

**DRAFT INDIVIDUAL ENVIRONMENTAL REPORT**  
**GOVERNMENT FURNISHED BORROW MATERIAL # 2**  
**JEFFERSON AND PLAQUEMINES PARISHES, LOUISIANA**  
**IER # 22**



**US Army Corps  
of Engineers®**

**APRIL 2008**

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## **1. Introduction**

The U.S. Army Corps of Engineers (USACE) Mississippi Valley Division, New Orleans District (CEMVN), has prepared this Individual Environmental Report # 22 (IER # 22) to evaluate the potential impacts associated with the possible excavation of five Government Furnished borrow areas. The proposed action areas are located in southeastern Louisiana (Figures 1 - 6). The term “borrow” is used in the fields of construction and engineering to describe material that is dug in one location for use at another location. CEMVN is proposing to use suitable borrow material for construction of the proposed Greater New Orleans Hurricane and Storm Damage Risk Reduction System (GNOHSDRRS).

IER # 22 has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality’s Regulations (40 CFR §1500-1508), as reflected in the USACE Engineering Regulation, ER 200-2-2. The execution of an IER, in lieu of a traditional Environmental Assessment (EA) or Environmental Impact Statement (EIS), is provided for in ER 200-2-2, Environmental Quality (33 CFR §230) Procedures for Implementing the NEPA and pursuant to the Council on Environmental Quality (CEQ) NEPA Implementation Regulations (40 CFR §1506.11). The Alternative Arrangements can be found at [www.nolaenvironmental.gov](http://www.nolaenvironmental.gov), and are herein incorporated by reference.

CEMVN implemented Alternative Arrangements on 13 March 2007 under the provisions of the Council on Environmental Quality 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 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 Hurricane and Storm Damage Reduction System in the New Orleans Metropolitan Area as a result of Hurricanes Katrina and Rita.

This Draft IER will be distributed for a 30-day public review and comment period. A public meeting specific to the proposed action will be held, if requested by a stakeholder during the review period. Any comments received during this public meeting will be considered part of official record. After the 30-day comment period, and public meeting if requested, the CEMVN District Commander will review all comments received during the review period and make a determination as to whether or not they are substantive. If comments are not considered to be substantive, the District Commander will make a decision on the proposed action. This decision will be documented in an IER Decision Record. If a comment(s) is determined to be substantive an Addendum to the IER will be prepared and published for a 30-day public review and comment period. After the expiration of the public comment period, the District Commander will make a decision on the proposed action. The decision will be documented in an IER Decision Record.

A total of five potential Government Furnished borrow areas investigated by the CEMVN Borrow Project Delivery Team (PDT) are discussed in this IER. The goal of the PDT is to acquire suitable borrow material needed for GNOHSDRRS improvements. Over 100,000,000 cubic yards of suitable material is estimated to be required to improve Federal and non-Federal levee and floodwall projects. Borrow areas investigated in this IER could potentially provide approximately 6,062,000 cubic yards of suitable material for levee and floodwall projects.

Due to the importance of providing safety to the citizens of southeastern Louisiana, and the amount of borrow needed to supply levee projects for the GNOHSDRRS, multiple borrow IERs are being prepared.

### **1.1 Purpose and Need for the Proposed Action**

The purpose of the proposed action is to identify borrow areas that contain suitable material that can be excavated to supply Federal GNOHSDRRS levee and floodwall projects. The completed GNOHSDRRS would lower the risk of harm to citizens and damage to infrastructure during a storm event. The safety of people in the region is the highest priority of CEMVN. The proposed action resulted from the need to provide a total of over 100,000,000 cubic yards of suitable clay for GNOHSDRRS projects that include the completion and improvement of hurricane protection levees in southeastern Louisiana. Additional borrow IERs will be completed until the borrow need has been met. Raising levee elevations and the completion of levees requires the excavation of material from borrow areas necessary for project construction to ensure authorized level of flood protection for local communities.

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

### **1.2 Authority for the Proposed Action**

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

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

The WBV project was authorized under the WRDA, as cited above. The Westwego to Harvey Canal Hurricane Protection Project was authorized by the WRDA of 1986. The WRDA of 1996 modified the project and added the Lake Cataouatche Project and the East of Harvey Canal Project. The WRDA of 1999 combined the three projects into one project under the current name.

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; the construction of permanent closures at the outfall canals; the improvement of the Inner Harbor Navigation Canal (IHNC); and the construction of levee armoring at critical locations. Additional Supplemental Appropriations include the U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007 H.R. 2206 (pg. 41-44) Title IV, Chapter 3, Flood Control and Coastal Emergencies, (5<sup>th</sup> Supplemental), General Provisions, Sec. 4302.

### **1.3 Prior Reports**

A number of studies and reports on water resources development in the proposed project area have been prepared by the USACE, other Federal, State, and Local agencies, research institutes, and individuals, and are herein incorporated by reference. Pertinent studies, reports and projects are discussed below:

#### Lake Pontchartrain and Vicinity Hurricane Protection Project

- On 14 March 2008, CEMVN signed a Decision Record on IER # 11 (Tier 1) entitled "Improved Protection on the Inner Harbor Navigation Canal, Orleans and St. Bernard Parishes, Louisiana." The document was prepared to evaluate potential impacts associated with building navigable and structural barriers to prevent storm surge from entering the Inner Harbor Navigation Canal from Lake Pontchartrain and/or the Gulf Intracoastal Waterway-Mississippi River Gulf Outlet-Lake Borgne complex. A Tier 2 document discussing alignment alternatives and designs of the navigable and structural barriers, and the impacts associated with exact footprints, is being completed.
- On 21 February 2008, CEMVN signed a Decision Record on IER # 18 entitled "Government Furnished Borrow Material, Jefferson, Orleans, Plaquemines, St. Charles, and St. Bernard Parishes, Louisiana." The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE as a result of excavating borrow areas for use in construction of the GNOHSDRRS.
- In 14 February 2008, CEMVN signed a Decision Record on IER # 19 entitled "Pre-Approved Contractor Furnished Borrow Material, Jefferson, Orleans, St. Bernard, Iberville, and Plaquemines Parishes, Louisiana, and Hancock County, Mississippi." The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors as a result of excavating borrow areas for use in construction of the GNOHSDRRS.
- In July 2006, 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 30 October 1998, CEMVN signed a FONSI on EA # 279 entitled "Lake Pontchartrain Lakefront, Breakwaters, Pump Stations 2 and 3." The report evaluated the impacts associated with providing fronting protection for outfall canals and pump stations. It was determined that the action would not significantly impact resources in the immediate area.

- On 2 October 1998, CEMVN signed a FONSI on EA # 282 entitled “LPV, Jefferson Parish Lakefront Levee, Landside Runoff Control: Alternate Borrow.” The report investigated the impacts of obtaining borrow material from an urban area in Jefferson Parish. No significant impacts to resources in the immediate area were expected.
- On 2 July 1992, CEMVN signed a FONSI on EA # 169 entitled “LPV, Hurricane Protection Project, East Jefferson Parish Levee System, Jefferson Parish, Louisiana, Gap Closure.” The report addressed the construction of a floodwall in Jefferson Parish to close a “gap” in the levee system. The area was previously levied and under forced drainage, and it was determined that the action would not significantly impact the already disturbed area.
- On 22 February 1991, CEMVN signed a FONSI on EA # 164 entitled “LPV Hurricane Protection – Alternate Borrow Area for the St. Charles Parish Reach.” The report addressed the impacts associated with the use of borrow material from the Mississippi River on the left descending bank in front of the Bonnet Carré Spillway Forebay for LPV construction.
- On 30 August 1990, CEMVN signed a FONSI on EA # 163 entitled “LPV Hurricane Protection – Alternate Borrow Area for Jefferson Parish Lakefront Levee, Reach III.” The report addressed the impacts associated with the use of a borrow area in Jefferson Parish for LPV construction.
- On 2 July 1991 CEMVN signed a FONSI on EA # 133 entitled “LPV Hurricane Protection – Alternate Borrow at Highway 433, Slidell, Louisiana.” The report addressed the impacts associated with the excavation of a borrow area in Slidell, Louisiana for LPV construction.
- On 12 September 1990, CEMVN signed a FONSI on EA # 105 entitled “LPV Hurricane Protection – South Point to Gulf Intracoastal Waterway, A. V. Keeler and Company Alternative Borrow Site.” The report addressed the impacts associated with the excavation of a borrow area in Slidell, Louisiana for LPV construction.
- On 12 March 1990, CEMVN signed a FONSI on EA # 102 entitled “LPV Hurricane Protection – 17th Street Canal Hurricane Protection.” The report addressed the use alternative methods of providing flood protection for the 17<sup>th</sup> Street Outfall Canal in association with LPV activity. Impacts to resources were found to be minimal.
- On 4 August 1989, CEMVN signed a FONSI on EA # 89 entitled “LPV Hurricane Protection, High Level Plan - Alternate Borrow Site 1C-2B.” The report addressed the impacts associated with the excavation of a borrow area along Chef Menteur Highway, Orleans Parish for LPV construction. The material was used in the construction of a levee west of the Inner Harbor Navigation Canal.
- On 27 October 1988, CEMVN signed a FONSI on EA # 79 entitled “LPV Hurricane Protection – London Avenue Outfall Canal.” The report investigated the impacts of strengthening existing hurricane protection at the London Avenue Outfall Canal.

- On 21 July 1988, CEMVN signed a FONSI on EA # 76 entitled “LPV Hurricane Protection – Orleans Avenue Outfall Canal.” The report investigated the impacts of strengthening existing hurricane protection at the Orleans Avenue Outfall Canal.
- On 26 February 1986, CEMVN signed a FONSI on EA # 52 entitled “LPV Hurricane Protection – Geohegan Canal.” The report addressed the impacts associated with the excavation of borrow material from an extension of the Geohegan Canal for LPV construction.
- Supplemental Information Report (SIR) # 25 entitled “LPV Hurricane Protection – Chalmette Area Plan, Alternate Borrow Area 1C-2A” was signed by CEMVN on 12 June 1987. The report addressed the used of an alternate contractor furnished borrow area for LPV construction.
- SIR # 27 entitled “LPV Hurricane Protection – Alternate Borrow Site for Chalmette Area Plan” was signed by CEMVN on 12 June 1987. The report addressed the used of an alternate contractor furnished borrow area for LPV construction.
- SIR # 28 entitled “LPV Hurricane Protection – Alternate Borrow Site, Mayfield Pit” was signed by CEMVN on 12 June 1987. The report addressed the used of an alternate contractor furnished borrow area for LPV construction.
- SIR # 29 entitled “LPV Hurricane Protection – South Point to GIWW Levee Enlargement” was signed by CEMVN on 12 June 1987. The report discussed the impacts associated with the enlargement of the GIWW.
- SIR # 30 entitled “LPV Hurricane Protection Project, Jefferson Lakefront Levee” was signed by CEMVN on 7 October 1987. The report investigated impacts associated with changes in Jefferson Parish LPV levee design.
- SIR # 17 entitled “LPV Hurricane Protection – New Orleans East Alternative Borrow, North of Chef Menteur Highway” was signed by CEMVN on 30 April 1986. The report addressed the used of an alternate contractor furnished borrow area for LPV construction.
- SIR # 22 entitled “LPV Hurricane Protection – Use of 17<sup>th</sup> Street Pumping Station Material for LPHP Levee” was signed by CEMVN on 5 August 1986. The report investigated the impacts of moving suitable borrow material from a levee at the 17<sup>th</sup> Street Canal in the construction of a stretch of levee from the Inner Harbor Navigation Canal to the London Avenue Canal.
- SIR # 10 entitled “LPV Hurricane Protection, Bonnet Carré Spillway Borrow” was signed by CEMVN on 3 September 1985. The report evaluated the impacts associated with using the Bonnet Carré Spillway as a borrow source for LPV construction, and found “no significant adverse effect on the human environment.”
- In December 1984, a SIR to complement the Supplement to Final EIS on the LPV Hurricane Protection project was filed with the Environmental Protection Agency.
- The Final EIS for the LPV Hurricane Protection Project, dated August 1974. A Statement of Findings was signed by CEMVN on 2 December 1974. Final

Supplement I to the EIS, dated July 1984, was followed by a Record of Decision (ROD), signed by CEMVN on 7 February 1985. Final Supplement II to the EIS, dated August 1994, was followed by a ROD signed by CEMVN on 3 November 1994.

