

**DRAFT INDIVIDUAL ENVIRONMENTAL REPORT
WEST BANK AND VICINITY, COMPANY CANAL FLOODWALL
JEFFERSON PARISH, LOUISIANA**

IER #17



**US Army Corps
of Engineers®**

NOVEMBER 2008

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1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Mississippi Valley Division, New Orleans District (CEMVN), has prepared this Individual Environmental Report #17 (IER #17) to evaluate the potential impacts associated with the proposed construction and maintenance of a 100-year level of protection along the West Bank and Vicinity (WBV), Company Canal Floodwall from the Bayou Segnette State Park to the New Westwego Pumping Station. 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 proposed project is located in Jefferson Parish near New Orleans, Louisiana (see figure 1).

The approximate project-area boundaries are the Bayou Segnette State Park to the southwest and the New Westwego Pumping Station on the east. The closest community center in this area is Westwego to the north. An elevated section of Lapalco Boulevard crosses this reach of the WBV alignment. Most of the area is under forced drainage¹ via several pumping stations. Forced drainage has facilitated development for recreational, residential, commercial, and/or industrial purposes within much of the area.

The existing Company Canal Floodwall is approximately 15,000 feet long at an elevation of approximately +9 feet NAVD 88 (North American Vertical Datum of 1988, 2004.65). Within the project area, the existing floodwall has six distinct reaches (see figure 2) as described below.

Reach 1 of the Company Canal Floodwall² originates at the southwest end of the Bayou Segnette State Park where the existing floodwall connects with the Lake Cataouatche Levee³ (IER #15) and proceeds northward (approximately 8,000 feet) within the Bayou Segnette State Park, under the elevated Lapalco Boulevard, to the Bayou Segnette Pumping Stations (see figure 2). Throughout reach 1, the floodwall is at its authorized elevation of +9 feet NAVD 88. The existing right-of-way (ROW) is approximately 50 feet on the flood side and varies between 50 to 110 feet on the protected side. For approximately the first 3,500 feet of alignment (from the beginning of the floodwall proceeding towards the Bayou Segnette Pumping Stations), the ROW is approximately 110 feet. Thereafter, the ROW narrows to between 50 and 60 feet for the remaining distance of reach 1.

¹ Forced drainage is the continuous pumping and removal of surface and groundwater to lower ambient water levels.

² Floodwalls are concrete and steel walls, built atop a levee, or in place of a levee, often where space is insufficient for a levee's broad base.

³ Levees are earthen structures, made of clay (sedimentary particles smaller in diameter than sand and silt), in cross section forming a truncated triangle. The base is commonly 10 times as wide as the height.

Figure 1. Company Canal Floodwall and Vicinity

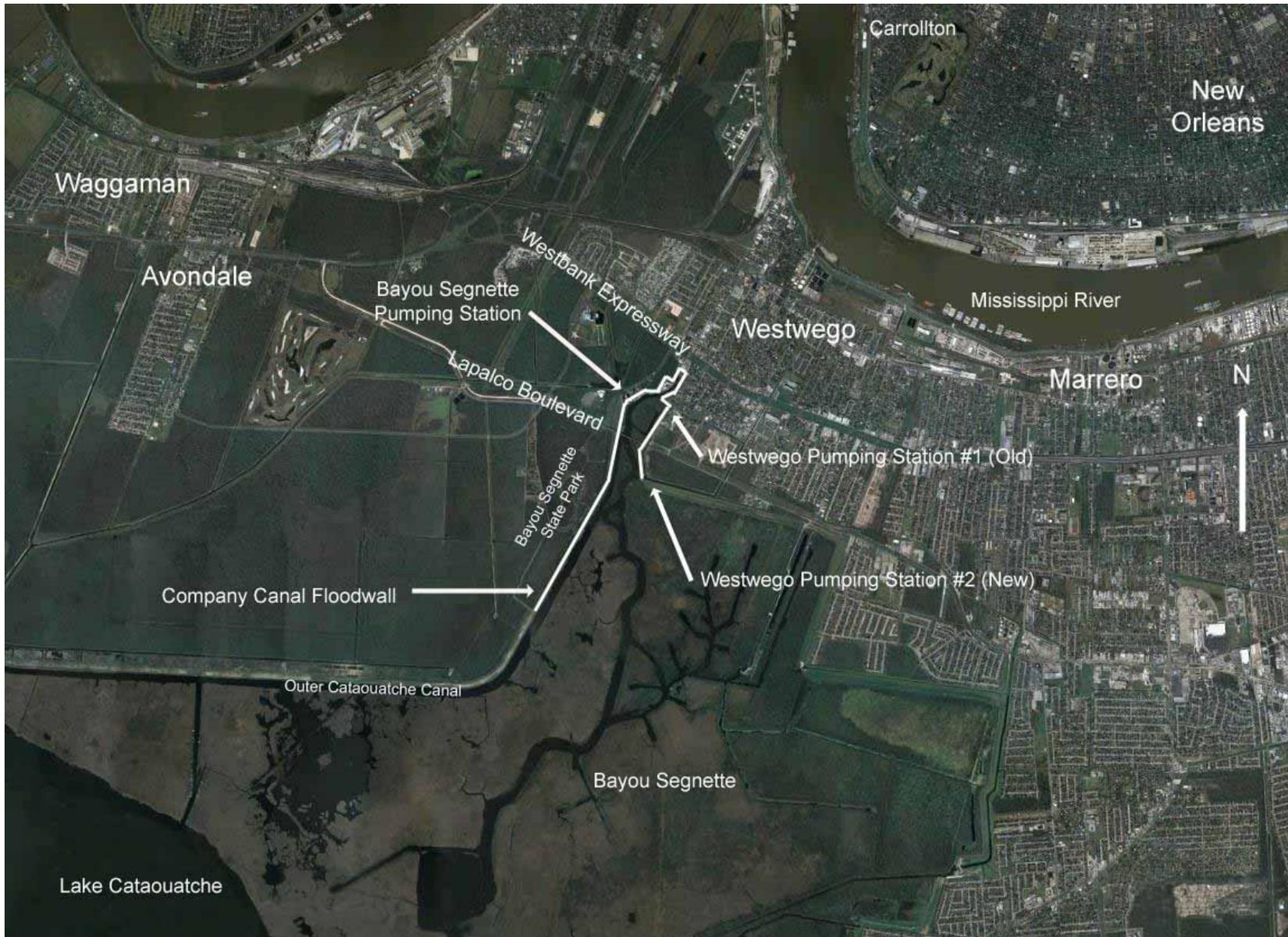


Figure 2. Reaches of the Company Canal Floodwall



Reach 2 is the fronting protection⁴ for the Bayou Segnette Pumping Stations and is approximately 450 feet long and at elevation +9 feet NAVD 88. This reach originates at the northeast end of reach 1 where the existing floodwall meets the Bayou Segnette Pumping Stations and proceeds around the pumping stations. The pumping stations have six 54-inch, 150 cubic feet per second (cfs) vertical pumps and two 96-inch, 570 cfs horizontal pumps. Water passes through steel discharge tubes from a protected side canal and empties into a discharge basin.

Reach 3 is the length of the floodwall surrounding the Company Canal between the Bayou Segnette Pumping Station and the Old Westwego Pumping Station. From the terminus of the Bayou Segnette Pumping Stations fronting protection, reach 3 proceeds approximately 850 feet north on the bank of the Bayou Segnette and then encircles the Company Canal (north along Louisiana Street, east at the north end/terminus, and then south along Laroussini Street). The existing floodwall then turns east to tie into fronting protection at the Old Westwego Pumping Station. The entire segment is approximately 3,300 feet long and at elevation +9 feet NAVD 88.

Reach 4 is the length of the floodwall providing fronting protection for the Old Westwego Pumping Station. The pumping station has a single 84-inch, 400 cfs vertical pump and water passes through steel discharge tubes and empties into a discharge basin. The floodwall itself is approximately 100 feet long and +9 feet NAVD 88 in elevation.

Reach 5 is the length of floodwall on the east side of Bayou Segnette between the Old Westwego Pumping Station and the New Westwego Pumping Station. Extending approximately 2,700 feet at +8.9 feet NAVD 88, the existing earthen levee with floodwall cap terminates at the New Westwego Pumping Station. Within this reach, the floodwall again passes under the elevated Lapalco Boulevard.

Reach 6 is the New Westwego Pumping Station fronting protection. This reach is approximately 200 feet long, is at elevation +10.0 feet, and is similar to the other pumping station fronting protection reaches (2 and 4). The New Westwego Pumping Station has three 84-inch, 300 cfs vertical pump and water passes through steel discharge tubes and empties into a discharge basin.

In addition to design alternatives for each of these reaches, this IER considers three new alignment alternatives where new alignments supersede existing protection. These new alignments each decrease the total length of protection needed, but would disturb habitat and require new closure structures⁵ and pumping stations.

IER #17 has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) 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 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.

⁴ Fronting protection is the extension of a floodwall across the front (or outflow side) of a pumping station. A major feature of fronting protection is sluice, or vertical-lift, gates installed on the outflow pipes that prevent backflow through the pumps in case of breakdown.

⁵ Closure structures are floodgates within a waterway that permit continued navigation. The structures remain open until a storm approaches and have the ability to hold back higher water from either direction when closed.

The CEMVN implemented Alternative Arrangements on 13 March 2007, under the provisions of the CEQ Regulations for Implementing the NEPA (40 CFR §1506.11). This process was implemented in order to expeditiously complete environmental analysis for any changes to the authorized system and the 100-year level of the Greater New Orleans Hurricane and Storm Damage Risk Reduction System (GNOHSDRRS), formerly known as the Hurricane Protection System (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 the official record. After the 30-day comment period, and public meeting if requested, the CEMVN District Commander will review all comments received during the review period and make a determination if they rise to the level of being substantive in nature. If comments are not considered to be substantive, the District Commander will make a decision on the proposed action. This decision will be documented in an IER Decision Record. If a comment(s) is determined to be substantive in nature, an Addendum to the IER will be prepared and published for an additional 30-day public review and comment period. After the expiration of the public comment period the District Commander will make a decision on the proposed action. The decision will be documented in an IER Decision Record.

1.1 PURPOSE AND NEED FOR THE PROPOSED ACTION

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 Company Canal area. The proposed action results from a defined need to reduce flood risk and storm damage to residences, businesses, and other infrastructure from hurricanes (100-year storm events) and other high water events. The completed GNOHSDRRS would lower the risk of harm to citizens, and damage to infrastructure during a storm event. The safety of people in the region is the highest priority of the CEMVN.

1.2 AUTHORITY FOR THE PROPOSED ACTION

The authority for the proposed action was provided as part of a number of hurricane protection projects spanning southeastern Louisiana, including the 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 Water Resources Development Act (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 of 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 (5th Supplemental - P.L. 110-28, Title IV, Chapter 3, Flood Control and Coastal Emergencies, Section 4302).

1.3 PRIOR REPORTS

The CEMVN and others have prepared a number of studies and reports on water resources development in the vicinity of the study area. Previous Federal and non-Federal studies have established an extensive database and are hereby incorporated by reference.

Studies and Reports on West Bank Hurricane Protection:

- On 26 August 2008, the CEMVN signed a Decision Record on IER #14, entitled, "Individual Environmental Report, West Bank and Vicinity, Westwego to Harvey Levee, Jefferson Parish, Louisiana." The document was prepared to examine the potential environmental impacts associated with the proposed construction and maintenance of 100-year level of protection along the WBV, Westwego to Harvey Levee project area.
- On 12 June 2008, the CEMVN signed a Decision Record on IER #15, entitled "Individual Environmental Report, West Bank and Vicinity, Lake Cataouatche Levee, Jefferson Parish, Louisiana." The document was prepared to examine the potential environmental impacts associated with the proposed construction and maintenance of 100-year level of protection along the WBV, Lake Cataouatche Flood Damage Reduction project area.
- On 30 May 2008, the CEMVN signed a Decision Record on IER #22 entitled "Government Furnished Borrow Material, Plaquemines and Jefferson Parishes, Louisiana." The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE as a result of excavating borrow areas for use in construction of the GNOHSDRRS.
- On 6 May 2008, the CEMVN signed a Decision Record on IER #23, entitled "Final Individual Environmental Report, Pre-Approved Contractor Furnished Borrow Material #2, St. Bernard, St. Charles, Plaquemines Parishes, Louisiana, and Hancock County Mississippi." The document was prepared to evaluate the potential impacts associated with

the actions taken by commercial contractors as a result of excavating borrow areas for use in construction of the GNOSDRRS.

- On 14 March 2008, the CEMVN signed a Decision Record on IER #11 (Tier 1) entitled "Improved Protection on the Inner Harbor Navigation Canal, Orleans and St. Bernard Parishes, Louisiana." The document was prepared to evaluate potential impacts associated with building navigable and structural barriers to prevent storm surge from entering the Inner Harbor Navigation Canal from Lake Pontchartrain and/or the Gulf Intracoastal Waterway-Mississippi River Gulf Outlet-Lake Borgne complex. Two Tier 2 documents discussing alignment alternatives and designs of the navigable and structural barriers, and the impacts associated with the exact footprint are being completed.
- On 21 February 2008, the CEMVN signed a Decision Record on IER # 18 entitled "Government Furnished Borrow Material, Jefferson, Orleans, Plaquemines, St. Charles, and St. Bernard Parishes, Louisiana." The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE as a result of excavating borrow areas for use in construction of the GNOHSDRRS.
- On 14 February 2008, the CEMVN signed a Decision Record on IER # 19 entitled "Pre-Approved Contractor Furnished Borrow Material, Jefferson, Orleans, St. Bernard, Iberville, and Plaquemines Parishes, Louisiana, and Hancock County, Mississippi." The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors as a result of excavating borrow areas for use in construction of the GNOHSDRRS.
- In March 2007, in response to imminent threat of flooding due to potential failure of the Company Canal Floodwall, the CEMVN prepared a memorandum (USACE, 2007) documenting the threat and determined that construction of a barge gate closure structure at the southern terminus of the Company Canal was the best engineering solution to address the situation in a timely manner. Engineering Regulation 200-2-2, Environmental Quality, Procedures for Implementing the National Environmental Policy Act, states that District Commanders may respond to emergency situations to prevent or reduce imminent risk of life, health, property, or severe economic losses in advance of compliance with the documentation and procedural requirements of NEPA. The CEMVN Environmental Planning & Compliance Branch made a determination that the proposed emergency actions at the Company Canal were not anticipated to have significant impacts to the human environment. Decisions to address the permanent repair for the protection of the Company Canal will be made based on this IER wherein the purposes and intent of NEPA are being addressed.
- In July 2006, the CEMVN signed a Finding of No Significant Impact (FONSI) on an EA # 433 entitled, "USACE Response to Hurricanes Katrina & Rita in Louisiana." The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE as a result of Hurricanes Katrina and Rita.
- On 23 August 2005, the CEMVN signed a FONSI on EA # 422 entitled "Mississippi River Levees – West Bank Gaps, Concrete Slope Pavement Borrow Area Designation, St. Charles and Jefferson Parishes, Louisiana." The report investigates the impacts of obtaining borrow material from various areas in Louisiana.
- On 19 June 2003, the CEMVN signed a FONSI on EA #373 entitled, "Lake Cataouatche Levee Enlargement." The report discusses actions to improve the existing levee from Bayou Segnette State Park to the Lake Cataouatche Pumping Station, Jefferson Parish.

- The Final EIS for the WBV, Lake Cataouatche, Hurricane Protection Project was completed. A ROD was signed by CEMVN in September 1998.
- The CEMVN completed a Post-Authorization Change Report and Environmental Impact Statement (EIS) titled, “Westwego to Harvey Canal, Louisiana Hurricane Protection Project Lake Cataouatche Area” (1996). The Final EIS and record of decision (ROD) examined 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.
- 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 CEMVN 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 recommended that the existing West Bank Hurricane Protection Project, Jefferson Parish, be modified to provide additional hurricane protection east of the Harvey Canal. The project was authorized by the WRDA of 1996.
- The CEMVN 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 CEMVN reconnaissance report titled, “Jefferson and Orleans Parishes, Louisiana Urban Flood Control and Water Quality Management” (1992) authorized to investigate 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 the CEMVN in February 1992. This study investigated 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.
- In December 1986, the CEMVN completed a Feasibility Report and EIS entitled, “West Bank of the Mississippi River in the Vicinity of New Orleans, La.” 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 report recommends implementing a plan that would provide the standard project hurricane (SPH) level of protection to an area on the west bank between Westwego and the Harvey Canal north of Crown Point. The project was authorized by the WRDA of 1986 (P.L. 99-662). Construction of the project was initiated in early 1991.
- In 1984, a feasibility report titled, “Louisiana Coastal Area, Freshwater Diversion to Barataria and Breton Sound Basins” was completed by the CEMVN that recommended 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, and tributary to, Bayou Segnette.

- 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 below Cairo, Illinois. The levees 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 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 the CEMVN. A notice of availability will be mailed/e-mailed to interested parties advising them of the availability of the draft CED for review. Additionally, a notice will be placed in national and local newspapers. Upon completion of the 60-day review period, all comments will be compiled and appropriately addressed. Upon resolution of any comments received, a final CED will be prepared, signed by the District Commander, and made available to any stakeholders requesting a copy.

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

IERs 1 through 17 are being prepared to address different reaches of the GNOHSDRRS for New Orleans and IER 21 will address mitigation efforts for WBV projects. Figure 3 depicts the various reaches and their respective IERs.

1.5 PUBLIC CONCERNS

The foremost public concern is reducing risk of hurricane, storm, and flood damage for businesses and residences, and enhancing public safety during major storm events in the Greater New Orleans metropolitan area. Hurricane Katrina forced most Jefferson Parish residents from their homes, and, due to extensive flooding, made the timely return to their homes unsafe. Additional concerns have been expressed about impacts to wetlands and aquatic ecology as well as noise from construction activities. Public concerns have also been identified regarding the criteria for selection and the increase in local traffic from the use of borrow areas on the west bank.

1.6 DATA GAPS AND UNCERTAINTY

The CEMVN has not completed identification of the source for levee material (i.e., borrow areas) to be used. In IERs #18, #19, #22, #23, #25, and #26, the CEMVN is examining issues

associated with the identification of acceptable borrow materials. Additionally, in IER #24, the CEMVN is examining issues associated with stockpile of borrow material.

