

DRAFT INDIVIDUAL ENVIRONMENTAL REPORT

WEST BANK AND VICINITY

LAKE CATAOUCHE LEVEE

JEFFERSON PARISH, LOUISIANA

IER #15



**US Army Corps
of Engineers®**

APRIL 2008

TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	Purpose And Need For The Proposed Action.....	7
1.2	Authority For The Proposed Action	7
1.3	Prior Reports	8
1.4	Integration With Other Individual Environmental Reports	10
1.5	Public Concerns	10
1.6	Data Gaps And Uncertainty	10
2.0	ALTERNATIVES	13
2.1	Alternatives Development And Preliminary Screening Criteria	13
2.2	Description Of The Alternatives.....	14
2.3	Proposed Action.....	14
2.3.1	Actions Common to All Reaches.....	15
2.3.1.1	Armoring.....	15
2.3.1.2	Relocations.....	16
2.3.1.3	Operations and Maintenance.....	16
2.3.1.4	Temporary Flood Protection Contractually Required During Construction.....	16
2.4	Alternatives To The Proposed Action.....	17
2.4.1	Reach 1.....	17
2.4.1.1	No Action.....	17
2.4.2	Reach 2.....	17
2.4.2.1	No Action.....	17
2.4.3	Reach 3.....	18
2.4.3.1	No Action.....	18
2.5	Alternatives Eliminated From Further Consideration.....	18

2.5.1	Hollow Core Levees	18
2.5.2	Reach 1.....	19
2.5.2.1	T-wall Cap on Existing Levee	19
2.5.2.2	Floodwall on Grade.....	19
2.5.3	Reach 2.....	20
2.5.3.1	Flood Side Shift of Alignment.....	20
2.5.3.2	Floodwall on Grade.....	20
2.5.3.3	Straddle Levee Expansion.....	20
2.5.4	Reach 3.....	21
2.5.4.1	Pump Stations Alternative 1	21
2.5.4.2	Pump Stations Alternative 2	21
2.5.5	All Reaches	22
2.5.5.1	Non-Structural Flood Protection Alternative.....	22
2.5.5.2	Acquisition of Flood-Prone Structures	22
2.5.5.3	Floodplain Zoning.....	23
2.5.5.4	Floodproofing	23
2.5.5.5	Deep Soil Mixing.....	23
2.6	Summary	24
3.0	AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	25
3.1	Environmental Setting	25
3.1.1	Terrain.....	25
3.1.2	Geology.....	25
3.1.3	Climate	26
3.2	Significant Resources.....	27
3.2.1	Air Quality	28
3.2.1.1	Existing Conditions.....	28

3.2.1.2	Discussion of Impacts	29
3.2.2	Water Quality	29
3.2.2.1	Existing Conditions.....	29
3.2.2.2	Discussion of Impacts	31
3.2.3	Terrestrial Habitat	31
3.2.3.1	Existing Conditions.....	31
3.2.3.2	Discussion of Impacts	33
3.2.4	Aquatic Habitat	33
3.2.4.1	Existing Conditions.....	33
3.2.4.2	Discussion of Impacts	35
3.2.5	Fish and Wildlife.....	35
3.2.5.1	Existing Conditions.....	35
3.2.5.2	Discussion of Impacts	36
3.2.6	Wetlands	37
3.2.6.1	Existing Conditions.....	37
3.2.6.2	Discussion of Impacts	37
3.2.7	Threatened and Endangered Species	38
3.2.7.1	Existing Conditions.....	38
3.2.7.2	Discussion of Impacts	38
3.2.8	Recreational Resources	39
3.2.8.1	Existing Conditions.....	39
3.2.8.2	Discussion of Impacts	39
3.2.9	Aesthetic Resources	39
3.2.9.1	Existing Conditions.....	39
3.2.9.2	Discussion of Impacts	40
3.2.10	Cultural Resources	40

3.2.10.1	Existing Conditions.....	40
3.2.10.2	Discussion of Impacts.....	41
3.2.11	Farmland.....	42
3.2.11.1	Existing Conditions.....	42
3.2.11.2	Discussion of Impacts.....	42
3.3	Socioeconomic Resources	42
3.3.1	Noise	43
3.3.1.1	Existing Conditions.....	43
3.3.1.2	Discussion of Impacts.....	43
3.3.2	Transportation.....	43
3.3.2.1	Existing Conditions.....	43
3.3.2.2	Discussion of Impacts.....	44
3.3.3	Population and Housing.....	44
3.3.3.1	Existing Conditions.....	44
3.3.3.2	Discussion of Impacts.....	44
3.3.4	Business and Industry, Property Values, and Public Facilities & Services	45
3.3.4.1	Existing Conditions.....	45
3.3.4.2	Discussion of Impacts.....	45
3.3.5	Health and Safety	45
3.3.5.1	Existing Conditions.....	45
3.3.5.2	Discussion of Impacts.....	45
3.3.6	Employment, Income, and Local Tax Base	46
3.3.6.1	Existing Conditions.....	46
3.3.6.2	Discussion of Impacts.....	46
3.3.7	Environmental Justice.....	46
3.3.7.1	Discussion of Impacts.....	47

3.4	Hazardous, Toxic, And Radioactive Waste	47
3.4.1	Existing Conditions.....	47
3.4.2	Discussion of Impacts	48
3.4.2.1	No Action.....	48
3.4.2.2	Proposed Action.....	48
4.0	CUMULATIVE IMPACTS.....	49
5.0	SELECTION RATIONALE.....	49
6.0	COORDINATION AND CONSULTATION	50
6.1	Public Involvement	50
6.2	Agency Coordination	51
7.0	MITIGATION	57
8.0	COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS	58
9.0	CONCLUSION.....	61
9.1	Interim Decision.....	61
9.2	Prepared By.....	61
9.3	Literature Cited	62

LIST OF TABLES

Table 1 Summary of Preliminary Alternative Screening Results24

Table 2 Significant Resources in Project Study Area27

Table 3. IER #15 Preparation Team62

LIST OF FIGURES

Figure 1. WBV - Lake Cataouatche.....3

Figure 2. Reach 14

Figure 3. Reach 25

Figure 4. Reach 36

Figure 5. Sub Basins and Representative IERs.....12

Figure 6. Typical Hollow Core Levee Section19

Figure 7. Outer Cataouatche Canal Looking South21

Figure 8. Typical Organic Soil.....26

Figure 9. Chinese Tallow32

Figure 10. Terrestrial Habitat in the Protected Side Right-of-Way34

Figure 11. Aquatic Vegetation in Outer Cataouatche Canal.....34

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Mississippi Valley Division, New Orleans District (CEMVN), has prepared this Individual Environmental Report #15 (IER #15) to evaluate the potential impacts associated with the proposed construction and maintenance of 100-year level of protection along the West Bank and Vicinity (WBV), Lake Cataouatche Flood Damage Reduction project area. The proposed action is located in Jefferson Parish of New Orleans, Louisiana (see figure 1). The term “100-year level of protection,” as it is used throughout this document, refers to a level of protection that reduces the risk of hurricane surge and wave-driven flooding that the New Orleans Metropolitan area has a 1 percent chance of experiencing each year.

The approximate project-area boundaries are Bayou Segnette on the east, Lake Cataouatche on the south, the Jefferson Parish/St. Charles Parish line on the west, and the Mississippi River on the north. The major communities in this area include Avondale, Bridge City, Waggaman, and the western part of Westwego. The Lake Cataouatche levee encloses the entire southern area, beginning near Bayou Segnette and U.S. Highway 90 (Hwy 90) on the east, sweeping southerly in a trapezoidal configuration to the west, and tying into Hwy 90 near the Jefferson Parish/St. Charles Parish line. Most of the study area is under forced drainage via several pumping stations. Forced drainage has facilitated development for residential, commercial, and/or industrial purposes within much of the study area, but most of the land within the southern third of the study area remains undeveloped.

The existing Lake Cataouatche levee alignment has three distinct reaches where the existing conditions (both opportunities and constraints) within the reach fostered alternative methods to be assessed at the smaller scale:

1. Reach 1 - Western Tie In to End of BFI Landfill – From the connection with Hwy 90 proceeding southeast 3,900 feet (ft), the existing levee is constrained to the east by a closed BFI landfill and to the west by open water in the Outer Cataouatche Canal (see figure 2). The existing right-of-way (ROW) and available land between the current levee centerline and the BFI landfill is approximately 300 ft and the available ROW on the flood side of the centerline is typically 250 ft. Alternative formulation will be different in this reach because of the protected-side constraint presented by the closed BFI landfill.
2. Reach 2 - Lake Cataouatche Levee from the BFI Landfill to the Bayou Segnette State Park Boundary – This reach is comprised of two sections that are separated by the Lake Cataouatche Pump Stations. The reach originates at the southern end of reach 1 and proceeds approximately 15,152 ft to the Lake Cataouatche Pump Stations No. 1 and No. 2. Excepting approximately 1,450 ft around the pump stations, reach 2 continues an additional 20,950 ft to the Bayou Segnette State Park boundary (see figure 3). Including both sections, this reach is approximately 6.84 miles in length.

Once the line of protection proceeds in a southerly direction past the BFI landfill, the existing ROW widens on the protected side from 700 ft to approximately 1,050 ft from the existing levee centerline. Along this entire alignment, the area has been cleared by construction activities to complete the currently authorized (but less than the 100-year) level of protection. The flood side land includes approximately 100 to 125 ft from the levee centerline to the Outer Cataouatche Canal surface water. Alternatives for this reach are limited by available land on the flood side and an abundance of previously disturbed land on the protected side.

3. Reach 3 - Lake Cataouatche Pump Stations No. 1 and No. 2 – At approximately the mid-point of reach 2 are Lake Cataouatche Pump Stations No. 1 and No. 2; this reach is

approximately 1,450 ft long and provides protection for the pumping stations (see figure 4). Lake Cataouatche Pump Station No. 1 provides 500 cubic ft per second (cfs) of pumping capacity and is fed by the north-south canal draining the Avondale Basin. Lake Cataouatche Pump Station No. 2 provides 600 cfs of pumping capacity and drains the basins feeding the east-west canals. There is a system of gated culverts immediately to the east of Pump Station No. 1 that enables the diversion of excessive flows from the north-south canal to Pump Station No. 2 to provide a full 1,100 cfs of pumping capacity. Through this reach, alternatives were considered that would maximize levee, minimize floodwall, and maintain the ability to keep these pump stations and the drainage basins they serve separate.

IER #15 has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality's (CEQ) Regulations (40 CFR §1500-1508), as reflected in the USACE Engineering Regulation, ER 200-2-2. The execution of an IER, in lieu of a traditional Environmental Assessment (EA) or Environmental Impact Statement (EIS), is provided for in ER 200-2-2, Environmental Quality (33 CFR §230) Procedures for Implementing the NEPA and pursuant to the CEQ NEPA Implementation Regulations (40 CFR §1506.11). The Alternative Arrangements can be found at www.nolaenvironmental.gov, and are herein incorporated by reference.

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

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 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 as to whether or not they are substantive. 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 an Addendum to the IER will be prepared and published for a 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.