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

#### West Bank and Vicinity Hurricane Protection Project

- On 14 March 2008, CEMVN signed a Decision Record on IER # 11 (Tier 1) entitled "Improved Protection on the Inner Harbor Navigation Canal, Orleans and St. Bernard Parishes, Louisiana." The document was prepared to evaluate potential impacts associated with building navigable and structural barriers to prevent storm surge from entering the Inner Harbor Navigation Canal from Lake Pontchartrain and/or the Gulf Intracoastal Waterway-Mississippi River Gulf Outlet-Lake Borgne complex. A Tier 2 document discussing alignment alternatives and designs of the navigable and structural barriers, and the impacts associated with exact footprints, is being completed.
- On 21 February 2008, CEMVN signed a Decision Record on IER # 18 entitled “Government Furnished Borrow Material, Jefferson, Orleans, Plaquemines, St. Charles, and St. Bernard Parishes, Louisiana.” The document was prepared to evaluate the potential impacts associated with the actions taken by the USACE as a result of excavating borrow areas for use in construction of the GNOHSDRRS.
- In 14 February 2008, CEMVN signed a Decision Record on IER # 19 entitled “Pre-Approved Contractor Furnished Borrow Material, Jefferson, Orleans, St. Bernard, Iberville, and Plaquemines Parishes, Louisiana, and Hancock County, Mississippi.” The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors as a result of excavating borrow areas for use in construction of the GNOHSDRRS.
- In July 2006, 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, 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 investigated the impacts of obtaining borrow material from various areas in Louisiana.
- On 22 February 2005, CEMVN signed a FONSI on EA # 306A entitled “West Bank Hurricane Protection Project – East of the Harvey Canal, Floodwall Realignment and Change in Method of Sector Gate.” The report discussed the

impacts related to the relocation of a proposed floodwall moved because of the aforementioned sector gate, as authorized by the LPV Project.

- On 5 May, 2003, CEMVN signed a FONSI on EA # 337 entitled “Algiers Canal Alternative Borrow Site.”
- On 19 June, 2003, CEMVN signed a FONSI on EA # 373 entitled “Lake Cataouatche Levee Enlargement.” The report discussed the impacts related to improvements to a levee from Bayou Segnette State Park to Lake Cataouatche.
- On 16 May 2002, CEMVN signed a FONSI on EA # 306 entitled “West Bank Hurricane Protection Project - Harvey Canal Sector Gate Site Relocation and Construction Method Change.” The report discussed the impacts related to the relocation of a proposed sector gate within the Harvey Canal, as authorized by the LPV Project.
- On 30 August, 2000 CEMVN signed a FONSI on EA # 320 entitled “West Bank Hurricane Protection Features.” The report evaluated the impacts associated with borrow sources and construction options to complete the Westwego to Harvey Canal Hurricane Protection Project.
- On 18 August 1998, CEMVN signed a FONSI on EA # 258 entitled “Mississippi River Levee Maintenance - Plaquemines West Bank Second Lift, Fort Jackson Borrow Site.”
- The Final EIS for the WBV, East of Harvey Canal, Hurricane Protection Project was completed in August 1994. A ROD was signed by CEMVN in September 1998.
- The Final EIS for the WBV, Lake Cataouatche, Hurricane Protection Project was completed. A ROD was signed by CEMVN in September 1998.
- In December 1996, the USACE completed a post-authorization change study entitled, “Westwego to Harvey Canal, Louisiana Hurricane Protection Project Lake Cataouatche Area, EIS.” The 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 Standard Project Hurricane (SPH) level of protection was recommended along the alignment followed by the existing non-Federal levee. The project was authorized by Section 101 (b) of the WRDA of 1996, Public Law 104-303, subject to the completion of a final report of the Chief of Engineers, which was signed on 23 December 1996.
- On 12 January, 1994, CEMVN signed a FONSI on an EA # 198 entitled, “West Bank of the Mississippi River in the Vicinity of New Orleans, LA, Hurricane Protection Project, Westwego to Harvey Canal, Jefferson Parish, Louisiana, Proposed Alternate Borrow Sources and Construction Options.” The report evaluated the impacts associated with borrow sources and construction options to complete the Westwego to Harvey Canal Hurricane Protection Levee.
- In August 1994, CEMVN completed a feasibility report entitled “WBV (East of the Harvey Canal).” 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 eastwards to the Mississippi River. The final report

recommended that the existing West Bank Hurricane Project, Jefferson Parish, Louisiana, authorized by the WRDA of 1986 (P.L. 99-662), approved November 17 1986, be modified to provide additional hurricane protection east of the Harvey Canal. The report also recommended that the level of protection for the area east of the Algiers Canal deviate from the National Economic Development Plan's level of protection and provide protection for the SPH. The Division Engineer's Notice was issued on 1 September 1994. The Chief of Engineer's report was issued on 1 May 1995. Preconstruction, engineering, and design was initiated in late 1994 and is continuing. The WRDA of 1996 authorized the project.

- On 20 March 1992, CEMVN signed a FONSI on EA # 165 entitled "Westwego to Harvey Canal Disposal Site."
- In February 1992, the USACE completed a reconnaissance study entitled "West Bank Hurricane Protection, Lake Cataouatche, Louisiana." The 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. The study found a 100-year level of protection to be economically justified based on constructing a combination levee/sheetpile wall along the alignment followed by the existing non-Federal levee. Due to potential impacts to the Westwego to Harvey Canal project, the study is proceeding as a post-authorization change.
- On 3 June 1991, CEMVN signed a FONSI on EA # 136 entitled "West Bank Additional Borrow Site between Hwy 45 and Estelle PS."
- On 15 March 1990, CEMVN signed a FONSI on EA # 121 entitled "West Bank Westwego to Harvey Changes to EIS." The report addressed the impacts associated with the use of borrow material from Fort Jackson for LPV construction. The material was used for constructing the second life for the Plaquemines West Bank levee upgrade, as part of LPV construction.
- In December 1986, the USACE completed a Feasibility Report and EIS entitled, "West Bank of the Mississippi River in the Vicinity of New Orleans, La." The report investigated 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 recommended implementing a plan that would provide 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.

#### **1.4 Integration with other Interim Environmental Reports**

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

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

### **1.5 Public Concerns**

The public has had the opportunity to give input about proposed GNOHSDRRS work throughout the planning process through a number of outlets (i.e., public meetings, written comments, [www.nolaenvironmental.gov](http://www.nolaenvironmental.gov)). IER # 18 and IER # 19 were the first in a series of IERs investigating the impacts of borrow excavation related to the GNOHSDRRS. Final IER # 18 and Final IER # 19 contain public comments regarding borrow issues. These documents are available at [www.nolaenvironmental.gov](http://www.nolaenvironmental.gov), or upon request.

According to the results of focus groups held by Unified New Orleans Plan (UNOP) the public places very high priority on storm protection. The public wants a 100-year or higher level of protection from storm events. Borrow excavation is an integral part of upgrading hurricane protection in the New Orleans Metropolitan Area. The public is concerned about safety issues during and after the borrow area is excavated. Some members of the public feel that the borrow areas should be backfilled; CEMVN is currently looking into the feasibility of backfilling utilized borrow areas. The cost for backfilling a borrow area with sand could vary from \$5-\$10 per cubic yard for hydraulically pumped material to \$15-\$25 per cubic yard for trucked material. The public is concerned about impacting wetlands; CEMVN is currently avoiding all jurisdictional wetlands as other reasonable alternatives are being investigated (see Section 2.1). The public is concerned about truck haulers causing traffic congestion. The public is concerned about safety issues during and after the borrow area is excavated. Landowners are concerned about the free use of their privately-owned property.

Verbal comments received during the 12 February 2008, Westbank I public meeting are found in Appendix B.

### **1.6 Data Gaps and Uncertainties**

Transportation impacts and routes for the delivery of borrow material have not been determined, as it currently is uncertain to which GNOHSDRRS construction sites each proposed borrow area would provide material. Large quantities of material would be delivered to GNOHSDRRS construction sites, as well as to other ongoing flood protection projects in the area. This could have localized short-term impacts to transportation corridors that can not be quantified at this time. CEMVN is completing a transportation study to determine any impacts associated with the transporting of material to construction sites. This analysis will be discussed in future IERs once it is completed.

CEMVN is studying the feasibility of backfilling Government Furnished borrow areas after excavation. Information will be discussed in future IERs once it becomes available.

Some construction schedules are changing or not known at this time.

## 2. Alternatives

### 2.1 Alternatives Development and Preliminary Screening Criteria

NEPA requires that in analyzing alternatives to a proposed action a Federal agency consider an alternative of “No Action.” Likewise, Section 73 of the WRDA of 1974 (PL 93-251) requires Federal agencies to give consideration to non-structural measures to reduce or prevent flood damage. Because this IER deals with Government Furnished borrow material there are no non-structural alternatives. Non-structural alternatives will be evaluated in the IERs dealing directly with the construction of the GNOHSDRRS projects.

CEMVN is pursuing three avenues of obtaining the estimated amount of borrow material needed for GNOHSDRRS construction. The three avenues that are being pursued by CEMVN to obtain borrow material are Government Furnished (the Government acquires rights to property), Pre-Approved Contractor Furnished (a CEMVN levee construction contractor works in partnership with a landowner to provide suitable pre-approved borrow material from the landowner’s property), and Supply Contract (a landowner or corporation delivers a pre-specified amount of suitable borrow material to a designated location for use by a CEMVN levee construction contractor). Two of the avenues being pursued (Pre-Approved Contractor Furnished and Supply Contract) allow a private individual or corporation to propose a site where borrow material could come from. It is possible that some of the Government Furnished, Contractor Furnished, and Supply Contract sources of borrow material may come from anywhere in the United States, not just from within the Greater New Orleans Metropolitan Area. IER # 18 discussed Government Furnished borrow alternatives. This IER discusses potential Government Furnished borrow areas. Approved Pre-Approved Contractor Furnished borrow areas were discussed in IER # 19 and Draft IER # 23. An additional IER(s) will discuss potential Supply Contract alternatives. Additional borrow IERs will be prepared as future potential Government Furnished and Pre-Approved Contractor Furnished borrow areas are identified.