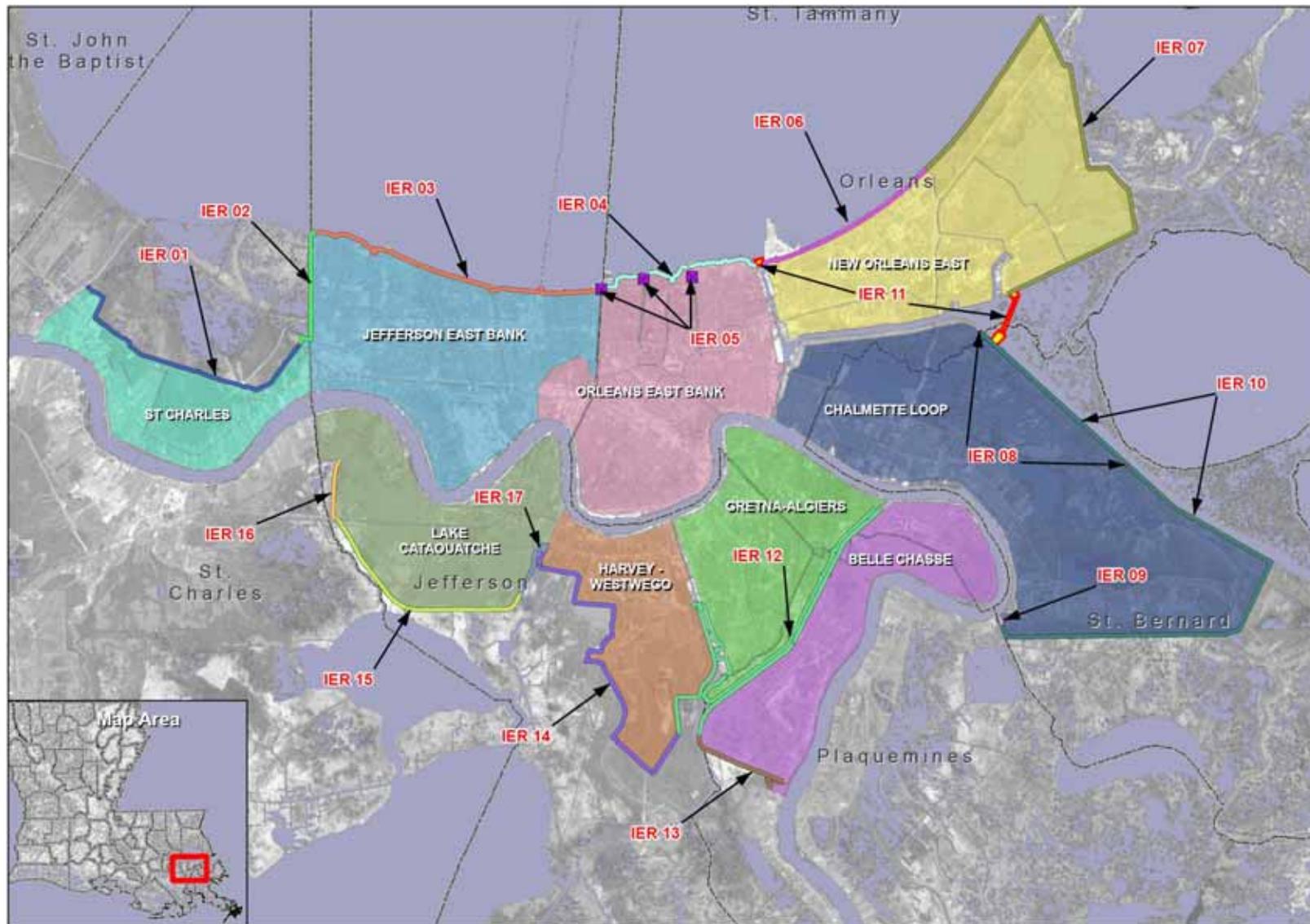
Large quantities of other construction materials (e.g. concrete, sheet pile and riprap) would be delivered to the project area, as well as to other on-going 100-year level of protection projects in the New Orleans Metropolitan Statistical Area (MSA). The sources for these materials and the transportation routes for delivering them have not been completely determined. Transportation of all materials to construction sites could have localized short-term impacts to transportation corridors that cannot be quantified at this time.

In addition, design reports for the reaches covered in IER #17 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 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.

Only limited data are available for the project area's post-Hurricane Katrina socioeconomic status. The recovery effort is on going and the status of jobs, economic growth, housing, education and business success are rapidly changing. The information that exists does not address the resources in detail. Any additional environmental justice data relating to the IER #17 project area will be incorporated into the CED.

Figure 3. 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 WRDA of 1974 (PL 93-251) requires Federal agencies to give consideration to non-structural measures to reduce or prevent flood damage. The CEMVN Project Delivery Team (PDT) considered the No Action alternative and non-structural measures in this IER, discussed in sections 2.3.1 and 2.5.2, respectively.

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

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

Alternatives:

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

Alternative Scales:

- Earthen Levee
- Floodwall
- Earthen Levee with Floodwall
- Earthen Levee using Deep Soil Mixing
- Closure Structures (e.g., miter gate, sector gate)

In addition to this standard set of action alternatives common to all reaches, different structural scales or combinations of scales were formulated to address reach-specific opportunities and constraints. Once a full range of scales was established for each reach, a preliminary screening was conducted to identify those scales that would proceed through detailed analysis. The criteria used to make this determination included engineering effectiveness, economic efficiency, and environmental and social acceptability. Those scales that did not adequately meet all of these criteria were considered infeasible and therefore were eliminated from detailed study in this IER. The remaining feasible scales, or combinations of scales, were combined to create the alternatives for detailed evaluation in the IER. Section 2.1.1 summarizes the reach-specific opportunities and constraints, identifies the reach-specific scales evaluated for feasibility, and selects the reach-specific scale that will be assessed in detail.

2.1.1 Reach-Specific Alternative Alignment and Alternative Scale Screening

2.1.1.1 Reach 1

The feasibility of alignment alternatives and alternative scales within reach 1 are limited on the flood side by the open water in the Outer Cataouatche Canal as well as 20 waterfront cabins between the existing floodwall and the Outer Cataouatche Canal. The alignment alternatives and alternative scales feasible on the protected side are limited by underground and overhead utilities, a small pumping station on the southwestern end, recreational amenities (e.g., RV camping area, swimming pool) in the Bayou Segnette State Park, and foundation requirements as the alignment passes beneath the elevated Lapalco Boulevard.

Five different measures were considered and evaluated to determine which alternative scale would be selected for the design in reach 1. The descriptions all begin with the measure at the southern end of reach 1 where the measure would tie into the existing Lake Cataouatche Levee (IER #15). The top elevation for all of the measures considered for reach 1, whether floodwall or levee, would be approximately +14 feet NAVD 88.

1. Floodwall – this measure would have a floodwall constructed along the entire approximately 8,000 foot length of reach 1 on the existing project centerline. Because of the need to move utilities and a service road, a variable width of 100-200 feet of ROW would be required on the protected side, south of Lapalco Boulevard and an area of approximately 12 parking spaces within the existing boat launch parking lot would be needed north of Lapalco Boulevard.
2. Reinforced Earthen Levee and Intermittent Floodwalls – this measure would consist of a combination of floodwall at the northern and southern ends of reach 1 with reinforced earthen levee in between. The southernmost floodwall would be approximately 900 feet long originating from the existing Lake Cataouatche Levee (IER #15) and continuing on the existing project centerline. After the 900 feet of floodwall, the alignment would transition to reinforced levee with a 45 foot protected side shift for approximately 4,800 feet. At the end of the levee section, the alignment would again transition to floodwall for the remaining 2,300 feet of reach 1 ending at the Bayou Segnette Pumping Stations fronting protection. This measure would require a total of approximately 300 feet of ROW on the protected side and approximately 12 parking spaces within the existing boat launch parking lot would be needed for ROW north of Lapalco Boulevard.
3. Reinforced Earthen Levee and Floodwalls – this measure would consist of reinforced earthen levee with a floodwall at the northern end of reach 1. The alignment would begin as a transition from Lake Cataouatche Levee (IER #15) to a reinforced levee with a 45-foot protected side shift and would proceed for approximately 6,800 feet. At the end of the levee section, the alignment would again transition to floodwall for the remaining 1,200 feet of reach 1 ending at the Bayou Segnette Pumping Stations fronting protection. This measure would require a total of approximately 300 feet of ROW on the protected side and approximately 12 parking spaces within the existing boat launch parking lot would be needed for ROW north of Lapalco Boulevard.
4. Full Earthen Levee and Northern End Floodwall – this measure would be a full earthen levee on the southern end and a floodwall from the Lapalco Boulevard Bridge north. The full earthen levee would originate at the existing Lake Cataouatche Levee (IER #15) and proceed approximately 6,800 feet north. The full earthen levee would be a protected-side shift with a base width of approximately 180 feet. To accommodate the levee, the existing protected-side canal would be shifted away from the toe of the new levee. Construction

would extend into the existing campground and other park amenities. At the end of the full levee section (just south of the Lapalco Boulevard Bridge) the alignment would transition to floodwall on approximately the current floodwall centerline and continue for approximately 1,200 feet to end of reach 1 at the Bayou Segnette Pumping Stations. The full levee would require approximately 400 feet of ROW on the protected side; ROW requirements for the floodwall on the northern end would require the taking of approximately 12 spaces within the existing boat launch parking lot north of Lapalco Boulevard.

5. Deep Soil Mix Levee and Northern End Floodwall - this measure would be a deep soil mixed levee on the southern end and a floodwall from the Lapalco Boulevard Bridge north. The deep soil mixed levee would originate at the existing Lake Cataouatche Levee (IER #15) and proceed approximately 6,800 feet north. The deep soil mixed levee would be a protected-side shift with a base width of approximately 100 feet and would require approximately 235 feet of protected side ROW. At the end of the deep soil mixed levee section (just south of the Lapalco Boulevard Bridge) the alignment would transition to floodwall on approximately the current floodwall centerline and continue approximately 1,200 additional feet to end of reach 1 at the Bayou Segnette Pumping Stations. Approximately 12 parking spaces in the boat launch parking lot would be lost as a result of project construction.

A decision matrix was used by the PDT to recommend the proposed action for this reach. Risk and reliability, environmental factors, time, cost, and operations and maintenance were categories used in the matrix that were compared and weighted. The factors were rated and measured according to their weight criteria, and the PDT chose the measure with the highest ranking score. Measure number 1, floodwall throughout the reach, rated the highest and will be considered in detail as the proposed action for reach 1.

2.1.1.2 Reach 2

The feasibility of alignment alternatives and alternative scales within reach 2 are limited by the space available and the need to integrate the 100-year level of protection into the operational requirements of the pumping station. Through this reach, different scales were considered that would maximize levee, minimize floodwall, and maintain the ability to keep the pumping stations and the drainage basins they serve operating. However, because of the limited space available and the operational requirements, the only scale that may be implemented for the pumping station fronting protection would be floodwall.

The proposed 100-year measure for reach 2 is to construct a continuous line of flood protection, connecting to new flood protection on each side of the Bayou Segnette pumping stations. This protection includes pile-founded reinforced concrete floodwalls constructed to elevation +16.0 feet NAVD 88 across the pump station, discharge basin, and as the tie-in walls. Additional wall height (+2 feet NAVD 88) is included for the walls within the pumping station, discharge basin, and tie in-walls. This additional height is referred to as “structural superiority.” Structural superiority means constructing a floodwall higher than recommended engineering standards, because of the difficulty in constructing it around the existing pump station and providing future maintenance. Any future construction would cause a major disruption in the pumping station fronting protection. The other alignment alternatives and alternative scales were excluded from detailed consideration because they failed to meet the engineering effectiveness and economic efficiency criteria.

2.1.1.3 Reach 3

Different alignments and scales were considered for the floodwall surrounding the Company Canal (reach 3) that would provide the 100-year elevation and not interfere with the commercial activities. However, because of the proximity of roads, residences, and businesses around the canal perimeter, the only scale that may be implemented for reach 3 would be a new floodwall on approximately the existing alignment.

The narrow width of the Company Canal renders all alignment alternatives based on flood-side growth infeasible. The proximity to local roads, residences, and commercial interests render all alignment alternatives and alternative scales other than a floodwall on the existing alignment (around the perimeter of the Company Canal) infeasible on the basis of economic efficiency and social acceptability.

2.1.1.4 Reach 4

Because reach 4 is the fronting protection for the Old Westwego Pumping Station, the feasibility of alignment alternatives and alternative scales are similar to reach 2. Different scales and alignments were considered that would provide the 100-year elevation, yet minimize interference during construction. However, because of the limited space available and the operational requirements for the Old Westwego Pumping Station, the only scale that may be implemented for fronting protection would be floodwall on the existing alignment.

The proposed 100-year measure for reach 4 is to construct a continuous line of floodwall, connecting to new floodwall on each side of the pumping station. This floodwall uses pile founded reinforced concrete floodwalls constructed to elevation +16.0 feet NAVD 88 across the pump station, discharge basin, and as the tie in walls. The additional wall height (+2 feet NAVD 88) is included for the walls within the pumping station, discharge basin, and tie in-walls for structural superiority. This scale and alignment was selected because of engineering effectiveness and economic efficiency criteria.

2.1.1.5 Reach 5

The feasibility of alignment alternatives and alternative scales within reach 5 are limited on the flood side by the open water and wetlands of the Westwego Canal and Bayou Segnette and on the protected side by the sewage treatment plant north of Lapalco Boulevard, the protected-side canal south of Lapalco Boulevard, and foundation requirements as it passes beneath the elevated section of Lapalco Boulevard.

The proposed 100-year measure for reach 5 is a floodwall on the existing alignment constructed to +14 feet NAVD 88. The open water and wetlands on the flood side, sewage treatment plant and canal on the protected-side render all alignment alternatives and alternative scales other than a floodwall on the existing alignment infeasible on the basis of economic efficiency and social acceptability.

2.1.1.6 Reach 6

Because of the limited space available and the operational requirements for the New Westwego Pumping Station, the only scale that may be implemented for fronting protection would be floodwall on the existing alignment because of engineering effectiveness and economic efficiency criteria.

The proposed 100-year measure for reach 6 is to construct a continuous line of floodwall, connecting to new floodwall on each side of the pumping station. This floodwall uses pile founded reinforced concrete floodwalls constructed to elevation +16.0 feet NAVD 88 across the pump station, discharge basin, and at the tie-in walls. The additional wall height (+2 feet NAVD 88) is included for the walls within the pumping station, discharge basin, and tie-in walls for structural superiority.

2.1.1.7 New Alignments

Because of the cost and limited real estate available to construct and maintain the 100-year elevation around the perimeter of the Company Canal, three new structural alignments (that each cut off reach 3) are being considered in detail. All of the new alignments being considered meet the engineering effectiveness, economic efficiency, and environmental and social acceptability criteria as well as providing an area of safe harbor for the Company Canal fleet during storms. These new alignments are featured as elements of alternatives 2, 3, and 4 and are described in detail in Section 2.3.3-2.3.5.

2.2 DESCRIPTION OF THE ALTERNATIVES

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

As such, the alternatives description that follows is organized by reach, noting those alternatives that are common among all reaches. The alternative description also states how each alternative relates to the range of alternatives for adjacent reaches, to insure awareness of the GNOHSDRRS as a whole.

2.3 ALTERNATIVES

2.3.1 No Action

Under the no action alternative, the proposed 100-year level of the GNOHSDRRS would not be constructed by the CEMVN in this portion of the WBV Project. As a result, the line of protection would be only at the previously authorized elevation (typically +9 feet NAVD 88) and would therefore be 3-4 feet lower than the proposed 100-year level of protection. The routine maintenance and replacement-in-kind actions for the existing levee, floodwall, and pumping stations would continue and operations would continue unchanged from the current conditions.

2.3.2 Alternative 1 – Improved Parallel Protection

As depicted in figure 4, alternative 1 would include the removal and replacement of the existing Company Canal Floodwall with a new floodwall constructed on the existing alignment to the 100-year elevation for all reaches (1 through 6). The existing floodwall would be replaced with new floodwall (see figure 5 for an illustration of a typical floodwall) to +14.0 NAVD 88 elevation for reaches 1, 3, and 5 and +16.0 feet NAVD 88 elevation for reaches 2, 4, and 6. This

new floodwall would be approximately 8,000 feet in length. The reach-specific actions necessary to complete alternative 1 are described below.

The proposed alignment would require an expansion of the protected side ROW between 90 and 250 feet. This expansion is necessary to accommodate relocated utilities, a relocated access road, stability berms, necessary grading, and provide for protected side drainage within reach 1. South of Lapalco Boulevard, this ROW would shift to between 200 and 300 feet (on the protected side) from the existing floodwall centerline. Pedestrian and vehicular gates through the floodwall would be included to provide access to recreational amenities within the park.

All vegetation between the existing floodwall and the existing borrow canal would be cleared and grubbed prior to construction. The majority of this area is already mowed grass; however, along the transition from the maintained mowed grass to the open water of the borrow canal, there is a narrow strip of wetlands vegetation that would be cleared and grubbed. Woody material removed from this location would be windrowed and burned in place. Including the entire distance of the protected side canal, the area that would be affected is approximately 5.5 acres of wetlands. Final grading plans could require the placement of fill a short distance into the open water of the existing canal. The need to place these materials is not certain at this time, but could conservatively result in the filling of up to 5 additional acres of open water.

North of Lapalco Boulevard, the floodwall would approximately follow the existing floodwall alignment and would require a small expansion of the ROW into the boat launch parking lot (eliminating about 12 parking spaces). All other construction within reach 1 would be completed within the existing ROW and within areas previously disturbed and currently maintained.

Constructing new floodwall on the existing alignment through reach 1 would require:

- Obtaining approximately 40 acres of new ROW,
- Clearing and grubbing approximately 5.5 acres of wetlands,
- Removing approximately 15,000 cubic yards (cy) of woody debris and organic material from the site for disposal,
- Demolishing the existing floodwall and removing the approximately 30,000 cy of concrete rubble offsite for reuse or disposal,
- Extracting the approximately 500,000 linear feet of sheetpile from the existing floodwall for offsite reuse or disposal,
- Placing approximately 350,000 square feet of sheet pile, 125,000 linear feet of H-pile, and 100,000 linear feet of pipe pile,
- Pouring approximately 20,000 cy of concrete,
- Compacting and grading approximately 150,000 cy of earthen material,
- Filling approximately 5 acres of open water of the existing protected side canal,
- Relocating overhead electrical utilities and underground sewer and water supply parallel to the new floodwall,
- Modifying the Bayou Segnette State Park boat launch access and parking area resulting in approximately 12 fewer parking spaces, and
- Working 60-hour workweeks for approximately 8 to 12 months.

Constructing the remaining reaches of alternative 1 (reaches 2 through 6) to the 100-year elevation would occur within previously disturbed areas and constructing the floodwall reaches between the pumping stations (3 and 5) would occur within existing ROW. Floodwall batter piles used to anchor the floodwall in reach 3 would extend beyond the available public ROW and pile tip easements (subsurface) would be required along the Company Canal. Additional

temporary and permanent ROW would be needed for construction at all three pumping stations as listed below.

Construction of most of the floodwall would be performed in dry conditions without the need of temporary retaining structures. The floodwall on the west side of Company Canal could require a shallow sheet pile wall on the flood side to keep the excavation dry. Construction along Company Canal would limit land access to the existing docks servicing the fishing fleet and would have to be phased to accommodate the fleet. Driving of piles from a floating platform may be considered; however, the platform cannot obstruct the fishing fleet and swamp tour businesses from access to Company Canal. Construction could begin at any of the pumping stations and proceed along the proposed alignment with the reaches being worked on concurrently. Assuming a 60-hour work week, reaches 2-6 would require approximately 14 months for construction.

Because of the extent of floodwall for this alternative, approximately 300,000 linear feet of H-pile as well as nearly 400,000 square feet of sheet pile would need to be driven deep into the ground during construction. Sheet and pile driving would be assumed to occur during the entire 16-hour workday throughout the entire construction duration.

