DRAFT INDIVIDUAL ENVIRONMENTAL REPORT

LAKE PONTCHARTRAIN AND VICINITY
NEW ORLEANS EAST CITRUS LAKEFRONT LEVEE

ORLEANS PARISH, LOUISIANA

IER #6

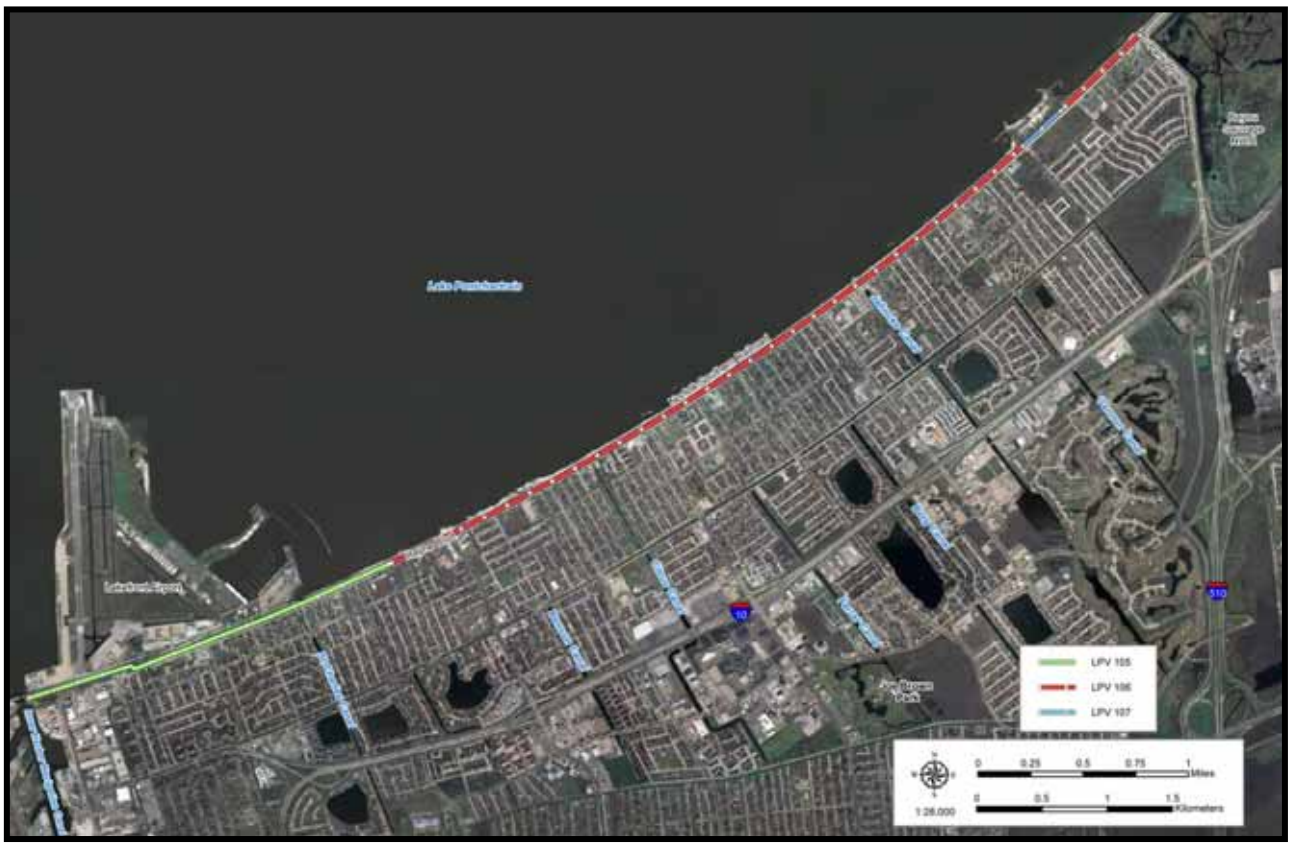

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TABLE OF CONTENTS

TITLE ..... PAGE
1. INTRODUCTION 1
1.1. PURPOSE AND NEED FOR THE PROPOSED ACTION 1
1.2. AUTHORITY FOR THE PROPOSED ACTION 5
1.3. PRIOR REPORTS 5
1.4. INTEGRATION WITH OTHER INDIVIDUAL ENVIRONMENTAL REPORTS 8
1.5. PUBLIC CONCERNS 8
1.6. DATA GAPS AND UNCERTAINTIES 9
2. ALTERNATIVES 11
2.1. ALTERNATIVES DEVELOPMENT AND PRELIMINARY SCREENING CRITERIA 11
2.2. DESCRIPTION OF THE ALTERNATIVES 20
2.3. PROPOSED ACTION 21
2.3.1. LPV 105 21
2.3.2. LPV 106 25
2.3.3. LPV 107 29
2.3.4. General Considerations for All Reaches 29
2.4. ALTERNATIVES TO THE PROPOSED ACTION 34
2.4.1. LPV 105 34
2.4.2. LPV 106 34
2.4.3. LPV 107 34
2.5. ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION 37
2.5.1. Non-Structural 37
2.5.2. Protected and Flood Side Shift of Existing Levee Sections 41
2.5.3. Structural Alternatives within Existing Alignment 41
2.5.4. Hollow Core Levee 41
2.6. SUMMARY 42
3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES 43
3.1 ENVIRONMENTAL SETTING 43
3.2 SIGNIFICANT RESOURCES 44
3.2.1. Lake Pontchartrain 44
3.2.2. Wetlands 47
3.2.3. Non-Wetland Resources / Upland Resources 48
3.2.4. Fisheries 51
3.2.5. Wildlife 54
3.2.6. Essential Fish Habitat 56
3.2.7. Endangered or Threatened Species 59
3.2.8. Cultural Resources 64
3.2.9. Recreational Resources 70
3.2.10. Aesthetics (Visual Resources) 74
3.2.11. Air Quality 76
3.2.12. Noise 78
3.3. TRANSPORTATION 81
3.4. SOCIAL AND ECONOMIC RESOURCES 88
3.5. HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE 96
4. CUMULATIVE IMPACTS 99
5. SELECTION RATIONALE 103
6. COORDINATION AND CONSULTATION 105
6.1 PUBLIC INVOLVEMENT 105
6.2 AGENCY COORDINATION 109
7. MITIGATION 115
8. COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS 117

9. CONCLUSION 119
9.1. INTERIM DECISION 119
9.2 PREPARED BY 119
9.3 LITERATURE CITED 120

LIST OF TABLES

TITLE **PAGE**

Table 1. Alternative Screening Results..... 42
Table 2. Significant Resources in Project Study Area..... 44
Table 3. List of Federally Managed Species and Their Habitat and Relative Abundance 57
Table 4. Total Air Emissions (Tons/Year) from Construction Activities..... 77
Table 5. A-Weighted (dBA) Sound Levels of Construction Equipment and Modeled Attenuation at Various Distances..... 79
Table 6. Number of Sensitive Noise Receptors that may be Subjected to a DNL Equal to or Greater than 65 dBA 80
Table 7. 2002 Economic Census Summary of Selected Data (Shipments and Sales in $1,000s) 89
Table 8. Labor Force, Employment, Unemployment, July 2005 through July 2007 89
Table 9. Employment Subject to the Louisiana Employment Security Law Units by NAICS Industry Codes and Average Employment, Fourth Quarter 2006 90
Table 10. Per Capita Personal Income, from 1970 through 2005 91
Table 11. Median Family and Household Incomes, 1959 through 1999, and 2004 91
Table 12. Census Population of the Project Area, 1980 through 2006..... 92
Table 13. Population Estimates, 1 July 2000, through 1 July 2006..... 92
Table 14. Housing Units in Project Area, 1980 through 2006..... 92
Table 15. Minority and Low Income Populations in the IER #6 Project Area..... 94
Table 16. HSDRRS Impacts and Compensatory Mitigation to be Completed from Proposed Actions 107
Table 17. IER Preparation Team 119

LIST OF FIGURES

FIGURE **PAGE**

Figure 1. The proposed action is located in the New Orleans East area of Orleans Parish near the Inner Harbor Navigation Canal (IHNC), New Orleans Lakefront Airport, Lake Pontchartrain, and Bayou Sauvage National Wildlife Refuge (NWR)..... 2
Figure 2. The project area includes three LPV reaches (105, 106, and 107) where approximately 6 miles of levees, floodwalls, and floodgates extend from the Inner Harbor Navigation Canal (IHNC) and New Orleans Lakefront Airport east to Paris Road 3
Figure 3. LPV 105 currently consists of 10,053 linear feet of floodwalls, earthen levees, and five floodgates..... 13
Figure 4. LPV 106 currently includes two levee reaches totaling approximately 4.18 miles located between reaches LPV 105 and Paris Road..... 17
Figure 5. LPV 107 comprises approximately 1,472 linear feet of floodwalls in the Lincoln Beach area along the shore of Lake Pontchartrain..... 18
Figure 6. Proposed Improvements to LPV 105 include realignment of the western 1,780 feet of T-wall 300 feet south, construction of a new, 80-foot wide floodgate at Downman Road, and replacement of 7,338 linear feet of I-wall and levee with T-wall and raised levee 23
Figure 7. Proposed improvements to LPV 106 include raising 4.18 linear miles of levee and reconstruction of gate structures at Jahncke and Citrus pump stations. The placement of 80,000 cubic yards of foreshore protection and dredging of access channels is a component of the previously authorized LPV project 27
Figure 8. Proposed improvements to LPV 107 include replacing 1,472 linear feet of I-wall with an earthen levee and replacing the Lincoln Beach Floodgate..... 31
Figure 9. All T-walls would be approximately 2-feet wide supported by a 12- to 17-foot wide and 3-foot high concrete slab connected to battered H-piles (driven to a depth of approximately -85 feet below the ground surface) and a continuous sheetpile cutoff wall (constructed to depths ranging from -50 to -60 feet below the ground surface) for further stabilization and seepage protection 33
Figure 10. LPV 105 Alternative 1: proposed Improvements to LPV 105 include replacing existing I-walls and floodgates with T-walls and floodgates west of Alabama Street, and replacement of 7,338 linear feet of I-wall and levee with T-walls east of Alabama Street 35
Figure 11. LPV 107 Alternative 1: proposed improvements to LPV 107 include replacing the existing I-wall and floodgate with a T-wall and new floodgate 39
Figure 12. Recreational Resources near the project corridor include Lake Pontchartrain, South Shore Harbor, New Orleans Lakefront Airport, Joe W. Brown Memorial Park, Kenilworth Park, Goretti Playground, Jazzland/Six Flags New Orleans, Lincoln Beach, and Bayou Sauvage National Wildlife Refuge (NWR) 71
Figure 13. Transportation resources near the project corridor include New Orleans Lakefront Airport, Norfolk Southern Railroad, Hayne Boulevard, and other arterial roadways 83

LIST OF PHOTOGRAPHS

PHOTOGRAPH **PAGE**

Photograph 1. View of LPV 105 Floodwall from South of Hayne Boulevard with Train on Norfolk Southern Railroad Tracks 11
Photograph 2. View of LPV 106 Levee Crown, NSRR Tracks, Hayne Boulevard, and Foreshore Protection.....15
Photograph 3. View of LPV 107 Floodgate and Floodwalls, with Hayne Boulevard in Front and Lincoln Beach Behind 19
Photograph 4. View of LPV 105 Floodwall and Roadways within the Lakefront Airport Runway Protection Zone 25
Photograph 5. View of Marshes Located at the toe of Foreshore Protection in LPV 106.....47
Photograph 6. Example of Deteriorated Structures at Lincoln Beach 49
Photograph 7. Hayne Boulevard at the Read Boulevard Intersection 82

LIST OF APPENDICES

Appendix A: List of Abbreviations and Acronyms
Appendix B: Public Comment and Response Summary
Appendix C: Members of Interagency Environmental Team
Appendix D: Agency Coordination
Appendix E: Air Quality Analysis

1. INTRODUCTION

U.S. Army Corps of Engineers (USACE), Mississippi Valley Division, New Orleans District (CEMVN), has prepared this Individual Environmental Report #6 (IER #6) to evaluate potential impacts associated with proposed improvements to three reaches of the East Orleans Hurricane Protection Levee that were originally constructed as part of the Lake Pontchartrain and Vicinity (LPV) project. The proposed action is located in the New Orleans East area of Orleans Parish, Louisiana (Figure 1), and includes three LPV reaches (105, 106, and 107) where approximately 6 miles of levees, floodwalls, and floodgates extending from the Inner Harbor Navigation Canal (IHNC) and New Orleans Lakefront Airport east to Paris Road (Figure 2) would be modified to provide the 100-year level of risk reduction. Combined, these reaches are locally known as the Citrus Lakefront Levee.

IER #6 has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and the Council of Environmental Quality's (CEQ) regulations (40 Code of Federal Regulations [CFR] 1500-1508), as reflected in 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, Procedures for Implementing NEPA (33 CFR 230) and pursuant to CEQ NEPA Implementation Regulations (40 CFR § 1506.11). The Alternative Arrangements can be found at www.nolaenvironmental.gov and are incorporated herein by reference.

The CEMVN implemented Alternative Arrangements on 13 March 2007 under the provisions of CEQ Regulations for Implementing 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 Greater New Orleans Hurricane and Storm Damage Risk Reduction System (HSDRRS), formerly known as Hurricane Protection System, authorized and funded by Congress and the Administration. Proposed actions are located in southeastern Louisiana and are part of the Federal effort to rebuild and complete construction of the HSDRRS in the New Orleans Metropolitan Area as a result of Hurricanes Katrina and Rita.

This draft IER will be distributed for a 30-day public review and comment period. A public meeting specific to the proposed action will be held if requested by a stakeholder during the review period. Any comments received during this public meeting will be considered part of the official record. After the 30-day comment period, and public meeting if requested, the CEMVN District Commander will 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 will make a decision on the proposed action. This decision will be documented in an IER Decision Record. If a comment(s) is determined to be substantive in nature, an Addendum to the IER will 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 will make a decision on the proposed action. The decision will 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 risk reduction for New Orleans East. The proposed action results from a defined need to reduce flood risk and storm damage to residences, businesses, and other infrastructure from hurricanes (100-year storm events) and other high water events in Lake Pontchartrain. Elevations of the existing floodwalls and levees within three reaches of the LPV project (reaches 105, 106, and 107) are below 100-year design elevations and do not meet CEMVN design criteria. The proposed action is needed to meet the 100-year design elevations and design criteria in these three reaches. The completed

Figure 1. The proposed action is located in the New Orleans East area of Orleans Parish near the Inner Harbor Navigation Canal (IHNC), New Orleans Lakefront Airport, Lake Pontchartrain, and Bayou Sauvage National Wildlife Refuge (NWR).

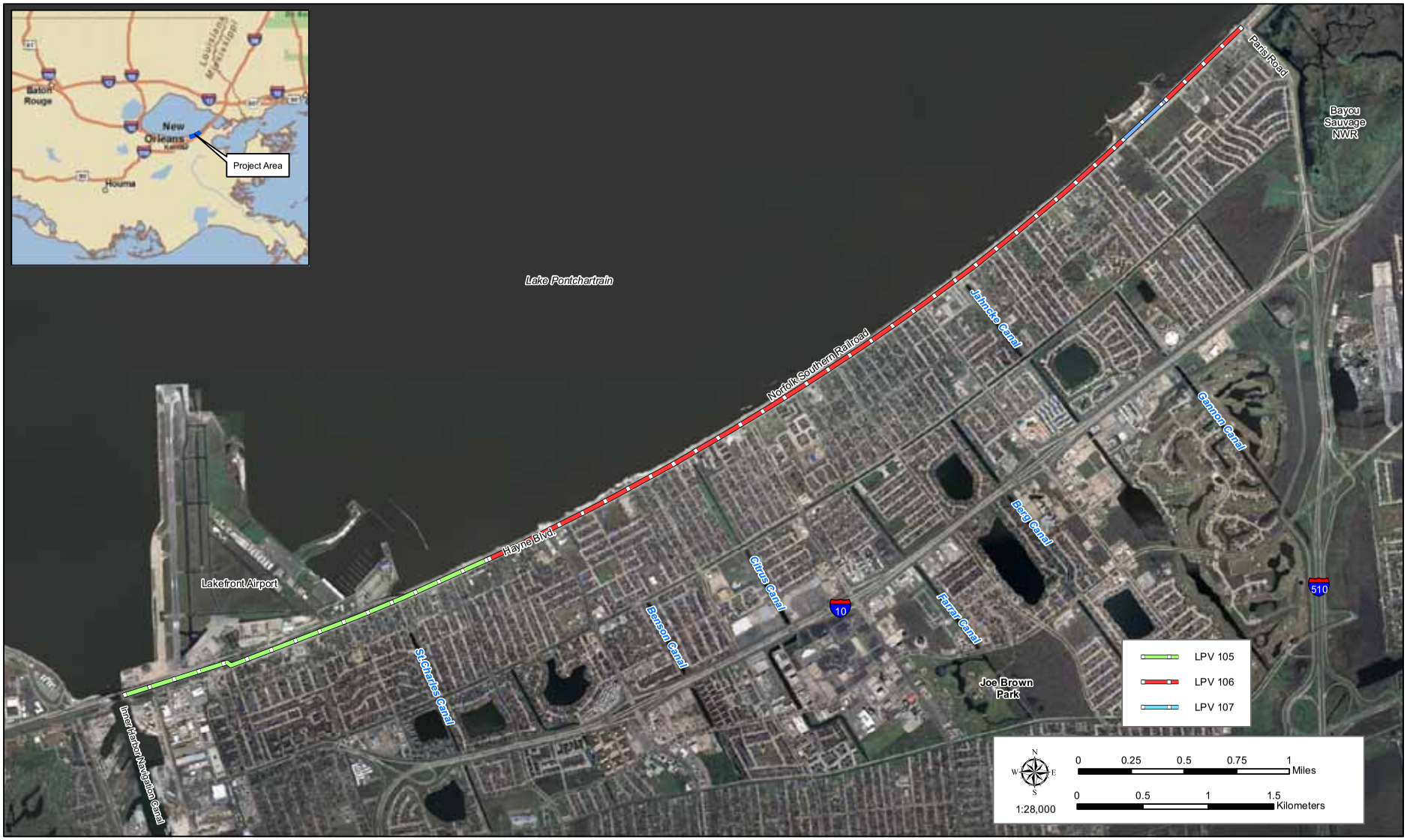

Figure 2. The project area includes three LPV reaches (105, 106, and 107) where approximately 6 miles of levees, floodwalls, and floodgates extend from the Inner Harbor Navigation Canal (IHNC) and New Orleans Lakefront Airport east to Paris Road.

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HSDRRS would lower the risk of harm to citizens, and damage to infrastructure during a storm event. The safety of people in the region is the highest priority of the CEMVN.

The term "100-year level of risk reduction," as it is used throughout this document, refers to a level of protection which reduces the risk of hurricane surge and wave driven flooding that the New Orleans Metropolitan Area has a 1 percent chance of experiencing each year.

1.2. AUTHORITY FOR THE PROPOSED ACTION

The authority for the proposed action was provided as part of a number of hurricane damage risk reduction 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 HSDRRS projects.

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

The Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico, and Pandemic Influenza Act of 2006 (3rd Supplemental - P.L. 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 100 percent Federal cost. The Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery of 2006 (4th Supplemental - P.L. 109-234, Title II, Chapter 3, Construction, and Flood Control and Coastal Emergencies) authorizes construction of a 100-year level of risk reduction; the replacement or reinforcement of floodwalls; 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, 2007 House of Representatives 2206 (pg. 41-44) Title IV, Chapter 3, Flood Control and Coastal Emergencies, (5th Supplemental), General Provisions, Sec. 4302, and the 6th Supplemental (P.L. 110-252), Title III, Chapter 3, Construction. .

1.3. PRIOR REPORTS

A number of studies and reports on water resources development in the Citrus Lakefront Levee project area have been prepared by the USACE and other Federal, state and local agencies, research institutes, and individuals. Pertinent studies, reports and projects are discussed below:

- On 13 March 2009, the CEMVN District Engineer signed the Decision Record on IER # 4 entitled "Lake Pontchartrain and Vicinity, Orleans East Bank, New Orleans Lakefront Levee, West of Inner Harbor Navigational Canal to the east bank of 17th Street Canal, Orleans Parish, Louisiana." IER # 4 evaluates the potential impacts associated with rebuilding and/or modifying earthen levees and floodwalls, replacing or adding new floodgates, modifying the Bayou St. John gate structure, and rebuilding roadway ramps within Orleans Parish.

- On 18 February 2009, the CEMVN District Engineer signed Decision Record on IER # 12 entitled "GIWW, Harvey, and Algiers Levees and Floodwalls, Jefferson, Orleans, and Plaquemines Parishes, Louisiana." IER # 12 evaluates the potential impacts associated with raising and/or constructing levees, floodwalls, and other structures to meet the 100-year level of risk reduction for Harvey-Westwego, Gretna-Algiers, and Belle Chase areas.

- On 3 February 2009, the CEMVN signed a Decision Record on IER # 25 entitled "Government Furnished Borrow Material, Orleans, Plaquemines and Jefferson 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 HSDRRS.

- On 21 January 2009, the CEMVN signed a Decision Record on IER # 17 entitled "West Bank and Vicinity, Company Canal Floodwall, Jefferson Parish, Louisiana." The document was prepared to evaluate the potential impacts associated with the proposed construction and maintenance of a 100-year level of risk reduction along the WBV, Company Canal Floodwall from the Bayou Segnette State Park to the New Westwego Pumping Station.

- On 21 October 2008, the CEMVN signed a Decision Record on IER # 11 Tier 2 Borgne entitled "Improved Protection on the Inner Harbor Navigation Canal, Tier 2 Borgne Orleans and St. Bernard Parishes, Louisiana." The document was prepared to evaluate the potential impacts associated with constructing a surge barrier on Lake Borgne.

- On 20 October 2008, the CEMVN signed a Decision Record on IER # 26 entitled "Pre-Approved Contractor Furnished Borrow Material # 3, Jefferson, Plaquemines, and St. John the Baptist Parishes, Louisiana, and Hancock County, Mississippi." The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors in the excavating of borrow areas for use in construction of the HSDRRS.

- On 25 July 2008, the CEMVN signed a Decision Record on IER # 3, entitled "Lake Pontchartrain and Vicinity, Lakefront Levee, Jefferson Parish, Louisiana." The proposed action includes rebuilding earthen levees, upgrading foreshore protection, replacing floodgates, constructing fronting protection for four pumping stations, and constructing or modifying breakwaters at four pumping stations in Jefferson Parish, Louisiana.

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

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

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

- On 6 May 2008, the CEMVN signed a Decision Record on IER # 23 entitled "Pre-Approved Contractor Furnished Borrow Material # 2, St. Bernard, St. Charles, Plaquemines Parishes, Louisiana, and Hancock County, Mississippi." The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors in the excavating of borrow areas for use in construction of the HSDRRS.

- On 14 March 2008, the CEMVN signed a Decision Record on IER # 11 (Tier 1) entitled "Improved Protection on the Inner Harbor Navigation Canal, Orleans and St. Bernard Parishes, Louisiana." The document was prepared to evaluate potential impacts associated with building navigable and structural barriers to prevent storm surge from entering the IHNC from Lake Pontchartrain and/or the Gulf Intracoastal Waterway-Mississippi River Gulf Outlet-Lake Borgne complex. The Tier 2 Decision Record document discussing alignment alternatives and designs of the navigable and structural barriers, and the impacts associated with exact footprints was signed by CEMVN on October 21, 2008.

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

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

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

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

- In December 1984, a Supplemental Information Report (SIR) to complement the Supplement to Final EIS on the LPV Hurricane Protection project was filed with the United States Environmental Protection Agency (USEPA).

- SIR #29 entitled "LPV Hurricane Protection – South Point to Gulf Intracoastal Waterway (GIWW) Levee Enlargement" was signed by CEMVN on 12 June 1987. The report discussed the impacts associated with the enlargement of the GIWW.

- On 12 September, 1990 CEMVN signed a Finding of No Significant Impact (FONSI) on EA # 105 entitled "LPV Hurricane Protection – South Point to Gulf Intracoastal Waterway, A. V. Keeler and Company Alternative Borrow Site." The report addressed the impacts associated with the excavation of a borrow area in Slidell, Louisiana for LPV construction.

- In July 2006, CEMVN signed a FONSI on EA #433 entitled, "USACE Response to Hurricanes Katrina & Rita in Louisiana" (USACE 2006). 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.

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 within the HSDRRS. 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 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 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.

Compensatory mitigation for unavoidable impacts associated with this and other proposed HSDRRS projects will be documented in forthcoming mitigation IERs, which are being written concurrently with all other IERs.

1.5. PUBLIC CONCERNS

The foremost public concern is reducing risk of hurricane, storm, and flood damage for businesses and residences, and enhancing public safety during major storm events in the Greater New Orleans Metropolitan Area. Hurricane Katrina forced most Orleans Parish residents from their homes and, due to extensive flooding, made returning to their homes in a timely manner unsafe. Additional concerns have been expressed by resource agencies during monthly interagency meetings and by the public during periodic public meetings held in New Orleans East about impacts to the Sewerage and Water Board mitigation site located at Lincoln Beach, impacts to wetlands and submerged aquatic vegetation (SAV) in Lake Pontchartrain, impacts to marsh restoration and creation projects implemented by the University of New Orleans (UNO), and noise impacts and air emissions from construction activities. There are also concerns about the New Orleans Lakefront Airport runway protection zone and impacts of construction activities on airport operations. The public also expressed concerns about highway closures, noise impacts and air emissions from construction activities, the length of time required for HSDRRS construction activities, improvements to IHNC floodwalls following Hurricane Katrina, and the amount of borrow material being investigated in New Orleans East.

1.6. DATA GAPS AND UNCERTAINTIES

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

Transportation routes for delivery of construction materials have not been determined. Large quantities of material (*e.g.*, concrete, pilings, sheet pile, rebar, soil) would be delivered to the Citrus Lakefront Levee project area, as well as to other ongoing HSDRRS projects. This could have localized short-term impacts to transportation corridors that cannot be quantified at this time.

The construction schedule (*e.g.*, exact start and end dates of construction work, and phasing of construction activities) is also not known at this time. It is anticipated that the construction period for the entire Citrus Lakefront Levee project would not exceed 2 years, and that construction could take place 24 hours per day, 7 days per week.

Only limited data for post-Hurricane Katrina socioeconomic status in the New Orleans Metropolitan Area are available. The recovery effort is ongoing and the status of jobs, economic growth, housing, education and business success is rapidly changing. Best available, pre- and post-Hurricane Katrina, information was used to analyze potential socioeconomic impacts. Public meetings have been held in the project area during the development of this IER to ensure that the concerns expressed by the public are included. Meetings were held on 24 July 2007; 25 October 2007; 10 March 2008; 29 April 2008; and 29 August 2008 to provide information and to address public comments on IER #6.

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2. ALTERNATIVES

2.1. ALTERNATIVES DEVELOPMENT AND PRELIMINARY SCREENING CRITERIA

Because portions of the New Orleans East area are at or below sea level, and gravity drainage is not possible, all of New Orleans East (see Figure 1) relies upon a series of levees, floodwalls, floodgates, and forced drainage (*i.e.*, pumps) for hurricane and storm damage risk reduction. Existing levees and floodwalls that protect all New Orleans East, including the Citrus Lakefront Levee extending from IHNC to Paris Road, were constructed as part of the LPV project. Each reach is identified by a project identification number (*e.g.*, LPV 105). LPV 105 is 10,053 linear feet and currently comprises floodwalls (Photograph 1), earthen levees, and five floodgates (Figure 3). LPV 105 consists primarily of I-wall type floodwalls (a sheet pile base with a concrete wall cap protruding above the ground) with T-wall type floodwalls (an inverted T with a below-ground concrete foundation anchored to battered H-piles) located at floodgates. LPV 105 also has three sections of earthen levees. There are one railroad and four vehicular floodgates ranging in length from 22 feet to 42 feet. Existing elevations of levees and floodwalls vary, and range from +11.0 to +14.0 feet, as referenced to North American Vertical Datum 88 (NAVD 88).

Photograph 1. View of LPV 105 Floodwall from South of Hayne Boulevard with Train on Norfolk Southern Railroad Tracks.

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Figure 3. LPV 105 currently consists of 10,053 linear feet of floodwalls, earthen levees, and five floodgates.

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LPV 106 currently includes two levee reaches totaling approximately 4.18 miles (Photograph 2) located between reach LPV 105 and Paris Road (Figure 4). The earthen levee has an average existing crown elevation of +13.0 feet NAVD 88. Two gate structures and sheetpiling (to prevent seepage) isolate Citrus and Jahncke pump stations from Lake Pontchartrain. The levee is located between the Norfolk Southern Railroad (NSRR) tracks on the north and Hayne Boulevard to the south. Riprap foreshore protection has been placed along the shoreline of Lake Pontchartrain immediately north of the NSRR tracks.

Photograph 2. View of LPV 106 Levee Crown, NSRR Tracks, Hayne Boulevard, and Foreshore Protection.

LPV 107 comprises approximately 1,472 linear feet of floodwalls along the shore of Lake Pontchartrain in the Lincoln Beach area (Figure 5). LPV 107 separates two sections of LPV 106. Floodwalls on the east and west ends of LPV 107 are I-walls, with the exception of approximately 150 linear feet of T-wall near the center of the reach that supports a floodgate (Photograph 3). The purpose of the floodgate was to provide access to the Lincoln Beach area, which was constructed in 1939 as a recreation area for New Orlean's African Americans, who were prohibited from entering the other segregated Lake Pontchartrain amusement parks. However, the gate has typically been closed since Lincoln Beach was abandoned in the late 1960s. Elevations of I-walls are +11.0 feet NAVD 88 and the elevation of the T-wall is +10.5 feet NAVD 88 (except over the top of the floodgate, where the T-wall elevation is +16.5 feet NAVD 88). There is an earthen levee on either side of the I-walls with a top elevation of +5.0 feet NAVD 88 and 3:1 (horizontal:vertical) side slopes.

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Figure 4. LPV 106 currently includes two levee reaches totaling approximately 4.18 miles located between reaches LPV 105 and Paris Road.

Figure 5. LPV 107 comprises approximately 1,472 linear feet of floodwalls in the Lincoln Beach area along the shore of Lake Pontchartrain.

Photograph 3. View of LPV 107 Floodgate and Floodwalls, with Hayne Boulevard in Front and Lincoln Beach Behind.

NEPA requires that, in analyzing alternatives to the proposed action, a Federal agency consider an alternative of "No Action." Likewise, Section 73 of the WRDA of 1974 (P.L. 93-251) requires Federal agencies to give consideration to non-structural measures to reduce or prevent flood damage. The CEMVN Project Delivery Team (PDT) considered a No Action Alternative and non-structural measures, which are discussed in Sections 2.4 and 2.5.1 of this IER, respectively.

In addition to these mandated alternatives, a range of reasonable alternatives was formulated through input by the CEMVN PDT, Value Engineering Team, engineering and design consultants, as well as local government, the public, and resource agencies for each reach described in this IER. The "action" alternatives formulated are comprised of alternative alignments for each risk reduction area. Within each of these alignment alternatives, several scales were considered to encompass various risk reduction design alternatives which could be utilized within that alignment. The following standard set of alignment alternatives and alternative scales within these alignments were initially considered for each reach:

Alternative Alignments:
- Existing alignment;
- Flood-side shift (all toe-to-toe growth occurs on flood side of levee or floodwall); and
- Protected-side shift (all toe-to-toe growth occurs on protected side of levee or floodwall).

Alternative Scales:
- Earthen levee;
- T-wall type floodwall;

- Modified T-wall straddling existing I-wall;
- Earthen levee with T-wall cap; and
- Earthen levee using deep soil mixing.

Additionally, 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 which alternatives would proceed through further analysis. Criteria used to make this determination included engineering effectiveness, economic efficiency, schedule, risk and reliability, right-of-way requirements, environmental, and operation and maintenance requirements. Those alternatives which did not adequately meet these criteria were considered infeasible and 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 HSDRRS to the 100-year level of risk reduction, each reach has its own range of alternatives. This approach allows for reach-by-reach decisions to be made in a manner cognizant of unique local circumstances. At the same time, alternatives analysis and selection remains integrated and comprehensive, considering reaches in relation to one another and to other past, current and reasonably foreseeable actions by the CEMVN and other entities within the project study area.

As such, the alternatives description below is organized by reach (*i.e.*, LPV 105, 106, and 107), noting those actions that are common to all reaches. The alternatives description also states how each alternative relates to the range of alternatives for adjacent reaches, to ensure awareness of the HSDRRS as a whole.

No Action. Under the no action alternative the levees and floodwalls and foreshore protection in reaches LPV 105, 106 and 107 would be restored to the originally authorized elevation utilizing current design criteria, as described above (as authorized under the Flood Control Act of 1965, PL 89-288, Title II, Section 204), rather than the 100-year level of risk reduction. Maintenance of all structures would continue. Since the placement of foreshore protection was previously described in the final EIS for the LPV Hurricane Protection Project and the original foreshore protection was placed in a larger 60-foot wide right-of-way, the impacts for this work will be discussed as part of the No Action Alternative and considered as part of the cumulative impacts of the proposed action alternative for LPV 106 in this IER.

LPV 106 Foreshore Protection. Riprap foreshore protection along Lake Pontchartrain would be raised to the previously authorized elevation (which is equal to or greater than the 100-year level of risk reduction) to reduce erosion and wave impact on the levee. Approximately 80,000 cubic yards of riprap would be required to raise levee foreshore protection to an elevation that would not settle below a net grade of approximately +14 feet NAVD 88 in 10 years. It is anticipated that riprap would be transported to the Lake Pontchartrain shoreline by barge and placed from equipment stationed on barges in the lake and from trucks and equipment accessing the foreshore protection from the shoreline. The placement of foreshore protection would occur within a 48-foot wide right-of-way along the shoreline of Lake Pontchartrain and permanently fill 6.9 acres of Lake Pontchartrain. To provide barge access, temporary channels would be dredged in Lake Pontchartrain perpendicular to the shoreline. It is expected that four offshore to inshore access channels perpendicular to the Lake Pontchartrain shoreline would be constructed to allow tug boats and barges to approach the construction area. Channel dimensions would be approximately 10 feet deep, 100 feet wide at the channel bottom, and between 1,448 and 1,940 feet long with a 2:1 slope on both sides of the channel. The dredging operation would excavate approximately 162,000 cubic yards of material. Dredged material (tailings) would be placed

within a 178-foot wide area located on one side of and parallel to the dredged channel. The width of the channel and dredged material placement area would create a 400-foot wide footprint, which includes the 100-foot wide channel (130-foot wide top width), the 178-foot wide dredged material stock pile and the space between the stock pile and channel. Assuming these dimensions, the channel and excavated sediments are expected to directly impact approximately 61.1 acres of lakebed. After construction activities have been completed, dredged material for the access channels would be used to backfill the dredged channels. A pre-construction and post-construction bathymetric survey and submerged aquatic vegetation populations survey would be conducted to document percent occurrences of aquatic plants in or near the construction area. If post construction surveys do not show a natural revegetation of the area occurring plantings of submerged aquatic vegetation would occur to return the site to pre-construction conditions.

Proposed Action. The proposed action consists of realigning portions of LPV 105 and LPV 107 and reconstructing all levees, floodwalls and floodgates to a grade that would achieve the 100-year level of risk reduction for the New Orleans Metropolitan Area. The proposed action for LPV 106 includes reconstruction of the earthen levee and gate structures at the Citrus and Jahncke pump stations and the restoration of the foreshore protection as discussed in the No Action alternative. The structural height and design to meet the 100-year level of risk reduction for each alternative was determined using a new, advanced modeling process for estimating hurricane inundation probabilities called the Joint Probability Method with Optimal Sampling (JPM-OS) Process. The JPM-OS frequency analysis determines the 1 percent surge elevations, 1 percent wave heights, and 1 percent wave characteristics for existing conditions, and then these are applied in the wave run-up and overtopping calculations. An additional analysis is performed to represent the conditions that may occur 50 years in the future (year 2057) as a result of changes in the surge levels and wave characteristics due to subsidence and sea level rise. The results from the JPM-OS hydraulic process have been incorporated into the Design Guidelines for the HSDRRS. Hard structures are also built with an additional 2 feet of structural superiority. Design specifications can be found at www.nolaenvironmental.gov. All earthen levee material would come from Government-approved borrow sites and the impacts are documented in Borrow IERs 18, 19, 22, 23, 24, 25 and 26.

2.3. PROPOSED ACTION

2.3.1. LPV 105

In the western portion of LPV 105 (west of the Alabama Street-Hayne Boulevard Intersection [see Figure 3]), the current I-wall alignment is located within the New Orleans Lakefront Airport runway protection zone (Photograph 4) and includes five floodgates (four vehicular and one railroad). To provide 100-year level of risk reduction, vacant land would be acquired 300 feet south of the current floodwall alignment (Figure 6) and 1,780 linear feet of T-wall would be constructed south of the NSRR to a height of +15.5 feet NAVD 88. This would require construction of a new 80-foot-wide floodgate at the floodwall's crossing of Downman Road. Additional drainage improvements may be necessary and accommodations would be incorporated for the design life of the project. New right-of-way would be acquired from NSRR for T-wall construction and pile placement. The I-wall and railroad and vehicular floodgates associated with the current I-wall alignment would not be improved or demolished.

The portion of LPV 105 east of the Alabama Street-Hayne Boulevard intersection comprises 7,338 linear feet of I-wall and earthen levee. Within its current alignment, 5,473 linear feet of I-wall and levee would be demolished in phases and replaced with a T-wall type floodwall at a height of +15.5 feet NAVD 88. Also, 1,915 linear feet of existing levee from east of Lamb Road to west of Danube Road would be raised to an elevation that would not settle below a net grade of approximately +13.5 feet NAVD 88 in 10 years (see Figure 6). No floodgate construction would be required.

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Figure 6. Proposed Improvements to LPV 105 include realignment of the western 1,780 feet of T-wall 300 feet south, construction of a new, 80-foot wide floodgate at Downman Road, and replacement of 7,338 linear feet of I-wall and levee with T-wall and raised levee.

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Photograph 4. View of LPV 105 Floodwall and Roadways within the Lakefront Airport Runway Protection Zone.

2.3.2. LPV 106

The LPV 106 reach includes 4.18 linear miles of levee improvements (Figure 7). The existing levee crown would be initially lowered to create a working platform for construction equipment and a cutoff wall would be constructed. One of several different types of cutoff walls may be constructed and include cement-bentonite and soil-cement bentonite. The material and method for cutoff wall construction would be determined during final design. The preferred option would be to construct a sheet pile cutoff wall (to prevent seepage beneath the levee) at the flood side toe of the levee to a depth of -17 feet below ground surface (bgs). After completion of the cutoff wall construction, the 4.18 miles of levee would be raised to an elevation that would not settle below a net grade of approximately +13.5 feet NAVD 88 in 10 years, with appropriate side slopes. An approximately 1-foot high cement curb would be constructed at the toe of the levee adjacent to Hayne Boulevard.

Two gate structures bounded by I-walls that isolate Citrus and Jahncke pump stations from Lake Pontchartrain would be reconstructed. At the pump stations, the gates could be replaced and soil added to raise the levee or the levee crest would be lowered and a T-wall would be constructed on the flood side of the centerline of the levee and would protrude 4.0 feet above the levee crest, providing risk reduction to +15.5 feet NAVD 88. The base of the T-wall would be approximately 24.5 feet wide, with the bottom side of the pile cap constructed at an elevation of +3.0 feet NAVD 88. The T-wall would be supported by three rows of battered H-piles on the flood side of levee centerline, and two rows of battered H-piles on the protected side of levee centerline. A steel sheet pile cut off wall would be constructed beneath the T-Wall, except in the

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Figure 7. Proposed improvements to LPV 106 include raising 4.18 linear miles of levee and reconstruction of gate structures at Jahncke and Citrus pump stations. The placement of 80,000 cubic yards of foreshore protection and dredging of access channels is a component of the previously authorized LPV project.

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area of the pump station culverts. The sheet pile wall would provide protection against seepage and reduce the possibility of piping of coarse-grained material in the foundation. All work would be within the existing levee footprint.

As previously discussed the foreshore protection in the LPV 106 reach would be restored to previously authorized elevations using riprap brought in by barge.

2.3.3. LPV 107

LPV 107 would replace existing I-wall and earthen levee with an earthen levee at an elevation that would not settle below net grade of approximately +13.5 feet NAVD 88 along a new alignment (Figure 8). The existing levee and floodwall alignment would be shifted approximately 12 feet south (further away from the NSRR embankment), aligning 1,472 linear feet of new levee with the LPV 106 alignment. The earthen levee would be constructed with 3:1 (horizontal:vertical) side slopes and a retaining (*i.e.*, mechanically stabilized earth) wall constructed along Hayne Boulevard. Improvements to subgrade soils below the new levee would be accomplished through deep soil mixing. The existing floodgate would be replaced with a new gate structure and floodgate at elevation +15.5 feet NAVD 88 for access to the Lincoln Beach area.

2.3.4. General Considerations for All Reaches

The proposed action would increase the elevation of structures to meet the 100-year level of risk reduction. Top-of-wall and levee elevations would range from approximately +13.5 feet to +15.5 feet NAVD 88 across the three component reaches in order to provide for 100-year level of risk reduction. All T-walls would be approximately 2 feet wide, supported by a 12- to 17-foot wide and 3-foot high concrete slab connected to battered H-piles driven to a depth of approximately -85 feet bgs, and a continuous sheetpile cutoff wall constructed to depths ranging from -50 to -60 feet bgs for further stabilization and seepage protection (Figure 9). It is anticipated that T-walls would be cast-in-place; however, consideration would be given to using precast concrete for T-wall foundations and wall stems.

While it is not currently anticipated that relief wells are required, if needed they would be located along the toe of the protected side of the levee. The wells would allow water to flow over ground to relieve high groundwater pressures that could potentially develop during a flood event against a levee system. The flow per well would be insignificant when compared to typical hurricane surface runoff from rainfall. A typical well along the levee reaches covered by this document would produce a discharge of approximately 100 gal per minute or less during the 100-yr hurricane event. Assuming a typical well spacing of 100 ft, the amount of flow within this basin would only be 1 gal per minute per foot of levee or 0.002 cubic feet per second per foot of levee. This is a minor amount of runoff and unlikely to be noticeable when compared to flows from a typical rain event occurring during a hurricane, which would produce more runoff by several orders of magnitude.