The US Fish and Wildlife Service (USFWS) supports CEMVN’s prioritization selection of potential borrow areas in the following order: existing commercial pits, upland sources, previously disturbed/manipulated wetlands within a levee system, and low-quality wetlands outside a levee system (Appendix D). USFWS recommended that prior to utilizing borrow sites every effort should be made to reduce impacts by using sheetpile and/or floodwalls to increase levee heights, wherever feasible. The USFWS also recommended the following protocol be adopted and utilized to identify borrow sources in descending order of priority:

1. “Permitted commercial sources, authorized borrow sources for which environmental clearance and mitigation have been completed, or non-functional levees after newly constructed adjacent levees are providing equal protection.
2. Areas under forced drainage that are protected from flooding by levees, and that are:
  - a) non-forested (e.g., pastures, fallow fields, abandoned orchards, former urban areas and non-wetlands;
  - b) wetland forests dominated by exotic tree species (i.e., Chinese tallow) or non-forested wetlands (e.g. wetland pastures), excluding marshes;

- c) disturbed wetlands (e.g., hydrologically altered, artificially impounded).
3. Sites that are outside a forced drainage system and levees, and that are:
- a) non-forested (e.g. pastures, fallow fields, abandoned orchards, former urban areas) and non-wetlands;
  - b) wetland forests dominated by exotic tree species (i.e., Chinese tallow) or non-forested wetlands (e.g. wetland pastures), excluding marshes;
  - c) disturbed wetlands (e.g., hydrologically altered, artificially impounded).”

The USFWS is currently assisting CEMVN in meeting this protocol.

The GNOHSDRRS includes the completion and raising of storm protection levees in southeastern Louisiana. Raising levee elevations and completion of levees requires the excavation of material from borrow areas for use in project construction. As part of the construction, numerous utilities, including electrical services, gas lines, telephone poles and lines, storm drainpipes, subdrain lines, and storm drain catch basins, would be avoided or relocated. The access routes and land would be cleared using bulldozers and excavators. Woody debris would be stockpiled on-site and placed in the pit once excavation is completed or in some cases the material may be removed to an approved landfill. Silt fencing would be installed around the perimeter of the borrow area to control runoff as per Best Management Practices (BMPs). Contractors would implement Best Management Practices, including standard USACE storm water prevention requirements at all borrow area locations, as well as complying with all other Federal, State, and local laws, regulations, and ordinances. It is the intent of CEMVN to not discharge any waters off site from a borrow area during excavation. Should this become necessary, a National Pollutant Discharge Elimination System (NPDES) permits would be obtained. In most cases excavation of the borrow areas would commence from the back of the areas to the access road to provide adequate space for staging haul trucks and stockpiled material. To make optimum use of available material, excavation shall begin at one end of the borrow area and be made continuous across the width of the areas to the required borrow depths to provide surface drainage to the low side of the borrow area as excavation proceeds. During this process, the overburden (topsoil that lays on top of suitable borrow material) would be stockpiled. The excavation shall be long enough to provide the required quantity of material, and shall be accomplished in such manner that all available material within the required width to full depth will be utilized. Upon completion of excavation, site restoration will include placing the stockpiled overburden back into the area and grading the slopes to the specified cross-section figure shown in the Plans and Specifications (P&S). If additional overburden is available at the areas, it would be used to create gradual side slopes, islands, and smooth out corners within the borrow area to enhance wildlife and fishery habitat. The Environmental Design Considerations for Main Stem Levee Borrow Areas Along the Lower Mississippi River Report 4: Part V (available at [www.nolaenvironmental.gov](http://www.nolaenvironmental.gov)), and CEMVN operating procedures will be referred to when designing the borrow areas. However, the full depth of the borrow area could be excavated according to the P&S of the approved borrow area depths to minimize impacts to the human and natural environment.

## **2.2 Description of the Alternatives**

Four alternatives were considered. These included the No Action, the Proposed Action, Pre-Approved Contractor Furnished Borrow Material, and Supply Contract.

No Action. Under the No Action alternative the proposed borrow areas would not be used by CEMVN. The borrow areas listed in the proposed action would not be excavated. GNOHSDRRS levee and floodwall projects would be built to authorized levels using Government and Pre-Approved Contractor Furnished borrow sites described in IERs # 18 and # 19, or other sources as yet to be identified.

Proposed Action. The proposed action consists of excavating the five proposed borrow areas discussed in Section 2.3. For Government furnished borrow material, the Government acquires the rights to a property, from which suitable borrow material is used for construction of the GNOHSDRRS.

Pre-Approved Contractor Furnished Borrow Material. Pre-Approved Contractor Furnished borrow alternatives area options that are discussed in IERs # 19 and Draft IER # 23, as well as future borrow IERs. A CEMVN levee construction contractor would work in partnership with a landowner to provide suitable pre-approved borrow material from the landowner's property. It is possible that some sources of Pre-Approved Contractor Furnished borrow material may come from anywhere in the United States.

Supply Contract Borrow Material. Supply Contract borrow alternatives may be discussed in future IERs. The Supply Contract would allow a private individual(s) or corporation(s) to deliver a pre-specified amount of suitable borrow material from an area(s) anywhere in the United States where suitable borrow material could come from. The individual(s) or corporation(s) would deliver the borrow material to a designated location for use by a CEMVN construction contractor.

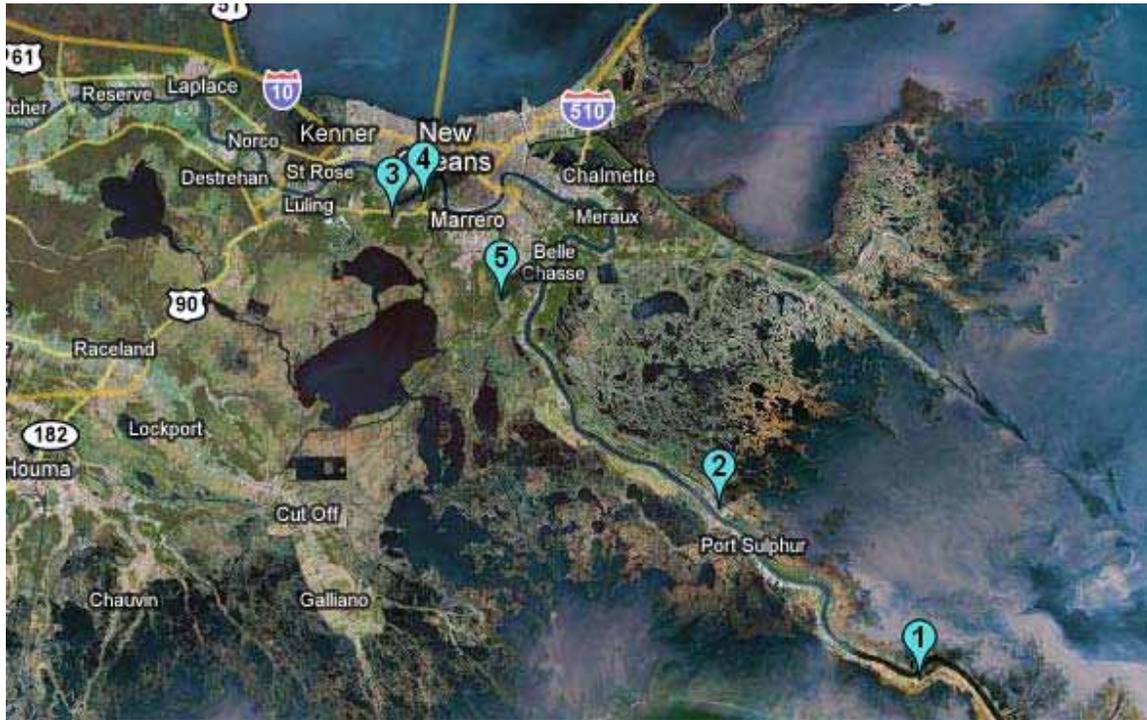
Without knowing the exact location(s) of this area(s) it is impossible to know the effects excavation of this borrow material would have on significant resources discussed in this document. IER(s) relating to Supply Contract-furnished material will be released independent of IER # 22, and as such no further discussion of Supply Contract Borrow Material will be done in IER # 22.

### **2.3 Proposed Action**

The proposed action (preferred alternative) consists of potentially excavating all suitable material from the proposed five borrow areas (Figure 1). In order to meet the borrow needs of the GNOHSDRRS, personnel from CEMVN Project Management, Engineering, Real Estate, Office of Counsel, Relocations, and Environmental branches established the Borrow PDT. This team worked closely with other CEMVN offices (Hurricane Protection Office, Protection and Restoration Office, and Regulatory Functions Branch) to accomplish its mission. The team's goal is to locate and procure high quality clay borrow sources suitable for levee and floodwall construction in such a way as to be least damaging to both the natural and human environments within the proposed borrow areas.

The team investigated and completed environmental coordination on the proposed borrow areas and is currently investigating others. When an area was proposed for CEMVN borrow procurement, Real Estate personnel acquired right-of-entry to investigate the property. A map of the site was forwarded to the Regulatory Functions Branch for a jurisdictional wetland determination. The proposed borrow area was revised as necessary to avoid jurisdictional wetlands. A CEMVN Archeologist completed a preliminary, in-office survey of mapped cultural resource sites to detect any obvious cultural resources within the proposed borrow area. A CEMVN Biologist completed an in-office survey of aerial photos of the area to determine if the potential area raised Coastal Zone Management (CZM) issues based on location or if there were other obvious environmental issues that could be detected from aerial photography. The Biologist also

coordinated with the USFWS to ensure the proposed area would not adversely affect threatened or endangered (T&E) species or their critical habitat.



**Figure 1: Proposed Borrow Areas**

1: Brad Buras / 2: Tabony / 3: Westbank F / 4: Westbank I / 5: Westbank N

Once the team completed a preliminary site approval, a site visit was conducted. The field team typically consisted of a Project Manager, Biologist, Geologist, Archeologist, and Hazardous, Toxic, and Radioactive Waste (HTRW) Investigator. The area was visually inspected for the presence of obvious HTRW issues and cultural resources. If no HTRW concerns or cultural resources were observed, the area was cleared to proceed with geotechnical borings to identify soil characteristics.

The proposed action consists of removing all suitable material from the following five borrow areas. Following GNOHSDRRS borrow protocol, excavation would have no effect on cultural resources, or threatened and endangered species or their critical habitat. All jurisdictional wetlands and HTRW issues would be avoided.

- The Brad Buras area is located on the south side of Louisiana Highway 23 in Plaquemines Parish, Louisiana (Figure 2). The area is 9 acres of maintained pasture land.
- The Tabony area is located on the east side of Louisiana Highway 15, in Plaquemines Parish, Louisiana (Figure 3). The area is 121.3 acres with a cell tower site and an existing borrow area that was excavated during Task Force Guardian.
- The Westbank F area is located on the south side of U.S. Highway 90 in Jefferson Parish, Louisiana (Figure 4). The area is 52 acres with a 8.8-acre access corridor. Approximately 60.8 acres of BLH would be impacted.

- The Westbank I area is located on the north side of Louisiana Highway 18 in Jefferson Parish, Louisiana (Figure 5). The total area is 33.7 acres in size compartmentalized into a 13.6 acre and 12.8 acre borrow area; a 5.8 acre stockpile area; and 1.5 acre access. The proposed borrow area is located behind the Bridge City playground baseball field.
- The Westbank N area is located on the south side of Walker Road, near Belle Chasse, Louisiana in Jefferson Parish (Figure 6). The area was initially investigated as a 145 acre potential borrow area, but was reduced to 76 acres to leave a buffer between the proposed borrow area and the levee.