Figure 1. WBV - Lake Cataouatche

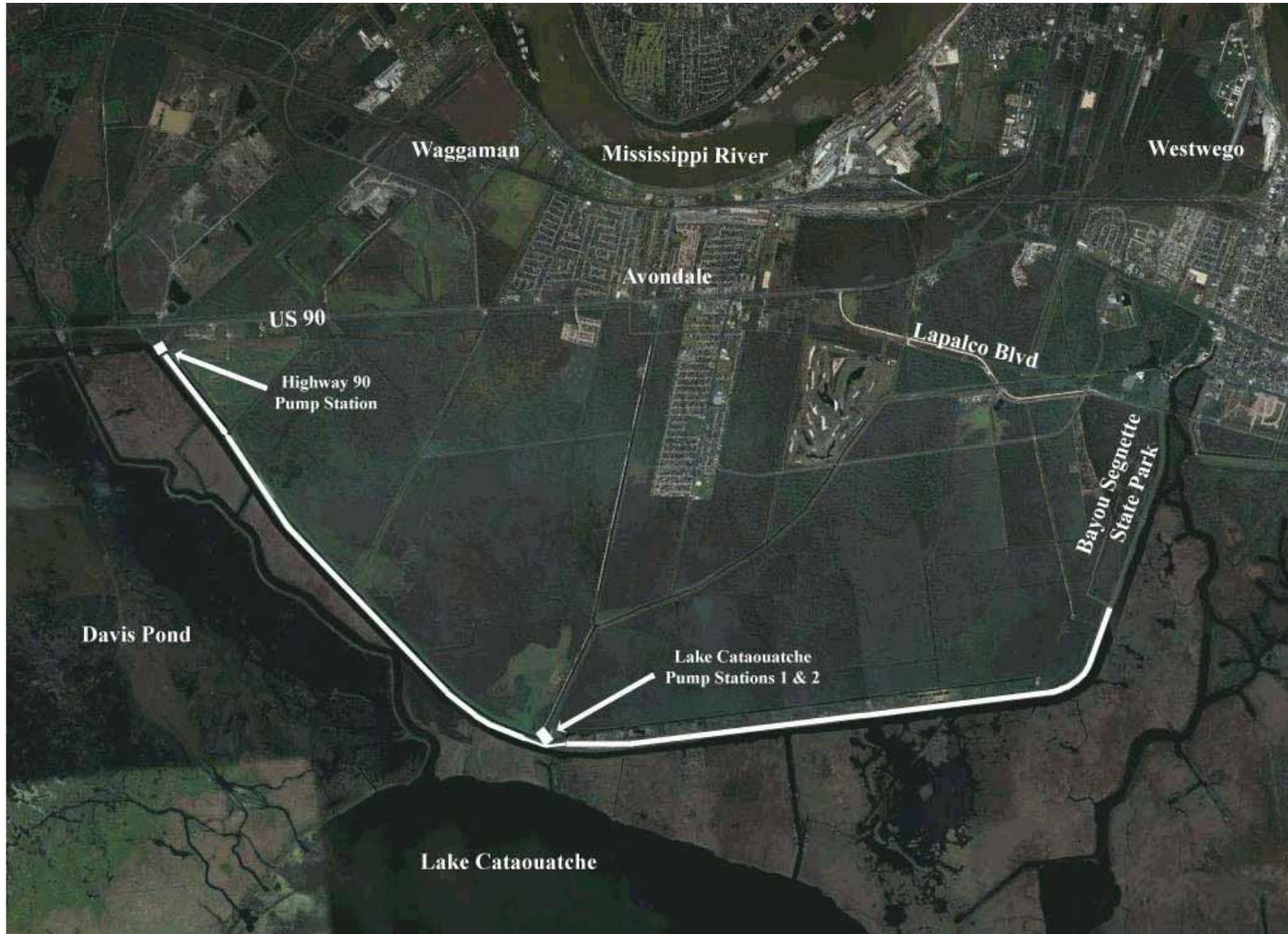


Figure 2. Reach 1

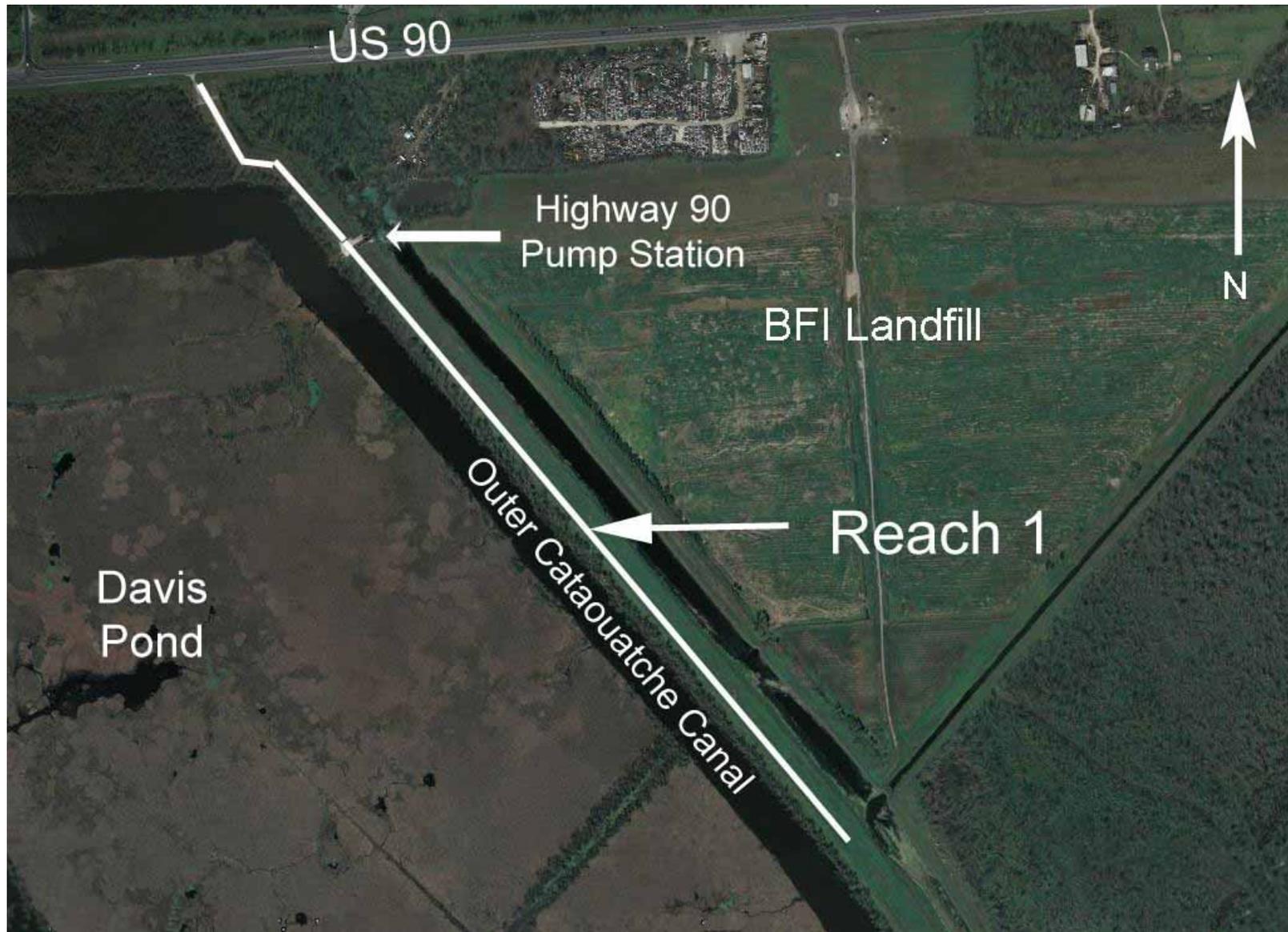


Figure 3. Reach 2

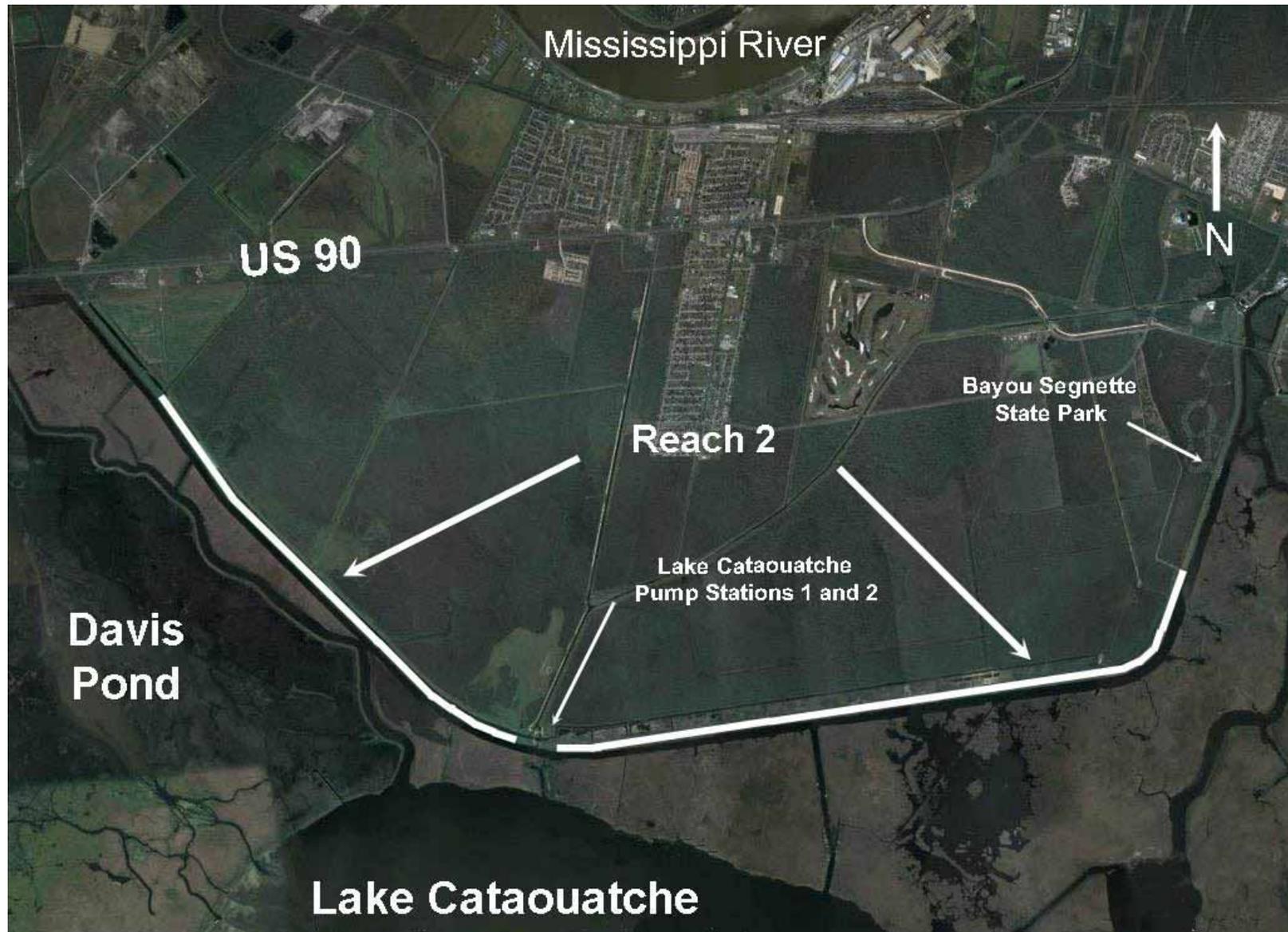
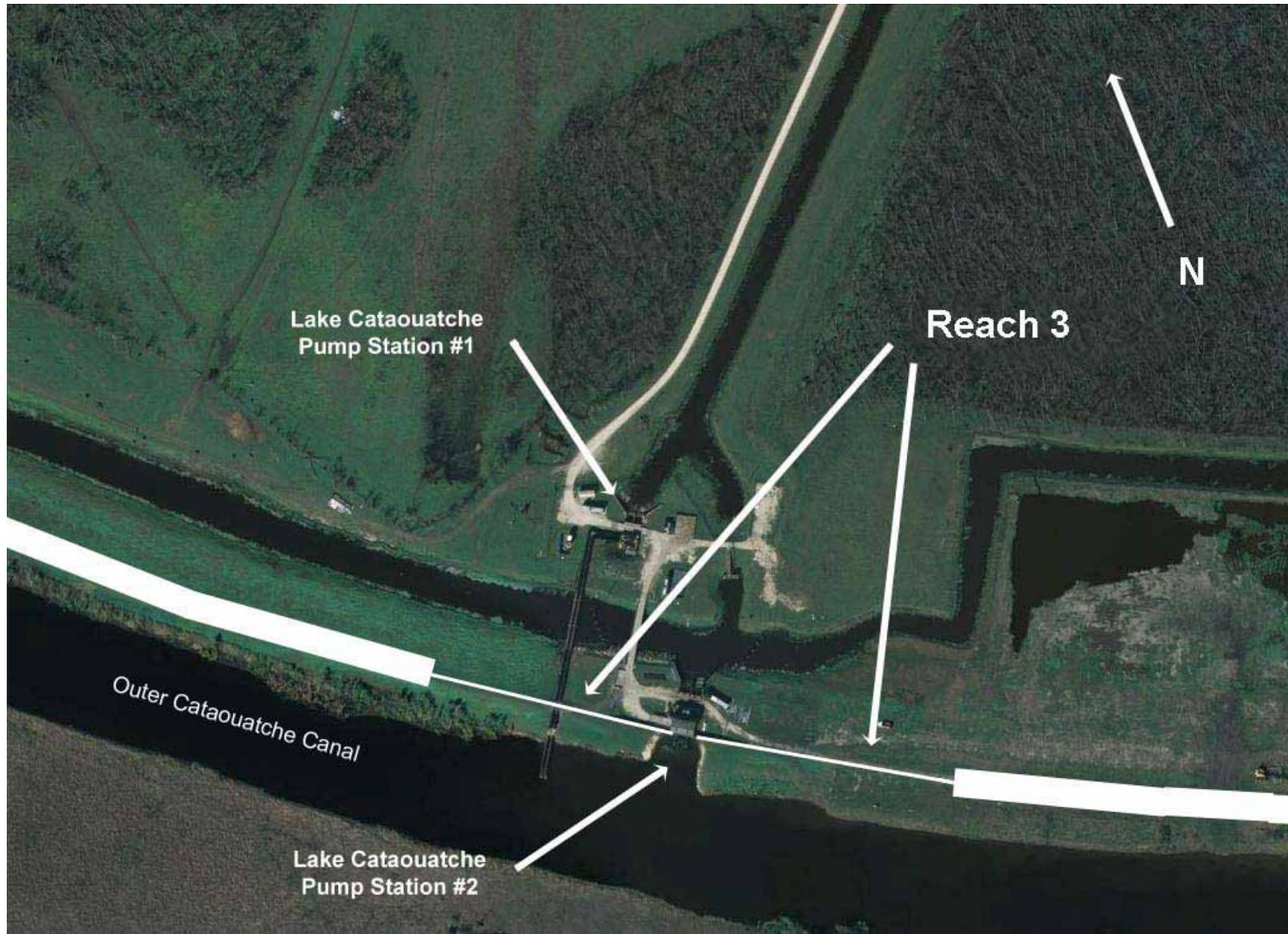


Figure 4. Reach 3



1.1 PURPOSE AND NEED FOR THE PROPOSED ACTION

On 29 August 2005, Hurricane Katrina caused major damage to the Federal and non-Federal flood control and GNOHSDRRS in southeast Louisiana. Hurricane Rita followed this storm on 24 September 2005, and made landfall on the Louisiana-Texas state border, causing damage to GNOHSDRRS in southern Louisiana. Since the storms, the USACE has been working with state and local officials to restore the Federal and non-Federal flood control and GNOHSDRRS projects and related works in the affected area.

To date, approximately 60 percent of the New Orleans population has returned to the area. Many residences and businesses are waiting to see positive improvements in the level of protection before returning to the area. A USACE goal of June 2011 has been set for completion of much of the work that will raise the level of protection in the New Orleans area to a new standard and provide a level of security to residents and businesses that will allow and encourage them to return to the area.

The purpose of the proposed action is to construct and maintain 100-year flood protection for the residents and businesses in the Lake Cataouatche area. The proposed action resulted 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. The completed GNOHSDRRS would lower the risk of harm to citizens, and damage to infrastructure during a storm event. The safety of people in the region is the highest priority of CEMVN.

1.2 AUTHORITY FOR THE PROPOSED ACTION

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

The Westwego to Harvey Canal Hurricane Protection Project was authorized by the WRDA of 1986 (P.L. 99-662, Section 401(b)). The WRDA of 1996 modified the project and added the Lake Cataouatche Project and the East of Harvey Canal Project (P.L. 104-303, Section 101(a)(17) & P.L. 104-303, 101(b)(11)). The WRDA 1999 combined the three projects into one project under the current name (P.L. 106-53, Section 328).

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% 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 protection; 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 H.R. 2206 (pg. 41-44) Title IV, Chapter 3, Flood Control and Coastal Emergencies, (5th Supplemental), General Provisions, SEC. 4302.

1.3 PRIOR REPORTS

USACE, other Federal, State, and local agencies, research institutes, and individuals have prepared a number of studies and reports on water resources development in the vicinity of the proposed project. The pertinent studies, reports, and projects are briefly discussed below:

- On 14 March 2008, CEMVN signed a Decision Record on IER #11 (Tier 1) entitled "Improved Protection on the Inner Harbor Navigation Canal, Orleans and St. Bernard Parishes, Louisiana." The document was prepared to evaluate potential impacts associated with building navigable and structural barriers to prevent storm surge from entering the Inner Harbor Navigation Canal from Lake Pontchartrain and/or the Gulf Intracoastal Waterway-Mississippi River Gulf Outlet-Lake Borgne complex. A Tier 2 document discussing alignment alternatives and designs of the navigable and structural barriers, and the impacts associated with exact footprints, is being completed.
- On 21 February 2008, CEMVN signed a Decision Record on IER # 18 entitled "Government Furnished Borrow Material, Jefferson, Orleans, Plaquemines, St. Charles, and St. Bernard Parishes, Louisiana." The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE as a result of excavating borrow areas for use in construction of the GNOHSDRRS.
- On 14 February 2008, CEMVN signed a Decision Record on IER # 19 titled "Pre-Approved Contractor Furnished Borrow Material, Jefferson, Orleans, St. Bernard, Iberville, and Plaquemines Parishes, Louisiana, and Hancock County, Mississippi." The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors as a result of excavating borrow areas for use in construction of the GNOHSDRRS.
- In July 2006, CEMVN signed a Finding of No Significant Impact (FONSI) on EA #433 entitled "USACE Response to Hurricanes Katrina & Rita in Louisiana." The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE as a result of Hurricanes Katrina and Rita.
- The USACE completed an Environmental Assessment (EA #437) and Finding of No Significant Impact (FONSI) for enlargement to the Lake Cataouatche Area levee, relocation of the drainage canal, excavation of a new borrow pit, and construction of a new haul road and fence (2006). The EA addresses changes to the "Westwego to Harvey Canal, Louisiana, Hurricane Protection Project, Lake Cataouatche Area, Post Authorization Change Report and Environmental Impact Statement," dated December 1996.
- The USACE completed an Environmental Assessment (EA #373) and Finding of No Significant Impact (FONSI) for actions to improve the existing levee from Bayou Segnette State Park to the Lake Cataouatche Pumping Station, Jefferson Parish (2003). The purpose of the project was to provide hurricane protection to residents from storm surges from Lakes Cataouatche and Salvador. This EA was prepared to evaluate the potential impacts associated with the proposed extension of a borrow area for improvement to the Westwego to Harvey Canal levee.
- The USACE completed a Post-Authorization Change Report and EIS titled, "Westwego to Harvey Canal, Louisiana Hurricane Protection Project Lake Cataouatche Area" (1996). The Final EIS and Record of Decision examine alternatives for providing increased levels of hurricane surge protection for several communities on the west bank of the Mississippi River. The recommended plan provided for the construction of levees and floodwalls from

Bayou Segnette State Park to the St. Charles Parish line along the same line of protection as the IER #15 project.

- A feasibility report titled, “West Bank of the Mississippi River in the Vicinity of New Orleans, Louisiana (East of the Harvey Canal)” was completed by the USACE, New Orleans District in August 1994. The study investigated the feasibility of providing hurricane surge protection to that portion of the west bank of Metropolitan New Orleans from the Harvey Canal eastward to the Mississippi River. The final report recommends that the existing West Bank Hurricane Protection Project, Jefferson Parish, be modified to provide additional hurricane damage reduction east of the Harvey Canal. The project was authorized by WRDA, 1996.
- The USACE conducted the “Southeast Louisiana Hurricane Preparedness Study” (1994) to provide state and local emergency managers with detailed information concerning the potential levels of hurricane surge flooding in nine southeastern Louisiana parishes.
- The USACE reconnaissance report titled, “Jefferson and Orleans Parishes, Louisiana Urban Flood Control and Water Quality Management” (1992) authorizes the investigation of rainfall flooding and water quality problems associated with storm water runoff in Jefferson and Orleans Parishes.
- A reconnaissance study titled, “West Bank Hurricane Protection, Lake Cataouatche, Louisiana” was completed by USACE in February 1992. This study investigates the feasibility of providing hurricane surge protection to that portion of the west bank of the Mississippi River in Jefferson Parish between Bayou Segnette and the St. Charles Parish line. A 100-year level of protection was economically justified based on constructing a combination levee/sheet pile wall along the alignment followed by the existing non-Federal levee. Due to potential impacts to the Westwego to Harvey Canal Project, the study proceeded as a post-authorization change.
- A feasibility report titled, “West Bank of the Mississippi River in the Vicinity of New Orleans, Louisiana” was published by USACE in December 1986. The report investigates the feasibility of providing hurricane surge protection to that portion of the west bank of the Mississippi River in Jefferson Parish between the Harvey Canal and Westwego and down to the vicinity of Crown Point, Louisiana. The Water Resources Development Act (WRDA) of 1986 authorized the project (PL 99-662).
- A feasibility report titled, “Louisiana Coastal Area, Freshwater Diversion to Barataria and Breton Sound Basins” (1984) recommends diverting Mississippi River water near Caernarvon into the Breton Sound and near Davis Pond into the Barataria Basin to enhance habitat conditions and improve fish and wildlife resources. The Davis Pond site is just west of the Lake Cataouatche study area.
- A report titled, “Flood Control, Mississippi River and Tributaries” (1927) resulted in authorization of a project by the Flood Control Act of 1928, providing comprehensive flood control for the lower Mississippi Valley. The project provided comprehensive flood control for the lower Mississippi Valley below Cairo, Illinois. The levees built as a result of this project provide protection from the standard project flood and the Mississippi River and Tributaries system.

1.4 INTEGRATION WITH OTHER INDIVIDUAL ENVIRONMENTAL REPORTS

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

The draft CED will be made 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 of availability 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.

There are 17 IERs being prepared to address different reaches of the line of protection for New Orleans. Figure 5 depicts the various reaches and their respective IERs.

1.5 PUBLIC CONCERNS

The greatest area of public concern is providing hurricane, storm, and flood damage reduction for businesses and residences, and providing for public safety during major storm events. Hurricane Katrina forced most Jefferson 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 about impacts to wetlands and aquatic ecosystems as well as noise impacts from construction activities.

1.6 DATA GAPS AND UNCERTAINTY

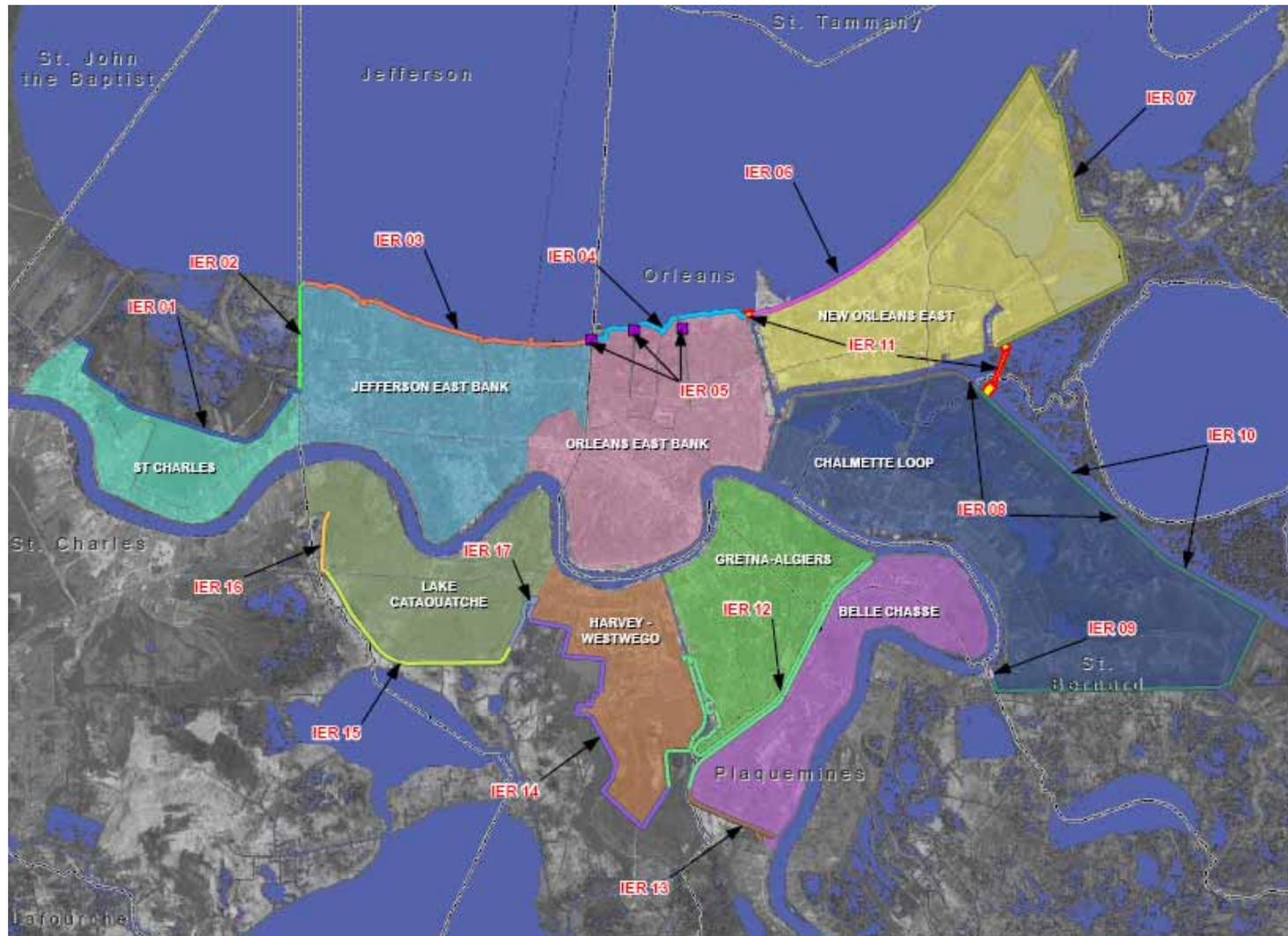
CEMVN has not completed identification of the source for levee material (i.e., borrow areas) to be used on this reach of the line of protection. In IERs #18, #19, #22, #23, #25, and 26, the CEMVN is examining issues associated with the identification of acceptable borrow materials.

In addition, design reports for the reaches covered in IER #15 are currently in preparation. As such, this analysis has been performed prior to formal design and is based on concept level design and reasonable assumptions regarding the proposed actions. While the alternatives described in this evaluation are preliminary, the basic function of their features and the footprint for their construction should remain substantially the same as the project progresses through actual design. Estimates of materials necessary to construct the project were developed from best professional judgment and design reports completed for similar levee and floodwall alignments nearby. As such, the alternative features and associated numbers developed were used to quantify the magnitude of the proposed actions and not to prescribe detailed materials, quantities, or design specifications.

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

Because of data gaps and uncertainties surrounding this project, comprehensive project costs have not yet been determined.

Figure 5. Sub Basins and Representative IERs



2.0 ALTERNATIVES

2.1 ALTERNATIVES DEVELOPMENT AND PRELIMINARY SCREENING CRITERIA

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

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

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

Alternatives:

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

Alternative Scales:

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

In addition to this standard set of action alternatives common to all reaches, alternatives were formulated to address reach-specific opportunities and constraints, all of which are described in detail in the following section. Once a full range of alternatives was established for each reach, a preliminary screening was conducted to identify alternatives that would proceed through further analysis. The criteria used to make this determination included engineering effectiveness, economic efficiency, and environmental and social acceptability. Those alternatives that did not adequately meet these criteria were considered infeasible and therefore were eliminated from further study in this IER. Where different alternative scales (i.e., earthen levee, T-wall floodwall, etc.) could be implemented at a location, the significant cost differences between earthen levee and all other scales typically leads to the selection of earthen levee as the preferred approach when alternative techniques are all feasible. The CEMVN Project Delivery Team considered a No Action alternative and Non-Structural measures in this IER, discussed in sections 2.4 and 2.5.5, respectively.

2.2 DESCRIPTION OF THE ALTERNATIVES

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

As such, the alternatives description is organized by reach, noting those alternatives that are common among all reaches. Each reach is identified by a project identification number (e.g. WBV-17b.2). The alternative description also explains how each alternative relates to the range of alternatives for adjacent reaches, to insure awareness of the GNOHSDRRS as a whole.