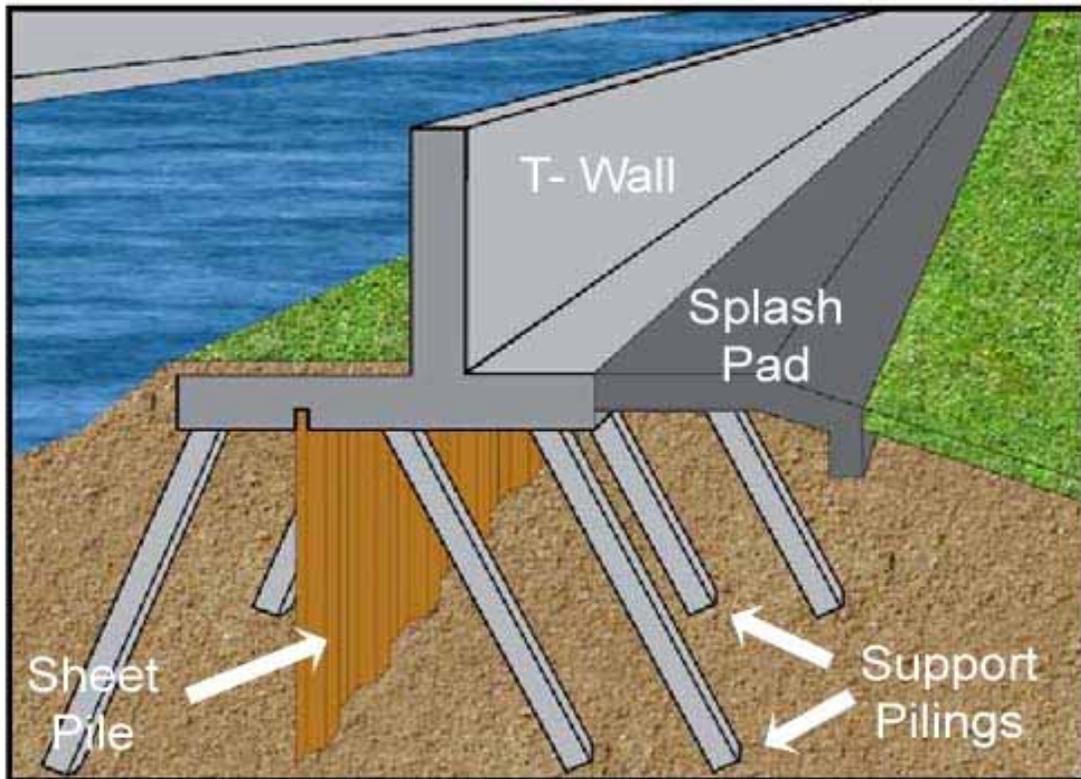
Constructing reaches 2 through 6 would require:

- Acquiring less than 1 acre of ROW for both the additional temporary construction easement on the protected side and the additional permanent ROW on the flood side for the Bayou Segnette Pumping Stations fronting protection (reach 2),
- Acquiring approximately 2 acres for permanent ROW and less than 1 acre for temporary construction easement for the Old Westwego Pumping Station fronting protection (reach 4),
- Acquiring approximately 1 acre of permanent ROW and approximately ¼ acre of construction easement for the New Westwego Pumping Station fronting protection (reach 6),
- Little to no additional clearing and grubbing,
- Minimal to no loss of habitat as areas to be used for construction are already disturbed or maintained for hurricane damage risk reduction purposes,
- Pouring approximately 20,000 CY of concrete, and
- Placing more than 300,000 linear feet of pile and 400,000 square feet of sheet pile.

Figure 4. Alternative 1 - Improved Parallel Protection



Figure 5. Typical T-wall Section



2.3.3 Alternative 2 – New Alignment North of Lapalco Boulevard

Alternative 2 would not differ from alternative 1 for reaches 1 and 2. However, within reach 3, the floodwall would depart from the existing alignment and turn east approximately 300 feet north of the Bayou Segnette Pumping Station (see figure 6). At that point, the new alignment would proceed across the open water of Bayou Segnette navigation channel in a southeast direction. This alignment would include two 24-foot vehicular swing gates (one is proposed for the existing pump station to provide access and the other is proposed where the floodwall crosses the pumping station access road), a 56-foot wide sector gate type navigation structure across a new navigation channel, approximately 1,000 to 1,200 feet of earthen levee across the existing dredge disposal island, and a new pumping station to be located on the existing dredge disposal island. All of these features would be constructed to +14.0 feet NAVD 88 except for the sector gate and pumping station fronting protection which will be constructed to +16.0 NAVD88. The alignment continues across the Westwego Canal and connects to a new floodwall within reach 5 just north of Lapalco Boulevard. The existing floodwall in reach 3 would be demolished and removed and reach 4 would not be included within the alternative 2 alignment.

The pumping station would be sized to be no less than the proposed pumping capacity of the Old Westwego Pumping Station (400 cfs). The Bayou Segnette navigation channel would be moved approximately 300 feet to the southeast and channel scour protection would be provided approximately 120 feet upstream and downstream of the closure structure extending across the navigation channel.

Construction access for equipment and materials to the site could be provided by barge access from Bayou Segnette, a pontoon bridge across Bayou Segnette, or a temporary access road on the stability berm of the proposed levee. Because the proposed location of the gated structures would be adjacent to the existing waterway with little to no room for open excavation, the structures would be constructed in a cofferdam. Due to the depth and size of the excavation, dewatering wells or well points would be continually pumped during construction to keep the area dry. Because space inside the cofferdam would be very limited, the equipment used to build the structure would be outside of the excavation on a marine plant or temporary work platform.

The alignment would cross a CEMVN dredge material disposal area designated for Operations Division use when dredging the Company Canal navigation channel through Bayou Segnette (USACE, 1989). The new alignment would require approximately 22 acres of new ROW, as none currently exists.

Construction of the earthen levee across the dredge island would require clearing and grubbing of all vegetation as well as de-mucking prior to placement of the fill material. Because the final design has not been completed, and to provide a conservative analysis of the environmental consequences, the entire dredge disposal island was assumed to be cleared and grubbed, excavated, inundated, or otherwise permanently disturbed from the existing conditions and all habitat on the approximately 19-acre dredge island would be permanently destroyed. Woody material cleared from the dredge disposal island would be windrowed and burned in place.

The construction would likely begin with building of the temporary retaining structure and miter gate. Following completion of the miter gate, the existing navigation channel would be relocated (i.e., dredged) approximately 300 feet to the east. The dredge material would be placed adjacent to the new navigation channel on the existing dredge disposal island. After construction was completed along the relocated navigation channel, including the closure gate and riprap, construction would proceed with the construction of the new pumping station followed by the completion of the new alignment. Assuming a 60-hour workweek, approximately 13 months would be needed to complete construction.

Construction of reaches 1, 2, and 6 would be identical to those for alternative 1; however, the following additional quantities would be required to construct the remainder of alternative 2:

- Acquiring approximately 22 acres of permanent ROW,
- Clearing, grubbing, and de-mucking 19 acres of cypress swamp (the entire dredge disposal island),
- Generating approximately 60,000 cy of woody debris and organic material,
- Dredging approximately 95,000 cy of earthen material to shift the navigation canal,
- Pouring approximately 17,000 cy of concrete and placing 11,000 tons of stone and rip-rap,
- Compacting approximately 115,000 cy of earthen material for the levee, and
- Placing more than 180,000 linear feet of pile and 290,000 square feet of sheet pile.

Figure 6. Alternative 2 - New Alignment North of Lapalco Boulevard



2.3.4 Alternative 3 – New Alignment South of Lapalco Boulevard

Alternative 3 is conceptually similar to alternative 2, but would cross Bayou Segnette south of the Lapalco Boulevard Bridge between Bayou Segnette State Park and the New Westwego Pumping Station. This alternative, as depicted in figure 7, would begin in reach 1 where the Lake Cataouatche Levee transitions to floodwall and would proceed approximately 5,600 feet in a northern direction to approximately the parking lot and entrance for the Bayou Segnette State Park swimming pool. In that vicinity, the alignment would turn approximately 90-degrees to the east crossing the Outer Cataouatche Canal, a dredge material disposal island, and Bayou Segnette with a new closure structure (e.g., sector gate), levee, and 2,500 cfs pumping station. Additional space considerations would also be included for the expansion of the pumping station by an additional 3,000 cfs for a total capacity of 5,500 cfs.

This alignment would require construction of approximately 450 feet of levee across a vegetated island in Bayou Segnette to the fronting protection of the New Westwego Pumping Station. Construction would be similar to construction for alternative 2 with a similarly sized closure structure (i.e., sector gate), a shorter length of levee, and a significantly larger capacity pumping station. The new alignment would require approximately 20 acres of new ROW as none currently exists.

Alternative 3 would be significantly shorter than the other alternatives because the new alignment precludes the need for floodwall for the remainder of reach 1 or reaches 2, 3, 4, or 5. This would result in no new floodwall being constructed north of the swimming pool entrance in the State Park, around the Company Canal, fronting the Bayou Segnette and Old Westwego Pumping Stations, or between the Old and New Westwego Pumping Stations. All of the existing floodwall through these reaches would still be demolished and removed.

The closure structure, pumping station, navigation channel, and levee section for alternative 3 would be constructed as they were described in alternative 2. Because the proposed location of the gated structures is adjacent to the existing waterway with little to no room for open excavation, the structures would be constructed in a cofferdam. Due to the depth and size of the excavation, dewatering wells or well points would be required to keep the construction area dry. The equipment used to build the structure would most likely be outside of the excavation on a marine plant or temporary work platform, because space inside the cofferdam would be very limited. Delivery of the majority of construction materials for this alternative would be via barge, but may also be delivered via truck.

To provide a conservative analysis of the environmental consequences, the entire island intersected by the new alignment was assumed to be permanently disturbed from the existing conditions and all habitats on the approximate 13.5-acre area would be permanently destroyed. Woody material cleared from the dredge disposal island would be windrowed and burned in place.

On the western bank of the Outer Cataouatche Canal, the closure structure would require a new navigation channel approximately 60-feet wide. Channel scour protection would be provided approximately 120 feet upstream and downstream of the structure and would extend across the navigation channel to a point a minimum of ten feet beyond the top of bank. Assuming a 60-hour workweek, this alternative would require approximately 24 to 36 months to complete construction.

The quantities of materials needed for reach 1 of alternative 3 would be slightly less than those described in alternative 1. Specifically, alternative 3 would require approximately 2,400 fewer

feet of levee and have no effect on the boat launch parking lot north of Lapalco Boulevard because the alignment would stop short of that area. The following quantities would be required to construct the remainder of alternative 3:

- Acquiring approximately 22 acres of permanent ROW,
- Clearing, grubbing, and de-mucking 13.5 acres of cypress swamp,
- Generating approximately 51,000 cy of woody debris and organic material,
- Dredging approximately 46,000 cy of material to shift the navigation canal,
- Pouring approximately 11,000 cy of concrete and placing 9,300 tons of stone and rip-rap,
- Compacting approximately 72,000 cy of earthen material for levee, and
- Placing approximately 40,000 linear feet of pile and 115,000 square feet of sheet pile.

Figure 7. Alternative 3 - New Alignment South of Lapalco Boulevard



2.3.5 Alternative 4 – Company Canal Closure Structure Upgrade

Alternative 4 (see figure 8) would be identical to alternative 1 for reaches 1, 2, 4, 5, and 6. However, for alternative 4, reach 3 would not consist of new floodwall surrounding the Company Canal as described for alternative 1. Instead, the existing closure structure (barge gate) at the southern terminus of the Company Canal would be upgraded to the 100-year level of protection, obviating the need for the floodwall around the perimeter of the Company Canal.

This alternative would require demolition and replacement of floodwall to the 100-year elevations for reaches 1, 2, 4, 5, and 6 and then retrofitting the recently completed +9-foot NAVD 88 elevation swing barge gate to a sector gated structure; the retrofit would provide the 100-year level of protection to an elevation of approximately +14 to +15 feet NAVD 88. Construction could begin at either end and proceed along the proposed alignment with the segments worked on concurrently. However, the work at the mouth of the Company Canal would be staged to accommodate the fishing fleet when possible.

The modification of the closure gate would necessitate moving the Old Westwego Pump Station discharge canal approximately 50 feet to the south. This would require dredging a new approximately 600-foot long discharge canal through a portion of the dredge material disposal island. Approximately 2 acres of permanent ROW would be acquired and the area would be cleared and grubbed and the channel dredged through the cypress swamp habitat. Woody material cleared from the dredge disposal island would be windrowed and burned in place. Materials dredged would be side cast and left in place.

Because of the upgraded closure structure, the approximately 3,300 linear feet of floodwall surrounding the Company Canal in reach 3 would not be constructed. However, as in alternative 1, the existing floodwall surrounding the Company Canal would be demolished. Assuming a 60-hour workweek, this alternative would require approximately 10 to 18 months to complete construction.

In addition to the quantities needed to construct reaches 1, 2, 4, 5, and 6 (as indicated in alternative 1), alternative 4 would require:

- Acquiring approximately 2 acres of permanent ROW for the Old Westwego Pumping Station discharge canal,
- Clearing, grubbing, and de-mucking 2 acres of cypress swamp,
- Generating approximately 5,000 cy of woody debris and organic material, and
- Dredging approximately 10,000 cy of material while excavating the discharge canal to be side cast in place.

Figure 8. Alternative 4 - Company Canal Closure Structure Upgrade



2.3.6 Actions Common to All Alternatives

2.3.6.1 2007 Emergency Company Canal Barge Gate and Floodwall Work

In 2007, the CEMVN determined that the floodwall surrounding the Company Canal was not in adequate condition to achieve the authorized level of protection (USACE, 2007) and took emergency actions by constructing a barge gate structure at the southern terminus of Company Canal (see appendix E for the Commander's determination of imminent threat) and various other actions to the Old and New Bayou Segnette Pumping Station and the floodwall surrounding the Company Canal necessary to provide hurricane damage risk reduction to residents and businesses from storm surges from Lakes Cataouatche and Salvador .

Coordination with the public (Public Notice, 2007; 2007a) and formal consultation with the appropriate resource agencies was completed (USACE, 2007b; USACE, 2007c; LDNR, 2007; LDEQ, 2007; USFWS, 2007; SHPO, 2007). However, compliance with the requirements of NEPA was incomplete, as neither an Environmental Assessment nor an Environmental Impact Statement was prepared prior to taking the emergency action. This IER will serve to document the environmental consequences of constructing the barge gate and improvements to the Company Canal floodwall. Section 3 (affected environment and environmental consequences) includes the environmental consequences to the significant resources from taking these emergency actions. Construction included the following:

- A floating barge gate and sheet pile/kicker pile system across mouth of the Company Canal;
- A vehicular gate and sheet pile/kicker pile system on the north side of Company Canal to the existing levee reach;
- A kicker pile wall system in front of Old Bayou Segnette Pumping Station;
- A kicker pile wall and I-wall between New Bayou Segnette Pumping Station and the Company Canal floating barge gate;
- An embankment to stabilize the existing concrete floodwall surrounding the Company Canal to the Old Westwego Pumping Station;
- A lift gate at the existing sheet pile opening at Old Bayou Segnette Pumping Station;
- An embankment and riprap to stabilize existing sheet pile walls at the Old Bayou Segnette Pumping Station; and
- Other associated work included excavation of waterbottoms, embankment, rock surfacing, riprap, concrete slope paving and miscellaneous construction.

The final height of the wall system was constructed to a design elevation final grade of +9.0 feet NAVD 88 and required that approximately 1,000 cy of earthen material be excavated from Company Canal and deposited in an approved commercial disposal area. In addition, about 2,500 cy of stone and 11,000 cy of embankment were hauled in for use in the construction.

2.3.6.2 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 transition into any hardened feature such as other levees, floodwalls, pumping stations, etc.), utility pipeline crossings, floodwall protected side slopes, and earthen levees that are exposed to wave and surge overtopping during a 500-year hurricane storm event. Specific locations have not been fully identified.

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.

2.3.6.3 Company Canal I-Wall Removal

For each of the action alternatives considered, the existing I-wall surrounding the Company Canal (approximately 4,500 linear feet) would be removed and disposed of off site. This removal would include both the floodwall itself and the rip rap/grout placed at the base of the floodwall for stability. Up to 9,000 cy of material would be generated by this demolition and removal, but much of the material could be re-used on other WBV projects.

2.3.6.4 Deep Soil Mixing

Deep soil mixing is being used on 3 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 methods⁶ have demonstrated that they can be used to substantially raise the in

⁶ 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.

situ shear strength of the soil several orders of magnitude. Deep soil mixing is substantially more expensive than typical levee construction. 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. With the current extent of engineering completed for IER #17, deep soil mixing could likely be used to construct the flood protection from the New Westwego Pumping Station to the Lapalco Bridge and south of the Lapalco Bridge within the Bayou Segnette State Park. If detailed engineering and subsequent soil borings dictate use of the technique, the overall construction effects assessed in this IER would encompass the environmental consequences of implementing deep soil mixing.

2.3.6.5 Staging Areas

Construction equipment and material staging areas would be established to implement any of the alternatives. Staging areas would be established within the existing or newly established ROW and areas previously disturbed.

2.3.6.6 Relocations

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

2.3.6.7 Operations and Maintenance

In addition to the activities necessary to construct these features, this proposal 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. All of these actions would be assumed included in the proposed action.

Operation and maintenance 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 the adding of 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 repair work.

2.3.6.8 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 would be 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 pounds per square inch (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 time they were required. It would be the responsibility of the contractor to 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, from whatever sources throughout the life of this project. 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 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, and 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 PROPOSED ACTION

The proposed action for IER #17 is alternative 2, the new alignment north of Lapalco Boulevard. This alternative was selected primarily on the basis of engineering effectiveness, economic efficiency, and social acceptability. This alternative would avoid the residential and commercial area around the Company Canal, minimizing potential construction conflicts with the fishing fleet and the adjacent property owners. In addition, this alternative would provide a safe harbor for commercial and recreational boats during storm events. Construction of the new alignment, sector gate, and pumping station would be in an undeveloped area previously designated for disturbance as a dredge material disposal area. This alternative would also only require a 400 cfs pumping station whereas alternative 3, while a shorter length of alignment, would require a much larger capacity (2,500 cfs, with future upgrading to 5,500 cfs), and therefore, more expensive pumping station that requires more maintenance.

2.5 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

The criteria used to determine whether an alternative would be feasible included consideration of engineering effectiveness, economic efficiency, and environmental and social acceptability. The screening and selection or elimination of alternative scales has been discussed in section 2.1. The following are alternative scales or measures that were excluded from detailed consideration for the reasons described herein.

2.5.1 Structural Flood Protection Measures

2.5.1.1 Earthen Levee with Floodwall Cap

Another structural measure considered was the construction of a floodwall cap atop a lower elevation levee. The floodwall on the levee could provide the necessary structural elevation on a smaller footprint than a levee alone would require. Constructing an earthen levee with a floodwall cap would require less earthen fill than the full levee and could be constructed entirely within the existing ROW. However, the floodwall component of the design would require hundreds of tons of structural steel (i.e., sheet pile and H-pile) as well as thousands of cubic yards of concrete.