Construction materials would be transported to active construction areas from staging areas or from contractors in the region. Staging areas would be located both within the proposed construction corridor and within previously developed areas adjacent to the project area that are being proposed as staging areas (*e.g.*, Lakefront Airport marina breakwater area, vacant lots south of Hayne Boulevard; see Figures 6, and 7). Temporary closure of sections of both westbound lanes of Hayne Boulevard would occur to allow for offloading of construction materials throughout the construction phase of the project.

As part of construction, electrical services, gas lines, telephone poles and lines, storm drainpipes, subdrain lines, and storm drain catch basins, would be avoided, removed or relocated. Heavy equipment that would likely be used during demolition and construction activities includes haulers, excavators, vibratory and hammer pile drivers, dozers, graders, cranes, backhoes, and

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Figure 8. Proposed improvements to LPV 107 include replacing 1,472 linear feet of I-wall with an earthen levee and replacing the Lincoln Beach Floodgate.

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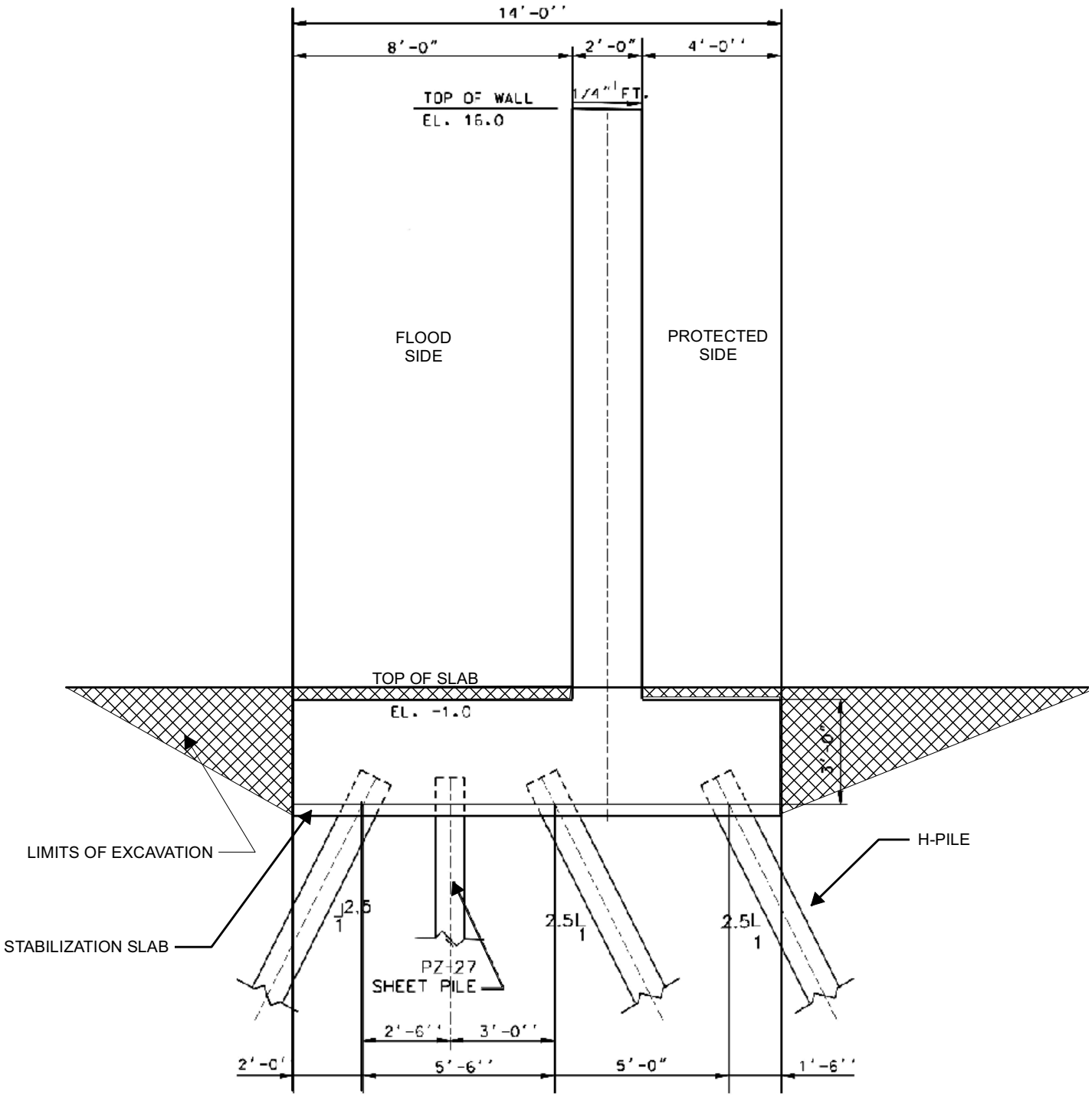

Figure 9. All T-walls would be approximately 2-feet wide supported by a 12- to 17-foot wide and 3-foot high concrete slab connected to battered H-piles (driven to a depth of approximately -85 feet below the ground surface) and a continuous sheetpile cutoff wall (constructed to depths ranging from -50 to -60 feet below the ground surface) for further stabilization and seepage protection.

water trucks. Construction activities could occur 24 hours daily and 7 days per week during the construction period. Construction of all three reaches is anticipated to require approximately 2 years.

It is anticipated that demolition of I-walls would be staged so that areas degraded or demolished during construction require closure within 48 continuous hours to provide hurricane and storm damage risk reduction should a tropical event pose a threat to the area. If the demolish material is clean and could be effectively used elsewhere (i.e., armoring, fish structures or in place of rock fill) in an environmentally friendly manor that is acceptable to the natural resource agencies; that use would be encouraged. Otherwise the contractor would remove the material to an approved disposal area.

2.4. ALTERNATIVES TO THE PROPOSED ACTION

Including the no action alternative, two alternatives to the proposed action were considered in detail for LPV 105, LPV 106, and LPV 107.

2.4.1. LPV 105

No Action. CEQ's regulations and CEMVN's ER 200-2-2 for implementing NEPA require that a no action alternative be evaluated. Under the no action alternative; floodgates, floodwalls and levee would be restored or constructed within the current alignment to meet the previously authorized elevation using current design criteria. Maintenance of structures would continue.

Alternative 1: Replace I-Wall with T-Wall Along Current Alignment. This alternative would replace approximately 2,715 linear feet of I-walls in the western portion of LPV 105 with T-walls at an elevation of +15.5 feet NAVD 88 in their current alignment (Figure 10). This would require replacement of five existing floodgates within the western portion of the LPV 105 reach.

The eastern portion of LPV 105 (east of Alabama Street) would be constructed as described by the proposed action.

2.4.2. LPV 106

No Action. Under the no action alternative, foreshore protection, gate structures, floodwalls and levees would be restored or constructed to meet the previously authorized elevation using current design criteria. Maintenance of structures would continue.

Alternative 1: Combination T-wall and Earthen Levee Along Current Alignment. Under this alternative, the existing levee crest elevation would be lowered from +13 feet NAVD 88 to +11 feet NAVD 88 to accommodate a new T-wall cap constructed at an elevation of +15.5 feet NAVD 88. The base of the T-wall would be approximately 9.5 feet wide, with the pile cap at an elevation of +8.5 feet NAVD 88. The concrete T-wall structure would be supported by two rows of battered steel H-piles to protect against overtopping and erosion. A steel sheetpile cut off wall would be constructed underneath the centerline of the T-Wall to -20 feet bgs to provide protection against seepage and reduce the possibility of piping of coarse-grained material in the foundation. The two gate structures that isolate the Citrus and Jahncke pump stations would be reconstructed as part of the T-wall placement.

2.4.3. LPV 107

No Action. Under the no action alternative, a floodgate, floodwalls and levee would be restored to meet the previously authorized elevation using current design criteria. Maintenance of structures would continue.

Figure 10. LPV 105 Alternative 1: proposed Improvements to LPV 105 include replacing existing I-walls and floodgates with T-walls and floodgates west of Alabama Street, and replacement of 7,338 linear feet of I-wall and levee with T-walls east of Alababma Street.

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Alternative 1: Replace I-Wall and Floodgate with Composite Levee/T-wall Along Proposed Action Alignment. This alternative would replace the existing I-wall with a composite levee/T-wall 12 feet south of the current alignment (the same alignment as described by the proposed action; Figure 11). The levee would be constructed at an elevation of +10.0 feet NAVD 88 with 3:1 (horizontal:vertical) side slopes; a pile supported concrete T-wall would be constructed on top of the levee from +10.0 feet to +15.5 feet NAVD 88. Sheetpile cutoff walls would be constructed to -20 feet bgs under the centerline of the composite levee/T-wall for seepage protection. The floodgate at Lincoln Beach would be reconstructed as described by the proposed action.

2.5. ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

2.5.1. Non-Structural

Section 73 of the WRDA of 1974 requires that non-structural alternatives be evaluated in flood damage reduction studies. ER 1105-2-100 provides planning guidance on applicable non-structural measures. Non-structural flood damage reduction measures typically include permanent relocation, evacuation, or demolition of structures in the floodplain; floodproofing of structures; flood warning systems; and regulation of floodplain uses. Flood warning systems and evacuation plans are already in place for all of Orleans Parish.

2.5.1.1. Structure Relocation

The mandatory public acquisition of properties and relocation of structures subject to flooding is a non-structural alternative. This would be done pursuant to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S. Code Section 4601, *et seq*., as amended) for financial assistance for subject properties. A non-structural program for acquisition of properties in flood-prone areas would be subject to these guidelines, including payment of just compensation for the acquired properties and payment of Uniform Relocation Assistance Benefits under Title II of the Uniform Relocation Assistance and Real Property Acquisition Policies Act for the displacement of individuals, families, businesses, farms and non-profit organizations. Two options are available under the structure relocation alternative: 1) relocation of the structure to a comparable site outside of the area of flooding; and 2) acquisition of the structure and site by the local sponsor for demolition and relocation. Neither of the options is viable for New Orleans East. A number of industries are located in the New Orleans East area due to its proximity to the GIWW and IHNC; acquisition and relocation would be very costly. Additionally, these industries are marine related, and the protection provided by the levee system and the proximity of New Orleans East to these waterways are the reasons these industries are located in New Orleans East. It has been estimated (using 2006 aerial photography) that 30,000 residences are located in New Orleans East and all of these homes would require acquisition and relocation.

2.5.1.2. Raise In Place

Floodproofing of structures by raising the ground floor elevation above the 100-year flood level in their existing location is another non-structural alternative, and the primary floodproofing method available for structure modification as a collective action. The average cost of elevating residential structures in New Orleans has been estimated at $95 per square foot (USACE 2007a). Thus, the cost of raising an 1,800 square foot residence would be approximately $171,000.

Because the Citrus Lakefront Levee Project is a component of the LPV project that provides protection to New Orleans East, all structures in New Orleans East below the 100-year flood level would need to be raised in elevation. Assuming each residence is 1,800 square feet, the cost of elevating 30,000 residences is approximately $5.1 billion. In addition, apartment buildings, businesses and critical infrastructure, such as utilities, roadways and public buildings, would also need to be elevated above the 100-year flood level. The cost of elevating these

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Figure 11. LPV 107 Alternative 1: proposed improvements to LPV 107 include replacing the existing I-wall and floodgate with a T-wall and new floodgate.

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structures is likely equivalent to the cost of elevating residences in the area. Therefore, it is estimated that the cost of raising the elevation of structures and critical infrastructure above the 100-year flood level in New Orleans East would exceed $10 billion. This cost does not include the loss of future development opportunities in New Orleans East due to the increased cost of building structures at a higher elevation. The cost of raising the Citrus Lakefront Levee Project levees and floodwalls to the 100-year level of risk reduction is estimated at approximately $155 million. Therefore, raising the elevation of residential and commercial structures at their current location is not a viable alternative.

2.5.1.3. Rezoning

Regulation of floodplain use can be used to preclude or limit development in flood prone areas. This alternative would minimize future damages on new development in flood-prone areas; however, it would not provide the 100-year level of risk reduction for existing structures. Further, rezoning is not within the authority of CEMVN as provided by the 4th Emergency Supplemental Appropriations Act.

2.5.2. Protected and Flood Side Shift of Existing Levee Sections

Realignment of the levees and floodwalls, both towards the flood side (*i.e.*, north) and towards the protected side (*i.e.*, south), was considered. Relocation of levees and floodwalls to the north would place the alignment across the NSRR and within Lake Pontchartrain. Given stability issues associated with constructing a levee in the lake, relocation of the NSRR which would require a long-term disruption in rail service, and additional impacts to wetlands, realignment to the north was eliminated from further consideration.

As estimated using 2006 aerial photography, realignment to the south would impact the curb and northern west-bound lane of Hayne Boulevard, requiring relocation of Hayne Boulevard further south, potentially impacting 180 residences and 25 businesses located along Hayne Boulevard. Furthermore, the Citrus and Jahncke pump stations would need to be entirely relocated. Because residences, businesses, and Citrus and Jahncke pump stations, would need to be relocated, realignment to the south was eliminated from further consideration.

2.5.3. Structural Alternatives within Existing Alignment

As part of the initial evaluation of floodwalls in LPV 105, T-walls and an earthen levee were considered for LPV 105. Replacing the existing I-wall with a T-wall and construction of a T-wall on an earthen levee section that ties into LPV 106 along the general current alignment was considered, but eliminated from detailed impact analysis. Restrictive conditions such as: airspace restrictions at Lakefront Airport, overhead and horizontal clearance to the Seakbrook Bridge, lack of sufficient right-of-way, existing utility penetrations through the existing I-wall, and demolition of the existing I-wall while maintaining flood protection during construction were considered with these alternative scales. Therefore, replacement of the existing floodwalls with T-walls or earthen levees was eliminated from further consideration based on right-of-way requirements, railroad issues, and airspace.

Constructing a new earthen levee to reduce existing floodwalls within LPV 105 and LPV 107 was eliminated due to right-of-way constrictions. Removing the entire earthen levee and constructing a T-wall within LPV 106 was eliminated due to costs, concerns about stability, and the limited construction schedule. The construction of an earthen levee with a T-wall cap within LPV 105 and 107 was eliminated due to right-of-way constrictions.

2.5.4. Hollow Core Levee

A hollow concrete levee is constructed so that the structure fills with water from the bottom as storm surge rises. The combined weight of the concrete frame and the water-filled voids inside

the frame result in a gravity structure that is designed to resist hydrostatic forces and impact forces from vessel collision. Hollow concrete levees are comprised of trapezoidal shapes similar to that of earthen levees. The levee superstructure sections are 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 are 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 are designed to protect against sliding under design loading conditions. The substructure consists of a concrete base slab or pad that is supported by steel piles. A hollow concrete levee was considered for LPV 106 but was eliminated from further consideration because the existing levee is only deficient by 0.5 to 1.0 foot in elevation. Therefore, degrading an existing levee and replacing with a hollow core levee section would not be cost effective or reduce environmental impacts.

2.6. SUMMARY

Table 1 provides a summary of the preliminary alternative screening results.

Table 1. Alternative Screening Results

Alternative	LPV105	LPV 106	LPV 107
No-Action	☑	☑	☑
Non-Structural	X	X	X
Existing Alignment			
• Earthen Levee	☑	☑	☑
• T-wall Floodwall	☑	X	☑
• Modified T-wall Straddling Existing I-wall	X	X	X
• Earthen Levee with T-wall Floodwall Cap	X	☑	X
• Earthen Levee using Deep Soil Mixing	N/A	N/A	N/A
Flood-side Shift			
• Earthen Levee	X	X	X
• T-wall Floodwall	X	X	X
• Earthen Levee with T-wall Floodwall cap	X	X	X
• Earthen Levee using Deep Soil Mixing	X	X	X
Protected-side Shift			
• Earthen Levee	X	X	X
• T-wall Floodwall	X	X	X
• Earthen Levee with T-wall Floodwall Cap	X	X	X
• Earthen Levee using Deep Soil Mixing	X	X	X
New Alignment	☑	X	☑

X = Eliminated from further study
☑ = Considered in detail
N/A = Not applicable; this alternative was not formulated for this reach

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 ENVIRONMENTAL SETTING

The project is located along the Lake Pontchartrain shoreline east of the IHNC. The project area is located between two transportation corridors (*i.e.*, Hayne Boulevard and the NSRR) and adjacent to the 23,000-acre Bayou Sauvage National Wildlife Refuge (NWR). The western end of the project area abuts the IHNC and New Orleans Lakefront Airport. North of the project area, beyond the NSRR railroad tracks, is the southern shore of Lake Pontchartrain.

In the project area, tropical storms typically produce the highest wind speeds and greatest rainfall events. Category 5 hurricanes, such as Hurricane Camille which made landfall just east of New Orleans on 17 August 1969, generate the highest recorded sustained wind speeds in the region (greater than 155 miles per hour). High winds are typically accompanied by massive storm surge, and storm surge can exceed 18 feet in height (National Hurricane Center 2007). Between 1926 and 2005 a total of 10 hurricanes have struck Orleans Parish (National Hurricane Center 2007). The frequency of hurricanes is greatest between August and October; however, hurricane season extends from June through November (National Hurricane Center 2007). Prior to Hurricane Katrina in 2005, Hurricane Betsy, on 9 September 1965, was the most damaging tropical storm in Metropolitan New Orleans. Hurricane Betsy caused a storm surge of 10 feet, flooding large parts of the city, claiming 81 lives, and causing $1 billion (1965 dollars) in damage (National Oceanographic and Atmospheric Administration [NOAA] 2007).

The near-surface geology of the area surrounding the Citrus Lakefront Levee can best be explained as the result of a subsiding Mississippi River delta lobe that has been drained, diked and filled with various types and vintages of dredged material derived from Lake Pontchartrain and adjacent drainage canals. The deepest formations investigated in the area are Pleistocene deposits, consisting of somewhat hardened fluvial sands, silts and muds at a depth of 40 to 60 feet bgs to depths around 180 feet bgs. These sediments were exposed and weathered during low sea level stands as a result of Pleistocene glaciations, resulting in relatively higher cohesive strengths than would normally be expected. Above the Pleistocene, Holocene deposits are the result of gradual deposition of organic peat mixed with fluvial silt and mud deposited as overbank deposits and interdistributary bay deposits of the Mississippi River in cypress swamps around Lake Pontchartrain (Kolb *et al*. 1975).

Much of the project area was formerly wetlands (*e.g.*, cypress swamps and marshes). As the New Orleans Metropolitan Area grew and the constructed levees were built ever higher, water was drained from swamps and marshes by canals and pumping, and dredged material, including peat and mud, was used to elevate the area for habitation. Resulting surface soils are classified as dredge material or muck (Natural Resource Conservation Service [NRCS] 2007). Land inside the levees is continually subsiding due to dewatering of peat deposits, resulting in surface elevations below sea level. Water content in soils is generally high, and increases with depth. The near-surface groundwater table is connected to the water level in Lake Pontchartrain, hence the need for numerous drainage canals and pumps to remove constant inflow.

Due to high water content and plasticity in the clays and silts of surface soils and deeper Holocene sediments, soil cohesive strengths are much lower in near surface Holocene and dredge deposits than in deeper more consolidated and weathered Pleistocene formations (Kolb *et al.* 1975). Thus, compressive activities, such as pile driving in these materials would translate easily into lateral compression and displacement of adjacent material.

Seismicity is generally not a factor in the New Orleans area. There are numerous small normal growth faults located beneath the city and Lake Pontchartrain, but sudden failure of these faults is not likely. Instead, a gradual slippage has been documented, resulting in general land subsidence on the down side (*i.e.*, Gulf of Mexico side) of the faults. The Michoud Fault, located east of the project area is thought to be responsible for higher land subsidence rates in the area around Michoud and New Orleans East (Dokka 2006).

3.2 SIGNIFICANT RESOURCES

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

The resources described in this section are those recognized as significant by laws, executive orders (EO), regulations, and other standards of National, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public. Further detail on the significance of each of these resources can be found by contacting the CEMVN, or on www.nolaenvironmental.gov, which offers information on the ecological and human value of these resources, as well as the laws and regulations governing each resource. Search for "Significant Resources Background Material" in the website's digital library for additional information. Table 2 shows those significant resources found within the project area, and notes whether they would be impacted by the proposed alternative.

Table 2. Significant Resources in Project Study Area

Significant Resources	Impacted	Not Impacted
Lake Pontchartrain	X	
Wetlands	X	
Non-Wetlands/uplands	X	
Fisheries	X	
Wildlife	X	
Essential Fish Habitat	X	
Endangered or Threatened Species	X	
Cultural Resources		X
Recreational Resources	X	
Aesthetics	X	
Air Quality	X	
Noise	X	

3.2.1. Lake Pontchartrain

Existing Conditions

Lake Pontchartrain, a large, brackish shallow estuary located in southeast Louisiana, receives fresh water from various lakes, rivers, bayous, and canals, while receiving salt water from the Gulf of Mexico (Environmental Atlas of the Lake Pontchartrain Basin 2002). The project area is parallel to approximately 6 miles of the south shore of Lake Pontchartrain. Water quality in Lake Pontchartrain is impaired by high concentrations of copper and fecal colliform bacteria. The lake is included on the Louisiana Department of Environmental Quality's (LaDEQ 2006) list of impaired waters (*i.e.*, the 303(d) list), but a total maximum daily load report has not been developed. Alluvial aquifers (*i.e.*, water that moves through recently deposited material and is

hydraulically connected to adjacent water bodies) underlie the project area 30 to 40 feet below the soil surface. The aquifer is confined by silt and clay layers and is in hydraulic connection with Lake Pontchartrain (LaDEQ 2006). The aquifer's water is brackish and not used as a water supply.

Principal SAV in Lake Pontchartrain includes wild celery (*Vallisneria americana*), widgeongrass (*Ruppia maritima*), slender pondweed (*Potamogeton perfoliatus*), Eurasian milfoil (*Myriophyllum spicatum*) and Southern naiad (*Najas guadalupensis*) (Duffy and Baltz 1998). Historically, SAV was abundant on all shores of Lake Pontchartrain; however, the total area of SAV within Lake Pontchartrain has decreased by approximately 90 percent between 1954 and 1998 (Suttkus *et al.* 1954, Darnell 1961, Montz 1978, Turner *et al.* 1980, Mayer 1986, Burns *et al.* 1993, Duffy and Baltz 1998). Shoreline modification, increased water turbidity, and algal overgrowth have contributed to this decline (Cho and Poirrier 2000).

Salinity in the Lake Pontchartrain estuary ranges from 0.5 to 15 parts per thousand (ppt). The highest salinities are found near the Rigolets and Chef Menteur passes just east of the project area as high salinity water is pushed from the passes into Lake Pontchartrain. The freshwater sources discharging into Lake Pontchartrain vary seasonally and this is reflected by fluctuations in salinity. Generally, the high-inflow/low-salinity periods are from late winter to late spring. The low-inflow/high-salinity periods are typically from late spring to late fall. Lake Pontchartrain sediments in the project vicinity contain a higher percentage of sand-size material than sediments in the lake's deeper basin (Manheim and Hayes 2002). Grain size data, extracted from the U.S. Geological Survey (USGS) database, for three near shore surface sediment samples in the project vicinity had percentages of sand ranging from 24 to 87 percent.

Discussion of Impacts

Future Conditions with No Action for LPV 105, 106, and 107

Temporary impacts to water quality, habitat for fisheries, and recreational opportunities in Lake Pontchartrain would occur with dredging and placement of foreshore protection, and levee and floodwall construction necessary to raise all structures to the previously authorized risk reduction elevations. Dredging Lake Pontchartrain to raise the foreshore protection would temporarily impact approximately 61.1 acres of lakebed. Best management practices including silt curtains would be utilized to minimize water quality impacts. Raising the foreshore protection to the authorized level would permanently fill approximately 6.9 acres of Lake Pontchartrain.

LPV 105

Future Conditions with Proposed Action

Direct Impacts to Lake Pontchartrain

Levee, T-wall, and floodgate construction activities would have minimal direct impacts on water quality. A General Stormwater Permit would be obtained prior to construction, and this would require approval of a site-specific Stormwater Pollution Prevention Plan (SWPPP) and Notice of Intent. A site-specific Spill Prevention, Control, and Countermeasures Plan (SPCCP) would also be in place prior to the start of construction. Best management practices outlined in these plans would reduce potential migration of soils, oil and grease, and construction debris into Lake Pontchartrain.

Indirect Impacts to Lake Pontchartrain

No indirect impacts to water quality in Lake Pontchartrain would occur.

Cumulative Impacts to Lake Pontchartrain

Construction of the proposed IHNC closure structure at Seabrook; construction of structures and pump stations at the 17th Street, London Avenue and Orleans Avenue Canals; dredging of access channels for foreshore protection and pump station fronting protection in Jefferson Parish; dredging of channels for placement of foreshore protection in New Orleans East as part of the no action work; pump station improvements from Southeast Louisiana Urban Flood Control project; and ongoing construction of the I-10 Twin Span Bridge replacement over Lake Pontchartrain would have cumulative impacts to water quality through increased turbidity and disturbance of water bottom in the near shore environment of Lake Pontchartrain. Although the area of impacts of all other HSDRRS projects has not been determined, it is anticipated that the cumulative impacts to water quality of Lake Pontchartrain from the construction, operation and maintenance of these structures would be temporary.

The Mississippi River Gulf Outlet (MRGO) closure structure which is being constructed at Bayou LaLoutre will cause a reduction in the salinity gradient of Lake Pontchartrain, and models of these changes indicate that salinities would be reduced between 4.6 and 6.9 ppt in the Little Woods area of Lake Pontchartrain near Paris Road and Hayne Boulevard (Tate *et al*. 2002). No substantial changes in Lake Pontchartrain salinities are anticipated from the construction of the Seabrook gate risk reduction structure as described in IER #11 or the improved protection on the IHNC (IER #11 Tier 2 Borgne; USACE 2008).

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Lake Pontchartrain

Direct, indirect and cumulative impacts to water quality in Lake Pontchartrain resulting from LPV 105 Alternative 1 would be similar to those occurring under the LPV 105 proposed action.

LPV 106

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Lake Pontchartrain

Direct, indirect and cumulative impacts to water quality in Lake Pontchartrain resulting from LPV 106 proposed action would be similar to those occurring under the LPV 105 proposed action. Foreshore protection would be restored to authorized elevations as described in the LPV 106 No Action section.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Lake Pontchartrain

Direct, indirect and cumulative impacts to water quality of Lake Pontchartrain from construction of a T-wall cap would be similar to those described by the LPV 105 proposed action.

LPV 107

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Lake Pontchartrain

Direct, indirect and cumulative impacts to water quality in Lake Pontchartrain resulting from the LPV 107 proposed action would be similar to those occurring under LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Lake Pontchartrain

Direct, indirect and cumulative impacts to water quality in Lake Pontchartrain resulting from LPV 107 Alternative 1 would be similar to those occurring under the LPV 105 proposed action.

3.2.2. Wetlands

Existing Conditions

The proposed project area is located along the south shoreline of Lake Pontchartrain. The majority of the project area is located in an upland terrestrial setting. However, north of the toe of foreshore protection, scattered areas of intertidal marsh associated with sandbars and shell mounds are present along the shoreline (Photograph 5). Marshes are land masses that are frequently or continually inundated by water and are characterized by emergent soft stemmed vegetation adapted to saturated soil conditions (USEPA 2007). Approximately 4 acres of emergent marsh is present along the Lake Pontchartrain shoreline adjacent to the foreshore protection. The predominant plant species is smooth cordgrass (*Spartina alterniflora*); associated plant species include marsh hay cordgrass (*Spartina patens*) and salt grass (*Distichlis spicata*). An invasive species, rattlebox (*Sesbania drummondii*), is an uncommon associated species located at higher elevations within these intertidal marsh areas.

Photograph 5. View of Marshes Located at the toe of Foreshore Protection in LPV 106.

In an effort to stabilize sandbars and create intertidal marsh habitat, UNO has been restoring marsh along the shoreline of Lake Pontchartrain since 1998. Through annual grants from

NOAA, UNO has been actively planting smooth cordgrass on exposed sandbars along the shoreline of Lake Pontchartrain. The UNO restoration project has utilized volunteers to restore 2 acres of tidal marsh along the Lake Pontchartrain shoreline. Additionally, in 1998 as part of a settlement for Clean Water Act (CWA) violations, the Sewerage and Water Board of New Orleans implemented a mitigation project at Lincoln Beach that included planting SAV, constructing vegetated buffer zones on the lake shore, and planting native wetland species to enhance existing wetland areas, and UNO assisted in these restoration efforts.

Discussion of Impacts

Future Conditions with No Action for LPV 105, 106, and 107

Waters of the U.S., including wetlands, would be impacted by mechanized activities under the no action alternative through dredging of Lake Pontchartrain and placement of foreshore protection as well as the improvement of levees, floodwalls and floodgates along LPV 105, 106 and 107, to meet the previously authorized elevation and current design criteria. Dredging and stockpiling material adjacent to the channel in Lake Pontchartrain to raise the foreshore protection would temporarily impact approximately 61.1 acres of lakebed, and indirectly impact existing submerged aquatic vegetation in the project area. Best management practices including silt curtains would be utilized to minimize water quality impacts. Raising the foreshore protection to the authorized level would impact approximately 4 acres of emergent marsh. A pre-construction and post-construction bathymetric survey and submerged aquatic vegetation populations surveys would be conducted to document percent occurrences of aquatic plants in or near the construction area. If post construction surveys do not show a natural revegetation of the area occurring, plantings of submerged aquatic vegetation would occur to return the site to pre-construction conditions. Sandbars associated with intertidal marsh areas would continue to be affected by natural forces such as wave action and wind. Sandbar stabilization and marsh revegetation efforts by UNO along the Lake Pontchartrain shoreline would likely continue so long as Federal grant monies are available.

Future Conditions with Proposed Action and Alternatives for LPV 105, 106, and 107

Direct, Indirect and Cumulative Impacts to Wetlands

No wetlands within the LPV 105, 106, and 107 project areas would be impacted except for those areas previously discussed under the no action alternative. All levee, floodwall and floodgate construction would occur south of the NSRR, which separates the project area from the Lake Pontchartrain shoreline. Therefore, there would be no direct or indirect impacts to wetlands from implementation of the any of the LPV 105, 106 or 107 proposed actions or alternatives for levee, floodwall and floodgate construction..

3.2.3. Non-Wetland Resources / Upland Resources

Existing Conditions

Upland vegetation within the project area and at staging areas south of Hayne Boulevard is primarily maintained turf grasses, such as Bahia grass (*Paspalum notatum*), with scattered oaks (*Quercus* spp.) and other trees. The area around Lincoln Beach consists of a disturbed forest community dominated by live oak (*Quercus virginiana*), sugarberry (*Celtis laevigata*), sweet pecan (*Carya illinoiensis*), water oak (*Quercus nigra*), black willow (*Salix nigra)* and yaupon (*Ilex vomitoria*). Chinese tallow tree (*Sapium sebiferum*), a non-native, invasive species, was also frequently observed. Common vines observed include grape (*Vitus* sp.), poison ivy (*Toxicodendron radicans*), and trumpet creeper (*Campsis radicans*). Roseau cane (*Phragmites australis*), giant cane (*Arundinaria gigantea*), baccharis (*Baccharis halimifolia*), and wax myrtle (*Morella cerifera*) were common around the edges of the area. A large portion of the Lincoln

Beach area has been degraded by past land use, and the area includes many deteriorated structures (Photograph 6), concrete pads, and hurricane and storm damage risk reduction structures. The staging area at New Orleans Lakefront Airport has been previously disturbed and developed.

Photograph 6. Example of Deteriorated Structures at Lincoln Beach.

Discussion of Impacts

Future Conditions with No Action for LPV 105, 106, and 107

Under the no action alternative levee slopes in LPV 106 would be temporarily impacted as the levees are raised to the previously authorized elevation. Periodic maintenance of structures to continue to provide the previously authorized elevation would have long-term impacts to upland resources through periodic mowing of vegetation on levee slopes and raising of levee elevations in the future to compensate for subsidence. Relative to the 100-year level of risk reduction, with the previously authorized levels of risk reduction, large tropical storms could flood much of New Orleans East and cause numerous upland areas to be temporarily impacted due to inundation with brackish estuarine waters.

LPV 105

Future Conditions with Proposed Action

Direct Impacts to Uplands

Approximately 12 acres of previously disturbed land dominated by maintained turf grasses would be permanently impacted and covered by impermeable surfaces from the construction of T-walls and floodgates. Approximately 23 acres of maintained turf grass and developed areas would be temporarily disturbed in the proposed staging areas located south of Hayne Boulevard. All temporarily disturbed areas, including levee slopes, would be revegetated with turf grasses following construction. There would be impacts to vegetated and developed areas at New Orleans Lakefront Airport used temporarily for staging during construction.

Indirect Impacts to Uplands

Some upland areas would be impacted as a result of construction and required maintenance of the proposed project. However, upland areas in general would receive an indirect benefit from the LPV 105 proposed action as the risk of flooding in upland areas within the HSDRRS would be reduced under the proposed action.

Cumulative Impacts to Uplands

All proposed 100-year HSDRRS projects, including the excavation of borrow material for levee construction, would have impacts to upland resources. However, the total area of impacts to upland resources from all proposed risk reduction projects, as well as projects proposed by others during the rebuilding efforts in Metropolitan New Orleans, cannot be quantified at this time. Cumulative impacts to upland resources from components of the HSDRRS, including all borrow locations in New Orleans East approved under Task Force Guardian and IERs addressing borrow material, would be adverse and long-term. However, because of the urban and developed nature of much of New Orleans East, and upland areas impacted by modifications to the HSDRRS and borrow areas, the cumulative impacts to relatively undisturbed upland resources would be minor.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Uplands

Direct, indirect and cumulative impacts on non-wetland resources resulting from LPV 105 Alternative 1 would be similar to those occurring under the proposed action with the exception of LPV 105 East (east of Alabama Street). A larger area of non-wetland resources would be disturbed during the replacement of the I-wall with a T-wall compared to constructing a new T-wall east of Alabama Street. The total area impacted by LPV 105 Alternative 1 is 12.6 acres. Most of these areas have been previously disturbed and are comprised of concrete I-walls, adjacent concrete slope protection and sidewalks; no substantial change in condition would occur under LPV 105 Alternative 1.

LPV 106

Future Conditions with Proposed Action

Direct Impacts to Uplands

LPV 106 proposed action alternative would temporarily degrade 35.6 acres of turf grasses in the levee area. Grasses would be planted on levee slopes following construction, and no permanent loss of turf grasses would occur. Temporary impacts to staging areas would be the same as described for LPV 105 proposed action.

Indirect and Cumulative Impacts to Uplands

Indirect and cumulative impacts to non-wetland resources would be similar to those described for the LPV 105 proposed action.

Future Conditions with Alternative 1

Direct Impacts to Uplands

The construction of a T-wall cap would result in the permanent loss of 1.6 acres of maintained turf grass within the levee area, as the levee crown would be replaced with a concrete T-wall and base. Temporary impacts to staging areas would be the same as described for LPV 105 proposed action.

Indirect and Cumulative Impacts to Uplands

Indirect and cumulative impacts to non-wetland resources would be similar to those described for the LPV 105 proposed action.

LPV 107

Future Conditions with Proposed Action

Direct Impacts to Uplands

Under the LPV 107 proposed action, the construction of a levee along a new alignment would result in temporary impacts to 3.9 acres of maintained turf grasses and developed areas. After the completion of levee construction, levee slopes would be vegetated with turf grasses and maintained by mowing the levee slopes periodically. Temporary impacts to staging areas would be the same as described for LPV 105 proposed action.

Indirect and Cumulative Impacts to Uplands

Indirect and cumulative impacts to non-wetland resources would be similar to those described for the LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impact to Uplands

Direct, indirect and cumulative impacts to non-wetland resources resulting from LPV 107 Alternative 1 would be similar to those occurring under the proposed action. However, 1.6 acres of maintained turf grasses and developed areas would be permanently altered with the construction of a T-wall.

3.2.4. Fisheries

Existing Conditions

Lake Pontchartrain contains diverse habitats and a wide-range of salinities, making the estuary suitable for a variety of fish and crustaceans throughout the year. Over 125 species of fish have been recorded from Lake Pontchartrain. The fauna is dominated by sciaenids in the saltier mid and eastern regions of the basin and by centrarchids where freshwater streams and swamps drain into the lake (University of New Orleans Nekton Research Laboratory 2008). Some common species include bay anchovy (*Anchoa mitchilli*), Atlantic croaker (*Micropogonias undulatus*), Gulf menhaden (*Brevoortia patronus*), and members of the silverside family (Atherinidae)

(Stone *et al.* 1980). Fish populations in Lake Pontchartrain also include a number of important gamefish such as spotted seatrout (*Cynoscion nebulous*) and red drum (*Sciaenops ocellatus*). The estuarine habitat produces many species of fish that serve as prey for predatory fish. Common prey species include rainwater killifish (*Lucania parva*), naked goby (*Gobiosoma bosc*), Gulf pipefish (*Syngnathus scovelli*), clown goby (*Microgobius gulosus*), pinfish (*Lagodon rhomboides*), bay anchovy, and speckled worm eel (*Myrophis punctatus*) (Duffy and Baltz 1998).

Lake Pontchartrain's substratum constitutes a major nursery ground for commercially valuable species harvested in Louisiana's coastal waters (NOAA Fisheries Service [Fisheries] 2007a). Post-larval, juvenile, and adult white shrimp (*Litopenaeus setiferus*) and brown shrimp (*Farfantepenaeus aztecus*) are abundant in Lake Pontchartrain year-round. White and brown shrimp landings represent large portions of the total harvest, respectively constituting 33 and 21 percent of the total value of annual fish landings in Louisiana. Across the state of Louisiana, white and brown shrimp, blue crab (*Callinectes sapidus*), and Gulf menhaden fisheries produce $250 million annually, which constitutes 80 percent of the total value of landings in the state.

The prey organisms found in Lake Pontchartrain provide food for large finfish harvested both commercially and recreationally along the Gulf coast and continental shelf (NOAA Fisheries 2007b). Commercial landings for all finfish combined constitute 7 percent of value of Louisiana's annual total statewide landings. The large Federally-managed finfish species, such as grouper (family Serranidae), snapper (family Lutjanidae), and mackerel (family Scombridae), represent $5.2 million and 2 percent of the total value of the annual landings in Louisiana.

Commercial fisheries create $2.8 billion annually in economic benefits for the Louisiana economy (Southwick 1997). Approximately 3,300 commercial vessels are licensed to fish in Louisiana coastal and estuarine waters. The commercial fishing vessels directly provide 31,400 jobs and economic benefits of commercial fishing support several other fishery sectors such as boat building and repairs, net construction, and value added seafood items. In Louisiana, coastal and offshore recreational fishing generates $745 million in local revenue and creates 7,786 jobs (American Sportfishing Association 2002). Lake Pontchartrain is an important estuarine component of the coastal fisheries in Louisiana, and contributes to these benefits directly through active commercial fishing, and indirectly by providing nursery grounds and prey organisms for commercial fish.

Discussion of Impacts

Future Conditions with No Action for LPV 105, 106, and 107

Raising the LPV 105 floodwalls, LPV 106 levee and foreshore protection, and LPV 107 floodgates to the previously authorized elevation using current design criteria would have temporary impacts to wetlands and lake bottom, primarily through dredging and stockpiling activities to create four perpendicular access channels. These would impact approximately 61.1 acres of lakebed and submerged aquatic vegetation in the project area associated with foreshore protection placement. The foreshore protection will permanently fill approximately 6.9 acres of Lake Pontchartrain, causing a loss of forage habitat for finfish. The indirect impacts of disturbed soils and sediments in the project area would be temporary and controlled through the use of best management practices, and would not permanently impact Lake Pontchartrain fish populations.

Stormwater would continue to be pumped into Lake Pontchartrain following typical rainfall events. Relative to the 100-year level of risk reduction, there would be a greater level of risk from future flooding of urban areas following the passage of a major tropical storm, which would require dewatering by pumping of flood waters into Lake Pontchartrain.

Short-term cumulative impacts to fisheries would occur from other HSDRRS projects that alter estuarine habitats during construction activities, such as dredging of Lake Pontchartrain for foreshore protection and filling of wetlands for expansion of levee footprints. Additionally, other construction projects, such as pump station improvements from the Southeast Louisiana Urban Flood Control Project and the I-10 Twin Span Bridge replacement, alter fisheries habitat through increased turbidity and disturbance of lake bottom. However, in the long-term, providing the 100-year level of risk reduction for the Metropolitan New Orleans Area reduces the risk of overtopping and urban flooding, which could result in temporary water quality impacts from pumping of floodwaters into adjacent estuaries.

LPV 105

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Fisheries

The construction of floodwalls, floodgates, and levee improvements would have no direct impacts to fish populations or fish habitats in Lake Pontchartrain. Implementation of a SWPPP would minimize temporary indirect impacts to fish populations and fish habitats resulting from potential soil erosion and consequent degradation of water quality.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Fisheries

Direct, indirect and cumulative impacts to fisheries resulting from LPV 105 Alternative 1 would be similar to those occurring under the LPV 105 proposed action.

LPV 106

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Fisheries

Direct, indirect, and cumulative impacts to fish populations and fish habitats resulting from construction of levee improvements would be similar to those occurring under the LPV 105 proposed action. Previously authorized foreshore protection work would cumulatively impact fisheries as described in the No Action alternative.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Fisheries

Direct, indirect and cumulative impacts to fisheries resulting from LPV 106 Alternative 1 would be similar to those occurring under the LPV 106 proposed action.

LPV 107

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Fisheries

Direct, indirect and cumulative impacts to fisheries resulting from LPV 107 proposed action would be similar to those occurring under the LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Fisheries

Direct, indirect and cumulative impacts to fisheries resulting from LPV 107 Alternative 1 would be similar to those occurring under the LPV 105 proposed action.