2.3 PROPOSED ACTION

Although a segment of the contiguous WBV project, this project originates where Hwy 90 intersects the line of protection and continues to approximately the Bayou Segnette State Park boundary. The project is designed to use existing ROW and levees within previously disturbed areas, therefore minimizing environmental consequences. The design, construction, and maintenance would be similar to that previously designed and constructed by the CEMVN along this alignment. As summarized in section 1, the existing Lake Cataouatche Levee alignment is described with three distinct reaches. The proposed actions for reaches 1, 2, and 3 are as follows:

Reach 1 – Levee for the Western Tie In to End of BFI Landfill (WBV 17b.2)

From the western terminus of this section at Hwy 90, the line of protection proceeds southeast for a distance of 3,900 ft. The construction ROW is constrained on the protected side by a closed BFI landfill and on the flood side by open water in the Outer Cataouatche Canal. The existing ROW and available land between the current levee centerline and the BFI landfill is approximately 300 ft and the available ROW on the flood side of the centerline is 250 ft. The proposed action in this reach is a flood side shift of the authorized levee to achieve 100-year protection. All work would take place within the existing ROW, but would have to shift slightly west, approximately 110 ft, into the Outer Cataouatche Canal to accommodate the larger levee. The authorized levee height in year 2007 is at +11.5 ft NGVD and the 100-year height in year 2057 would be approximately +15.5 ft NAVD88 (North American Vertical Datum of 1988, 2004.65). The new levee would require approximately 882,000 cubic yards (cy) of earthen material to construct.

The construction footprint on the protected side would fall entirely within an area of recent construction activity and stay within the area of previous disturbance. On the flood side, although within the existing ROW, construction would require building the toe of the levee approximately 40 ft out into the Outer Cataouatche Canal by "pushing a mud wave." This would require placing earthen fill at the toe of the existing grade (into the wetland/open water) to push the organic material out into the open channel and eventually achieve the desired ground surface elevation. Based on the depth of the canal, the depth to which this material must be filled is assumed to be 3 ft. The flood side would be expanded at this 3-ft depth at least 40 ft into the canal with the mud wave pushing the organic material ahead an additional 70 ft into the canal for

a total area of disturbance of 110 ft. This would result in approximately 17,500 cy¹ of fill being placed into wetlands and open water over an area of approximately 10 acres.²

Reach 2 - Lake Cataouatche Levee from the BFI Landfill to the Bayou Segnette State Park (WBV 18.2 and WBV 15a.2)

The proposed action for this reach is to construct approximately 6.84 miles of uniform-design, protected-side shift of levee entirely within the existing construction ROW and area of previous and recent disturbance. The authorized levee height in year 2007 is at +11.5 ft NGVD and the 100-year height in year 2057 would be approximately +15.5 ft NAVD88. Construction of this reach of levee would require approximately 1.79 million cy of earthen material.

Borrow material required for construction of the earthen levee would be provided from Government-approved borrow sites. The environmental consequences incurred to extract and transport the borrow material to the construction site would be evaluated under separate IERs as sites become available for investigation. Currently, IERs #18, #19, #22, #23, #25, and #26 address the acquisition of borrow for the GNOHSDRRS. All levees would be fertilized and seeded upon completion and the proposed action would include all necessary maintenance for the completed project.

Site preparation to construct the earthen levee would require clearing and grubbing of vegetation and stripping topsoil within the footprint of all work areas. The clearing and grubbing of the vegetation and topsoil stripping would be necessary to ensure that trees, roots, and topsoil zones do not provide weak path planes where water seepage could jeopardize the integrity of the levee. However, the footprint of disturbance (~1,100 ft) has been recently stripped of woody vegetation and is significantly disturbed; thus little, if any, material would be generated. None of the grubbed material would be re-used as fill for the project. Removed vegetation and topsoil would be trucked for disposal or held for re-use elsewhere. The material would be deposited and stored in a manner to ensure that materials would not be eroded from the site.

Reach 3 - Lake Cataouatche Pump Stations No. 1 and No. 2 Floodwall (WBV 15b.2)

The proposed action for this reach would involve the construction of approximately 1,450 ft of T-wall floodwall to approximately +15.5 ft NAVD88. In addition to the new floodwall, the discharge pipes would be extended from pump station #2 to penetrate the new floodwall, and an access road canal crossing would be constructed. All permanent work is within existing ROW. Temporary construction ROW in Jefferson Parish drainage servitude would be required. This option requires no relocations of existing utilities.

2.3.1 Actions Common to All Reaches

2.3.1.1 Armoring

Armoring may be provided at specific locations throughout the GNOHSDRRS. Armoring may be used to protect against erosion and scour on the protected side of selected critical portions of levees and floodwalls in the GNOHSDRRS. These critical areas include: transition points (where levees and floodwalls transition into any hardened feature such as other levees, floodwalls, pump stations, etc.), utility pipeline crossings, floodwall protected side slopes, and earthen levees that are exposed to excessive wave overtopping during a 500-year hurricane storm event. Specific locations have not been fully identified.

¹ 3 ft deep x 40 ft toe expansion x 3,900 ft length of reach = 468,000 CF/27 CF per CY = 17,333 CY

² 40 ft toe expansion + 70 ft mud wave effects = 110 ft x 3,900 ft length of reach = 429,000 SF = 9.8 AC

There are five proposed methods of armoring that could be used at the critical locations:

1. ACB - Articulated concrete blocks;
2. ACB/TRM – Articulated concrete blocks/Turf reinforcement mattress: The physical conditions or hydraulic parameters are such that small modifications could allow a reduction to a TRM;
3. TRM – Turf reinforcement mattress;
4. TRM/Grass – The physical conditions or hydraulic parameters are such that small modifications could allow a reduction to a surface with good grass cover only;
5. Good grass cover.

2.3.1.2 Relocations

Where needed, utilities would be relocated to cross the project in accordance with existing standards. Disruptions to existing facilities would be kept to a minimum.

2.3.1.3 Operations and Maintenance

In addition to the activities necessary to construct these features, the proposed action includes all routine maintenance (e.g., mowing, inspections, re-paving, repairs to structures, in-kind replacements) for both the local sponsor operations and maintenance (O&M) and USACE-related activities necessary to maintain the safety or integrity of the GNOHSDRRS.

O&M of the GNOHSDRRS would have minimal impact on the significant resources of the area. The levees would be mowed periodically and herbicides may be used on a very limited basis around control structures. The floodwall and levees would be subject to annual inspection and repair, as necessary, up to and including in-kind replacement as well as adding subsequent lifts of earthen material to levees to address subsidence. Activities would be conducted within the existing ROW and would be within previously disturbed areas. Temporary and localized construction-related effects (e.g., noise, emissions-air quality, temporary increase in traffic, etc.) would occur during operations and maintenance work.

2.3.1.4 Temporary Flood Protection Contractually Required During Construction

As part of the construction process, temporary flood protection would be required whenever a reach of the existing floodwall or levee is removed until the replacement floodwall or levee was sufficiently completed to withstand floodwaters. Sufficiently completed is defined as the time when the concrete in the replacement floodwall reaches a compressive strength of 4,000 psi and all earthwork for the floodwall/levee replacement has been completed. Typically, the contractor would provide temporary protection or a cofferdam that would in no way affect the stability of the existing flood protection or flood protection being constructed. The contractor would maintain all temporary flood control, including maintaining and operating drainage facilities, during the required time. The contractor would provide, maintain, and operate pumps of adequate capacities, for the removal of the water that could accumulate in excavations within the area protected by the temporary flood protection, during construction. The discharge from the pumps would be into the flood side. The contractor would remove all temporary flood control structures, and incidental features when no longer required. All materials used in providing temporary flood control structures, and any debris generated during their removal would become the property of the contractor and would be removed from the job site prior to completion.

Prior to beginning work, the contractor would submit for approval their proposed plan to accomplish the specified temporary flood protection. The submittal would be in accordance with Section 01330, "Submittal Procedures" and would include, but not necessarily be limited to the following:

1. Design and layout of temporary flood protection works,
2. Methods and duration of maintenance of temporary flood protection,
3. Methods, sequence, equipment, and materials to be used for drainage of excavations for floodwall demolition and floodwall replacement, and
4. Method and sequence of removal, including disposal of materials.

These measures provide assurance that protection would be maintained during the construction process even in the event of significant flooding.

2.4 ALTERNATIVES TO THE PROPOSED ACTION

2.4.1 Reach 1

Western Tie In to End of BFI Landfill

Within this reach, the only alternative to be considered in detail, other than the proposed action, is the no action alternative. Other alternative alignments (flood side shift or protected side shift) or alternative scales (e.g., earthen levee with T-wall cap, T-wall, I-wall, L-wall, deep soil mixing) are not feasible for detailed consideration because of the constraints identified in Section 1. Action alternatives removed from consideration failed to meet at least one of the engineering effectiveness, economic efficiency, and environmental, and social acceptability criteria necessary to be considered as feasible.

2.4.1.1 No Action

Under the no action alternative, the proposed 100-year level of hurricane and storm damage risk reduction would not be constructed by CEMVN in this portion of the WBV project. As a result, the line of protection would remain at the previously authorized elevation, typically 3 to 4 ft lower than the proposed action's 100-year level of protection. Routine maintenance and replacement-in-kind actions for the existing levee and pump stations would continue and operations would continue unchanged from the current conditions.

2.4.2 Reach 2

Lake Cataouatche Levee from the BFI Landfill to Bayou Segnette State Park

Within this reach, the only alternative to be considered in detail, other than the proposed action, is the no action alternative. Other alternative alignments (flood side shift or protected side shift) or alternative scales (e.g., earthen levee with T-wall cap, T-wall, I-wall, L-wall, deep soil mixing) failed to meet at least one of the engineering effectiveness, economic efficiency, and environmental and social acceptability criteria.

2.4.2.1 No Action

Under the no action alternative, the proposed 100-year level of hurricane and storm damage risk reduction would not be constructed by CEMVN in this portion of the WBV project. As a result, the line of protection would remain at the previously authorized elevation; typically 3 to 4 ft lower than the proposed action's 100-year level of protection. Routine maintenance and

replacement-in-kind actions for the existing levee and pump stations would continue and operations would continue unchanged from the current conditions.

2.4.3 Reach 3

Lake Cataouatche Pump Stations No. 1 and No. 2 Alternatives

2.4.3.1 No Action

Under the no action alternative, the proposed 100-year level of hurricane and storm damage risk reduction would not be constructed by CEMVN in this portion of the WBV project. As a result, the line of protection would be built to and maintained at the levels authorized prior to Hurricane Katrina. This would be typically 3 to 4 ft lower than the proposed action's 100-year level of protection. The routine maintenance and replacement-in-kind actions for the existing levee and pump stations would continue and operations would continue unchanged from the current conditions.

2.5 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

2.5.1 Hollow Core Levees

The concept of the hollow concrete levee system is such that the section fills with water from the bottom as the storm surge rises. The combined weight of the concrete frame and its water filled voids inside the frame result in a gravity structure that is designed to resist hydrostatic forces and impact forces from vessel collision.

Hollow concrete levees are comprised of trapezoidal shapes similar to 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 would be supported by steel pipe piles. Excavation and granular backfill would be required to construct the pile supported concrete pad. The concrete base slab serves a two-fold purpose. It distributes loads to the pile foundations as well as serves as a "roadway" for cast-in-place construction. A typical section is shown in the Figure 6 below.

The concrete levee section would not be advantageous to use in lieu of a traditional reinforced levee section. The existing levees in Jefferson Parish are only deficient by 4.5 to 5.0 ft. Therefore, degrading an existing levee and replacing with a concrete levee section would not be cost effective.

2.5.3 Reach 2

2.5.3.1 Flood Side Shift of Alignment

An alternative of constructing the levee to the 100-year level of protection on the flood side of the centerline of the existing Lake Cataouatche Levee (as opposed to the protected side) was considered early in the planning process. However, in order to construct to the appropriate elevation, the footprint of construction would require enlarging the levee out into the Lake Cataouatche Canal on the flood side of the existing levee. Typically this is accomplished by pushing a “mud wave” by placing enough fill at the toe of the existing grade (into the wetland/open water) to push all the organic material out into the open channel and eventually achieve the desired ground surface elevation. Preliminary calculations of flood side expansion indicate that the toe of the existing levee would be expanded at least 40 ft into the canal with the mud wave pushing organic material ahead an additional 70 ft into the canal.

For reach 2, this would result in approximately 160,500 cy³ of fill being placed into wetlands and open water, which would result in elimination or significant degradation to approximately 91.2 acres.⁴ These environmental effects would be avoided by constructing a protected side expansion through the entire reach 2.

The distance perpendicular from the current centerline would be approximately 250 ft. Such construction would require extensive deposition of fill into the open water canal over the 6.84 mile distance of reach 2. Figure 7 is a photograph of the existing canal looking southeast from the Hwy 90 pump station outlet. Flood-side levee construction would require the unnecessary filling of a substantial area of wetlands and open water.

As previously stated, the criteria used to determine whether an alternative would be feasible included consideration of engineering effectiveness, economic efficiency, and environmental and social acceptability. Flood side expansion for reach 2 would result in significant, and unnecessary, environmental effects when compared to constructing on the previously disturbed protected side. For this reason, flood side alternatives have been eliminated from further consideration.

2.5.3.2 Floodwall on Grade

Reach 2 is currently a continuous reach of levee excepting the floodwall around the Lake Cataouatche Pump Stations No. 1 and No. 2. Although site-specific situations may vary, costs for floodwall (e.g., I-wall, L-wall, and T-wall) are typically in excess of two times the costs of levee construction. Providing the 100-year elevation of protection across the entire alignment with floodwalls would be cost-prohibitive and the alternative is therefore eliminated from detailed consideration based on economic efficiency criteria.

2.5.3.3 Straddle Levee Expansion

Similar to the flood side expansion, a straddle levee over the centerline of the existing Lake Cataouatche levee would require an expansion into the wetlands and open water of the Outer Cataouatche Canal (figure 7). As such, the straddle levee expansion has been eliminated from detailed consideration on the basis of environmental acceptability criteria.

³ 3 ft deep x 40 ft toe expansion x 36,102 ft length of reach = 4,332,240 CF/27 CF per CY = 160,453 CY

⁴ 40 ft toe expansion + 70 ft mud wave effects = 110 ft x 36,102 ft length of reach = 3,971,220 SF = 91.2 AC

2.5.4 Reach 3

2.5.4.1 Pump Stations Alternative 1

For this alternative, flood protection would be provided by constructing approximately 577 ft of new floodwall (to elevation 15.50 NAVD 88 (2004.65)) and extending the levees on either side to connect to the new floodwall. This alternative would require extending the discharge pipes from pump station #2 to penetrate the new floodwall, relocating both pump station fuel tanks, adding culverts in the Inner Cataouatche Canal, relocating two access roads, and constructing an access road canal crossing. All permanent work would be within the existing ROW. Temporary construction ROW in the Jefferson Parish drainage servitude would be required. This option would require the extensive relocation of utilities, and was eliminated from detailed consideration on the basis of the economic efficiency criteria.

Figure 7. Outer Cataouatche Canal Looking South



2.5.4.2 Pump Stations Alternative 2

For this alternative, flood protection would be provided by constructing approximately 665 feet of new floodwall (to elevation 15.50 NAVD 88 (2004.65)) and extending the levees on either side to connect to the new floodwall. Lake Cataouatche Pump Station #1 would be removed, and a new Pump Station #1 would be built. Pump Station #2 would remain in its existing location. This alternative would require extending the discharge pipes from both pump stations to penetrate the new floodwall, realigning the Inner Cataouatche Canal on both sides, realigning the Avondale Canal, relocating the control gate structure, realigning the access road, and constructing two access road canal crossings. New ROW would be required. This option would require the extensive relocations of utilities and was eliminated from detailed consideration on the basis of the economic efficiency criteria.

2.5.5 All Reaches

2.5.5.1 Non-Structural Flood Protection Alternative

In addition to the alternative alignments and different structural methods of flood protection, non-structural alternatives were formulated to address hurricane damage reduction. However, full-scale, non-structural measures were screened out early in plan formulation due to the number of flood-prone structures in the study area. The following non-structural measures were identified as potentially applicable to flood damage reduction in the study area, including: (1) acquisition of flood-prone structures, (2) floodplain zoning, and (3) floodproofing. Analysis of the non-structural measures to provide flood damage reduction eliminated most of these measures.

As with the structural alternatives, the criteria used to determine feasibility included engineering effectiveness, economic efficiency, and environmental and social acceptability. Those alternatives that did not adequately meet the criteria were considered infeasible and therefore were eliminated from detailed consideration in this IER. The screening of non-structural measures is summarized below.

2.5.5.2 Acquisition of Flood-Prone Structures

Permanent evacuation of the floodplain involves acquisition of land and structures by fee purchase or by exercising powers of eminent domain. Following acquisition, all structures and improvements are demolished or relocated. Buyout costs for approximately 1,275 residential structures in the immediate vicinity could exceed \$180 million (1,275 x \$144,000) and relocation costs under the Uniform Relocation Assistance Act could total an additional \$20 million. The cost savings in annual flood insurance premiums, assuming 100 percent flood insurance participation by every property in the flood zone would equal roughly \$240,000. This is the maximum value of the potential flood damage reduction benefits of relocation plans. Relocation of the standard project hurricane (SPH) floodplain structures would result in a maximum savings of \$240,000 in average annual flood damage reduction benefits, compared to over \$200 million in average flood damage reduction costs (the total cost of acquisition and relocation). Under this alternative, the affected property owners would relinquish title to their existing lot in exchange for ownership of the property to which they were relocated.

No new use value would be attributed to the vacated lands. No value would be associated with reduced damages to public property, such as roads and utilities. Minor reduction in emergency services costs would be gained. No reduction in administrative costs of the National Flood Insurance Program and disaster relief programs would be anticipated.

While environmental benefits of a buyout in the study area initially appear to be attractive, more detailed analyses of the potential benefits cannot support a positive recommendation for an acquisition/relocation plan. The study area already has a significant amount of open space in, and adjacent to, the developed areas. Bayou Segnette State Park, located adjacent to the study area, is among the significant recreation resources cited in the State Comprehensive Outdoor Recreation Plan (SCORP) that meets the study area's active recreation needs.

Restoring the ecosystem through the acquisition of flood-prone structures would generate benefits, but it is highly unlikely that these benefits would be sufficient to justify the approximate \$200 million cost of the relocation of all structures in the SPH floodplain, or the scaled costs of smaller relocation efforts. Establishing Federal, state, or regional significance would be problematic because there are no designated habitats for Federal or state listed species within or near the study area. Regarding the Other Social Effects (OSE) and Regional Economic

Development (RED) Accounts, the social and economic impacts resulting from the necessary displacement of 1,275 households, 20 businesses and public buildings, the demolition of an equivalent number of buildings of all types, and the removal of tens of millions of dollars in property value and tax base would have significant negative effects on the local economy. The plan would also generate significant local controversy, disrupt community cohesion, and place economic burdens on relocated families, relatives, and neighbors.

For the reasons cited previously, it is unlikely that a floodplain buyout plan would meet P&G guidelines (Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies). Additionally, the buyout plan would not provide significant offsetting environmental or economic benefits, and would have negative effects on the RED and OSE Accounts. Therefore, acquisition of flood prone structures was eliminated from consideration as a stand-alone alternative.

2.5.5.3 Floodplain Zoning

Through proper land use regulation, floodplains can be managed to ensure that their use is compatible with the severity of a flood hazard. Several means of regulation are available, including zoning ordinances, subdivision regulations, and building and housing codes. Their purpose is to reduce losses by controlling the future use of floodplain lands. Jefferson Parish already participates in the National Flood Insurance Program (NFIP) and manages floodplain land uses consistent with the program. However, a majority of the buildings in the study area floodplain were built prior to the adoption of NFIP zoning standards and are not subject to current floodplain zoning regulations unless they are substantially improved. Therefore, zoning cannot be considered independently as a long-term mitigation solution for flood damage reduction to existing structures.

2.5.5.4 Floodproofing

Floodproofing reduces flood damages through modifications to structures and relocation of building contents. Floodproofing techniques involve keeping water out of the structure, as well as reducing the effects of inundation. Non-structural adjustments, such as the elevation of structures, can be applied by an individual or as part of a collective action either when flood-prone buildings are under construction or through retrofitting of an existing structure. Floodproofing alone was found to be prohibitively expensive, since a majority of structures would require costly raising (an average cost of \$95 per square foot, (USACE 2007b)). While eliminated as a major element in the formulation of alternative plans, selective floodproofing was retained as a flood damage reduction measure as a part of other comprehensive alternative plans.

