrocotyle</i> spp.
Pumpkin ash	<i>Fraxinus tomentosa</i>
Rattlebox	<i>Sesbania drummondii</i>
Red maple	<i>Acer rubrum</i>
Red mulberry	<i>Morus rubra</i>
Roughleaf dogwood	<i>Cornus drummondii</i>
Rubus	<i>Rubus</i> spp.
Smartweed	<i>Polygonum</i> spp.
Smooth cordgrass	<i>Spartina alterniflora</i>
Spikerush	<i>Eleocharis</i> spp.

Sugarberry	<i>Celtis laevigata</i>
Tupelo	<i>Nyssa aquatica</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>
Walter's millet	<i>Echinochloa walteri</i>
Waterhyssop	<i>Bacopa</i>
Water oak	<i>Quercus nigra</i>
Willow oak	<i>Quercus phellos</i>

FISH

Bigmouth buffalo	<i>Ictiobus cyprinellus</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Blue catfish	<i>Ictalurus furcatus</i>
Bluegill	<i>Lepomis macrochirus</i>
Bowfin	<i>Amia calva</i>
Channel catfish	<i>Ictalurus punctatus</i>
Common carp	<i>Cyprinus carpio</i>
Freshwater drum	<i>Aplodinotus grunniens</i>
Grass carp	<i>Ctenopharyngodon idella</i>
Largemouth bass	<i>Micropterus salmoides</i>
Redear sunfish	<i>Lepomis microlophus</i>
Shortnose gar	<i>Lepisosteus platostomus</i>
Smallmouth buffalo	<i>Ictiobus bubalus</i>
Spotted gar	<i>Lepisosteus oculatus</i>
Warmouth	<i>Lepomis gulosus</i>
White crappie	<i>Pomoxis annularis</i>
Yellow bullhead	<i>Ameiurus natalis</i>

AMPHIBIANS

Bullfrog	<i>Rana catesbeiana</i>
Dusky salamander	<i>Desmognathus auriculatus</i>
Dwarf salamander	<i>Eurycea quadridigitata</i>
Eastern narrow-mouthed toad	<i>Gastrophryne carolinensis</i>
Eastern newt	<i>Notophthalmus viridescens</i>
Green frog	<i>Rana clamitans</i>
Green treefrog	<i>Hyla cinerea</i>
Gulf coast toad	<i>Bufo valliceps</i>
Lesser siren	<i>Siren intermedia</i>
Northern cricket frog	<i>Acris crepitans</i>
Pig frog	<i>Rana grylio</i>
Southern leopard frog	<i>Rana sphenoccephala</i>
Spring peeper	<i>Hyla crucifer</i>

Squirrel treefrog *Hyla squirella*
Three-toed amphiuma *Amphiuma tridactylum*

REPTILES

American alligator *Alligator mississippiensis*
Broadhead skink *Eumeces laticeps*
Cottonmouth *Agkistrodon piscivorus*
Eastern mud turtle *Kinosternon subrubrum*
Garter snake *Thamnophis sirtalis*
Green anole *Anolis carolinensis*
Ground skink *Scincella lateralis*
Gulf coast ribbon snake *Thamnophis proximus*
Mud snake *Farancia abacura*
Rat snake *Elaphe obsoleta*
Red-eared turtle *Trachemys scripta*
Speckled kingsnake *Lampropeltis getulus*
Snapping turtle *Chelydra serpentina*
Water snakes *Neodia* spp.

BIRDS

American kestrel *Falco sparverius*
Barn owl *Tyto alba*
Barred owl *Strix varia*
Cattle egret *Bubulcus ibis*
Common screech owl *Otus asio*
Great blue heron *Ardea herodias*
Great egret *Ardea alba*
Green heron *Butorides virescens*
Great horned owl *Bubo virginianus*
Marsh hawk *Circus cyaneus*
Mottled duck *Anas fulvigula*
Red-shouldered hawk *Buteo lineatus*
Red-tailed hawk *Buteo jamaicensis*
Snowy egret *Egretta thula*
Wood duck *Aix sponsa*

MAMMALS

Armadillo *Dasypus novemcinctus*
Bobcat *Lynx rufus*
Cotton mouse *Peromyscus gossypinus*
Eastern cottontail rabbit *Sylvilagus floridanus*

Fox	<i>Vulpes vulpes</i>
	<i>Urocyon cinereoargenteus</i>
Fox squirrel	<i>Sciurus niger</i>
Grey squirrel	<i>Sciurus carolinensis</i>
Hispid cotton rat	<i>Sigmodon hispidus</i>
Mink	<i>Mustela vison</i>
Muskrat	<i>Ondatra zibethicus rivalictus</i>
Northern raccoon	<i>Procyon lotor</i>
Nutria	<i>Myocaster coypus</i>
River Otter	<i>Lutra canadensis</i>
Swamp rabbit	<i>Sylvilagus aquaticus</i>
Virginia opossum	<i>Didelphis virginiana</i>
White-tailed deer	<i>Odocoileus virginianus</i>