3.2.5. Wildlife

The Lake Pontchartrain shoreline provides habitat for birds and mammals that are utilized for hunting and other recreational uses, such as bird watching. Species not typically found on levees and floodwalls in the project area, but that could be found in the areas surrounding Lake Pontchartrain, such as white-tailed deer (*Odoccoileus virginianus*), American alligator (*Alligator mississippiensis*), and wood duck (*Aix sponsa*), provide state income in the form of hunting license fees. The Lake Pontchartrain Basin and the nearby Bayou Sauvage NWR are popular areas for viewing American alligator and various migratory bird species and have rich wildlife diversity. Although much of the Lake Pontchartrain Basin provides habitat for a variety of important wildlife species, the project area is mostly disturbed, and species that are common to the area are those that are most adapted to an urban environment, such as nutria (*Myocaster coypus*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), nine-banded armadillo (*Dasypus novemcinctus*), house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), rock dove (*Columba livia*), cattle egret (*Bulbulcus ibis*), common grackle (*Quiscalus quiscula*), and American crow (*Corvus brachyrhynchos*).

Discussion of Impacts

Future Conditions with No Action for LPV 105, 106, and 107

The no action alternative would temporarily degrade foraging habitat for some ducks and wading birds in Lake Pontchartrain during dredging operations and placement of the previously authorized foreshore protection. Also, construction activities necessary to meet the previously authorized HSDRRS elevation could temporarily preclude the movement of common wildlife along the Lake Pontchartrain shoreline. Wildlife using the LPV 106 levee area would be temporarily disturbed during construction activities necessary to raise the levee to the previously authorized elevation using new design criteria. Periodic disturbances from operations and maintenance, such as periodic mowing of turf grasses along levee alignments would also disturb wildlife. Relative to the 100-year level of risk reduction, there would be a greater risk of flooding associated with a large tropical storm event that could cause the direct loss of less mobile wildlife species that would not be able to escape floodwaters within urban areas of New Orleans.

LPV 105

Future Conditions with Proposed Action

Direct Impacts to Wildlife

Wildlife utilizing habitats along the Lake Pontchartrain shoreline and the staging areas along Hayne Boulevard and New Orleans Lakefront Airport could be temporarily disturbed by construction activities. Mobile species, such as birds and mammals, would utilize nearby habitats such as Bayou Sauvage NWR or open space adjacent to the New Orleans Lakefront Airport during construction and would be able to return to habitats along the shoreline of Lake Pontchartrain following construction. Due to the general lack of wildlife habitat and the relatively low quality of existing habitats, these temporary direct impacts would be minimal.

Bald eagles may nest in mature trees near marshes and open water habitat; however, eagle nests have not been recorded in the vicinity of the project area. USFWS has provided recommendations as described by the National Bald Eagle Management Guidelines for compliance with the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. CEMVN will fully comply with the guidelines provided by USFWS to avoid impacts to nesting bald eagles (Appendix D).

Indirect Impacts to Wildlife

No indirect impacts resulting from the LPV 105 proposed action on wildlife are anticipated.

Cumulative Impacts to Wildlife

Most HSDRRS projects and components of the Southeast Louisiana Urban Flood Control project, as well as projects proposed by others in the New Orleans Metropolitan Area, would occur in urbanized areas where there is little wildlife habitat present. Few direct cumulative impacts to wildlife are anticipated from these projects. However, the loss of habitat for some species that are adapted to urban environments due to borrow projects' excavation activities would be a direct cumulative impact to wildlife. The construction of a gated structure at Seabrook; the construction of the MRGO, GIWW, Bayou Bienvenue and Golden Triangle Marsh floodwall/gated system; and dredging activities in Lake Pontchartrain could have short-term cumulative impacts to bottlenose dolphin (*Tursiops truncatus*) foraging and travel because of disturbance to estuarine environments.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Wildlife

Direct, indirect and cumulative impacts to wildlife resulting from LPV 105 Alternative 1 would be similar to those occurring under the LPV 105 proposed action.

LPV 106

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Wildlife

The direct, indirect and cumulative impacts to wildlife resulting from levee improvements would be similar to those described for the LPV 105 proposed action. The implementation of dredging for previously authorized foreshore protection along Lake Pontchartrain as described in the No Action alternative would cumulatively impact wildlife.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Wildlife

Direct, indirect and cumulative impacts to wildlife resulting from LPV 106 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

LPV 107

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Wildlife

Impacts to wildlife resulting from LPV 107 proposed action would be similar to those occurring under LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Wildlife

Impacts to wildlife resulting from LPV 107 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

3.2.6. Essential Fish Habitat

Existing Conditions

Designated Essential Fish Habitat (EFH) structure in the estuarine regions of the Gulf of Mexico consists of oyster reefs, SAV, wetlands and artificial structures (Gulf of Mexico Fisheries Management Council [GMFMC] 2004). Each of these habitats can be found in the shallow waters of Lake Pontchartrain. Therefore, Lake Pontchartrain provides EFH within the project area and includes EFH for the following Federally managed species: brown shrimp, white shrimp, and red drum.

Rangia clams (*Rangia cuneata*) are abundant in Lake Pontchartrain. They are prey species for many lake predators, including white shrimp, blue crab (*Callinectes sapidus*) and benthic feeding fishes. The remains of rangia clams introduce hard substrate to the lake bottom that is composed largely of clays and silts. The rangia clam hard substrata provide surface area for a wide range of benthic copepods, polychaetes, benthic algae, mollusks, bryozoans, amphipods, and other zooplankton to feed and reproduce. Ichthyoplankton feed over the reefs. The rangia clam is a keystone species in Lake Pontchartrain. They suffer mortality due to a reduction in dissolved oxygen associated with dredging, severe weather events, high salinity levels and stratification, and non-point source pollution (Poirrier *et al.* In-press). Hurricane Katrina resulted in low dissolved oxygen in the bottom layer of Lake Pontchartrain, which reduced the abundance of rangia clams in Lake Pontchartrain. Rangia clams and other community dominants were lost from 50 percent of the lake bottom, and have been slow to recover (Poirrier and Spalding 2007).

In early 2000, the Lake Pontchartrain Artificial Reef Working Group, a partnership of the Lake Pontchartrain Basin Foundation, sportsmen, private groups, and local and state agencies, initiated the creation of artificial reefs in Lake Pontchartrain. From 2001 to 2004, five artificial reef sites were developed and donated to the Louisiana Department of Wildlife and Fisheries (LaDWF). One of the artificial reef sites is located 3 miles offshore of the project area. This reef is a series of crushed limestone rubble mounds. The mounds are spread over a 2-acre site to create a large area of varied relief (Lake Pontchartrain Basin Foundation 2007). Table 3 presents the Federally managed species found in Lake Pontchartrain and Lake Borgne and their preferred habitats.

Table 3. List of Federally Managed Species and Their Habitat and Relative Abundance

Managed Species	Life Stages	Designated EFH (1)	Relative Abundance (2)
Brown shrimp (*Farfantepenaeus aztecus*)	Eggs	Sand, shell and soft bottom	Common
	Larvae	SAV, emergent marsh and oyster reef	Abundant
	Adult	SAV, emergent marsh, oyster reef and sand, shell and soft bottom	Rare
White shrimp (*Litopenaeus setiferus*)	Eggs	Sand, shell and soft bottom	Common
	Larvae	SAV, soft bottom and emergent marsh	Abundant
	Adult	SAV, emergent marsh, oyster reef and sand, shell and soft bottom	Abundant
Pink Shrimp (*Farfantepenaeus duorarum*)	Eggs	Sand and shell bottom	Common
	Larvae	SAV, sand and shell bottom	Common
	Adult	Sand and shell substrate	Rare
Gulf stone crab (*Menippe mercenaria*)	Eggs	Sand, shell and soft bottom	Not Present
	Larvae	Oyster reefs and soft bottom	Not Present
	Adult	Sand, shell and soft bottom and oyster reefs	Rare
Red drum (*Sciaenops ocellatus*)	Eggs	SAV, emergent marsh, oyster reef and sand, shell and soft bottom	Common
	Larvae	SAV, emergent marsh, oyster reef and sand, shell and soft bottom	Common
	Adult	SAV, emergent marsh, oyster reef and sand, shell and soft bottom	Common
Spanish mackerel (*Scomberomorus maculatus*)	Juvenile	Water column	Rare
	Adult	Water column	Not Present

Source: 1. NOAA Fisheries 2007b. 2. GMFMC 2004.

Discussion of Impacts

Future Conditions with No Action for LPV 105, 106, and 107

Replacing the I-wall with a T-wall in LPV 105, raising the LPV 106 levee, dredging four perpendicular temporary access channels and placement of foreshore protection, and replacing the existing LPV 107 floodwall and floodgate to the previously authorized elevation and current design criteria would have temporary impacts to wetlands and lake bottom causing a loss of forage habitat for finfish and shrimp, and directly impact approximately 61.1 acres of lakebed and submerged aquatic vegetation in the project area. The placement of foreshore protection would permanently fill 6.9 acres of Lake Pontchartrain and replace it with rock riprap.

Stormwater would continue to be pumped into Lake Pontchartrain following typical rainfall events. Relative to the 100-year level of risk reduction, future flooding of urban areas following the passage of a major tropical storm would require more dewatering by pumping of flood waters into Lake Pontchartrain.

Dredging activities for foreshore protection placement is proposed for much of Lake Pontchartrain in New Orleans East and Jefferson Parish; construction activities for a gated structure at Seabrook; construction of new pump stations at the Orleans Avenue, London Avenue, and 17th Street canals; dredging for access at the West Return Floodwall; breakwater improvements at Jefferson Parish pump stations; HSDRRS improvements at Causeway Boulevard; and replacement of the I-10 Twin Span Bridge across Lake Pontchartrain by Louisiana Department of Transportation and Development (DOTD) would have cumulative

direct effects to EFH. These activities could temporarily increase turbidity in Lake Pontchartrain and could disturb SAV and shallow lake bottom habitats. Other proposed projects in the vicinity of Citrus Lakefront Levee, such as the construction of floodwalls, levees, and pump stations; a gated structure at Seabrook; the floodwall/gated system across the GIWW, Bayou Bienvenue, MRGO and the Golden Triangle marsh; and the IHNC Lock Replacement project would fill intertidal wetlands, and would therefore contribute to the cumulative effects to EFH. There would be no cumulative effects to EFH from the implementation of borrow projects in New Orleans East.

LPV 105

Future Conditions with Proposed Action

Direct and Indirect Impacts to EFH

The construction of a new floodgate, floodwalls and levee could result in a temporary increase in suspended sediments discharged to adjacent water bodies during construction activities. Construction equipment and operations may create miscellaneous operational pollution such as oil leaks, mud spatters, and discards from human activities. Implementation of best management practices as described by the project's SWPPP would minimize temporary indirect impacts to EFH resulting from potential soil erosion and consequent degradation of water quality.

The artificial reef located 3 miles offshore of the project area would not be impacted by construction activities.

Cumulative Impacts to EFH

Short-term cumulative impacts to EFH would occur from other HSDRRS projects that alter estuarine habitats during construction activities, such as dredging of Lake Pontchartrain for placement of previously authorized foreshore protection and filling of wetlands for expansion of levee footprints. Additionally, other construction projects such as the I-10 Twin Span Bridge replacement alters fisheries habitat through increased turbidity and disturbance of lake bottom. However, in the long-term, providing the 100-year level of risk reduction for the New Orleans Metropolitan Area reduces the risk of overtopping and urban flooding, and temporary water quality impacts from pumping of floodwaters into adjacent estuaries.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to EFH

Direct, indirect and cumulative impacts to EFH resulting from LPV 105 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

LPV 106

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to EFH

Direct, indirect and cumulative impacts on EFH resulting from levee improvements under the LPV 106 proposed action would be similar to those occurring under the LPV 105 proposed action. Short-term cumulative impacts to EFH would occur from other HSDRRS projects that alter estuarine habitats during construction activities and from the dredging of Lake Pontchartrain in order to restore foreshore protection as discussed in the no action alternative.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to EFH

Direct, indirect and cumulative impacts on EFH resulting from LPV 106 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

LPV 107

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to EFH

Direct, indirect and cumulative impacts on EFH resulting from LPV 107 proposed action would be similar to those occurring under LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to EFH

Direct, indirect and cumulative impacts on EFH resulting from LPV 107 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

3.2.7. Endangered or Threatened Species

Existing Conditions

Several species listed as threatened (T) or endangered (E) could occur in the Citrus Lakefront Levee project area (U.S. Fish and Wildlife Service [USFWS] 2008a). These species are brown pelican (*Pelecanus occidnetalis*) (E), Gulf sturgeon (*Acipenser oxyrhynchus desotoi*) (T), and West Indian manatee (*Trichechus manatus*) (E). However, there are no direct or indirect impacts to Lake Pontchartrain from the proposed action or alternative activities.

Three listed species of sea turtles may occur at the project site: the Kemp's ridley (*Lepidochelys kempii*) (E), the green (*Chelonia mydas*) (T), and the loggerhead (*Caretta caretta*) (T). All three of these sea turtle species are known to forage as juveniles and adults in nearshore waters, including estuaries, in Louisiana and may be more likely to occur there in months when the waters are warmer. None of these species have designated critical habitat in Lake Pontchartrain or the region. NOAA Fisheries (Section 7 consultation letter 13 March 2009, Appendix D) determined that the project would not likely impact these species and they are not considered further. However, should a sea turtle(s) be observed in the project area then the mitigation measures outlined below would be followed.

The project area and adjacent coastal waters provide low quality habitat for protected species. The brown pelican is more likely to use these waters for foraging due to the availability of spits and off-shore sandbars which provide resting and roosting areas for this species (LaDWF 2006). No brown pelican breeding or nesting areas occur in the vicinity of the project area.

Brown Pelican

Brown pelicans feed along the U.S. coast in shallow estuarine waters, using sand spits and offshore sand bars as daily resting and nocturnal roosting areas (USFWS 1995). Brown pelican nesting colonies are found on small, off-shore islands protected from mammalian predators where nests are built in mangrove trees or other shrubby vegetation. The brown pelican was extirpated from Louisiana in 1963 as a result of exposure to pesticides and was reintroduced

between 1968 and 1980 (LaDWF 2006). Population productivity peaked in Louisiana in 2004, when 16,501 nesting pairs produced 39,021 fledglings. During 2005, tropical storms and hurricanes resulted in reduced productivity and substantial loss of habitat, especially east of the Mississippi River. Furthermore, an oil spill from Amerada Hess' Breton Sound 51 oil production platform occurred in 2005 that washed directly into the nesting areas on West Breton Island and many young pelicans were covered in oil (USFWS 2008b). Major threats to this species include chemical pollutants, colony site erosion, disease, and human disturbance (USFWS 1995).

Gulf Sturgeon
The Gulf sturgeon, Federally listed as a threatened species, is an anadromous fish that occurs in many rivers, streams, and estuarine waters along the northern Gulf coast between the Mississippi River and the Suwanee River, Florida (USFWS 2003). In Louisiana, the Gulf sturgeon has been reported at Rigolets Pass, rivers and lakes of the Pontchartrain Basin, and adjacent estuarine areas. Spawning occurs in coastal rivers between late winter and early spring (i.e., March to May). Adults and sub-adults may be found in coastal rivers and streams until November, and in estuarine or marine waters during the remainder of the year. Gulf sturgeons less than 2 years old appear to remain in riverine habitats and estuarine areas throughout the year, rather than migrate to marine waters. Habitat alterations such as those caused by water control structures that limit and prevent spawning, poor water quality, and over-fishing have negatively affected this species.

Critical habitat for the Gulf sturgeon occurs in Louisiana, Mississippi, Alabama, and Florida (USFWS 2003). Unit 1 of this critical habitat includes portions of the Pearl and Bogue Chitto Rivers, Lake Pontchartrain east of the Lake Pontchartrain Causeway, all of Little Lake, the Rigolets, Lake St. Catherine, and Lake Borgne within Louisiana (USFWS 2003). The primary constituent elements essential for the conservation of Gulf sturgeon are those habitat components that support feeding, resting, sheltering, reproduction, migration, and physical features necessary for maintaining the natural processes that support those habitat components. The primary constituent elements for Gulf sturgeon critical habitat in estuarine areas include:

- abundant prey items for juvenile, sub-adult, and adult life stages;
- water quality including; temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics necessary for normal behavior, growth, and viability;
- sediment quality including; texture and other chemical characteristics, necessary for normal behavior, growth, and viability; and
- safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats.

West Indian Manatee
Federally listed as an endangered species, West Indian manatees can be found in shallow, slow-moving rivers, estuaries, salt-water bays, canals, and coastal areas (LaDWF 2007). West Indian manatees are typically found in waters with dense submerged aquatic beds or floating vegetation where the species grazes on a variety of aquatic plants. West Indian manatees occasionally enter Lake Pontchartrain and Lake Maurepas, and associated coastal waters and streams during the summer months (i.e., June through September) (USFWS 2007). Manatees have been reported in the Amite, Blind, Tchefuncte, and Tickfaw Rivers, and in canals within the adjacent coastal marshes of Louisiana. They have also been occasionally observed elsewhere along the Louisiana Gulf coast. The manatee has declined in numbers due to collisions with boats and barges, entrapment in flood control structures, poaching, habitat loss, and pollution.

Discussion of Impacts

Future Conditions with No Action for LPV 105, 106, and 107

Construction of levees and floodwalls to meet the previously authorized level of risk reduction would have temporary direct impacts on Gulf sturgeon or West Indian manatee habitat, however best management practices such as silt curtains and time windows for dredging four perpendicular access channels would be restricted to the months of May through September to minimize impacts. The restoration of the foreshore protection to previously authorized elevations would permanently impact 6.9 acres of Gulf sturgeon critical habitat. The dredging activities would temporarily impact another 61.1 acres of Gulf sturgeon critical habitat. The bucket drop procedure developed by USFWS would also be employed to encourage any Gulf sturgeon in the vicinity to leave the project area. The shallow estuarine waters adjacent to the project area would continue to provide potential foraging habitat for brown pelicans. West Indian manatees could still migrate through the area. However, the risk of flooding of urban areas due to storm-driven waves topping the previously authorized level of the HSDRRS would be greater than the 100-year level of risk reduction, and dewatering of New Orleans East could affect water quality in Lake Pontchartrain. Dewatering could result in minimal reduction of forage availability for brown pelicans, manatee and Gulf sturgeon. Individuals would temporarily forage in unaffected areas, and would quickly return to the affected area once suitable water quality returns. Depending on the level of contaminants in floodwaters pumped into Lake Pontchartrain, chronic disease in some individual sturgeon and potentially mortality could occur.

Dredging activities associated with the placement of previously authorized foreshore protection may affect but would not likely adversely affect Gulf sturgeon or West Indian manatee. However, dredging activities would temporarily alter Gulf sturgeon critical habitat. The National Marine Fisheries Service Protected Species Division concurred with the CEMVN determination that the actions proposed do not rise to the level of jeopardy to the Gulf sturgeon or destruction or adverse modifications of Gulf sturgeon designated habitat for IER 6 on 13 March 2009 (see Appendix D).

Gulf sturgeon and manatee protection measures, as recommended by USFWS and NOAA Fisheries during Endangered Species Act Section 7 consultation (Appendix D), would be implemented to minimize impacts to these two species. In order to minimize the potential for construction activities under the proposed action to cause impacts to the manatee, standard manatee protection measures would be followed. These procedures have been recommended by USFWS (USFWS 2007) and adopted by USACE (2005) for use in situations where in-water construction activities potentially could occur where manatees may be present. These procedures include the following:

All contract personnel associated with the project would be informed of the potential for manatees to be present and of the need to avoid collisions with manatees, which are protected under the Endangered Species Act and the Marine Mammal Protection Act of 1972. All construction personnel would be responsible for observing water-related activities for the presence of manatees. Temporary signs would be posted before and during all construction activities to remind personnel to be alert for the possible presence of manatees during active construction operations and within vessel movement zones in the work area; at least one sign would be placed where it would be visible to the vessel operator. Siltation barriers would be made of material in which manatees could not become entangled and would be properly secured and monitored if used. If a manatee were to be sighted within 100 yards of the active work zone, special operating conditions would be implemented, including: no operation of moving equipment within 50 ft of a manatee; all vessels would operate at no wake/idle speeds within 100 yards of the work area; and siltation barriers, if used, would be re-secured and monitored.

Activities would not resume until the manatee has left the 100-yard buffer zone around the work area on its own accord. Then, special operating conditions would no longer be necessary, and careful observation would resume. Any sighting of a manatee would be immediately reported to the USFWS Lafayette, Louisiana field office and the Natural Heritage Program of the LaDWF.

In order to minimize the potential for construction activities under the proposed action to cause impacts to sea turtles, construction conditions recommended by NMFS would be followed. These conditions include the following:

All personnel associated with the project would be instructed of the potential presence of sea turtles and the need to avoid collisions with sea turtles. All construction personnel would be responsible for observing water-related activities for the presence of these species. All construction personnel would be advised that there are civil and criminal penalties for harming, harassing, or killing sea turtles, which are protected under the Endangered Species Act of 1973. Siltation barriers would be made of materials in which sea turtles cannot become entangled, be properly secured, and be regularly monitored to avoid protected species entrapment. Barriers would not block sea turtle entry to or exit from designated critical habitat without prior agreement from the NMFS' Protected Resources Division, St. Petersburg, Florida. All vessels associated with the construction project would operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels would preferentially follow deep-water routes (e.g. marked channels) whenever possible. If a sea turtle is seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions would be implemented to ensure its protection. These precautions would include the cessation of operation of any moving equipment closer than 50 feet of a sea turtle. Operation of any mechanical construction equipment would cease immediately if a sea turtle is seen within a 50 feet radius of the equipment. Activities would not resume until the protected species has departed the project area of its own volition. Any collision with and/or injury to a sea turtle would be reported immediately to the NMFS' Protected Resources Division (727-824-5312) and the local authorized sea turtle stranding/rescue organization.

LPV 105

Future Conditions with Proposed Action

Direct Impacts to Endangered or Threatened Species

Implementation of the proposed action would result in increased noise and disturbance in the project area and could temporarily displace any brown pelicans resting or foraging in the area. However, brown pelicans are not currently known to nest in the project vicinity. The USFWS in a letter received February 2, 2009 concurred with the CEMVN determination that construction of the proposed project features is not likely to adversely affect the brown pelican.

Indirect Impacts to Endangered or Threatened Species

No indirect effects to the brown pelican would occur under the LPV 105 proposed action.

Cumulative Impacts to Endangered or Threatened Species

Dredging activities as described in the No Action alternative for previously authorized foreshore protection placement to the shoreline of Lake Pontchartrain in New Orleans East and Jefferson Parish; construction activities for a gated structure at Seabrook; construction of new pump stations at the Orleans Avenue, London Avenue and 17th Street canals; placement of additional protection around Jefferson Parish pump stations; and replacement of the I-10 Twin Span Bridge across Lake Pontchartrain by DOTD would have cumulative indirect effects to the West Indian

manatee and Gulf sturgeon. These activities would temporarily increase turbidity in Lake Pontchartrain and could disturb SAV and shallow water habitats utilized by Gulf sturgeon, West Indian manatee and brown pelican for foraging. Other proposed projects in the vicinity of LPV 109, such as the construction of floodwalls, levees, and pump stations; a gated structure at Seabrook; the floodwall/gated system across the GIWW, Bayou Bienvenue, MRGO, and the Golden Triangle marsh; and the IHNC Lock Replacement project would have similar impacts as those described by the proposed action, and would therefore contribute to the short-term cumulative effects to brown pelican, Gulf sturgeon and West Indian manatee. There would be no cumulative effects to these species from the implementation of borrow projects in New Orleans East.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Endangered or Threatened Species

Direct, indirect and cumulative effects on brown pelican resulting from LPV 105 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

LPV 106

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Endangered or Threatened Species

Direct, indirect and cumulative effects to brown pelican from levee improvements would be similar to those described for the LPV 105 proposed action. The restoration of the foreshore protection would result in temporary and permanent impacts to Gulf sturgeon critical habitat as discussed in the no action alternative.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Endangered or Threatened Species

Direct, indirect and cumulative effects on brown pelican resulting from LPV 106 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

LPV 107

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Endangered or Threatened Species

Direct, indirect and cumulative effects on brown pelican resulting from LPV 107 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Endangered or Threatened Species

Direct, indirect and cumulative effects on endangered or threatened species resulting from LPV 107 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

3.2.8. Cultural Resources

Existing Conditions

Numerous archaeological sites and historic properties have been previously recorded in the greater New Orleans Metropolitan Area, including the IER #6 study area, and its immediate vicinity. Known prehistoric sites are primarily situated on the relatively high natural levee and shoreline deposits located adjacent to the Mississippi River, Lake Pontchartrain, and along smaller waterways such as Bayou St. John and the high ground running along Metairie Ridge. Similarly, historic period archaeological sites and structures, including those associated with forts, plantations, farmsteads, and cemeteries; residential, commercial, and industrial areas; and river and lake port facilities initially developed along these same elevated areas. Further historic development later expanded into drained back swamp, land-filled locations and along canal waterways. Historic period watercraft are recorded in Lake Pontchartrain as well as bayou and river channels in the region.

CEMVN contracted R. Christopher Goodwin and Associates, Inc. to conduct a cultural resources investigation of the IER #6 study area, including the proposed action and all project alternatives being considered at that time (Heller *et al*. 2008). This study investigated an area much larger than the proposed action boundaries and included a 1,750-foot-wide linear corridor extending approximately 1,250 feet north into Lake Pontchartrain and 500 feet south on the protected side of the existing levee/floodwall center line. The study extended from the IHNC east to Paris Road. Researchers reviewed previous cultural resources investigations and site records, along with soil data and field reconnaissance information, to identify and selectively investigate previously recorded archaeological sites and high potential areas for archaeological resources. A general assessment of historic structures in the project area was also conducted to identify individual historic structures and historic districts that may be eligible for, or that are listed on, the National Register of Historic Places (NRHP). In addition, a remote sensing survey of submerged lands was conducted from the shoreline north approximately 1,250 feet into Lake Pontchartrain along the entire project length to identify targets exhibiting cultural resources characteristics.

Background research conducted at the Louisiana Division of Archaeology identified four previously conducted cultural resources surveys within or intersecting the IER #6 study area. Three of these surveys were conducted by or on behalf of the USACE in conjunction with levee improvement projects, while the fourth survey was conducted for the U.S. Department of Transportation and DOTD in conjunction with a proposed highway widening project.

Six recorded terrestrial prehistoric archaeological sites, including 16OR2 (Little Woods), 16OR5 (Little Woods), 16OR15 (Hayne Boulevard and Paris Road), 16OR20 (Citrus Canal), 16OR24 (Seabrook, Locus A and B), and 16OR28 (Little Woods); two historic military sites, including a portion of the Army Air Base-Naval Reserve Headquarters Facility and the former location of the Louisiana State National Guard Observation Base; and one submerged historic shipwreck site, 16OR97 (Citrus Lakefront Shipwreck) are previously documented in, or immediately adjacent to, the study area boundaries. A review of the NRHP database found no listed properties in the study area.

Although background research and field investigations identified four cultural resource sites situated directly within the boundaries of the LPV 106 proposed action, further investigations determined that these sites lacked sufficient integrity and research potential to be considered eligible for listing in the NRHP. These include two prehistoric period archaeological sites reported on the Lake Pontchartrain shoreline - 16OR24 (Seabrook, Locus B) and 16OR28 (Little Woods), and two historic period archaeological sites recently discovered within proposed staging areas - 16OR444 (Locus 06-B-01, Locus 06-B-02) and 16OR446 (Locus 06-E-01).

Site 16OR24 (Seabrook, Locus B) was recorded in 1976 as the second remnant of a much larger prehistoric shell midden first documented in 1951 along the shoreline of Lake Pontchartrain. Recent investigations conducted in 2008 found no archaeological material at the reported site location and researchers surmise that severe wave action has completely destroyed the site.

Site 16OR28 (Little Woods) is a prehistoric shell midden first recorded in 1957 and later described in the 1970s and 1980s as a heavily eroded and redeposited beach scatter exhibiting shell and prehistoric artifacts along the lake shoreline. Recent investigations conducted within the LPV 106 portion of the site identified only a few historic period artifacts and shell that had been redeposited on top of shoreline riprap. Researchers confirmed the results of previous investigations and concluded that the IER #6 portion of Site 16OR28 (Little Woods) has been destroyed.

Site 16OR444 (Locus 06-B-01 and Locus 06-B-02) was identified during Phase 1 investigations at the proposed Crowder Boulevard Staging Area, which is situated on a 4.6-acre undeveloped lot south of Hayne Boulevard. Subsurface testing identified two separate loci exhibiting a low density scatter of historic debris dating from the late nineteenth and early twentieth centuries, as well as the modern era. Researchers determined that these low density historic scatters are situated in redeposited soil and lack sufficient integrity to be considered eligible for listing on the NRHP.

Site 16OR446 (Locus 06-E-01) is situated within the proposed 1.7-acre Read Boulevard Staging Area. Recent Phase 1 and Phase 2 cultural resource investigations at the site identified a historic period occupation represented by distinct layers of architectural rubble and domestic refuse, with artifacts dating from the mid-nineteenth and mid-twentieth centuries, and from the modern era. Researchers determined that the subsurface strata at the site was redeposited and lacked sufficient integrity to be considered eligible for listing on the NRHP.

Field reconnaissance survey and soil data review identified additional cultural resources and high probability areas in the IER #6 study area including three historic properties, the New Orleans Lakefront Airport, Fountain of the Four Winds, and the Lincoln Beach Recreation Park; two potential historic districts, including the Pine Village and Little Woods historic neighborhoods; and 39 land parcels exhibiting a high potential for archaeological deposits located south of Hayne Boulevard (Heller *et al*. 2008).

Four of the 39 land parcels exhibiting a high potential for archaeological sites are located in the proposed action and are designated as staging areas. Phase 1 and selected Phase 2 cultural resources investigations conducted within these four land parcels identified two new historic period archaeological sites, 16OR444 (Locus 06-B-01 and 06-B-02) and 16OR446 (Locus 06-E-01). The remaining 35 land parcels are not located in the proposed action boundaries and were not investigated.

Researchers also conducted Phase 1 nautical remote sensing survey and selected Phase 2 dive operations in the Lake Pontchartrain portion of the study area (Heller *et al*. 2008). The survey was designed to identify specific magnetic, acoustic, and sub-bottom anomalies that might represent significant submerged cultural resources. This survey identified seven targets exhibiting shipwreck characteristics. Researchers recommended all seven targets be avoided during construction activities. These include the previously recorded 16OR97 (Citrus Lakefront Shipwreck) and newly discovered 16OR449 (Seabrook 1 Shipwreck), 16OR450 (Edge Lake 1 Shipwreck), 16OR451 (Edge Lake 2 Shipwreck), 16OR452 (Edge Lake 3 Shipwreck), Target 28-4 and Target 29-1.

Phase 2 dive operations at 16OR450 (Edge Lake 1 Shipwreck) identified a shipwreck that appears to be the remains of a late nineteenth century V-bottom Gulf scow schooner.

Researchers believe the site contains sufficient integrity and significance to be eligible for listing on the NRHP.

Five of the cultural resources identified in the study area and briefly discussed above are located within the proposed action boundaries. These include: 1) 16OR24 (Seabrook), 2) 16OR28 (Little Woods), 3) 16OR444 (Locus 06-B-01 and 06-B-02), 4) 16OR446 (Locus 06-E-01), and 5) Lincoln Beach Recreation Park.

The CEMVN held meetings with the State Historic Preservation Office (SHPO) staff and Tribal governments in 2007 to discuss the emergency alternative arrangements approved under NEPA for HSDRRS project review and the development of a Programmatic Agreement (PA) to tailor the Section 106 consultation process under these alternative arrangements. The CEMVN formally initiated Section 106 consultation for the LPV Hurricane Protection Project (100-year), which includes IER #6, in a letter dated 9 April 2007 and emphasized that standard Section 106 consultation procedures would be followed during PA development. A public meeting was held on 18 July 2007 to discuss the working draft PA.

In letters to the SHPO and Indian Tribes dated 8 August 2008, the CEMVN provided project documentation, an evaluation of cultural resources potential in the project area, and the results of reconnaissance survey and Phase 1/Phase 2 investigations, and found that proposed construction activities within all reaches of the proposed action would have no adverse impacts on significant cultural resources. The SHPO concurred with CEMVN's "no adverse effect" finding in a letter dated 19 September 2008. The Seminole Tribe of Florida, Seminole Nation of Oklahoma, Quapaw Tribe of Oklahoma, and the Alabama-Coushatta Tribe of Texas concurred with CEMVN's effect determination on 14 August 2008, 15 August 2008, 15 August 2008, and 4 September 2008, respectively. No additional Indian Tribes responded to CEMVN requests for comment. Section 106 consultation for the proposed action has been concluded. However, if any unrecorded cultural resources are determined to exist within the proposed action boundaries, no work will proceed in the area containing these cultural resources until a CEMVN archaeologist has been notified and final coordination with the SHPO and Indian Tribes has been completed.

The following discussion of impacts is based on information provided in the cultural resources investigation management summary prepared by R. Christopher Goodwin and Associates, Inc. (Heller *et al.* 2008).

Future Conditions with No Action for LPV 105, 106, and 107

Without implementation of the proposed action, there would be construction and modification of the existing levees, floodwalls, floodgates, and foreshore protection at the three LPV reaches to meet the previously authorized elevation for the HSDRRS. Three cultural resources have been recorded in the existing project right-of-way. Recent Phase 1 investigations indicate that sites 16OR24 (Seabrook, Locus A and B) and 16OR28 (Little Woods) have been destroyed by previous railroad embankment construction, foreshore protection, and continuous shoreline wave action. The Lincoln Beach Recreation Park site does not contain any historic standing structures, architectural features or intact archaeological deposits within the existing project right-of-way. These three sites are considered not eligible for listing on the NRHP. Therefore, effects on cultural resources would not differ substantially from what was described in the Final EIS for the LPV Hurricane Protection Project (August 1974) and its supplements (Final Supplement I [July 1984] and Final Supplement II [August 1994]).

LPV 105

Future Conditions with Proposed Action

Direct Impacts to Cultural Resources

The proposed action for LPV 105 would have no direct impacts on cultural resources. The proposed action boundaries, which includes the existing project right-of-way and an additional area proposed for new floodwall alignment was examined for cultural resources as part of a larger study conducted in 2008 (Heller *et al.* 2008). No significant cultural resources were identified.

The majority of the LPV 105 proposed action, which is located between the NSRR embankment and Hayne Boulevard, has been severely impacted by previous floodwall and earthen levee construction. The likelihood for intact and significant cultural resources in these disturbed areas is considered extremely minimal.

Although background research identified one previously recorded archaeological site directly within the LPV 105 proposed action boundaries, recent investigations conducted in 2008 found no evidence of any archaeological material at the reported location. Site 16OR24 (Seabrook, Locus A) was recorded in 1976 as a small remnant of what once was a much larger prehistoric shell midden first documented in 1951 along a 1-mile long section of Lake Pontchartrain shoreline. These shoreline deposits are being continuously deflated and redeposited by wave action and have been impacted by the placement of riprap for foreshore protection. Researchers surmise that the archaeological deposits at Site 16OR24 (Seabrook, Locus A) have been destroyed.

Indirect Impacts to Cultural Resources

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 project area by reducing the damage caused by flood events.

Recent cultural resources investigations examined an area in the LPV 105 reach that is much larger than the proposed action (Heller *et al*. 2008). Background research and reconnaissance level field investigations identified six historic period cultural resources and thirteen land parcels exhibiting a high potential for archaeological resources in the LPV 105 reach. These include 1) the New Orleans Lakefront Airport, 2) Fountain of the Four Winds, 3) a portion of the Army Airbase/Naval Reserve Headquarters Facility, 4) former location of the Louisiana State National Guard Observation Base, 5) Pine Village historic neighborhood 6) Little Woods historic neighborhood, and 7) 13 abandoned residential/commercial lots located south of Hayne Boulevard. These cultural resources and high probability areas are located outside of the LPV 105 proposed action boundaries and will not be indirectly or visually impacted by proposed construction.

Cumulative Impacts to Cultural Resources

Implementation of the proposed action would have beneficial cumulative impacts on cultural resources in the greater New Orleans Metropolitan Area. The combined effects from construction of the multiple projects underway and planned for the Lake Pontchartrain Hurricane Protection System would reduce flood risk and storm damage to cultural resources including archaeological sites, individual historic properties, engineering structures and historic districts.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Cultural Resources

Direct, indirect and cumulative impacts to cultural resources resulting from LPV 105 Alternative 1 would be similar to those occurring under the LPV 105 proposed action.

LPV 106

Future Conditions with Proposed Action

Direct Impacts to Cultural Resources

The proposed action for LPV 106 would have no direct impacts on cultural resources. The LPV 106 proposed action, which includes the existing project right-of-way and four staging areas south of Hayne Boulevard, was examined for cultural resources as part of a larger study conducted in 2008 (Heller *et al.* 2008). No significant cultural resources were identified in the LPV 106 proposed action.

Researchers found that the majority of the LPV 106 proposed action is located within the existing project right-of-way located between the NSRR tracks and Hayne Boulevard in an area that has been severely impacted by previous floodwall, floodgate, and earthen levee construction. The likelihood for intact and significant cultural resources in this disturbed area is considered extremely minimal.

Indirect Impacts to Cultural Resources

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 project area by reducing the damage caused by flood events.

Recent cultural resources investigations examined an area in the LPV 106 reach that is much larger than the proposed action (Heller et al. 2008). Background research, reconnaissance level field investigations, Phase 1 terrestrial survey and Phase 1 and 2 nautical surveys identified four previously recorded prehistoric archaeological sites, one previously recorded historic shipwreck, six newly discovered nautical sites exhibiting shipwreck characteristics, and 20 land parcels exhibiting a high potential for archaeological resources in the LPV 106 reach.

These cultural resources include: 1) 16OR2 (Little Woods), 2) 16OR5 (Little Woods), 3) 16OR15 (Hayne Boulevard and Paris Road), 4) 16OR20 (Citrus Canal), 5) 16OR97 (Citrus Lakefront Shipwreck), 6) 16OR449 (Seabrook 1 Shipwreck), 7) 16OR450 (Edge Lake 1 Shipwreck), 8) 16OR451 (Edge Lake 2 Shipwreck), 9) 16OR452 (Edge Lake 3 Shipwreck), 10) Target 28-4, 11) Target 29-1, and 12) 20 abandoned residential/commercial lots located south of Hayne Boulevard exhibiting a high potential for archaeological deposits. These cultural resources and high probability areas are located outside of the LPV 106 proposed action boundaries and will not be indirectly or visually impacted by proposed construction.

Cumulative Impacts to Cultural Resources

Cumulative impacts to cultural resources resulting from LPV 106 proposed action would be similar to those occurring under the LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Cultural Resources

Direct, indirect and cumulative impacts to cultural resources resulting from LPV 106 Alternative 1 would be similar to those occurring under the LPV 106 proposed action.

LPV 107

Future Conditions with Proposed Action

Direct Impacts to Cultural Resources

The proposed action for LPV 107 would have no direct impacts on cultural resources. The LPV 107 proposed action, which includes the existing project right-of-way and one proposed staging area located south of Hayne Boulevard, was examined for cultural resources as part of a larger study conducted in 2008 (Heller *et al.* 2008). No significant cultural resources were identified in the LPV 107 proposed action boundary.

Although background research and field investigations identified one cultural resource site extending into the LPV 107 proposed action boundary, further investigations determined that the site lacked sufficient integrity and research potential to be considered eligible for listing in the NRHP. Located along Hayne Boulevard at Vincent Road, the Lincoln Beach Recreation Park was constructed in 1939 as a recreation area for New Orleans' African Americans, who were prohibited from entering the other segregated Lake Pontchartrain amusement parks. Lincoln Beach expanded in the 1960s, becoming a center for the performance of popular musical acts such as Fats Domino and Earl King. The facility closed in or around 1964. The recreation facilities were situated in an area located immediately north of the existing project right-of-way on man-made land extending into Lake Pontchartrain. Parking was located on the south side of Hayne Boulevard, where the proposed action staging area is proposed.

The existing project right-of-way is situated between the NSRR embankment and Hayne Boulevard in an area that has been extensively impacted by floodwall, floodgate, and earthen levee construction. The likelihood for intact and undisturbed archaeological deposits in the right-of-way is considered extremely minimal and no architectural features related to the Lincoln Beach Recreation Park are located within its boundaries. Recent Phase 1 investigations within the proposed Lincoln Beach Staging Area encountered a thick deposit of shell across the entire site and confirmed its previous use as a parking lot. Proposed use of this staging area during project construction will have no direct impact on cultural resources.

Indirect Impacts to Cultural Resources

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 project area by reducing the damage caused by flood events.

Recent cultural resources investigations examined an area in the LPV 107 reach that is much larger than the proposed action (Heller *et al.* 2008). Background research, reconnaissance level field investigations, a Phase 1 terrestrial survey and a Phase 1 nautical survey identified one previously recorded historic property, a portion of the Lincoln Beach Recreation Park, and one land parcel exhibiting a high potential for archaeological cultural resources located south of Hayne Boulevard. These two properties are located outside of the LPV 107 proposed action boundaries and will not be indirectly or visually impacted by proposed construction.

Cumulative Impacts to Cultural Resources

Cumulative impacts to cultural resources resulting from LPV 107 proposed action would be similar to those occurring under the LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Cultural Resources

Direct, indirect and cumulative impacts to cultural resources resulting from LPV 107 Alternative 1 would be similar to those occurring under the LPV 107 proposed action.

3.2.9. Recreational Resources

Existing Conditions

Recreational resources near the project area are identified in Figure 12. As discussed previously, Lake Pontchartrain is an important recreational resource and provides boating and fishing opportunities for the New Orleans Metropolitan Area. South Shore Harbor, located adjacent to the Lakefront Airport and LPV 105, offers open and covered slips and is home to the South Shore Yacht Club. Levees along Lake Pontchartrain, including the levee within LPV 106, provide a trail system that is used by the public for walking, running, and bicycling. Several parks administered by the City of New Orleans Recreation Department are located near the project area. The 187-acre Joe W. Brown Memorial Park, located about 1.5 miles south of the project area, temporarily closed following Hurricane Katrina, but partially reopened on 30 June 2007. The park includes an indoor swimming pool, a full-size soccer field, tennis courts, and several basketball hoops. Several smaller neighborhood parks, such as Kenilworth Park and Goretti Playground, are located just south of the project area.