2.5.5.5 Deep Soil Mixing

Deep soil mixing can be used to improve the competency of soils. Deep soil mixing currently is being used on three of 59 construction projects that have been awarded to repair the entire levee system. Two of these projects entail using deep soil mixing to decrease lateral active earth pressures and increase lateral passive earth pressures at closure structures under construction at the mouths of interior drainage canals in New Orleans. The third deep soil mixing application is being used beneath an earthen hurricane/river flooding protection levee in Plaquemines Parish to improve the overall foundation competency with respect to landside slope stability.

The deep soil mixing method involves the blending of a binder (e.g., lime, cement, slag, fly ash, etc.) into the soil through a hollow stem auger and mixing tool arrangement to produce round “columns” of treated soil (Woodward, 2006). These columns of treated soil exhibit markedly different physical characteristics than the existing conditions and have proven to be a viable

method to effectively improve the competency of soils in Southeast Louisiana. Both dry and wet deep soil mixing methods⁵ have demonstrated that they can be used to substantially raise the in situ shear strength of the soil several orders of magnitude. Deep soil mixing is substantially more expensive than typical levee construction and all three of the locations where Task Force Guardian has utilized deep soil mixing justified the costs because the situations required rapid construction techniques, construction sequencing, and was further constrained by working in confined work areas. Although the work area in reach 1 is confined by the BFI landfill, the costs associated with using the deep soil mixing technique would be unnecessarily high. The criterion used to exclude this technique from detailed consideration is the lack of economic efficiency. Typical levee construction is adequate and therefore the deep soil mixing technique was eliminated from detailed study for this IER.

2.6 SUMMARY

Table 1 summarizes the alternatives that were examined for each of the reaches for IER #15.

**Table 1
Summary of Preliminary Alternative Screening Results**

Alternative	Scale	Reach 1	Reach 2	Reach 3
No Action		✓	✓	✓
Non-Structural		X	X	X
Existing Alignment				
•	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
Flood-side Shift				
•	Earthen Levee	✓	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
•	T-wall Floodwall	X	X	✓
•	Earthen Levee with T-wall Floodwall cap	X	X	X
•	Earthen Levee using Deep Soil Mixing	X	X	X
New Alignment		n/a	n/a	n/a

X: eliminated from further study ✓: considered in detail

n/a: not applicable; this alternative was not formulated for this reach

⁵ The dry mix method uses a mixing tool that is rotated downward into the soil at high speed while compressed air is blown through the binder port in the tool shearing the soil. Once the required depth is reached, the direction of the tool is reversed and dry binder is pneumatically blown into the soil as the mixing tool is withdrawn. Moisture is drawn from the in-situ soil for hydration of the binder. In the wet mix method, the binder is premixed with water to create slurry that is pumped into soil under relatively low pressures. The wet method normally produces columns of higher strength compared to dry mixed columns, but produces significant spoils compared to a relative absence of spoils with the dry mix method.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 ENVIRONMENTAL SETTING

The project area is situated on the west bank of the Mississippi River in Jefferson Parish near New Orleans, Louisiana, between approximate Mississippi River miles 105 and 114 above Head of Passes. The area is part of the Barataria Basin. The basin is bounded to the west by the Bayou Lafourche ridge, the Mississippi River to the north and east, and the Gulf of Mexico to the south. Lakes Salvador and Cataouatche are estuary areas to the south that connect to the Gulf of Mexico through Barataria Bay. Tidal waters can be carried into the project area through Bayou Barataria, Lakes Salvador and Cataouatche, and Bayou Segnette. Freshwater is introduced into the study area from the Mississippi River via the Harvey and Algiers Locks, direct rainfall, pumpage from levied areas, and the Davis Pond Diversion Canal.

3.1.1 Terrain

The project area has little relief that is characteristic of an alluvial plain. Land elevations slope gently from an average elevation of about 10 ft NAVD88 along the levee of the Mississippi River to about 3 ft below sea level in portions of the levied area. Natural ground elevations in the un-levied marsh areas in the southern part of the project area average 0.5 to 1.0 foot NAVD88. Pumping of the area to an artificially low water table provides additional flood protection in the form of increased water storage capacity, but has promoted soil consolidation and decay of the exposed organic materials (see figure 8). As a consequence, land elevations inside the protected area have subsided and are now lower than the water surface elevations of adjoining bayous and lakes outside the protected area.

The entire area is protected from flooding by the Mississippi River levee system. Flooding originating in the Gulf of Mexico and Lakes Salvador and Cataouatche can travel across the marsh and through the many natural and man-made channels to threaten the project area from the south.

3.1.2 Geology

The project area is located south of the Mississippi River, and north of Lake Cataouatche, in the north-central portion of the Mississippi River deltaic plain. Dominant physiographic features in the vicinity include Lake Cataouatche, Bayou Segnette, and freshwater swamps and marshes. The shallow subsurface beneath, and immediately adjacent to, the protection levee is composed of swamp, interdistributary, and prodelta deposits. Swamp deposits are found at the surface and are approximately 20 ft thick. Swamp deposits are composed of soft to medium clays with some silt, peat, and wood. Interdistributary deposits approximately 30 ft thick are found beneath swamp deposits. Interdistributary deposits are characterized by very soft to soft clay with silt strata and shells. Prodelta deposits up to 20 ft thick are located below interdistributary deposits. Prodelta deposits are generally composed of medium clay with minor amounts of silt.

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

Groundwater is artificially lowered north of the protection levee by forced drainage and is at or near the surface south of the levee. Long-term relative subsidence resulting mainly from

compaction of Holocene sediments, is estimated at 0.5 ft per century. Eustatic sea level is predicted to rise an additional 1.3 ft over the next century (IPCC, 2001). Therefore, the natural, long-term, relative subsidence rate at the project site is estimated to be 1.8 ft per century. Ground subsidence related to artificial lowering of the water table within the protected area likely exceeds the natural rate of subsidence.

Figure 8. Typical Organic Soil



3.1.3 Climate

The study area has a subtropical marine climate. Located in a subtropical latitude, its climate is influenced by the many water surfaces of the lakes, streams, and the Gulf of Mexico. Throughout the year, these water bodies modify the relative humidity and temperature conditions decreasing the range between the extremes. When southern winds prevail, these effects are increased, thus imparting the characteristics of a marine climate.

The area has mild winters and hot, humid summers with monthly mean temperature extremes from the low 50s in January to the low 80s in July. Temperature extremes of greater than 100°F and less than 10°F have been recorded within the last 30 years. During the summer, prevailing southerly winds produce conditions favorable for afternoon thundershowers. In the colder seasons, the area is subject to frontal movements that produce squalls and sudden temperature drops. River fogs are prevalent in the winter and spring when the temperature of the Mississippi River is somewhat colder than the air temperature.

Southeast winds predominate in the spring. The prevailing winds of the fall and winter are from the northeast. Winter storms in the area have produced wind speeds of up to 47 miles per hour (mph). The mid-late summer is often disturbed by tropical storms and hurricanes that produce the highest winds in the area.

The annual normal precipitation for New Orleans Audubon Park and New Orleans Algiers station is over 60 inches. Extreme monthly rainfalls exceeding 12 inches are common and as much as 20 inches of rainfall has been recorded in a single month. The maximum 24-hour recorded rainfall in over 50 years of monitoring at Algiers station is over 22 inches.

3.2 SIGNIFICANT RESOURCES

This section identifies 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, 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 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 action analyzed in this IER.

**Table 2
Significant Resources in Project Study Area**

Significant Resource	Impacted	Not Impacted
Air Quality	X	
Water Quality	X	
Terrestrial Habitat	X	
Aquatic Habitat	X	
Fish and Wildlife	X	
Wetlands	X	
Threatened and Endangered Species		X
Recreational Resources		X
Aesthetic Resources		X
Cultural Resources		X
Farmland		X

3.2.1 Air Quality

3.2.1.1 Existing Conditions

The U.S. Environmental Protection Agency (USEPA) Office of Air Quality Planning and Standards has set National Ambient Air Quality Standards (NAAQS) for six principal pollutants, called “criteria” pollutants. They are carbon monoxide, nitrogen dioxide, ozone, lead, particulates of 10 microns or less in size (PM-10 and PM-2.5), and sulfur dioxide. Ozone is the only parameter not directly emitted into the air but forms in the atmosphere when three atoms of oxygen (O₃) are combined by a chemical reaction between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. Motor vehicle exhaust and industrial emissions, gasoline vapors, and chemical solvents are some of the major sources of NO_x and VOC, also known as ozone precursors. Strong sunlight and hot weather can cause ground-level ozone to form in harmful concentrations in the air.

The Clean Air Act General Conformity Rule (58 FR 63214, November 30, 1993, Final Rule, Determining Conformity of General Federal Actions to State or Federal Implementation Plans) dictates that a conformity review be performed when a Federal action generates air pollutants in a region that has been designated a non-attainment or maintenance area for one or more NAAQS. The general conformity rule was designed to ensure that Federal actions do not impede local efforts to control air pollution. It is called a conformity rule because Federal agencies are required to demonstrate that their actions “conform with” (i.e., do not undermine) the approved SIP for their geographic area. The purpose of conformity is to (1) ensure Federal activities do not interfere with the air quality budgets in the SIPs; (2) ensure actions do not cause or contribute to new violations, and (3) ensure attainment and maintenance of the NAAQS. Federal agencies make this demonstration by performing a conformity review when the actions they are planning to carry out will be conducted in an area designated as a non-attainment or maintenance area for one of the criteria pollutants.

For all of greater New Orleans, including Jefferson Parish and St. Charles Parish, all six parameters are in attainment of the air quality standards (USEPA, 2007). A conformity assessment would require quantifying the direct and indirect emissions of criteria pollutants caused by the Federal action to determine whether the proposed action conforms to Clean Air Act requirements and any State Implementation Plan (SIP). Because the project area is designated as an attainment area, no conformity review is required for the proposed action.

If one or more of the priority pollutants was not in attainment, then the proposed action would be subject to detailed conformity determinations unless they are *de minimus* emissions. Use of the *de minimus* levels assures that the conformity rule covers only major Federal actions (USEPA, 1993). A conformity review requires consideration of both *direct* and *indirect* air emissions associated with the proposed action. Sources that would contribute to direct emissions from this project would include demolition or construction activities associated with the proposed action and equipment used to facilitate the action (e.g., construction vehicles). To be counted as an indirect emission, the Federal proponent for the action must have continuing control over the source of the indirect emissions. Sources of indirect emissions include commuter activity to and from the construction site (e.g., employee vehicle emissions). Both stationary and mobile sources must be included when calculating the total of direct and indirect emissions, but this project would involve only mobile sources.

3.2.1.2 Discussion of Impacts

3.2.1.2.1 No Action

Under the no action alternative, potential air quality impacts associated with the construction and operation of new storm damage reduction measures in this reach would not occur. Air quality would not be predicted to change from existing conditions where periodic flooding can lead to temporary deterioration in air quality during and after flooding. Floods typically result in the contamination of surface waters with sewage and other contaminants that can contribute to poor air quality. In addition, sediment clean up can lead to temporary increases in fugitive dust from street sweeping of sediment. Also, transportation of debris and rubble from clean up of storm damages contribute to local emissions and decrease air quality.

3.2.1.2.2 Proposed Action

No detailed conformity assessment is required because Jefferson Parish is designated as an attainment area for the designated priority pollutants. Direct significant environmental effects to air quality are not likely to occur as a result of the proposed action.

Design reports are currently being prepared; therefore, detailed quantification of the emissions associated with construction of the proposed action cannot be completed. The indirect effects to air quality of implementing the proposed action would be related to the emissions from transportation of personnel and equipment to and from the job site on a daily basis until the completion of construction.

3.2.2 Water Quality

3.2.2.1 Existing Conditions

3.2.2.1.1 Protected Side

The waters within the protected area of the proposed hurricane damage reduction project to the Mississippi River have been classified "Effluent Limited" by the State of Louisiana. The "Effluent Limited" classification indicates that water quality is meeting and will continue to meet applicable water quality standards, or that water quality will meet those standards in the future after application of effluent limitations required by the Federal Clean Water Act or Louisiana Water Quality Regulations (USACE, 1996).

Jefferson Parish has collected extensive water quality data in the study area from 1983 to the present. Most samples were collected approximately monthly at various locations throughout the drainage canal system on the West Bank of Jefferson Parish. Water quality analysis in the interior protected area is based on available Jefferson Parish canal data. The three sample locations that are applicable to the interior protected area are:

- Intake side of Hwy 90 Pump Station near the intersection of the outfall canal and the Inner Cataouatche Canal (off of the levee just east of the Jefferson/St. Charles Parish line),
- Main Extension Canal on the intake side of the Cataouatche Pump Station, and
- Main Canal on the intake side of the Bayou Segnette Pump Station.

These data indicate that despite the "Effluent Limited" designation by the State, water quality in the drainage canal system often does not meet applicable water quality standards (USACE, 1996). The most serious water quality problems are most likely due to sanitary wastewater contamination of the drainage system. Raw or partially treated wastewater is often combined with stormwater runoff as the result of bypasses and overflows and infiltration and inflow from the sanitary wastewater conveyance system into the storm water conveyance system. Stormwater runoff also contributes urban pollution to the canal system, although much of the area is rural.

Pathogenic bacteria in water may be harmful to humans, particularly if ingested while swimming. Organisms that are discharged from the intestinal tracts of humans or animals in fecal material may be pathogenic to humans or may alternatively serve as useful indicators of fecal pollution and the probable presence of pathogens. The most commonly employed pathogenic indicators are in the coliform group of bacteria, which consist predominantly of harmless organisms. Fecal coliform bacteria are not ideal indicators of fecal pollution since they do not always exist in the same proportions to the pathogens. However, for practical reasons, they are usually measured to monitor for the presence of human and/or animal fecal pollution in water.

Although not enough samples were collected to strictly compare to the applicable "Primary Contact Recreation" standard, the data show that 63 percent of the fecal coliform samples exceeded the 200/100mL level and many Biological Oxygen Demand (BOD) readings were also elevated (USACE, 1996). BOD is an indicator of biodegradable organic material related to wastewater as well as synthesized organic materials. The primary importance of biodegradable materials in water quality is that their decaying process can deplete oxygen in the water column. This can be detrimental to aquatic species and can cause undesirable anaerobic conditions.

Seven metals associated with urban pollution were analyzed and of these metals, copper and zinc levels exceeded the criteria most frequently (USACE, 1996). Sixty-six percent of the copper levels exceeded the chronic criteria while 71 percent of the lead levels exceeded the chronic criteria (USACE, 1996). Many of the copper levels also exceeded the acute criteria, but most lead levels were within the acute criteria. The elevated levels of these constituents are most likely due to stormwater runoff from the urbanized areas within this basin, although agricultural and grazing activities also contribute, especially with respect to fecal coliform levels and BOD.

3.2.2.1.2 Flood Side

The waters adjacent to and on the flood side of the proposed levee and floodwall have been classified "Water Quality Limited" by the State of Louisiana (USACE, 1996). These waters include Lake Cataouatche, its tributaries, and Bayou Segnette. The "Water Quality Limited" classification indicates that water quality is not meeting, and will not meet applicable water quality standards even after the application of effluent limitations required by the Federal Clean Water Act or Louisiana Water Quality Regulations. Water quality analysis in the adjacent waterbodies is based on the same available Jefferson Parish canal data as the interior protected area. Only one station, Bayou Segnette north of the Lapalco Bridge, is applicable to this area. This location is near the Bayou Segnette Pump Station outfall.

Data acquired from this station are similar to the data acquired within the protected area. Fifty-nine percent of the fecal coliform readings exceeded the 200/100mL level. Many of the copper and lead levels were also elevated as 65 percent of the copper levels and 88 percent of the lead levels exceeded their chronic criterion (USACE, 1996). These readings are indicative of the effects of pumped stormwater on this area. Due to the proximity of the sampling location to the drainage pump station, the data may be somewhat biased. However, degraded water quality

conditions are common in this area as indicated by the “Water Quality Limited” designation by the State of Louisiana, which is supported by these data. Water quality conditions near the Lake Cataouatche Pump Station and impact area would be expected to be similar.

3.2.2.2 Discussion of Impacts

3.2.2.2.1 No Action

The no action alternative would not impact surface water resources in the same way as the construction alternatives. However, failing to provide this segment of the WBV 100-year protection measures could contribute to the temporary deterioration of the surface water quality in the event of large-scale flooding. Flooding in residential and commercial areas frequently results in the mixing of surface waters with sewage, contamination of drinking water supplies, and potential mobilization of HTRW. As floodwaters recede, these constituents all enter the surface waters causing temporary reductions in surface water quality.

3.2.2.2.2 Proposed Action

The proposed action for reach 1 would be a flood side shift from the existing alignment (as described in section 2.3) requiring the placement of fill into the Outer Cataouatche Canal. The area of total disturbance would be expected to be approximately 10 acres. Of the 10 acres, approximately 6.5 acres would impact water quality and 3.5 acres would impact fringe wildlife habitat. Because the receiving water is already classified as “Water Quality Limited,” indicating that water quality is not meeting, and will not meet, applicable water quality standards, the temporary direct effects to water quality from this construction activity would be expected to affect the existing conditions.

All other activities for the proposed action in reaches 2 and 3 would take place on the protected side of the existing alignment and would be expected to have little to no effect on water quality. Earth-moving activities during construction disturb soils and can create indirect water quality effects in the event of uncontrolled runoff or simply poor sediment control practices during construction. Adherence to best management practices and an approved sediment control plan by the construction contractor would minimize the risk of these indirect water quality effects.

There are no permanent cumulative effects to water quality anticipated by implementing the proposed action. Should construction of reach 1 coincide with construction activities for IER #16 (the Western Terminus Levee located immediately to the west of IER #15), there could be construction-related water quality degradation that would have a temporary cumulative effect.

3.2.3 Terrestrial Habitat

3.2.3.1 Existing Conditions

Habitat types in the project area can be generally classified as forested (swamps and bottomland hardwoods), scrub/shrub (early successional bottomland hardwoods), open water, and developed. The surrounding levee and extensive forced-drainage systems have altered hydrology and the associated vegetation in all habitat types within the project area. Because of the drainage improvements and pumped drainage, few tracts of bottomland hardwood retain their natural characteristics.

Drained bottomland hardwoods occur in parcels ranging from 10 acres to 300 acres south of Hwy 90. Bottomland hardwood habitats include both wetlands and upland communities. The uplands developed in areas subject to intensive drainage. Dominant woody vegetation typically

includes sugarberry, red maple, American elm, and green ash, with interspersed Nuttall oak, box elder, bald cypress, and black willow. Shrubby and herbaceous vegetation typically includes elderberry, rattan vine, pepper vine, Virginia creeper, poison ivy, blackberry, and nutgrass (USACE, 1996). The majority of forested areas, although under pumped drainage, are classified as wetlands. However, providing the interior drainage as part of the existing flood damage reduction has resulted in the loss of much of the wetland value and function (USACE, 1996).

Drained swamp sites in the project area typically exhibit an overstory dominated by bald cypress and red maple, with tupelo gum, pumpkin ash, black willow, and green ash. The shrub layer is lightly to moderately developed, and indicates a general invasion by some species adapted to drier sites. Elderberry, box elder, and red maple are dominant, with scattered sugarberry and Chinese tallow. Ground cover is generally sparse, and usually consists of smartweeds, nut grass, and pennyworts (USACE, 1996).

The scrub/shrub habitats occur as wetlands and non-wetlands scattered throughout the area. Scrub/shrub communities support woody vegetation generally less than 20 ft in height and occur locally in partially drained fresh marshes where an invasion of species adapted to drier sites is occurring. The principal difference between wetland and non-wetland scrub/shrub habitats is the extent to which drainage has occurred. Typical scrub/shrub communities in the project area are vegetated with maiden cane, Chinese tallow, black willow, elderberry, blackberry, goldenrod, thistle, common reed, fall aster, and smartweed. Chinese tallow has become a prolific invasive, almost monoculture, species in proximity to the proposed alignment. Figure 9 provides a typical example of the Chinese tallow stem density immediately adjacent to the ROW on the protected side.