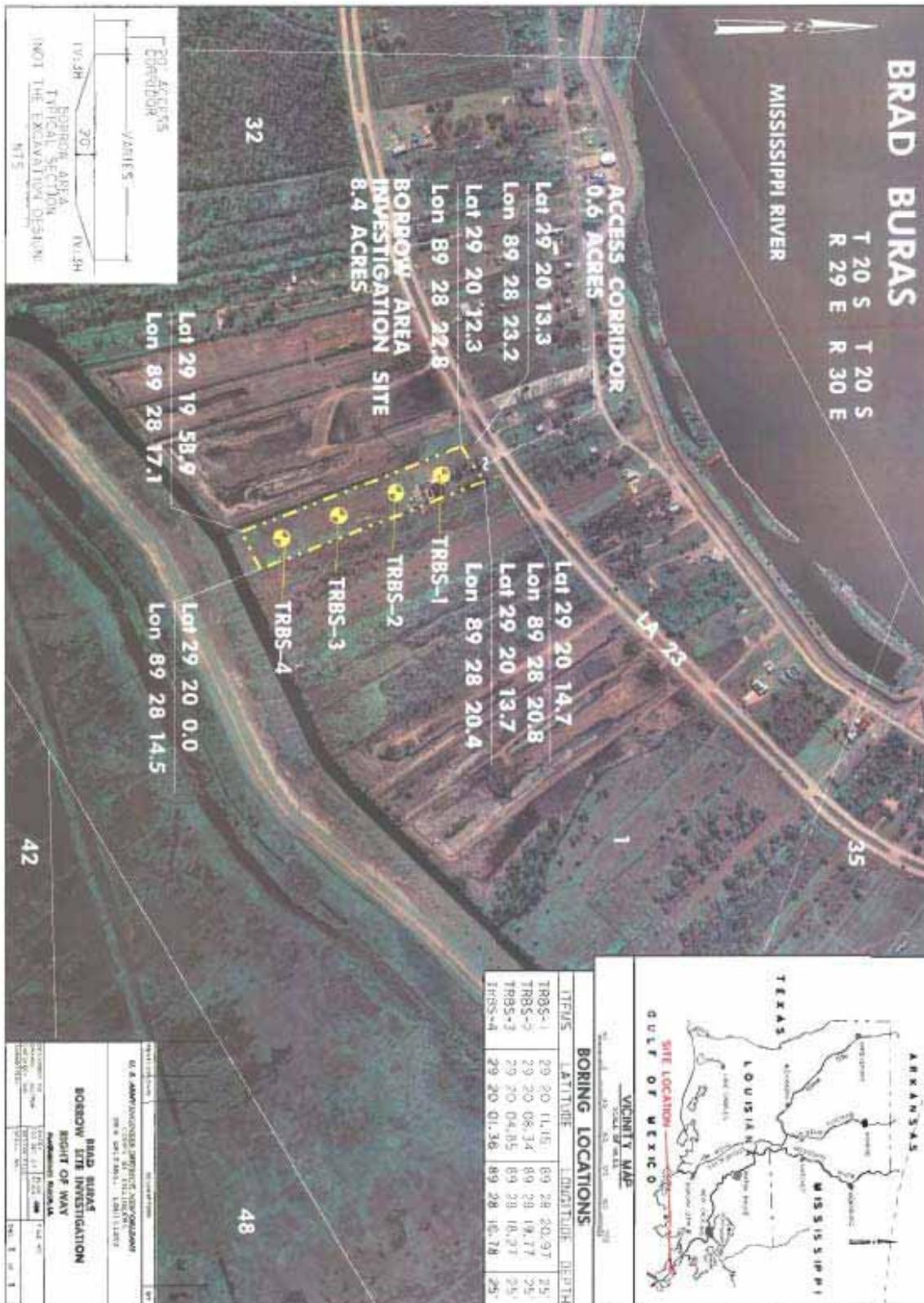


Figure 2: Proposed Brad Buras Borrow Area

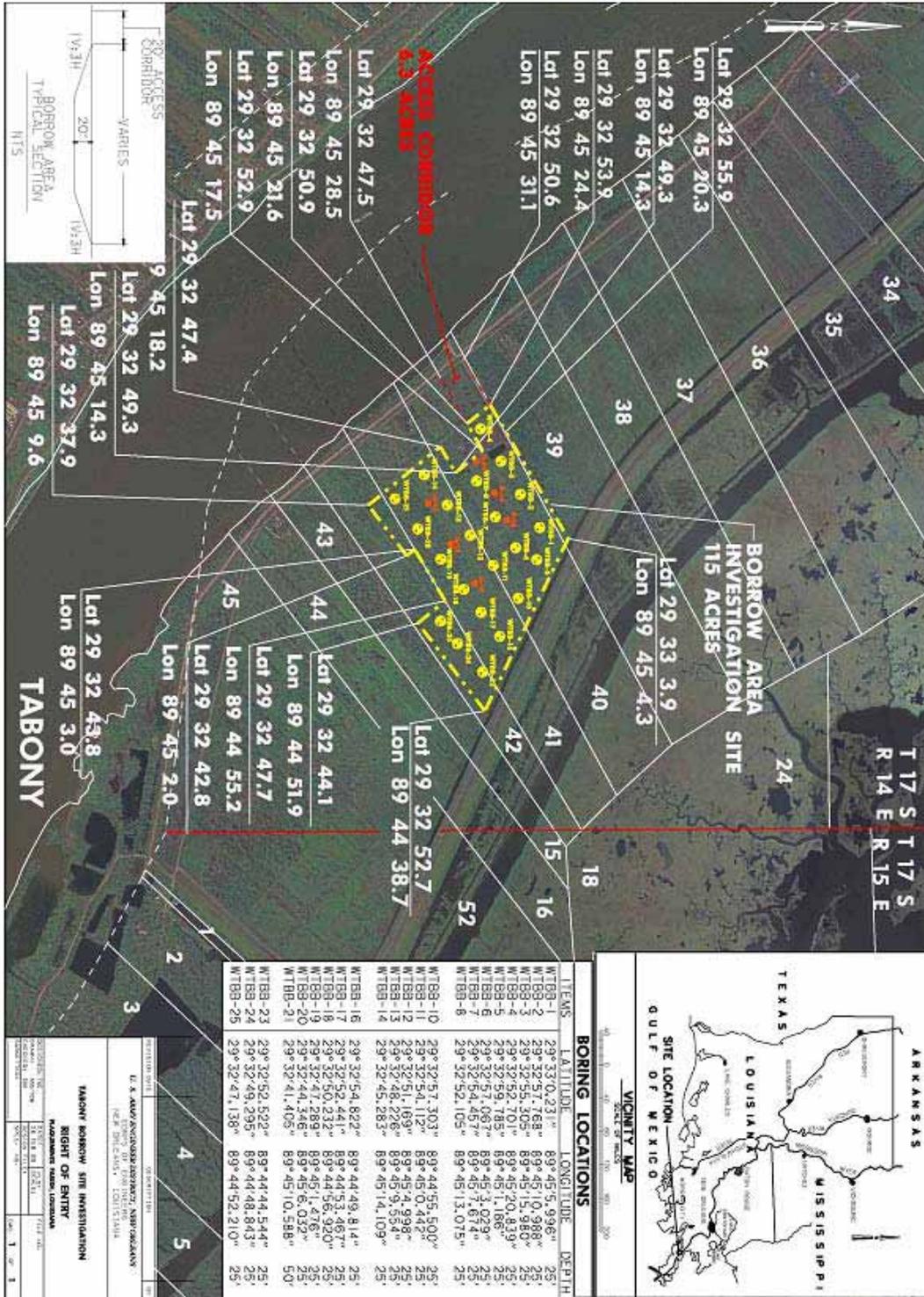


Figure 3: Proposed Tabony Borrow Area

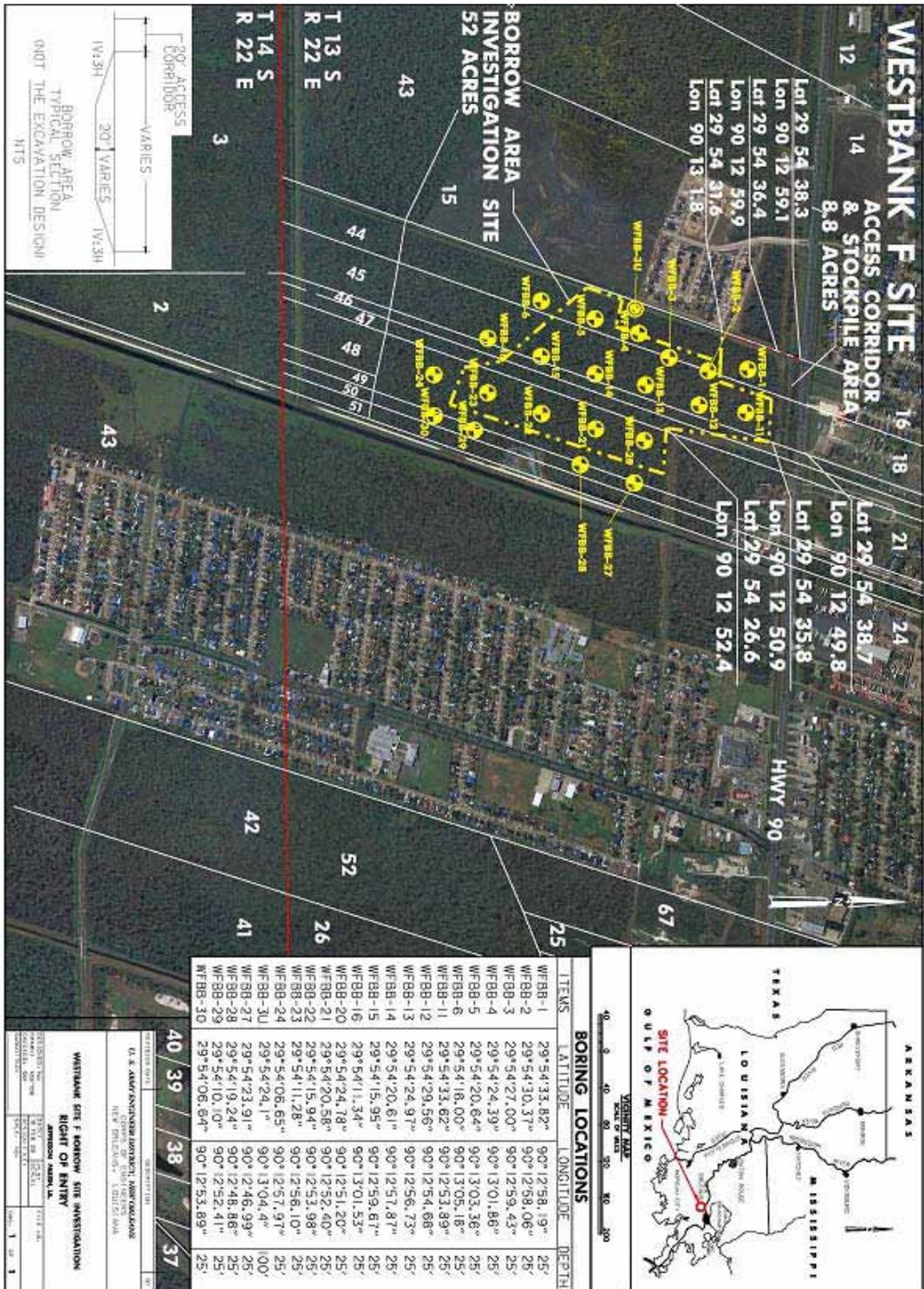


Figure 4: Proposed Westbank F Borrow Area

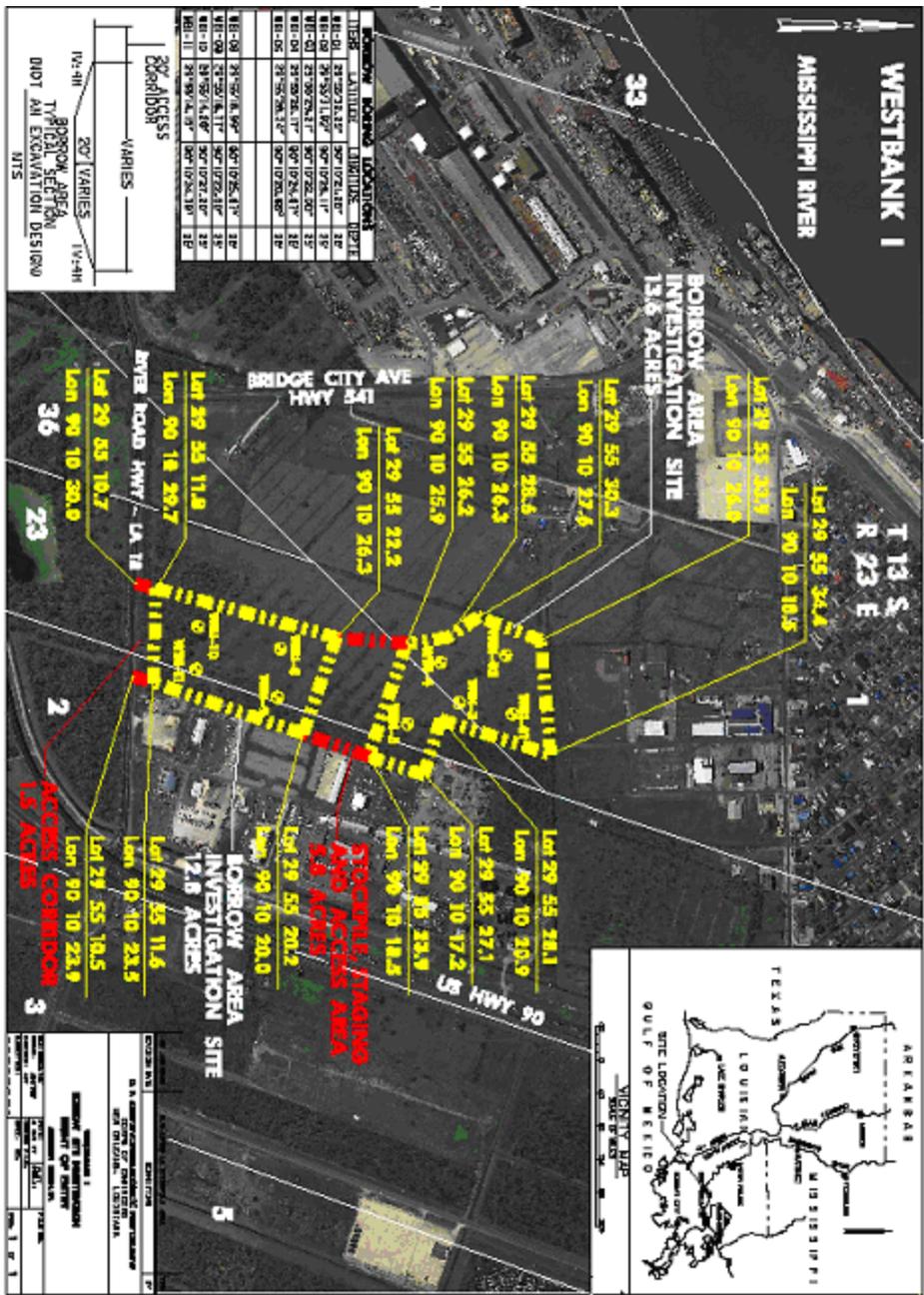


Figure 5: Proposed Westbank I Borrow Area

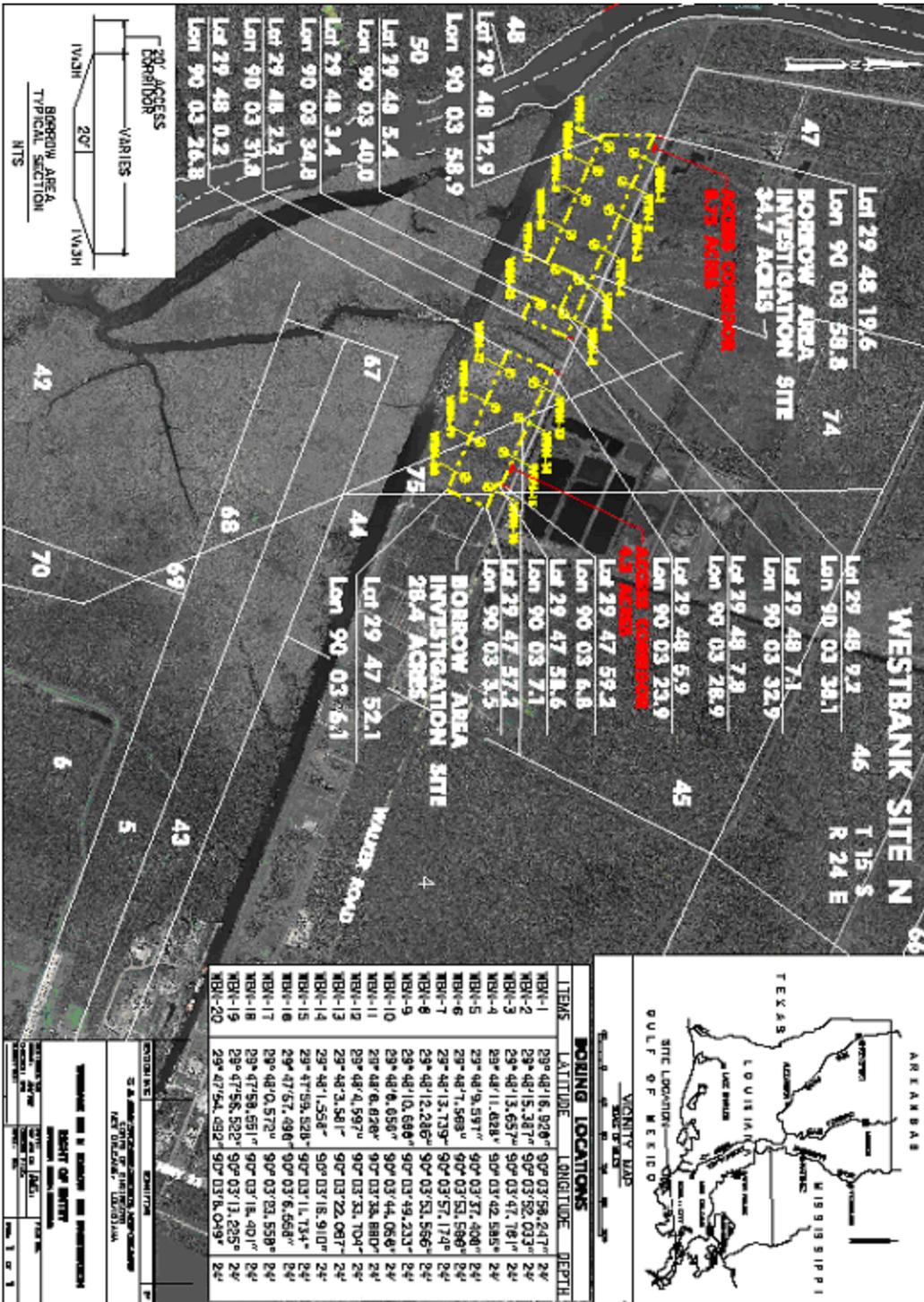


Figure 6: Proposed Westbank N Borrow Area

Some of the proposed borrow areas have a designated stockpile area. If additional material is needed for levee construction, the stockpile areas may be utilized as a borrow source if suitable soils are present, as opposed to impacting new areas.

#### **2.4 Alternatives to the Proposed Action**

Other alternatives to the proposed action were considered, as described below.

No Action. Under the No Action alternative the proposed borrow areas would not be used by CEMVN. The borrow areas listed in the proposed action would not be excavated. The levees and floodwall projects would be built to authorized levels using Government and Contractor Furnished borrow sites described in IERs # 18 and # 19, or other sources as yet to be identified.

Pre-Approved Contractor Furnished Borrow Material. Due to the large quantities of suitable clay material needed for the GNOHSDRRS projects, Pre-Approved Contractor Furnished borrow alternatives are options that will be discussed in IERs # 19 and Draft IER # 23, as well as future borrow IERs.

Supply Contract Borrow Material. Due to the large quantities of suitable clay material needed for the GNOHSDRRS projects, Supply Contract borrow alternatives may be discussed in future IERs. IER(s) relating to Supply Contract-furnished material will be released independent of IER # 22, and as such no further discussion of Supply Contract Borrow Material will be done in IER # 22.

#### **2.5 Alternatives Eliminated from Further Consideration**

The following investigated areas were deemed unsuitable by CEMVN for GNOHSDRRS activities:

- The Westbank G area located in Jefferson Parish discussed in IER # 18 will not be used for GNOHSDRRS levee or floodwall construction. Geotechnical analysis revealed unsuitable soil conditions at the site.
- The Chauvin area is located on the north side of Louisiana Highway 23 in Plaquemines Parish, Louisiana. This 28 acres area of maintained pasture land was investigated, but declined due to geotechnical analysis.