Formerly known as Jazzland, Six Flags New Orleans amusement park closed in 2005 after being destroyed by Hurricane Katrina. The park is not scheduled to reopen and may be closed indefinitely. Lincoln Beach is located along the south shore of Lake Pontchartrain. It operated from 1939 through 1965 until other beaches and amusement parks in the New Orleans area were desegregated. The facilities included rides, games, a swimming pool, beach front swimming, and a venue for live music performances. As mentioned previously, Lincoln Beach has remained closed since 1965.

Bayou Sauvage NWR was established in 1990. The refuge is one of the last remaining tracts of contiguous marsh located adjacent to Lake Pontchartrain and encompasses approximately 23,000 acres. The refuge contains a wide variety of habitat, including bottomland hardwoods, fresh and brackish water marshes, lagoons, canals, borrow pits, cheniers, and natural bayous. Most of the refuge is located within levees built to reduce the risk of damage to New Orleans East from storm surges and flooding. A network of pumps and flapgated structures regulate water levels seasonally to encourage summer growth of emergent plants that, in turn, provide waterfowl food supplies in winter.

Discussion of Impacts

Future Conditions with No Action for LPV 105, 106, and 107

Construction activities along LPV 106 to raise the levee and foreshore protection to the previously authorized elevation and meet current design criteria would temporarily disrupt recreational uses of the levee area. These temporary impacts to recreational fishing in the area would occur during dredging and stockpile activities to create four perpendicular access channels. Temporary access channels and stockpile areas for the placement of foreshore

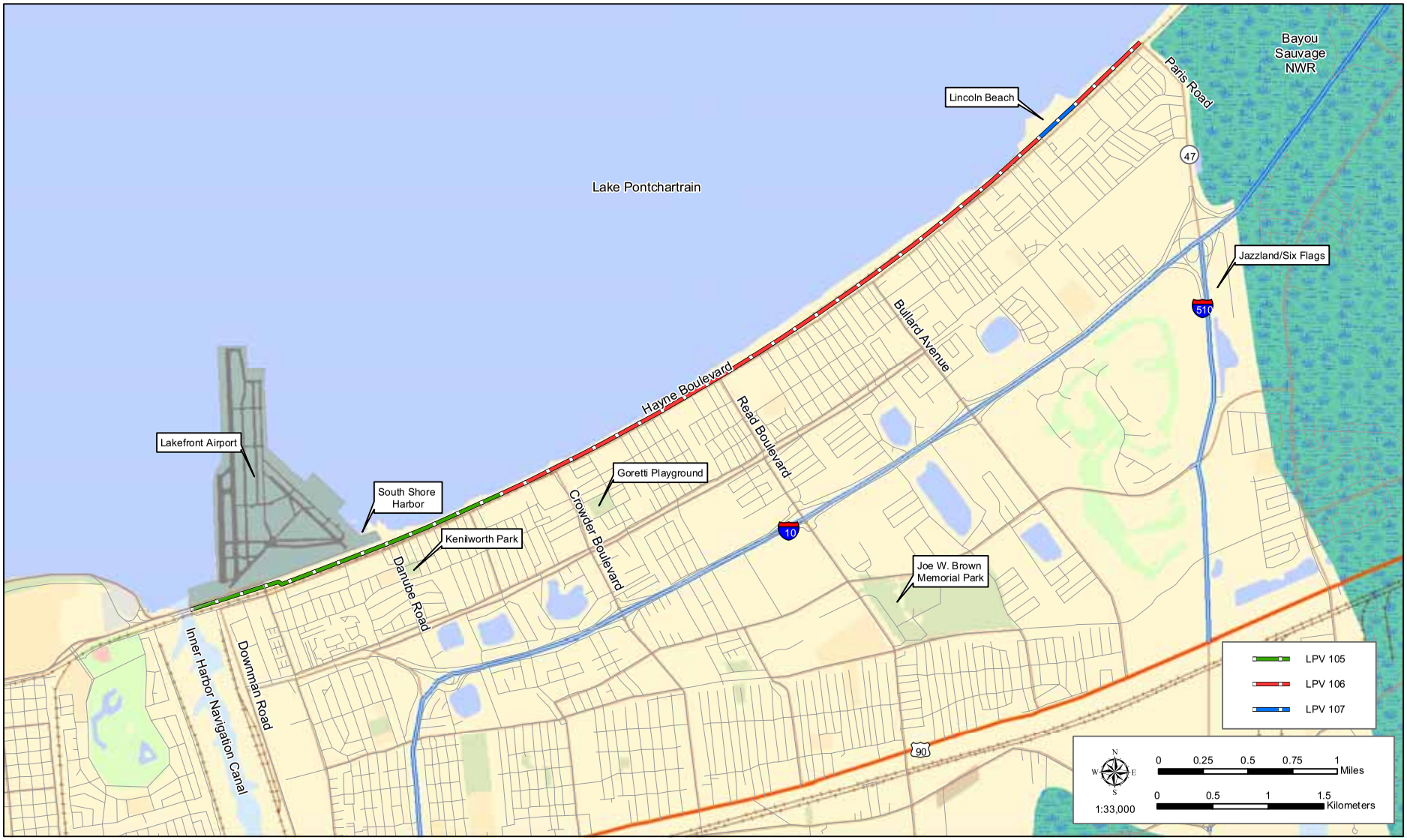

Figure 12. Recreational Resources near the project corridor include Lake Pontchartrain, South Shore Harbor, New Orleans Lakefront Airport, Joe W. Brown Memorial Park, Kenilworth Park, Goretti Playground, Jazzland/Six Flags New Orleans, Lincoln Beach, and Bayou Sauvage National Wildlife Refuge (NWR).

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protection would temporarily impact approximately 61.1 acres of lakebed and submerged aquatic vegetation in the project area. The foreshore protection will permanently fill approximately 6.9 acres of Lake Pontchartrain, causing a loss of forage habitat for finfish. The indirect impacts of disturbed soils and sediments in the project area would be temporary and controlled through the use of best management practices, and would not permanently impact Lake Pontchartrain fish populations. Following completion of construction, the improved levee area would allow for pedestrian access by the public, except during periodic maintenance activities.

LPV 105

Future Conditions with Proposed Action

Direct Impacts to Recreational Resources

The LPV 105 proposed action would result in temporary increased noise levels near construction activities. Increased noise levels during construction would impact recreation opportunities at Kenilworth Park and Goretti Playground. Noise levels would return to pre-construction levels following construction. No impacts to South Shore Harbor from levee and floodwall construction activities are anticipated.

Indirect Impacts to Recreational Resources

Increased protection of recreational facilities and resources in the Citrus Lakefront area from flooding would provide long-term indirect benefits.

Cumulative Impacts to Recreational Resources

Dredging activities proposed for access to the Lake Pontchartrain shoreline for foreshore protection improvements along LPV 106 and LPV 108; the construction of a gated structure at Seabrook; and the construction of floodwall/gates system at the GIWW, MRGO, Bayou Bienvenue and the Golden Triangle marsh would contribute to the cumulative temporary impacts to fishing and recreational boating in Lake Pontchartrain. Regionally, other HSDRRS projects (the IHNC Lock Replacement project and construction of the I-10 Twin Span Bridge across Lake Pontchartrain) would involve construction activities on levees and floodwalls, and in Lake Pontchartrain, potentially causing temporary cumulative impacts to recreational resources from noise and closures of facilities to allow for ingress and egress of construction equipment. However, following the completion of these construction projects, access and noise in the vicinity of recreational facilities would return to pre-construction levels. The reduced risk of hurricane and storm damage could provide incentive to rebuild damaged recreational facilities.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Recreational Resources

Direct, indirect and cumulative impacts to recreational resources resulting from LPV 105 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

LPV 106

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Recreational Resources

Direct, indirect and cumulative impacts to recreational resources resulting from LPV 106 proposed action would be similar to those occurring under LPV 105 proposed action.

Future Conditions with Alternative 1

Direct Impacts to Recreational Resources

The replacement of the levee with a T-wall in the LPV 106 reach would eliminate the path along the top of the levee currently used by pedestrians and bicyclists and, consequently, would limit recreational opportunities along the Lake Pontchartrain shoreline in New Orleans East.

Indirect Impacts to Recreational Resources

Indirect impacts on recreation would be the same as described for the LPV 105 proposed action.

Cumulative Impacts to Recreational Resources

Other HSDRRS projects in New Orleans East include alternatives for replacing levees with a T-wall or T-wall cap. These alternatives in combination with LPV 106 Alternative 1 would further reduce recreational opportunities along the Lake Pontchartrain shoreline and along bayou and canal banks in New Orleans East.

LPV 107

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Recreational Resources

Direct, indirect and cumulative impacts on recreational resources from construction noise would be similar to those occurring under the LPV 105 proposed action. Although the area is not currently used for recreation, future access to Lincoln Beach would be maintained. Increased protection of recreational facilities and resources from flooding would provide long term benefits.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Recreational Resources

Impacts on recreational resources resulting from LPV 107 Alternative 1 would be similar to those occurring under LPV 107 proposed action.

3.2.10. Aesthetics (Visual Resources)

Existing Conditions

Visually, the project area's landscape is dominated by urban development protected by risk reduction measures that include earthen berm levees, architecturally treated floodwalls, floodgates, drainage canals, and pumping stations. Dominant landscape features within the project area are the Lakefront Airport, the Southshore Harbor Marina, and the remnants of Lincoln Beach. The project area is highly urbanized including roadways, railroad transportation areas, and residential, commercial, and public services. Damages to infrastructure resulting from Hurricane Katrina and consequent rebuilding efforts continue to detract from the overall visual character of the area. Green space within the project area is limited to the area between the NSRR and Hayne Boulevard west of Downman Road, and the LPV 105 levee west of Danube Road.

Discussion of Impacts

Future Conditions with No Action for LPV 105, 106, and 107

With the no action alternative, the 100-year level of risk reduction would not occur and the HSDRRS system would be built only to the levels authorized prior to Hurricane Katrina. This would involve a combination of earthen berm levee and floodwall improvements as well as dredging in Lake Pontchartrain for foreshore protection improvements. With the no action alternative, direct, indirect and cumulative impacts would occur to the visual character of the project area's landscape. The visual character of the project area would be temporarily impacted by construction activities related to the floodwall and earthen levee work, and by transport activities needed to move equipment and materials to and from the site. After construction, the visual character of the project area should stabilize quickly, as the improved floodwall structures and earthen berm levee would be constructed in areas where similar risk reduction measures currently exist, and the project area would be returned, as much as possible, to pre-construction conditions. Long term impacts to the visual character of the area would occur as the result of the increased height of the risk reduction measures. The visual impacts caused by the floodwalls would be reduced with the application of an architectural treatment to the floodwall concrete and by landscaping the adjacent area where appropriate, treatments which are strongly recommended in urbanized areas (EM 1110-2-2504, Design of Sheet Pile Walls). Cumulatively, the visual impacts caused by flood protection measures throughout the HSDRRS and nationwide could be considered significant. Flood prone natural landscapes protected by unnatural levees and floodwalls similar to those to be generated by the proposed action may be increasingly converted to developable land. Urbanization of this land may be considered visually distressing depending on the complexity of natural or cultural elements lost.

LPV 105

Future Conditions with Proposed Action

Direct Impacts to Aesthetics

Impacts to visual resources resulting from the proposed action would be similar to those occurring under the Future Conditions with No Action.

Indirect Impacts to Aesthetics

No indirect impacts on visual resources are anticipated from the implementation of LPV 105 proposed action.

Cumulative Impacts to Aesthetics

Due to the presence of construction equipment, construction activities associated with other HSDRRS projects in combination with numerous renovation and rebuilding projects would have cumulative temporary impacts on visual resources in New Orleans East.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Aesthetics

Impacts to visual resources resulting from the Alternative 1 would be similar to those occurring under the Future Conditions with No Action.

LPV 106

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Aesthetics

Impacts to visual resources resulting from the proposed action would be similar to those occurring under the Future Conditions with No Action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Aesthetics

Impacts to visual resources resulting from the Alternative 1 would be similar to those occurring under the Future Conditions with No Action.

LPV 107

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Aesthetics

Impacts to visual resources resulting from the proposed action would be similar to those occurring under the Future Conditions with No Action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Aesthetics

Impacts to visual resources resulting from the Alternative 1 would be similar to those occurring under the Future Conditions with No Action.

3.2.11. Air Quality

Existing Conditions

The Federal Clean Air Act (CAA) requires that all states comply with National Ambient Air Quality Standards (NAAQS). NAAQS have been developed for seven pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), and two forms of particulate matter (PM 10 – particulate matter with a diameter of 10 micrometers or less; and PM 2.5 - particulate matter with a diameter of 2.5 micrometers or less). Orleans Parish is classified as in attainment for all NAAQS pollutants (USEPA 2006).

Discussion of Impacts

Future Conditions with No Action for LPV 105, LPV 106, and LPV 107

Temporary impacts to air quality from increased air emissions would occur from the operation of equipment and disturbance of soils during the construction of levees, floodwalls and foreshore protection in order to meet the previously authorized elevation and new design criteria for risk reduction measures in the project area.

LPV 105

Future Conditions with Proposed Action

Direct Impacts to Air Quality

Temporary and minor increases in air pollution would occur from the operation of construction equipment and disturbance of soils. Operation of construction equipment and support vehicles would also generate volatile organic compounds (VOC), PM 10, PM 2.5, NO_2, CO, O_3 and SO_2 emissions from gasoline and diesel engine combustion. Particulate emissions (*i.e.*, PM 10 and PM 2.5) would also be generated by activities that disturb and suspend soils, such as equipment operating on disturbed soils, bulldozing, compacting, truck dumping, and grading operations.

Calculations were performed to estimate the total combustible air emissions from all construction activities. Calculations were made for standard construction equipment, such as pile drivers, generators, cement trucks, back hoes, cranes, bulldozers, tug boats and barges using emission factors from the USEPA-approved emission model NONROAD 6.2. The emissions from supply trucks and workers commuting to work were also included in the analysis. Fugitive dust calculations were made for disturbing the soils while constructing T-walls, and were calculated using emission factors from Mid-Atlantic Regional Air Management Association (2006). A summary of the total emissions for all three reaches (LPV 105, 106, and 107), assuming a worst case scenario in which construction within all three reaches could occur simultaneously, is presented in Table 4. See Appendix E for model input variables and results.

Table 4. Total Air Emissions (Tons/Year) from Construction Activities

Pollutant	Total (tons/year)
CO	74.93
VOCs	16.42
NO_2	160.52
PM 10	80.87
PM 2.5	25.89
SO_2	20.19

Source: 40 CFR 51.853, GSRC (Appendix E)

Proper and routine maintenance of all vehicles and other construction equipment would be implemented to ensure that emissions are within the design standards of all construction equipment. Dust suppression methods would be implemented to minimize fugitive dust emissions. All impacts on ambient air quality are expected to be short-term and minor and are not expected to cause or contribute to a violation of Federal or state ambient air quality standards.

Indirect Impacts to Air Quality

No indirect impacts on air quality in the region are anticipated from the implementation of LPV 105 proposed action alternative.

Cumulative Impacts to Air Quality

Air emissions from other construction activities in the region would have adverse temporary cumulative impacts on air quality. Following completion of construction activities in the LPV 105 reach there would be no further incremental contribution to air emissions. Other HSDRRS projects such as levee and floodwall improvements in New Orleans East and borrow projects would cause soil disturbance and the potential for increases in fugitive dust. However, standard

construction best management practices would be implemented in all HSDRRS projects reducing these temporary cumulative impacts. Although air emissions from HSDRRS projects would be expected to occur concurrently, cumulative impacts to air quality would be temporary and no further air emissions from HSDRRS projects are anticipated following completion of construction in 2011.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Air Quality

Direct, indirect and cumulative impacts on air quality resulting from LPV 105 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

LPV 106

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Air Quality

Direct, indirect and cumulative impacts on air quality resulting from LPV 106 proposed action would be similar to those occurring under LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Air Quality

Direct, indirect and cumulative impacts on air quality resulting from LPV 106 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

LPV 107

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Air Quality

Direct, indirect and cumulative impacts on air quality resulting from LPV 107 proposed action would be similar to those occurring under LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Air Quality

Direct, indirect and cumulative impacts on air quality resulting from LPV 107 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

3.2.12. Noise

Existing Conditions

Noise is generally described as unwanted sound, which can be based either on objective effects (*e.g.*, hearing loss, damage to structures) or subjective judgments (*e.g.*, community annoyance). Sound is usually represented on a logarithmic scale with a unit called the decibel (dB). The threshold of human hearing is 0 dB, and the threshold of discomfort or pain is 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). Sounds occurring at night generally produce a greater annoyance than do the same sounds occurring during the day. It is generally agreed that people perceive intrusive noise at night as being 10 A-weighted decibels (dBA- the relative loudness of

sounds in air as perceived by the human ear) louder than the same level of noise during the day. DNL is the community noise metric recommended by the USEPA and has been adopted by most Federal agencies (USEPA 1974). A DNL of 65 dBA is the impact threshold most commonly used for noise planning purposes, and represents a compromise between community impact and the need for activities like construction. A DNL of 55 dBA was identified by USEPA as a level below which there is no adverse impact (USEPA 1974).

The DNL in urban areas south of the project area is affected by airplane take-off and landing at New Orleans Lakefront Airport and exceeds 65 dBA for all of the LPV 105 reach (New Orleans Lakefront Airport Master Plan Update 1995). Trains utilizing the NSRR tracks and vehicles along Hayne Boulevard also contribute to DNL in the project area. There are numerous sensitive receptors (*e.g.*, residences, schools, churches and day care centers) located south of Hayne Boulevard.

Description of Impacts

Future Conditions with No Action for LPV 105, 106, and 107

Under the no action alternative, noise receptors near the project area would experience additional noise associated with construction activities, such as pile driving and vehicles, to raise the levees, floodwalls, floodgates and foreshore protection to the elevations authorized prior to Hurricane Katrina. Areas south of LPV 105 would continue to experience a DNL exceeding 65 dBA from airplanes at New Orleans Lakefront Airport, and the DNL of the entire project area would continue to be affected by trains on the NSRR, traffic along Hayne Boulevard, and continuing reconstruction efforts.

LPV 105

Future Conditions with Proposed Action

Direct Impacts of Noise

Table 5 presents noise emission levels for construction equipment expected to be used during the proposed construction activities. Anticipated sound levels at 50 feet range from 76 dBA to 91 dBA based on data from the Federal Highway Administration (FHWA; 2007).

Table 5. A-Weighted (dBA) Sound Levels of Construction Equipment and Modeled Attenuation at Various Distances[1]

Noise Source	50 feet	100 feet	200 feet	500 feet	1000 feet
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
Bull Dozer	82	76	70	62	56
Pile Driver	91	85	79	71	65

Source: FHWA 2007

1. The dBA at 50 feet is a measured noise emission. The 100- to 1,000-foot results are modeled estimates.

Depending upon the length of time of construction, and the number, type, and distribution of construction equipment being used, DNL in the project area could temporarily exceed 65 dBA up to 1,000 feet from the project area. There is an industrial and commercial zone east of Downman Road near LPV 105 and some commercial sites intermittently located along Hayne Boulevard that would not be impacted by increased noise levels. Geographic Information Systems and Liu and Plyer (2007) were used to determine the number of sensitive noise receptors within 1,000 feet of the Citrus Lakefront Levee alignment (Table 6) that would be temporarily impacted during construction activities.

Table 6. Number of Sensitive Noise Receptors that may be Subjected to a DNL Equal to or Greater than 65 dBA

Sensitive Noise Receptors	Number of Units
Single Family Units	2,063
Multiple Family Units	62
Churches	4
Schools	2
Child Care Centers*	2

Source: Aerial photography provided by State of Louisiana Governor's Office of Homeland Security and Emergency Preparedness, USACE, United States Geological Survey, National Geospatial Intelligence Agency May 2006.
*Liu and Plyer 2007

Indirect Impacts to Noise

Indirect impacts from construction-related noise emissions include disruption to normal lifestyle activities, stress and other emotional responses. Additionally, noise emissions indirectly affect wildlife and recreational users.

Cumulative Impacts to Noise

Other construction activities associated with HSDRRS projects such as the Seabrook gate structure and LPV 108 improvements, renovation and rebuilding activities and daily transportation-related noise emissions (*e.g.*, air traffic from takeoff and landing at New Orleans Lakefront Airport, NSRR, ship traffic in the IHNC and vehicular traffic on Hayne Boulevard and Downman Road) would collectively contribute to increased noise emissions during LPV 105 construction activities.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Noise

Direct, indirect and cumulative impacts from increased noise levels resulting from LPV 105 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

LPV 106

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Noise

The area south of the LPV 106 consists largely of single family residential homes. A number of apartment buildings, churches, schools, and child day care centers are located within 1,000 feet of the levee. Direct, indirect and cumulative impacts from increased noise resulting from LPV 106 proposed action would be similar to those occurring under LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Noise

Direct, indirect and cumulative impacts from increased noise levels resulting from LPV 106 Alternative 1 would be similar to those occurring under LPV 106 proposed action.

LPV 107

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Noise

Direct, indirect and cumulative impacts from increased noise levels resulting from LPV 107 proposed action would be similar to those occurring under LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Noise

Direct, indirect and cumulative impacts from increased noise resulting from LPV 107 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

3.3. TRANSPORTATION

Existing Conditions

Regional transportation includes a series of connecting deep-draft ports extending from the mouth of the Mississippi River and the Gulf of Mexico to points north of the City of Baton Rouge, Louisiana more than 200 miles upstream. This transportation network includes adjacent shallow-draft waterways, major rail lines, trucking companies, and limited access highways as well as the streets and bridges supporting the urban center and evacuation routes needed in response to hurricanes that pass through the region. The metropolitan community also includes commercial airline services.

The New Orleans Transportation Plan (City of New Orleans 2004) lists several road segments in the vicinity of the project area as primary arterials and collectors. Downman Road, Crowder Boulevard, Read Boulevard, and Bullard Avenue are perpendicular to the project area and carry traffic between Interstate 10 (I-10) and Lake Pontchartrain (Figure 13). Hayne Boulevard (Photograph 7) is parallel to the project area and carries east- and west-bound, cross-town traffic along the Lake Pontchartrain shoreline between Louisiana Highway 47 (LA 47) and the Seabrook Bridge over IHNC. LA 47 begins in St. Bernard Parish as Paris Road and runs concurrently with Interstate-510 (I-510) to I-10. North of I-10, LA 47 continues as Paris Road and runs along the lakefront as Hayne Boulevard up to Downman Road. The average daily traffic count for LA 47 has been collected by DOTD, and traffic volumes on LA 47 have decreased substantially since Hurricane Katrina. In 2004, the average daily traffic count on LA 47 near the Morrison Road intersection was 7,598 vehicles. In 2008, the average daily traffic count on LA 47 at the same intersection was 5,173 vehicles (DOTD 2009). That is a 32 percent decrease in the average traffic volume on LA 47.

Photograph 7. Hayne Boulevard at the Read Boulevard Intersection.

The New Orleans Lakefront Airport, located at the western end of the project area, serves general recreation flights, private business flights, charter flights, corporate fleets, small aircraft pilot training, mosquito control, and some military flights (City of New Orleans 2004). In 2002, 280 aircraft were based at Lakefront Airport, and 29,960 visiting private flights carried a total of 107,854 passengers to and from the airport, the largest number of private flights of any airport in Louisiana. During special events such as the Sugar Bowl, Super Bowl, Mardi Gras, or a major National convention, Lakefront Airport handles an increased volume of private aircraft. New Orleans Lakefront Airport has three runways (18R/36L; 18L/36R; and 09/27). Runway 18R/36L is the main runway and is 6,880 feet long and 150 feet wide, and is routinely used by large commercial and military aircraft including B-727, B-737, C-130, and occasionally C-17 and C-5 aircraft. Hayne Boulevard connects to South Shore Harbor Boulevard and Stars and Stripes Boulevard, and provides west bound traffic access to New Orleans Lakefront Airport (Figure 13). Downman Road provides airport access to north bound traffic in the western portion of the project area. Leon C Simon Drive connects traffic west of IHNC via Seabrook Bridge at the western end of the project area.

The runway protection zone for Runway 36L includes airspace that is longitudinally centered on the runway centerline and extends outward and upward from each end of the primary surface (*i.e.*, an approach surface) (USACE 2007b). The current approach surface is 34:1 (horizontal:vertical); however, the airport has future plans to upgrade the runway to allow precision instrument approach which requires a 50H:1V approach surface. The approach surface is part of Federal Aviation Administration (FAA) Regulations Part 77; Objects Affecting Navigable Space. The runway protection zone extends southward from Runway 36L and crosses

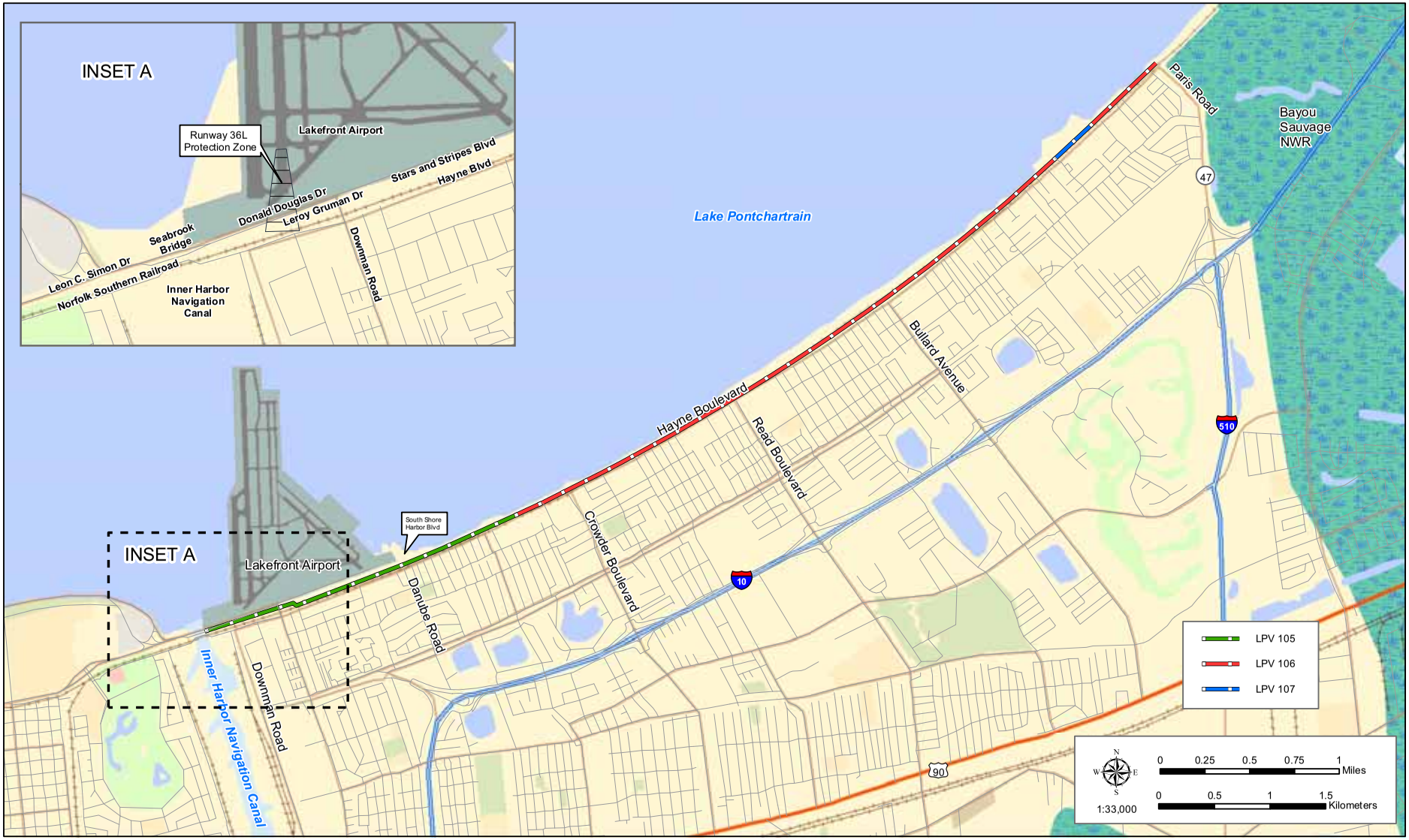

Figure 13. Transportation resources near the project corridor include New Orleans Lakefront Airport, Norfolk Southern Railroad, Hayne Boulevard, and other arterial roadways.

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the existing I-wall alignment between the Seabrook Bridge and the flyover between Stars and Stripes Boulevard and Hayne Boulevard. Donald Douglas Drive and Leroy Gruman Drive, which are small, 2-lane airport access roads, are also in the runway protection zone (see Figure 13).

NSRR, which parallels Hayne Boulevard along the south shore of Lake Pontchartrain, is one of the six largest national railroads in New Orleans (City of New Orleans 2004). It controls the "back belt," a strategic segment of rail from City Park through Old Metairie to East Bridge Junction near Central Avenue in Jefferson Parish. This route is substantially shorter, quicker, and more cost effective for through rail traffic than the "front belt" along the crescent of the Mississippi River. NSRR services down river wharfs at Alabo Street, Domino Sugar Refinery, Chalmette Slip, Port of St. Bernard industrial area along the Mississippi River, and the east bank of Plaquemines Parish.

Description of Impacts

Future Conditions with No Action for LPV 105, 106, and 107

Levee and floodwall segments in the Citrus Lakefront drainage area, including LPV 105, LPV 106, and LPV 107 would be raised to the previously authorized elevation and the ingress and egress of construction equipment to these levee segments would temporarily impact traffic on adjacent roadways such as I-10 and Hayne Boulevard. Segments of the two west-bound lanes of Hayne Boulevard would experience periodic closures during construction. After completion of raising levees, floodwalls and floodgates to the previously authorized elevation, all highways in New Orleans East would be at a greater risk of flooding in the event of a large tropical storm event similar to Hurricane Katrina compared to the 100-year level of risk reduction. The majority of NSRR is on the lakeside of the existing levee alignment and would continue to be subject to flooding. In the event of a large-scale flood event, all road segments in the project area, including I-10, would be temporarily inaccessible.

LPV 105

Future Conditions with Proposed Action

Direct Impacts to Transportation

Construction easements and transport of construction equipment and materials would temporarily impede vehicle traffic and result in a minimal reduction of the level of service (LOS; a metric describing traffic volume relative to capacity) on some local road segments. Flagmen, signage, cones, barricades, and detours would be used where required to facilitate movement of construction equipment, construction materials, and local traffic on affected road segments. Segments of the two west-bound lanes of Hayne Boulevard would be closed during construction. Traffic would be diverted to east-bound lanes and appropriate measures to ensure safety and facilitate movement of traffic would be implemented. Current traffic volume on Hayne Boulevard (LA 47) has decreased by 32 percent since Hurricane Katrina. Further, it is not likely that in the near future traffic volume on Hayne Boulevard would substantially increase and approach pre-Katrina levels. Therefore, it is unlikely that vehicular traffic would exceed the capacity of the two open lanes provided during construction and traffic delays due to construction activities are expected to be minimal, and temporary.

The height of the T-wall would not penetrate the existing arrival runway protection zone non-precision instrument approach surface at New Orleans Lakefront Airport, and would not impact future arrival and departure runway protection zone approach surfaces if the airport upgraded the runway to precision instrument landing, which requires a 50:1 (horizontal:vertical) approach surface. During construction of the floodwalls and floodgate at Downman Road, cranes would

likely penetrate the runway protection zone and cause New Orleans Lakefront Airport to temporarily close Runway 36L. Because the New Orleans Lakefront Airport operates 24 hours a day, any construction activities that would cause the temporary closure of the main runway (36L) would have a significant temporary impact on operations at New Orleans Lakefront Airport. However, approximately 90 percent of all aviation traffic at New Orleans Lakefront Airport occurs between the hours of 6:00 AM and 8:00 PM. Therefore, by constructing the T-wall located beneath 36L runway protection zone approach surfaces between 8:00 PM and 6:00 AM, temporary impacts to airport operations would be mitigated (USACE 2007b).

NSRR generally parallels the proposed T-wall alignment. Early coordination with NSRR would be necessary to assure that all requirements for construction near a railroad are met. Additionally, the tracks may require temporary shoring during excavation for the foundation of the T-wall. All feasible measures to limit impacts to railroad traffic identified through early coordination would be implemented, thus impacts to railroad traffic would be minimal.

The proposed alignment of new T-wall construction crosses Downman Road near the Downman Road/Hayne Boulevard intersection. This new T-wall alignment and floodgate design would provide for adequate line of site at the intersection following DOTD and American Association of State Highway and Transportation Officials standards. Alternately, modifications of the intersection would be required.

Indirect Impacts to Transportation

The new T-Wall alignment would permanently expose an additional segment of NSRR and a portion of Stars and Stripes Boulevard to inundation in the event of a flood. For NSRR, substantial portions of the railroad are currently north of the existing levee/floodwall alignment and subject to flooding.

Cumulative Impacts to Transportation

Increased truck traffic in the region would be anticipated with the implementation of other large construction projects such as the Seabrook gate structure, levee and floodwall improvements in New Orleans East (LPV 108 – LPV 111), borrow projects and the IHNC Lock Replacement project. This includes the transportation of large volumes of borrow material, and thousands of H-piles and sheetpiles to construction sites. A large lay-down yard in New Orleans East would be used for the construction of the IHNC surge barrier, and the access to construction areas of the GIWW would be along the existing GIWW and Michoud Canal levees. Borrow sites identified in New Orleans East would generate truck trips both locally to provide material for projects in New Orleans East, and regionally to other HSDRRS projects. The cumulative impacts of the increased construction traffic include temporary traffic delays and damage to road surfaces. Furthermore, other HSDRRS projects, such as the Jefferson Parish Lakefront Levee project, in combination with ongoing road construction project such as the replacement of the I-10 Twin Span Bridge over Lake Pontchartrain, I-10 widening project in Metairie and the Huey P. Long Bridge widening project require temporary modifications of major arterials (*e.g.*, Causeway approach) causing short-term impacts to vehicular traffic. Although some significant temporary cumulative traffic impacts would be realized, the LOS for most surface streets in New Orleans East is high and traffic volumes in these areas post-Katrina have decreased dramatically.

Future Conditions with Alternative 1

Direct Impacts to Transportation

The implementation of LPV 105 Alternative 1 would result in temporary construction related impacts to local road, airport, and railroad traffic that would be similar to those described for the

LPV 105 proposed action. Construction equipment would block portions of Donald Douglas Drive and Leroy Gruman Drive during the construction of T-walls below the Seabrook Bridge. These road segments provide access to New Orleans Lakefront Airport fuel storage tanks and other facilities accessible from the north side of existing I-walls. The new T-wall within New Orleans Lakefront Airport runway protection zone would not penetrate the existing arrival runway protection zone approach surface, but would penetrate the future proposed 50:1 (horizontal:vertical) arrival and departure runway protection zone approach surfaces required by the FAA for precision instrument landing (USACE 2007b). New floodgates would be constructed to replace existing floodgates and the floodgate at Downman Road would not be required.

Indirect Impacts to Transportation

Under LPV 105 Alternative 1, no additional segments of NSRR or Stars and Stripes Boulevard would be exposed to flooding.

Cumulative Impacts to Transportation

Cumulative impacts on transportation in the region would be the same as described for the LPV 105 proposed action.

LPV 106

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Transportation

The implementation of the LPV 106 proposed action would result in direct impacts to traffic from partial closures of Hayne Boulevard during construction activities. The indirect and cumulative impacts to transportation from LPV 106 proposed action would be the same as described for LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Transportation

The implementation of the LPV 106 Alternative 1 would have similar direct, indirect and cumulative impacts to transportation as those described under the LPV 105 proposed action.

LPV 107

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Transportation

The LPV 107 proposed action would result in direct, indirect and cumulative impacts to local road traffic similar to those described occurring under the LPV 106 proposed action alternative.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Transportation

This alternative would result in similar direct, indirect and cumulative impacts to transportation as described for the LPV 105 proposed action.

3.4. SOCIAL AND ECONOMIC RESOURCES

Existing Conditions

Impacts of Hurricane Katrina included loss of life, destruction of homes and businesses, damage and disruption to public facilities and services, high unemployment, loss of income, disruption and closure of local institutions, and in many cases, the loss of neighborhood unity. The destruction of so many thousands of housing units has delayed the immediate return to the metropolitan area for many residents, whether or not employment has been available.

Land and Water, Minerals, Fisheries, Forestry, and Agriculture
The east bank section of New Orleans is highly urbanized and much of it was devastated by Hurricane Katrina. While some of the residential sections along the Lake Pontchartrain survived the impacts of the surge, wind damage, and levee breaks from the hurricane without severe damage, many more experienced severe damage and destruction and the creation of millions of cubic yards of debris. Efforts are underway to restore land and water developments. Other economic activities in Orleans Parish are focused more on tourism, port activities, and industrial processing, rather than the production of minerals, fisheries, forestry, and agriculture.

Business and Industry, Employment and Income
The project area includes businesses, employment, and income opportunities in New Orleans East. Historically, New Orleans is one of the older urban centers in the U.S., developing from its natural waterways, port facilities and services, commercial fisheries, ship building, oil and gas production, National Aeronautics and Space Administration (NASA) space programs, and its tourism, entertainment, and convention facilities. Tables 6 through 10 summarize selected information on business, industry, employment and income in the project area. Table 6 compares selected economic data within Orleans Parish and the state, with shipments and sales ranging from 2.5 percent (manufacturing shipments) to more than 16 percent (service employment). Table 7 shows employment data, comparing declines between July 2005 and July 2006 and 2007. The data in Table 8 indicate that total employment in Orleans Parish as of the fourth quarter of 2006 was 160,000, while employment as of the second quarter in 2005 was more than 244,000. Table 9 shows the sharp drop in per capita personal income in the parish between 2004 and 2005, largely due to hurricane damages. Table 10 shows a comparison of Orleans Parish and state data as of 2004; but comparable data following the hurricanes are not yet available. Note also that Table 10 data for 2004 are for "household income" rather than "family income."

Table 7. 2002 Economic Census Summary of Selected Data (Shipments and Sales in $1,000s)

	Manufacturing			Wholesale Trade			Retail Trade			Services	
	Units	Shipments	Employees	Units	Sales	Employees	Units	Sales	Employees	Units	Employees
Orleans	225	2,226,191	8,584	448	2,792,080	5,693	1,722	3,158,341	19,628	6,164	119,757
% of Louisiana	6.4	2.5	5.7	7.6	5.9	7.7	9.8	7.5	8.6	12.9	16.1
Louisiana	3,521	$ 89,540,799	150,401	5,904	$ 47,192,153	73,548	17,613	$ 41,885,192	228,290	47,791	741,738

* In some instances, data within individual parishes were withheld to avoid disclosure of individual companies and in some cases underestimate Totals within the study area.
SOURCE: U.S. Department of Commerce, Bureau of the Census, 2002 Economic Census. (Latest sources comparable) (U.S. Census Bureau 2002)

Table 8. Labor Force, Employment, Unemployment, July 2005 through July 2007

Parish	July 2007 Civilian Labor Force	Employed	Unemployed Rate (%)		July 2006 Civilian Labor Force	Employed	Unemployment Rate (%)		July 2005 Civilian Labor Force	Employed	Unemployment Rate (%)
Orleans	152, 733	145,286	4.9		149,207	142,434	4.5		202,350	189,949	6.1
% of Louisiana	7.6	7.5	-		7.4	7.4	-		9.5	9.5	-
Louisiana	2,020,784	1,932,315	4.4		2,010,899	1,930,393	4.0		2,122,078	2,004,493	5.5

SOURCE: Louisiana Department of Labor, Labor Market Statistics (No Date)

Table 9. Employment Subject to the Louisiana Employment Security Law Units by NAICS Industry Codes and Average Employment, Fourth Quarter 2006

		Orleans Parish, 2006 Fourth Quarter				Louisiana, 2006 Fourth Quarter		
	NAICS Code	Total Units	Average Employment	Quarter, Total Wages ($)	Average Weekly Wage ($)	Total Units	Average Employment	Average Weekly Wage ($)
Orleans/Louisiana Employment and Wages		11,771	160,069	1,958,474,097	941	123,654	1,843,779	748
Agriculture, forestry, fishing and hunting	11	13	55	486,923	681	1,569	11,349	566
Mining	21	78	3,669	108,664,372	2,278	1,659	47,606	1436
Utilities	22	26	1,063	13,851,121	1,002	841	14,203	967
Construction	23	619	6,046	83,356,819	1,061	11,788	140,896	879
Manufacturing	31-33	248	7,256	102,462,961	1,086	4,296	155,394	1036
Wholesale trade	42	688	4,524	74,883,078	1,273	7,986	73,709	1034
Retail trade	44-45	1,511	10,964	82,551,453	579	17,238	227,399	468
Transportation and warehousing	48-49	325	9,476	132,342,743	1,074	4,770	79,770	950
Information	51	207	3,085	36,650,292	914	1,765	29,066	797
Finance and insurance	52	622	6,065	115,932,542	1,470	8,342	58,886	979
Real estate and rental and leasing	53	491	2,314	23,937,267	796	5,301	34,968	831
Professional and technical services	54	1,796	13,290	285,153,242	1,650	13,067	80,358	1190
Management of companies and enterprises	55	52	3,444	53,421,422	1,193	592	21,912	1116
Administrative and waste services	56	687	10,568	97,872,728	712	6,325	98,901	577
Educational services	61	160	17,613	192,509,737	841	1,060	164,914	632
Health care and social assistance	62	970	15,547	182,394,836	902	11,714	258,450	725
Arts, entertainment, and recreation	71	190	6,302	42,313,711	516	1,555	40,261	513
Accommodation and food services	72	1,223	21,972	123,975,763	434	8,331	156,767	289
Other services, except public administration	81	1,349	4,896	39,087,636	614	10,260	49,626	561
Public administration	92	147	11,428	161,894,411	1,090	3,142	96,447	755

SOURCE: Louisiana Department of Labor, employees subject to the Louisiana Employment Security Act

Table 10. Per Capita Personal Income, from 1970 through 2005

Study Area	2005*	2004	2000	1995	1990	1985	1980	1970
Orleans	$12,837	$31,344	$25,523	$21,564	$17,657	$13,564	$9,599	$3,719
Louisiana	$24,664	$27,297	$ 23,079	$19,077	$15,173	$12,113	$ 8,777	$3,090
United States	$34,471	$33,050	$29,845	$23,076	$19,477	$14,758	$10,114	$4,085

* Note- As explained by BEA, the data includes losses of personal income following Hurricane Katrina.
SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis (BEA No Date)

Population and Housing
Tables 11, 12, and 13 summarize population and housing in Orleans Parish. As the economy and transportation systems of the New Orleans Metropolitan Area evolved, population and housing increased until the 1960s. Due to the maturation of NASA programs, the development of limited access interstate highways, and construction of additional Mississippi River bridge crossings, the suburban population expanded and the population of Orleans Parish declined. Table 11 shows census population estimates from 1980 to 2006 and Table 12 shows provisional estimates between 2000 and 2006. Note that a sharp population decline occurred in Orleans Parish between 2005 and 2006 due to damage caused by Hurricane Katrina. The U.S. Census Bureau indicates that population in Orleans Parish has returned from less than 200,000 on January 2006 to 223,388 by July 2006. As of July 2007, GCR and Associates, Inc. has estimated that population in the City of New Orleans has increased to 273,598. Many of the people who have returned to the metropolitan area are still living in Federal Emergency Management Agency (FEMA) trailers while housing units are being repaired or reconstructed. Even if the housing units were not destroyed by the hurricane, but severely damaged, many people who lived in apartments or multi- and single-family units were unable to return following Hurricane Katrina. Table 13 shows historical trends of the housing units within parishes that include the project areas.