United States Department of the Interior

FISH AND WILDLIFE SERVICE

646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

March 5, 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) St. Charles Parish, Louisiana (IER1). 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 redefined the proposed plan. The U.S. Fish and Wildlife Service (Service) provided recommendations on the originally proposed plan to the Corps in a January 14, 2008, Fish and Wildlife Coordination Act (FWCA) 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 change to the current plan refines the impact area, and addresses the replacement of the existing Bayou Trepagnier drainage structure with a T-wall and a stability berm. Other features of the plan will remain as previously described in our January 14, 2008, FWCA Report (herein incorporated by reference).

As a result of the changes in impact area the total area of swamp and bottomland hardwood wetlands impacted by the project will be increased from 213 acres and 148 AAHUs to 292 acres with a loss of 193 AAHUs. Construction of the Bayou Trepagnier drainage structure would not result in any additional direct impacts to swamp or bottomland hardwood habitats.

According to the Corps, the Bayou Trepagnier drainage structure gates are generally left closed. After reviewing LiDar (elevation data) of this area, the Service believes that the flood-side hydrology would not be changed if the Bayou Trepagnier drainage structure was replaced with a

T-wall. The Service is concerned about the operation of the pumps in relation to the protected-side swamps. The area is currently pumped. Once the gate is replaced with a T-wall, the protected-side area will act as a sump and excess water would only be drained when the pumps are operating. If the protected-side swamp holds water more often and longer with little or no water exchange resulting in stagnant or impounded swamps or if the water is removed to the extent that wetlands are drained, those impacts would need to be assessed and mitigated. Therefore the Service recommends the pumps be operated to maintain the same water levels there by minimizing those impacts.

With the changes to the project the Service does not object to the construction of the proposed project. Therefore, the Service believes that the recommendations (presented below) provided in our January 2008, FWCA Report continue to remain valid with changes to reflect the current AAHUs, an additional recommendation to address the Bayou Trepagnier T-wall (recommendation #5), and with additional comments from NMFS and LDWF incorporated.

1. The Corps and local sponsor shall provide 193 AAHUs to compensate for the unavoidable, project-related loss of forested wetlands. The Service, National Marine Fisheries Service (NMFS), Louisiana Department of Wildlife and Fisheries (LDWF), and Louisiana Department of Natural Resources (LDNR) should be consulted regarding the adequacy of any proposed alternative mitigation sites. The mitigation plan developed to offset project related impacts should be consistent with mitigation requirements of the Clean Water Act regulatory program, and include monitoring, success criteria, and financial assurance components.
2. The Service recommends that any impacts to forested wetlands should be avoided or minimized to the greatest extent practicable.
3. Three new access roads will be constructed at the Shell pipeline crossing, under I-310, and at the Walker structure. The potential for induced development is increased greatly with these new access corridors, especially in regards to the access road at the Walker structure. The Service recommends that all three access roads be only used temporarily during construction and to be degraded and replanted with appropriate bottomland hardwood forest or cypress swamp species after construction activities are complete. Restoration activities should include the use of measures to prevent nutria herbivory, and monitoring to document habitat recovery and the need for further actions. If any of the access roads are not degraded after construction activities are completed, then secondary and cumulative impacts would have to be assessed.
4. 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 hydrology.
5. To avoid the protected-side swamps near the Bayou Trepagnier pumps and drainage structure from becoming impounded or drained, provide assurance that once the drainage structure is replaced with a T-wall that the pumps will be operated to achieve the same hydrologic results (i.e. water levels) as in the past thus perpetuating existing conditions and minimizing secondary impacts from development and hydrologic alteration

6. Avoid adverse impacts to wading bird colonies through careful design project features and timing of construction. Colonies that are not currently listed in the database maintained by the Louisiana Department of Wildlife and Fisheries may be present. That database is updated primarily by monitoring the colony sites that were previously surveyed during the 1980s. Until a new, comprehensive coast-wide survey is conducted to determine the location of newly-established nesting colonies, the Service recommends that a qualified biologist inspect the proposed work site for the presence of undocumented nesting colonies during the nesting season.
7. 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.
8. 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.
9. The project's first Project Cooperation Agreement (or similar document) shall include language that includes the responsibility of the local-cost sharer to provide operational, monitoring, and maintenance funds for mitigation features.
10. 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.

Thank you for the opportunity to review the draft IER 1 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