- The Rene Uzee area is located in Plaquemines Parish. This 20 acre area was investigated, but declined due to the presence of mixed wetlands throughout the property. The CEMVN may be forced to reconsider this area at some point in the future should there be an inadequate quantity of suitable borrow material for construction of the GNOHSDRRS, after it has exhausted its search for reasonable and practicable non-wetland sites. Refer to CEMVN selection prioritization of potential borrow areas (Section 2.1), and USFWS guidance (Appendix D).
- 
- The Westbank B area is located in Jefferson Parish. The area was 163 acres and, according to the preliminary wetland determination, the area contained mixed wetland and upland areas, making it impractical to excavate without disturbing the wetlands. The CEMVN may be forced to reconsider this area at some point in the future should there be an inadequate quantity of suitable borrow material for construction of the GNOHSDRRS, after it has exhausted its search for reasonable

and practicable non-wetland sites. Refer to CEMVN selection prioritization of potential borrow areas (Section 2.1), and USFWS guidance (Appendix D).

- The Lynn Dean area is located in St. Bernard Parish. This 50 acre area was investigated, and contained mixed wetland and upland areas, making it impractical to excavate without disturbing the wetlands. The CEMVN may be forced to reconsider this area at some point in the future should there be an inadequate quantity of suitable borrow material for construction of the GNOHSDRRS, after it has exhausted its search for reasonable and practicable non-wetland sites. Refer to CEMVN selection prioritization of potential borrow areas (Section 2.1), and USFWS guidance (Appendix D).
- The Plaisance area is located in Jefferson Parish. This 8 acre area was investigated, but declined because the relatively small size of the property makes it infeasible to use the site as a source of Government Furnished borrow material.

### **3. Affected Environment and Environmental Consequences**

#### **3.1 Environmental Setting**

The proposed borrow areas described in this report are located in Jefferson and Plaquemines Parishes. The study area is bounded to the north by Lake Pontchartrain, to the west by the town of Waggaman, and to the south into Lake Cataouatche and eventually marsh. The area is bordered on three sides by an extensive marsh system that provides a barrier between residences and infrastructure within these parishes, and the Gulf of Mexico. Louisiana's coastal plain remains the largest expanse of coastal wetlands in the contiguous United States. The proposed Westbank F area is located in urban areas of Jefferson Parish, while Westbank I and N are located in an industrial area of the parish. The proposed Brad Buras and Tabony areas are located in rural areas of Plaquemines Parish.