Table 11. Median Family and Household Incomes, 1959 through 1999, and 2004

Parishes	2004*	1999	1989	1979**	1969**	1959**
Orleans	$27,355	$32,338	$22,182	$25,140	$23,422	$18,863
Louisiana	$35,216	$39,774	$26,313	$30,310	$23,689	$16,764
United States	$44,334	$50,046	$35,225	$33,374	$30,169	$22,210

*The 2004 data available are for median household income rather than family income. ** Income estimates for 1979, 1969, and 1959 adjusted to 1989 CPI dollars.
SOURCES: U.S. Department of Commerce, Bureau of the Census; and U.S. Census Bureau QuickFacts (2004)

The population of the larger New Orleans Metropolitan Statistical Area (MSA) that includes the City of New Orleans (Orleans Parish) and Jefferson, Plaquemines, St. Bernard, St. Charles, St. John the Baptist, and St. Tammany Parishes totaled 1,124,000 in 1970, increasing to about 1,319,000 by July 2005, prior to Hurricane Katrina. The estimated population of the MSA as of 1 July 2006 was about 1,064,000, some 255,000 people less than the previous year. The American Red Cross estimated that about 135,000 housing units in the New Orleans MSA were destroyed by Katrina, while many more were severely damaged.

Property Values, Tax Revenue, Public Facilities and Services
The project area is immediately adjacent to a highly urbanized area of the City of New Orleans along Lake Pontchartrain, including a wide range of commercial and residential properties with a wide range of values, as well as public facilities and services, utilities, public transit, streets and bridges, police and fire protection facilities and services, schools and educational services, and hospitals and health care services dependent upon a local tax base. Many of these properties and services have been severely impacted from damages caused by Hurricane Katrina. The New

Table 12. Census Population of the Project Area, 1980 through 2006

PARISHES	2006	2000	1990	1980	1980-90 %Change	1990-00 %Change	2000-06 %Change
Orleans	223,338	484,674	496,938	557,515	-10.9	-2.5	-53.9
% of Louisiana	17.4	10.8	11.8	13.3	-	-	-
Louisiana Total	4,287,768	4,468,976	4,219,973	4,205,900	0.3	5.9	-4.1

SOURCE: U.S. Bureau of the Census; Louisiana Tech University Provisional Population estimates of 2006 (Louisiana Health Public Institute 2006)

Table 13. Population Estimates, 1 July 2000, through 1 July 2006

Parishes	Population Estimates								
	1 July 2006	1 July 2005	1 July 004	1 July 2003	1 July 2002	1 July 2001	1 July 2000	1 July 2000-2006	% Change
Orleans	223,338	454,863	461,115	467,592	472,409	477,632	483,560	-260,222	-53.8
% of Louisiana	17.4	23.3	23.5	23.7	23.8	24.0	24.2	-	-
Louisiana	4,287,768	4,523,628	4,506,685	4,490,380	4,475,003	4,465,258	4,469,495	-181,727	-8.1

SOURCE: U.S. Department of Commerce, Bureau of the Census, Annual Estimates of the Population for Counties of Louisiana: 1 April 2000 to 1 July 2006 (CO-EST2005-01-22) (U.S. Census Bureau 2006)

Table 14. Housing Units in Project Area, 1980 through 2006

Parishes	2006 Households	2005 (pre- Katrina)	2000	1990	1980	1980-2000 % change
Orleans	86,316	213,137	215,091	225,573	226,680	-9.5
% of Louisiana	N/A	-	11.6	13.1	14.6	-
Louisiana Total	N/A	1,940,399	1,847,181	1,716,229	1,548,523	19.3
% Change	-	5%	7.6%	10.8%		-

SOURCES: U.S. Bureau of the Census; provisional estimates of Enhancement of the U.S. Census Bureau (U.S. Census Bureau No Date) 2006 Annual Population Estimates from the 2006 Louisiana Health and Population Survey (Louisiana Health Public Institute 2006)

Orleans Metropolitan Area is one of the largest market centers in the southeastern U.S. with unique resources discussed in the above paragraphs on economic developments, influencing property values. The 2000 census estimated that the owner-occupied housing units specified in Orleans Parish had a median value of $87,300, slightly greater than the $85,000 estimate for the state, and less than the median value of $98,700 for the larger New Orleans MSA. The effects of Hurricane Katrina have led to lower property values in neighborhoods adjacent to the proposed project right-of-way.

Community and Regional Growth
Generally desirable community and regional growth is considered to be growth supported by local and regional institutions through economic developments, social programs, and the human environment, including water resource development supported by neighborhoods and metropolitan areas as reflected by employment, income, and population trends. While total employment and population within the immediate area of the community adjacent to the project areas have tended to decline in recent decades, the larger MSA has increased as adjacent suburban areas have expanded. As previously mentioned, the effects of Hurricane Katrina have included severe damage to communities immediately adjacent to the project area, the New Orleans MSA, and a larger region extending for about 200 miles along the Gulf coast. The Louisiana Recovery Authority (LRA) estimates that Hurricanes Katrina and Rita caused the destruction of 200,000 housing units and 18,000 businesses, many of which have not been restored, influencing community and regional growth. The Greater New Orleans Community Data Center and other reports have pointed out that some of the deepest flooding in New Orleans was adjacent to Lake Pontchartrain, and these areas are experiencing difficulty in recovery.

Health and Safety
The immediate project areas do not include health and safety facilities providing related services. One of the functions of the HSDRRS, is to reduce the risk to health and safety created by severe storms and hurricanes. The limitations of the existing systems and their costs when failures occur can be catastrophic, as in the case of Hurricane Katrina and to some degree Hurricane Rita. The LRA estimated that 1,464 fatalities occurred from Hurricane Katrina with 135 residents still missing. Some lived in areas adjacent to the Citrus Lakefront Levee. Both Hurricanes Katrina and Rita reduced the availability of health facilities and services, and required additional fire and police protection. In addition to the damages to hospitals, police stations, and fire stations, many employees providing related services have lost their homes, reducing the staffs needed to operate health and safety services. As many as 30 hospitals were initially closed following the hurricanes, with as many as 141 damaged at various levels of impact. Some facilities remain closed, and dislocated employees may not have returned.

Community Cohesion
Community cohesion is the unifying force of conditions that provide commonality within a group. These characteristics may include such things as race, education, income, ethnicity, religion, language, and mutual economic and social benefits. Community cohesion has been described as the unifying force that bonds people together long enough to establish meaningful interactions, common institutions, and agreed ways of behavior. It is a dynamic process, changing as the physical and human environment changes. Conditions brought about by water resource development can impact community cohesion through changing a right-of-way that can divide a community, cause the dislocations of a significant number of residents, or require the relocation of an important local institution, such as a church or community center. In some cases, mitigation may be required; however, the basic objectives of water resource development have essentially been to provide additional security through flood control and hurricane risk reduction, improved navigation, environmental restoration, and recreation through civil works, as needed by the local community, region, and Nation. Public involvement with the community is part of this process. Many residents and businesses adjacent to the project area were destroyed by Hurricane Katrina, reducing the potential for community cohesion. Currently a number of

Federal, state, and local organizations, businesses, schools, religious and other non-profit organizations, and other institutions have participated in the recovery of New Orleans following Hurricane Katrina, a reflection of social bond, community cohesion, and national support.

Environmental Justice
All Census Block Groups within a 1-mile radius of the IER #6 footprint are defined as the IER #6 study area, which includes the neighborhoods closest to Lake Pontchartrain in New Orleans East. Per the U.S. Census data, the IER #6 study area was a minority, non-low income community in 2000. According to ESRI (Earth Science Research Institute) estimates, the low income and minority population changed very little from 2000 to 2007. Therefore, it is probable the IER #6 study area remains a minority, non-low income area.

IER #6 impacts many neighborhoods within New Orleans East by providing 100-year hurricane protection. The neighborhoods within New Orleans East include Little Woods, Pine Village, West Lake Forest, Read Boulevard East and West, Plum Orchard, Viavant/Venetian Isles, Village de L'est, and Lake Catherine. Per the U.S. Census data, New Orleans East was a minority, non-low income community in 2000. The low income and minority population changed little from 2000 to 2007 per ESRI estimates. Therefore, it is probable New Orleans East remains a minority, non-low income community.

Table 15. Minority and Low Income Populations in the IER #6 Project Area.

	IER 6 Project Area		New Orleans East		Orleans Parish		Louisiana	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Minority Population, 2000	59,135	90.5%	85,029	89.0%	355,803	74.3%	1,689,422	37.8%
Estimated Minority Population, 2007	15,570	88.3%	25,369	90.6%	168,017	63.4%	1,741,453	39.8%
Low-Income Population, 2000	11,046	17.2%	19,315	20.5%	130,896,	27.9%	851,113	19.6%
*Estimated Low-Income Population, 2007	901	15.8%	1,696	18.9%	24,726	24.4%	351,703	21.4%

*Note: 2007 does not use the equivalent definition for "low income" due to the limited information available in 2007 at the Block Group level. In 2000, the definition is equivalent to all populations living below the poverty line, whereas in 2007, the definition uses all households earning less than $15,000 per year

Description of Impacts

Future Conditions with No Action for LPV 105, 106, and 107

Construction activities associated with raising LPV 105, 106 and 107 to the previously authorized elevation, and long term maintenance of structures would provide a direct socioeconomic benefit through local spending and employment. Relative to providing the 100-year level of risk reduction, raising the HSDRRS to the previously authorized level of risk reduction would expose New Orleans East to a greater risk of flooding. With a greater risk of flooding, the potential for future development would be limited. This decline may eventually have the cumulative impact of higher demand for land in other, more protected areas. Impacts to mineral production, commercial fishing, forestry, and agriculture would be minor, since these resources are not currently contributing as much to the Orleans Parish economy as tourism, port activities, and other market forces. Recreational fishing and boating are important to the local economy, and may decline somewhat if previous levels of risk reduction are not restored.

Businesses and industries planning to maintain operations in the future without improvements to the HSDRRS would eventually experience additional costs from increasing levels of risk, adversely affecting adjacent businesses, employment and income. Those with marginal success may need to move to more protected areas further inland. Without adequate risk reduction, businesses, employment, and income are subject to decline as the threat of flood damage continues. Furthermore, the increased risk may limit the demand for additional housing construction and associated residential population, or increase the cost of construction and flood insurance.

Without HSDRRS improvements, property values in the marginally protected areas may decline, while the value of more protected adjacent areas may gradually increase. Similarly, public facilities and services in the New Orleans Metropolitan Area, including those services for health and safety that depend on a local tax base, would decline on a relative basis within areas adjacent to the project area. Additionally, the potential for community and regional recovery in the New Orleans area would decline as periodic threats from storms continue and residents tend to relocate elsewhere. The social bond of the adjacent community would have no additional risk reduction than previously authorized.

LPV 105

Future Conditions with Proposed Action

Direct Impacts to Social and Economic Resources

The proposed project improvements would primarily occur in existing levee and floodwall rights-of-way with the exception of the new LPV 105 alignment located east of Alabama Street. New rights-of-way would be required; however, no displacement of people or adverse impacts to community cohesion would occur. Construction activities would provide a temporary direct socioeconomic benefit through local spending and employment. In the long term, providing 100-year level of risk reduction would improve and maintain land area in the immediate vicinity of the Citrus Lakefront Levee in New Orleans East, contribute to improvements to eastern boundaries of LPV and allow FEMA certification of that level of risk reduction providing an economic benefit to the community. No significant adverse impacts to mineral or fisheries production have been identified. Orleans Parish does not produce quantities of forestry or agricultural products that would be impacted from floodwall construction. No construction-related impacts to businesses and industries and related employment within the right-of-way would occur; however, many businesses, employment, and income have been severely impacted from Hurricane Katrina.

Indirect Impacts to Social and Economic Resources

With the 100-year level of HSDRRS, the probability of residential destruction from a storm event would decline. The population of more secure neighborhoods may return. No changes in land use in the LPV 105 project area are anticipated as a result of the proposed action.

Cumulative Impacts to Social and Economic Resources

The proposed LPV 105 improvements are a part of the HSDRRS and would add value for various purposes ranging from industrial, commercial, residential, institutional, and public immediately adjacent to the developments of Orleans Parish. The proposed structures would add to community and regional growth and recovery, including improvements to the HSDRRS for areas adjacent to the Citrus Lakefront Levee. Although the 100-year level of risk reduction would add to improvements for much of the New Orleans area, the potential for damages from hurricane storm surges would still exist but with a reduced level of risk. Emergency procedures for evacuation would still be needed within the community and region.

The proposed LPV 105 project features are located immediately within highly populated communities in the City of New Orleans that have common bonds highly dependent upon storm damage risk reduction adjacent to the levees and floodwalls. With respect to the larger metropolitan area, community cohesion may improve through increased flood and hurricane damage risk reduction, continued national economic development, and social well-being. The additional risk reduction measures would cover the entire parish, and would not disproportionately put a burden on minority or low-income populations.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Social and Economic Resources

With the implementation of LPV 105 Alternative 1, the direct, indirect and cumulative socioeconomic impacts would be the same as those occurring under the LPV 105 proposed action. If New Orleans Lakefront Airport can not operate because a floodwall impedes flight paths due to an intrusion into the airport's runway protection zone, there may be a decrease in the revenue in the area from commercial and private aircraft traffic.

LPV 106

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Social and Economic Resources

The direct, indirect and cumulative impacts on socioeconomics and land use resulting from LPV 106 proposed action would be similar to those occurring under LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Social and Economic Resources

The direct, indirect and cumulative impacts on socioeconomics and land use resulting from LPV 106 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

LPV 107

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts to Social and Economic Resources

The direct, indirect and cumulative impacts on socioeconomics and land use resulting from LPV 107 proposed action would be similar to those occurring under LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts to Social and Economic Resources

The direct, indirect and cumulative impacts on socioeconomics and land use resulting from LPV 107 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

3.5. HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

Existing Conditions

CEMVN is obligated under ER 1165-2-132 to assume responsibility for reasonable identification and evaluation of all Hazardous, Toxic, and Radioactive Waste (HTRW) contamination within

the vicinity of the proposed action. ER 1165-2-132 identifies CEMVN's HTRW policy to avoid 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.

ASTM (American Society for Testing and Materials) E 1527-05 Phase I Environmental Site Assessments (ESA) were completed for the project area. A copy of the Phase I ESAs will be maintained on file at CEMVN. The Phase I ESAs documented the Recognized Environmental Conditions (REC) for the project area. If a REC cannot be avoided due to the necessity of construction requirements, CEMVN may further investigate the REC to confirm presence or absence of contaminants, to plan actions to avoid possible contaminants, and to determine whether local, state or Federal coordination is required. Because CEMVN plans to avoid RECs, the probability of encountering HTRW in the course of project construction is low. A site reconnaissance conducted 6 April 2009 revealed no new additional HTRW concerns.

Description of Impacts

Future Conditions with No Action

Under the no action alternative, there would be no changes to HTRW within the LPV 105, 106, and 107 project footprints. RECs observed within the LPV 105 and 106 footprints would remain in their current condition or be cleaned up by the landowner or local sponsor.

LPV 105

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts from Hazardous, Toxic, and Radioactive Waste

No RECs were observed within the footprint of the proposed floodwall construction. However, four leaks, or possible leaks, from transformers and nine facilities that store petroleum products, metals, pesticides or other hazardous materials were identified within 1,000 feet of LPV 105 reach (Earth Tech, Inc. 2007a). RECs within the LPV 105 footprint would be avoided where possible. If the REC cannot be avoided then the Non-Federal Sponsor would be responsible for remediation. If construction should reveal the existence of previously unknown HTRW, then work on that section would stop until the risk from HTRW can be evaluated and an appropriate response determined.

Future Conditions with Alternative 1

Direct, Indirect, and Cumulative Impacts from Hazardous, Toxic, and Radioactive Waste

Direct, indirect, and cumulative impacts associated with HTRW resulting from LPV 105 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

LPV 106

Future Conditions with Proposed Action

Direct, Indirect and Cumulative Impacts from Hazardous, Toxic, and Radioactive Waste

Impacts resulting from HTRW associated with LPV 106 proposed action would be similar to those occurring under LPV 105 proposed action. Two leaks, or possible leaks, from transformers and one facility that stores petroleum products were identified within 1,000 feet of the LPV 106 reach (Earth Tech, Inc. 2007b). RECs within the project area would be avoided where possible. If the REC cannot be avoided then the Non-Federal Sponsor would be responsible for remediation. If construction should reveal the existence of previously-unknown HTRW, then work on that section would stop until the risk from HTRW can be evaluated and an appropriate response determined. Cumulative impacts from HTRW would be the same as described for the LPV 105 proposed action.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts from Hazardous, Toxic and Radioactive Waste

Direct, indirect and cumulative impacts associated with HTRW resulting from LPV 106 Alternative 1 would be similar to those occurring under LPV 105 proposed action.

Future Conditions with Alternative 2

Direct, Indirect, and Cumulative Impacts from Hazardous, Toxic, and Radioactive Waste

Direct, indirect, and cumulative impacts resulting from HTRW associated with LPV 106 Alternative 2 would be similar to those occurring under LPV 105 proposed action.

LPV 107

Future Conditions with Proposed Action

Direct, Indirect, and Cumulative Impacts from Hazardous, Toxic, and Radioactive Waste

No RECs were recorded within 1,000 feet of the LPV 107 proposed action alignment (EarthTech, Inc. 2007c); therefore, no direct, indirect, or cumulative impacts from HTRW are anticipated.

Future Conditions with Alternative 1

Direct, Indirect and Cumulative Impacts from Hazardous, Toxic, and Radioactive Waste

No RECs were recorded within 1,000 feet of the LPV 107 alternative 1 alignment (EarthTech, Inc. 2007c); therefore, no direct, indirect, or cumulative impacts from HTRW are anticipated.

4. CUMULATIVE IMPACTS

NEPA requires a Federal agency to consider not only direct and indirect impacts of a proposed action, but also cumulative impacts of the action. Cumulative impacts are defined as the "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.

The HSDRRS is divided into three USACE authorized projects: 1) LPV; 2) WBV; and 3) New Orleans to Venice. WBV and New Orleans to Venice projects are not discussed further because their alignments are not located in Orleans Parish or near New Orleans East. The LPV project was authorized by Section 204 of the Flood Control Act of 1965 (P.L. 89-298 as amended), and currently provides for enlargement of hurricane damage risk reduction levees along Lake Pontchartrain in Orleans, Jefferson, and St. Charles parishes and in portions of Orleans and St. Bernard parishes between the Mississippi River and MRGO. Impacts of Hurricane Betsy on New Orleans in September 1965 (81 deaths and billions of dollars in property damage) prompted Congress to authorize the LPV project to protect areas in the vicinity of Lake Pontchartrain and surrounding parishes from storm surges. Various projects that make up the LPV have resulted in construction of 125 miles of levees, concrete floodwalls and other structures. The LPV project has provided increasing levels of storm surge protection for the New Orleans area as funding for various component projects has been approved during the past 40 years.

Following Hurricane Katrina, it was recognized that portions of the levees and floodwalls that comprise the LPV project were never constructed to authorized elevations, or had not been maintained to keep previously constructed structures at the authorized elevation. Therefore, CEMVN is in the process of implementing construction projects to raise the levees, foreshore protection, and floodwalls associated with the LPV project to authorized elevations.

In addition to ongoing construction in association with raising levee, foreshore protection, and floodwall elevations to authorized levels within various reaches of the LPV project, CEMVN is planning to raise levees, floodwalls, and floodgates, and construct new structures within all reaches of the LPV to provide 100-year level of risk reduction. This includes modifications in St. Charles Basin, Jefferson East Bank Basin, Orleans East Bank Basin, remaining portions of New Orleans East Basin not covered by this IER, and Chalmette Loop Basin. Levee improvements throughout the LPV project would require substantial amounts of borrow material, and borrow pits have been identified to provide adequate material in proximity to proposed risk reduction projects. In addition to modifying and raising existing structures, three new outfall canal closure structures are proposed at 17th Street, Orleans Avenue, and London Avenue canals in Orleans East Bank Basin, and new floodgates are proposed within the IHNC. All of these HSDRRS projects are currently in design and construction stages, and impacts from these component projects will be addressed in separate IERs and in the CED.

Replacement of the lock structure at the IHNC and construction of new floodwalls and levees and integration of those floodwalls and levees into Mississippi River flood protection system is also in planning stages. This involves construction of a new lock within the IHNC north of Claiborne Avenue, raising the North Claiborne Avenue Bridge, replacing the St. Claude Avenue Bridge and demolishing the existing lock.

The Southeast Louisiana Urban Flood Control project has components to improve the master drainage plans and some of these components are located in Jefferson and Orleans parishes. These improvements will reduce the risk of flooding in urban areas from rainfall events. In Orleans Parish, this includes improvements to five major drainage lines, adding pumping

capacity to one pump station, and building two new pump stations. In Jefferson Parish, improvements would occur to 24 drainage canals; additional pumping capacity would be provided for four pump stations, and two new pump stations would be constructed. In Jefferson Parish, 41 contracts have been awarded, with 31 completed. In Orleans Parish, nine contracts have been awarded, with eight having been completed. Overall, the currently scheduled work in Orleans and Jefferson Parishes is about 60 percent complete and should be finished in 2016, if funding is made available.

CEMVN is also involved in other regional risk reduction and coastal restoration planning efforts. Louisiana Coastal Protection and Restoration (LACPR) efforts involve comprehensive planning for protection and restoration for all of coastal Louisiana. CEMVN contracted the closure of the MRGO at the Bayou LaLoutre ridge which would stop all maritime access, including both deep-draft and shallow-draft, in the MRGO to the Gulf of Mexico from the IHNC. The closure structure will be constructed of riprap and built to an elevation of +7 feet NAVD, connecting the historic Bayou LaLoutre ridgeline. Once completed, there would be no further access for maritime traffic between the Mississippi River, Breton Sound and Gulf of Mexico to the eastern leg of the GIWW besides the IHNC lock. Closure of the MRGO at the Bayou LaLoutre ridge would lower salinity levels north and west of the structure. CEMVN is implementing an MRGO Ecosystem Restoration Study that could lead to the restoration of all areas affected by the MRGO navigation channel. CEMVN as well as other Federal agencies participate in coastal restoration projects through the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA). These are specific prioritized restoration projects implemented coast-wide by the USACE and Louisiana Department of Natural Resources (LaDNR), Coastal Restoration Division in cooperation with Federal agencies. Within 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. Projects involve numerous protection and restoration methods, including rock armored shoreline protection breakwaters, dredge material marsh construction, marsh terracing and planting, fresh water and sediment diversion projects, and modification or management of existing structures.

The IHNC surge barrier, similar to a floodwall but much larger, will be constructed at the confluence of the GIWW and the MRGO, running north-south from a point just east of Michoud Canal on the north bank of the GIWW and just south of the existing Bayou Bienvenue flood control structure. This new feature will reduce the risk of storm damage to some of the region's most vulnerable areas; New Orleans East, Metropolitan New Orleans, the 9th Ward, and St. Bernard Parish. Further, the project aims to protect those areas from storm surge coming from the Gulf of Mexico and Lake Borgne. The Decision Record for the Tier 2 portion of the IER which investigated alternative alignments and footprints, construction materials and methods, and other design details was signed by the New Orleans District Commander in October 2008. CEMVN then awarded a contract to Shaw Environmental and Infrastructure to design and construct the surge barrier simultaneously. The Commander of the Mississippi Valley Division signed the Notice to Proceed with construction on 14 January 2009.

Rebuilding efforts are taking place throughout southeast Louisiana and along the Mississippi and Alabama Gulf Coast. The Insurance Information Institute has estimated that total insured losses from Hurricane Katrina was $40.6 billion in six states (2007a), and in Louisiana insured losses are estimated at nearly $26 billion (2007b); much of those insured losses will be a component of regional rebuilding efforts. Although it is unknown how many structures will be rebuilt in Orleans Parish and throughout the Gulf Coast over the next 5 to 10 years, a large-scale rebuilding effort is underway. FEMA is providing funding to the various public agencies in the City of New Orleans and St. Bernard Parish for rebuilding efforts. This includes funding for street repairs, including 6,000 city blocks in Orleans Parish, sidewalk repairs, repairs to damaged sewer and potable water infrastructure, and repairs or replacement of public buildings.

To assist in guiding rebuilding efforts by planning district, a District Plan for New Orleans East was prepared as part of the Unified New Orleans Plan, which is a comprehensive post-Katrina planning effort required by the New Orleans City Charter and the LRA. The planning effort was developed through an interdisciplinary team led by the New Orleans Community Support Foundation and Community Support Organization. Funding for the planning was provided by the Greater New Orleans Foundation, Rockefeller Foundation, Bush-Clinton Katrina Fund and DaimlerChrysler. Each District Plan recommends specific prioritized projects for future implementation. The District Plan for New Orleans East primarily focuses on housing recovery, redevelopment of neighborhood parks and schools, a regional library, utility and transportation upgrades, Lakefront Airport relocation and redevelopment, and redevelopment of retail shopping complexes.

Several transportation projects in the area are proposed including the replacement of the Almonaster Bridge over the IHNC. The replacement of the Almonaster Bridge with a four-lane bridge would make Almonaster Boulevard a continuous four-lane roadway from Franklin Avenue to I-510 and Old Gentilly Road in Eastern New Orleans. Further, the existing bridge, which is now nearly 90 years old, suffers from chronic maintenance problems and has been closed to vehicular traffic since Hurricane Katrina. The Almonaster Bridge also serves as the crossing for the CSX Railroad between their intermodal yard just east of the IHNC and the New Orleans Public Belt system that serves the extensive port facilities and other Class I railroads in the region, and a new bridge would make this crossing more reliable.

The widening of the I-10 high-rise bridge at the IHNC (north of the IHNC lock) to an eight-lane highway, with breakdown lanes, between the Almonaster exit of I-10 and Crowder Boulevard in eastern New Orleans is also proposed. The replacement of the I-10 Twin Span Bridge across Lake Pontchartrain from New Orleans East to Slidell is under construction. This project was initiated following Hurricane Katrina and will replace the existing bridge crossing. Once completed, portions of the existing bridge may be left for recreational purposes (*i.e.*, fishing).

Construction of T-walls and floodgates would have a short-term adverse cumulative impact on noise and transportation. As a part of rebuilding efforts associated with Hurricane Katrina and other HSDRRS projects, such as the proposed Seabrook floodgate at the IHNC and levee improvements along LPV 108, east of the project area, ongoing construction projects in New Orleans East would contribute to road closures and increased construction traffic as well as increased noise levels in the region. It is anticipated that 75 million cubic yards of material would be needed to raise levee elevations regionally to meet the 100-year level of risk reduction. The total number of truck trips required, or haul routes, for the movement of this quantity of material is unknown, but cumulative short-term impacts to transportation would occur. Numerous sensitive receptors regionally would be exposed to DNL exceeding 65 dBA during nearby construction activities. However, because most of the proposed construction occurs within existing HSDRRS areas, no adverse cumulative impacts are anticipated to any other resource as a result of construction of T-walls and floodgates.

Dredging of channels in Lake Pontchartrain to complete foreshore protection in reaches LPV 106 and LPV 108, construction of the I-10 Twin Span Bridge, and construction of the Seabrook floodgate at the IHNC would have cumulative adverse impacts to water quality, fisheries, EFH, and Gulf sturgeon critical habitat through increased turbidity, suspension of sediments, increased sediment oxygen demand, and damage to SAV and lake bottom. Construction of HSDRRS projects would have significant cumulative impacts to wetlands, primarily through increased footprints of risk reduction structures.

The proposed action would have cumulative beneficial impacts to socioeconomics. The LPV project would be improved to provide additional hurricane and storm risk reduction, reducing the threat of inundation of infrastructure due to severe tropical storm events. Improved hurricane

and storm risk reduction benefits all residents, regardless of income or race, increases confidence, reduces insurance rates, and allows for development and redevelopment of existing urban areas. Providing 100-year level of risk reduction would aid in the recovery and creation of businesses and industries, employment and income in the New Orleans area.

As indicated previously, in addition to this IER, the CEMVN is preparing a draft CED that will describe the work completed and the work remaining to be constructed. The purpose of the draft CED will be to document the work completed by the CEMVN on a system-wide scale. The draft CED will describe the integration of individual IERs into a systematic planning effort. 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. Overall cumulative impacts and future operations and maintenance requirements will also be included. Table 16 describes an overview of other HSDRRS projects that may contribute to the cumulative impacts previously discussed.

5. SELECTION RATIONALE

Based on the analysis of the potential environmental impacts to the human and natural environment described in this IER and the evaluation of the engineering effectiveness, risk and reliability, social acceptability and economic value, the proposed action alternatives for LPV 105, LPV 106 and LPV 107 is the environmentally preferred alternative.

The LPV 105 proposed action reduces the length of floodwall and number of floodgates by choosing a shorter alignment south of the NSRR. The same level of storm damage risk reduction is provided to businesses and residences as a result of this alternative; however, costs of construction, operation and maintenance are reduced and the total area impacted by construction activities is less. Further, temporary impacts to NSRR and the New Orleans Lakefront Airport from construction equipment's interference with rail and air traffic are greatly reduced compared to Alternative 1. The reduced impacts to transportation occur because construction equipment that could extend into the safety zone for aircraft using runway 36L at New Orleans Lakefront Airport, would be located further south of the airport than in Alternative 1, providing greater clearance for construction equipment. Additionally, the NSRR floodgate would not be reconstructed and impacts to railroad operations would be avoided.

Raising the elevation of the existing levee along the LPV 106 alignment as described by the proposed action provides the same level of storm damage risk reduction as the construction of a T-wall cap, but reduces the cost of construction and maintenance. Raising the levee instead of constructing a T-wall cap also reduces construction times, subjecting residents to shorter road closures and less pile driving, and provides long term recreational opportunities similar to existing conditions.

The realignment of the risk reduction structure for LPV 107 and construction of a new levee is the most effective engineering solution, and directly ties LPV 107 into the adjacent levee reaches. Alternative 1 requires angles to be constructed into the risk reduction alignment. Furthermore, the LPV 107 proposed action reduces the length of the construction area decreasing the time of construction activities and impacts to transportation and noise. The LPV 107 proposed action replaces the floodgate at Lincoln Beach providing for opportunities for future redevelopment and continued access to this area.

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6. COORDINATION AND CONSULTATION

6.1 PUBLIC INVOLVEMENT

Extensive public involvement has been sought in preparation of this IER. The project analyzed in this IER was publicly disclosed and described in the *Federal Register* on 13 March 2007 and on the website www.nolaenvironmental.gov. Scoping for this project was initiated on 12 March 2007 through placement of advertisements/public notices in the *New Orleans Times-Picayune* and *USA Today*. After the scoping meetings, a 30 day public comment period was open for comment submission. CEMVN hosted public meetings on 24 July 2007; 25 October 2007; 10 March 2008; 29 April 2008; and 29 August 2008. The public was able to provide verbal comments during meetings and written comments after each meeting. Meetings were advertised in the *New Orleans Times-Picayune* 1 week prior to each meeting. Comments and concerns at these public meetings focused on the time frame for implementing the HSDRRS projects; how the NSRR impacts the levee; the height of the 100-year storm surge; the heights of the risk reduction measures; pump sizes and capacity; redevelopment of New Orleans East; air emissions concerns; and MRGO closure.

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Table 16. HSDRRS Impacts and Compensatory Mitigation to be Completed from Proposed Actions

IER	Parish		Non-wet BLH (acres)	Non-wet BLHBLH AAHUs	BLH (acres)	BLH AAHUs	Swamp (acres)	Swamp AAHUs	Marsh (acres)	Marsh AAHUs	EFH (acres)
1 LPV, La Branche Wetlands Levee	St. Charles	Protected Side	-	-	-	-	137.05	73.99	-	-	-
		Flood Side	-	-	11.33	8.09	143.57	110.97	-	-	-
2 LPV, West Return Floodwall	St. Charles, Jefferson	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	33.40	9.00	-	-	-
3 LPV, Jefferson Lakefront Levee	Jefferson	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	26.00
4 LPV, Orleans Lakefront Levee	Orleans	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
6 LPV, NOE Citrus Lakefront	Orleans	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
10 LPV, Chalmette Loop Levee	St. Bernard	Protected Side	-	-	38.32	16.44	-	-	106.55	57.31	-
		Flood Side	-	-	35.31	14.22	-	-	323.04	209.94	-
11 Tier 2 Borgne IHNC Protection	Orleans, St. Bernard	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	15.00	2.59	-	-	186.00	24.33	-
12 GIWW, Harvey, Algiers	Jefferson, Orleans, Plaquemines	Protected Side	-	-	251.70	177.3	-	-	-	-	-
		Flood Side	-	-	2.30	1.90	74.90	38.50	-	-	-
14 WBV, Westwego to Harvey Levee	Jefferson	Protected Side	-	-	45.00	30.00	-	-	-	-	-
		Flood Side	-	-	45.50	18.58	29.75	17.02	-	-	-
15 WBV, Lake Cataouatche Levee	Jefferson	Protected Side	-	-	23.50	6.13	-	-	-	-	-
		Flood Side	-	-	3.60	1.35	-	-	-	-	-
17 Company Canal Floodwall	Jefferson	Protected Side	-	-	5.50	2.69	-	-	-	-	-
		Flood Side	-	-	-	-	19.00	17.09	-	-	-
18 GFBM	Jefferson, Plaquemines, St. Charles	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
18 GFBM	Orleans	Protected Side	226.00	68.79	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
18 GFBM	St. Bernard	Protected Side	74.30	43.59	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-

Table 16, continued

IER	Parish		Non-wet BLH (acres)	Non-wet BLHBLH AAHUs	BLH (acres)	BLH AAHUs	Swamp (acres)	Swamp AAHUs	Marsh (acres)	Marsh AAHUs	EFH (acres)
19 CFBM	Hancock County, MS; Iberville, Orleans, Plaquemines, St. Bernard	Protected Side	-	-	-	-	-	-	-		-
		Flood Side	-	-	-	-	-	-	-	-	-
19 CFBM	Jefferson	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
22 GFBM	Jefferson	Protected Side	157.76	89.64	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
22 GFBM	Plaquemines	Protected Side	86.93	28.90	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
23 CFBM	Hancock County, MS; Plaquemines, St. Bernard, St. Charles	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
25 GFBM	Jefferson	Protected Side	78.30	40.90	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
25 GFBM	Orleans	Protected Side	873.00	231.00	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
25 GFBM	Plaquemines	Protected Side	17.70	12.10	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
26 CFBM	Jefferson, Plaquemines, St. John the Baptist; Hancock County, MS	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
		Protected Side									
		Flood Side									
Totals		Protected Side	1473.09	514.92	364.02	232.56	137.05	73.99	106.55	57.31	00.00
		Flood Side	-	-	113.04	46.73	300.62	192.58	509.04	234.27	26.00
		Both	1473.09	514.92	477.06	279.29	437.67	266.57	615.59	291.58	26.00

- Not applicable to the IER or number impacted is 0.
AAHU – average annual habitat unit, BLH – bottomland hardwood, CFBM – contractor-furnished borrow material, GFBM – government-furnished borrow material

This draft IER will be distributed for a 30-day public review and comment period. A public meeting specific to the proposed action will be held if requested by any stakeholder during the review period. Any comments received during this public meeting will be considered part of official record. After the 30-day comment period, and public meeting if requested, the CEMVN District Commander will 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 will make a decision on the proposed action. This decision will be documented in an IER Decision Record. If a comment(s) is determined to be substantive in nature, an Addendum to the IER will be prepared and published for an additional 30-day public review and comment period. After expiration of the public comment period the District Commander will make a decision on the proposed action. The decision will be documented in an IER Decision Record.

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 project planning and alternative analysis phases of the project. Members of this team are listed in Appendix C. This interagency team was integrated with the CEMVN-PDT to assist in planning of this project and to complete a mitigation determination of potential direct and indirect impacts. Monthly meetings with resource agencies were also held concerning this and other 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 Fisheries
U.S. Natural Resources Conservation Service
Governor's Executive Assistant for Coastal Activities
Louisiana Department of Wildlife and Fisheries
Louisiana Department of Natural Resources, Coastal Management Division
Louisiana Department of Natural Resources, Coastal Restoration Division
Louisiana Department of Environmental Quality
Louisiana State Historic Preservation Officer

The CEMVN received a draft programmatic Coordination Act Report from the USFWS on 26 November 2007 (Appendix D). The USFWS's programmatic recommendations applicable to this project would be incorporated into project design studies to the extent practicable, consistent with engineering and public safety requirements. The USFWS's programmatic recommendations, and the CEMVN's response to them, are listed below:

Recommendation 1: To the greatest extent possible, situate flood protection measures so that destruction of wetlands and non-wet bottomland hardwoods are avoided or minimized.

CEMVN Response 1: The proposed alignments for LPV 105, 106 and 107 avoid impacts to wetlands and non-wet bottomland hardwoods.

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: No wetlands would be enclosed by new levee alignments.

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: No bald eagle nesting or wading bird colonies would be adversely impacted because none exist within the project area.

Recommendation 4: Forest clearing associated with project features should be conducted during the fall or winter to minimize impacts to nesting migratory birds, when practicable.

CEMVN Response 4: No forest clearing would occur as part of the proposed action.

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

CEMVN Response 5: USACE Project Partnering Agreements (PPA) do not mandate that funds be available for specific project features, but require the non-Federal sponsor to provide certification of sufficient funding for the entire project. Any mitigation components are considered a feature of the entire project. The non-Federal sponsor is responsible for all Operational, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) of all project features as required by the USACE OMRR&R manual provided to the non-Federal sponsor upon completion of a 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, NOAA Fisheries, LaDWF, USEPA, and LaDNR. The USFWS shall be provided an opportunity to review and submit recommendations on all the work addressed in those reports.

CEMVN Response 6: Concur.

Recommendation 7: The CEMVN should avoid impacts to public lands, if feasible. If not feasible, the CEMVN should establish and continue coordination with agencies managing public lands that may be impacted by a project feature until construction of that feature is complete and prior to any subsequent maintenance. Points of contacts for the agencies overseeing public lands potentially impacted by project features are: Kenneth Litzenberger, Project Leader for the USFWS' Southeast National Wildlife Refuges, and Jack Bohannan (985) 822-2000, Refuge Manager for the Bayou Sauvage 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: No impacts to public lands would occur from the proposed action.

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 Fish and Wildlife Coordination Act for mitigation lands.

CEMVN Response 8: Concur.

Recommendation 9: If mitigation lands are purchased for inclusion within a NWR, those lands must meet certain requirements; a summary of some of those requirements is provided in Appendix A (to the draft Fish and Wildlife Coordination Act Report.) Other land-managing natural resource agencies may have similar requirements that must be met prior to accepting mitigation lands; therefore, if they are proposed as a manager of a mitigation site, they should be contacted early in the planning phase regarding such requirements.

CEMVN Response 9: Concur.

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

CEMVN Response 10: Concur.

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

CEMVN Response 11: Concur; however, the proposed action would not affect fish passage.

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: No water control structures in watercourses would be constructed or modified under the proposed action.

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, NOAA Fisheries, LaDWF, and LaDNR.

CEMVN Response 13: See CEMVN Response 12.

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: See CEMVN Response 12.

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: See CEMVN Response 11.

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: No risk reduction structures would be located within a waterway under the proposed action.

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 feet per second. However, this may not necessarily be applicable to tidal passes or other similar major exchange points.

CEMVN Response 17: See CEMVN Response 16.

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: See CEMVN Response 16.

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 feet 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 feet long and an area would hydrologically be isolated without that culvert.

CEMVN Response 19: No construction access roads would be needed under the proposed action.

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: See CEMVN Response 16.

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: See CEMVN Response 16.

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: See CEMVN Response 16.

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

CEMVN Response 23: Concur; however, no wetlands or non-wet bottomland hardwoods would be impacted by the proposed action.

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: See CEMVN Response 5.

Recommendation 25: Any proposed change in mitigation features or plans should be coordinated in advance with the USFWS, NOAA Fisheries, LaDWF, USEPA, and LaDNR.

CEMVN Response 25: Concur.

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, NOAA Fisheries, USEPA, LaDNR, and LaDWF. 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 in their draft Fish and Wildlife Coordination Act (FWCA) Report provided by letter on 27 March 2009 (Appendix D), and CEMVN's responses to the recommendations, are listed below,

Recommendation 1: The USFWS 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 1: CEMVN will provide USFWS with a copy of all draft plans and specifications for review and comment.

Recommendation 2: CEMVN should utilize USFWS provided guidance concerning the West Indian manatee and Gulf sturgeon.

CEMVN Response 2: Concur; CEMVN will utilize USFWS guidance concerning the West Indian manatee and Gulf sturgeon

Recommendation 3: If practicable, any dredged material excavated for construction of the access channels determined to be in excess of what is required to refill the channels should be used beneficially. Placement along the south shore of Lake Pontchartrain adjacent to the foreshore rock protection would likely hasten emergent marsh habitat establishment.