This measure was eliminated from detailed consideration for two primary reasons: the cost and because the design does not adequately address subsidence. Although possible, adding concrete over time to a pre-fabricated floodwall would not be economically viable or a desirable construction practice. Adding subsequent height to the flood protection alignment to compensate for the subsidence would significantly increase the long-term maintenance costs. As such, this measure was eliminated from detailed consideration for failing to meet engineering effectiveness or economic efficiency criteria in the preliminary screening process.

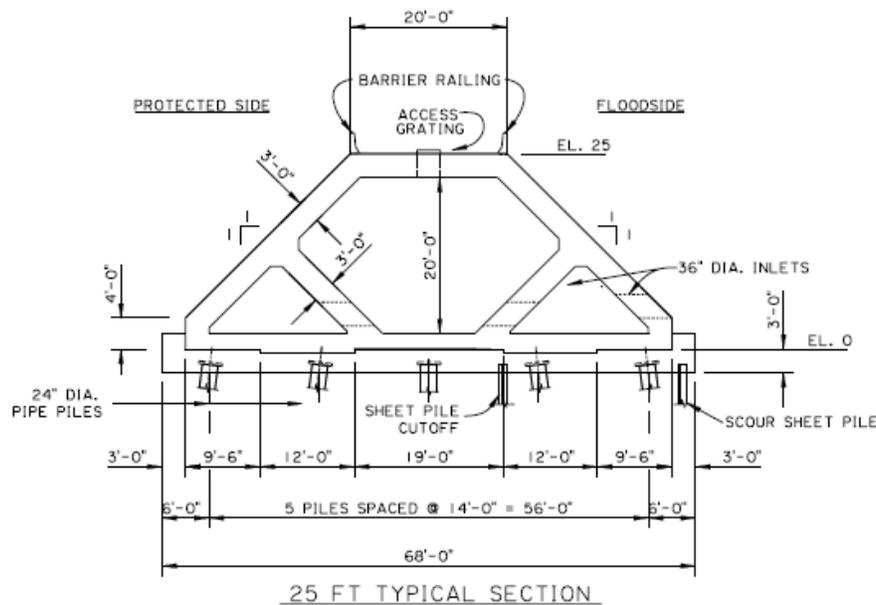
2.5.1.2 Hollow Core Levee

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 sidewalls 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 9 below.

The concrete levee section would not be advantageous to use in lieu of a traditional reinforced levee section. Earthen levees and floodwalls are both more robust and resilient than hollow core levees. In the cases where earthen levees are not feasible, floodwall would be preferred over hollow core levees for the reason of engineering effectiveness.

Figure 9. Typical Hollow Core Levee Section



2.5.2 Non-Structural Flood Protection Alternatives

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.

2.5.2.1 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 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.

2.5.2.2 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.

2.5.2.3 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 2007a)). 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.

2.6 SUMMARY

Table 1 summarizes the alternatives that were examined for each of the reaches for IER #17.

Table 1. Summary of Preliminary Alternative Screening Results

Alternative / Alternative Scales	Reach 1	Reach 2	Reach 3	Reach 4	Reach 5	Reach 6
No-Action	<input type="checkbox"/>					
Non-Structural	X	X	X	X	X	X
Existing Alignment						
• Earthen Levee	X	X	X	X	X	X
• Alternative 1: Floodwall	<input type="checkbox"/>					
• Earthen Levee with Floodwall cap	X	X	X	X	X	X
• Earthen Levee using Deep Soil Mixing	X	X	X	X	X	X
Flood-side Shift						
• Earthen Levee	X	X	X	X	X	X
• Floodwall	X	X	X	X	X	X
• Earthen Levee with Floodwall cap	X	X	X	X	X	X
• Earthen Levee using Deep Soil Mixing	X	X	X	X	X	X
Protected-side Shift						
• Earthen Levee	X	X	X	X	X	X
• Floodwall	X	X	X	X	X	X
• Earthen Levee with Floodwall cap	X	X	X	X	X	X
• Earthen Levee With Deep Soil Mixing	X	X	X	X	X	X
New Alignments						
• Alternative 2: North of Lapalco Blvd	<input type="checkbox"/>	n/a	n/a	n/a	<input type="checkbox"/>	n/a
• Alternative 3: South of Lapalco Blvd	<input type="checkbox"/>	n/a	n/a	n/a	<input type="checkbox"/>	n/a
• Alternative 4: Company Canal Closure Structure Upgrade	n/a	n/a	<input type="checkbox"/>	n/a	n/a	n/a

: considered in detail

X: eliminated from further study

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

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, to the north and east by the Mississippi River, and to the south by the Gulf of Mexico. 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 Canals, direct rainfall, pumpage from leveed areas, and the Davis Pond Freshwater Diversion Structure.

3.1.1 Terrain

The project area has little relief and is characteristic of an alluvial plain. Ground elevations slope gently from an average elevation of about +10 feet NAVD 88 along the levee of the Mississippi River to about 3 feet below sea level NAVD 88 in portions of the leveed area. Natural ground elevations in the un-leveed marsh areas in the southern part of the project area average +0.5 to +1.0 foot NAVD 88. 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. 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 natural levee, swamp, interdistributary, and prodelta deposits. Natural levee deposits at the surface and shallow subsurface are associated with Bayou Segnette, an abandoned distributary. Natural levee deposits are less than 10 feet thick and are composed of medium to stiff, oxidized clays and silt with minor organics. Swamp deposits are found at the surface and are approximately 20 feet thick. Swamp deposits are composed of soft to medium clays with some silt, peat, and wood. Interdistributary deposits approximately 30 feet 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 feet thick are located below interdistributary deposits. Prodelta deposits are generally composed of medium clay with minor amounts of silt.

The study site contains Barbary and Kenner-Allemands soils. Barbary soils are level, very poorly drained soils that have a thin mucky surface layer and clayey underlying material in swamps. Kenner-Allemands soils are level, very poorly drained soils that have a moderately thick mucky surface layer and mucky and clayey underlying material 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 feet per century. Eustatic sea level is predicted to rise an additional 1.3 feet over the next century (IPCC, 2001). Therefore, the natural, long-term, relative subsidence rate at the project site is estimated to be 1.8 feet per century. Ground subsidence related to artificial lowering of the water table within the protected area likely exceeds the natural rate of subsidence.

An erosion and sediment control plan identifying the type and location of the erosion and sediment controls would be developed and provided by the construction contractor. The plan includes monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, state, and local laws and regulations. Drawings would be included showing locations of proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.

The construction contractor's field offices, staging areas, stockpile storage, and any temporary facilities would be placed in areas as directed by the Contracting Officer. Erosion and sediment controls would be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas would be controlled to protect adjacent areas. See the United States Department of Agriculture (USDA) Soil Conservation Service manual for soil types.

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 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, 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 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 recorded in over 50 years of monitoring at the 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. In addition to the proposed action and alternatives, the effects to significant resources from the 2007 Emergency Company Canal Barge Gate construction are addressed under a separate sub-heading.

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

3.2.1 Air Quality

3.2.1.1 Existing Conditions

The US 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. 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).

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. Because Jefferson Parish is designated as an attainment area for the designated priority pollutants, no detailed conformity is required and direct significant environmental effects to air quality are not likely.

If one or more of the priority pollutants was not in attainment, then the proposed action would be subject to detailed conformity determinations unless these actions are clearly considered *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.

For all of greater New Orleans, including Jefferson Parish, all six parameters are in attainment of the air quality standards (USEPA, 2007). Because the project area is designated as an attainment area, no conformity review is required for the proposed action.

3.2.1.2 Discussion of Impacts

3.2.1.2.1 No Action

Under the no action alternative, potential direct and indirect air quality impacts associated with the construction and operation of new storm damage reduction measures in this area would not occur. However, routine maintenance of the existing floodwall and replacement-in-kind at pumping stations would generate minor equipment emissions and fugitive dust. The direct effects of these releases would be temporary and localized in the immediate work area.

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 Alternative 1 – Improved Parallel Protection

Because design reports are currently being prepared at the time this IER was being written, detailed quantification of the direct effects of emissions associated with construction of alternative 1 cannot be completed. Probable impacts to air quality would include emissions from the operation of heavy construction equipment and associated fugitive dust. However, this alternative represents the longest total length of structural protection of any of the alternatives (nearly 14,000 linear feet of alignment). The burning in place of woody material cleared within reach 1 would cause a minor and temporary decrease in air quality downwind of the burning. These impacts are anticipated to be localized and temporary.

The indirect effects to air quality of implementing alternative 1 would be related to the emissions from transportation of personnel, construction materials, and equipment to and from the job site on a daily basis for the duration of construction. Because this alternative has the longest linear length to construct, the emissions, and potential effects on air quality, would be the greatest. The cumulative effects to air quality are being considered separately in the CED.

3.2.1.2.3 Alternative 2 – New Alignment North of Lapalco Boulevard (Proposed Action)

The total length of the alignment for alternative 2 would be approximately 10,500 feet because the new alignment would cross Bayou Segnette north of Lapalco Boulevard and would no longer surround the Company Canal. Constructing this shorter alignment would result in fewer emissions from construction equipment operation than construction of alternative 1, but would have additional emissions from the burning of woody material cut and windrowed during the mechanical clearing and grubbing of the dredge disposal island.

3.2.1.2.4 Alternative 3 – New Alternative South of Lapalco Boulevard

The total length of the alignment for alternative 3 would be the shortest (approximately 7,000 feet) because this alignment would cross Bayou Segnette south of Lapalco Boulevard. Constructing this alternative would likely result in less construction-related emissions than any of the other alternatives, but like alternative 2 would have additional emissions from the burning of woody material cut and windrowed during the mechanical clearing and grubbing of the dredge disposal island.

3.2.1.2.5 Alternative 4 – Company Canal Closure Structure Upgrade

The total length of the alignment for alternative 4 would be approximately 12,500 feet. Because this alignment would only exclude the floodwall surrounding the Company Canal, it would require almost as much construction activity to construct as alternative 1. Constructing this alignment would have similar emissions as alternative 1, but would have more emissions than alternative 2 or alternative 3.

3.2.1.2.6 2007 Emergency Company Canal Barge Gate and Floodwall Work

Emissions from diesel-fuel burning construction equipment, materials transportation trucks, and dredge operations occurred intermittently in 2007 to construct the emergency measures described in section 2.3.6.1. All impacts were localized and temporary.

3.2.2 Water Quality

3.2.2.1 Existing Conditions – 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 routinely collected 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 sample location applicable to the project area is the main canal on the intake side of the Bayou Segnette Pumping Stations.

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 harmful to humans. Alternatively, these organisms may 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 criterion while 71 percent of the lead levels exceeded the chronic criterion (USACE, 1996). Many of the copper levels also exceeded the acute criterion but most lead levels were within the acute criterion. The elevated levels of these constituents are most likely due to stormwater runoff from nearby urbanized areas, although agricultural and grazing activities also contribute, especially with respect to fecal coliform levels and BOD.

3.2.2.2 Existing Conditions – 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 (USACE, 1996). These waters include Company Canal, the Outer Cataouatche Canal, 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 Pumping Stations 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 criteria (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 pumping stations, 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; these data support that designation.

3.2.2.3 Discussion of Impacts

3.2.2.3.1 No Action

Routine maintenance of the existing floodwall and replacement-in-kind of equipment at pumping stations could generate discharges of cleaning agents or other materials to the surface water. The effects of these releases would be temporary and localized in the immediate work area.

Failing to provide this segment of the WBV with 100-year protection measures would predictably, and regularly, 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 hazardous, toxic, and radioactive waste (HTRW). As floodwaters recede, these constituents all enter the surface waters causing temporary reductions in surface water quality.

3.2.2.3.2 Alternative 1 – Improved Parallel Protection

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. Within reach 1, clearing, grubbing, and re-grading the protected side of the new floodwall would likely cause some temporary, construction-related effects to the already poor, protected side water quality. No effects would be expected in the Outer Cataouatche Canal and Bayou Segnette. No permanent decrease in water quality from construction of reach 1 would be predicted. Construction of reaches 2 through 6 would take place primarily on the protected side of the existing alignment and would be expected to have little to no effect on water quality. With best management practices (e.g., sediment curtain) in place during construction, the temporary effects to water quality in reach 1 should be isolated to the protected side canal.

Should construction of reach 1 coincide with construction activities for IER #15 (Lake Cataouatche Levee located immediately to the west of IER #17), there could be construction-related water quality degradation that could have a temporary cumulative effect. These projects would probably not be scheduled for concurrent construction. Adherence to best management practices and an approved sediment control plan by the construction contractor would minimize the risk of indirect water quality effects. There would be no permanent cumulative effects to water quality anticipated by implementing alternative 1.

3.2.2.3.3 Alternative 2 – New Alignment North of Lapalco Boulevard (Proposed Action)

The effects to water quality from construction of reaches 1, 2, and 6 would be the unchanged from those described for alternative 1 because these reaches would be the same. However, the construction-related water quality effects to Bayou Segnette from constructing the new alignment between reach 3 and reach 5 would be substantially worse.

The following activities necessary to construct the new alignment north of Lapalco Boulevard would be expected to temporarily decrease water quality in the immediate vicinity:

- Dredging the new navigation channel approximately 300 feet to the east of the current location,
- Excavating the area for and constructing the closure structure and pumping station across the navigation channel,
- Clearing, grubbing, and de-mucking of the entire approximately 19-acre dredge island,
- Placing earthen material for the 1,000-1,200 feet of new earthen levee across the cleared dredge island, and
- Placing stone and rip-rap for the 120 feet of scour protection up and downstream of the new navigation channel.

The localized temporary decrease in water quality would result from an increase in turbidity and suspended sediments, a mobilization of nutrients and detritus from the bottom leading to a localized reduction in dissolved oxygen, and a potential for the mobilization of contaminants sequestered in bottom sediments.

In order to construct the pumping station and closure structure in dry conditions, a cofferdam would be built and the interior continually dewatered with dewatering wells or well points. The duration of operation of the dewatering pumps and therefore the quantity of effluent water generated is unknown at this stage of design. However, many thousands of gallons of discharge water could be pumped daily from the open excavation into the adjacent Bayou Segnette until construction was completed. The quality of the discharge water would be expected to be

substantially the same as the receiving water with some suspended sediments or organic material adding turbidity in the vicinity of the discharge pipe.

Constructing the remainder of these features would be expected to result in a temporary decrease in water quality (e.g., increased turbidity and suspended sediments) in the project vicinity. The permanent effects of installing the new alignment and closure structure across Bayou Segnette would be expected to be minimal. Base discharge into Bayou Segnette would remain unchanged and the only changes to flow would occur during storm surge when the gates were closed. The gate would be closed a very small percentage of the time such that changes from the current water quality in the Company Canal and upper Bayou Segnette would not be predicted.

From the location where the new alignment north of Lapalco Boulevard intersects reach 5 (on the east of Bayou Segnette), the construction through the remainder of reach 5 and reach 6 would not be expected to result in significant effects to water quality.

3.2.2.3.4 Alternative 3 – New Alternative South of Lapalco Boulevard

The effects to water quality from the construction and operation of alternative 3 would be similar to, but slightly less than those from alternative 2 because of the shorter distance of this alignment. Alternative 3 would require a new alignment across the Outer Cataouatche Canal and Bayou Segnette, but the alignment would cross a smaller island and would tie directly into the new fronting protection at the New Westwego Pumping Station (reach 6). Because reach 1 would not be constructed all the way to the Bayou Segnette Pumping Stations with this alternative, (approximately 2,400 fewer feet of reach 1 would need to be constructed) a shorter reach of wetlands and protected side canal would be affected by floodwall construction and re-grading in reach 1. In addition, crossing Bayou Segnette south of Lapalco Boulevard would require a shorter distance to connect to the alignment on the east side of Bayou Segnette and the clearing, grubbing, and de-mucking of a smaller island (13.5 acres). Each of the elements needed for the construction of alternative 2 would be necessary for alternative 3; they would just be of a slightly smaller scale resulting in commensurately less effects.

3.2.2.3.5 Alternative 4 – Company Canal Closure Structure Upgrade

The effects to water quality from implementing alternative 4 would be essentially the same as the effects described for alternative 1 for reaches 1, 2, 4, 5, and 6. However, moving the Old Westwego Pumping Station discharge canal to the south of the current location would result in a temporary decrease in water quality during construction. The clearing and grubbing of the 2-acres of cypress swamp habitat and the subsequent dredging of the approximate 600 foot-long discharge canal would be expected to degrade water quality from an increase in turbidity, a release of nutrients, a reduction in dissolved oxygen in the water column, and potentially the mobilization of contaminants from the substrate (USACE, 1989). After the completion of construction, no permanent water quality effects would be predicted. Operation of the upgraded closure structure at the mouth of the Company Canal would not be expected to have any effects different from those incurred from the operation of the existing structure.

3.2.2.3.6 2007 Emergency Company Canal Barge Gate and Floodwall Work

The effects to water quality from the activities necessary to construct the emergency measures described in section 2.3.6.1 resulted in temporary effects to water quality in the immediate vicinity of construction activities. The localized temporary decrease in water quality resulted from an increase in turbidity and suspended sediments, a mobilization of nutrients and detritus from the bottom leading to a localized reduction in dissolved oxygen, and a potential for the

mobilization of contaminants sequestered in bottom sediments. No permanent effects to water quality occurred and water quality conditions improved after construction was completed.

3.2.3 Terrestrial Habitat

3.2.3.1 Existing Conditions

The majority of the terrestrial habitat within the potential footprint of disturbance is culturally influenced, significantly disturbed, and considered low quality. These areas have been developed for recreational, residential, commercial, and industrial use, as well as roads and maintained flood protection features (e.g., floodwalls, pumping stations, levees). There are two exceptions to these low quality areas: the swamps adjacent to the protected side canal within the Bayou Segnette State Park and the islands within Bayou Segnette.

The swamp habitats in Bayou Segnette State Park include both wetlands and, in areas subject to intensive drainage, upland communities. 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).

Habitat on the dredge islands within Bayou Segnette is of much higher quality because these areas have not been disturbed after being designated for dredge materials disposal. The islands remain in a natural condition inundated and desiccated with the hydrologic cycles. The overstory of the swamp area is mostly red maple in the southern portion and mostly cypress and red maple in the northern portion (USACE, 1989); both areas also include black willow and green ash. Black willow dominates the bank areas (USACE, 1989). A small east-west ridge and swale from a buried pipeline separates the swamp and keeps more water on the northern portion (USACE, 1989). The ground cover is fairly sparse, consisting of butterweed, pennywort, smartweed, lizard's tail, and swamp lily. The shrub and herbaceous layers are dominated by hydrophilic vegetation indicating wetlands throughout the island as seen in figure 10.

Figure 10. Dredge Island Vegetation



3.2.3.2 Discussion of Impacts

3.2.3.2.1 No Action

Routine maintenance of the existing floodwall and replacement-in-kind of equipment at pumping stations would have no effect on terrestrial habitat as these actions take place within maintained areas.