#### **Fauna and Flora**

The Louisiana Coastal Plain area contains an extraordinary diversity of estuarine habitats that range from narrow natural levee and beach ridges to expanses of bottomland hardwood (BLH) forest, forested swamps and fresh, brackish, and saline marshes, and pasture lands. The wetlands support various functions and values, including commercial fisheries harvesting of furbearers, recreational fishing and hunting, ecotourism, critical wildlife habitat (including threatened and endangered species), water quality improvement, navigation and waterborne commerce, flood control, and buffering protection from storms.

Terrestrial animals that may inhabit some of the proposed borrow areas include nutria, muskrat, raccoon, mink, and otter, which are harvested for their furs. White-tailed deer, feral hogs, rabbits, various small mammals, and a variety of birds, reptiles, amphibians, and mosquitos also occur in the study area. Forests, wetlands, bottomland hardwood forests, and pastures may be found in some of the proposed borrow areas. Agricultural crops grown in the vicinity of some of the proposed borrow areas include citrus fruits and truck crops.

## Soils

The term “borrow” is used in the fields of construction and engineering to describe material that is dug in one location for use at another location. The term “suitable” as it relates to borrow material discussed in this document is defined as meeting the following current criteria after placement as levee fill:

- Soils classified as clays (CH or CL) are allowed as per the Unified Soils Classification System;
- Soils with organic contents greater than 9% are not allowed;
- Soils with plasticity indices (PI) less than 10 are not allowed;
- Soils classified as Silts (ML) are not allowed;
- Clays will not have more than 35% sand content.

The USACE Hurricane and Storm Damage Reduction System Design Guidelines, of which the soil standards previously discussed are a part, are reviewed and updated as necessary to ensure that the USACE is constructing the safest levees possible. Changes to the guidelines are reviewed and approved by USACE experts at the local, regional and headquarters level; additional reviews are completed by academia and private individuals who are recognized experts in their fields. Additionally, the guidelines being utilized by CEMVN have been reviewed by members of the Interagency Performance Evaluation Team (IPET). The design guidelines may be updated from time to time to respond to new engineering analysis of improved technology, innovative processes, or new data. An implementation plan for an external review is currently being finalized.

Geotechnical borings were collected at each area to determine the suitability of the material for levee construction use. The borings were spaced to adequately define the material in the area, but in no case spaced greater than 500 feet on center. Borings along the proposed borrow area boundary were located no further than one-half of the boring spacing in the area or 250 feet, whichever was less.

The soils were classified, logged, and recorded within seven days of obtaining the samples in the field. The Unified Soil Classification System was used in classifying the soils. A water content determination was made and recorded on all samples classified as fat clay (CH), lean clay (CL), and silt (ML) at one foot intervals (recommended) or two foot intervals (required). For (CH), (CL), and (ML) soils, Atterberg Limits and Organic Content Testing (American Society of Testing and Materials [ASTM] D 2974, Method C), was required every five feet (minimum). Samples with moisture contents at 70% or higher or having a Liquid Limit of 70 or higher were tested for organic content, as well as for a sample two feet above and two feet below that sample (2.5 feet also acceptable). Grain size distribution determinations including both sieve (#200 sieve required) and hydrometer testing was required for samples that classify as CL with a PI greater than 10 for two or more consecutive feet, but not more than one test every five feet of sampling.

The resulting classification, plasticity, water content, and organic content determinations and borrow area boring logs with GPS readings at the boring locations were analyzed for potential borrow use by CEMVN to determine the suitability of the soil. Geotechnical testing and soil analysis is ongoing at some of the areas, so that it is possible that the area of suitable acreages may decrease as the results are finalized.

### 3.2 Significant Resources

This section contains a list of the significant resources located in the vicinity of the proposed action, and describes in detail those resources that would be impacted, directly

or indirectly, by the alternatives. Direct impacts are those that are caused by the action taken and occur at the same time and place (40 CFR §1508.8(a)). Indirect impacts are those that are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable (40 CFR §1508.8(b)). Cumulative impacts are discussed in Section 4.

The resources described in this section are those recognized as significant by laws, executive orders, 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 CEMVN or on [www.nolaenvironmental.gov](http://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 1 shows those significant resources found within the project area and notes whether they would be impacted by the proposed alternative.

**Table 1: Significant Resources in Project Study Area**

<b>Significant Resource</b>	<b>Impacted</b>	<b>Not Impacted</b>
Jurisdictional Wetlands		X
Non-Jurisdictional Bottomland Hardwood Forest	X	
Non-Wetland Resources/Upland Resources	X	
Prime and Unique Farmland	X	
Fisheries		X
Wildlife	X	
Threatened and Endangered Species		X
Cultural Resources		X
Recreational Resources		X
Noise	X	
Air Quality	X	
Water Quality		X
Aesthetics		X
Socioeconomics	X	
Transportation	X	

### **3.2.1 Jurisdictional Wetlands**

#### Existing Conditions

The jurisdictional wetland habitat types in the proposed borrow areas may include pasture wetlands and cypress swamps. The jurisdictional wetlands contain hydrophytic vegetation, hydric soils, and hydrology indicators. Pasture wetlands are comprised of soft rushes, flat sedges, smartweed, alligator weed, and other wetland grasses. Cypress swamp areas are dominated by bald cypress and tupelo gum. The jurisdictional bottomland hardwood tree species include hackberry, Chinese tallow tree, pecan, American elm, live oak, water oak, green ash, bald cypress, black willow, box elder, and red maple.

The CEMVN Regulatory Functions Branch delineated jurisdictional wetlands during initial investigations of potential borrow areas. Jurisdictional wetland areas will be avoided if the site is used as a source for suitable borrow material. Five of the areas described in this document contain wetland areas. Three (Rene Uzee, Westbank B, and Lynn Dean) were eliminated from further consideration due to their ridge/swale

topography (e.g., mixed wetland/upland habitat). The excavation plans for Westbank N and Westbank F were revised to avoid jurisdictional wetland areas. Wetland acreages avoided are shown in Table 2.

Discussion of Impacts

No Action

With implementation of this alternative, no direct or indirect impacts to jurisdictional wetlands through CEMVN actions would occur at the proposed borrow areas. GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow sites described in IERs # 18 and # 19, or other sources as yet to be identified.

Proposed Action

With implementation of the proposed action, no direct or indirect impact to jurisdictional wetlands at the proposed borrow areas would occur. The jurisdictional wetland areas would be avoided (Table 2). The remaining areas would be used as a borrow source. BMPs would be implemented to ensure no indirect impacts to the jurisdictional wetland areas.

**Table 2: Jurisdictional Wetland Acreage Avoided**

<b>Proposed Borrow Area</b>	<b>Parish</b>	<b>Initial Area Investigated (acres)</b>	<b>Jurisdictional Wetlands Present (acres)</b>	<b>Jurisdictional Wetlands Avoided (acres)</b>	<b>Size After Jurisdictional Wetland Avoidance (acres)</b>
Westbank N	Jefferson	76	7	7	69
Westbank F	Jefferson	155	3	3	152
Lynn Dean	St. Bernard	50	Mixed 50	Mixed 50	0
Westbank B	Jefferson	163	Mixed 163	Mixed 163	0
Rene Uzee	Plaquemines	20	Mixed 20	Mixed 20	0

Mixed: Impractical to excavate without disturbing the wetlands

**3.2.2 Non-Jurisdictional Bottomland Hardwood Forest**

Existing Conditions

Non-jurisdictional BLH forests are comprised of dominant species such as hackberry, Chinese tallow tree, pecan, American elm, live oak, water oak, green ash, bald cypress, black willow, box elder, and red maple. Some understory species include dewberry, lizard’s tail, and poison ivy. A variety of birds utilize these hardwoods for nesting, breeding, brooding, and as perches. Hard mast (nuts) and soft mast (samaras, berries) provide a valuable nutritional food source for birds, mammals, and other wildlife species. Non-jurisdictional BLH forests lack one or more of the following criteria to be considered a Clean Water Act Section 404 wetland: hydrophytic vegetation, hydric soils, and/or wetland hydrology (USACE 1987). Manmade ditches, canals, and/or pumping stations are present at some of the proposed borrow areas.

- The Tabony area includes 87 acres of forested area, comprised of red maple, box elder, pecan, Chinese tallow tree, hackberry, and live oaks.

- The Westbank F area includes 60.8 acres of forested non-wetlands. The tree canopy is comprised of red maple, green ash, box elder, elm, bald cypress, hackberry, Chinese tallow tree, and water oak.
- The Westbank I area contains 9.8 acres of black willow, Chinese tallow, red maple, and hackberry.

### Discussion of Impacts

#### No Action

With implementation of this alternative, there would be no direct or indirect impacts to BLH through CEMVN actions at the proposed borrow areas. GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow sites described in IERs # 18 and # 19, or other sources as yet to be identified.

#### Proposed Action

With implementation of the proposed action, there would be direct and indirect impacts to BLH forest. Mature trees would be cut down with the use of chainsaws or pushed down with bulldozers and excavators. Saw logs could be sold to the mill and younger trees could be processed into pulp wood for paper products. Woody debris leftover would be cleaned up and all berms would be leveled to eliminate hydrologic impacts. Once excavated, the area would no longer be viable for silviculture practices, and some wildlife habitat would be removed. The area would be converted to ponds and small lakes if water is retained, or by vegetation and woody plants if water is not retained. It is expected that either type of area would attract a variety of wildlife including birds, reptiles, amphibians, and small mammals.

This office has assessed the environmental impacts of the proposed action, and has determined that the proposed action would have unavoidable impacts to a total of 244.69 acres and 118.54 Average Annualized Habitat Units (AAHUs) of non-jurisdictional BLH. (Habitat Units represent a numerical combination of habitat quality [Habitat Suitability Index] and habitat quantity [acres] within a given area at a given point in time. Average Annual Habitat Units represent the average number of Habitat Units within any given year over the project life for a given area.) Mitigation for unavoidable impacts to non-jurisdictional BLH is discussed in Section 6, and will be described under a separate IER.

### **3.2.3 Non-Wetland Resources/Upland Resources**

#### Existing Conditions

Species identified in the non-wet pasture areas include Johnson grass, yellow bristle grass, annual sumpweed, arrow-leaf sida, vasey grass, Brazilian vervain, and eastern false-willow. The scrub/shrub areas are comprised of Chinese tallow tree, eastern false-willow, wax myrtle, giant ragweed, dew berry, elderberry, red mulberry, pepper vine, and dog-fennel.

The areas listed below show representative vegetation found in the pasture and scrub/shrub areas.

- The Brad Buras area is approximately 9 acres of pasture land. The herbaceous layer comprised of Johnson grass, dog fennel, and great ragweed.
- The Tabony area contains approximately 84 acres of unmaintained pasture land. These areas are comprised of great ragweed, dewberry, Brazilian vervain,

peppervine, dog fennel, deer pea, golden rod, eastern false-willow, and Chinese tallow.

- The Westbank N area is approximately 76 acres of pasture land. The herbaceous layer is comprised of golden rod, dog fennel, arrow-leaf sida, and Johnson grass.

Discussion of Impacts

No Action

With implementation of this alternative, no direct or indirect impacts to non-wetland resources/upland resources through CEMVN actions would occur at the proposed borrow areas. GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow sites described in IERs # 18 and # 19, or other sources as yet to be identified.

Proposed Action

With implementation of the proposed action, non-wetland resources/upland resources would be cleared and excavated. The borrow areas would likely be converted to ponds and small lakes. The pasture areas would no longer provide grasses for herbivores such as deer, rabbits, and cattle. The thick scrub/shrub areas that provided cover for wildlife would be removed. Some scrub/shrub areas may redevelop around the borrow area perimeters in time. Borrow areas that remain dry would be expected to be colonized by vegetation and woody plants, which could offset some habitat loss.