CEMVN Response 3: CEMVN anticipates utilizing all dredged material excavated for construction of access channels to refill the dredged channels. However, if it is determined that excess material is excavated during dredging of access channels, CEMVN will consider using the excess dredged material along the south shore of Lake Pontchartrain to raise the elevation and improve conditions for emergent marsh habitat establishment.

Recommendation 4: If a proposed project feature is changed significantly or is not implemented within one year of the date of our Endangered Species Act consultation letter, we recommend that CEMVN reinitiate coordination with this office to ensure that the proposed project would not adversely affect any Federally listed threatened or endangered species or their habitat.

CEMVN Response 4: Concur.

The USFWS reviewed the proposed action to see if it would affect any threatened and endangered species under its jurisdiction, or their critical habitat. The USFWS reconcurred with the CEMVN in another letter dated 2 February 2009 that the proposed action would not have adverse effects to threatened and endangered species under its jurisdiction (Appendix D). No project-specific recommendations were made by the USFWS.

The NOAA Fisheries reviewed the proposed action to see if it would affect any threatened and endangered species under its jurisdiction, or their critical habitat. Section 7 consultation with NOAA Fisheries was initiated by letter on 17 September 2008, and CEMVN made the determination that the proposed action would not have adverse impacts to threatened and endangered species under its jurisdiction (Appendix D). NOAA Fisheries concurred with CEMVN's determination on 13 March 2009 (Appendix D).

LaDNR reviewed the proposed action for consistency with the Louisiana Coastal Resource Program (LCRP). CEMVN determined that the project is consistent with the LCRP, and submitted the coastal consistency determination to LaDNR for review (Appendix D).

CEMVN submitted the Water Quality Certification and Air Quality Certification to LaDEQ on the proposed action. LaDEQ issued the Water Quality Certification on 6 April 2009 (Appendix D).

Section 106 of the National Historic Preservation Act, as amended, requires consultation with the SHPO and Native American tribes. The SHPO reviewed the proposed action and determined that it would not adversely affect any cultural resources (Appendix D). Eleven Federally recognized tribes that have an interest in the region were given the opportunity to review the proposed action. Three tribes responded and concurred with the SHPO response.

7. MITIGATION

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.

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8. COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

Construction of the proposed actions will not commence until the proposed actions achieve environmental compliance with all applicable laws and regulations, as described below. Environmental compliance for the proposed actions would be achieved upon: coordination of this IER with appropriate agencies, organizations, and individuals for their review and comments; USFWS and NOAA Fisheries confirmation that the proposed action would not be likely to adversely affect any endangered or threatened species or completion of Endangered Species Act Section 7 consultation (received from USFWS on 2 February 2009 and NOAA Fisheries on 13 March 2009); LaDNR concurrence with the determination that the proposed action is consistent, to the maximum extent practicable, with the LCRP, coordination with the SHPO; receipt and acceptance or resolution of all LaDEQ comments on the air quality impact analysis documented in the IER; and receipt and acceptance or resolution of all NOAA Fisheries' EFH recommendations.

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9. CONCLUSION

9.1. INTERIM DECISION

The proposed action would require the construction of structures necessary to provide the 100-year level of risk reduction for New Orleans East. The following structures would be improved under the proposed action.

The proposed action would require the construction of:

- The existing floodwall in the western portion of LPV 105 would be realigned 300 feet south of the current floodwall alignment and T-wall would be constructed south of the NSSR. A new floodgate would be constructed at the floodwall's crossing of Downman Road. In the eastern portion, the earthen levee would be raised and the I-Wall portion would be demolished in phases and replaced with a T-wall type floodwall.

- The elevation of the existing levee within the LPV 106 project area would be increased and a new curb constructed along Hayne Boulevard.

- LPV 107 would be realigned to match the LPV 106 alignment. The existing I-walls and T-walls would be demolished and a new earthen levee constructed. The existing floodgate at Lincoln Beach would be replaced.

9.2 PREPARED BY

The point of contact for this IER is Gib Owen, USACE, New Orleans District. Table 17 lists the preparers of relevant sections of this report. The address of the preparers is: U.S. Army Corps of Engineers, New Orleans District; Planning, Programs, and Project Management Division, CEMVN-PM; P.O. Box 60267; New Orleans, Louisiana 70160-0267.

Table 17. IER Preparation Team

IER Section	Team Member
Environmental Manager	Laura Lee Wilkinson, CEMVN-HPO
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Aesthetics	Richard Radford, CEMVN
HTRW	Dr. Christopher Brown, CEMVN
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Recreation	Andrew Perez, CEMVN
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Legal Review	Robert Northey, CEMVN
Legal Review	Frank Lupo, CEMVN
Technical Coordinator	Randall Kraciun, CEMVR
Technical Coordinator	Lee Walker, Evans-Graves Engineers - HPO
Project Manager	Eric Webb, GSRC
Geology and Soils	Steve Oivanki, GSRC
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Recreational Resources, Socioeconomics, and Water Resources	Shanna McCarty, GSRC
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Table 17, continued

IER Section	Team Member
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APPENDIX A

LIST OF ABBREVIATIONS AND ACRONYMS

BEA – Bureau of Economic Analysis
bgs – below ground surface
CAA – Clean Air Act
CED – Comprehensive Environmental Document
CEMVN – New Orleans District
CEQ – Council on Environmental Quality
CERCLA – Comprehensive Environmental Response, Compensation and Liability Act
CFR – Code of Federal Regulations
CO – carbon monoxide
CWA – Clean Water Act
CWPPRA – Coastal Wetlands Planning, Protection and Restoration Act
dB – decibel
dBA – A-weighted decibel
DNL – day-night average sound level
DOTD – Louisiana Department of Transportation and Devlopment
E – endangered
EA – Environmental Assessment
EO – Executive Order
EFH – Essential Fish Habitat
EIS – Environmental Impact Statement
ER – Engineering Regulations
ESA – Environmental Site Assessment
FAA – Federal Aviation Administration
FEMA – Federal Emergency Management Agency
FHWA – Federal Highway Administration
FONSI – Finding of No Significant Impact
FWCA – Fish and Wildlife Coordination Act
GIWW – Gulf Intracoastal Waterway
GMFMC – Gulf of Mexico Fisheries Management Council
HSDRRS – Greater New Orleans Hurricane and Storm Damage Risk Reduction System
HTRW – hazardous, toxic and radioactive waste
I-10 – Interstate 10
I-510 – Interstate 510
IER – Individual Environmental Report
IHNC – Inner Harbor Navigation Canal
JPM-OS – Joint Probability Method with Optimal Sampling
LA – Louisiana Highway
LACPR – Louisiana Coastal Protection and Restoration
LCRP – Louisiana Coastal Resources Program
LaDEQ – Louisiana Department of Environmental Quality
LaDNR – Louisiana Department of Natural Resources
LaDWF – Louisiana Department of Wildlife and Fisheries
LOS – level of service
LPV – Lake Pontchartrain and Vicinity Project
LRA – Louisiana Recovery Authority
MRGO - Mississippi River Gulf Outlet
MSA – metropolitan statistical area
NAAQS – National Ambient Air Quality Standards
NASA – National Aeronautics and Space Administration
NAVD 88 – North American Vertical Datum 88

NEPA – National Environmental Policy Act
NO_2 – nitrogen dioxide
NOAA – National Oceanographic and Atmospheric Administration
NOAA Fisheries – National Marine Fisheries Service
NPS – National Park Service
NRCS – Natural Resources Conservation Service
NRHP – National Register of Historic Places
NSRR – Norfolk Southern Railroad
NWR – National Wildlife Refuge
O_3 – ozone
OMRR&R – Operational, Maintenance, Repair, Replacement and Rehabilitation
PA – Programmatic Agreement
Pb - lead
PCPI – per capita personal income
PDT – project delivery team
P.L. – Public Law
PM 2.5 – particulate matter less than 2.5 microns in size
PM 10 – particulate matter less than 10 microns in size
PPA – Project Partnering Agreements
Ppt – parts per thousand
RCRA – Resource Conservation and Recovery Act
REC – recognized environmental condition
ROD – Record of Decision
SAV - submerged aquatic vegetation
SHPO –State Historic Preservation Officer
SIR – Supplemental Information Report
SO_2 – sulfur oxide
SOD – sediment oxygen demand
SWPPP – Stormwater Pollution Prevention Plan
SPCCP – Spill Prevention Control and Countermeasures Plan
T – threatened
TPI – total personal income
UNO – University of New Orleans
U.S. – United States of America
USACE – U.S. Army Corps of Engineers
USEPA – U.S. Environmental Protection Agency
USFWS – U.S. Fish and Wildlife Service
USGS – U.S. Geological Survey
VOC – volatile organic compounds
WBV – West Bank and Vicinity
WRDA – Water Resources Development Act

APPENDIX B

PUBLIC COMMENT AND RESPONSE SUMMARY

All comments received during the public review of the Draft IER #6 will be included in Appendix B

APPENDIX C

MEMBERS OF INTERAGENCY ENVIRONMENTAL TEAM

Kyle Balkum	Louisiana Department of Wildlife and Fisheries
Brian Marks	Louisiana Department of Natural Resources
Catherine Breaux	U.S. Fish and Wildlife Service
David Castellanos	U.S. Fish and Wildlife Service
James Harris	U.S. Fish and Wildlife Service
Ken Litzenberger	U.S. Fish and Wildlife Service
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David Muth	U.S. National Park Service
Jamie Phillippe	Louisiana Department of Environmental Quality
Manuel Ruiz	Louisiana Department of Wildlife and Fisheries
Reneé Sanders	Coastal Protection and Restoration Authority
Ismail Merhi	Coastal Protection and Restoration Authority
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
AGENCY COORDINATION

U.S. FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
646 CAJUNDOME BLVD.
SUITE 400
LAFAYETTE, LA 70506

FAXFORM
FAX (337) 291-3139
COMM (337) 291-3100

DATE: 12-6-07

TO: Ms. Laura Lee Wilkinson 504-862-1557 CEMVN

FROM: David Castellano

SUBJECT: T+E Concurrence IERs 5-11

NUMBER OF PAGES TO FOLLOW: 5

REMARKS:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506
December 6, 2007

Colonel Jeffery Bedey
Hurricane Protection Office (HPO)
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Colonel Bedey,

Please reference the November 7, 2007, letter, and November 11, 2007, electronic mail from Laura Lee Wilkinson requesting our review of the U.S. Army Corps of Engineers' (Corps) proposed 100 Year Hurricane Protection Projects for Individual Environmental Reports (IER) 5-11 in Orleans, Jefferson, and St. Bernard Parishes and concurrence with determinations on effects to Federally Listed Species. That project would involve improvements to levees, floodwalls, floodgates, and construction of new barriers, closure structures, navigable gates and/or permanent pump stations in the New Orleans East Bank, New Orleans East and Chalmette Loop sub basins. These improvements are necessary to provide 100-year level flood protection for the New Orleans Metropolitan area. The U.S. Fish and Wildlife Service (Service) has reviewed the information provided, and offers the following comments in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d), Migratory Bird Treaty Act (MBTA) (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.), and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

The projects included in IERs 5-11 span a large geographic area and have unique components, but the number of potentially impacted threatened or endangered species is small; therefore, the IERs will be grouped according to potentially affected species.

Federally listed as an endangered species, West Indian manatees (*Trichechus manatus*) occasionally enter Lakes Pontchartrain and Maurepas, and associated coastal waters and streams during the summer months (i.e., June through September). Manatee occurrences appear to be increasing, and they have been regularly reported in the Amite, Blind, Tchefuncte, and Tickfaw Rivers, and in canals within the adjacent coastal marshes of Louisiana. They have also been occasionally observed elsewhere along the Louisiana Gulf coast. The manatee has declined in numbers due to collisions with boats and barges, entrapment in flood control structures, poaching, habitat loss, and pollution. Cold weather and outbreaks of red tide may also adversely affect these animals.

Some or all of the proposed project features, including alternatives, of IERs 5, 6, 7, 8, and 11 (especially the dredging of access channels for IERs 6 and 7), could potentially impact the manatee. The Corps has incorporated the following protective measures into its construction

contracts; therefore, the Service concurs with your determination that construction of the proposed project features is not likely to adversely affect the manatee.

All contract personnel associated with the project should be informed of the potential presence of manatees and the need to avoid collisions with manatees, which are protected under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973. All construction personnel are responsible for observing water-related activities for the presence of manatee(s). Temporary signs should be posted prior to and during all construction/dredging activities to remind personnel to be observant for manatees during active construction/dredging operations or within vessel movement zones (i.e., work area), and at least one sign should be placed where it is visible to the vessel operator. Siltation barriers, if used, should be made of material in which manatees could not become entangled, and should be properly secured and monitored. If a manatee is sighted within 100 yards of the active work zone, special operating conditions should be implemented, including: no operation of moving equipment within 50 feet of a manatee; all vessels should operate at no wake/idle speeds within 100 yards of the work area; and siltation barriers, if used, should be re-secured and monitored. Once the manatee has left the 100-yard buffer zone around the work area on its own accord, special operating conditions are no longer necessary, but careful observations would be resumed. Any manatee sighting should be immediately reported to the Service's Lafayette, Louisiana Field Office (337/291-3100) and the Louisiana Department of Wildlife and Fisheries, Natural Heritage Program (225/765-2821).

The Gulf sturgeon (*Acipenser oxyrhynchus desotoi*), federally listed as a threatened species, is an anadromous fish that occurs in many rivers, streams, and estuarine waters along the northern Gulf coast between the Mississippi River and the Suwanee River, Florida. In Louisiana, Gulf sturgeon have been reported at Rigolets Pass, rivers and lakes of the Lake Pontchartrain basin, and adjacent estuarine areas. Spawning occurs in coastal rivers between late winter and early spring (i.e., March to May). Adults and sub-adults may be found in those rivers and streams until November, and in estuarine or marine waters during the remainder of the year. Sturgeon less than two years old appear to remain in riverine habitats and estuarine areas throughout the year, rather than migrate to marine waters. Habitat alterations such as those caused by water control structures that limit and prevent spawning, poor water quality, and over-fishing have negatively affected this species.

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

In that critical habitat designation, responsibility for consultation with specific Federal agencies was also identified for the Service and for the NMFS. For estuarine and marine waters in Louisiana, the NMFS is responsible for consultations regarding impacts to the sturgeon and its

critical habitat with all Federal agencies, except the Department of Transportation, the Environmental Protection Agency, the U.S. Coast Guard, and the Federal Emergency Management Agency, which consult with the Service. Therefore, please contact Dr. Stephania Bolden (727/824-5312) in St. Petersburg, Florida, for information concerning that species and its critical habitat. Should the proposed project directly or indirectly affect the Gulf sturgeon or its critical habitat in Louisiana, further consultation with that office will be necessary.

The pallid sturgeon (*Scaphirhynchus albus*) is an endangered fish found in both the Mississippi and Atchafalaya Rivers (with known concentrations in the vicinity of the Old River Control Structure Complex). The pallid sturgeon is adapted to large, free-flowing, turbid rivers with a diverse assemblage of physical characteristics that are in a constant state of change. Habitat loss through river channelization and dams has adversely affected this species throughout its range. According to the information provided, the construction of the proposed project features, including alternatives, of IERs 5-11 would not impact the Mississippi River, therefore we concur that they are not likely to adversely affect the pallid sturgeon.

The project-area forested wetlands may provide nesting habitat for the bald eagle (*Haliaeetus leucocephalus*), which has officially been removed from the List of Endangered and Threatened Species as of August 8, 2007. Bald eagles nest in Louisiana from October through mid-May. Eagles typically nest in mature trees (e.g., bald cypress, sycamore, willow, etc.) near fresh to intermediate marshes or open water in the southeastern Parishes. Major threats to this species include habitat alteration, human disturbance, and environmental contaminants (i.e., organochlorine pesticides and lead).

The Service developed the National Bald Eagle Management (NBEM) Guidelines to provide landowners, land managers, and others with information and recommendations regarding how to minimize potential project impacts to bald eagles, particularly where such impacts may constitute "disturbance," which is prohibited by the Bald and Golden Eagle Protection Act. A copy of the NBEM Guidelines is available at: http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf. The construction of the proposed project features, including alternatives, of IERs 7, and 10 may potentially impact the bald eagle. If the Corps determines that construction activities will be located at or closer than 660 feet from a nest tree, the Service recommends that the Corps contact this office to aid in determining the appropriate size and configuration of buffers or the timing of activities in the vicinity of the nest to cause the least impact.

Federally listed as an endangered species, brown pelicans (*Pelecanus occidentalis*) are not currently known to nest in the project vicinity. Brown pelicans feed along the Louisiana coast in shallow estuarine waters, using sand spits and offshore sand bars as rest and roost areas. Major threats to this species include chemical pollutants, colony site erosion, disease, and human disturbance. The Service concurs that construction of the proposed project features is not likely to adversely affect the brown pelican.

Federally listed as a threatened species, the piping plover (*Charadrius melodus*), as well as its designated critical habitat, occur along the Louisiana coast. Piping plovers winter in Louisiana, and may be present for 8 to 10 months annually. They arrive from the breeding grounds as early

as late July and remain until late March or April. Piping plovers feed extensively on intertidal beaches, mudflats, sand flats, algal flats, and wash-over passes with no or very sparse emergent vegetation; they also require unvegetated or sparsely vegetated areas for roosting. Plovers move among sites as environmental conditions change, and studies have indicated that they generally remain within a 2-mile area. Major threats to this species include the loss and degradation of habitat due to development, disturbance by humans and pets, and predation. The Service concurs that construction of the proposed project features is not likely to adversely impact the piping plover or its critical habitat because they are not known to occur in the project area.

The project area is located where colonial nesting waterbirds may be present. LDWF currently maintains a database of these colonies locations. 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, we recommend that a qualified biologist inspect the proposed work sites for the presence of undocumented nesting colonies during the nesting season (e.g. February through September depending on the species). If colonies exist, work should not be conducted within 1,000 feet of the colony during the nesting season

Several portions of the project area are located within or will require access through the Service's Bayou Sauvage National Wildlife Refuge. The National Wildlife Refuge System Improvement Act of 1997 authorized that no new or expanded use of a refuge may be allowed unless it is first determined to be compatible. A compatibility determination is a written determination signed and dated by the Refuge Manager and Regional Refuge Chief, signifying that a proposed or existing use of a national wildlife refuge is a compatible use or is not a compatible use. A compatible use is defined as a proposed or existing wildlife-dependent recreational use or any other use of a national wildlife refuge that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the national wildlife refuge. A compatibility determination is only required when the Service has jurisdiction over the use. For example, proposed uses that deal exclusively with air space, navigable waters or overly refuges where another Federal agency has primary jurisdiction over the area, would not be subject to compatibility.

Federal agencies proposing a project that includes features on a national wildlife refuge are encouraged to contact the Refuge Manager early in the planning process. The Refuge Manager will work with the project proponent to determine if the proposed project constitutes a "refuge use" subject to a compatibility determination. If the proposed project requires a compatibility determination, a concise description of the project (refuge use) including who, what, where, when, how and why will be needed to prepare the compatibility determination. In order to determine the anticipated impacts of use, the project proponent may be required to provide sufficient data and information sources to document any short-term, long-term, direct, indirect or cumulative impacts on refuge resources. Compatibility determinations will include a public review and comment before issuing a final determination.

All construction or maintenance activities (e.g., surveys, land clearing, etc.) on a National Wildlife Refuge (NWR) will require the Corps to obtain a Special Use Permit from the Refuge

Manager; furthermore, all activities on that NWR must be coordinated with the Refuge Manager. Therefore, we recommend that the Corps request issuance of a Special Use Permit well in advance of conducting any work on the refuge. Please contact Kenneth Litzenberger, Project Leader for the Service's Southeast National Wildlife Refuges and Jack Bohannan (985) 822-2000, Refuge Manager for the Bayou Sauvage National Wildlife Refuge for further information on compatibility of flood control features, and for assistance in obtaining a Special Use Permit. Close coordination by both the Corps and its contractor must be maintained with the Refuge Manager to ensure that construction and maintenance activities are carried out in accordance with provisions of any Special Use Permit issued by the NWR.

Based on our review, the Service concurs with your determinations that the construction of the proposed project features in IERs 5-11 is not likely to adversely affect the pallid sturgeon, brown pelican, bald eagle, and piping plover. Because of manatee protective measures included in the Corps' construction contracts, the Service also concurs that the construction of the proposed project features in IERs 5-11 is not likely to adversely affect the manatee. The Service recommends that the Corps contact NMFS regarding impacts to the Gulf sturgeon and its critical habitat and implement the above mentioned survey and protection measure to protect colonial nesting birds.

We appreciate the opportunity to review the Proposed 100 Year Hurricane Protection Projects for IERs 5-11. If you need further assistance or have questions regarding this letter, please contact David Castellanos (337/291-3112) of this office.

Sincerely,

James F. Boggs
Acting Field Supervisor
Louisiana Field Office

cc: NOAA, St. Petersburg, FL
Laura Lee Wilkinson, CEMVN, New Orleans, LA
LDWF, Natural Heritage, Baton Rouge, LA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506
January 30, 2007

Colonel Michael McCormick
Hurricane Protection Office (HPO)
U.S. Army Corps of Engineers
Post Office Box 60267
New Orleans, Louisiana 70160-0267

Dear Colonel McCormick:

Please reference the December 31, 2008, letter from Mr. Gib Owen, Acting Chief of the Environmental Planning and Compliance Branch, requesting our concurrence with determinations regarding impacts to threatened or endangered species and their critical habitat made by U.S. Army Corps of Engineers' (Corps) for work proposed in Individual Environmental Reports (IER) 5-11 in Orleans, Jefferson, and St. Bernard Parishes. Those projects would involve improvements to levees, floodwalls, floodgates, and construction of new barriers, closure structures, navigable gates and/or permanent pump stations in the New Orleans East Bank, New Orleans East and Chalmette Loop sub basins. These improvements are necessary to provide 100-year level flood protection for the New Orleans Metropolitan area. The U.S. Fish and Wildlife Service (Service) has reviewed the information provided, and offers the following comments in accordance with the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d), Migratory Bird Treaty Act (MBTA) (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.), and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

The projects included in IERs 5-11 span a large geographic area and have unique components, but the number of potentially impacted threatened or endangered species is small; therefore, the IERs will be grouped according to potentially affected species.

Federally listed as an endangered species, West Indian manatees (*Trichechus manatus*) occasionally enter Lakes Pontchartrain and Maurepas, and associated coastal waters and streams during the summer months (i.e., June through September). Manatee occurrences appear to be increasing, and they have been regularly reported in the Amite, Blind, Tchefuncte, and Tickfaw Rivers, and in canals within the adjacent coastal marshes of Louisiana. They have also been occasionally observed elsewhere along the Louisiana Gulf coast. The manatee has declined in numbers due to collisions with boats and barges, entrapment in flood control structures, poaching, habitat loss, and pollution. Cold weather and outbreaks of red tide may also adversely affect these animals.

Some or all of the proposed project features, including alternatives, of IERs 5, 6, 7, 8, and 11 (especially the dredging of access channels for IERs 6 and 7), could potentially impact the

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manatee. The Corps has incorporated the following protective measures into its construction contracts; therefore, the Service concurs with your determination that construction of the proposed project features is not likely to adversely affect the manatee.

All contract personnel associated with the project should be informed of the potential presence of manatees and the need to avoid collisions with manatees, which are protected under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973. All construction personnel are responsible for observing water-related activities for the presence of manatee(s). Temporary signs should be posted prior to and during all construction/dredging activities to remind personnel to be observant for manatees during active construction/dredging operations or within vessel movement zones (i.e., work area), and at least one sign should be placed where it is visible to the vessel operator. Siltation barriers, if used, should be made of material in which manatees could not become entangled, and should be properly secured and monitored. If a manatee is sighted within 100 yards of the active work zone, special operating conditions should be implemented, including: no operation of moving equipment within 50 feet of a manatee; all vessels should operate at no wake/idle speeds within 100 yards of the work area; and siltation barriers, if used, should be re-secured and monitored. Once the manatee has left the 100-yard buffer zone around the work area on its own accord, special operating conditions are no longer necessary, but careful observations would be resumed. Any manatee sighting should be immediately reported to the Service's Lafayette, Louisiana Field Office (337/291-3100) and the Louisiana Department of Wildlife and Fisheries, Natural Heritage Program (225/765-2821).

The Gulf sturgeon (*Acipenser oxyrhynchus desotoi*), federally listed as a threatened species, is an anadromous fish that occurs in many rivers, streams, and estuarine waters along the northern Gulf coast between the Mississippi River and the Suwanee River, Florida. In Louisiana, Gulf sturgeon have been reported at Rigolets Pass, rivers and lakes of the Lake Pontchartrain basin, and adjacent estuarine areas. Spawning occurs in coastal rivers between late winter and early spring (i.e., March to May). Adults and sub-adults may be found in those rivers and streams until November, and in estuarine or marine waters during the remainder of the year. Sturgeon less than two years old appear to remain in riverine habitats and estuarine areas throughout the year, rather than migrate to marine waters. Habitat alterations such as those caused by water control structures that limit and prevent spawning, poor water quality, and over-fishing have negatively affected this species.

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

In that critical habitat designation, responsibility for consultation with specific Federal agencies was also identified for the Service and for the NMFS. For estuarine and marine waters in

Louisiana, the NMFS is responsible for consultations regarding impacts to the sturgeon and its critical habitat with all Federal agencies, except the Department of Transportation, the Environmental Protection Agency, the U.S. Coast Guard, and the Federal Emergency Management Agency, which consult with the Service. Therefore, please contact Dr. Stephania Bolden (727/824-5312) in St. Petersburg, Florida, for information concerning that species and its critical habitat. Should the proposed project directly or indirectly affect the Gulf sturgeon or its critical habitat in Louisiana, further consultation with that office will be necessary.

The project-area forested wetlands may provide nesting habitat for the bald eagle (*Haliaeetus leucocephalus*), which has officially been removed from the List of Endangered and Threatened Species as of August 8, 2007, however the bald eagle continues to be protected under the MBTA and the BGEPA. Bald eagles nest in Louisiana from October through mid-May. Eagles typically nest in mature trees (e.g., bald cypress, sycamore, willow, etc.) near fresh to intermediate marshes or open water in the southeastern parishes. Major threats to this species include habitat alteration, human disturbance, and environmental contaminants.

The Service developed the National Bald Eagle Management (NBEM) Guidelines to provide landowners, land managers, and others with information and recommendations regarding how to minimize potential project impacts to bald eagles, particularly where such impacts may constitute "disturbance," which is prohibited by the BGEPA. A copy of the NBEM Guidelines is available at:
http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf. Those guidelines recommend: (1) maintaining a specified distance between the activity and the nest (buffer area); (2) maintaining natural areas (preferably forested) between the activity and nest trees (landscape buffers); and (3) avoiding certain activities during the breeding season. On-site personnel should be informed of the possible presence of nesting bald eagles within the project boundary, and should identify, avoid, and immediately report any such nests to this office. The construction of the proposed project features for IER 10, Reach LPV 148, may potentially impact the bald eagle. If the Corps determines that construction activities will be located at or closer than 660 feet from a nest tree, the Service recommends that the Corps conduct an on-line evaluation at: http://www.fws.gov/southeast/es/baldeagle. Following completion of the evaluation, that website will provide a determination of whether additional consultation is necessary. A copy of that determination should be provided to this office. The Division of Migratory Birds for the Southeast Region of the Service (phone: 404/679-7051, e-mail: SEmigratorybirds@fws.gov) has the lead role in conducting such consultations. Should you need further assistance interpreting the guidelines or performing an on-line project evaluation, please contact our office.

Federally listed as an endangered species, brown pelicans (*Pelecanus occidentalis*) are not currently known to nest in the project vicinity. Brown pelicans feed along the Louisiana coast in shallow estuarine waters, using sand spits and offshore sand bars as rest and roost areas. Major threats to this species include chemical pollutants, colony site erosion, disease, and human disturbance. The Service concurs that construction of the proposed project features is not likely to adversely affect the brown pelican.

IERs 6, 7, 8, 9, and 10 are located where colonial nesting waterbirds may be present. LDWF currently maintains a database of these colonies locations. 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, we recommend that a qualified biologist inspect the proposed work sites for the presence of undocumented nesting colonies during the nesting season (e.g. February through September depending on the species). If colonies exist, work should not be conducted within 1,000 feet of the colony during the nesting season

Portions of IER 6 and 7 are located within or may require access through the Service's Bayou Sauvage National Wildlife Refuge. The National Wildlife Refuge System Improvement Act of 1997 authorized that no new or expanded use of a refuge may be allowed unless it is first determined to be compatible. A compatibility determination is a written determination signed and dated by the Refuge Manager and Regional Refuge Chief, signifying that a proposed or existing use of a national wildlife refuge is a compatible use or is not a compatible use. A compatible use is defined as a proposed or existing wildlife-dependent recreational use or any other use of a national wildlife refuge that, based on sound professional judgment, will not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purposes of the national wildlife refuge. A compatibility determination is only required when the Service has jurisdiction over the use. For example, proposed uses that deal exclusively with air space, navigable waters or overly refuges where another Federal agency has primary jurisdiction over the area, would not be subject to compatibility.

Federal agencies proposing a project that includes features on a national wildlife refuge are encouraged to contact the Refuge Manager early in the planning process. The Refuge Manager will work with the project proponent to determine if the proposed project constitutes a "refuge use" subject to a compatibility determination. If the proposed project requires a compatibility determination, a concise description of the project (refuge use) including who, what, where, when, how, and why will be needed to prepare the compatibility determination. In order to determine the anticipated impacts of use, the project proponent may be required to provide sufficient data and information sources to document any short-term, long-term, direct, indirect or cumulative impacts on refuge resources. Compatibility determinations will include a public review and comment before issuing a final determination.

All construction or maintenance activities (e.g., surveys, land clearing, etc.) on a National Wildlife Refuge (NWR) will require the Corps to obtain a Special Use Permit from the Refuge Manager; furthermore, all activities on that NWR must be coordinated with the Refuge Manager. Therefore, we recommend that the Corps request issuance of a Special Use Permit well in advance of conducting any work on the refuge. Please contact Kenneth Litzenberger, Project Leader for the Service's Southeast National Wildlife Refuges and Jack Bohannan Refuge Manager for the Bayou Sauvage National Wildlife Refuge at (985) 822-2000, for further information on compatibility of flood control features, and for assistance in obtaining a Special Use Permit. Close coordination by both the Corps and its contractor must be maintained with the Refuge Manager to ensure that construction and maintenance activities are carried out in accordance with provisions of any Special Use Permit issued by the NWR.

Based on our review, the Service concurs with your determinations that the construction of the proposed project features in IERs 5-11 is not likely to adversely affect the brown pelican, and because of manatee protective measures included in the Corps' construction contracts, the Service also concurs that the construction of the proposed project features in IERs 5-11 is not likely to adversely affect the manatee. The Service recommends that the Corps contact NMFS regarding impacts to the Gulf sturgeon and its critical habitat and implement the above mentioned survey and protection measure to protect colonial nesting birds. The Service is also willing to assist the Corps evaluate the potential impacts to the bald eagle under the NBEM Guidelines.

We appreciate the opportunity to review the proposed 100 Year Hurricane Protection Projects for IERs 5-11. If you need further assistance or have questions regarding this letter, please contact David Walther (337/291-3122) of this office.

Sincerely,

for James F. Boggs
Field Supervisor
Louisiana Field Office

cc: NOAA, St. Petersburg, FL
Laura Lee Wilkinson, CEMVN, New Orleans, LA
LDWF, Natural Heritage, Baton Rouge, LA

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September 17, 2008

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

Subject: Informal Endangered Species Act Section 7 Consultation for **IER 6**: Lake Pontchartrain and Vicinity, New Orleans East, New Orleans Lakefront Levee to Citrus Lakefront Levee, New Orleans Airport Floodwall to Paris Road, Orleans Parish, Louisiana Project and **IER 7**: Lake Pontchartrain and Vicinity, New Orleans East, New Orleans East Lakefront Levee to New Orleans East Back Levee, Paris Road to Eastbank of Michoud Canal, Orleans Parish, Louisiana Project.

Mr. David Bernhart
U.S. National Marine Fisheries
Southeastern Regional Office
Protected Resources Division
263 13th Ave. South
St. Petersburg, FL 33701

Dear Mr. Bernhart:

The U.S. Army Corps of Engineers, New Orleans District (CEMVN), is preparing two Individual Environmental Reports (IERs) on improvements to the New Orleans (N.O.) Lakefront Levee to the Citrus Lakefront Levee; N.O. Airport Floodwall to Paris Road; N.O. East Lakefront Levee to N.O. East Back Levee, and Paris Road to Eastbank of Michoud Canal, in Orleans Parish, Louisiana (figure 1). The purpose of the proposed action is to upgrade the Lake Pontchartrain and Vicinity (LPV) levees in Orleans Parish to the 100 year level of protection and to provide shoreline protection along Lake Pontchartrain to protect these levees.

The proposed action would provide shoreline protection in the form of foreshore rock placed along the Lake Pontchartrain shoreline and involve construction access dredging of 9 channels (see enclosed drawings). Using the digitized 2004 Lake Pontchartrain shoreline, the foreshore rock would extend into the water and cover approximately 14 acres of Gulf sturgeon critical habitat. Approximately 44 acres of Lake Pontchartrain water bottom would be dredged via bucket dredge as access channels for construction. Material dredged from the access channels would be temporarily stockpiled adjacent to the channels on approximately 134 acres of Lake Pontchartrain water bottom, but would be returned to the channels following completion of construction.

The threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is known to occur in Lake Pontchartrain through the sampling efforts of Louisiana Department of Wildlife and Fisheries Inland Fisheries Division. On March 19, 2003, the United States Fish and Wildlife Service (USFWS) and the National Oceanographic and Atmospheric Administration (NOAA) published a final rule in the Federal Register (Volume 68, No. 53) designating critical habitat for Gulf sturgeon in Louisiana. This designation included portions of the Pearl and BogueChitto Rivers; Lake Pontchartrain east of the Lake Pontchartrain Causeway; and all of Little Lake, the Rigolets, Lake St. Catherine, and Lake Borgne. Although the proposed project would involve activities in the critical habitat of a Federally listed species, the CEMVN believes that the scope of the activities constitute a Not Likely to Adversely Affect (NLAA) determination for the species and its habitat under Section 7 of the Endangered Species Act (ESA). As a result, the CEMVN requests concurrence from NOAA in a finding of NLAA for the Federally listed Gulf sturgeon and its critical habitat through informal consultation. Details on the parts of the project in Gulf sturgeon critical habitat and a narrative describing our conclusions in this regard are provided below.

Rock would be placed upon approximately 11 miles of existing foreshore protection that was initially installed in 1985, raising it to elevation 14 feet (ft) NAVD88. Using the digitized 2004 Lake Pontchartrain shoreline, this added rock would extend into the water and permanently cover approximately 14 acres of Gulf sturgeon critical habitat (see enclosed drawings).

Placement of the rock foreshore protection would be via access channels perpendicular and parallel to the protection alignment. These access channels would be dredged to a depth of -10 ft NAVD 88 via bucket dredge, be no wider than 100 ft bottom width, and disturb approximately 44 acres of water bottom (figure 2). Material from the access/floatation channels would be stockpiled linearly, adjacent to and on one side of the channels in an area equaling approximately 134 acres (including the 14 - 40 ft buffer between the access/floatation channels and stockpile sites) and be returned to the floatation channel at the end of construction. A silt curtain would be deployed on all sides of the stockpile sites except the side(s) adjacent to the access channel or directly on land in an effort to contain the stockpiled material to the maximum extent possible for backfilling.

The potential physical impacts to species of concern are related to direct physical impacts and habitat alteration due to activities conducted in the water and are summarized as follows:

The construction of the shoreline protection would result in the permanent loss of water bottom habitat in these areas. The footprint of the shoreline protection would cover 14 acres of Lake Pontchartrain water bottom and impact the benthic habitat in waters less than 1 meter deep.

A temporary loss of benthic invertebrates would occur with the dredging of the access channels and the stockpiling of the access channel material. The stockpiled access material would be returned to its original location upon project completion. Benthic habitat disturbed during the project for the access channels is approximately 44 acres. Access channel material stockpiled adjacent to the channel would disturb approximately 134 acres of benthic habitat. Total temporary impact to Gulf sturgeon critical habitat would be approximately 178 acres.

Turbidity in the project area would temporarily increase during project construction but would return to normal after construction is completed.

Gulf sturgeon: The USFWS and NOAA utilized primary constituent elements essential for the conservation of the Gulf sturgeon in order to designate critical habitat for the species in the March 19, 2003 Federal Register. These primary constituent elements are those habitat components that support feeding, resting, sheltering, reproduction, migration, and physical features necessary for maintaining the natural processes that support those habitat components. The following are the primary constituent elements for Gulf sturgeon critical habitat and CEMVN's responses on how the MRGO, Louisiana, and Lake Pontchartrain Wetland Creation and Shoreline Protection project would affect these elements. CEMVN has determined that the proposed action is Not Likely To Adversely Affect Gulf sturgeon critical habitat based on these responses.

1) Abundant prey items within riverine habitats for larval and juvenile life stages, and within estuarine and marine habitats for juvenile, sub-adult, and adult life stages.

The proposed action would not affect any riverine habitats.

The proposed action would temporarily decrease the amount of Gulf sturgeon prey species available in the estuarine areas that are being dredged for the project's access channels as well as those areas acting as temporary disposal sites for access channel material. These areas would, however, quickly re-colonize with the benthic species important to the diet of the various stages of Gulf sturgeon using the area upon project completion.

The proposed action would permanently decrease the amount of Gulf sturgeon prey species available in the estuarine areas in the proposed location of the foreshore rick dikes. Fox et al., (AFS Symposium 28:111-126, 2002) found in their investigations of the estuarine and nearshore marine habitats used by Gulf sturgeon in the Choctawhatchee Bay and nearshore Gulf of Mexico that Gulf sturgeon were typically found in water depths of 2-4 meters. The depths along the foreshore protection alignment in Lake Pontchartrain are shallower than 1 meter in depth. As such, the CEMVN believes these areas are rarely, if ever used by Gulf sturgeon foraging for prey species.

2) Riverine spawning sites with substrates suitable for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay.

The proposed action will not occur within a riverine system or spawning area.

3) Riverine aggregation areas, also referred to as resting, holding and staging areas, used by adult, sub-adult, and/or juveniles, generally, but not always, located in holes below normal riverbend depths, believed necessary for minimizing energy expenditures during freshwater residency and possibly for osmoregulatory functions.

The proposed action will not occur within a riverine system or near any potential resting, holding, or staging areas.

4) A flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of freshwater discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging; and necessary for maintaining spawning sites in suitable condition for egg attachment, egg sheltering, resting, and larvae staging.

The proposed action will not occur within a riverine system. Additionally, the proposed action will not impact the flow or flushing of water through a riverine system.

5) Water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages.

The proposed action would result in a localized increase in turbidity at the project area from actions associated with the dredging of the access channels, placement of the stockpiled material and placement of the foreshore protection. However, the rise in turbidity would be temporary and would be reduced with the movement of the tides. As such, there would be no significant change in the temperature, salinity, pH, hardness, turbidity, oxygen content, or other chemical characteristics of the water in Lake Pontchartrain as a result of the proposed action that would affect the normal behavior, growth, and viability of all Gulf sturgeon life stages. In addition, if Gulf sturgeon were in the area during construction, they would be free to relocate in the vicinity of the proposed project since the project area encompasses only a small section of a 403,200 acre estuarine/brackish lake of which approximately ½ is designated critical habitat.

6) Sediment quality, including texture and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages.

The proposed action would result in localized sediment disturbance at the project area from actions associated with the dredging of the access channels, placement of the stockpiled material and placement of the foreshore protection. However, the sediments disturbed from the dredging of the access channels would be returned to their original location upon project completion. The removal of sediments from the access channel would not impact the texture and other chemical characteristics necessary for the normal behavior, growth, and viability of Gulf sturgeon life stages because either these disturbances will occur in waters depths that Gulf sturgeon do not normally utilize or the type of sediment presently occurring in the project area would be restored at the end of construction.

7) Safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (e.g., a river unobstructed by a permanent structure, or a dammed river that still allows for passage).

The proposed action is for shoreline protection adjacent to an estuarine/brackish lake and does not block nor hinder the migratory movements of Gulf sturgeon between their riverine, estuarine and marine habitats.

In an effort to avoid direct impacts to Gulf sturgeon that may possibly be using the project area during the winter months to forage, the CEMVN would adhere to a dredging window for the project, allowing construction in the project area to occur during the months of May through September. The bucket drop procedure developed by USFWS would also be employed to encourage any Gulf sturgeon in the vicinity to leave the project area. Due to the water depths along the Lake Pontchartrain shoreline where the foreshore protection will be placed, the size of the estuarine/brackish lake this work is to occur in, and the ability of benthic organisms to rapidly re-colonize disturbed areas, the CEMVN believes that the proposed action is not likely to adversely affect Gulf sturgeon or their critical habitat.

Based on the information provided in this correspondence, CEMVN requests concurrence of a NLAA determination for Gulf sturgeon and their associated critical habitat for IERs 6 and 7. The NOAA will be notified immediately if any of the actions considered in this document are modified, requiring further consultation. If impacts to Gulf sturgeon and their critical habitat occur beyond what has been already considered, all operations will cease and NOAA will be notified. Any modifications or conditions to the proposed action as a result of this concurrence will be implemented prior to commencement of activities. CEMVN believes this fulfills all requirements of the Endangered Species Act and no further action is necessary. Questions or comments on this issue should be addressed to Mrs. Elizabeth Behrens who may be reached via telephone at (504) 862-2025, by email at elizabeth.h.behrens@usace.army.mil or by mail at U.S. Army Corps of Engineers; CEMVN-PM-RS; P.O. Box 60267; New Orleans, Louisiana, 70160-0267.