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 very low quality, and of little value to wildlife. There would be no changes to the ongoing program of pumped drainage and thus the factors that have contributed to habitat deterioration and the propagation of exotics (e.g., Chinese tallow) would continue as they have been under the no action scenario.

3.2.3.2.2 Alternative 1 – Improved Parallel Protection

Alternative 1 would be constructed primarily within extensively modified terrestrial habitat (i.e., mowed grass-state park, commercial and residential areas surrounding Company Canal, and within the cleared/maintained floodwall ROW between the New and Old Westwego Pumping Stations). These areas have little wildlife habitat function and constructing the 100-year level of protection would result in little temporary or permanent effects to wildlife therein.

3.2.3.2.3 Alternative 2 – New Alignment North of Lapalco Boulevard (Proposed Action)

The effects to terrestrial habitat from construction of reaches 1, 2, and 6 would be the same for alternative 2 as they were with alternative 1 because these reaches would be identical. There would be less habitat affected in reach 5 because alternative 2 requires a shorter length of floodwall, but reach 5 offers little value for the terrestrial habitat and the effects would be minimal. The effects to terrestrial habitat from constructing the new alignment between reach 3 and reach 5 would be the permanent destruction of 19 acres of cypress swamp habitat by clearing and grubbing the entire island. Although previously designated as a dredge material disposal area (USACE, 1989), all terrestrial habitat on the island would be destroyed to construct the new alignment.

3.2.3.2.4 Alternative 3 – New Alternative South of Lapalco Boulevard

The effects to terrestrial habitat from the construction and operation of alternative 3 would be similar to, but slightly less than, those from alternative 2. Building the new alignment south of Lapalco Boulevard would require the permanent destruction of the terrestrial habitat on a smaller island (approximately 13.5 acres). Similar to alternative 2, this island had also been designated as a dredge material disposal area (USACE, 1989).

3.2.3.2.5 Alternative 4 – Company Canal Closure Structure Upgrade

The effects to terrestrial habitat from implementing alternative 4 would be limited to the loss of 2 acres of terrestrial habitat permanently converted to open water by moving the Old Westwego Pumping Station canal to the south of the current location.

3.2.3.2.6 2007 Emergency Company Canal Barge Gate and Floodwall Work

The area of terrestrial habitat disturbed to construct the emergency measures described in section 2.3.6.1 was significantly disturbed and had little wildlife habitat prior to construction. Constructing the emergency measures would have resulted in little temporary or permanent effects to wildlife therein.

3.2.4 Aquatic Habitat

3.2.4.1 Existing Conditions

Most of the open water habitats in the project area consist of freshwater canals, ditches, maintained navigation channels, and Bayou Segnette. Almost all of the interior water bodies are designed for, and function as, drainage for the developed areas. Within these canals, flow is sluggish to non-existent except during and shortly after a rain. The shallower areas support submerged and/or floating aquatic vegetation such as Eurasian water milfoil, coontail, pondweeds, naiads, fanwort, water hyacinth, and American lotus. Many of the smaller canals become choked with aquatic vegetation during the summer and most are subjected to large variations in flow because of their drainage function. Figure 11 is a photograph of a hyacinth-filled canal taken from the footbridge over the protected side canal within Bayou Segnette State Park.

Bayou Segnette has significantly higher aquatic habitat value than the remainder of the watercourses of the area (USACE, 1996). However, it receives the effluent from a wastewater treatment plant near its upper limits and receives discharge from the Bayou Segnette Pumping Station and the Old Westwego Pumping Station. Input from these sources results in high levels

of introduced pollutants from urban runoff (USACE, 1996). Despite the contributions from urban areas, tidal flow within Bayou Segnette and the Outer Cataouatche Canal provide significant contaminant dispersal (USACE, 1996).

Figure 11. Protected Side Canal within Bayou Segnette State Park



3.2.4.2 Discussion of Impacts

3.2.4.2.1 No Action

Routine maintenance of the existing floodwall and replacement-in-kind of equipment at pumping stations would have no effect on aquatic habitat as these actions take place within previously disturbed areas.

Under the no action alternative, there would be no direct construction-related effects to aquatic habitat within the footprint of disturbance and surrounding habitat. Failing to provide the 100-year level of protection would lead to a short-term decrease in water quality after storm-related flooding. This decrease in water quality would negatively affect aquatic habitat (e.g., aquatic vegetation) by stressing or killing aquatic vegetation.

3.2.4.2.2 Alternative 1 – Improved Parallel Protection

Alternative 1 would be constructed primarily within existing ROW and on the current alignment; there would be no direct or indirect effects on aquatic habitat predicted from construction of

reaches 2-6. Within reach 1, potential re-grading of the protected side could fill up to 5 acres of open water in the protected side canal south of Lapalco Boulevard. This would be the loss of very low quality aquatic habitat.

3.2.4.2.3 Alternative 2 – New Alignment North of Lapalco Boulevard (Proposed Action)

The effects to aquatic habitat from construction of reaches 1, 2, 5, and 6 would be the same as with alternative 1 because these reaches would be identical. However, the effects to aquatic habitat in the Outer Cataouatche Canal and Bayou Segnette from constructing the new alignment between reach 3 and reach 5 would be greater from the new alignment than from alternative 1. Due to construction activities on the dredge disposal island, motile aquatic organisms would relocate to nearby waterways or inundated environments and seek refuge in new aquatic habitats. Sessile aquatic organisms and the habitat that supports aquatic organisms would be destroyed from the local ecosystem on the island.

The new alignment between reach 3 and reach 5 would require constructing the temporary retaining structure and closure gate, dredging the new navigation channel (approximately 300 feet to the east), and constructing the remainder of the alignment. This would permanently disturb or fill approximately 4 acres of the Outer Cataouatche Canal, Bayou Segnette, and the Westwego Canal.

The dredged material generated from the navigation channel realignment would be placed adjacent to the new navigation channel on the dredge disposal island. The current plan of work includes impacting the entire 19-acre cypress swamp island by clearing, grubbing, and de-mucking. All dredged material from the channel would be placed on the cleared area.

3.2.4.2.4 Alternative 3 – New Alternative South of Lapalco Boulevard

The effects to aquatic habitat from the construction and operation of alternative 3 would be similar to, but slightly less than, those from alternative 2 because of the shorter distance of this alignment. Reach 1 could need a smaller area of aquatic habitat to be filled during re-grading because the new floodwall would turn to the east approximately 1,200 feet south of Lapalco Boulevard. The new alignment would cross the Outer Cataouatche Canal and Bayou Segnette, but the alignment would cross these waterbodies for a shorter distance than for alternative 2. Constructing the temporary retaining structure and closure gate, moving the existing navigation channel (approximately 100 feet to the east), and constructing the remainder of the new alignment would be similar to construction for alternative 2, permanently altering approximately 4 acres of aquatic habitat. Although this alternative crosses the Outer Cataouatche Canal and Bayou Segnette at a different location than alternative 2, there would be no anticipated difference in the effects to the aquatic habitat from the different location.

3.2.4.2.5 Alternative 4 – Company Canal Closure Structure Upgrade

The effects to aquatic habitat from implementing alternative 4 would be essentially the same as the effects described for alternative 1, with the exception of the effects from moving the Old Westwego Pumping Station discharge canal. The clearing, grubbing, and dredging of the new discharge canal would create approximately 2 acres of new aquatic habitat.

3.2.4.2.6 2007 Emergency Company Canal Barge Gate and Floodwall Work

The area of aquatic habitat disturbed to construct the emergency measures described in section 2.3.6.1 was limited to the mouth of the Company Canal and the fronting protection of the Bayou Segnette Pumping Stations. These areas would have endured temporary decrease in the quality

of aquatic habitat during the construction process, but would have returned to the pre-construction conditions quickly after the construction was completed. Constructing the emergency measures would have resulted short-term, temporary effects to aquatic habitat and no permanent effects.

3.2.5 Fish and Wildlife

3.2.5.1 Existing Conditions

The majority of the terrestrial habitat within the potential footprint of disturbance is culturally influenced, significantly disturbed, and considered of low quality. The exceptions are the cypress swamp habitat and protected side canal within Bayou Segnette State Park and the islands within Bayou Segnette.

Benthic organisms of the interior canals are commonly dominated by species of midges and oligochaetes, which are adapted to the soft substrates and are often tolerant of pollutants. Fish in the interior canals are represented by a species tolerant of low dissolved oxygen such as shortnose and longnose gar and bowfin. Those in the exterior borrow canal consist 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 canals and borrow pits of the project area support recreationally important fishes and shellfishes. Freshwater sport fishes present include largemouth bass, bluegill, redear sunfish, warmouth, channel catfish, and blue catfish. Other fishes that inhabit project area aquatic habitats include yellow bullhead, freshwater drum, bowfin, carp, buffaloes, and gars. The wetlands of the project area also provide habitat for red swamp crawfish, which are harvested recreationally.

Bayou Segnette forms the eastern boundary of the study 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 Pumping Stations all contribute to the low aquatic habitat in the upper portions of Bayou Segnette. The lower portions of Segnette offer significantly higher habitat value than the watercourses of the remainder of the area.

The canals, borrow pits, and forested wetlands (during periods of inundation) are utilized by wood ducks, blue-winged teal, green-winged teal, and mallards (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 project 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, white ibises, and glossy ibises (USACE, 1996).

Many resident and transient raptors also use the project area. Permanent residents include red-shouldered hawk, barn owl, common screech owl, great horned owl, and barred owl. Winter residents include red-tailed hawk, marsh hawk, and American kestrel. The Mississippi kite and broad-winged hawk are common summer residents. In addition, the project 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. Important 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.

Amphibians expected to occur on canal and ditch edges, 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.

3.2.5.2 Discussion of Impacts

3.2.5.2.1 No Action

Routine maintenance of the existing floodwall and replacement-in-kind of equipment at pumping stations would have little or no effect on fish and wildlife as these actions take place within previously disturbed areas.

Under the no action alternative, there would be no direct impacts to the fisheries and wildlife of the Outer Cataouatche Canal, Bayou Segnette, Lake Cataouatche, or Barataria Bay. However, failing to provide flood protection for the IER #17 area would allow contamination of surface waters during flooding by floodwaters mobilizing contaminants from domestic, industrial/commercial, or municipal sources (e.g., sanitary sewage, chemicals from industrial facilities). Although diluted by the volume of water associated with flooding, these constituents enter the aquatic environment and food chain during floods.

Under the no action alternative, there would be no changes in land use predicted near the project area. In the absence of a flood protection measure for IER #17, wildlife abundance and diversity within the project area would remain substantially unchanged.

3.2.5.2.2 Alternative 1 – Improved Parallel Protection

All reaches of alternative 1 would be constructed on or very close to the current floodwall centerline, within existing ROW, and in previously disturbed areas. The mowed grass, paved areas, and properties adjacent to the maintained floodwall ROW are of little habitat value. Constructing, operating, and maintaining alternative 1 would be expected to have little temporary or permanent effects to fish and wildlife.

There would be minor permanent effects to fish and wildlife within reach 1 because of the protected side clearing and grubbing (5.5 acres) and re-grading (up to 5 acres of fill into the protected side canal) during floodwall construction south of Lapalco Boulevard. The affected habitat is a long, linear feature on the eastern side of the canal. Mobile species of fish and wildlife could find refuge in nearby habitat until the construction disturbance ended. Sessile and dormant species would likely be destroyed during construction.

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 and mobile species could find

refuge in other areas until the construction disturbance is over. The cumulative effects to wildlife will be addressed in the CED.

Ongoing coordination with the USFWS indicates that no significant effects to fish or wildlife are expected to occur. As such, the responsibilities of the USACE to protect migratory birds under Executive Order (EO) No. 13,186 (66 FR 3853 (17 January 2001)) 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.

3.2.5.2.3 Alternative 2 – New Alignment North of Lapalco Boulevard (Proposed Action)

The effects to fish and wildlife from construction of alternative 2 would be identical to those for alternative 1 for reaches 1, 2, 5, and 6. However, constructing the new alignment north of Lapalco Boulevard would disturb fish and wildlife within approximately 4 acres of aquatic habitat and would permanently displace all fish and wildlife within the 19-acre dredge island and the surrounding vegetated shallows. The dredge island and surrounding shallows would be transformed from natural habitat by removing all of the vegetation and constructing the new alignment. In addition, dredging of the navigation channel and excavation and removal of surficial sediments would cause temporary localized increases in turbidity from the disruption of sediments during construction. The removal of vegetation would decrease the extent of shade within Bayou Segnette by removing overhanging and shallow vegetation and permanently eliminating refuge areas for juvenile fish.

3.2.5.2.4 Alternative 3 – New Alternative South of Lapalco Boulevard

The effects to fish and wildlife from construction and operation of alternative 3 would be similar to, but slightly less than, those from alternative 2 because of the smaller area of disturbance. Constructing the new alignment south of Lapalco Boulevard would disturb fish and wildlife within approximately 4 acres of aquatic habitat and displace all wildlife within the 13.5-acre island. Because reach 1 would end well south of Lapalco Boulevard, a shorter reach of the existing protected side canal would be moved and a smaller area of aquatic and terrestrial habitat and associated effects to fish and wildlife would occur within Bayou Segnette State Park.

3.2.5.2.5 Alternative 4 – Company Canal Closure Structure Upgrade

The effects to fish and wildlife from implementing alternative 4 would be essentially the same as the effects described for alternative 1 with the exception of the effects from moving the Old Westwego Pumping Station discharge canal. The clearing, grubbing, and dredging of the new discharge canal would eliminate 2 acres of terrestrial habitat and create approximately 2 acres of new aquatic habitat. Mobile species of fish and wildlife could find refuge in nearby habitat until the construction disturbance ended. Sessile and dormant species would likely be destroyed during construction.

3.2.5.2.6 2007 Emergency Company Canal Barge Gate and Floodwall Work

The effects to fish and wildlife from implementing the emergency measures described in section 2.3.6.1 was limited to the disturbance of aquatic species at the mouth of the Company Canal and the fronting protection of the Bayou Segnette Pumping Stations and vibration and noise-related disturbance to wildlife near the construction area. Mobile species of fish and wildlife could find refuge in nearby habitat until the construction disturbance ended. However, sessile and dormant species would likely have been destroyed during construction. The fish and wildlife within these areas would have endured temporary construction-related disturbance, but would have returned to the pre-construction conditions quickly after the construction was completed. Constructing

the emergency measures would have resulted in short-term, temporary effects to fish and wildlife with minimal permanent effects.

3.2.6 Wetlands

3.2.6.1 Existing Conditions

Nearly 25 percent (140,000 acres) of Barataria Basin wetlands have been lost over the past 30 years via conversion to open-water areas or uplands (USACE, 1996). Contributing factors responsible for that 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 newly available open water habitat, are adversely affected by decreases in productivity, nursery habitat, and detrital export associated with wetland loss. All terrestrial or semi-aquatic 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.

Cypress swamps in the project area exist on the dredged material island and in portions of Bayou Segnette State Park. Cypress swamps remain inundated throughout much of the year due to tidal exchange and rainfall events and are a highly valuable wildlife habitat resource. These wetlands provide flood storage, water quality benefits through filtration of pollutants such as nitrates and phosphates that might otherwise reach water bodies via runoff, areas for feeding, cover, resting, and reproduction for faunal components, exchange of nutrients and detritus materials, diversity, and maintenance of air quality through evapotranspiration of the trees.

The USFWS field investigations determined that the site provides valuable habitat for an abundance of wildlife species. The marshlands and forested wetlands provide feeding, resting, nesting, hunting, and escape habitat to numerous species of game and non-game mammals and commercially important furbearers, as well as songbirds, raptors, migratory and resident waterfowl, wading birds, woodpeckers, and many species of amphibians and reptiles.

3.2.6.2 Discussion of Impacts

3.2.6.2.1 No Action

Routine maintenance of the existing floodwall and replacement-in-kind of equipment at pumping stations would have no effect on wetlands as these actions take place within previously disturbed areas. Therefore, there would be no direct impacts to wetlands under this alternative. In the absence of the GNOHSDRRS, the wetlands within the project area would continue to be influenced by periodic flooding and rainfall events.

3.2.6.2.2 Alternative 1 – Improved Parallel Protection

Because alternative 1 mainly follows previously disturbed areas, a total of 5.5 acres of wetland habitat located within Bayou Segnette State Park would be directly impacted by following this alignment. Impacts include mechanically clearing and grubbing the site for preparation to be included as part of the floodwall expansion. Sessile and benthic organisms located within this corridor would be destroyed during project construction. Indirect impacts include the relocation of motile organisms to nearby habitats, along with noise, vibrations, etc. associated with construction impacts. Cumulative effects will be discussed in the CED.

3.2.6.2.3 Alternative 2 – New Alignment North of Lapalco Boulevard (Proposed Action)

The 19 acres of cypress swamp located on the dredged material island and the 5.5 acres of cypress swamp habitat within Bayou Segnette State Park would be permanently impacted by the project. Construction of this new alignment would eliminate the benefits these wetlands provide from the ecosystem. All terrestrial and semi-aquatic organisms would directly be impacted by the loss of their native habitat, but are expected to survive and relocate within nearby similar habitat areas. Any non-motile species would be destroyed by construction activities. Indirect impacts include noise and vibrations related to heavy equipment usage to prepare the site and actual construction activities. Cumulative effects will be discussed in the CED.

3.2.6.2.4 Alternative 3 – New Alternative South of Lapalco Boulevard

This alternative would employ the shortest and most southern alignment that would include permanent impacts to a 13.5 acre cypress swamp island. All direct, indirect, and cumulative impacts would be similar to those identified for alternative 2 above.

3.2.6.2.5 Alternative 4 – Company Canal Closure Structure Upgrade

Wetland effects associated with alternative 4 would be the same as those identified for alternative 1 above.

3.2.6.2.6 2007 Emergency Company Canal Barge Gate and Floodwall Work

No construction work occurred in wetlands; therefore, no direct, indirect, or cumulative effects occurred in wetlands as a result of implementing the emergency Company Canal barge gate and floodwall work as described in section 2.3.6.1.

3.2.7 Threatened and Endangered Species

3.2.7.1 Existing Conditions

Except for the occasional transient species, no Federally-listed, threatened, endangered, 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 threatened 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 USFWS also indicated that requirements under the Fish and Wildlife Coordination Act (FWCA) will be met upon completion of a final programmatic FWCA report and a project-

specific FWCA report. 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. The USFWS concurred with the USACE's determination that project implementation would not adversely affect any threatened or endangered species in their letter dated 28 November 2007 (USFWS, 2007b).

3.2.7.2 Discussion of Impacts

3.2.7.2.1 No Action

Routine maintenance of the existing floodwall and replacement-in-kind of equipment at pumping stations would have no effect on threatened or endangered species as these actions take place within previously disturbed areas where protected species do not occur.

3.2.7.2.2 Alternative 1, 2, 3, and 4

Consultation with appropriate 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 be predicted to protected species as a result of implementing any of the alternatives.

3.2.7.2.3 2007 Emergency Company Canal Barge Gate and Floodwall Work

There were no direct, indirect, or cumulative effects to threatened or endangered species as a result of implementing the emergency Company Canal barge gate and floodwall work as described in section 2.3.6.1.