**3.2.4 Prime and Unique Farmland**

Existing Conditions

Three proposed borrow areas contain prime and unique soils according to the National Resources Conservation Service National Resource Conservation Service (Table 3).

**Table 3: Prime and Unique Farmland Soils Present**

<b>Proposed Borrow Area</b>	<b>Parish</b>	<b>Soil map unit(s)</b>	<b>Prime and Unique Farmland Present</b>	<b>Acres of Prime and Unique Farmland</b>
Tabony	Plaquemines	Shriever clay	Yes	171
Westbank F	Jefferson	Harahan clay	Yes	148
		Shriever clay		
Westbank I	Jefferson	Shriever clay	Yes	34.5

Discussion of Impacts

No Action

Without implementation of the proposed action, no direct or indirect impact to prime and unique farmlands would occur to the proposed borrow areas. GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow sites described in IERs # 18 and # 19, or other sources as yet to be identified.

### Proposed Action

With implementation of the proposed action, prime and unique farmlands would be cleared and excavated. Removing soils from these proposed borrow areas would result in a permanent loss of prime and unique farmlands and the areas would no longer be available for farming. The proposed borrow areas would most likely fill with water and be converted to ponds or small lakes. Borrow areas that do not retain water would probably not be able to produce food and fiber crops. The land would no longer provide grasses for herbivores such as deer, rabbits, or cattle.

### **3.2.5 Fisheries**

#### Existing Conditions

The proposed Tabony borrow area contains a small pond that may support fisheries. It is the only proposed borrow area that contains suitable fisheries habitat.

#### Discussion of Impacts

##### No Action

Without implementation of the proposed action, no direct or indirect impact to fisheries would occur. GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow sites described in IERs # 18 and # 19, or other sources as yet to be identified.

##### Proposed Action

With implementation of the proposed action, non-jurisdictional wetland and upland resources would be cleared and excavated. The existing pond at the Tabony site would be drained, and fish mortality would occur. Dry land sites may be converted to ponds and small lakes. The areas could provide fishery habitats if stocked by landowners, which would not be inconsistent with other land uses near the project area. Fish that may thrive in the borrow areas include mosquitofish, killifish, shortnose and spotted gar, redbfin shad, bass, bluegill, and catfish. Landowners could enjoy benefits from fishing once the areas are established.

If overburden is sufficient, sloped and fringe shallows may be created to provide shallows for both near edge and submergent vegetative growth. Overburden material would be used, to the maximum extent practicable, to create fringe wetlands and fishery habitats.

### **3.2.6 Wildlife**

#### Existing Conditions

The study area contains a great variety of mammals, birds, reptiles, and amphibians. Species inhabiting the area include nutria, muskrat, mink, otter, raccoon, white-tailed deer, skunks, rabbits, squirrels, armadillos, and a variety of smaller mammals. Wood ducks and some migratory waterfowl may be present during winter, especially in the proposed Brad Buras, Tabony, and Westbank N areas due to the close proximity of the sties to the Mississippi River, which is a major flyway.

Non-game wading birds, shore birds, and sea birds including egrets, ibis, herons, sandpipers, willets, black-necked stilts, gulls, terns, skimmers, grebes, loons, cormorants, and white and brown pelicans are found in the project vicinity. Various raptors such as barred owls, red-shouldered hawks, northern harriers (marsh hawks), American kestrel, and red-tailed hawks may be present. Passerine birds in the areas include sparrows, vireos, warblers, mockingbirds, grackles, red-winged blackbirds, wrens, blue jays, cardinals, and crows. Many of these birds are present primarily during periods of spring and fall migrations. The areas may also provide habitat for the American alligator,

salamanders, toads, frogs, turtles, and several species of poisonous and nonpoisonous snakes. The existing ditches, canals, marshes, and Mississippi River bature currently provides suitable breeding habitat for various species of mosquitoes.

The bald eagle is a raptor that is found in various areas throughout the United States and Canada as well as throughout the study area. Bald eagles are Federally protected under the Bald Eagle Protection Act of 1940. The bald eagle feeds on fish, rabbits, waterfowl, seabirds, and carrion (Ehrlich et al. 1988). The main basis of the bald eagle diet is fish, but they will feed on other items such as birds and carrion depending upon availability of the various foods. Eagles require roosting and nesting habitat, which in Louisiana consists of large trees in fairly open stands (Anthony et al. 1982). Bald eagles nest in Louisiana from October through mid-May. Eagles typically nest in bald cypress trees near fresh to intermediate marshes or open water in the southeastern parishes.

### Discussion of Impacts

#### No Action

Without implementation of the proposed action, no direct or indirect impact to wildlife would occur to the proposed borrow areas. GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow sites described in IERs # 18 and # 19, or other sources as yet to be identified.

#### Proposed Action

With implementation of the proposed action, wildlife would be displaced when the areas are cleared and excavated. The areas may be converted to ponds and small lakes that could provide wading bird, fish, and mosquito habitat. At that time, some aquatic vegetation may colonize the shallow littoral edge of the areas, and wildlife (otters, alligators, raccoons, wading birds, and ducks) adapted to an aquatic environment would be expected to expand their range into the new waterbodies. A variety of plant species may colonize adjacent to the water that could provide important wildlife habitat utilized for nesting, feeding, and cover. Any areas that remain dry would be expected to be colonized by vegetation and woody plants, which could offset some habitat loss. The dense vegetation could attract a variety of wildlife including birds, reptiles, amphibians, small mammals, and mosquitoes. While the borrow areas have the potential to become mosquito breeding areas, the amount of surface acres of water is considered to be small compared to surrounding wetlands. However, local parish mosquito control programs, not CEMVN, are responsible for mosquito control.

### **3.2.7 Threatened and Endangered Species**

#### Existing Conditions

The brown pelican may be in the vicinity of the proposed borrow areas. It is a year-round resident that typically forages on fish throughout the study area. In winter, spring, and summer, nests are built in mangrove trees or other shrubby vegetation, although occasional ground nesting may occur. Small coastal islands and sand bars are typically used as loafing areas and nocturnal roosting areas.

### Discussion of Impacts

#### No Action

Without implementation of the proposed action no direct or indirect impacts to T&E species or their critical habitats would occur to the proposed borrow areas. GNOHSDRRS projects would be built to authorized levels using Government and

Contractor Furnished borrow sites described in IERs # 18 and # 19, or other sources as yet to be identified.

Proposed Action

The proposed action is not likely to adversely affect any T&E species or their critical habitats. The endangered brown pelican may be present in the project vicinity. However, none were seen at the borrow areas described in this document. The USFWS concurred with the CEMVN that excavation of the proposed borrow areas would not be likely to adversely affect the brown pelican or other T&E species, or their critical habitat (Table 4).

**Table 4: USFWS T&E Concurrence**

<b>Proposed Borrow Area</b>	<b>USFWS Concurrence</b>
Brad Buras	28 June 2007
Tabony	14 September 2007
Westbank F	19 September 2007
Westbank I	28 September 2007
Westbank N	19 September 2007

**3.2.8 Cultural Resources**

Existing Conditions

Cultural resources have been considered for each proposed borrow area (Table 5). The level of investigation varied depending on the probability of cultural resources being located within the project area. Investigations were geared toward identifying known and previously unrecorded historic properties within proposed borrow areas and the areas of potential effect (APE). Background research involving review of known resources within the area, investigating informant reports of cultural resources, and assessing the likelihood of cultural resources based on soil and geomorphologic data was completed for all proposed borrow areas. Investigations included reconnaissance or Phase I archaeological surveys for four of the five borrow areas (Harlan and Nolan 2007; Harlan and Smith 2007; Nolan et al. 2007; Pokrant and Harlan 2007). Section 106 of the National Historic Act of 1966, as amended, consultation included correspondence with the Louisiana State Historic Preservation Officer (SHPO) and federally recognized Tribes that have an interest in the region.

The results of these investigations revealed that no known listed National Register of Historic Places properties or sites eligible for listing on the National Register of Historic Places exist within the proposed project locations or will be affected by the proposed development.

Archeological surveys in the vicinity of the proposed borrow areas have identified both prehistoric and historic sites in the vicinity of the proposed action. When sites lie in the vicinity of the proposed action, they have been adequately buffered in order to prevent inadvertent damage to the sites. Therefore no sites are located within the proposed borrow area APE (Harlan and Nolan 2007, Harlan and Smith 2007; Nolan et al. 2007; , Wiseman et al. 1979). Given the recent geologic development of the Mississippi delta and the age of deposits within the southeastern Louisiana, archaeological sites are not expected to date prior to the Poverty Point Phase (1700 – 500 B.C.) (Wiseman 1979). Prehistoric sites, such as shell middens, hunting and gathering camps, habitation sites, villages and mounds sites, tend to be located on active and abandoned distributary channel levee complexes, major beach ridges, and on older stable portions of the delta, and in association with freshwater marshes. Similarly, historic period sites, such as forts

plantations, and industrial features tend to be located on levees and along waterways. The dynamic nature of flooding and sedimentation from the Mississippi River has likely buried some archeological sites, and subsidence has likely inundated others.

All of the proposed borrow areas are located, either partly or wholly, in drained backswamps. While backswamps were utilized for resource extraction during both prehistoric and historic periods, there is little evidence of occupation in this habitat. Thus the likelihood for the presence of undiscovered cultural sites within these project areas remains low. Portions of the proposed Westbank I and Westbank N borrow sites lie within natural levees, a landform that served as a focus of prehistoric and historic occupation. Intensive subsurface testing of these project areas failed to identify cultural resources in the APEs (Nolan et al. 2007; Harlan and Nolan 2007).

### Discussion of Impacts

#### No Action

Without implementation of the proposed action, no direct impacts to cultural resources are anticipated. Any undiscovered or unreported cultural resources or traditional cultural properties will likely remain intact and in their current state of preservation. The burial or subsidence of historic land surfaces will continue in the current pattern. There is no reason to believe that No Action will have any direct positive or negative impacts to cultural resources. GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified.

#### Proposed Action

With implementation of the proposed action, any undiscovered cultural resources may be damaged during borrow excavation and construction operations. However, it is unlikely that such direct impacts would occur because steps have been taken to previously identify cultural resources within the proposed borrow areas.

**Table 5. Summary of Cultural Resource Investigations and Section 106 Consultation for Government Furnished Borrow Areas**

Proposed Borrow Area	Cultural Resource Investigation	CEMVN letter date	SHPO	Chitimacha Tribe of LA	MS Band of Choctaw Indians	Alabama Coushatta Tribe of TX	Caddo Nation of OK	Choctaw Nation of OK	Coushatta Tribe of LA	Jena Band of Choctaw Indians	Quapaw Tribe of OK	Seminole Nation of OK	Seminole Tribe of FL	Tunica-Biloxi Tribe of LA
Brad Buras	CEMVN Investigation	7/9/07	7/31/07	10/10/07*	7/10/07	10/10/07*	10/10/07*	10/10/07*	10/10/07*	10/10/07*	7/12/07	10/10/07*	10/10/07*	10/10/07*
Tabony	ESI, Phase I	11/28/07 1/24/08** 3/6/08**	3/10/08	12/27/207	12/28/07*	12/28/07*	12/28/07*	12/5/07	12/28/07*	12/28/07*	12/28/07*	12/28/07*	2/28/08*	12/28/07*
Westbank F	ESI, Recon	1/14/08	2/4/08	2/19/208	1/14/08	2/19/08	2/19/08	2/19/08	2/19/08	2/19/08	2/19/08	2/19/08	2/19/08	2/19/08
Westbank I	ESI, Phase I	10/10/07 10/18/07**	11/28/07 12/6/07	11/21/07*	10/15/07	11/21/07*	11/21/07*	10/25/07	11/21/07*	11/21/07*	11/21/07*	11/21/07*	10/23/07 & 11/8/07	11/21/07*
Westbank N	ESI, Phase I	11/28/07	12/26/07	12/27/07	1/15/08	1/2/08**	1/2/08**	12/5/07	1/2/08**	1/2/08**	1/2/08**	1/2/08**	1/2/08**	1/2/08**

- \*Response date reflects the end of the 30 day comment period. No response implies concurrence with federal effect determination as per 36 CFR 800.3(c)(4).
- \*\*Additional information was sent to SHPO on these dates.