Sincerely,

For Elizabeth Wiggins
Chief, Environmental Planning
and Compliance Branch

Enclosures

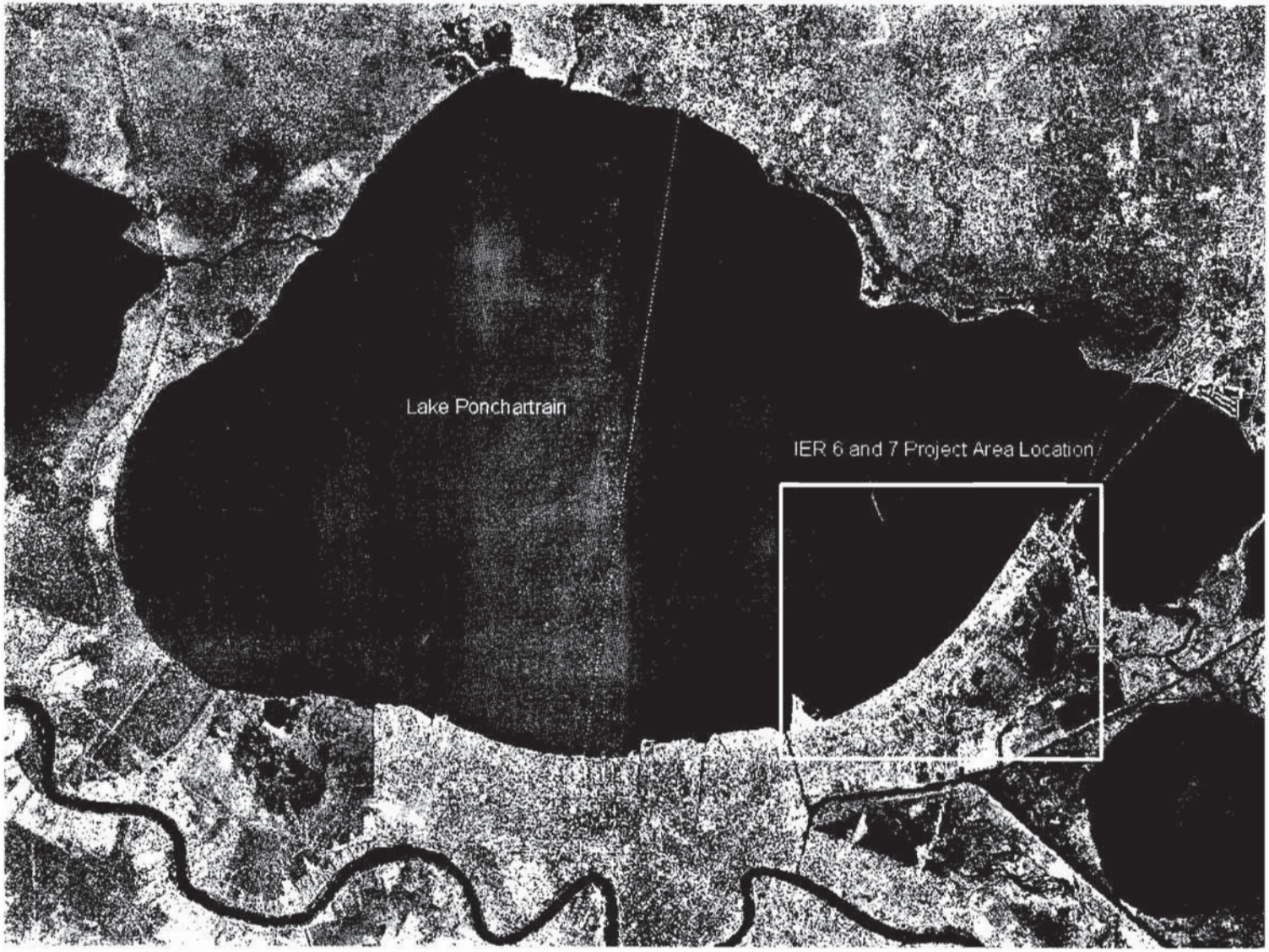

Figure 1. IER 6 & 7 Project Area

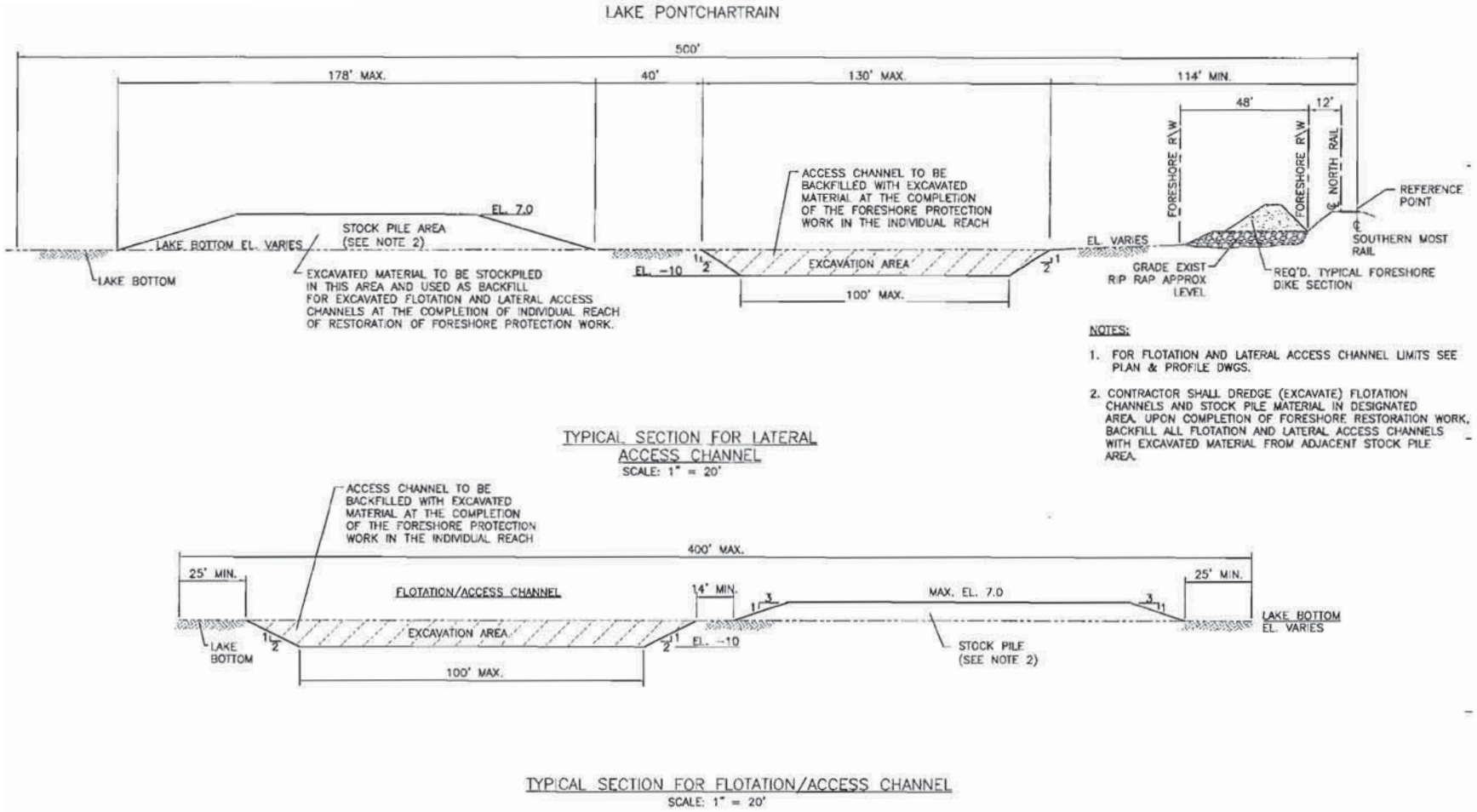

Figure 2. Access/Floatation Channel Cross Sections

The draft programmatic fish coordination act report dated 26 November 2007 can be viewed on www.nolaenvironmental.gov at the following link:

http://www.nolaenvironmental.gov/nola_public_data/projects/usace_levee/docs/original/FWCADraftReportProgramtic.pdf

United States Department of the Interior

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

March 27, 2009

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 Six (IER 6). 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 instructed the U.S. Army Corps of Engineers (Corps) to proceed with engineering, design, and modification (and construction where necessary) of the Lake Pontchartrain and Vicinity and the West Bank and Vicinity 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 prevented our agencies from following 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 a 2(b) report for each IER. This report contains a description of the existing fish and wildlife resources of the project area, discusses future with and without project habitat conditions, identifies fish and wildlife-related impacts of the proposed project, and provides recommendations to minimize project impacts on those resources.

This draft report incorporates and supplements our FWCA Reports that addressed impacts and mitigation features for the Lake Pontchartrain and Vicinity Hurricane (dated July 25, 1984, and January 17, 1992) Protection projects, and a November 26, 2007, draft programmatic FWCA report that addressed the overall 100 year hurricane protection project.

This draft 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.

TAKE PRIDE IN AMERICA

DESCRIPTION OF THE STUDY AREA

The study area is located in the northern part of Orleans Parish, Louisiana. The area includes part of the southern shore of Lake Ponchartrain to the north and is bounded by the city of New Orleans to the south (Figure 1). The narrow study area is bounded by the Lakefront Airport to the west and Paris Road to the east. The project area includes the Lake Pontchartrain and Vicinity Hurricane protection levee, rock foreshore protection, and parts of the rim and bottom of the generally oligohaline (0.5 ppt to 5.0 ppt) Lake Pontchartrain. The habitat types are mowed pasture (levee), developed (road and railway), sand beach, shallow open water and small areas of brackish marsh vegetation (saltmeadow cordgrass, smooth cordgrass and some common reed).

FISH AND WILDLIFE RESOURCES

The Service's November 2007, report contains a thorough discussion of the significant fish and wildlife resources (including habitats) that occur within the entire 100 year levee protection study area. For brevity, that discussion is incorporated by reference herein. For the specific area of the IER 6 study, resources in the area consist of aquatic animals such as oligohaline fishes (e.g. red drum, mullet), crustaceans (e.g. blue crab), and bivalve mollusks(e.g. road clam, stout razor clam). Avian wildlife includes gulls, pelicans, and various shorebirds. Small mammals, reptiles, and amphibians also inhabit the area between the levee and the lake. The Service provided information about threatened and endangered species that may occur in the area in letters dated December 6, 2007 and January 30, 2009. The Gulf sturgeon and the West Indian manatee were identified as potentially occurring in the study area.

Future fish and wildlife resources with and without the project are expected to be approximately equal. Without construction of the proposed plan, rock foreshore protection, floodgates, floodwalls and the levee would still be improved to meet the previously authorized elevation and current design criteria. During construction, some terrestrial and mobile aquatic animals would be temporarily displaced, but are expected to return to the area because the project plans call for returning the area essentially to its preconstruction conditions. Some animals, especially benthic invertebrates, may be killed, but recolonization of the impacted area is expected.

DESCRIPTION OF SELECTED PLAN

The purpose of the proposed plan is to provide the 100-year level of protection for the Greater New Orleans Hurricane and Storm Damage Risk Reduction System (HSDRRS) for New Orleans East. The term "100-year level of risk reduction," as it is used throughout this document, refers to a level of protection which reduces the risk of hurricane surge and wave driven flooding that the New Orleans Metropolitan area has a 1 percent chance of experiencing each year. Elevations of the existing floodwalls and levees within three reaches of the Lake Pontchartrain and Vicinity (LPV) project (reaches 105, 106, and 107 which comprise the Citrus Lakefront Levee project), a component of the HSDRRS, are below 100-year design elevations and do not meet the New Orleans District Corps design criteria. The proposed plan results from a defined need to reduce

Figure 1. IER 6 study area.

flood risk and storm damage to residences, businesses, and other infrastructure from hurricanes (100-year storm events) and other high water events. The completed HSDRRS would lower the risk of harm to citizens, and damage to infrastructure during a storm event.

Various alternative alignments and structures (*i.e.*, floodwalls and levees) were evaluated for each of the three Citrus Lakefront Levee project reaches. Based upon a detailed analysis that included evaluating risk and reliability; construction schedule; cost; right-of-way requirements; environmental impacts; and operations and maintenance needs, the following alignments and structures were chosen as the proposed project for LPV 105, 106 and 107.

Earthen levees in southern Louisiana settle over time due to the type of soils and geology present in the area. Because of this settlement, levees are maintained over the project life (50 years) by a process of multiple lifts. The Corps has determined that a base elevation for the levees would allow the levee to be certified into the National Flood Insurance Program (NFIP). This base elevation plus some overbuild is what the Corps is proposing to construct as discussed below for each reach. Because settlement is an issue in this location, the Corps proposed plan includes initially overbuilding the levees to an elevation that has been determined to allow the levee to settle for 10 years, but would still be above the height required to be eligible for certification into the NFIP. After 10 years, an additional lift would be required to maintain the levee above the required NFIP elevation.

In the western portion of LPV 105 (west of the Alabama Street-Hayne Boulevard Intersection), the current I-wall type floodwall alignment is 2,715 linear feet and is located within the New Orleans Lakefront Airport runway protection zone (Figure 2). The current alignment includes one railroad and four vehicular floodgates. The existing elevations of the levees and floodwalls vary, but range from +11.0 to +14.0 feet as referenced to the North American Vertical Datum (NAVD) 88. To provide the 100-year level of risk reduction, a new 1,780-foot long T-wall (floodwall) would be constructed 300 feet south of the current floodwall alignment (south of the Norfolk Southern Railroad [NSRR]) to a height of +15.5 feet NAVD 88. This would require construction of a new 80-foot-wide floodgate at the floodwall's crossing of Downman Road. The existing I-wall and floodgates (railroad and vehicular) associated with the current I-wall alignment would not be improved. Additional drainage improvements may be necessary and accommodations would be incorporated for the design life of the project.

The eastern portion of LPV 105 (east of the Alabama Street-Hayne Boulevard intersection), comprises 7,338 linear feet of I-wall and earthen levee. Within its current alignment, 5,473 linear feet of I-wall and levee would be demolished in phases and replaced with a T-wall type floodwall at a height of +15.5 feet NAVD 88. Also, 1,915 linear feet of existing levee (from east of Lamb Road to west of Danube Road) would be raised to an elevation that would not settle below a net grade of approximately +13.5 feet NAVD 88 in 10 years. No floodgate construction would be required.

The LPV 106 reach includes 4.18 linear miles of levee improvements (Figure 3). The earthen

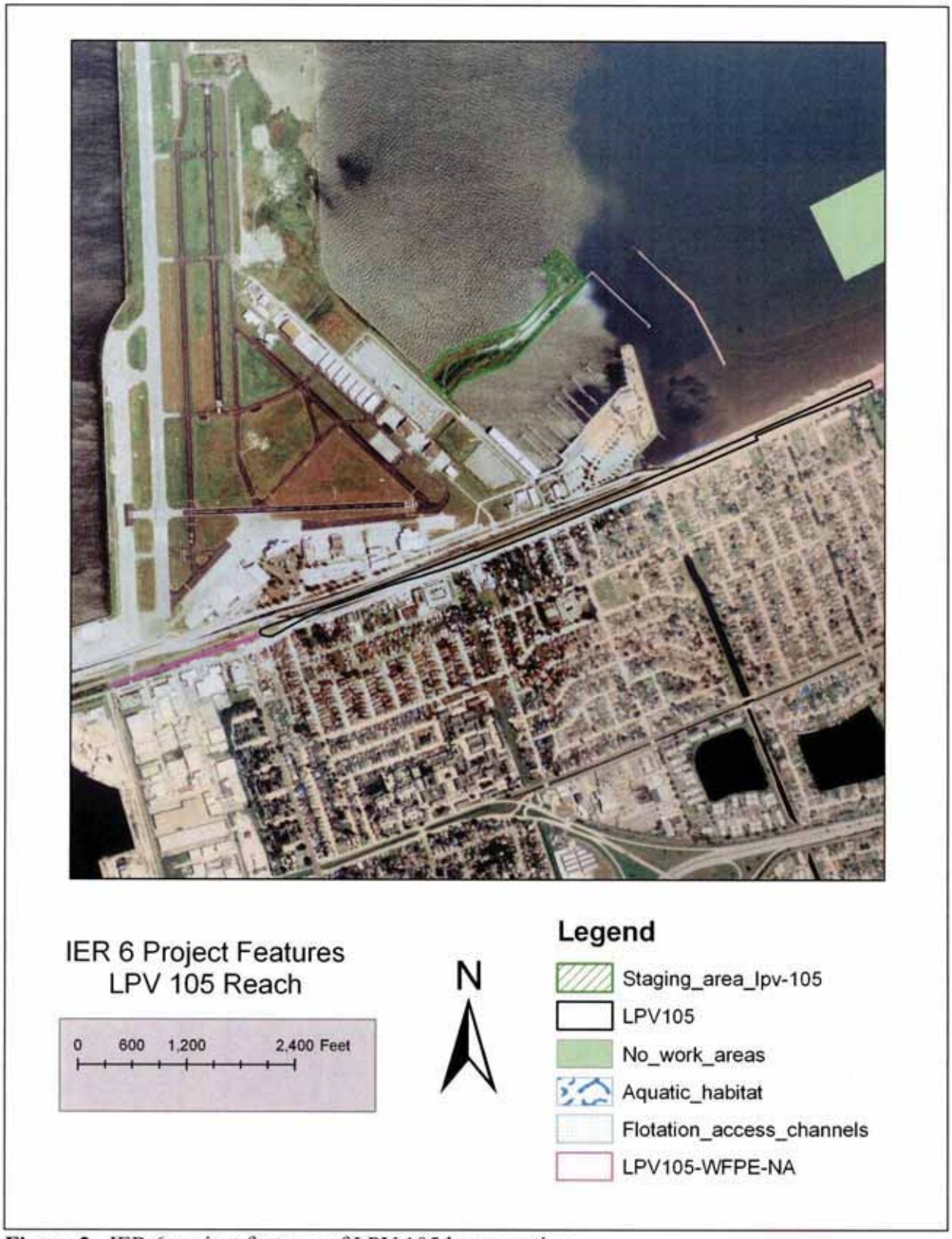

Figure 2. IER 6 project features of LPV 105 levee section.

Figure 3. IER 6 project features for the LPV 106 and 107 levee sections.

levee has an average existing crest elevation of +13.0 feet NAVD with two gate structures and sheetpiling (to prevent seepage and reduce the piezometric conditions in the upper silty soil layer) that isolate the Citrus and Jahncke pump stations from Lake Pontchartrain. The existing levee crown would be lowered initially to create a flat, stable working platform for construction equipment and a seepage cutoff wall would be constructed. The preferred option would be to construct a sheet pile seepage cutoff wall at the flood side toe of the levee to a depth of -17 feet below ground surface (bgs). However, one of several different types of cutoff walls may be constructed and include deep soil mixing, cement-bentonite and soil-cement bentonite; the material and method for cutoff wall construction would be determined during final design. After completion of the cutoff wall construction, the levee elevation would be raised to an elevation with appropriate side slopes that would not settle below a net grade of approximately +13.5 feet NAVD 88 in 10 years. An approximately 1-foot high cement curb would be constructed at the toe of the levee adjacent to Hayne Boulevard.

Two gated structures bounded by I-walls that isolate Citrus and Jahncke pump stations from Lake Pontchartrain would be reconstructed. At the pump stations, the levee crest would be lowered to +11.5 feet NAVD 88 on the flood side and +12.5 feet NAVD 88 on the protected side and the T-wall along the levee would protrude 4.0 feet above the crest, providing risk reduction to +15.5 feet NAVD 88. The base of the T-wall would be approximately 24.5 feet wide, with the bottom side of the pile cap constructed at an elevation of +3.0 feet NAVD 88. The T-wall would be supported by three rows of battered H-piles on the flood side of levee centerline, and two rows of battered H-piles on the protected side of levee centerline. A steel sheet pile cut off wall would be constructed beneath the T-Wall, except in the area of the pump station culverts. The sheet pile wall would provide protection against seepage and reduce the possibility of piping of coarse-grained material in the foundation. All work would be within the existing levee footprint.

Riprap foreshore protection along Lake Pontchartrain would be raised to reduce erosion and wave impact on the new T-wall, and a concrete slab would be constructed along the existing flood side of the levee slope, adjacent to the NSRR tracks. Approximately 80,000 cubic yards of riprap would be required to raise levee foreshore protection to an elevation that would not settle below a net grade of approximately +14 feet NAVD 88 in 10 years. It is anticipated that riprap would be transported to the Lake Pontchartrain shoreline by barges and would be put in place from equipment stationed on the barges in the lake and from trucks and equipment accessing the foreshore protection area from the shoreline. The placement of foreshore protection would permanently fill approximately 7.0 acres of Lake Pontchartrain. To provide barge access, channels would be dredged in Lake Pontchartrain perpendicular to the shoreline. It is proposed that four access channels perpendicular to the Lake Pontchartrain shoreline would be constructed to allow the tug boats and barges to approach the construction area. Channel dimensions would be approximately 10 feet deep, 100 feet wide at the channel bottom and between 1,448 and 1,940 feet long with a 2:1 slope on both sides of the channel. The dredging operation would excavate approximately 130,000 cubic yards of material. Dredged material (tailings) would be placed within a 178-foot wide stockpile area located on one side of and parallel to the new dredged channel. The width of the channel and dredged material placement area would create a 400-foot

wide footprint, which includes a 178-foot wide dredged material stockpile area, a channel with a top width of 140-feet and a bottom width of 100-feet, and the space between the stockpile and channel. The new channels and material stockpile areas would directly impact approximately 53.4 acres of lakebed. After construction activities have been completed, dredged stockpiled materials for the access channels would be used to backfill the dredged channels.

The proposed plan in the LPV 107 reach is to replace existing I-walls and earthen levees with an earthen levee along a new alignment at an elevation that would not settle below net grade of approximately +13.5 feet NAVD 88 (Figure 3). The existing levee and floodwall alignment would be shifted approximately 12 feet south (further away from the NSRR embankment), aligning 1,472 linear feet of new levee with the LPV 106 alignment. The earthen levee would be constructed with the appropriate side slopes and a mechanically stabilized earth wall (*i.e.*, retaining wall) at locations on the protected side of the levee along Hayne Boulevard. Improvements to subgrade soils below the new levee would be accomplished through deep soil mixing. The existing floodgate would be replaced with a new floodgate in the new location to provide access to the Lincoln Beach area.

The proposed project would increase the elevation of structures to meet the 100-year level of flood protection. All T-walls would be approximately 2-feet wide, supported by a 12- to 17-foot wide, 3-foot high concrete slab connected to battered H-piles (driven to a depth of approximately -85 feet bgs, and a continuous sheetpile cutoff wall (constructed to depths ranging from -45 to -60 feet bgs) for further stabilization and seepage control. It is anticipated that T-walls would be cast-in-place; however, consideration would be given to using precast concrete for T-wall foundations and wall stems.

Construction materials would be transported to staging areas and then to active construction from a supply chain dock constructed at the Inner Harbor Navigational Canal (IHNC) and Hayne Boulevard, or shipped directly from contractors in the region. Staging areas would be located both within the construction corridor and within previously developed areas adjacent to the project corridor (*e.g.*, Lakefront Airport parking area, and vacant lots south of Hayne Boulevard) (Figure 1). Temporary closure of sections of both westbound lanes of Hayne Boulevard would occur during the construction process to allow for offloading of construction materials. Additional traffic impacts would occur throughout the project due to the transport of earthen material to the project sites. It is estimated that approximately 98,800 cubic yards or 6,600 loads of earthen material would be transported to the construction site from borrow sites in the New Orleans East area.

As part of construction, electrical services, gas lines, telephone poles and lines, storm drainpipes, subdrain lines, and storm drain catch basins, would be avoided, removed or relocated as needed. Heavy equipment that would likely be used during demolition and construction activities includes haulers, excavators, pile drivers (vibratory and hammer), dozers, graders, cranes, backhoes, and water trucks. Construction of all three reaches is anticipated to require approximately 2 years. It is anticipated that demolition of I-walls would be staged so that areas

degraded or demolished during hurricane season would be replaced within 48 hours to provide area hurricane and storm damage risk reduction should a tropical event pose a threat to the area.

ALTERNATIVES UNDER CONSIDERATION

Including the no action alternative, two alternatives to the proposed action were considered in detail for LPV 105, LPV 106, and LPV 107.

LPV 105

No Action. CEQ's regulations and the Corps' ER 200-2-2 for implementing NEPA require that a no action alternative be evaluated. Under the no action alternative, floodgates, floodwalls and levee would be improved or constructed within the current alignment to meet the previously authorized elevation and current design criteria. Maintenance of structures would continue.

Alternative 1: Replace I-Wall with T-Wall Along Current Alignment. This alternative would replace approximately 2,715 linear feet of I-walls in the western portion of LPV 105 with T-walls at an elevation of +15.5 feet NAVD 88 in their current alignment. This would require replacement of five existing floodgates within the western portion of the LPV 105 reach. The eastern portion of LPV 105 (east of Alabama Street) would be constructed as described by the proposed action.

LPV 106

No Action. Under the no action alternative, foreshore protection, gate structures, floodwalls and levee would be improved or constructed to meet the previously authorized elevation and current design criteria. Maintenance of structures would continue.

Alternative 1: Combination T-wall and Earthen Levee Along Current Alignment. Under this alternative, the existing levee crest elevation would be lowered from +13 feet NAVD 88 to +11 feet NAVD 88 to accommodate a new T-wall cap constructed at an elevation of +15.5 feet NAVD 88. The base of the T-wall would be approximately 9.5 feet wide, with the pile cap at an elevation of +8.5 feet NAVD 88. The concrete T-wall structure would be supported by two rows of battered steel H-piles to protect against overtopping and erosion. A steel sheetpile cut off wall would be constructed underneath the centerline of the T-Wall to -20 feet bgs to provide protection against seepage and reduce the possibility of piping of coarse-grained material in the foundation. The two gate structures that isolate the Citrus and Jahncke pump stations would be reconstructed as part of the T-wall placement.

LPV 107

No Action. Under the no action alternative, a floodgate, floodwalls and levee would be improved to meet the previously authorized elevation and current design criteria. Maintenance of structures would continue.

Alternative 1: Replace I-Wall and Floodgate with Composite Levee/T-wall Along Proposed

Action Alignment. This alternative would replace the existing I-wall with a composite levee/T-wall 12 feet south of the current alignment (the same alignment as described by the proposed action). The levee would be constructed at an elevation of +10.0 feet NAVD 88 with 3:1 (horizontal:vertical) side slopes; a pile supported concrete T-wall would be constructed on top of the levee from +10.0 feet to +15.5 feet NAVD 88. Sheetpile cutoff walls would be constructed to -20 feet bgs under the centerline of the composite levee/T-wall for seepage protection. The floodgate at Lincoln Beach would be reconstructed as described by the proposed action.

EVALUATION OF SELECTED PLAN AND ALTERNATIVES

The features of the proposed plan and the alternatives, including the no action alternative, are very similar. Impacts to fish and wildlife resources of all the plans would be minimal and there would be no differential acreages impacted among them. The Service, therefore, did not prepare a quantitative habitat analysis for this project.

PROJECT IMPACTS OF SELECTED PLAN

Much of the physical disturbance of the selected plan would affect only the existing protection levee and foreshore rock protection. Non-significant impacts to fish and wildlife would be mostly restricted to the LPV 106 reach where rock foreshore protection expansion (7.03 acres) and temporary access channels (53.4 acres) would result in the loss of a small amount of marsh habitat and cause mortality of some benthic organisms. These channels would be refilled to their prior elevation following project completion and would be expected to be recolonized by benthic invertebrates. The proposed plan could potentially impact the West Indian manatee; however, the Corps has incorporated protective measures, as recommended in letters dated December 6, 2007 and January 30, 2009, into their construction contracts. The Service concurred that the proposed project is not likely to adversely affect the manatee.

FISH AND WILDLIFE CONSERVATION MEASURES

The Service has determined that the proposed project would not significantly impact fish and wildlife resources; however, conservation measures, whenever practicable, should always be considered. Part of the proposed plan is to excavate channels perpendicular to the Lake Pontchartrain shoreline for access to the foreshore protection. Following project completion, these channels are to be refilled with the excavated material back to the original bottom elevation. The Service proposes the beneficial use of any material that may be determined to be in excess of what is required for refilling the channels. That material could be placed on the lakeside edge of the foreshore protection feature to hasten the establishment of emergent marsh habitat.

COMPENSATORY MITIGATION MEASURES

The non vegetated open water habitat impacted is not of high value to fish and wildlife, and is

not scarce. This habitat type is actually increasing due to the rapid conversion of wetlands to open water in coastal region of Louisiana. Because there is only a minimal amount of high value habitat (approximately less than one acre of marsh) likely to be impacted, no mitigation is recommended at this time.

SERVICE POSITION AND RECOMMENDATIONS

The proposed improvements to the LPV flood protection levee would provide greater storm protection for people and property in the New Orleans area. Service does not object to the construction of the proposed project provided the following fish and wildlife conservation recommendations are implemented concurrently with project implementation:

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

2. The Corps should utilize Service provided guidance concerning the West Indian manatee and the Gulf sturgeon.

3. If practicable, any dredged material excavated for construction of the access channels determined to be in excess of what is required to refill the channels should be used beneficially. Placement along the south shore of Lake Pontchartrain adjacent to the foreshore rock protection would likely hasten emergent marsh habitat establishment.

4. If a proposed project feature is changed significantly or is not implemented within one year of the date of our Endangered Species Act consultation letter, we recommend that the Corps reinitiate coordination with this office to ensure that the proposed project would not adversely affect any federally listed threatened or endangered species or their habitat.

The Service appreciates its role in the planning stages of project development and is pleased to provide comments on the proposed project. If you or your staff has questions or comments concerning this report, please contact David Castellanos of this office at (337) 291-3112.

Sincerely,

for James F. Boggs
Supervisor
Louisiana Field Office

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

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

REPLY TO
ATTENTION OF:

August 8, 2008

Planning, Programs, and
Project Management Division
Environmental Planning
and Compliance Branch
Attn: CEMVN-PM-RN

Mr. Robert Collins
Deputy State Historic Preservation Officer
Office of Cultural Development
Department of Culture, Recreation, and Tourism
P.O. Box 44247
Baton Rouge, Louisiana 70804

RE: Request to Continue Consultation Under Section 106 of the National Historic Preservation Act for the Lake Pontchartrain and Vicinity Hurricane Protection Project, New Orleans East, Individual Environmental Report #6, Orleans Parish, Louisiana.

Dear Mr. Collins:

The U.S. Army Corps of Engineers, Mississippi Valley Division, New Orleans District (CEMVN), is proposing to construct flood reduction improvements within the Lake Pontchartrain and Vicinity Hurricane Protection Project, New Orleans East, Orleans Parish, Louisiana. These proposed improvements are an upgrade of existing flood protection features.

This improvement project is currently being studied under the emergency alternative arrangements approved by the Council on Environmental Quality for the Lake Pontchartrain and Vicinity Hurricane Protection Project, Individual Environmental Report (IER) #6. Additional information on the Emergency Alternative Arrangements and IER's can be found on the District's web page (HTTP://www.nolaenvironmental.gov).

In a letter dated April 9, 2007, CEMVN initiated Section 106 consultation for the Lake Pontchartrain and Vicinity Hurricane Protection Project. Upon the request of the Advisory Council on Historic Preservation, CEMVN initiated the development of a Programmatic Agreement (PA) to tailor Section 106 consultation for the IERs. CEMVN is following standard Section 106 consultation procedures for the IERs until the PA is executed. A copy of this letter is attached herein.

Pursuant to Section 106 of the National Historic Preservation Act (NHPA), the District, in consultation with the State Historic Preservation Officer (SHPO) and Indian Tribes, will determine if the area of potential effects (APE) established for the IER #6 project area contains historic properties. The APE measures approximately 6.10 miles in length and runs parallel to Hayne Boulevard and the Lake Pontchartrain shoreline from Jourdan Road east to Paris Road. The APE remains within the existing authorized project right of way for a distance of approximately 1.25 miles from Jourdan Road to the eastern end of the South Shore Harbor Marina. Then, the APE expands to approximately 1480 feet in width from Hayne Boulevard north into Lake Pontchartrain and runs for a distance of approximately 4.85 miles from the marina east to Paris Road. The APE extends north an additional 450 to 710 feet beyond the 1480 foot boundary in four areas proposed for floatation channel excavation. Five proposed staging areas are also included in the APE. In total, the APE measures approximately 1135 acres in size (see Figure #1). Proposed construction activities in the APE include earthen levee, floodgate, and floodwall upgrades and the placement of shoreline rip-wrap within the previously authorized project right of way. Temporary use of equipment staging areas and the excavation of floatation channels are proposed in areas located outside of existing authorized project boundaries.

In accordance with the scopes of work provided as an attachment to our April 9, 2007 letter, the District contracted R. Christopher Goodwin and Associates, Inc. (RCG) to conduct cultural resources investigations of the IER #6 study area. This work included a reconnaissance, Phase 1 and Phase 2 terrestrial survey, Phase 1 nautical remote sensing survey, and Phase 2 dive investigation. At the time the task orders were awarded, several project alternatives were being considered and RCG was asked to investigate a study area much larger than the current project APE (Heller et al. 2008).

Researchers utilized background research, previous cultural resource investigations review, soil and topographic analyses, field reconnaissance information, and Phase 1 terrestrial and nautical survey data to identify and investigate high potential areas for archaeological resources, assess historic structures and potential historic districts, and identify submerged remote sensing anomalies exhibiting cultural resources characteristics. Phase 2 terrestrial and nautical investigations were conducted at site locations exhibiting a high potential for significant cultural resources. The management summary of this investigation is attached herein (Heller et al. 2008). The results of this research are summarized below.

Background research and field reconnaissance identified four previous cultural resources investigations, six previously recorded archaeological sites (16OR2, 16OR5, 16OR15, 16OR20, 16OR24 and 16OR28), five existing historic properties, two potential historic districts, and 39 land parcels exhibiting a high potential for archaeological deposits in the IER #6 study area. Historic properties include the New Orleans Lakefront Airport, Fountain of the Winds, portions of the Army Air Base-Naval Reserve Headquarters Facility and the Louisiana State National Guard Observation Base, Lincoln Beach Recreation Park, and the Pine Village and Little Woods historic neighborhoods. Brief descriptions of previous investigations, previously recorded archaeological sites, historic properties, and high probability areas are provided in the attached management summary (Heller et al. 2008).

Subsequent to initiation of Phase 1 field investigations in the IER #6 study area, the CEMVN defined the project's APE, which is primarily located north of Hayne Boulevard (Figure #1). Phase 1 terrestrial field investigations were conducted along the lakefront shoreline and within five high probability areas selected for potential use as staging areas. These potential staging areas are located south of Hayne Boulevard. Archaeological sites and historic properties initially identified during the background research and reconnaissance phase of the study, including Sites 16OR2, 16OR5, 16OR15, and 16OR20, 34 additional high probability areas, New Orleans Lakefront Airport, Fountain of the Winds, portions of the Army Air Base-Naval Reserve Headquarters Facility and the Louisiana State National Guard Observation Base, and the Pineville Village and Little Woods historic neighborhoods, were not surveyed because they are located outside of the APE and will not be impacted by proposed construction.

Phase 1 terrestrial surface inspections of the Lake Pontchartrain shoreline were conducted twice at low tide in an attempt to locate previously recorded and newly discovered archaeological sites. Shovel tests could not be excavated due to the difficult survey conditions existing between the toe of the railroad embankment and the water's edge. No archaeological material was identified between the South Shore Harbor Marina and Lincoln Beach Recreation Park, which includes the reported locations of 16OR24.

A small amount of re-deposited artifacts was observed on top of the rip-rap in the IER #6 portion of Site 16OR28 and on the western side of Lincoln Beach (Locus 06-02). The remains of a historic brick wall and covered portico were also noted at Lincoln Beach. Constructed in 1939 for lake access and as a recreation area for New Orleans' African Americans, Lincoln Beach is associated with the important historic theme of racial segregation.

Phase 1 and selected Phase 2 terrestrial investigations were conducted at five potential staging areas located immediately south of Hayne Boulevard at Crowder Boulevard, Benson Street, Symmes Avenue, Lincoln Beach, and Read Boulevard. Shovel tests excavated at the Crowder Boulevard Staging Area identified Site 16OR444 (Locus 06-B-01) and one historic locus (06-B-02). Both site and locus are described by researchers as low density scatters of potentially re-deposited historic/modern domestic refuse exhibiting little research potential. Investigations at the Benson Street Staging Area were hampered by standing water through out most of the scheduled fieldwork. Limited shovel tests indentified Site 16OR445 (Locus 06-18-01), which exhibits late nineteenth-early twentieth century historic material. Due to adverse field conditions, the staging area could not be completely assessed for cultural resources. Researchers recommend the parcel be removed from consideration as a staging area.

Subsurface testing at the proposed Symmes Avenue Staging Area produced a large quantity of modern refuse across most of the property. No artifacts over 50 years old were identified and all of the material appears to be the result of very recent dumping activities. The proposed Lincoln Beach Staging Area served as the former parking lot and a later drive-in theater. A thick layer of shell placed as a parking surface was found across the site. Researchers conclude this shell surface would protect any buried deposits during staging activities.

Phase 1 and Phase 2 investigations at the Read Boulevard Staging Area resulted in the identification of Site 16OR446 (Locus 06-E-01). Researchers initially described the site as a historic period occupation represented by distinct layers of architectural rubble and domestic refuse with artifacts dating from the mid-nineteenth to mid-twentieth centuries. However, analysis of Phase 2 stratigraphy demonstrated conclusively that the cultural deposits at the site were severely disturbed. Subsequent to Goodwin's IER #6 investigations, the CEMVN identified one additional staging area located in the South Shore Harbor Marina parking lot (Figure #1). This area is located on man-made land where there is no potential for archaeological deposits.

Phase 1 nautical remote sensing survey and selected Phase 2 dive operations were conducted in the Lake Pontchartrain portion of the APE (Heller et al. 2008). Phase 1 investigations were conducted within a 1250 foot wide corridor running parallel to the shoreline and four perpendicular floatation channels extending beyond the 1250 foot boundary (see Figure #2). Seven targets exhibiting shipwreck characteristics were identified in the project APE and include Target 26-1 (Citrus Lake Front Shipwreck 16OR97), Target 26-2, Target 28-2, Target 28-3, Target 28-4, Target 29-1, and Unknown Target #1. Researchers recommend avoiding these target locations. Specific information on these seven targets, including the results of Phase 2 dive operations at Target 28-2, is provided in the attached management summary (Heller et al. 2008).

Based on a review of the information summarized above, it is our view that proposed project activities will have no adverse effect on significant cultural resources. Continuous wave action erosion, re-deposition of shoreline deposits, and the construction of man-made land, foreshore protection measures, a railroad embankment, earthen levees and floodwalls, and roads have all severely impacted terrestrial soil deposits in the portion of the APE located north of Hayne Boulevard. Not surprisingly, no significant archaeological sites were identified. No artifacts were identified within the reported shoreline location of Site 16OR24 and the few artifacts noted at the shoreline locations of Site 16OR28 and Locus 06-02 (Lincoln Beach) were re-deposited, suggesting these sites have been destroyed. In addition, the remaining architectural features associated with the Lincoln Beach Recreation Park have been severely impacted from years of storm and wave damage. Researchers believe the site lacks sufficient integrity necessary for listing on the NRHP.

No significant archaeological material was identified in the proposed staging areas. Subsurface excavations at Crowder Boulevard Site 16OR444 (Locus 06-B-01) and Locus 06-B-02, Reed Boulevard Site 16OR446 (Locus 06-E-01), and the Symmes Avenue staging areas identified severely disturbed soils and re-deposited artifacts exhibiting little or no research potential. An existing thick surface layer of modern shell covering the entire Lincoln Beach Staging Area will protect subsurface deposits during staging activities. The South Shore Harbor Marina Staging Area is located in an existing parking lot built on man-made land. Due to adverse field conditions, investigations at the Benson Street Staging Area Site 16OR445 (Locus

06-18-01) could not be completely assessed and will be removed from consideration as a staging area. The use of these five staging areas will have no impact on cultural resources.

Phase 1 remote sensing survey conducted within the nautical portion of the APE identified seven targets exhibiting shipwreck characteristics. Phase 2 dive operations conducted at two of these targets, one by Stout (1985) at Target 26-1 (Citrus Lake Front Shipwreck 16OR97) and the other by Heller and others (2008) at Target 28-2, identified historic vessel remains that are eligible for listing on the NRHP. Recent analysis of Phase 1 side-scan sonar and magnetometer data suggests Target 26-2, Target 28-3, Target 28-4, Target 29-1, and Unknown Target #1 exhibit significant shipwreck features (Heller et al. 2008). Proposed excavation of floatation channels has the potential to impact these target locations. However, measures will be taken to ensure impacts will be avoided, or minimized, at these seven target locations by placing a 350 foot buffer zone around each target and marking these areas as "no work areas" on the plans and specifications (Figure #2). In the event that cultural resources are encountered during construction activities, work will be halted and your office will be contacted for further consultation. Any resources encountered will be recorded and documented, and state archaeological site forms will be provided.

Please review the enclosed project documentation and provide this office with your opinion regarding our "no adverse effect" finding within 30 days of receipt of this letter. If you have any questions and/or concerns, please contact Mr. Michael Swanda at (504) 862-2036.

Sincerely,

Elizabeth Wiggins
Chief, Environmental Planning
and Compliance Branch

Enclosures

CF: Klima, Advisory Council on Historic Preservation
Rivet, SHPO
Varnado, SHPO

References Cited

Heller, Nathanael, Troy J. Nowack, Kathryn A. Ryberg, Katy Coyle, Lindsay Hannah, Ginny Jones, and Lauren Bair.

2008 *Management Summary: Phase I Cultural Resources Survey and Inventory, Nautical Remote Sensing Survey, Phase II National Register Testing and Evaluation of Site 04-02, and Dive Investigations of Targets 28_1 and 28_2, Performed for Lake Pontchartrain and Vicinity Project, Individual Environmental Report Area 6 (IER #6): Orleans Parish, Louisiana.* R. Christopher Goodwin and Associates, Inc., New Orleans. Submitted to U.S. Army Corps of Engineers, New Orleans District.

Stout, Michael E.

1985 *Remote Sensing Investigation of the Citrus Lakefront Levee Mobilization Sites, Lake Pontchartrain and Vicinity Hurricane Protection Project, Orleans Parish, Louisiana.* U.S. Army Corps of Engineers, New Orleans District.