3.2.8 Cultural Resources

3.2.8.1 Existing Conditions

Humans have used the study area in prehistoric as well as historic times. Most prehistoric archeological sites date to the Coles Creek period (A.D. 700 - A.D. 1200). Europeans began to settle in the region in the early 1700s. Many archeological sites in the area have been lost over time. Dredging, erosion, subsidence, and construction have typically been the cause of these losses.

There are no National Register of Historic Places properties recorded in the project area. Seventeen archeological sites are recorded within a five-mile radius of the project area. Nine of these sites cluster along the east or west shoreline of Lake Cataouatche. The remaining sites are situated on higher elevations along the Mississippi River. The high frequency of flooding and the total amount of fresh water entering the project area, historically, has affected the density of prehistoric and historic site occurrences in the project area. Significant cultural resources are most likely to occur along the Lake Cataouatche shoreline where natural levees of distributary networks enter the lake. Unrecorded cultural resources would continue to be affected by both physical and chemical processes of erosion and site destruction.

The 1989 Environmental Assessment and Finding of No Significant Impact used to establish the dredge island disposal area stated, "There are no sites in the project area [on the dredge island] that are currently listed on or listed as eligible for the National Register of Historic Places. There are no

known archeological or historical sites or shipwrecks in the areas that would be affected by dredging or disposal. Archeological sites or other cultural resources are not likely to occur in the area” (USACE, 1989).

3.2.8.2 Discussion of Impacts

3.2.8.2.1 No Action

Under the no action alternative, preventive maintenance and replacements-in-kind to the existing floodwall would continue within the existing project ROW and would have no effects on significant cultural resources. The existing project ROW has been subjected to severe ground disturbing activities associated with previous construction. The likelihood for intact and undisturbed cultural resources in the existing project ROW is extremely minimal. No further cultural resources investigations would be recommended.

3.2.8.2.2 Alternatives 1, 2, 3, and 4

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 any of the alternatives would have no impact on cultural resources. The proposed action would be constructed in areas substantially within existing ROW that have been subjected to severe ground disturbing activities associated with previous floodwall, and pumping station construction, and canal and borrow excavations. The likelihood for intact and undisturbed cultural resources in the project area is extremely minimal. Implementation of any of these actions would be expected to have no direct, indirect, or cumulative impact on cultural resources.

3.2.8.2.3 2007 Emergency Company Canal Barge Gate and Floodwall Work

There were no direct, indirect, or cumulative effects to cultural resources as a result of implementing the emergency Company Canal barge gate and floodwall work as described in section 2.3.6.1.

3.2.9 Recreational Resources

3.2.9.1 Existing Conditions

The project area includes a segment of Bayou Segnette State Park. It has become one of the most popular state parks in Louisiana, averaging approximately 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 and Heritage 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, a large wave pool and an outdoor swimming pool. Picnic areas provide opportunities for relaxing or watching wildlife. Overnight facilities, including 100 campsites, 20 waterfront cabins (being renovated), a group camp with dormitories sleeping 120 people, and a meeting room, all of which attract national and international visitors, many of them repeat guests who participate in boating and fishing. An 8-lane boat ramp is also located within the State Park near the pumping station between the existing levee/floodwall and the waterway.

Parking for trailers is located on the protected side of the protection system. 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.

In addition to recreational resources at Bayou Segnette, recreational salt and freshwater fishing also takes place in waters around the park. The canals and borrow pits of the project area support recreationally important fishes and shellfishes. Freshwater sport fishes present include largemouth bass, bluegill, redear sunfish, warmouth, channel catfish, and blue catfish. Other fishes that inhabit project area aquatic habitats include yellow bullhead, freshwater drum, bowfin, carp, buffaloes, and gars. The wetlands of the project area also provide habitat for red swamp crawfish, which are harvested recreationally.

3.2.9.2 Discussion of Impacts

3.2.9.2.1 No Action

Routine maintenance of the existing floodwall and replacement-in-kind of equipment at pumping stations would have no effect on recreation. Without implementation of the proposed action, storm surge could inundate parts of Bayou Segnette State Park causing damage to its recreation facilities.

3.2.9.2.2 Alternative 1 – Improved Parallel Protection

The only permanent effects to recreation from constructing reach 1 would be the loss of approximately 12 parking spaces out of 178 in the boat ramp parking area. Temporary effects to recreation would be from construction-related noise, vibration, and dust for 60-hour workweeks for approximately 12 to 18 months and the 20 cabins on the Outer Cataouatche Canal would not be available for rent during the construction period.

Constructing the necessary features for reaches 2 through 6 would be expected to have little effect on recreation facilities. However, recreational fishing in adjacent waters would be impacted during construction activities for all the reaches. Species sensitive to disturbance would likely not utilize nearby areas because of the regular disturbances related to activities at the state park, Company Canal, and pumping stations.

3.2.9.2.3 Alternative 2 – New Alignment North of Lapalco Boulevard (Proposed Action)

The effects to recreation from alternative 2 would be similar as for alternative 1, with the exception that the new closure structure for Bayou Segnette would provide a safe harbor for recreational boaters during hurricanes. Alternative 1 would not provide such protection.

3.2.9.2.4 Alternative 3 – New Alternative South of Lapalco Boulevard

Because the new alignment for alternative 3 turns east south of Lapalco Boulevard in Bayou Segnette State Park, this alternative would not require the loss of 12 parking areas within reach 1. Alternative 3 would also provide a much larger area of protected harbor for recreational boaters during storm events.

3.2.9.2.5 Alternative 4 – Company Canal Closure Structure Upgrade

The effects would be the same as alternative 1. This alternative would provide safe harbor only within the Company Canal for recreational boaters during storm events.

3.2.9.2.6 2007 Emergency Company Canal Barge Gate and Floodwall Work

There may have been a temporary disturbance to recreation activities in the immediate vicinity of construction activities due to construction-related noise or vibration. There were no permanent effects to recreation as a result of implementing the emergency Company Canal barge gate and floodwall work as described in section 2.3.6.1.

3.2.10 Aesthetic (Visual) Resources

3.2.10.1 Existing Conditions

Visually, the project area's landscape is characterized primarily by Bayou Segnette State Park's recreational setting as described in the Recreational Resources section. Primary viewpoints into the project area originate from the state park's roads, parking lots, and various recreational amenities, including boat launches and cabins located along the Outer Cataouatche Canal. Flood protection measures dominate the viewshed along the southern and eastern portions of the state park, which include an earthen berm levee, concrete floodwalls, a pumping station, and previous borrow areas for levee building material. Company Canal is adjacent to Bayou Segnette State Park in its southeast corner; visually that area contains infrastructure related to the maritime industry, including warehouses, retail seafood vendors, and docks for fishing vessels. Company Canal is bounded by flood protection measures that provide protection for adjacent residential areas.

3.2.10.2 Discussion of Impacts

3.2.10.2.1 No Action

Under the no action alternative, preventive maintenance and replacements-in-kind to the existing floodwall would continue within the existing project ROW and would cause temporary impacts to visual resources. The visual attributes of the project corridor would be temporarily impacted by construction and maintenance activities at the project sites and by transport activities needed to move equipment and materials to and from the sites. However, these impacts would last only through the period when the replacements-in-kind are under construction or when the maintenance activities are occurring..

3.2.10.2.2 Alternative 1 – Improved Parallel Protection

With implementation of alternative 1, the direct and indirect impacts to visual resources would be minimal. Visually, the vast majority of the footprint of disturbance necessary to construct the proposed action is within the existing ROW in areas where similar flood protection measures and other civil works infrastructure currently exists. The movement of material and construction of the flood control infrastructure would also have minimal impacts on visual resources. The visual attributes of the project corridor would be temporarily impacted by construction activities at the project sites and by transport activities needed to move equipment and materials to and from the sites. However, these impacts would last only through the period when the flood protection is

under construction. The long-term impacts on visual resources would be minimal. Cumulatively, the visual impacts caused by flood protection measures regionally and nationwide may be considered significant. Flood prone natural landscapes protected by unnatural visual conditions similar to the proposed project may be increasingly converted to developable land. Land development may be considered visually distressing depending on the complexity of natural elements lost.

3.2.10.2.3 Alternative 2 – New Alignment North of Lapalco Boulevard (Proposed Action)

The impacts to visual resources would be similar to alternative 1.

3.2.10.2.4 Alternative 3 – New Alternative South of Lapalco Boulevard

The vast majority of the footprint of disturbance necessary to construct alternative 3 is within the existing ROW in areas where similar flood protection measures currently exist. The footprint necessary to construct alternative 3 is also significantly less than alternative 1; therefore, the impacts to visual resources would be less severe than alternative 1. Other project areas are remote and visually inaccessible to most as no public access roads (or hiking trails) are available.

3.2.10.2.5 Alternative 4 – Company Canal Closure Structure Upgrade

The effects to visual resources would be similar to alternative 1.

3.2.10.2.6 2007 Emergency Company Canal Barge Gate and Floodwall Work

The direct and indirect impacts caused by the 2007 Emergency Company Canal barge gate and floodwall work to visual resources were minimal. Visually, the vast majority of the footprint of disturbance necessary to construct the barge gate and floodwall work was within the existing ROW in areas where similar flood protection measures and other civil works infrastructure currently exists. The movement of material and construction of the flood control infrastructure also had minimal impacts on visual resources. The visual attributes of the project corridor were temporarily impacted by construction activities at the project sites and by transport activities needed to move equipment and materials to and from the sites. However, these impacts lasted only through the period when the flood protection work was under construction. The long-term impacts on visual resources were minimal. Cumulatively, the visual impacts caused by flood protection measures regionally and nationwide may be considered significant. Flood prone natural landscapes protected by unnatural visual conditions similar to the barge gate and floodwall work may be increasingly converted to developable land. Land development may be considered visually distressing depending on the complexity of natural elements lost.

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; routine maintenance and replacement-in-kind at pumping stations under no action would have no more or less effect than the proposed action.

3.2.11.2.2 Alternatives 1, 2, 3, and 4

The actions necessary to implement any of the action alternatives (including the proposed action) would not involve conversion of, or otherwise cause direct, indirect, or cumulative effects to prime, unique, or important U.S. farmland.

3.2.11.2.3 2007 Emergency Company Canal Barge Gate and Floodwall Work

There were no direct, indirect, or cumulative effects to protected farmland as a result of implementing the emergency Company Canal barge gate and floodwall work as described in section 2.3.6.1.

3.2.12 Transportation

3.2.12.1 Existing Conditions

Transportation infrastructure within the vicinity of the construction alignment primary consists of US 90 Business (West Bank Expressway), Lapalco Boulevard, and municipal thoroughfares. Railroad lines are situated deep into the protected area nearer the Mississippi River and would not be used for the implementation of any of the alternatives. No municipal airports are located in the study area. The project area has well developed and maintained waterborne access at the Company Canal (terminus of Bayou Segnette) and the Harvey Canal. These areas serve commercial and recreational vessels.

3.2.12.2 Discussion of Impacts

3.2.12.2.1 No Action

Under the no action alternative, additional construction activities necessary to achieve 100-year level of protection would not be constructed. This additional protection is the proposed action. The current flood damage risk would persist without the construction of this section of the WBV. There are substantial traffic effects prior to, and after, large-scale flooding events in this area with the current level of risk reduction. Community evacuation in preparation for storms leads to significant traffic. When flooded, roads are impassable until after floodwaters recede and residual sediments and debris are cleaned up. Removal of debris destroyed by flooding (building materials, appliances, furniture, etc.) also causes substantial increases in local traffic. Chronic

flooding could also accelerate deterioration of bridges, culverts, and road surfaces for which longer-term traffic problems would exist until the infrastructure was repaired or replaced.

3.2.12.2.2 Alternatives 1, 2, 3, and 4

With the construction of any of the action alternatives, the direct effect on transportation would result from increased vehicular congestion along collector and local roads leading to and from the construction sites. Indirect effects from vehicle emissions, decreases in level of service (e.g., longer waits at intersections), and decrease in road surface quality would be expected. No impacts to rail transportation systems are anticipated. Some impacts to waterborne transportation systems may occur if construction activities are conducted on a marine plant or temporary work platform located over water. To reduce the impacts to waterborne transportation, where possible, water based construction activities would be phased or sequenced to minimize impacts.

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.

3.2.12.2.3 2007 Emergency Company Canal Barge Gate and Floodwall Work

There were no significant direct, indirect, or cumulative effects to transportation as a result of implementing the emergency Company Canal barge gate and floodwall work as described in section 2.3.6.1.

3.3 SOCIOECONOMICS

3.3.1 Existing Conditions

According to the 2005 American Community Survey that documented conditions prior to Hurricane Katrina, Jefferson Parish had a population of 449,000. The Greater New Orleans area, which includes both Jefferson and Orleans Parishes, is the largest metropolitan area in the state. Jefferson Parish was affected by Hurricane Katrina, but has rebounded more quickly than neighboring Orleans Parish. A population estimate conducted after Hurricane Katrina (June through October 2006) by the Louisiana Recovery Authority estimated Jefferson Parish at 440,000 residents or 99 percent of its 2005 total. Because the proportion of post-Katrina population to pre-Katrina population is nearly 100 percent, it has been assumed that demographic, employment, income, and housing data from the 2005 American Community Survey adequately depicts current post-Katrina socioeconomic conditions.

The 20,400-acre study area lies within an area of tidal influence and is currently provided with hurricane damage reduction by Federal levees located adjacent to Lake Cataouatche. The majority of the urban development in the Lake Cataouatche study area has taken place in the area surrounding the Huey P. Long Bridge, as well as along Highway 90, River Road, and the West Bank Expressway. The major communities located within the study area include Avondale and Westwego.

3.3.1.1 Demographics

According to the 2005 American Community Survey (prior to Hurricane Katrina), Jefferson Parish had a household population of 449,000; composed of 233,000 (52 percent) females and 216,000 (48 percent) males. The median age was 37.9 years. The age distribution in the parish was spread out with 25 percent under the age of 18, 9 percent from 18 to 24, 30 percent from 25 to 44, 23 percent from 45 to 64, and 12 percent who were 65 years of age or older. For every 100 females there were 92.40 males. For every 100 females age 18 and over, there were 88.60 males.

At the time of the American Community Survey, there were 173,000 households in Jefferson Parish. The average household size was 2.6 people. Families comprised 64 percent of the households in Jefferson Parish. This figure includes both married-couple families (42 percent) and other families (22 percent). Non-family households made up 36 percent of all households in Jefferson Parish. Most of the non-family households were people living alone, but some were comprised of people living in households in which no one was related to the householder.

For people reporting one race alone, 67 percent were White; 27 percent were Black or African American; less than 0.5 percent was American Indian and Alaska Native; 3 percent were Asian; less than 0.5 percent was Native Hawaiian and Other Pacific Islander and 2 percent were some other race. Two percent reported two or more races. Eight percent of the people in Jefferson Parish were Hispanic. Sixty percent of the people in Jefferson Parish were White non-Hispanic. People of Hispanic origin may be of any race.

In 2005, 83 percent of people 25 years and older had at least graduated from high school and 23 percent had a bachelor's degree or higher. Among people 16 to 19 years old, 8 percent were dropouts; they were not enrolled in school and had not graduated from high school. The total school enrollment in Jefferson Parish was 114,000 in 2005. Nursery school and kindergarten enrollment was 13,000 and elementary or high school enrollment was 72,000 children. College or graduate school enrollment was 29,000.

3.3.1.2 Employment and Income

Approximately 91 percent of Jefferson Parish's civilian labor force is employed. In 2005, for the employed population 16 years and older, the leading industries in Jefferson Parish were educational services, health care and social assistance, 20 percent, and retail trade, 13 percent.

Among the most common occupations were: management, professional, and related occupations (34 percent); sales and office occupations (29 percent); service occupations (15 percent); construction, extraction, maintenance and repair occupations (12 percent); and production, transportation, and material moving occupations (10 percent). Eighty-one percent of the people employed were private wage and salary workers; 12 percent were Federal, state, or local government workers; and 6 percent were self-employed in their own, unincorporated business.

The median income of households in Jefferson Parish was \$41,773. Eighty percent of the households received earnings and 16 percent received retirement income other than Social Security. Twenty-eight percent of the households received Social Security. The average income from Social Security was \$12,693. These income sources are not mutually exclusive; that is, some households received income from more than one source. In 2005, 15 percent of people were in poverty. Twenty-three percent of related children under 18 were below the poverty level, compared with 13 percent of people 65 years old and over. Twelve percent of all families and 30 percent of families with a female householder and no spouse present had incomes below the poverty level.

3.3.1.3 Housing

In 2005, prior to Hurricane Katrina, Jefferson Parish had a total of 192,000 housing units, 10 percent of which were vacant. Of the total housing units, 68 percent were in single-unit structures, 30 percent were in multi-unit structures, and 1 percent was mobile homes. Nine percent of the housing units were built since 1990. Also in 2005, Jefferson Parish had 173,000 occupied housing units - 111,000 (64 percent) owner occupied and 62,000 (36 percent) renter occupied. Four percent of the households did not have telephone service and 7 percent of the households did not have access to a car, truck, or van for private use. Multi-vehicle households were not rare. Thirty-seven percent of households had two vehicles and another 14 percent had three or more vehicles.

The median monthly housing costs for mortgaged owners was \$1,081, non-mortgaged owners \$319, and renters \$669. Thirty-two percent of owners with mortgages, 14 percent of owners without mortgages, and 46 percent of renters in Jefferson Parish spent 30 percent or more of household income on housing.

3.3.1.4 Environmental Justice

An Environmental Justice analysis is required for any Federal action under Executive Order (EO) 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 made up of six separate and distinct reaches as well as three pumping stations along Bayou Segnette and Company Canal.

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 relatively 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 are being posted to the calendar at the website: www.nolaenvironmental.gov.

3.3.2 Discussion of Impacts

3.3.2.1 No Action

Under the no action alternative, routine maintenance of existing structures would continue. Flood protection would be maintained with replacement-in-kind at pumping stations. No disproportionate impacts would occur to minority or low-income communities under the no action alternative. Without implementation of the proposed action, storm surge could inundate parts of the area. Future catastrophic flooding could result in major economic and social effects to the area including loss of homes and destruction of important recreation areas and businesses. In areas with recurring flooding, homes tend to become more degraded over time because money that could be used for general improvements is used for flood repairs. Over time, the market value of real property diminishes and negatively impacts local tax revenues. Recurring flooding also requires the expenditure of local tax revenues for flood-fighting, clean-up, infrastructure repair, and emergency response. This diverts local revenues from infrastructure and recreation improvements from the entire community, not just the flooded areas. Damage to commercial and industrial facilities ripple through the economy when businesses are forced to close, lay-off workers, and cease production for several weeks.

3.3.2.1.1 Alternative 1 – Improved Parallel Protection

Implementing alternative 1 would not result in negative direct socioeconomic effects such as a decrease in community cohesion because construction of the proposed alignment would not require the taking of residences or businesses. Additionally, construction of alternative 1 would not disproportionately impact any minority or low-income community.