Figure 9. Chinese Tallow



Developed habitats include residential, commercial, and industrial areas, as well as roads and maintained levees. These areas do not provide important wildlife habitat value. That portion of the project area located immediately adjacent to Hwy 90 in Avondale has been intensively developed for residential, commercial, and industrial purposes. Such development is becoming more intensive north of Hwy 90, as wetlands are filled to accommodate growth. The western

portion of the project area, south of Hwy 90, is dedicated to the BFI landfill operations and is of little habitat value.

3.2.3.2 Discussion of Impacts

3.2.3.2.1 No Action

Under the no action alternative, potential terrestrial habitat impacts associated with the construction and operation of the additional storm damage reduction measures would not occur. Terrestrial habitat within the footprint of disturbance would not be affected, but the habitat within the existing ROW is significantly disturbed, of low quality, and of little value to wildlife. There would be no changes to the existing practice of pumped drainage of the area. The factors contributing to habitat deterioration and the propagation of exotics (i.e., Chinese tallow) would continue.

3.2.3.2.2 Proposed Action

The vast majority of the footprint of disturbance necessary to construct the proposed action is located within the existing ROW in areas of mowed grass or recently disturbed soil where levee work has been recently completed. Where the mowed area transitions to woody vegetation (at the edge of the ROW) Chinese tallow is nearly a monoculture. Figure 10 shows an example of the terrestrial habitat within the ROW on the protected side. The photo is taken at the border of the Bayou Segnette State Park boundary looking southwest at the IER #15 alignment. The top of the existing line of protection is immediately in the foreground and the woody vegetation to the right is at the edge of the ROW. Lake Cataouatche can be seen in the upper left of the photo.

Direct effects to terrestrial habitat as a result of constructing the proposed action would be permanent and consistent with the extent of previous disturbance and recent construction activities along this entire reach. Indirect effects of construction (e.g., noise, fugitive dust, etc.) would have only temporary effects to the terrestrial habitat and would not be significant. There would be minor cumulative effects to terrestrial habitat. Approximately 27.0 acres of low quality terrestrial habitat would be impacted.

3.2.4 Aquatic Habitat

3.2.4.1 Existing Conditions

There are approximately 26 miles of drainage canals and bayous within the interior of the project area and the Outer Cataouatche Canal is approximately 9 miles in length. Flow is sluggish to non-existent in most of the inner canals except during and shortly after a rainfall. Almost all of the interior water bodies are designed and function as drainage for the developed area. Many of the smaller water bodies (canals) become choked with aquatic vegetation during the summer and most are subjected to large variations in flow because of their drainage function. The shallower areas support submerged and/or floating aquatic vegetation such as Eurasian water milfoil, coontail, pondweeds, naiads, fanwort, water hyacinth, and American lotus (USACE, 1996). Figure 11 is a photograph of the Outer Cataouatche Canal taken in a western direction from the discharge pipes of the Hwy 90 Pump Station. The overall appearance and extent of aquatic vegetation is representative of the entire Outer Cataouatche Canal.

Figure 10. Terrestrial Habitat in the Protected Side Right-of-Way



Figure 11. Aquatic Vegetation in Outer Cataouatche Canal



3.2.4.2 Discussion of Impacts

3.2.4.2.1 No Action

Under the no action alternative, no impacts to aquatic habitat within the footprint of disturbance would occur in reach 1. Additionally, there would be no alterations to the levee toe. There would be no changes to the ongoing program of pumped drainage, thus allowing the factors that have contributed to habitat deterioration and the propagation of exotics (e.g., Chinese tallow) to continue.

3.2.4.2.2 Proposed Action

Direct and permanent effects from implementation of the proposed action would result from the placement of approximately 17,500 cy of earthen material into the aquatic habitat of the Outer Cataouatche Canal to construct the toe of the levee in reach 1. The total area of disturbance in this reach is estimated to be approximately 10 acres, which includes aquatic habitat (6.5 acres). The aquatic habitat includes the area where the fill would be placed and the potential area of disturbance from the “mud wave” generated during construction. There would be no other flood side expansion within reaches 2 and 3 to avoid additional direct effects to the aquatic habitat of Lake Cataouatche. There would be no changes predicted to the aquatic habitat of the inner canals, as the source of that water would remain unchanged and no significant alterations in operations would be expected. The overall impacts of the proposed action to aquatic resources would not be predicted to be significant.

Indirect effects to water quality from construction (e.g., increased local turbidity, decreased dissolved oxygen, vibration, and subsurface noise) would have only temporary effects to the aquatic habitat and would not be considered significant. There would be no cumulative effects to aquatic habitat because there would be no significant loss of habitat projected for implementation of the proposed action.

3.2.5 Fish and Wildlife

3.2.5.1 Existing Conditions

The benthos of the interior canals is dominated by low water quality tolerant species adapted to the soft substrates (e.g., midges and oligochaetes) (USACE, 1996). Fish in the interior canals are similarly represented by species tolerant of low dissolved oxygen (shortnose and longnose gar and bowfin). The diversity of species in the Outer Cataouatche Canal indicates moderately improved water quality and consists of a mixture of fresh and saltwater species, including sunfish species, channel catfish, shortnose and longnose gar, striped mullet, and gizzard shad (USACE, 1996).

The Outer Cataouatche Canal forms the eastern boundary of the project area and is heavily used by sport and commercial fishermen (USACE, 1996). The docking of commercial fishing boats along with the outflow from a nearby sewage treatment plant and the discharge from the Bayou Segnette Pump Station contribute to the low quality of the aquatic habitat in the upper portions of Bayou Segnette. The lower portions of Segnette offer significantly higher habitat value than the watercourses in proximity to the proposed construction activities.

Many species of waterfowl (e.g., wood ducks, blue-winged teal, green-winged teal, and mallards) utilize the canals, borrow pits, and forested wetlands as permanent residents or for wintering (USACE, 1996). Numerous other game birds are present in or adjacent to the project area, including American coot, rails, gallinules, common snipe, and American woodcock.

Passerine and wading bird species also utilize the area, including least bittern, pied-billed grebe, killdeer, and various species of gulls and terns. Two active rookeries are located less than ten miles west and southwest of the project area. Those rookeries support nearly 1,000 nesting tricolored herons, little blue herons, cattle egrets, snowy egrets, and white and glossy ibis (USACE, 1996), but are at too great a distance to be affected by the proposed activities.

Many permanent resident and wintering birds of prey can be observed in the general area (USACE, 1996). Permanent residents include red-shouldered hawk, barn owl, common screech owl, great horned owl, and barred owl. Winter residents include red-tailed hawk, northern harrier, and American kestrel. The Mississippi kite and broad-winged hawk are common summer residents (breeding in the general area). In addition, the area supports many species of resident and migratory passerine birds; cuckoos, swifts, hummingbirds, goatsuckers, woodpeckers, and belted kingfishers are also present.

Important game mammals occurring in the project area include white-tailed deer, eastern cottontail, swamp rabbit, gray squirrel, and fox squirrel. Furbearers include nutria, striped skunk, raccoon, and mink. Other land mammals inhabiting the project area include various species of insectivores, bats, rodents, coyote, and the nine-banded armadillo (USACE, 1996).

Amphibians expected to occur on canal and ditch edges, old borrow pits, and forested wetlands of the project area include lesser siren, three-toed amphiuma, Gulf Coast toad, eastern narrow-mouthed toad, Fowler's toad, green tree frog, cricket frog, bronze frog, and bullfrog. Commercially important reptiles found in the project-area canals and borrow pits include American alligator, common snapping turtle, alligator snapping turtle, and softshell turtles. Other reptiles commonly found in the project area include red-eared turtle, painted turtle, Mississippi mud turtle, stinkpot, green anole, broad-headed skink, various water snakes, western ribbon snake, speckled king snake, and western cottonmouth (USACE, 1996).

Urban expansion has led to increased eutrophication of many of the waterways. Important factors in that process include increased volume of nutrient-laden urban runoff, decreased acreage of wetlands that serve to filter nutrients emanating from developed urban areas, and increased structural flood control and drainage measures which directly bypass adjacent wetlands and shunt urban runoff into downstream aquatic systems. Consequently, degraded water quality in the Barataria Basin remains a concern relative to fish and wildlife resources, as reported by the Barataria Terrebonne National Estuary Program Comprehensive Conservation and Management Plan (Moore and Rivers, 1996).

3.2.5.2 Discussion of Impacts

3.2.5.2.1 No Action

Under the no action alternative, land use would remain substantially unchanged in this section of the WBV from Hwy 90 to the border with Bayou Segnette State Park. Within this area, wildlife habitat is characterized as relatively low quality, significantly disturbed, and under extreme pressure from invasive exotic Chinese tallow. In the absence of an improved hurricane damage reduction measure for IER #15, wildlife abundance and diversity within the project area would remain unchanged.

3.2.5.2.2 Proposed Action

The proposed action would be constructed primarily within the mowed and maintained ROW for the existing alignment. Recently disturbed areas to be utilized for construction have little to no wildlife habitat function. Direct effects to wildlife within the footprint of disturbance from

implementing the proposed action would be minimal. Some disturbance-tolerant individuals of certain species may be permanently displaced or destroyed during construction of reach 1. As such, constructing the proposed action would have a temporary disturbance on species within the edge and aquatic habitat, and would create significant permanent effects to wildlife. Approximately 33.5 acres of fish and wildlife habitat would be affected by the proposed action.

Indirect effects to wildlife species due to construction activities (e.g., noise, vibration) within adjacent wetlands or aquatic habitat would be short term and temporary. However, the area of disturbance is a relatively small part of the local aquatic ecosystem. Mobile species could find refuge in other areas until the construction disturbance is over. In addition, species sensitive to disturbance would likely not utilize these areas because of the recent disturbances related to ongoing construction that is scheduled for completion by late 2008.

Coordination with the U.S. Fish and Wildlife Service (USFWS) indicates that no significant effects to fish and wildlife would be expected to occur from implementing the proposed action. As such, the responsibilities of the USACE to protect migratory birds under Executive Order (EO) 13186 would have been met. This EO establishes further coordination requirements with the USFWS when agency actions have, or are likely to have, a measurable negative effect on migratory bird populations.

3.2.6 Wetlands

3.2.6.1 Existing Conditions

Executive Order 11990 (Protection of Wetlands) requires Federal agencies to take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. The discharge of fill materials in waters of the United States must also comply with Clean Water Act Section 404(b)(1) Guidelines for Specification of Disposal sites for Dredged or Fill Material found at 40 CFR §230.

As of the mid-1990s, nearly 25 percent (140,000 acres) of Barataria Basin wetlands had been lost over the previous 30 years as a result of conversion to open-water areas or uplands. Contributing factors responsible for wetland loss include subsidence, saltwater intrusion, sea level rise, canal and levee construction, urban expansion, and navigation and flood-control projects. Such wetland losses have resulted in serious biological and socioeconomic impacts. Aquatic species, while gaining available open-water habitat, are adversely affected by decreases in productivity, nursery habitat, and detrital export associated with wetland loss. All terrestrial animals are adversely affected by the loss of cover, nesting, and feeding habitat. Even relatively small or localized wetland losses can, when combined with other such events, have significant, long-term impacts to fish and wildlife resources on a regional scale.

3.2.6.2 Discussion of Impacts

3.2.6.2.1 No Action

There would be no direct impacts to wetlands under this alternative. In the absence of the hurricane damage reduction project, the wetlands within the project area would continue to be influenced by periodic flooding and rainfall events.

3.2.6.2.2 Proposed Action

The proposed project corridor is located along the northern shoreline of the Outer Cataouatche Canal. The vast majority of the project area has been previously disturbed. The remaining

wooded areas possess some characteristics of wetlands; however, due to pumped drainage since the early 1960's, the amount and quality of those wetlands has diminished over time. Three pumping stations affect the hydrology of the area - Cataouatche Pump Stations No. 1 and No. 2, and the Bayou Segnette Pump Station, constructed in the mid-1970's, 1985, and 1986, respectively. Although the pump stations were constructed to provide drainage for the Bridge City and Westwego areas, they connected portions of the study area through a series of drainage canals. Pumping the area to an artificially low water table has caused a consolidation and decay of organic materials, resulting in subsidence, and has contributed to the conversion of wetlands to bottomland hardwoods. The bottomland hardwoods remaining in the project area have a low quality value because of the excessive quantity of invasive Chinese tallow trees.

With the proposed action, the footprint of the improved levee would fill in the remaining bottomland hardwood wetlands within the ROW. Approximately 27 acres of low to moderate quality wetlands would be impacted by the project.

Indirect effects include minor impacts to water quality from construction (e.g., increased local turbidity, decreased dissolved oxygen levels, vibration and subsurface noise) and temporary impacts to mobile organisms through relocation of species inhabiting the area.

The Public Notice describing the Clean Water Act, Section 404 impacts was released for public review during the period 10 March – 9 April 2008.

3.2.7 Threatened and Endangered Species

3.2.7.1 Existing Conditions

Except for the occasional transient species, no Federally-listed endangered, threatened, or candidate species under USFWS jurisdiction are known to exist in the project area. However, the American alligator is common in canals. This species is listed as protected under the Similarity of Appearance clause of the Endangered Species Act (Federal Register 1981, Vol. 46, pp. 40664-40669), but is not biologically threatened or endangered. Therefore, no Biological Assessment or further Section 7 consultation under the Endangered Species Act is required with the USFWS.

The Fish and Wildlife Coordination Act provides that whenever the waters or channel of a body of water are modified by a department or agency of the U.S., the department or agency first shall consult with the USFWS and with the head of the agency exercising administration over the wildlife resources of the state where construction would occur, with a view to the conservation of wildlife resources.

3.2.7.2 Discussion of Impacts

3.2.7.2.1 No Action

Under the no action alternative, there would be no additional construction activity within the existing ROW. Within the project area, wildlife habitat is characterized as relatively low quality and significantly disturbed. In the absence of the proposed action, wildlife abundance and diversity within the project area would remain unchanged.

3.2.7.2.2 Proposed Action

Consultation with appropriate state and Federal resource agencies indicates that no listed endangered, threatened, or candidate species are known to exist in the potential project impact

areas. Therefore, no direct, indirect, or cumulative effects would therefore be predicted to protected species or their critical habitat as a result of implementing the proposed action. The USFWS concurred with the USACE's determination that project implementation would not adversely affect any threatened or endangered species or their critical habitat in their letter dated 28 November 2007.

3.2.8 Recreational Resources

3.2.8.1 Existing Conditions

The project area is located adjacent to Bayou Segnette State Park, which has become one of the most popular state parks in Louisiana, averaging about 200,000 visits for the year ending June 2007. Prior to Hurricanes Katrina and Rita, annual visitation was around 400,000. About 75 percent of visitation is day use by Louisiana residents. The remaining 25 percent is overnight use primarily by out of state and international visitors. Many of the overnight out-of-town visitors come to the area for special events, such as the annual Jazz Festival and Mardi Gras, and for major sporting events, such as the Super Bowl.

Currently the park's facilities are geared to providing access to water-based recreation. There are boat launches, fishing piers, and a large wave pool. Picnic areas provide opportunities for relaxing or watching wildlife. Overnight facilities, including 100 campsites, 20 cabins, and dormitories, attract national and international visitors, many of them repeat guests who participate in boating and fishing. The park's master plan proposes hiking, interpretive, and fitness trails. Park managers identify a high demand by park visitors for hiking opportunities. Currently, many of the park's nature trails and cabins are still in ruins from the effects of Hurricanes Katrina and Rita.

3.2.8.2 Discussion of Impacts

3.2.8.2.1 No Action

Without implementation of the proposed action, recreational resources would continue to be threatened by tropical systems that could inundate parts of Bayou Segnette State Park, causing damage to its recreation facilities. The State of Louisiana may allocate funds in the future for the repair of the existing damaged cabins and swimming pool. Upon their repair, the public would continue to enjoy these recreational amenities.

3.2.8.2.2 Proposed Action

With implementation of the proposed action, work to redesign the levee height would not cause impacts to the park's recreational activities. Construction activities could temporarily reduce accessibility to a nature trail, which has an entrance near the park boundary.

3.2.9 Aesthetic Resources

3.2.9.1 Existing Conditions

Visually, the project area's landscape is characterized by flood protection measures, which include an earthen berm levee and previous borrow areas for levee building material. The existing earthen berm levee is long, monotonous and its appearance is unnatural. The levee dominates a landscape where the focus on manmade structures is strengthened by vegetation (see Terrestrial Habitat) along the linear canals that surround the levee. This focus is enhanced by the

strong textual contrast of the turf that blankets the levee and the vegetation surrounding it. Construction of borrow areas adjacent to the earthen berm levee has also resulted in canals whose geometric lines and forms are not naturally found within the project area.

3.2.9.2 Discussion of Impacts

3.2.9.2.1 No Action

Without implementation of the proposed action, visual resources would remain as stated above (existing conditions), or be manipulated as dictated by future land-use maintenance requirements. Regardless of what the future holds for the project area, visual access to the proposed project site by humans is minimal. The project area is remote and inaccessible to the general public as no public access roads are available.

3.2.9.2.2 Proposed Action

Visually, the vast majority of the footprint of disturbance necessary to construct the proposed action is within the existing right-of-way in areas where similar flood protection measures currently exist. The project area is remote and inaccessible to the general public as no public access roads are available. Therefore, the direct or indirect visual impacts to the project area would be insignificant. The cumulative visual impacts caused by flood protection measures throughout the metropolitan New Orleans region and nationwide may be considered significant. Flood prone natural landscapes protected by unnatural flood control structures create visual conditions similar to the project area's existing conditions. The land areas protected by the flood protection measures may be converted to developed land, which, in many cases may be considered visually unappealing.

3.2.10 Cultural Resources

3.2.10.1 Existing Conditions

Records on file at the Louisiana Division of Archaeology and the CEMVN indicate previously recorded cultural resources are located within one mile of the proposed project. Site forms and previous archaeological investigations describe these known sites. Prehistoric midden sites in the region are primarily located on natural levee deposits, major beach ridges and other stable portions of the delta adjacent to bayou, river, lake and bay environments. Due to recent geologic development of the Mississippi River Delta and the age of the deposits within the project area, the earliest known archaeological sites in the region date to the Poverty Point period (1700 – 500 B.C.). Similarly, historic period sites and structures, such as plantations, farmsteads, and residential properties were initially located on relatively high natural levee areas adjacent to waterways and later developed in drained backswamp and land-filled locations. Historic period watercraft are recorded in the region. The reader may wish to refer to the reports summarized below for specific historical information on the IER #15 project area (Jones et al., 1994; Jones et al., 1997; Wells, 2007).

Three previous cultural resources investigations have been conducted within the IER #15 project area. In the first study, researchers investigated a small portion of the project area extending along the south bank of Bayou Verret on the flood side of the levee (Jones et al., 1994). No cultural resources were identified. In the second study, researchers investigated the existing IER #15 project ROW on the protected side of the levee alignment from Bayou Segnette State Park to the Waggaman Canal south of Hwy 90 (Jones et al., 1997). No cultural resources were identified in the IER #15 project ROW.

In the third study, CEMVN contracted Coastal Environments Inc. to conduct a Phase 1A cultural resources records review and field reconnaissance of the IER #15 study area (Wells, 2007). At the time this study was initiated, researchers were asked to investigate an area much larger than the existing project ROW. The study area investigated extends along the entire length of the levee alignment in an area measuring 2,000 ft on the protected side and 500 ft on the flood side of the levee centerline for a total of 2,333 acres. Researchers utilized background research, cultural resources investigations review, soil and topographic analyses, and reconnaissance level field data to locate known cultural resources and to identify high potential areas for archaeological sites. Twelve locations exhibiting a high potential for archaeological sites were identified. Seven high probability areas are located on the flood side of the levee south of the Outer Cataouatche Canal and are not located in the project ROW. Although five high probability areas on the protected side of the levee extend into the project ROW, the report concludes that the existing ROW was previously investigated by Jones et al. (1997) and no archaeological sites or historically significant standing structures were identified.

One archaeological site (16JE133) has been recorded in the immediate project vicinity. This site was recorded as a surface scatter containing prehistoric ceramics and human remains. Although the site's location on state maps is vague, it is shown south of the Outer Cataouatche Canal and clearly outside of the project ROW.