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

PAM BREAUX
SECRETARY

SCOTT HUTCHESON
ASSISTANT SECRETARY

IER #6

September 19, 2008

Ms. Elizabeth Wiggins
Chief, Environmental Planning and Compliance Branch
Department of the Army
New Orleans District, Corps of Engineers
P.O. Box 60267
New Orleans, Louisiana 70160-0276

Re: Management Summary - Phase I & Phase II CRM Report
LA Division of Archaeology Report No. 22-3139
Management Summary: Phase I Cultural Resources Survey and Inventory, Nautical Remote Sensing Survey, Phase II National Register Testing and Evaluation of Site 12OR446, and Dive Investigations of Targets 28_1 and 28_2 (Site 16OR450) Performed for Lake Pontchartrain and Vicinity Project, Individual Environmental Report Area 6 (IER #6): Orleans Parish, Louisiana
R. Christopher Goodwin & Associates, Inc.

Dear Ms. Wiggins:

We acknowledge the receipt of your letter dated September 10, 2008, and two copies of the above-referenced management summary report. We have completed our review of the summary and offer the following comments.

The revised Area of Potential Effects (APE) provided with the transmittal letter along with the associated report provides adequate information to comment on the proposed project activities effect on historic properties. The identified terrestrial sites north of Hayne Boulevard (16OR24and 16OR28) were either assessed as being destroyed (16OR28) or not having any extant cultural deposits remaining along the Lake Pontchartrain shoreline (16OR24). We agree with this assessment but caution that there may be remains of the latter site in areas of the APE that were not investigated south of the shore line and north of Hayne Boulevard, due to the built environment. We concur that sites 16OR444 and 16OR446 do not meet the criteria for inclusion on the NRHP. Site 16OR445 identified in the Benson staging area is of unknown eligibility status due to survey conditions preventing further assessment of the site. We concur with the recommendation that this staging area should be removed from consideration and replaced by another area identified by the USACE to the north of Hayne Boulevard in the South Shore Marina parking lot which is located on man-made land and has no potential for archaeological deposits.

Locus 06-02 (Lincoln Beach), the man-made peninsula constructed circa 1960 as an extension of the earlier 1939 portion of Lincoln Beach Park, may not meet the 50-year NRHP eligibility criteria but is considered significant by association with the important theme of segregation. The remains of the Lincoln Beach Park, a brick wall and covered portico, may not possess enough integrity to be assessed as standing structures but should be recorded as part of the archaeological record. The location and the minimal remains of the park should be documented and included in the archaeological record (redundant). This would include the associated parking lot south of Hayne Boulevard identified in the testing of the Lincoln Beach Staging area.

The proposed undertaking will not impact this feature but nontheless should be recorded as an archaeological site. The features identified north of Hayne Boulevard should be included within the site description boundary. In the final report we would expect to see a detailed history of the Lincoln Beach Park along with historic photos, maps and possibly oral histories.

The nautical remote sensing portion of the investigation identified five submerged historic watercraft (16OR97, 16OR449, 16OR450, 16OR451 and 16OR452) and two areas that may represent submerged historic watercraft (Target 28_4 and Target 29_1). We strongly agree that these areas should be avoided during project activity. The 350' buffer zone placed around each submerged resource must be strictly enforced. We would be interested in knowing what measures will be taken by the construction contractors to identify and avoid these areas. The images of the identified shipwrecks (Figure 51- 55) clearly show that these submerged historic resources (16OR97, 16OR449, 16OR450, 16OR451 and 16OR452) possess a significant amount of integrity and are candidates for inclusion on the NRHP. Based on the Phase II testing of the Edge Lake 1 Shipwreck (16OR450), we concur that this site is eligible for inclusion on the NRHP. We look forward to receiving the draft report with additional information provided on each of the identified shipwrecks.

Please review the enclosed technical comments and photocopied pages with comments or corrections noted. Comments should be addressed as appropriate in the subsequent report. Site forms associated with the report will need to be finalized prior to at acceptance of the final report. If you should have any questions, please contact Stacie Palmer in the Division of Archaeology by email at spalmer@crt.state.la.us or by phone at (225) 342-5737.

Sincerely,

Phil Boggan
Deputy State Historic Preservation Officer

PB:SP:s

Enclosures: as stated

Technical Comments:

1. In the draft report please consistently reference all sites with the LA site number if applicable.

2. Please include a description of the disposition (temporary and final) of field notes, reports, photographs, artifacts and maps.

3. The APE was identified as a high probability zone but some staging areas were shovel tested at 50-meter intervals. Please include justification for using low a probability subsurface testing interval in an area designated as a high probability zone.

4. Methodology (terrestrial) please include a description of the following:

    a. Surface collection strategy
    b. Pedestrian survey methodology
    c. Justification of in-field discard of "brick, mortar, coal, and slate or similar materials" (our current guidelines require a 10% representative sample to be collected).
    d. Artifact Analysis

5. In order to comment of the eligibility of the standing structures addresses in the report, we will need photographs of the structures evaluated. General elevations should be sufficient for our review.

6. The subsequent report should report on the updated APE.

7. Please make sure that the staging areas are labeled on the subsequent report.

8. Shipwreck sites: Can scaled drawings of the shipwreck sites be produced from the side scan sonar images?

9. Figure 28 – Can a large-scale map be produced from the aerial photograph of the park layout and landscape design?

10. The project area has a rich cultural history. We look forward to reading expanded culture history chapter!

BOBBY JINDAL
GOVERNOR

SCOTT A. ANGELLE
SECRETARY

State of Louisiana

DEPARTMENT OF NATURAL RESOURCES

OFFICE OF COASTAL RESTORATION AND MANAGEMENT

March 11, 2009

Elizabeth Wiggins
Chief, Environmental Planning and Compliance Branch
U.S. Army Corps of Engineers, New Orleans District
PO Box 60267
New Orleans, Louisiana 70160-0267

RE: **C20090065,** Coastal Zone Consistency
U.S. Army Corps of Engineers, New Orleans District
Direct Federal Action
IER 6 – New Orleans East Citrus Lakefront Hurricane Protection Levee
Orleans 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,

Karl L Moy for

Jim Rives,
Administrator

JR/jdh

cc: Laura Lee Wilkinson, COE-NOD
David Butler, LDWF
Wynetca Fisher, Orleans Parish
Tim Killeen, CMD FI

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
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MAR 13 2009 F/SER31:KS

Ms. Elizabeth Wiggins
New Orleans District Corps of Engineers
P.O. Box 60267
New Orleans, Louisiana 70160-0267

Re: IER 6 and 7

Dear Ms. Wiggins:

This responds to your letter dated September 17, 2008, requesting section 7 consultation pursuant to the Endangered Species Act (ESA) for the Army Corps of Engineers' (COE) Individual Environmental Reports (IER) 6 and 7. The reports evaluate the COE's proposal to upgrade the existing hurricane protection system to protect communities and infrastructure in Orleans Parish, Louisiana, from 100-year level storms. The proposed projects include the placement of rock on the existing foreshore protection to raise its elevation on several sections of the levee system on Lake Pontchartrain near New Orleans, Louisiana. You requested concurrence from the National Marine Fisheries Service (NMFS) with your determination the projects are not likely to adversely affect the threatened Gulf sturgeon and its designated critical habitat. NMFS' determinations regarding the effects of the proposed action are based on the description of the action in this and any related consultation documents. You are reminded that any changes to the proposed action may negate the findings of the present and completed consultations and may require reinitiation of consultation with NMFS.

Alternative Arrangements for NEPA and Incremental ESA Analysis

Though NMFS has previously completed consultation on three COE-proposed hurricane protection projects, we have only recently recognized that those projects as well as the projects evaluated in IERs 6 and 7 are components of the COE's comprehensive plan to upgrade existing structures in the Greater New Orleans Hurricane and Storm Damage Risk Reduction System, which was authorized and funded under Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery (2006). The 17 projects included in the proposed comprehensive plan will upgrade the existing hurricane protection system, damaged and weakened by Hurricanes Katrina and Rita in 2005, to reduce the threats to communities and infrastructure from 100-year level storms. On March 13, 2007, the COE implemented Alternative Arrangements under the provisions of the Council on Environmental Quality Regulations for Implementing the National Environmental Policy Act (NEPA; 40 CFR 1506.11) to expedite complete environmental analysis for the proposed comprehensive plan. The Alternative Arrangements allow decisions on individual components

of the overall proposed action so that the process can be completed more quickly than under the traditional NEPA process. The COE deemed the Alternative Arrangements necessary to reduce the risk of flooding and to restore public confidence in the hurricane protection system so that economic recovery of the area could proceed. When sufficient information is available from each of the IERs analyzing the proposed individual projects making up the comprehensive plan, the COE will produce a draft Comprehensive Environmental Document (CED). The CED will incorporate the IERs by reference and address the work completed, as well as the remaining work to be completed, on a system-wide scale and include a final mitigation plan. The COE has committed to NMFS that if individual and/or cumulative effects to listed species or designated critical habitat not previously addressed in IERs that have undergone consultation are subsequently identified in the CED, the COE will reinitiate consultation with NMFS.

The Endangered Species Act has been interpreted by courts, including the Supreme Court of the United States, as requiring comprehensive consultation on the entire scope of a proposed project or plan. Incremental consultation on separate stages or phases of a project is allowable only where the project is implemented under statutes that authorize staged decision-making, including staged environmental reviews and the potential for modification or cancellation of subsequent stages.

The regulations implementing the ESA include provisions at 50 CFR 402.14(k) for consulting on projects in incremental steps that are based on the caselaw discussed above. Section 402.14(k) provides that:

> Incremental steps. When the action is authorized by a statute that allows the agency to take incremental steps toward the completion of the action, the Service shall, if requested by the Federal agency, issue a biological opinion on the incremental step being considered, including its views on the entire action. Upon the issuance of such a biological opinion, the Federal agency may proceed with or authorize the incremental steps of the action if:
> (1) The biological opinion does not conclude that the incremental step would violate section 7(a)(2);
> (2) The Federal agency continues consultation with respect to the entire action and obtains biological opinions, as required, for each incremental step;
> (3) The Federal agency fulfills its continuing obligation to obtain sufficient data upon which to base the final biological opinion on the entire action;
> (4) The incremental step does not violate section 7(d) of the Act concerning irreversible or irretrievable commitment of resources; and
> (5) There is a reasonable likelihood that the entire action will not violate section 7(a)(2) of the Act.

In accordance with these provisions, the consultation on each incremental step must be in the context of the entire action (i.e., the effects of all previous steps should be considered in the evaluation of the effects of the current step). NMFS has previously completed consultations on IERs 2, 3, and 11. Therefore, this consultation will consider the effects of those projects in the evaluation of the effects of the currently proposed actions, IERs 6 and 7, on listed species and critical habitat under NMFS purview.

Previously Authorized IER Projects

Section 7 consultation was completed on IER 2 on June 6, 2008. The project consists of replacing existing floodwalls with new T-walls, constructing a breakwater, and dredging a channel for equipment access in the western portion of Lake Pontchartrain in Jefferson and St. Charles Parishes, Louisiana. NMFS determined project activities are not likely to adversely affect Gulf sturgeon or listed sea turtles (Kemp's ridley, green, or loggerhead) potentially found in the project area. The project is not located in designated Gulf sturgeon critical habitat and has not yet been constructed.

Consultation for IER 3 was completed on May 28, 2008; consultation on modifications to the project was completed on November 6, 2008. The project, as modified, consists of the construction of a cement breakwater, the addition of rock riprap to existing foreshore protection along the shoreline, and dredging for equipment access in Lake Pontchartrain in Jefferson Parish, Louisiana. NMFS determined project activities are not likely to adversely affect Gulf sturgeon or listed sea turtles (Kemp's ridley, green, or loggerhead) potentially found in the project area. In addition, NMFS determined that IER 3 was not likely to adversely affect designated Gulf sturgeon critical habitat in Unit 8. Water quality impacts related to dredging and stockpiling of dredged material are expected to be insignificant because they will be temporary and minimized by the use of silt curtains. Potential effects to sediment quality resulting from dredging and stockpiling of dredged material will also be insignificant. While dredging may temporarily uncover a layer of finer-grained sediment, the original material will be placed back in the channel and sediment quality will be returned to pre-project conditions. Prey abundance will be temporarily affected by the dredging of 9 acres of waterbottom and the placement of dredged material on 20 acres of waterbottom. However, the project area encompasses only a small portion of the 403,200 acres of available habitat in Lake Pontchartrain supporting Gulf sturgeon prey items. Stockpiled material will be placed back into the dredged channels upon project completion and returned to pre-project contours. Benthic invertebrates utilized by Gulf sturgeon are expected to recolonize the dredged area rapidly, as they have been found to recolonize within one year when sediment composition and depth remain consistent. The permanent loss of 9 acres of habitat (due to the construction of the breakwater, riprap, and foreshore protection) on prey abundance is also expected to be insignificant. Gulf sturgeon prey are expected to be found in sandy substrate, while the substrate found at the site of the breakwater is mainly hard bottom. Further, Gulf sturgeon are expected to be found in deeper waters (2 to 4 meters) than those at the site of the proposed foreshore protection (less than 1 meter). The project has not yet been constructed.

Consultation on IER 11 was completed on August 12, 2008. The project consists of construction of storm surge protection structures (flood control gates and concrete floodwalls) and dredging for equipment access between the Inner Harbor Navigation Canal and Lake Borgne in Orleans and St. Bernard Parishes, Louisiana. NMFS determined project activities are not likely to adversely affect Gulf sturgeon or listed sea turtles (Kemp's ridley, green, or loggerhead) potentially found in the project area. Although not located in designated Gulf sturgeon critical habitat, the project is hydrologically connected to designated critical habitat in Unit 8. Based on modeling reports and analyses provided by the COE, the project will not significantly affect hydroperiod, salinity, ability for benthic communities to be established and maintained, water

velocity, dissolved oxygen, siltation, or accessibility; therefore, NMFS determined the project was not likely to adversely affect designated Gulf sturgeon critical habitat. This project is currently under construction.

Currently Proposed Projects

The proposed projects, IERs 6 and 7, are located between 30.0381°N, 90.0126°W (WGS84) and 30.1488°N, 89.8800°W (WGS84) in Orleans Parish, Louisiana, and includes improvements to structures from the New Orleans Lakefront Levee to the Citrus Lakefront Levee, the New Orleans Airport Floodwall to Paris Road, New Orleans East Lakefront Levee to New Orleans East Back Levee, and Paris Road to Eastbank of Michoud Canal. The elevation of 11 miles of existing foreshore protection will be raised to 14 feet NAVD88 by placing additional rock on the structure. To access the foreshore protection for rock placement, a bucket dredge will be used to excavate nine 10-foot-deep channels perpendicular to the shoreline of Lake Pontchartrain, ranging from 750- to 1,600-feet long and up to 400 feet wide. Four 2,000- by 500-foot-wide lateral access channels parallel to the shoreline will also be dredged. Dredging will only occur May through September in order to avoid impacts to Gulf sturgeon that may use Lake Pontchartrain as winter foraging habitat. Dredged material will be stockpiled adjacent to the channels (with a 14- to 40-foot buffer in between) and surrounded with a siltation curtain to keep it in place. All dredged material will be returned to the access channels once the project is completed. Approximately 44 acres of waterbottom will be dredged and 134 acres of waterbottom will be temporarily covered by the stockpiled dredged material, resulting in temporary impacts to 178 acres of benthic habitat through burying and physical disruption of potential prey. Permanent impacts will result from the placement of rock on the existing foreshore protection, which will extend into the water and permanently cover an additional 14 acres of waterbottom. Water depths in the area where the rock will be placed are less than 1 meter deep.

Effects to Species and Designated Critical Habitat from Previous and Currently Proposed IER Projects

As discussed in a previous section of the document, in accordance with the provisions of the ESA at 50 CFR 402.14(k), section 7 consultation on each incremental step of a phased/staged action must be in the context of the entire action (i.e., the effects of all previous steps should be considered in the evaluation of the effects of the current step). NMFS has previously completed consultations on IERs 2, 3, and 11. Therefore, this consultation will consider the effects of those projects in the evaluation of the effects of the currently proposed actions, IERs 6 and 7, on listed species and critical habitat under NMFS purview.

In addition to Gulf sturgeon, three listed species of sea turtles may occur at the project sites: the endangered Kemp's ridley, the threatened/endangered[1] green, and the threatened loggerhead. The currently proposed projects, IERs 6 and 7, as well as IER 3 are located within designated Gulf sturgeon critical habitat Unit 8. Although not located in critical habitat, IER 11 is

[1]Green turtles are listed as threatened, except for breeding populations in Florida and the Pacific Coast of Mexico, which are listed as endangered.

hydrologically connected to Unit 8. The primary constituent elements (PCEs) essential for the conservation of Gulf sturgeon present in Unit 8 include: abundant prey items; water quality and sediment quality necessary for normal behavior, growth, and viability of all life stages; and, safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats. Of these PCEs, NMFS believes water quality, sediment quality, and prey abundance may be affected.

NMFS has analyzed the routes of potential effects from the proposed projects in IERs 2, 3, 6, 7, and 11 and concluded that listed sea turtles and Gulf sturgeon are not likely to be adversely affected from the suite of activities proposed. The risk of injury to listed species from dredging activities associated with IERs 6 and 7 will be discountable based on the type of dredge being used and the adherence to the May-September dredging window. Gulf sturgeon are not likely to be present during dredging activities because they primarily utilize Lake Pontchartrain for winter foraging and dredging will only occur in the summer. There are no reported takes of sea turtles or Gulf sturgeon by a bucket dredge. Further, the likelihood of sea turtles and Gulf sturgeon being struck by the transit and anchoring of equipment and vessels at the project site is discountable due to these species' mobility. The likelihood of effects to Gulf sturgeon and sea turtles from dredging and the transit and anchoring of equipment and vessels were also determined to be discountable in the consultations on IERs 2, 3, and 11 due to these species' mobility, the type of dredges being used, and/or the lack of species' presence in dredging sites located in marsh or in heavily controlled artificial waterways of low habitat value.

NMFS considers the temporary loss of 178 acres of benthic habitat due to dredging and stockpiling of dredged material, and the permanent loss of 14 acres of habitat due to placement of rock on the existing foreshore protection, proposed in IERs 6 and 7 as having insignificant effects on sea turtles and Gulf sturgeon. The project area encompasses only a small portion of the 403,200-acre lake and there is similar habitat in the vicinity such that impacts to foraging success, reproduction, resting, or other activities that might occur in the area are expected to be minor and insignificant. Further, the bottom substrate does not support submerged aquatic vegetation and is likely a poor source of other forage resources for sea turtle species. Due to the shallow water depth and high-energy wave environment where the rock will be placed, the project area provides poor foraging habitat for Gulf sturgeon, as well. Water depths in the 14-acre rock placement site are less than 1 meter. Gulf sturgeon are usually found at deeper depths (2 to 4 meters), where lower wave energy at the substrate, compared to the shallower swash zone, interferes less with feeding.

We evaluated the potential impacts on listed species from the additive loss of a total of 322 acres of habitat (266 temporarily, 56 permanently) from implementing IERs 2, 3, 6, 7 and 11. If all impacts occurred in areas utilized by species under NMFS' purview, then only 0.08 percent of the available habitat in Lake Pontchartrain would be temporarily or permanently lost as foraging habitat. There is sufficient available habitat in the vicinity such that impacts to foraging success, reproduction, resting, or other behaviors are expected to be minor and insignificant. However, all of the permanent impacts and a portion of the temporary impacts will occur in areas that are not utilized by listed species under NMFS' purview because: (1) they consist of marsh, peat substrate, or hardbottom that do not support prey species or other foraging resources for sturgeon

and sea turtles; (2) the sites have high wave energy that interferes with feeding; and, (3) they are much shallower (less than 1 meter) than depths preferred by sturgeon and sea turtles. Project activities in IER 11 will not impact habitat in Lake Pontchartrain, but may cause sea turtles and Gulf sturgeon to temporarily avoid the project site due to construction noise. Also, the operation of flood control structures could potentially hinder access by sea turtles and sturgeon to Lake Pontchartrain, but the structures will remain open at all times with the exception of major storms or hurricanes and many other access points to the lake will remain available to these species.

NMFS and the United States Fish and Wildlife Service jointly designated Gulf sturgeon critical habitat on April 18, 2003 (50 CFR 226.214). NMFS believes the suite of project activities in IERs 3, 6, 7, and 11[2] may affect but are not likely to adversely affect Gulf sturgeon critical habitat in Unit 8. Water quality PCE impacts related to dredging and stockpiling of dredged material in IERs 3, 6, and 7 are expected to be insignificant because they will be temporary and minimized by the use of silt curtains. Potential effects to the sediment quality PCE resulting from dredging and stockpiling of dredged material will also be insignificant. While dredging in IERs 3, 6, and 7 may temporarily uncover a layer of finer-grained sediment, the original material will be placed back in the channel and sediment quality will be returned to pre-project conditions. Further, the placement of inert, non-toxic rock in these projects will not affect water quality or sediment quality. Prey abundance will be temporarily affected by the currently proposed projects (IERs 6 and 7) from the dredging of 44 acres of waterbottom and the placement of dredged material on 134 acres of waterbottom. The total temporary loss of Gulf sturgeon critical habitat from activities in IERs 3, 6, and 7 of 207 acres will be insignificant. This represents only a small portion (0.05 percent) of the available habitat in Lake Pontchartrain supporting Gulf sturgeon prey items. Further, stockpiled material will be placed back into the dredged channels upon project completion and returned to pre-project contours. Benthic invertebrates utilized by Gulf sturgeon are expected to recolonize the dredged area rapidly, as they have been found to recolonize within one year when sediment composition and depth remain consistent. The permanent loss of 14 acres of habitat will result from the placement of rock on the existing foreshore protection associated with IERs 6 and 7. The total permanent loss of prey associated with habitat that will be impacted by IERs 3, 6, and 7 of 23 acres will also be insignificant. Water depths at the project sites are less than 1 meter and these areas experience high wave energy. Gulf sturgeon are suction feeders; due to their feeding morphology, they are usually found at deeper depths (2 to 4 meters), where lower wave energy at the substrate, compared to the shallower swash zone, interferes less with feeding. Although not located in designated Gulf sturgeon critical habitat, project activities in IER 11 are hydrologically connected to designated critical habitat in Unit 8. Based on modeling reports and analyses provided by the COE, the project will not significantly affect hydroperiod, salinity, the ability for benthic communities to be established and maintained, water velocity, dissolved oxygen, siltation, or accessibility; therefore, NMFS determined the project was not likely to adversely affect designated Gulf sturgeon critical habitat.

Future IER Projects

Based on information provided by the COE, two consultations on three remaining IERs must be completed with NMFS. Varying levels of information are available regarding the remaining IER

[2]Project activities in IER 2 are not located in designated critical habitat.

projects. A brief summary of each remaining IER, with the key available details, are presented here in order to make a determination that the continued incremental consultation on each IER complies with 50 CFR 402.14(k).

IER 5 consists of the construction of two breakwaters to protect two pump stations in Orleans and Jefferson Parishes, Louisiana; consultation on this IER has been initiated. The project is located in Gulf sturgeon critical habitat Unit 8. Substrate at the project site is 50 percent sand and water depths at the breakwater locations are between 8 and 11 feet of water. Because the project is located in designated Gulf sturgeon critical habitat, and the substrate and water depth characteristics at the sites suggest they support Gulf sturgeon foraging activities, this project may adversely affect designated Gulf sturgeon critical habitat, and formal consultation is required. However, based on the small size of the area affected by the breakwaters (3.3 acres), we believe it would not be reasonably expected that this project would result in the destruction or adverse modification of designated critical habitat. Adverse effects to listed sea turtles from IER 5 are not expected. These conclusions, however, must be evaluated through completing the formal consultation on IER 5.

The COE will submit a single request for consultation on a supplement to IER 3 and IER 11 Tier 2. The IER 3 supplemental activities include the construction of bypass/detour lanes coming off the Lake Pontchartrain Causeway into New Orleans to reroute traffic around the other constructed components of IER 3. The project will occur in Gulf sturgeon critical habitat Unit 8. Temporary impacts from dredging for equipment access and the stockpiling of dredged material are expected to be similar to, or less than, the temporary impacts to 29 acres of habitat currently proposed in IER 3. Permanent impacts will result from the driving of piles into waterbottoms for the detour lanes. It is unknown how much designated critical habitat will be affected by these activities; however, other similar projects in Gulf sturgeon critical habitat have been found to affect a relatively small footprint and sturgeon can continue to forage underneath the pile-supported structure once construction is completed. IER 11 Tier 2 is not located in Gulf sturgeon critical habitat. However, components of the project involve placing flood control structures and shallowing waterbottoms with fill material in areas traversed by sturgeon and sea turtles. The COE will place coffer dams around the area during the majority of the construction period to exclude listed species from the site and to prevent sediments and other materials from flowing into Lake Pontchartrain. Further, the majority of construction will occur between May and September when Gulf sturgeon are not expected to be in the area. However, some components of the project may occur when the coffer dams are not in place and outside the May to September timeframe. Therefore, NMFS will have to evaluate expected impacts from IER 11 Tier 2 to listed species when all the necessary information becomes available. However, based on the short duration of the construction impacts, the low likelihood of interactions between construction activities and listed species, and the lack of operational impacts to listed species, any impacts associated with the project would not reasonably be expected to result in jeopardy. This conclusion must be verified through the completion of consultation on the project.

Analysis of Compliance with 50 CFR 402.14(k)

As discussed above, NMFS has determined that the incremental step of implementing IERs 6 and

7 will not violate section 7(a)(2) of the ESA, as required in 50 CFR 402.12(k)(1). As required by 50 CFR 402.14(k) paragraphs (2) and (3), the COE will consult with NMFS on all future IERs that may affect species or critical habitat under NMFS' purview, and through ongoing information collection, will reinitiate consultation if new or unanticipated effects of previous action become apparent. Further, COE will complete a comprehensive environmental review of the effects of the entire hurricane protection plan as soon as sufficient information is available about each of the IERs.

Though specific project details for the remaining IERs are still in development, based on information currently available analyzed above, there is a reasonable likelihood that the COE's comprehensive plan to upgrade the Greater New Orleans Hurricane and Storm Damage Risk Reduction System will not violate section 7(a)(2) of the ESA by jeopardizing the continued existence of a listed species or destroying or adversely modifying designated critical habitat. Paragraph (4) of 50 CFR 402.14(k) requires that each incremental step of a comprehensive action does not violate section 7(d) of the ESA concerning irreversible or irretrievable commitment of resources. Therefore, the actions consulted on and authorized in IERs 2, 3, 6, 7, and 11 cannot foreclose the implementation of reasonable and prudent alternatives (RPAs), that may be necessary to address effects from the remaining consultations on IERs 3 supplemental, 5, and 11 Tier 2, or the additive effects of successively implemented projects. None of the impacts from the IERs, either individually or comprehensively, are expected to rise to the level of jeopardy to a listed species or destruction or adverse modification of designated critical. However, if information provided by the COE in the future suggests that jeopardy or adverse modification are likely, then potential RPAs (e.g., fully adhering to dredging/construction windows, modifications to structure design and placement) are still available to the action agency. Therefore, based on available information to date, we conclude that consultations on the IER projects under the Alternative Arrangements comply with all the provisions contained in 50 CFR 402.14(k) for consultations on incremental actions.

This concludes your consultation responsibilities under the ESA for species under NMFS' purview until such time as additional information on IER projects under the comprehensive plan to upgrade the Greater New Orleans Hurricane and Storm Damage Risk Reduction System becomes available. Consultation must also be reinitiated if a take occurs or new information reveals effects of the action not previously considered, or the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action. We have enclosed additional information on other statutory requirements that may apply to this action, and on NMFS' Public Consultation Tracking System (PCTS) to allow you to track the status of ESA consultations.

Thank you for your continued cooperation in the conservation of threatened and endangered species under NMFS' purview. If you have any questions on this consultation or PCTS, please contact Kelly Shotts at (727) 824-5312, or by e-mail at kelly.shotts@noaa.gov.

Sincerely,

Roy E. Crabtree, Ph.D.
Regional Administrator

Enclosure

cc: F/SER43, Hartman/Williams

File: 1514-22 F.1. LA
Ref: I/SER/2008/06354

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PCTS Access and Additional Considerations for ESA Section 7 Consultations (Revised 5-13-2008)

Public Consultation Tracking System (PCTS) Guidance: PCTS is an online query system at **https://pcts.nmfs.noaa.gov/** that allows federal agencies and U.S. Army Corps of Engineers' (COE) permit applicants and their consultants to ascertain the status of NMFS' Endangered Species Act (ESA) and Essential Fish Habitat (EFH) consultations, conducted pursuant to ESA section 7, and Magnuson-Stevens Fishery Conservation and Management Act's (MSA) sections 305(b)2 and 305(b)(4), respectively. Federal agencies are required to enter an agency-specific username and password to query the Federal Agency Site. The COE "Permit Site" (no password needed) allows COE permit applicants and consultants to check on the current status of Clean Water Act section 404 permit actions for which NMFS has conducted, or is in the process of conducting, an ESA or EFH consultation with the COE.

For COE-permitted projects, click on "Enter Corps Permit Site." From the "Choose Agency Subdivision (Required)" list, pick the appropriate COE district. At "Enter Agency Permit Number" type in the COE district identifier, hyphen, year, hyphen, number. The COE is in the processing of converting its permit application database to PCTS-compatible "ORM." An example permit number is: SAJ-2005-000001234-IPS-1. For the Jacksonville District, which has already converted to ORM, permit application numbers should be entered as SAJ (hyphen), followed by 4-digit year (hyphen), followed by permit application numeric identifier with no preceding zeros. For example: SAJ-2005-123; SAJ-2005-1234; SAJ-2005-12345.

For inquiries regarding applications processed by COE districts that have not yet made the conversion to ORM (e.g., Mobile District), enter the 9-digit numeric identifier, or convert the existing COE-assigned application number to 9 numeric digits by deleting all letters, hyphens, and commas; converting the year to 4-digit format (e.g., -04 to 2004); and adding additional zeros in front of the numeric identifier to make a total of 9 numeric digits. For example: AL05-982-F converts to 200500982; MS05-04401-A converts to 200504401. PCTS questions should be directed to Eric Hawk at Eric.Hawk@noaa.gov. Requests for username and password should be directed to PCTS.Usersupport@noaa.gov.

EFH Recommendations: In addition to its protected species/critical habitat consultation requirements with NMFS' Protected Resources Division pursuant to section 7 of the ESA, prior to proceeding with the proposed action the action agency must also consult with NMFS' Habitat Conservation Division (HCD) pursuant to the MSA requirements for EFH consultation (16 U.S.C. 1855 (b)(2) and 50 CFR 600.905-.930, subpart K). The action agency should also ensure that the applicant understands the ESA and EFH processes; that ESA and EFH consultations are separate, distinct, and guided by different statutes, goals, and time lines for responding to the action agency; and that the action agency will (and the applicant may) receive separate consultation correspondence on NMFS letterhead from HCD regarding their concerns and/or finalizing EFH consultation.

Marine Mammal Protection Act (MMPA) Recommendations: The ESA section 7 process does not authorize incidental takes of listed or non-listed marine mammals. If such takes may occur an incidental take authorization under MMPA section 101 (a)(5) is necessary. Contact Ken Hollingshead of our NMFS Headquarters' Protected Resources staff at (301) 713-2323 for more information on MMPA permitting procedures.

BOBBY JINDAL
GOVERNOR

HAROLD LEGGETT, PH.D.
SECRETARY

State of Louisiana

DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL SERVICES

APR 06 2009

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

Attention: Laura Lee Wilkinson

RE: Water Quality Certification (WQC 090306-01/AI 163529/CER 20090001)
Individual Environmental Report (IER) #6
Individual Environmental Report (IER) #7
Orleans Parish

Dear Ms. Wilkinson:

The Department has reviewed your application for the construction of the Citrus Lakefront (IER #6) and Lakefront to Michoud Canal (IER #7) hurricane protection levees, in the vicinity of New Orleans East.

The requirements for Water Quality Certification have been met in accordance with LAC 33:IX.1507.A-E. Based on the information provided in your application, we have determined that the placement of the fill material will not violate the water quality standards of Louisiana provided for under LAC 33:IX.Chapter 11. Therefore, the Department has issued a Water Quality Certification.

Sincerely,

Thomas F. Harris
Administrator
Waste Permits Division

TFH/jjp

APPENDIX E
AIR QUALITY ANALYSIS

CALCULATION SHEET-COMBUSTABLE EMISSIONS-CITRUS LAKE LEVEE

Assumptions for Cumbustable Emissions					
Type of Construction Equipment	Num. of Units	HP Rated	Hrs/day	Days/yr	Total hp-hrs
Water Truck	2	300	12	240	1728000
Tug Boat	1	1200	12	240	3456000
Diesel Dump Truck	6	300	12	240	5184000
Clam Shell Dredge	1	300	12	240	864000
Diesel Trenchers	2	175	12	240	1008000
Diesel Pile Driver	2	300	12	240	1728000
Diesel Cement & Mortar Mixers	5	300	12	240	4320000
Diesel Cranes	2	175	12	240	1008000
Diesel Graders	0	300	12	240	0
Diesel Tractors/Loaders/Backhoes	2	100	12	240	576000
Diesel Bull Dozers	3	300	12	240	2592000
Diesel Front End Loaders	2	300	12	240	1728000
Diesel Fork Lifts	3	100	12	240	864000
Diesel Generator Set	2	40	12	240	230400

Emission Factors							
Type of Construction Equipment	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	PM-10 g/hp-hr	PM-2.5 g/hp-hr	SO2 g/hp-hr	CO2 g/hp-hr
Water Truck	0.440	2.070	5.490	0.410	0.400	0.740	536.000
Tug Boat (1200 hp Stern Drive)	0.242	1.040	6.757	0.180	0.174	0.842	530.801
Diesel Dump Truck	0.440	2.070	5.490	0.410	0.400	0.740	536.000
Clam Shell Dredge	0.340	1.300	4.600	0.320	0.310	0.740	536.300
Diesel Trenchers	0.510	2.440	5.810	0.460	0.440	0.740	535.800
Diesel Bore/Drill Rigs	0.600	2.290	7.150	0.500	0.490	0.730	529.700
Diesel Cement & Mortar Mixers	0.610	2.320	7.280	0.480	0.470	0.730	529.700
Diesel Cranes	0.440	1.300	5.720	0.340	0.330	0.730	530.200
Diesel Graders	0.350	1.360	4.730	0.330	0.320	0.740	536.300
Diesel Tractors/Loaders/Backhoes	1.850	8.210	7.220	1.370	1.330	0.950	691.100
Diesel Bull Dozers	0.360	1.380	4.760	0.330	0.320	0.740	536.300
Diesel Front End Loaders	0.380	1.550	5.000	0.350	0.340	0.740	536.200
Diesel Fork Lifts	1.980	7.760	8.560	1.390	1.350	0.950	690.800
Diesel Generator Set	1.210	3.760	5.970	0.730	0.710	0.810	587.300

Emission factors (EF) were generated from the NONROAD2005 model for the 2006 calendar year. The VOC EFs includes exhaust and evaporative emissions. The VOC evaporative components included in the NONROAD2005 model are diurnal, hotsoak, running loss, tank permeation, hose permeation, displacement, and spillage. The construction equipment age distribution in the NONROAD2005 model is based on the age population of equipment in U.S. for the 2006 calendar year.

CALCULATION SHEET-COMBUSTABLE EMISSIONS-CITRUS LAKE LEVEE

Emission Calculations							
Type of Construction Equipment	VOC tons/yr	CO tons/yr	NOx tons/yr	PM-10 tons/yr	PM-2.5 tons/yr	SO2 tons/yr	CO2 tons/yr
Water Truck	0.838	3.942	10.454	0.781	0.762	1.409	1020.681
Tug Boat (1200 hp Stern Drive)	1.409	5.637	18.662	1.295	1.257	2.818	2042.124
Diesel Dump Truck	2.514	11.825	31.363	2.342	2.285	4.227	3062.044
Clam Shell Dredge	0.324	1.238	4.380	0.305	0.295	0.705	510.626
Diesel Hole Cleaners\Trenchers	0.567	2.710	6.454	0.511	0.489	0.822	595.175
Diesel Bore/Drill Rigs	1.143	4.361	13.615	0.952	0.933	1.390	1008.684
Diesel Cement & Mortar Mixers	2.904	11.045	34.657	2.285	2.238	3.475	2521.711
Diesel Cranes	0.489	1.444	6.354	0.378	0.367	0.811	588.955
Diesel Graders	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Diesel Tractors/Loaders/Backhoes	1.174	5.211	4.583	0.870	0.844	0.603	438.677
Diesel Bull Dozers	1.028	3.942	13.596	0.943	0.914	2.114	1531.879
Diesel Front End Loaders	0.724	2.952	9.521	0.666	0.647	1.409	1021.062
Diesel Aerial Lifts	1.885	7.389	8.150	1.323	1.285	0.905	657.730
Diesel Generator Set	0.307	0.955	1.516	0.185	0.180	0.206	149.116
Total Emissions	**14.981**	**61.412**	**158.926**	**12.531**	**12.201**	**20.189**	**14637.838**

Conversion factors	
Grams to tons	1.102E-06

CALCULATION SHEET-SUMMARY OF EMISSIONS-CITRUS LAKEFRONT LEVEE

Proposed Action Construction Emissions for Criteria Pollutants (tons per year)						
Emission source	VOC	CO	NOx	PM-10	PM-2.5	SO_2
Combustable Emissions	14.98	61.41	158.93	12.53	12.20	20.19
Construction Site-fugitive PM-10	NA	NA	NA	68.32	13.66	NA
Construction Workers Commuter & Trucking	1.44	13.52	1.59	0.02	0.02	NA
Total emissions	16.42	74.93	160.52	80.87	25.89	20.19
De minimis threshold	NA	NA	NA	NA	NA	NA

CALCULATION SHEET-TRANSPORTATION COMBUSTABLE EMISSIONS-CITRUS LAKE LEVEE

Construction WorkerPersonal Vehicle Commuting to Construction Sight-Passenger and Light Duty Trucks									
	Emission Factors		Assumptions				Results by Pollutant		
Pollutants	Passenger Cars g/mile	Pick-up Trucks, SUVs g/mile	Mile/day	Day/yr	Number of cars	Number of trucks	Total Emisssions Cars tns/yr	Total Emissions Trucks tns/yr	Total tns/yr
VOCs	1.36	1.61	120	240	15	15	0.65	0.77	1.41
CO	12.4	15.7	120	240	15	15	5.90	7.47	13.38
NOx	0.95	1.22	120	240	15	15	0.45	0.58	1.03
PM-10	0.0052	0.0065	120	240	15	15	0.00	0.00	0.01
PM 2.5	0.0049	0.006	120	240	15	15	0.00	0.00	0.01

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Heavy Duty Trucks Delivery Supply Trucks to Construction Sight									
	Emission Factors		Assumptions				Results by Pollutant		
Pollutants	10,000-19,500 lb Delivery Truck	33,000-60,000 lb semi trailer rig	Mile/day	Day/yr	Number of trucks	Number of trucks	Total Emisssions Cars tns/yr	Total Emissions Trucks tns/yr	Total tns/yr
VOCs	0.29	0.55	60	240	2	2	0.01	0.02	0.03
CO	1.32	3.21	60	240	2	2	0.04	0.10	0.14
NOx	4.97	12.6	60	240	2	2	0.16	0.40	0.56
PM-10	0.12	0.33	60	240	2	2	0.00	0.01	0.01
PM 2.5	0.13	0.36	60	240	2	2	0.00	0.01	0.02

OBP Commute to New Site									
	Emission Factors		Assumptions				Results by Pollutant		
Pollutants	Passenger Cars g/mile	Pick-up Trucks, SUVs g/mile	Mile/day	Day/yr	Number of cars	Number of trucks	Total Emisssions Cars tns/yr	Total Emissions Trucks tns/yr	Total tns/yr
VOCs	1.36	1.61	60	0	0	0	-	0.00	-
CO	12.4	15.7	60	0	0	0	-	0.00	-
NOx	0.95	1.22	60	0	0	0	-	0.00	-
PM-10	0.0052	0.0065	60	0	0	0	-	0.00	-
PM 2.5	0.0049	0.006	60	0	0	0	-	0.00	-

POV Source: USEPA 2005 Emission Facts: Average annual emissions and fuel consumption for gasoline-fueled passenger cars and light trucks. EPA 420-F-05-022 August 2005. Emission rates were generated using MOBILE.6 highway vehicle emission factor model.
Fleet Charactorization: 20 POVs commuting to work were 50% are pick up trucks and 50% passenger cars

Conversion factor:	gms to tons
	0.000001102

CALCULATION SHEET-FUGITIVE DUST-CITRUS LAKE LEVEE

Fugitive Dust Emissions at New Construction Site.					
Construction Site	**Emission Factor tons/acre/month (1)**	**Total Area-Construction Site/month**	**Months/yr**	**Total PM-10 Emissions tns/yr**	**Total PM-2.5 (2)**
Fugitive Dust Emissions	0.11	51.76	12	68.32	13.66

1. Mid-Atlantic Regional Air Management Association (MARAMA). Fugitive Dust-Construction Calculation Sheet can be found online at: http://www.marama.org/visibility/Calculation_Sheets/. MRI= Midwest Research Institute, Inventory of Agricultural Tiling, Unpaved Roads, Airstrips and construction Sites., prepared for the U.S. EPA, PB 238-929, Contract 68-02-1437 (November 1977)

2. 20% of the total PM-10 emissions are PM-2.5 (EPA 2006).

Coastruction Site Area	**Demension (ft)**			
Proposed Prioject	**Length**	**Width**	**Units**	**Total Acres**
New Construction Area	32,208	70	1	51.76
New Construction Area	20	20	0	0.00
Total				**51.76**

Conversion Factors	**Miles to feet**	**Acres to sq ft**	**Sq ft to acres**	**Sq ft in 0.5 acres**
	5280	0.000022957	43560	21780

Assumptions	**Sections/day**	**Length of Section (ft)**	**Length/day (ft)**	**Days/yr**	**Length/yr (ft)**	**Miles/yr**
Floodwall installed per day (ft)	22	10	220	290	63800	12.08

Assumptions	**Sections/day**	**Length of Section (ft)**	**Length/day (ft)**	**Days/Month**	**Length/Month (ft)**	**Miles/Month**
Floodwall installed per day (ft)	22	10	220	24	5280	1.00
Length of floodwall/yr (miles)	6.10					