Indirect socioeconomic effects associated with implementing the proposed action are noteworthy. The project would be constructed in an area where ongoing construction activities have been performed by local firms whose employees are able to commute to the work site without relocating families. Construction of alternative 1 would not require specialized expertise that would lead to an influx of workers during the construction phase. As such, the construction phase of the project would not be expected to lead to any temporary or permanent increase in the population or changes in the housing or rental markets.

The risk of negative indirect socioeconomic effects of implementing alternative 1 would be the greatest to the businesses surrounding the Company Canal and to the commercial fishing and tourism businesses that utilize the Company Canal. Approximately 20 retail seafood outlets are located between the Company Canal terminus and the south side of the West Bank Expressway. These retailers sell primarily seafood (shrimp, oysters, and various finfish) to the general public. Based on a phone interview with the wholesale distributor to these outlets, the fleet docked in the Company Canal provides only 10 percent of the shrimp sold at this market; the remainder is supplied by commercial vessels offloaded in Venice, Louisiana (Plaquemines Parish). Commercial finfishing vessels docked in the Company Canal sell most of their catch in Venice, as well. Temporary disruption to the vessels docked in the Company Canal would not necessarily hinder the nearby seafood outlets. Planning for the construction of the 100-year level of protection and demolition of the existing floodwall would be done to minimize the effects to these businesses during construction.

The positive indirect effects of construction of alternative 1 would also result in minor, temporary benefits to the local economy. The short duration of construction and overall cost similarities among the design alternatives would not be sufficient to significantly differentiate them from one another in terms of their effect on the local employment and income. There

would only be short-term and minor increases to the employment and income associated with project construction.

Considering the relatively small contribution from IER #17 in the context of the entire 100-year GNOHSDRRS for both the WBV and the LPV system, the cumulative socioeconomic effects would likely be significant. The construction needs and overall schedules for the other IERs are not available at this time, and the availability of sufficient workers, equipment, and materials to physically construct all of the necessary components remains to be well understood. Fortunately, New Orleans has extensive temporary living accommodations (e.g., hotel rooms) to house the influx of laborers and skilled operators necessary to complete the projects.

Compliance with EO 12898 on Environmental Justice requires an evaluation of the nature of the proposed actions and the human context into which those actions would be undertaken. In order to have potential Environmental Justice impacts, a proposal must have the potential for disproportionately high and adverse human health or environmental effects on low-income populations, minority populations, or Native American tribes. The proposed action has been evaluated for potential disproportionately high environmental effects on minority or low-income populations and there would not be a high human health or environmental impact on minority or low-income populations. Implementation of the proposed action would not result in any change to environmental resources that individuals involved in subsistence fishing or hunting utilize. Also, construction of the proposed action would not involve the release of hazardous, toxic, or radioactive materials to which minority or low-income populations could be exposed. As such, implementation of the proposed action would not create disproportionately high and adverse human health or environmental effects on low-income populations, minority populations, or Native American tribes.

3.3.2.1.2 Alternative 2 – New Alignment North of Lapalco Boulevard (Proposed Action)

Because the alignment does not surround the Company Canal in alternative 2, negative indirect construction-related socioeconomic effects would be avoided. However, because this alternative requires construction of a new alignment crossing Bayou Segnette and the Outer Cataouatche Canal, access and egress to the Company Canal could be limited during construction.

3.3.2.1.3 Alternatives 3 and 4

The effects for alternatives 3 and 4 would be the same as alternative 2.

3.3.2.1.4 2007 Emergency Company Canal Barge Gate and Floodwall Work

There were no significant direct, indirect, or cumulative socioeconomic effects or effects to low-income populations, minority populations, or Native American tribes as a result of implementing the emergency Company Canal barge gate and floodwall work as described in section 2.3.6.1.

3.4 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

3.4.1 Existing Conditions

There must be reasonable identification and evaluation of all HTRW contamination within the vicinity of the proposed action. 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 American Society for Testing and Materials (ASTM) E Phase I Environmental Site Assessment (ESA) was completed for the project area. A copy of the Phase I ESA will be maintained on file at the 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 the CEMVN plans to avoid RECs, and would be working primarily 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

Routine maintenance of the existing floodwall and replacement-in-kind of equipment at pumping stations would have no effect on sources of HTRW as these actions take place within previously disturbed areas. Potential flooding as a result of not providing the 100-year elevation 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 commercial, municipal, and residential sources. 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.

3.4.2.1.1 Alternative 1 – Improved Parallel Protection

Because no specific HTRW concerns were identified from previous site investigations, no direct, indirect, or cumulative effects from HTRW would be predicted from implementing alternative 1. 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.

3.4.2.1.2 Alternatives 2, 3, and 4

The effects for alternatives 2 (Proposed Action), 3, and 4 would be the same as alternative 1.

3.4.2.1.3 2007 Emergency Company Canal Barge Gate and Floodwall Work

There were no direct, indirect, or cumulative HTRW effects as a result of implementing the emergency Company Canal barge gate and floodwall work as described in section 2.3.6.1.

3.5 NOISE AND VIBRATION

3.5.1 Existing Conditions

The project area includes residential, commercial, and recreational areas with varying degrees of associated noise. Changes in noise are typically measured and reported in units of decibels (dBA), a weighted measure of sound level. The primary sources of noise within the area include everyday vehicular traffic along nearby roadways (typically between 50 and 60 dBA at 100 feet), maintenance of roadways, bridges, and the other structures (typically between 80 and 100 dBA at 50 feet), and the ongoing construction of various components of the existing floodwalls, pumping stations, and closure structures.

Noise effects in a residential setting such as those bordering Company Canal along Laroussini Street are dominated by transportation sources such as buses, delivery and construction trucks, private vehicles, and emergency vehicles. Noise from occasional commercial aircraft crossing at high altitudes is typically indistinguishable from the natural background noise of the city. Noise ranging from about 10 dBA for the rustling of leaves to as much as 115 dBA (the upper limit for unprotected hearing exposure established by the Occupational Safety and Health Administration) is common in areas where there are sources of industrial operations, construction activities, and vehicular traffic.

The U.S. Federal Transit Administration (FTA) has established noise impact criteria founded on well-documented research on community reaction to noise based on change in noise exposure using a sliding scale (USFTA, 1995). The FTA Noise Impact Criteria groups noise sensitive land uses into the following three categories:

- Category 1: Buildings or parks where quiet is an essential element of their purpose,
- Category 2: Residences and buildings where people normally sleep (e.g., residences, hospitals, and hotels with high nighttime sensitivity), and
- Category 3: Institutional buildings with primarily daytime and evening use (e.g., schools, libraries, and churches).

Lands adjacent to the project area do not include any Category 1 properties, because quiet is not an essential element to the Bayou Segnette State Park's purpose. However, the residences adjacent to Company Canal and along Vic A. Pitre Drive near the Old Westwego Pumping Station and new residences at the Segnette Estates east of Bayou Segnette and north of Lapalco Boulevard (www.marreroland.com/segnette-estates.pdf) are Category 2 properties. The only known Category 3 property is the New Life Fellowship Church, located approximately 0.2 miles northeast from the end of Company Canal on the north side of the West Bank Expressway and Avenue A.

3.5.2 Discussion of Impacts

3.5.2.1 No Action

Without construction of the GNOHSDRRS for IER #17, noise within the area would remain unchanged from current conditions. Routine maintenance of the existing floodwall and replacement-in-kind of equipment at pumping stations would occasionally create temporary sources of noise and vibration within previously disturbed areas.

In the event of significant hurricane flooding, noise would be generated associated with the pumping stations operation as well as after floodwaters had receded from the heavy equipment used for cleanup and reconstruction. The effects of these noise sources would include annoyance and community disturbance. Under the no action alternative, this community-wide cleanup and reconstruction noise would occur more frequently than if one of the action alternatives would be implemented.

3.5.2.1.1 Alternative 1 – Improved Parallel Protection

Construction of alternative 1 would require the use of earth-moving equipment (dozers, rollers, excavators), trucks to haul materials to and from the site (dump trucks, concrete trucks, and flatbed haul trucks), cranes (for pile driving), and equipment for the demolition and removal of the existing floodwall. At over 13,500 linear feet of structural protection, alternative 1 represents the longest distance of alignment among the four alternatives. In addition, because alternative 1 replaces the floodwall surrounding the Company Canal, this alternative would have the greatest amount of construction activity in close proximity to human receptors.

The schedule requirements dictate that construction noise would be generated 10 hours a day, 6 days a week, for the entire 12 to 18 month period. Given the quantity of sheet pile, H-pile, and pipe pile to be driven, building floodwall and the duration of the construction period, the local residents, businesses, and Bayou Segnette State Park visitors would be expected to experience significant temporary noise effects during construction.

The construction contractor would be expected to keep construction activities under surveillance and control to minimize environmental damage by noise. Techniques for abating construction noise vary from simple, inexpensive, easily implemented measures (e.g., ensuring that all engines are equipped with a properly operating muffler) to more expensive, elaborate methods, such as constructing temporary noise barriers.

Methods to minimize the effects of construction noise that could be implemented include:

- (1) Design considerations and project layout,
- (2) Alternative construction methods,
- (3) Source control,
- (4) Site control,
- (5) Time and activity constraints, and
- (6) Community awareness.

During the final design, sensitive noise receptors can be identified, and steps can be taken to lessen the construction noise impacts. During location studies, natural and artificial barriers such as ground elevation changes and existing buildings can be considered for use as shields against construction noise. Material dump and storage sites can be designated in areas where they also serve as noise barriers. Haul roads may be designated in locations where the noise effects caused by truck traffic would be reduced.

Effects may also be reduced by scheduling noise-producing operations concurrently to take advantage of the fact that the noise levels produced would not be significantly greater than the level produced if the operations were performed separately.

Another abatement technique is to specify and employ site noise limits and noise control measures within the construction contract. Specifications may be written that set certain limits at the receptors, thus allowing the contractor to devise their own methods for meeting the requirements or they may directly specify certain actions that may be taken to achieve noise reduction at the receptors. One way to reduce noise impacts at sensitive receptors is to operate

stationary equipment (e.g., air compressors, generators, etc.) as far away from the sensitive receptors as practical.

In some cases, activities such as form building or other work involving stationary activities can be conducted inside an enclosure in order to reduce noise impacts. In all cases where enclosures and excavation are involved, proper ventilation, access, egress and safety for the construction workers must be considered and maintained. In residential areas or on isolated sections of a project, it may be beneficial to construct barriers adjacent to the work area.

Construction activity and its associated noise can be quite annoying and disruptive during leisure hours, during sleep hours, and any time when loud continuous noises may affect receptors. Time constraints and use of equipment regulations can be effective in reducing the effects caused during these hours of the day. The basis for the noise control strategy is to limit the times that certain construction activities may be conducted. Generally, this can be accomplished by requiring contractors to perform such work during daylight hours when the majority of individuals who would ordinarily be affected by the noise are either not present or are engaged in less noise-sensitive activities.

Although not a physical method of noise abatement, public relations and community awareness is a positive method of lessening the effects of construction-related noise and disturbances. There may be numerous occasions during construction when noise reduction is neither feasible nor warranted. In these cases, it is especially helpful for the affected property owners to be made aware of the impending noise levels. Various techniques may be employed to inform the public of upcoming noise impacts related to construction activity. Depending on the duration of a particular phase of work and the degree of unavoidable effect, the methods used can be as simple as distributing flyers to the adjacent property owners or may be as complex as conducting public informational meetings. The most important considerations are early communication and a clear explanation of the scope of the proposed work and the duration in order to allow residents to plan their activities accordingly.

Construction related activities that generate noise also create subsurface vibration. The driving of sheet, pipe, and H-piles could generate significant levels of vibration. Pressure waves are generated when the hammer strikes the pile, imparting a flexural wave that moves down the pile at approximately 5,000 feet per second (McKee, 2006). As the wave does this, it interacts with the air, creating a localized pressure perturbation, resulting in airborne noise. If the pile is being driven through surface water, then it moves through the water column creating compressional waves resulting in a hydroacoustic pulse. Lastly, the energy moves down into the more-resistant substrate (i.e., soil), where it is dissipated through the physical displacement of soil particles (McKee, 2006). A wave travels down, then back up, and it continues to reverberate until all of the energy has been dissipated into the air, water, and soil.

Typical pile driving could produce ground-borne vibration levels that might be perceptible within approximately 650 feet of the pile-driving activity (USDOH, 1998). Ground-borne vibration levels at distances of approximately 200 feet or more will generally not result in adverse effects. Pile driving very close to structures (generally within 60 feet) can cause structural damage due to displacement of soil and resulting lateral movement. Vibration from pile driving occurring within about 10 feet can cause architectural and structural damage to some buildings, especially un-reinforced or older buildings (USDOH, 1998). If deemed appropriate, the construction specifications may contain the appropriate number and type of structural inspections, and vibration analyses to ensure that construction equipment (including pile installation equipment) does not adversely affect nearby structures. Further, the number of structures that could be subject to damage would be determined and mitigation plans would be developed.

3.5.2.1.2 Alternative 2 – New Alignment North of Lapalco Boulevard (Proposed Action)

At approximately 10,200 linear feet, alternative 2 would be identical to alternative 1 for reaches 1, 2, and 6. However, for reaches 3, 4, and 5, construction of alternative 2 would result in significantly less noise and vibration than alternative 1. The new alignment across Bayou Segnette would not require the construction of any of the floodwall in reach 3 and would not require any of the fronting protection for reach 4 (Old Westwego Pumping Station). Removal of the existing floodwall surrounding the Company Canal would still occur under alternative 2, but the noise and vibration associated with construction of the floodwall around the Company Canal for alternative 1 would be avoided.

3.5.2.1.3 Alternative 3 – New Alternative South of Lapalco Boulevard

With both the shortest length and the greatest distance south from sensitive receptors, alternative 3 would result in the least noise and vibration effects.

3.5.2.1.4 Alternative 4 – Company Canal Closure Structure Upgrade

The noise and vibration effects from alternative 4 would be less than alternative 1, but more than alternative 2 because of the new closure structure work at the mouth of the Company Canal (reach 3).

3.5.2.1.5 2007 Emergency Company Canal Barge Gate and Floodwall Work

There were construction-related temporary noise and vibration effects as a result of implementing the emergency Company Canal barge gate and floodwall work as described in section 2.3.6.1. Driving sheet pile and pipe pile required pounding with large cranes and construction of floodwall stabilization measures required hauling and placing large quantities of rock and concrete in close proximity to residences and businesses. These actions caused temporary noise and vibration disturbance to nearby residents and businesses.

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.

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

below describes an overview of other actions, projects, and occurrences that may contribute to the cumulative impacts previously discussed.

Providing the Company Canal reach of the WBV with the 100-year level of protection would contribute to the protection of life and to the reduction of 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 large 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 (alternative 2) that could contribute cumulatively with the effects of other projects include temporary construction-related increases in truck traffic, noise and vibration, vehicle and equipment emissions, and degradation of water quality. Permanent loss of 24.5 acres of cypress swamp habitat and 5 acres of aquatic habitat would also be required. The total loss of habitat related to the implementation of all actions under all of the IERs has not yet been compiled. When available, the loss from IER #17 would be included in the total cumulative loss. The positive cumulative effects of implementing the proposed action include the temporary expansion of the local economy through the influx of construction-related expenditures.

The WBV project extends approximately 66 miles in length from the Western Tie-in (IER #16), 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 as well as the positive consequences (e.g., spending in the local economy) resulting from providing the 100-year level of hurricane damage risk reduction for these projects may potentially represent the largest cumulative environmental consequences in the New Orleans region for the next 4 to 7 years. Cumulative impacts for the actions considered in all of the IERs will be incorporated into the CED.

Table 3: GNOHSDRRS Impacts and Compensatory Mitigation to be Completed

IER	Parish		Non-wet BLH (acres)	Non-wet BLH AAHUs	BLH (acres)	BLH AAHUs	Swamp (Acres)	Swamp AAHUs	Marsh (Acres)	Marsh AAHUs	EFH (Acres)
1: LPV, La Branche Wetlands Levee	St. Charles	Protected Side	-	-	-	-	137.05	73.99	-	-	-
		Flood Side	-	-	11.33	8.09	143.57	110.97	-	-	-
2: LPV, West Return Floodwall	St. Charles, Jefferson	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	33.40	9.00	-	-	-
3: LPV, Lakefront Levee	Jefferson	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	26
14: WBV, Westwego to Harvey Levee	Jefferson	Protected Side	-	-	45.00	30.00	-	-	-	-	-
		Flood Side	-	-	45.50	18.58	29.75	17.02	-	-	-
15: WBV, Lake Cataouatche Levee	Jefferson	Protected Side	-	-	23.50	6.13	-	-	-	-	-
		Flood Side	-	-	3.600	1.35	-	-	-	-	-
17: WBV, Company Canal Floodwall	Jefferson	Protected Side					10.5	9.44			
		Flood Side					14	12.59			
18: GFBM	Jefferson,	Protected Side	-	-	-	-	-	-	-	-	-

	Plaquemines, St. Charles	Flood Side	-	-	-	-	-	-	-	-	-
18: GFBM	Orleans	Protected Side	226.00	68.79	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
18: GFBM	St. Bernard	Protected Side	74.30	43.59	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
19: CFBM	Hancock County, MS; Iberville; Orleans; Plaquemines; St. Bernard; Jefferson	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
22: GFBM	Jefferson	Protected Side	157.76	89.64	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
22: GFBM	Plaquemines	Protected Side	86.93	28.90	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
23: CFBM	Hancock County, MS; Plaquemines; St. Bernard; St. Charles	Protected Side	-	-	-	-	-	-	-	-	-
		Flood Side	-	-	-	-	-	-	-	-	-
Totals		Protected Side	544.99	230.92	68.50	36.13	137.05	73.99	-	-	-

		Flood Side	-	-	60.43	28.02	206.72	136.99	-	-	-
		Both	544.99	230.92	128.93	64.15	343.77	210.98	-	-	-

- Not applicable to the IER or number impacted is 0

GFBM: Government Furnished Borrow Material

CFBM: Contractor Furnished Borrow Material

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, alternative 2 (the new alignment north of Lapalco Boulevard) 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 IER #17 (alternative 2) presents an engineering-effective, cost-efficient, environmentally-preferable selection when compared to other alignment alternatives. The three alternatives not selected, (alternative 1 - improved parallel protection, alternative 3 – new alignment south of Lapalco Boulevard, and alternative 4 – Company Canal Closure Structure upgrade) were rejected primarily because they 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.

Failing to provide residents with flood damage protection measures could, in the predictable occurrence of a significant flood, contribute to the loss of life and physical as well as environmental damage to Jefferson Parish. Significant flooding can result in the overtopping of sewage treatment works, contamination of drinking water supplies, dispersion of HTRW and dispersion of large quantities of solid waste that need clean up from the floodplain when the storm surge subsides. Substantial quantities of debris (e.g., homes, vehicles, mobile homes, etc.) and sediment must be removed from the area after a flooding event. The physical removal of the debris from the damaged area typically involves large, heavy equipment and requires the removal of trees and vegetation to provide points of ingress and egress for the cleanup equipment. Hauling the collected debris to a local municipal landfill requires significant transportation, construction-type noise during cleanup, and involves huge quantities of solid waste that fill available landfill space.