CEMVN held meetings with State Historic Preservation Office staff and Tribal governments to discuss the emergency alternative arrangements approved for NEPA project review and the development of a Programmatic Agreement (PA) to tailor the Section 106 consultation process under the alternative arrangements. CEMVN formally initiated Section 106 consultation for the WBV project (100-year level of flood protection), which includes IER #15, in a letter dated 9 April 2007. This letter emphasized that standard Section 106 consultation procedures would be implemented during the PA development. A public meeting was held on 18 July 2007, to discuss the working draft PA. It is anticipated that the PA may be executed in April 2008.

In letters to the State Historic Preservation Officer (SHPO) and Indian Tribes dated 1 November 2007, CEMVN provided project documentation, evaluated cultural resources potential in the project area, and found that the proposed action would have no impact on cultural resources. The SHPO and Mississippi Band of Choctaw Indians concurred with our "no historic properties affected" finding in a letter dated 11 December 2007, and in an email dated 29 November 2007, respectively. No other Indian Tribes responded to our request for comments. Section 106 consultation for the proposed actions is concluded. However, if any unrecorded cultural resources are determined to exist within the proposed project boundaries, then no work will proceed in the area containing these cultural resources until a CEMVN archaeologist has been notified and final coordination with the SHPO and Indian Tribes has been completed.

3.2.10.2 Discussion of Impacts

3.2.10.2.1 No Action

Under the no action alternative, all proposed activities associated with raising the existing levees and floodwalls up to the originally authorized grade would be conducted within the existing project ROW and would have no impact on significant cultural resources. The existing project ROW has been subjected to severe ground disturbing activities associated with previous levee, floodwall, and pump station construction, and canal and borrow excavations. The likelihood for intact and undisturbed cultural resources in the existing project ROW is extremely minimal. No further cultural resources investigations would be recommended.

3.2.10.2.2 Proposed Action

Based on the review of State records, previous cultural resources studies, and the results of a recent reconnaissance cultural resources investigation in the project area, implementation of the proposed action would have no impact on cultural resources. The proposed action would be constructed in the existing project ROW, which has been subjected to severe ground disturbing activities associated with previous levee, floodwall, and pump station construction, and canal and borrow excavations. The likelihood for intact and undisturbed cultural resources in the project area is extremely minimal. Implementation of this action would have no direct impact on cultural resources.

3.2.11 Farmland

3.2.11.1 Existing Conditions

Within NEPA evaluations, the USACE must consider the protection of the nations' significant/important agricultural lands from irreversible conversion to uses that result in their loss as an environmental or essential food production resource. The Farmland Protection Policy Act (FPPA), 7 USC 4201 et seq., and the U.S. Department of Agriculture's (USDA) implementing procedures (7 CFR §658) require Federal agencies to evaluate the adverse effects of their actions on prime and unique farmland, including farmland of statewide and local importance.

During consultation with the Natural Resources Conservation Service (NRCS) for previous Lake Cataouatche levee work, a farmland conversion impact rating form was developed and sent to the NRCS containing information on those lands to be converted by the proposed action (USACE, 1996). The rating form was returned with the explanation that there were no prime farmlands in the project area (USACE, 1996). Therefore, no further action is required and no consultation on this issue would be necessary.

3.2.11.2 Discussion of Impacts

3.2.11.2.1 No Action

There are no protected farmlands designated within the potential area of effect; taking no action would have no more or less of an effect than the proposed action.

3.2.11.2.2 Proposed Action

The proposed action-or any actions within the existing ROW would not involve conversion of, or otherwise cause direct, indirect, or cumulative effects to affect, prime, unique, or important U.S. farmland.

3.3 SOCIOECONOMIC RESOURCES

The focus of socioeconomic resources is to evaluate the relative socioeconomic impacts, if any, of construction activities associated with modifying the currently authorized GNOHSDRRS such that the 100-year level of protection is achieved. The currently authorized alignment that is the subject of IER #15 extends from an eastern boundary with the Bayou Segnette State Park, westward and south of Hwy 90 to higher ground near the Jefferson Parish-St. Charles Parish line. However, the alignment is an integral part of a larger one that extends from the Harvey Canal in the east to a point on the Mississippi River in St. Charles Parish in the west. The area protected

constitutes an interconnected hydrologic unit. IERs #14, #16, and #17 address socioeconomic impacts associated with other constituent parts of the alignment. This section of the document will describe in general terms the area protected and identify socioeconomic impacts associated with construction activities within the scope of IER #15.

3.3.1 Noise

3.3.1.1 Existing Conditions

The area protected by the authorized alignment is extensively developed, primarily as residential and commercial properties. Currently, little, if any, of the authorized hurricane protection works have been constructed in this area. Therefore, noise impacts on resident population are largely absent under existing conditions.

3.3.1.2 Discussion of Impacts

3.3.1.2.1 No Action

Under the no action alternative, the authorized GNOHSDRRS project would be constructed in this area while additional construction activities necessary to achieve 100-year level of protection would not be constructed. This additional protection is the proposed alternative.

With the construction of the authorized project, construction activities would ensue along the perimeter of the developed area, and the adverse effects of noise created by construction activities would be introduced. Noise would be created from high-powered machinery and human activities within the project ROW and emanate various distances beyond the construction site until the noise energy dissipates. Because of the proximity of the construction site to the developed area, the number of residential and commercial properties exposed to the adverse impacts of noise is minimal. There is greater potential, however, for adverse noise impacts to be generated by construction vehicles and personal vehicles for contract laborers that may require the use of public roads and highways for access to construction sites.

3.3.1.2.2 Proposed Action

The proposed action is to supplement the authorized plan for hurricane damage reduction with designs that increase performance such that protection for the one percent annual chance event is achieved. To the extent that project ROW are unaffected by the enhanced design, the primary result of the proposed action is to increase the duration of construction. Therefore, any adverse noise impacts that may be created under the no-action plan may be extended to reflect the added construction duration that is required to implement the proposed action.

3.3.2 Transportation

3.3.2.1 Existing Conditions

Transportation infrastructure within the vicinity of the construction alignment primary consists of Hwy 90 and municipal thoroughfares. Railroad lines are situated deep into the protected area nearer the Mississippi River. No municipal airports are located in the study area. Waterborne transportation facilities are focused on the Company Canal at the terminus of Bayou Segnette and the Harvey Canal, none of which serve other than commercial and recreational traffic.

3.3.2.2 Discussion of Impacts

3.3.2.2.1 No Action

Under the no action alternative, the authorized GNOHSDRRS project would be constructed in this area while additional construction activities necessary to achieve 100-year level of protection would not be constructed. This additional protection is the proposed alternative.

With the construction of the authorized project, increased vehicular congestion along roads, highways, and streets leading to the construction site is expected. No impacts to rail or waterborne transportation systems are anticipated.

3.3.2.2.2 Proposed Action

The proposed action is to supplement the authorized plan for hurricane damage reduction with designs that increase performance such that protection for the one percent annual chance event is achieved. The duration of traffic congestion would be extended significantly due to the extensive amount of construction materials and borrow material needed for construction.

3.3.3 Population and Housing

3.3.3.1 Existing Conditions

The GNOHSDRRS project alignment that is spread among IERs #14, #15, #16, and #17, is designed to lower the risk of storm surge to the Harvey-Westwego-Lake Cataouatche area. The post-Katrina population of this area is estimated to be 118,500 as of August 2007 (Updated IPET estimate, 2007). The number of residential structures on the protected side of the alignment is approximately 52,000. No significant numbers of residents or residential structures are within the immediate vicinity of the construction alignment considered under IER #15.

3.3.3.2 Discussion of Impacts

3.3.3.2.1 No Action

Under the no action alternative, the authorized GNOHSDRRS project would be constructed in this area while additional construction activities necessary to achieve 100-year level of protection would not be constructed. This additional protection is the proposed alternative.

With the construction of the authorized project, no displacement of population and no acquisition of residential structures are anticipated.

3.3.3.2.2 Proposed Action

The proposed action is to supplement the authorized plan for hurricane damage reduction with designs that increase performance such that protection for the one percent annual chance event is achieved. Relative to the no action plan, no incremental impacts to population and housing will occur.

3.3.4 Business and Industry, Property Values, and Public Facilities & Services

3.3.4.1 Existing Conditions

The Northrop Grumman Shipyard, located on the Mississippi River in Avondale and the Harvey Canal industrial corridor in Harvey are among the largest commercial enterprises in the metropolitan area. An extensive commercial network of retail, wholesale, and light industrial properties characterizes the west bank of Jefferson Parish. Together with residential properties, this infrastructure, which is valued upwards of \$9 billion, constitutes a significant tax base for Jefferson Parish government. Property values represent a significant portion of the value of infrastructure. The Harvey-Westwego-Lake Cataouatche area is also the location of many municipal facilities, including government administrative buildings, water and sewerage treatment plants, telecommunications operations, schools, clinics, and a major hospital.

3.3.4.2 Discussion of Impacts

3.3.4.2.1 No Action

Under the no action alternative, the authorized GNOHSDRRS project would be constructed in this area while additional construction activities necessary to achieve 100-year level of protection would not be constructed. This additional protection is the proposed alternative.

With the construction of the authorized project, construction activities would ensue along the perimeter of the developed area, and direct impacts to business, industrial, and public property and facilities would be minimal.

3.3.4.2.2 Proposed Action

The proposed action is to supplement the authorized plan for hurricane damage reduction project with designs that increase performance such that protection for the one percent annual chance event is achieved. Relative to the no action plan, no incremental impacts to business and industry, property values, and public facilities and services will occur.

3.3.5 Health and Safety

3.3.5.1 Existing Conditions

Parish governments and private entities devoted to healthcare are the most important contributors to health and safety for the resident population of the area. The West Jefferson Medical Center in Marrero serves not only the Harvey-Westwego-Lake Cataouatche area, but all of the west bank within the metropolitan area. The effective operation of these facilities is comparable to that which existed prior to the hurricane season of 2005. In addition, Hwy 90 currently serves as an evacuation route for the study area.

3.3.5.2 Discussion of Impacts

3.3.5.2.1 No Action

Under the no action alternative, the authorized GNOHSDRRS project would be constructed in this area while additional construction activities necessary to achieve 100-year level of protection would not be constructed. This additional protection is the proposed alternative.

With the construction of the authorized project, construction activities are not expected to directly and adversely impact the health and safety services in the study area. Nor is it expected to introduce effects that would compromise public health and safety beyond that associated with increased noise and vehicular traffic. The construction site is sufficiently set apart from the community such that hazards which may be associated with construction activities would be outside of the usual routes travelled by the public.

3.3.5.2.2 Proposed Action

The proposed action is to supplement the authorized plan for hurricane damage reduction with designs that increase performance such that protection for the one percent annual chance event is achieved. Relative to the no action plan, no incremental impacts to health and safety will occur.

3.3.6 Employment, Income, and Local Tax Base

3.3.6.1 Existing Conditions

The Harvey-Westwego-Lake Cataouatche area is a highly-developed mix of residential, commercial, industrial, and public properties. The economy of Jefferson Parish, including the west bank, is growing as evidenced in high levels of employment and income when compared to state averages. The health of the local economy is such that the tax base that supports government services is large and sustainable.

3.3.6.2 Discussion of Impacts

3.3.6.2.1 No Action

Under the no action alternative, the authorized GNOHSDRRS project would be constructed in this area while additional construction activities necessary to achieve 100-year level of protection would not be constructed. This additional protection is the proposed alternative.

With the construction of the authorized project, construction activities are not expected to directly and adversely impact levels of employment and income in the area, other than to perhaps increase them due to additional need for local labor and materials. To this extent, the local tax base is enhanced.

3.3.6.2.2 Proposed Action

The proposed action is to supplement the authorized plan for hurricane damage reduction with designs that increase performance such that protection for the one percent annual chance event is achieved. Relative to the no action plan, no incremental impacts to employment, income and tax base is anticipated, with perhaps the exception of increased earnings and tax revenues that may occur as a result of higher construction expenditures.

3.3.7 Environmental Justice

An Environmental Justice analysis is required for any Federal Action under Executive Order 12898. It is defined specifically as the fair treatment of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The USEPA states that environmental justice “will be achieved when everyone enjoys the same degree of protections from environmental and

health hazards and equal access to the decision making process to have a healthy environment in which to live, learn, and work.”

This project in Jefferson Parish is an 8-mile long levee wall and two pumping stations located on the northern side of Lake Cataouatche. The project discussed in IER #15 is made up of three separate and distinct reaches.

The west bank of Jefferson Parish, which stretches from the Mississippi River south to the Gulf of Mexico, is a far more diverse area than its northern counterpart. Just as the east bank of Jefferson Parish is recognized as a higher income bedroom community for New Orleans, the west bank is home to an assorted mix of land uses, income groups, and ethnic communities. The northern section of the Parish’s west bank is a more developed residential and retail area, as well as host to several large hospitals. The southern section has a much more rural character, with a strong economic base tied to the fishing industry and oil support services.

Jefferson Parish is a particularly diverse area compared to Louisiana, with a substantial Hispanic and Asian population. Since 2000, the White population decreased while the Black/African-American population increased. This trend will likely not continue, and the current distribution of Whites and Blacks/African Americans currently mirrors the state racial composition.

A series of community-focused public meetings is currently on-going as an outreach effort to explain the proposed 100-year level of construction activities to any interested parties. The dates and times for these public meetings is being posted to the calendar on our website at www.nolaenvironmental.com.

3.3.7.1 Discussion of Impacts

3.3.7.1.1 No Action

The resultant conditions of a "no action" alternative would be that all people, including minority and low-income populations, that reside inside of the existing flood protection structures may be exposed to catastrophic damages from storm surge in the event of a major storm event.

3.3.7.1.2 Proposed Action

Within flood protection levees, all populations, including the minority and low-income population, would have the same level of risk from storm surge.

The proposed action has been evaluated for potential disproportionately high environmental effects on minority or low-income populations. There would be no disproportionately high environmental effects on minority or low-income populations.

Comprehensive Environmental Document

Information about the environmental justice program will be included in the CED. This will include the information developed in small group meetings with stakeholders.

3.4 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

3.4.1 Existing Conditions

Under Engineer Regulation (ER) 1165-2-132 the reasonable identification and evaluation of Hazardous, Toxic, and Radioactive Waste (HTRW) contamination within a proposed area of

construction is required. ER 1165-2-132 identifies the USACE policy to avoid the use of project funds for HTRW removal and remediation activities. Costs for necessary special handling or remediation of wastes (e.g., Resource Conservation and Recovery Act (RCRA) regulated), pollutants and other contaminants, which are not regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), would be treated as project costs if the requirement is the result of a validly promulgated Federal, state, or local regulation.

An ASTM E Phase I Environmental Site Assessment (ESA) was completed for the project area on 4 December 2007. A copy of the Phase I ESA will be maintained on file at CEMVN. The Phase I ESA documented the Recognized Environmental Conditions (RECs) for the project area. No RECs were identified within the project footprint. If a REC cannot be avoided, due to the necessity of construction requirements, the CEMVN may further investigate the REC to confirm presence or absence of contaminants, actions to avoid possible contaminants, and if local, state or federal coordination is required. Because CEMVN plans to avoid RECs, and would be working within the previously established ROW, the probability of encountering HTRW in the project area is very low.

3.4.2 Discussion of Impacts

3.4.2.1 No Action

No 100-year flood protection would be realized with the no action alternative. Potential flooding as a result of the lesser protection could indirectly contribute to the dispersion of HTRW materials and environmental damage to the local communities, Lake Cataouatche, and Bayou Segnette. Significant flooding can result in the mobilization and dispersion of HTRW from businesses, residences, and buried materials. Hurricane damage clean-up experience has shown that vast quantities of debris and increasingly hazardous materials are dispersed into the terrestrial and aquatic environment when large-scale flooding occurs.

3.4.2.2 Proposed Action

Because no specific HTRW concerns were identified from previous site investigations, no direct, indirect, or cumulative effects from HTRW would be predicted from implementing the proposed action. However, the potential to create HTRW materials during the construction process remains an environmental concern. Storage, fueling, and lubrication of equipment and motor vehicles associated with the construction process would be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants, and oil would be managed and stored in accordance with all Federal, state, and local laws and regulations. Used lubricants and used oil would be stored in marked corrosion-resistant containers and recycled or disposed in accordance with appropriate requirements. The construction contractor would be required to develop a Spill Control Plan.

In the event of an unplanned discovery of HTRW materials during construction, work that could affect the contaminated materials would be stopped and appropriate notification and coordination would be completed. Investigations would be conducted to characterize the nature and extent of the contamination and establish appropriate resolution.

4.0 CUMULATIVE IMPACTS

NEPA requires a Federal agency to consider not only the direct and indirect impacts of a proposed action, but also the cumulative impact of the action. A cumulative impact is defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR §1508.7).” Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. These actions include on- or off-site projects conducted by government agencies, businesses, or individuals that are within the spatial and temporal boundaries of the actions considered in this IER.

Providing the Lake Cataouatche reach of the WBV with the 100-year level of protection would contribute to the protection of life, and to the reduction of future physical and environmental damage. Significant flooding often results in contamination of drinking water supplies, dispersion of HTRW, and dispersion of large quantities of solid waste that require clean up and disposal. Experience has shown that vast quantities of debris (e.g., homes, vehicles, mobile homes, etc.) and sediment must be collected and hauled away after a flooding event. Hauling the collected debris to a local municipal landfill requires significant transportation and involves huge quantities of solid waste that fill available landfill space. Providing the 100-year level of protection significantly reduces the probability that these environmental consequences of flooding would be incurred.

Negative effects associated with implementation of the proposed action that could contribute cumulatively with the effects of other projects include increases in truck traffic, construction noise, construction related emissions, and the loss of 27 acres of wetlands and aquatic habitat. The total loss of habitat related to the implementation of all actions under all of the IERs has not yet been compiled, but will be identified in the CED.

The positive cumulative effects of implementing the proposed action include the temporary expansion of the local economy through the influx of construction-related expenditures. Construction will bring laborers to the region that will spend money on temporary housing, utilities, gasoline, food, and supplies. In addition, they may bring their families, who will require schooling and medical services.

The WBV project extends approximately 66 miles in length from the Western Tie-in (IER #16) just northwest of IER #15, to the Hero Canal Levee and Eastern Terminus in Belle Chasse (IER #13) (USACE, 2007). The LPV Project (IERs #1-11) extends an even larger distance protecting the East Bank of New Orleans. The construction-related negative effects associated with wetland impacts and aquatic resources as well as the positive consequences (e.g., spending in the local economy) resulting from providing the 100-year level of hurricane damage reduction for these projects may potentially represent the largest cumulative effects in the New Orleans region for the next 4 to 7 years.

5.0 SELECTION RATIONALE

On the basis of the assessment of potential environmental impacts presented in this IER and the evaluation of feasibility based on the engineering effectiveness, economic efficiency, and environmental and social acceptability criteria, the proposed action is selected and is environmentally preferred.

The CEQ regulations for implementing NEPA require that the Record of Decision (ROD) for an environmental impact statement specify "the alternative or alternatives which were considered to be environmentally preferable" (40 CFR §1505.2(b)). This alternative has generally been interpreted to mean the alternative that will promote the national environmental policy as expressed in NEPA's Section 101 (CEQ's "Forty Most-Asked Questions," 46 Federal Register, 18026, March 23, 1981). Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources.

The proposed action for each reach represented in IER #15 presents an engineering-effective, cost-efficient, environmentally-preferable selection to other alignment alternatives that would have had greater effects on aquatic habitat (i.e., flood side shift) or required significant demolition and reconstruction to maintain the authorized 100-year level of protection (i.e., I-wall on levee or Alternatives 1 and 2 for Reach 3). The two alternatives not selected for Reach 3 were not the engineering-preferred alternatives, based on economic efficiency and engineering effectiveness. Taking no action, although avoiding the direct effects from construction of the 100-year level of protection, may lead to indirect effects from large-scale flooding to area residences and businesses, and associated costs for clean up.

6.0 COORDINATION AND CONSULTATION

6.1 PUBLIC INVOLVEMENT

Extensive public involvement has been sought in preparing this IER. Proposed Federal projects analyzed by IERs have been publicly disclosed and described in the Federal Register on 13 March 2007, (72 FR 11337) and on the website www.nolaenvironmental.gov. Scoping for this project was initiated on 12 March 2007, through placing advertisements/public notices in USA Today and the Times-Picayune. Nine public scoping meetings were held throughout the New Orleans Metropolitan area between 27 March 2007 and 12 April 2007, after which a 30-day scoping period was open for public comment submission. Additionally, CEMVN is hosting monthly public meetings to keep the stakeholders advised of project status. The public was able to provide verbal comments during the meetings and written comments after each meeting in person, by mail, and via the www.nolaenvironmental.gov website.

Comments were received at a public meeting on 19 July 2007, at the St. Bonaventure Catholic Church in Avondale, LA. The public concern that evening was focused on getting clarification regarding the schedule for completion of the ongoing levee work, the schedule for construction to the new authorized elevation, and how the alignment would intersect Hwy 90 at the western end. Additional questions posed included sources of borrow material for levee construction and the extent of storm surge reduction due to the wetlands near Lake Cataouatche.

At a public meeting held on 19 September 2007, at Westwego City Hall, Westwego, the community members expressed their concerns about the following:

- Lack of better models to address coastal restoration and wetlands preservation
- GNOHSDRRS concentrating more on the levee construction and not on coastal restoration and wetland restoration and preservation
- 404(c) Bayou aux Carpes site is of great concern for its historical and cultural value

- Relationship between 100-year level of flood protection and categories of storms (1-5) with respect to the level of protection that needs to be provided
- Criteria for 100-year level of protection and recent storm data incorporation into the selection criteria and models
- Interim protection for the area from hurricanes and floods before the entire levee system is brought up to the 100-year level of protection
- General concerns about floodwalls being replaced

Since this project includes unavoidable adverse impacts to jurisdictional wetlands under Section 404 of the Clean Water Act, a 404 public notice was made available to the public and other interested parties on the www.nolaenvironmental.gov website. The 404 public notice was advertised for the 30-day period of 10 March – 9 April 2007.

The draft IER is distributed to the public for a 30-day comment period. A public meeting discussing the draft IER will be held if requested by a stakeholder during the 30-day comment period. Any comments received during the comment period will be considered as part of the official record. After the 30-day comment period and the public meeting, if requested, the CEMVN District Commander will review all comments received and will make a determination of whether the comments are substantive in nature. If the comments are not considered to be substantive, the District Commander will make a decision on the proposed action. This decision will be documented in the form of an IER Decision Record. If comments are determined to be substantive in nature, an addendum will be prepared and published for a 30-day public 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 the form of 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 the project planning and alternative analysis phases of the project (members of this team are listed in appendix D). This interagency environmental team was integrated with the CEMVN Project Delivery Team to assist in the planning of this project and to complete a mitigation determination of the potential direct and indirect impacts of the proposed action. Monthly interagency meetings with resource agencies were also held concerning this and other CEMVN IER projects. The following agencies, as well as other interested parties, are receiving copies of this draft IER:

U.S. Department of the Interior, Fish and Wildlife Service
U.S. Department of the Interior, National Park Service
U.S. Environmental Protection Agency, Region VI
U.S. Department of Commerce, National Marine Fisheries Service
U.S. Natural Resources Conservation Service, State Conservationist
Advisory Council on Historic Preservation
Governor's Executive Assistant for Coastal Activities
Louisiana Department of Wildlife and Fisheries

Louisiana Department of Natural Resources, Coastal Management Division
Louisiana Department of Natural Resources, Coastal Restoration Division
Louisiana Department of Environmental Quality
Louisiana State Historic Preservation Officer

The USFWS has reviewed the proposed action and in a Planning Aid letter dated 28 November 2007, stated that the USFWS is unaware of any known threatened or endangered species in the proposed project area. National Oceanic and Atmospheric Administration (NOAA) NMFS is currently reviewing the proposed action to ensure compliance with Section 305 of the Magnuson-Stevens Fishery Conservation and Management Act and the Fish and Wildlife Coordination Act.

In compliance with the Coastal Zone Management Act, CEMVN has coordinated with LDNR for consistency with the Louisiana Coastal Resource Program (LCRP) and the Consistency Determination was issued on 10 March 2008.

A Water Quality Certification has been received from with the Louisiana Department of Environmental Quality (LDEQ) by letter dated 4 March 2008. An Air Quality certification is being coordinated with LDEQ through the 30-day public review period associated with IER #15.

Section 106 of the National Historic Preservation Act, as amended, requires consultation with SHPO and Native American tribes. SHPO reviewed the proposed action and determined that it would not adversely affect any cultural resources by letter dated 11 December 2007. Eleven Federally recognized tribes that have an interest in the region were given the opportunity to review and comment on the proposed action.

The USFWS reviewed the proposed action in accordance with the Fish and Wildlife Coordination Act and prepared a draft Coordination Act Report for IER #15 dated 17 March 2008, supplemented on 24 March 2008. A final report would be prepared after the 30-day public review of IER #15 and comments related to USFWS trust resources have been resolved. The USFWS also provided programmatic recommendations, in the “Draft Fish and Wildlife Coordination Act Report for the Individual Environmental Reports (IER), Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4)” in November 2007. The uncertainties in the design of several projects prohibited a complete evaluation of the impacts to fish and wildlife species and the reporting responsibilities under Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended: 16 U.S.C. 661 et seq.). Therefore, a subsequent final supplemental report will be provided by the USFWS at a later date. The draft (programmatic) Fish and Wildlife Coordination Act Report for the IERs dated November 2007, can be accessed through the www.nolaenvironmental.gov website.

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

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

CEMVN Response 1: The project will utilize the authorized level of protection footprint and minimize impacts to wetlands.

Recommendation 2: Minimize enclosure of wetlands with new levee alignments. When enclosing wetlands is unavoidable, acquire non-development easements on those wetlands, or maintain hydrologic connections with adjacent, un-enclosed wetlands to minimize secondary impacts from development and hydrologic alteration.

CEMVN Response 2: Not applicable.

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 known bald eagle nesting locations or wading bird colonies exist within the scope of this project.

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

CEMVN Response 4: This recommendation will be considered in the design of the project to the greatest extent practicable.

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

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

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

CEMVN Response 6: Concur.

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

CEMVN Response 7: Concur.

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

CEMVN Response 8: Concur.

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

CEMVN Response 9: Concur.

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

CEMVN Response 10: Concur.

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

CEMVN Response 11: Not applicable.

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: Not applicable.

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

CEMVN Response 13: Not applicable.

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: Not applicable.

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

CEMVN Response 15: Not applicable.

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

CEMVN Response 16: Not applicable

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

CEMVN Response 17: Not applicable.

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

CEMVN Response 18: Concur.

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

CEMVN Response 19: Concur.

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

CEMVN Response 20: Not applicable.

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

CEMVN Response 21: Not applicable.

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

CEMVN Response 22: Not applicable.

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

CEMVN Response 23: Concur.

Recommendation 24: Acquisition, habitat development, maintenance and management of mitigation lands should be allocated as first-cost expenses of the project, and the local project-

sponsor should be responsible for operational costs. If the local project-sponsor is unable to fulfill the financial mitigation requirements for operation, then the CEMVN shall provide the necessary funding to ensure mitigation obligations are met on behalf of the public interest.

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

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

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

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

CEMVN Response 26: Concur.

The USFWS' project-specific recommendations in their Planning Aid Report, by letter dated 28 November 2007, and CEMVN's response to the recommendations, are listed below:

Recommendation 1: Expansion of all levees should be towards the protected side, wherever feasible.

CEMVN Response 1: Concur.

Recommendation 2: (see Recommendation 1 in programmatic recommendations and our response.)

Recommendation 3: Avoid or minimize the enclosure of wetlands with new levee alignments. Alternatives presented in Figures 4 and 5 for IER 15 appear to best achieve this recommendation.

CEMVN Response 3: We believe the reference to figures 4 and 5 in Recommendation 3 is from an earlier set of figures provided to USFWS. These figures most likely coincide with figures 2, 3, and 4 in IER #15; therefore we concur.

Recommendation 4: 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 4: Upon completion of construction, there will be no enclosed or isolated wetlands within the project area.

Recommendation 5: (see Recommendation 4 in programmatic recommendations and our response.)

7.0 MITIGATION

Mitigation for unavoidable impacts to the human and natural environment described in this and other IERs will be addressed in separate mitigation IERs. 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.

Twenty-seven acres have been identified in IER #15 that would require compensatory mitigation. Quantitative analysis utilizing existing methodologies for water resource planning has identified the acreages and habitat type for the direct or indirect impacts of implementing the proposed action.

On 12 September 2007, an interagency field trip was conducted to obtain raw field data for the IER #15 project. The methodology being utilized in determining appropriate mitigation, which would include no-net-loss of wetland values, is the interagency Wetland Value Assessment (WVA). The WVA computes the Average Annualized Habitat Units (AAHUs) lost by project implementation. The AAHUs are converted to acres needed to meet the nation's no-net-loss of wetlands policy once the mitigation site is selected.

Two distinct areas of bottomland hardwoods would be directly impacted by the proposed project construction, as described in this document. Area one consists of 3.6 acres of low to moderate habitat, and is located along the Outer Cataouatche Canal on the flood side of the BFI landfill. The WVA model concluded that mitigation for 1.35 AAHUs would be required for area one. Area two consists of 23.5 acres of low to moderate habitat, and is located east of the Cataouatche pump stations between the Bridgeline pipeline and the Bayou Segnette State Park boundary. The WVA concluded that mitigation for 6.13 AAHUs would be required for area two. A total of 7.5 AAHUs for bottomland hardwoods will be included in the overall totals for the 100-year hurricane damage reduction system projects.

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

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

8.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

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

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

Executive Order (E.O.) 11988. E.O. 11988, Floodplain Management, addresses minimizing or avoiding adverse impacts associated with the base floodplain unless there are no practicable alternatives. It also involves giving public notice of proposed actions that may affect the base floodplain. The proposed action would not accelerate development of the floodplain for the following reasons: development of the study area is more closely related to access routes and the need for affordable housing space than flooding potential and conditions conducive for development were established initially when the area was levied and forced drainage was initiated in the middle 1960s.

Executive Order 11990. E.O. 11990, Protection of Wetlands, has been important in project planning. It is acknowledged that much of the area enclosed by the existing levee consists of wetlands. However, by following the existing alignments and working in developed areas, there would be minimal direct adverse impacts to wetlands for this project. Any increased size of the interior borrow/drainage canal as a result of levee enlargement would result in increased capacity; however, this would have essentially no indirect effect on the rate of drainage from the basin. Increased pumping station capacities are not a part of this action.

Consistency with Coastal Zone Management (CZM) Program. CEMVN has determined that construction and maintenance of 100-year level of protection along the WBV, Lake Cataouatche Levee Project is consistent, to the maximum extent practicable, with the guidelines of the State of Louisiana's approved Coastal Zone Management Program. A CZM consistency determination, C20080049, was dated 10 March 2008. The consistency letter of approval from the LDNR completes the consistency requirements.

Clean Air Act. The original 1970 CAA authorized USEPA to establish National Ambient Air Quality Standards (NAAQS) to limit levels of pollutants in the air. The USEPA has promulgated NAAQS for six criteria pollutants: sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), ozone, lead, and particulate matter (PM-10). All areas of the United States must maintain ambient levels of these pollutants below the ceilings established by the NAAQS; any area that does not meet these standards is considered a "non-attainment" area (NAA). The 1990 Amendments require that the boundaries of serious, severe, or extreme ozone or CO non-attainment areas located within Metropolitan Statistical Areas (MSAs) or Consolidated

Metropolitan Statistical Areas (CMSAs) be expanded to include the entire MSA or CMSA unless the governor makes certain findings and the Administrator of the USEPA concurs. Consequently, all urban counties included in an affected MSA or CMSA, regardless of their attainment status, will become part of the NAA. The project is located in Jefferson Parish, which is classified as an attainment area; therefore NAAQS are not applicable to this project.

Clean Water Act. The Clean Water Act (CWA; 33 U.S.C. 1251-1387; Act of June 30, 1948, as amended) is a very broad statute with the goal of maintaining and restoring waters of the United States. The CWA authorizes water quality and pollution research, provides grants for sewage treatment facilities, sets pollution discharge and water quality standards, addresses oil and hazardous substances liability, and establishes permit programs for water quality, point source pollutant discharges, ocean pollution discharges, and dredging or filling of wetlands. The intent of the CWA's §404 program and its §404(b)(1) "Guidelines" is to prevent destruction of aquatic ecosystems including wetlands, unless the action will not individually or cumulatively adversely affect the ecosystem.

Section 404(b)(1) guidelines were used to evaluate the discharge of dredged or fill material for adverse impacts to the aquatic ecosystem. The following actions would be taken to minimize the potential for adverse environmental impacts. The existing levee alignment would be followed in construction of the proposed levee. Riprap stone armament would be included in the wave berm in areas subject to significant wave impact and to minimize erosion into the exterior borrow canal. All sloped areas would be seeded. Non-forested wetlands, consisting of mown levee grasses or grazed pasture, were not mitigated because of their low value to fish and wildlife resources. The proposed project complies with the requirements of the guidelines. The LDEQ Water Quality Certification letter, JP 080213-05, dated 4 March 2008, completes the certification process.

Endangered Species Act. The Endangered Species Act (ESA; 16 U.S.C. 1531-1543; Pub. L. 93-205, as amended) was enacted in 1973, for the purpose of providing for the conservation of species which are in danger of extinction throughout all or a significant portion of their range. "Species" is defined by the ESA to mean either a species, a subspecies, or, for vertebrates (*i.e.*, fish, reptiles, mammals, etc.) only, a distinct population. No threatened or endangered species or their critical habitat would be impacted by the proposed action. The USFWS concurred with our determination in their letter dated 28 November 2007.

Fish and Wildlife Coordination Act. The Fish and Wildlife Coordination Act (16 U.S.C. 661-666c; Act of March 10, 1934, as amended) requires that wildlife, including fish, receive equal consideration and be coordinated with other aspects of water resource development. This is accomplished by requiring consultation with the USFWS and NMFS whenever modifications are proposed to a body of water and a Federal permit or license is required. This consultation determines the possible harm to fish and wildlife resources, as well as the measures that are needed to prevent the damage to and loss of these resources and to develop and improve the resources, in connection with water resource development. NMFS submits comments and recommendations to Federal licensing and permitting agencies, and to Federal agencies conducting construction projects on the potential harm to living marine resources caused by proposed water development projects, and suggests recommendations to prevent harm. The USFWS provided the "Draft Fish and Wildlife Coordination Act Report for the Individual Environmental Reports (IER), Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4)" in November 2007. To fulfill the responsibilities of the Fish and Wildlife Coordination Act, the USFWS will provide a post-authorization final supplemental 2(b) report to the draft programmatic report. A draft project-specific Coordination Act Report was received from USFWS by letter dated 17 March 2008, with a supplemental report dated 24 March 2008. A

final report would be prepared after the 30-day public review period and all comments regarding USFWS trust resources have been resolved, and before a final IER has been completed.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act of 1918 (MBTA), is the domestic law that affirms, or implements, the United States' commitment to four international conventions with Canada, Japan, Mexico, and Russia for the protection of shared migratory bird resources. The MBTA governs the taking, killing, possessing, transporting, and importing of migratory birds, their eggs, parts, and nests. The take of all migratory birds is governed by the MBTA's regulation of taking migratory birds for educational, scientific, and recreational purposes and requiring harvest to be limited to levels that prevent over-utilization. Section 704 of the MBTA states that the Secretary of the Interior is authorized and directed to determine if, and by what means, the take of migratory birds should be allowed and to adopt suitable regulations permitting and governing take. The MBTA prohibits the take, possession, import, export, transport, sale, purchase, barter, or offer for sale, purchase or barter, of any migratory bird, their eggs, parts, and nests, except as authorized under a valid permit (50 CFR §21.11). The USFWS addressed compliance with this Act in the "Draft Fish and Wildlife Coordination Act Report for the Individual Environmental Reports (IER), Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4)" in November 2007. To fulfill the responsibilities of the Fish and Wildlife Coordination Act, the USFWS will provide a post-authorization final supplemental 2(b) report to the draft programmatic report.

National Environmental Policy Act. The National Environmental Policy Act (NEPA; 42 U.S.C. 4321-4347; Pub. L. 91-190, as amended) requires Federal agencies to analyze the potential effects of a proposed Federal action that would significantly affect historical, cultural, or natural aspects of the environment. It specifically requires agencies to use a systematic, interdisciplinary approach in planning and decision-making, to insure that environmental values may be given appropriate consideration, and to provide detailed statements on the environmental impacts of proposed actions including: (1) any adverse impacts; (2) alternatives to the proposed action; and (3) the relationship between short-term uses and long-term productivity. The agencies use the results of this analysis in their decision-making process. The preparation of this IER is a part of complying with NEPA.

National Historic Preservation Act. Congress established the most comprehensive national policy on historic preservation with the passage of the National Historic Preservation Act of 1966 (NHPA). In this Act, historic preservation was defined to include "the protection, rehabilitation, restoration and reconstruction of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, or culture." The Act led to the creation of the National Register of Historic Places, a file of cultural resources of national, regional, state, and local significance. The act also established the Advisory Council on Historic Preservation (the Council), an independent Federal agency responsible for administering the protective provisions of the act. The major provisions of the NHPA are Sections 106 and 110. Both sections aim to ensure that historic properties are appropriately considered in planning Federal initiatives and actions. Section 106 is a specific, issue-related mandate to which Federal agencies must adhere. It is a reactive mechanism that is driven by a Federal action. Section 110, in contrast, sets out broad Federal agency responsibilities with respect to historic properties. It is a proactive mechanism with emphasis on ongoing management of historic preservation sites and activities at Federal facilities. Coordination of this project with SHPO fulfills the requirements to comply with the NHPA, and the SHPO letter dated 11 December 2007, concludes this process.

9.0 CONCLUSION

9.1 INTERIM DECISION

The proposed action would require the construction of:

- A flood side shift of approximately 3,900 ft of authorized levee within reach 1 to achieve 100-year protection. All work would take place within the existing ROW, but would have to shift slightly southward approximately 110 ft into the Outer Cataouatche Canal to accommodate the larger levee,
- A protected side shift that is within the existing construction ROW and areas of previous and recent disturbance for reach 2. Approximately 6.84 miles of uniform-design levee would be constructed to achieve 100-year protection, and
- Approximately 1,450 ft of new T-wall floodwall fronting around the Lake Cataouatche Pump Stations No. 1 and No. 2 would be constructed in reach 3.

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

- Short-term impact to air quality from heavy equipment and trucks used during construction and maintenance of the 100-year level of protection.
- Short-term impact to water quality in the Outer Cataouatche Canal throughout reach 1 during construction of 100-year level of protection.
- Short-term disturbance to nearby habitat from construction noise and 27.0 acres of bottomland hardwood forest impacts to terrestrial habitat.
- Short-term impacts to traffic and transportation patterns.
- Permanent loss of approximately 6.5 acres of aquatic habitat in the Outer Cataouatche Canal by the construction of the 100-year level of protection throughout reach 1 and pushing a mud wave during construction.
- Permanent displacement of fish and temporary displacement of wading birds, waterfowl, or other wildlife within the 10-acre area filled in and near the Outer Cataouatche Canal.

9.2 PREPARED BY

The point of contact and responsible manager for the preparation of this IER is Bonnie Obiol, CEMVN. 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 3 lists the preparers of the various sections and topics in this IER.

**Table 3.
IER #15 Preparation Team**

Environmental Team Leader	Gib Owen, CEMVN
Environmental Manager	Bonnie Obiol, CEMVN
Project Manager	Michael Stack, CEMVN
Review	Frank Lupo, CEMVN – Office of Counsel Thomas Keevin, CEMVS - Independent Technical Review
HTRW	J. Christopher Brown, CEMVN
Cultural Resources	Michael Swanda, CEMVN
Recreational Resources	Andrew Perez, CEMVN
Aesthetic Resources	Richard Radford, CEMVN
Environmental Justice	Edwin Lyon, CEMVN
Economics	Robert Lacy, CEMVN
Technical Editor	Jennifer Darville, CEMVN
NEPA Specialist/Ecologist	Michael McGarry, David Miller and Associates, Inc.
NEPA Specialist/Economist	Vinicio Vannicola, David Miller and Associates, Inc.
Ecologist	Robert Wiley, David Miller and Associates, Inc.
Environmental Engineer	Steven Gebhardt, David Miller and Associates, Inc.
Other Contributions	Judith S. Smith, HDR Inc.

9.3 LITERATURE CITED

Council on Environmental Quality (CEQ). 1997. Environmental Justice Guidance Under the National Environmental Policy Act. Executive Office of the President. Washington, D.C.