Debris generated as a result of hurricane damages to Louisiana in 2005 has been estimated at 26.5 million cy; all of this debris needed to be removed for appropriate disposal (USACE, 2007a). Assuming the clean up was performed using dump trucks that could haul 40 cy of debris, the debris removal alone would require more than 1 million truckloads and tens of millions of miles traveled (USACE, 2007a). Failing to provide New Orleans with appropriate hurricane risk reduction would result in significant quantities of debris requiring extraction, transportation, and disposal.

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, the CEMVN is hosting monthly public meetings to keep the stakeholders advised of project status. The public has been 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. Project-specific public meetings were also held 19 July and 19 September 2007 as well as 15 January and 25 March 2008.

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. There were no questions specifically addressing issues associated with IER #17.

At the 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.

Comments were also received on 15 January 2008 at the St. Bonaventure Catholic Church in Avondale, LA. The public concern that evening addressed whether the decisions regarding the type of protection (e.g., floodwall vs. levee) was risk based, why St. Charles Parish was not part of the original WBV project, whether the design for pumping station modifications would include back-flow prevention, whether the new levees would have armoring, and questions involving the identification, selection, use, and post-extraction use of borrow locations.

Lastly, comments were received 25 March 2008 at the John Ehret High School gym in Marrero, Louisiana. During that meeting, no public comments were made addressing IER #17. Public comments that evening focused on the issues of borrow site suitability in the West Bank. There were other more general questions such as characterizing the difference between I-walls and T-walls and whether the West Bank communities would have been damaged more severely if Katrina had made landfall 20 miles to the west. One comment was also made asking the

CEMVN staff to correlate the 100-year level of risk reduction being developed as the GNOHSDRRS to protection for a storm of what category on the Saffir-Simpson scale.

Since this project includes unavoidable adverse impacts to jurisdictional wetlands under Section 404 of the Clean Water Act, a 404 public notice will be made available to the public and other interested parties on the www.nolaenvironmental.gov website. The 404 public notice will be posted to the website with the draft IER notice of availability 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 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 under its jurisdiction in the proposed project area. National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (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, the CEMVN has coordinated with Louisiana Department of Natural Resources (LDNR) for consistency with the Louisiana Coastal Resource Program (LCRP) and the Consistency Determination was issued on 11 September 2008.

A Water Quality Certification has been received from the Louisiana Department of Environmental Quality (LDEQ) by letter dated 14 July 2008. An Air Quality certification is being coordinated with LDEQ through the 30-day public review period associated with IER #17.

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 the proposed action would not adversely affect any cultural resources by letter dated 1 May 2008. Eleven Federally recognized tribes that have an interest in the region were given the opportunity to review and comment on the proposed action. The following tribes concurred with our effect determination: Mississippi Band of Choctaw, Chitimacha Tribe of Louisiana, Choctaw Nation of Oklahoma and Seminole Tribe of Florida. The other seven tribes provided no response.

The USFWS reviewed the proposed action in accordance with the Fish and Wildlife Coordination Act and prepared a draft Coordination Act Report for IER #17 dated 5 August 2008. A final report would be prepared after the 30-day public review of IER #17 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 (USFWS, 2007a).

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

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

CEMVN Response 1: The project will utilize the authorized level of protection ROW as much as practicable to avoid 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 and implementation 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 reinitiate coordination to ensure that the proposed project would not adversely affect any Federally-listed threatened or endangered species or their habitat.

CEMVN Response 10: Concur.

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

CEMVN Response 11: Concur.

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: Concur.

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: Concur.

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: Concur.

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: Concur.

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: Concur.

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: Concur.

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 feet 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: Concur.

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: Concur.

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: Concur.

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

CEMVN Response 23: Concur.

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

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

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

CEMVN Response 25: Mitigation for the impacts caused by this project will be coordinated through a mitigation IER. Any 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 (USFWS, 2007b), and the 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.

CEMVN Response 3: 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. The CEMVN has partnered with Federal and state resource agencies to form an interagency mitigation team that is working to assess and verify these impacts, and to look for potential mitigation sites in the appropriate hydrologic basin. This effort is occurring concurrently with the IER planning process in an effort to complete mitigation work and construct mitigation projects expeditiously. As with the planning process of all other IERs, the public will have the opportunity to give input about the proposed work. These mitigation IERs will, as described in section 1 of this IER, be available for a 30-day public review and comment period.

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. Compensatory mitigation will be required for 24.5 acres of swamp habitat: 5.5 acres in reach 1 and 19 acres on the dredge island north of Lapalco Boulevard. On 12 September 2007, an interagency field trip was conducted to obtain raw field data for the IER #17 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 areas of habitat requiring mitigation would be directly impacted by the proposed project construction, as described in this document. The first consists of approximately 5.5 acres of swamp wetland habitat within the Bayou Segnette State Park. The second would be the 19 acres of cypress swamps on the dredge island north of Lapalco Boulevard. The WVA concluded that mitigation for 22.03 AAHUs would be required for both areas. Therefore, 22.03 AAHUs will be included from this project in the overall totals for the GNOHSDRRS projects (Table 3).

A complementary comprehensive mitigation IER or IERs 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.

Mitigation IERs will be prepared documenting and compiling the unavoidable impacts discussed in each IER. The mitigation IERs will implement compensatory mitigation as early as possible. All mitigation activities will be consistent with standards and policies established in appropriate Federal and state laws, and USACE policies and regulations.

8.0 COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

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

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

Executive Order (E.O.) 11988. E.O. 11988, Floodplain Management, deals with 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 1960's.

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 floodwall consists of wetlands. However, by following the existing alignments where feasible and working in developed areas, there would be minimal direct adverse impacts to wetlands for this project. No increased pumping station capacities are a part of this action.

Consistency with Coastal Zone Management (CZM) Program. The CEMVN has determined that construction and maintenance of 100-year protection along the West Bank and Vicinity (WBV), Company Canal Floodwall 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 was prepared and provided to the Louisiana Department of Natural Resources (DNR). The CZM consistency determination, C20080289, was dated 11 September 2008. The consistency letter of approval from the LDNR completes the consistency requirements.

Clean Air Act. The original 1970 Clean Air Act (CAA) authorized USEPA to establish National Ambient Air Quality Standards (NAAQS) to limit levels of pollutants in the air. 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 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 currently 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 floodwall alignment would be followed, to the extent practicable, in construction of the proposed action. A cofferdam would be constructed at the area in front of the Bayou Segnette Pumping Station. Dredged material placement would be accomplished by dragline or bucket dredge that would minimize turbidity and suspended solids. Riprap stone armament would be included in the wave berm in areas subject to significant wave impact and to minimize erosion into the Outer Cataouatche Canal and Bayou Segnette. All sloped areas would be seeded. Unavoidable project impacts to swamps would be mitigated as described previously. Non-forested wetlands, 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 080522-02 dated 14 July 2008, completed the certification process.

Endangered Species Act. The Endangered Species Act (16 U.S.C. 1531-1543; Pub. L. 93-205, as amended) was enacted in 1973 to provide for the conservation of species that 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 26 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, and the measures that are needed to both 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 the proposed water development project, and submits 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 (USFWS, 2007a). 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 28 November 2007. 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, possession, transportation, and importation 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, selling, purchase, barter, or offering for sale, purchase or barter, 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 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 (USFWS, 2007a). 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 decision-making. The preparation of this IER is a part of compliance 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 1 May 2008 concludes this process.

9.0 CONCLUSION

9.1 INTERIM DECISION

The proposed action would require construction of:

- Reach 1 (floodwall in Bayou Segnette State Park) would require the demolition of existing floodwall and the construction of approximately 8,000 feet of new floodwall on approximately the existing alignment to the 100-year elevation.
- Reach 2 (Bayou Segnette Pumping Stations Fronting Protection) would require the demolition of the existing floodwall and the construction of new floodwall fronting protection to the 100-year elevation.
- Reach 3 (floodwall around Company Canal) would begin with a new alignment crossing the open water of the Company Canal navigation channel, Bayou Segnette, and the Westwego Canal in a southeast direction. This alignment would include a closure structure across the navigation channel, approximately 1,000 to 1,200 feet of earthen levee across the existing dredge disposal island, and a new pumping station. All of these features would be constructed to the 100-year elevation. On the east side of Bayou Segnette, the alignment would connect to new floodwall within reach 5 just north of Lapalco Boulevard. The existing floodwall in reach 3 would be demolished and removed.
- Reach 4 (fronting protection for the Old Westwego Pumping Station) would have no actions taken to provide 100-year protection because the new alignment would preclude the need for new fronting protection for the Old Westwego Pumping Station.
- Reach 5 (floodwall between the Old Westwego Pumping Station and the New Westwego Pumping Station) would require the demolition of existing floodwall and the construction of new floodwall from the end of the new alignment, under Lapalco Boulevard, and terminating at reach 6.
- Reach 6 (New Westwego Pumping Station fronting protection) would require the demolition and removal of the existing 200 feet of floodwall. New floodwall construction would approximate the current floodwall centerline and would occur substantially within existing ROW.

The 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, Bayou Segnette, and Westwego Canal.
- Short-term disturbance to nearby habitat from construction noise.
- Short-term impact to recreation (fishing).
- Permanent loss of 19 acres of cypress swamp on the dredge disposal island.
- Permanent loss of 5.5 acres of swamp wetlands in Bayou Segnette State Park.
- Permanent loss of approximately 9 acres of aquatic habitat (5.5 acres in Bayou Segnette State Park and 5 acres from Bayou Segnette).
- Permanent displacement of fish and temporary displacement of wading birds, waterfowl, or other wildlife within the 19-acre dredge island and surrounding shallows.

9.2 PREPARED BY

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10.0 APPENDICES

Appendix A

List of Acronyms and Definitions of Common Terms

AAHU	Average Annualized Habitat Units
ACB	Articulated Concrete Blocks
ASTM	American Society for Testing and Materials
BFI	Browning-Ferris Industries Landfill
BOD	Biological Oxygen Demand
CAA	Clean Air Act
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
CMSA	Consolidated Metropolitan Statistical Area
CW	Civil Works Program
CWA	Clean Water Act
CY	Cubic Yard
CZM	Coastal Zone Management
dba	Decibels – a scale
DNR	Department of Natural Resources
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EM	Engineering Manual
EO	Executive Order
EPW	Evaluation Of Planned Wetlands
ER	Engineering Regulation
ESA	Environmental Site Assessment
FCU	Functional Capacity Units
FCI	Functional Capacity Index
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FR	Federal Register
FT	feet
FTA	Federal Transit Administration

FWCA	Fish and Wildlife Coordination Act
GNOHSDRRS	Greater New Orleans Hurricane and Storm Damage Risk Reduction System
HTRW	Hazardous, Toxic, and Radioactive Waste
HPS	Hurricane Protection System
IER	Individual Environmental Report
LCRP	Louisiana Coastal Resources Program
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LDWF	Louisiana Department of Wildlife and Fisheries
LPV	Lake Pontchartrain and Vicinity
MBTA	Migratory Bird Treaty Act
mL	Milliliters
MPH	Miles per Hour
MSA	Metropolitan Statistical Area
NAA	Non-Attainment Area
NAAQS	National Ambient Air Quality Standards
NAVD 88	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
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWR	National Wildlife Refuge
O&M	Operations And Maintenance
OMRR&R	Operations, Maintenance, Repair, Replacement, & Rehabilitation
OSE	Other Social Effects
PA	Programmatic Agreement
PDT	Project Delivery Team
PL	Public Law
PM	Particulate Matter
PPA	Project Partnering Agreements
PS	Pumping 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
TRM	Turf Reinforcement Mattress
US	United States
USACE	United States Army Corps Of Engineers
USDA	United States Department of Agriculture
USDOH	United States Department of Highways
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
WVA	Wetland Value Assessment

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 Hurricane Protection 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 plants 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	Regulations protect aquatic organisms from pollution and development, including limiting turbidity that 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

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Agaha Brass	Louisiana Department of Natural Resources
Catherine Breaux	U.S. Fish and Wildlife Service
David Castellanos	U.S. Fish and Wildlife Service
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Angela Trahan	U.S. Fish and Wildlife Service
David Walther	U.S. Fish and Wildlife Service
Patrick Williams	NOAA National Marine Fisheries Service

Appendix E

Commander's Determination of Imminent Threat



REPLY TO
ATTENTION OF:

CEMVN-PM-R

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

MEMORANDUM FOR New Orleans District Staff and All Interested Parties

SUBJECT: Imminent Threat of Flooding Due to Potential for Failure of the Company Canal Floodwall

1. In March 2007, Engineers with the U.S. Army Corps of Engineers (Corps) determined that the floodwall along the perimeter of the Company Canal, a constructed segment of the West Bank and Vicinity, New Orleans, Louisiana Hurricane Protection Project, were not in condition to achieve the authorized level of protection. The Corps has further determined that the construction of a barge gate structure at the southern terminus of Company Canal is the best engineering solution to address this situation in a timely manner. These efforts are being conducted under the authority provided by Public Law 109-148, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico, and Pandemic Influenza Act, 2006 (hereinafter 3rd Supplemental). This memorandum addresses the Corps' efforts pursuant to its authority under the 3rd Supplemental to restore hurricane protection projects and related works, to provide the level of protection for which they were designed, at full Federal expense.
2. The Corps' restoration and rehabilitation efforts under the 3rd Supplemental are being implemented with funds from the Flood Control and Coastal Emergency funds (related to Hurricane Katrina). Work under the 3rd Supplemental to restore and rehabilitate the described Federal flood control and hurricane protection projects and to accelerate construction of said projects represents a part of the continuing Federal response to the impacts of Hurricane Katrina upon south Louisiana.
3. Engineering Regulation (ER) 200-2-2, Environmental Quality, Procedures for Implementing the National Environmental Policy Act (NEPA), at paragraph 8, states that District Commanders may respond to emergency situations to prevent or reduce imminent risk of life, health, property, or severe economic losses in advance of compliance with the documentation and procedural requirements of NEPA. Paragraph 8 of the regulation states that NEPA documentation should be accomplished prior to initiation of emergency work if time constraints render this practicable; however, if appropriate, such documentation may be accomplished concurrently or after completion of the emergency work. Paragraph 8 also states that, when possible, emergency actions considered major in scope with potentially significant environmental impacts shall be referred through the Division Commanders to HQUSACE (CECW-RE) for consultation with the Council for Environmental Quality (CEQ) regarding the utilization of emergency procedures in a manner that is compliant with NEPA requirements and regulations. The Corps New Orleans Environmental Branch had made a determination that the proposed emergency actions described in this memorandum are not anticipated to have significant impacts to the human environment. I

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concur in this determination and deem it appropriate that such NEPA documentation may be accomplished concurrently with completion of the emergency work. Compliance with non-NEPA Federal, state and local environmental statutes and regulations will take place prior to initiating construction activities.

4. A direct analogy exists between the work to be performed pursuant to this determination and the work addressed in P. L. 84-99 and its regulations, Engineering Regulation and Engineering Pamphlet 500-1-1, Emergency Employment of Army and Other Resources - Civil Emergency Management Program, which provides that emergency flood control and hurricane protection project activities performed under Public Law 84-99 are not subject to the established NEPA documentation requirements if risk to life, health, property, or severe economic losses is imminent. This regulation defines imminent risk as a subjective, statistically supported evaluation of how quickly a threat scenario can develop, how likely that threat is to develop in a given geographical location, and how likely it is that the threat will produce catastrophic consequences to life and improved property. Implicit in the timing aspect can be considerations of time or season or of known cyclical activities.

5. Several criteria cited in the above definition are important in determining if there is an imminent threat to the public in the vicinity of the Company Canal, Jefferson Parish located in the area know as the West Bank.

a. The first is "subjective" which allows a decision to be based on sound reasoning. The Company Canal floodwall comprises the most vulnerable reach of existing Federal protection in the West Bank project. The stability of this wall is critical and it does not currently meet an adequate factor of safety. If the water levels reach 5.0 feet in the canal, which has a 3.3 percent chance in any given year (30-year storm), the factor of safety is below one and the wall might fail. The second and third criteria are "statistically supported evaluation" and "how likely that threat is to develop in a given geographical location." During the past five hurricane seasons, southeast Louisiana has had 13 tropical storms or hurricanes pass within 300 miles of the city (three in 2002, two in 2003, three in 2004, five in 2005, and zero in 2006). This represents an average of 2.6 storms per hurricane season. The National Hurricane Center has been reporting for the past several years that we have entered a period of more active hurricane seasons. The National Oceanic and Atmospheric Administration (NOAA) 2007 Atlantic hurricane season outlook is for an 80 percent chance of an above-normal hurricane season. This outlook is produced by scientists at NOAA's Climate Prediction Center, National Hurricane Center, and Hurricane Research Division. The outlook calls for a very active 2007 season, with 13-16 named storms, 8-10 hurricanes, and 4-6 major hurricanes. Hurricane experts, Dr. Philip J. Klotzbach, Dr. William M. Gray, and other associates at Colorado State University, predict that the 2007 hurricane season will produce between 6-14 named storms with 4-8 storms reaching hurricane strength, and that 1-3 of the storms will become major hurricanes.

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The team also predicts that there is a 40 percent chance that a hurricane will make landfall somewhere along the Gulf coast between the Florida Panhandle and Brownsville, Texas. The average landfall in the Gulf of Mexico for the last century is 30 percent.

b. The next key phrase is "how likely the threat will produce catastrophic consequences to life and improved property". Nothing demonstrates this better than Hurricane Rita in September 2005. Hurricane Rita came ashore along the Louisiana/Texas state line, approximately 250 miles from New Orleans, yet the impacts of the storm in Southeast Louisiana were significant. Hurricane Rita caused an estimated five billion dollars worth of damage in Louisiana alone. Approximately 10,000 homes flooded in Louisiana as a result of the storm surge generated by Hurricane Rita.

c. The last phrase of significance is "known cyclical activities." As every day passes, we move closer to the 2007 hurricane season, and the threat to life and property increases without adequate storm surge protection.

6. Environmental compliance for the West Bank and Vicinity Hurricane Protection was completed on September 1998 with the signing of a Record of Decision for an Environmental Impact Statement entitled *Westbank Hurricane Protection, Lake Cataouatche*. Due to the emergency nature of the proposed actions concerning the Company Canal floodwalls, a new environmental compliance analysis is required. The probable environmental consequences of these actions are that minor temporary impacts to water quality in Company Canal will occur. NEPA documentation in the form of an Individual Environmental Document is being prepared for the Company Canal segment of the New Orleans Hurricane and Storm Damage Risk Reduction System in accordance with the Alternative NEPA Arrangements as implemented by the Corps on February 23, 2007. I expect to decide on a permanent repair for the protection system in the Company Canal area by September 2007.

7. Based upon applicable regulations and guidance and upon the facts and circumstances set forth above, I consider the Company Canal area of the West Bank and Vicinity, New Orleans, Louisiana Hurricane Protection Project to be under an imminent threat from flooding as a result of the potential for the floodwall to fail. I consider this threat to remain in effect for the Company Canal area until construction of the proposed actions described in this document is completed.

4-16-07

Date



RICHARD P. WAGENAAR
Colonel, EN
Commanding