Executive Office of the President (Executive Order). 1994. Federal Actions to Address Environmental Justice in Minority Population and Low-Income Populations. Executive Order 12898, 59 Fed. Reg. 7629.

Intergovernmental Panel on Climate Change (IPCC). 2001. IPCC Third Assessment Report: Climate Change 2001. Webpage at: www.ipcc.ch/ipccreports/assessments-reports.htm

Jones, K., H.A. Franks, T.R. Kidder. 1994. Cultural Resources Survey and Testing for Davis Pond Freshwater Diversion, St. Charles Parish, Louisiana. Earth Search, Inc., New Orleans. Submitted to CEMVN.

Jones, K., R. Smith, B. Maygarden. 1997. Cultural Resources Survey of the Westwego to Harvey Canal Hurricane Protection Project, Lake Cataouatche Area, Jefferson Parish. Louisiana. Earth Search, Inc., New Orleans. Submitted to CEMVN.

Louisiana Recovery Authority 2007. Enhancement of the U.S. Census Bureau 2006 Annual Population Estimates. On-line Resource at: <http://lra.louisiana.gov/> and http://www.popest.org/popestla2006/files/PopEst_Jefferson_SurveyReport_01_11_07.pdf

Moore, David M. and Rivers, Robert D. 1996. The Executive Summary: Program Objectives, Action Plans, and Implementation Strategies at a Glance, CCMP - Part I. Barataria-Terrebonne National Estuary Program, Thibodaux, Louisiana.

Smardon, R.C., Palmer, J.F., Knopf, Alfred, Grinde, Kate, Henderson, J.E., and Peyman-Dove, L. 1988. Visual Resource Assessment Procedure for U.S. Army Corps of Engineers. Instruction Report EL-88-1, prepared by State University of New York, Syracuse, for U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

U.S. Army Corps of Engineers (USACE). 1996. Westwego to Harvey Canal, LA Hurricane Protection Project, Lake Cataouatche Area, Tech Appendixes (sic), Vol. 2. New Orleans District.

---. 2007. West Bank and Vicinity, New Orleans, LA Hurricane Protection Project, Project Fact Sheet. Accessed Nov. 21, 2007 at <http://www.mvn.usace.army.mil/pao/visitor/index.htm>.

U.S. Bureau of the Census. 2000. U.S. Poverty Thresholds in 2000. On-line Resource at: <http://www.census.gov/hhes/poverty/threshld/thresh00.html>.

U.S. Department of Agriculture, Soil Conservation Service (SCS). 1981. Soil Survey of Jefferson Parish, Louisiana.

U.S. Environmental Protection Agency (USEPA). 1993. Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule, 40 CFR §Parts 6, 51, and 93. Federal Register 63213-63259, November 30, 1993.

---. 2007. Nonattainment for Each County by Year (Green Book). On-line Resource at: <http://www.epa.gov/oar/oaqps/greenbk/anay.html>

U.S. Census Bureau 2006. American Community Survey, Jefferson Parish

Wells, D.C. 2007. Management Summary: Cultural Resources Assessment of the Lake Cataouatche Segment (IER #15), West Bank and Vicinity Hurricane Protection Levee, Jefferson Parish, Louisiana. Coastal Environments, Inc., Baton Rouge. Submitted to CEMVN, under Contract W912P8-07-D-0041, Delivery Order 001.

Woodward, M.L. 2006. Three Deep Mixing Applications for Task Force Guardian.

10.0 APPENDICES

Appendix A

List of Acronyms and Definitions of Common Terms

ASTM	American Society for Testing and Materials
BFI	Browning-Ferris Industries Landfill
BOD	Biological Oxygen Demand
CED	Comprehensive Environmental Document
CEMVN	Corps of Engineers, Mississippi Valley Division, New Orleans District
CEQ	The President's Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CFS	Cubic Ft Per Second
CW	Civil Works Program
CWA	Clean Water Act
CY	Cubic Yard
CSMA	Consolidated Metropolitan Statistical Area
CZM	Coastal Zone Management
dba	Decibels
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EM	Engineering Manual
EPW	Evaluation Of Planned Wetlands
ER	Engineering Regulation
FCU	Functional Capacity Units
FCI	Functional Capacity Index
FEMA	Federal Emergency Management Agency
DPR	Detailed Project Report
DPR/EA	Detailed Project Report/Environmental Assessment
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FWCA	Fish and Wildlife Coordination Act
GNOHSDRRS	Greater New Orleans Storm Damage Risk Reduction System
HTRW	Hazardous, Toxic, and Radioactive Waste
IER	Individual Environmental Report
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LPV	Lake Ponchartrain and Vicinity

MBTA	Migratory Bird Treaty Act
ML	Milliliters
NAAQS	National Ambient Air Quality Standards
NAVD	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHP	Natural Heritage Program
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRCS	National Resources Conservation Service
O&M	Operations And Maintenance
OMRR&R	Operations, Maintenance, Repair, Replacement, & Rehabilitation
OSE	Other Social Effects
PA	Programmatic Agreement
PL	Public Law
PS	Pump Station
PSI	Pounds Per Square Inch
P&G	Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RED	Regional Economic Development
ROD	Record of Decision
ROW	Right-of-Way
SCORP	State Comprehensive Outdoor Recreation Plan
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SPH	Standard Project Hurricane
USACE	United States Army Corps Of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish And Wildlife Service
USGS	United States Geological Survey
VOC	Volatile Organic Compounds
WBV	West Bank and Vicinity
WRDA	Water Resources Development Act

Appendix B
Public Comment and Response Summary

Appendix C

Institutional, Ecological, and Public Significance of Resources

SIGNIFICANCE OF RESOURCES

The National Environmental Policy Act (NEPA) requires Federal agencies to analyze the impacts of proposed actions on those resources that are considered “significant.” The following table provides a list of resources that are commonly found in the vicinity of the Lake Pontchartrain and Vicinity and West Bank and Vicinity GNOHSDRRS Projects. In providing a list of some of the key laws and regulations governing these resources, as well as a short description of some of their ecological and human environment value, this table offers a rationale for why these resources are considered significant for the purposes of NEPA analysis.

SIGNIFICANT RESOURCE	GOVERNING LAWS AND REGULATIONS	ECOLOGICAL and HUMAN ENVIRONMENT VALUE
Agriculture	Farmland Protection Policy Act of 1981; Food Security Act of 1985; Prime and Unique Farmlands, 1980 CEQ Memorandum	Provision or potential for provision of forest products and human and livestock food products
Air	Clean Air Act of 1963, as amended; Deepwater Port Act of 1974 Louisiana Air Control Act; Louisiana Environmental Quality Act of 1983 National Ambient Air Quality Standards (NAAQS)	Clean air is important for human health and safety
Coastal Zones	Coastal Barrier Resources Act of 1982, 1990, as amended; Coastal Zone Management Act of 1972; Coastal Zone Protection Act of 1996; Deepwater Port Act of 1974 Federal Water Project Recreation Act of 1965; Outer Continental Shelf Lands Act of 1953; Submerged Land Act of 1953	Barrier islands: Protect mainland and associated fish, wildlife, and other natural resources. Coastal zones: Protect wetlands*, floodplains*, estuaries*, beaches, dunes, barrier islands, reefs, bays, ponds, bayous, dunes, and fish and wildlife* and their habitats *See specific resources for additional regulations
Cultural and Historic	Abandoned Shipwreck Act of 1987; American Folklife Preservation Act of 1976; American Indian Religious Freedom Act of 1978; Antiquities Act of 1906 Archaeological Resources Protection Act of 1979; Archaeological and Historical Preservation Act of 1974; Consultation and Coordination with Indian Tribal Governments (EO 13175) of 2000; Historic Sites Act of 1935; Historic and Archaeological Data-Preservation of 1974; Indian Sacred Sites (EO 13007) of 1996 National Historic Preservation Act of 1966; Native American Graves Protection and Repatriation Act of 1990; Protection and Enhancement of the Cultural Environment (EO 11593) of 1971; Protection of Cultural Property (EO 12555) of 1986; Reclamation Projects Authorization and Adjustments Act of 1992	Their association or linkage to past events, to historically important persons, and to design and/or construction values Their ability to yield important information about prehistory and history

SIGNIFICANT RESOURCE	GOVERNING LAWS AND REGULATIONS	ECOLOGICAL and HUMAN ENVIRONMENT VALUE
Economic Resources	Deepwater Port Act of 1974; Environmental Review of Trade Agreements (EO 13141) of 1999	<p>Strong economies enhance human standards of living and can allow for greater expendability of funds for the protection and enhancement of ecological resources</p> <p>Trade agreements and international trade can have both positive and negative environmental effects</p> <p>Positive effects can include greater cooperation between nation states in preserving species which cross political boundaries</p>
Endangered/Threatened Species	Endangered Species Act of 1973; Marine Mammal Protection Act of 1972	The status of such species provides an indication of the overall health of an ecosystem. US Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), Louisiana Department of Wildlife and Fisheries (LDWF), and USACE cooperate to protect endangered and threatened species; Audubon Blue List recognizes rare species
Environmental Justice	American Indian Religious Freedom Act of 1978; Civil Rights Act of 1964; Consultation and Coordination with Indian Tribal Governments (EO 13175) of 2000; Executive Order 12898 of 1994; Federal Actions to Address Environmental Justice in Minority Populations & Low-Income Populations (EO 12898, 12948) of 1994, as amended	Ensuring the rights of minority and low-income populations can lead to greater sustainability through less burden on the environment in which these populations live, including better treatment of wastes and building processes
Essential Fish Habitat	Coastal Zone Management Act of 1972; Marine Protected Areas (EO 13158) of 2000; Magnuson-Stevens Fishery Conservation and Management Act of 1976	Shallow intertidal waters provide essential fish habitat in the form of nursery, foraging, and grow out areas. National Marine Fisheries Service recognizes value of essential fish habitat as necessary for continued survival of fisheries resources
Estuaries	Coastal Zone Management Act of 1972; Deepwater Port Act of 1974; Estuaries and Clean Waters Act of 2000; Estuary Protection Act of 1968; Estuary Restoration Act of 2000	Shallow intertidal waters provide essential fish habitat in the form of nursery, foraging, and grow out areas. Protect aquatic nurseries and oyster beds

SIGNIFICANT RESOURCE	GOVERNING LAWS AND REGULATIONS	ECOLOGICAL and HUMAN ENVIRONMENT VALUE
Fisheries (Commercial and Recreational)	Anadromous Fish Conservation Act of 1965; Coastal Zone Management Act of 1972; Fish and Wildlife Conservation Act of 1980; Magnuson-Stevens Fishery Conservation and Management Act of 1976; Endangered Species Act of 1973 Federal Water Project Recreation Act of 1965; Fish and Wildlife Coordination Act of 1958; Recreational Fisheries (EO 12962) of 1995; Sustainable Fisheries Act of 1996	Critical element of many valuable freshwater and marine habitats. Indicator of the health of various freshwater and marine habitats USFWS, NMFS, LDWF, Louisiana Department of Natural Resources (LDNR), and USACE recognize value of fisheries and good water quality.
Flood Control/ Hurricane Protection Levees	Floodplain Management (EO 11988) of 1977; River and Harbor and Flood Control Act of 1970; Watershed Protection & Flood Prevention Act of 1954	Dewatering activities associated with urban floods result in discharge of floodwater potentially containing pollutants associated with residential, commercial, and industrial facilities
Floodplains	Coastal Zone Management Act of 1972; Floodplain Management (EO 11988) of 1977; River and Harbor and Flood Control Act of 1970	Floodplains provide storage of floodwaters and habitat for forest-dwelling wildlife and plant species. The typically linear aspect of floodplains provide important travel routes for wildlife (including insects) and plant species
Forestry	Reservoir Areas – Forest Cover Act of 1960	Managed forests provide cover and travel routes for forest-dwelling wildlife
Habitat (General)	Marine Protected Areas (EO 13158) of 2000; Oil Pollution Act of 1990	Habitat provided for open, forest-dwelling, and aquatic wildlife. Provision or potential for provision of forest products and human and livestock food products
Hazards/ Wastes	Clean Air Act of 1963, as amended; Comprehensive Environmental Response, Compensation, and Liability Act of 1980; Emergency Planning and Community Right-to-Know Act of 1986; Federal Compliance with Pollution Control Standards (EO 12088) of 1978; Federal Facilities Compliance Act of 1992; Federal Insecticide, Fungicide, and Rodenticide Act of 1996; Oil Pollution Act of 1990; Pollution Prevention Act of 1990; Resource Conservation and Recovery Act of 1976; Toxic Substances Control Act of 1976	Pollutants directly affect the health and viability of ecological habitats and all organisms living within them. Laws and regulations such as the Clean Air Act address problems such as acid rain, ground-level ozone, stratospheric ozone depletion, and air toxics. Laws such as the Pollution Prevention Act allow the government to focus on the sources of pollution rather than after-the-fact treatment

SIGNIFICANT RESOURCE	GOVERNING LAWS AND REGULATIONS	ECOLOGICAL and HUMAN ENVIRONMENT VALUE
Invasive Species	Exotic Organisms (EO 11987) of 1977; Invasive Species (EO 13112) of 1999; National Invasive Species Act of 1996; Non-indigenous Aquatic Nuisance Prevention and Control Act of 1996	Invasive species alter interactive relationships of plants and wildlife that have developed over long periods of time and can completely alter natural habitats. Control of the introduction of invasive species protects habitats by preserving these relationships.
Lake Pontchartrain	Clean Water Act of 1977; Federal Water Project Recreation Act of 1965	Provides habitat for various species of wildlife, finfish, and shellfish.
Marine Areas	Abandoned Shipwreck Act of 1987; Coastal Zone Management Act of 1972; Federal Water Project Recreation Act of 1965; Marine Protected Areas (EO 13158) of 2000; Marine, Protection, Research, and Sanctuaries Act of 1972	Provides habitat for aquatic plant and wildlife.
Navigable Waters	Clean Water Act of 1977; Federal Water Project Recreation Act of 1965; Rivers and Harbors Acts of 1899, 1956 (Sec. 10); Outer Continental Shelf Lands Act of 1953; Rivers and Harbors Acts of 1899, 1956; River and Harbor and Flood Control Act of 1970; Submerged Land Act of 1953	Regulations and laws allow for protection of aquatic habitats from pollution and development. Regulations and laws maintain habitat for aquatic and water-dependent plants and wildlife. Maintained navigable waterways provide routes for shipping and recreational activity, protecting natural habitat from harmful intrusion.
Noise	Noise Control Act of 1972	High levels can affect the quality of habitat for wildlife and humans.
Oil, Gas, and Utilities Pipelines/ Activities	Deepwater Port Act of 1974	Regulation protects aquatic from pollution and development, including limiting turbidity which decreases aquatic plant growth.
Real Estate	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646)	Regulations and laws assist in the acquisition of lands for conservation and preservation.
Recreation	Abandoned Shipwreck Act of 1987; Federal Water Project Recreation Act of 1965; Flood Control Act of 1944; Land and Water Conservation Fund Act of 1965; National Trails System Act of 1968; Reclamation Projects Authorization and Adjustments Act of 1992; Wild and Scenic River Act of 1968; Wilderness Act of 1964	Potential for interacting with the natural world. High economic value of recreational activities and their contribution to local, state, and national economies. Many fishing and hunting person-days are logged. Various existing facilities satisfy numerous user-days of recreation annually

SIGNIFICANT RESOURCE	GOVERNING LAWS AND REGULATIONS	ECOLOGICAL and HUMAN ENVIRONMENT VALUE
Soils	Watershed Protection & Flood Prevention Act of 1954	Provide the building blocks for habitat for plants and wildlife, including invertebrate species Regulation provides technical and financial assistance for watershed protection, flood mitigation, flood prevention, water quality improvement, soil erosion reduction, sediment control, fish and wildlife habitat enhancement, and wetland and wetland function creation and restoration
Water	Clean Water Act of 1977; Deepwater Port Act of 1974; Estuaries and Clean Waters Act of 2000; Federal Water Pollution Control Act of 1972; Federal Water Project Recreation Act of 1965; Flood Control Act of 1944; Safe Drinking Water Act of 1974; Water Resources Development Acts of 1976, 1986, 1990, and 1992; Water Resources Planning Act of 1965; Watershed Protection & Flood Prevention Act of 1954	Allows for protection of aquatic habitats from pollution and development. Maintains habitat for aquatic and water-dependent plants and wildlife. Provides technical and financial assistance for watershed protection, flood mitigation, flood prevention, water quality improvement, soil erosion reduction, sediment control, fish and wildlife habitat enhancement, and wetland and wetland function creation and restoration
Wetlands	Coastal Wetlands Planning, Protection, and Restoration Act of 1990; Coastal Zone Management Act of 1972; Clean Water Act of 1977; Deepwater Port Act of 1974; Emergency Wetlands Restoration Act of 1986; Estuaries and Clean Waters Act of 2000; Estuary Protection Act of 1968; Estuary Restoration Act of 2000; Floodplain Management (EO 11988) of 1977; Louisiana State and Local Coastal Resources Management Act of 1978; "No Net Loss" Policy of 1988; North American Wetlands Conservation Act of 1989; Protection of Wetlands (EO 11990) of 1977; Rivers and Harbors Acts of 1899, 1956 (Sec. 10); Water Resources Development Acts of 1976, 1986, 1990, and 1992 (Sec. 906); *Wetland Value Assessment (WVA); *Habitat Suitability Index (HIS)	Provide habitat for a number of species of special emphasis (USFWS). Louisiana loses 30 square miles of wetland per year. Provide necessary habitat for various species of plants, fish, and wildlife, many of them commercially important. Serve as ground water recharge areas. Provide storage areas for storm and flood waters. Serve as natural water filtration areas. Provide protection from wave action, erosion, and storm damage. Important source of lumber and other commercial forest products (Bottomland Hardwood Forest).

SIGNIFICANT RESOURCE	GOVERNING LAWS AND REGULATIONS	ECOLOGICAL and HUMAN ENVIRONMENT VALUE
Wildlife & Fish	Endangered Species Act of 1973; Federal Water Project Recreation Act of 1965; Fish and Wildlife Conservation Act of 1980; Fish and Wildlife Coordination Act of 1958; Fish and Wildlife Programs and Improvement and National Wildlife Refuge System Centennial Act of 2000; Migratory Bird Conservation Act of 1929; Migratory Bird Treaty Act of 1918; Migratory Bird Habitat Protection (EO 13186) of 2001; Neotropical Migratory Bird Conservation Act of 2000; Outer Continental Shelf Lands Act of 1953; Reclamation Projects Authorization and Adjustments Act of 1992 Submerged Land Act of 1953; Responsibilities of Federal Agencies to Protect Migratory Birds (EO 13186) of 2001; Wild and Scenic River Act of 1968; *Also see Endangered and Threatened Species, habitats	Habitat for a number of species of special emphasis (USFWS). Critical element of many valuable aquatic and terrestrial habitats. Indicator of the health of various aquatic and terrestrial habitats. Many species are important commercial resources. USFWS, NMFS, LDWF, LDNR, and USACE recognize value of wildlife.

Appendix D

Members of Interagency Environmental Team

Kyle Balkum	Louisiana Dept. of Wildlife and Fisheries
Agaha Brass	Louisiana Department of Natural Resources
Catherine Breaux	U.S. Fish and Wildlife Service
David Castellanos	U.S. Fish and Wildlife Service
Frank Cole	Louisiana Department of Natural Resources
John Ettinger	U.S. Environmental Protection Agency
Jeffrey Harris	Louisiana Department of Natural Resources
Richard Hartman	NOAA National Marine Fisheries Service
Jeffrey Hill	NOAA National Marine Fisheries Service
Christina Hunnicutt	U.S. Geologic Survey
Barbara Keeler	U.S. Environmental Protection Agency
Kirk Kilgen	Louisiana Department of Natural Resources
Tim Killeen	Louisiana Department of Natural Resources
Brian Lezina	Louisiana Dept. of Wildlife and Fisheries
David Muth	U.S. National Park Service
Clint Padgett	U.S. Geologic Survey
Jamie Phillippe	Louisiana Dept. of Environmental Quality
Molly Reif	U.S. Geologic Survey
Manuel Ruiz	Louisiana Dept. of Wildlife and Fisheries
Renée Sanders	Louisiana Department of Natural Resources
Angela Trahan	U.S. Fish and Wildlife Service
David Walther	U.S. Fish and Wildlife Service
Patrick Williams	NOAA National Marine Fisheries Service