### **3.2.9 Recreational Resources**

#### Existing Conditions

The region in which the proposed actions are to take place is rich with recreation resources. The potential borrow areas may have some recreational potential, but contain no existing recreational infrastructure or specific features and are privately owned and not open to public access. Immediately adjacent to site “West Bank I” is Bridge City Playground.

#### Discussion of Impacts

##### No Action

Without the proposed action, there should be no direct or indirect impacts to recreation resources. GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified.

##### Proposed Action

The proposed actions will not directly or indirectly impact existing recreation resources in the region. For site “West Bank I,” the Bridge City Playground is outside the project boundary and should not be impacted. In some cases, depending on how the end site is left, the habitat may be suitable to support some recreational activities (i.e., wildlife viewing, fishing), but these benefits are expected to be minimal and sites would not be open to public access.

### **3.2.10 Noise Quality**

#### Existing Conditions

Some of the proposed borrow sites are located near highways, interstates, and residential areas, while others are located in rural areas. The Westbank I site is near a school and church. Currently, sound levels would be expected to be moderate. The primary producers of sound would be from traffic, people, and, wildlife. Local traffic may have short-term sound levels that are high.

#### Discussion of Impacts

##### No Action

With implementation of this alternative, no direct or indirect impacts to noise quality through CEMVN actions would occur at the proposed borrow areas. GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow sites described in IERs # 18 and # 19, or other sources as yet to be identified.

##### Proposed Action

With implementation of the proposed action, there would be an elevation of noise levels during construction. This noise would be associated with construction equipment such as bulldozers, excavators, haul trucks, and/ or chainsaws. Portable pumps would also be used if needed. Elevated noise levels may impact nearby residents. However, these impacts are expected to be constrained to construction hours.

### **3.2.11 Air Quality**

#### Existing Conditions

As of 15 June 2005, the 1-hour ozone standard for the New Orleans area (Orleans, Jefferson, St. Bernard, Plaquemines, and St. Charles Parishes) was revoked and replaced by an 8-hour standard. The New Orleans area is currently not subject to any conformity requirements of the Clean Air Act. In other words, these parishes are now in attainment of the 8-hour ozone standard and all other criteria pollutant National Ambient Air Quality Standards (NAAQS). The parishes listed above are currently in attainment of all NAAQS. This classification is the result of area-wide air quality modeling studies.

#### Discussion of Impacts

##### No Action

With implementation of this alternative, no direct or indirect impacts to air quality through CEMVN actions would occur at the proposed borrow areas. GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow sites described in IERs # 18 and # 19, or other sources as yet to be identified.

##### Proposed Action

With implementation of the proposed action, there would be short duration impacts to air quality that would result from the construction of borrow areas in Jefferson and Plaquemines parishes. These impacts would be controlled by proper best management practices (BMP). Air quality impacts would be limited to those produced by heavy equipment, and suspended dust particles could be generated by bulldozing, dumping, and grading operations. Operation of construction equipment and support vehicles would generate volatile organic compounds (VOCs), particulate matter (PM) 10, PM 2.5, nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), ozone (O<sub>3</sub>) and sulfur oxides (SO<sub>x</sub>) emissions from diesel engine combustion. The construction equipment and haul trucks should have catalytic converters and mufflers to reduce exhaust emissions.

Dust suppression methods would be implemented to minimize dust emissions. Air emissions from the proposed action would be temporary and should not significantly impair air quality in the region. Due to the short duration of excavation, any increases or impacts on ambient air quality are expected to be short-term and minor and are not expected to cause or contribute to a violation of Federal or State ambient air quality standards.

### **3.2.12 Water Quality**

#### Existing Conditions

Louisiana Department of Environmental Quality (LDEQ) regulates both point and nonpoint source pollution. Many of the proposed borrow areas are uplands with associated man-made drainage features.

#### Discussion of Impacts

##### No Action

With implementation of this alternative, no direct or indirect impacts to water quality through CEMVN actions would occur at the proposed borrow areas. GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow sites described in IERs # 18 and # 19, or other sources as yet to be identified.

### Proposed Action

Despite the use of best management practices, with implementation of the proposed action, there would be some disturbances to water quality in the immediate vicinity of the proposed borrow areas. The contractor would be required to secure all proper Federal, State, and local permits required for potentially impacting water quality. The CEMVN requires that construction BMPs be implemented and followed during the construction phase. Silt fencing and hay bales would be installed around the perimeter of the proposed borrow areas to control runoff. To make optimal use of available material, excavation would begin at one end of the borrow area and be made continuous across the width of the areas to the required borrow depths, to provide surface drainage to the low side of the borrow area as excavation proceeds. Excavation for semi-compacted fill would not be permitted in water nor shall excavated material be scraped, dragged, or otherwise moved through water. In some cases, the borrow areas may need to be drained with the use of a sump pump. Upon abandonment, site restoration would include placing the stockpiled overburden back into the area and grading the slopes to the specified cross-section figures. Abrupt changes in grade should be avoided, and the bottom of the borrow area shall be left relatively smooth and sloped from one end to the other. Any excavation below the depths and slopes specified shall be backfilled to the specified permissible excavation line in accordance with construction plans and specifications. Abrupt changes in borrow area alignment shall be avoided.

### **3.2.13 Transportation**

#### Existing Conditions

Additional information on the potential impacts associated with transporting borrow material is being developed by CEMVN and will be discussed in future IERs. This is a known data gap (Section 1.6).

The following is a listing of each proposed borrow area by parish and the sites' proximity to roads and highways.

- Plaquemines Parish: The Brad Buras area is located on Highway 23, a major highway traversing north/south through the parish. The Tabony area is located on the east side of the Mississippi River and fronts Highway 15.
- Jefferson Parish: The Westbank F area is located on Highway 90 and is adjacent to an unnamed shell road on the east. The Westbank Site I is located on the north side of LA 18. The Westbank Site N is located on the south side of Walker Road.

#### Discussion of Impacts

##### No Action

With implementation of this alternative, no direct or indirect impacts to transportation through CEMVN actions would occur at the proposed borrow areas. GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow sites described in IERs # 18 and # 19, or other sources as yet to be identified.

##### Proposed Action

With implementation of the proposed action, construction equipment such as bulldozers and excavators would need to be delivered and haul trucks would be entering and exiting the sites on a daily basis during the period of excavation. The truck hauling would temporarily impede vehicle traffic and result in a minimal reduction in the level of service (LOS, a metric describing traffic volume relative to

capacity) on some local road segments. Flagmen, signage, cones, barricades, and detours would be used where required to facilitate the movement of heavy equipment and local traffic on affected road segments. The proposed design of all areas would require methods to avoid exposure of adjacent traffic routes and other urban developments. Appropriate measures to ensure safety and facilitate the movement of traffic would be implemented at all approved borrow areas.

- **Plaquemines Parish:** The proposed Brad Buras area is near Highway 23, a road segment that is used daily by large trucks hauling freight to and from Venice, Louisiana, to supply local industry. The area is 9 acres in size, so truck hauling would be short-lived from the area. The Tabony area is located near the end of Highway 15 and Highway 39 in a rural part of the parish. If the proposed borrow area is used, material would more than likely be used for GNOHSDRRS construction sites closest to the borrow areas, minimizing the disruption of transportation through developed areas.
- **Jefferson Parish:** The proposed Westbank F area is located in an urban area close to Highway 90, a heavily used commercial road on the west bank of Jefferson Parish. The area is near residential and commercial developments including landfills that garbage and debris haulers utilize daily. Currently, an unnamed road is being used to supply borrow material for the Lake Cataouatche levee. Clay haulers should blend in with the local commercial traffic in the area. U.S. Highway 90 and an adjacent unnamed road would be used for accessing the area. The Westbank I area is located in a commercial area close to LA 18, a heavily used commercial road on the west bank of Jefferson Parish. The Westbank N area is located in a rural area adjacent to Walker Road which intersect Highway 23, a road segment that is used daily by large trucks hauling freight to and from Venice, Louisiana.

Appropriate measures to ensure safety and facilitate the movement of traffic would be implemented at all potential borrow areas. The current traffic volume at these areas is unknown.

### **3.2.14 Aesthetic (Visual) Resources**

#### Existing Conditions

Most of the proposed borrow areas contain similar land use patterns (i.e., former- or presently-cultivated land) to the immediate and adjacent areas and, generally, they lack distinct qualities that make them visually significant. However, the Westbank F proposed borrow site is adjacent to residential areas. Noteworthy is the physical condition of the area surrounding the proposed Tabony and Brad Buras borrow areas, as it remains scarred from the effects of Hurricane Katrina. Other proposed borrow areas are visually remote and inaccessible.

#### Discussion of Impacts

##### No Action

With implementation of this alternative, no direct or indirect impacts to visual resources through CEMVN actions would occur at the proposed borrow areas. GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow sites described in IERs # 18 and # 19, or other sources as yet to be identified.

### Proposed Action

It is recognized that some proposed borrow areas are adjacent to residential areas where their existence may not be considered as positive environmental features. With that said, all approved borrow areas should be developed as positive environmental features. Previously, traditional borrow areas were excavated in a rectangular shape with no aesthetic concerns as outlined in Figure 16-1, Appendix 16, Mississippi River Mainline Levees Enlargement and Seepage Control. These borrow areas should be utilized as positive environmental features, whenever possible. Therefore, they should be designed and constructed with gradual side slopes, irregular shapes, and have some islands, and where practical vegetation should be allowed to serve as its backdrop. Specific design guidelines for these borrow areas are found in Part V of Environmental Design Considerations for Main Stem Levee Borrow Areas Along the Lower Mississippi River, Lower Mississippi River Environmental Program, Report 4, April 1986. Where it is not feasible to develop these borrow sites as positive environmental features, measures such as landscaping should be utilized to screen off negative viewsheds into the borrow areas.

## **3.3 Socioeconomic Resources**

The focus of this section is to evaluate the relative socioeconomic impacts, if any, of construction activities associated with acquiring borrow material from five areas in the vicinity of the New Orleans Metropolitan Area. This borrow material would be used to construct Federal GNOHSDRRS projects, usually in the same parish where it is acquired.

### **3.3.1 Population and Housing, Business and Industry, Property Values & Public Facilities & Services**

#### Existing Conditions

Located within the New Orleans Metropolitan Area, and within non-wetland areas, the proposed borrow areas have more property value than large tracts of adjacent wetlands. These areas indirectly, if not directly, contribute to the local tax base. The close proximity of the proposed borrow areas to additional urban developments adds value to the adjacent area, commercial and residential property values, public facilities and services, utilities, public transit, safe highways, streets and bridges, police and fire protection facilities and services, schools and education services, hospitals and health care services, and the many other public facilities and services of Federal, State, and local government.

Of the two parishes in Louisiana discussed in this report, the specified median value of homes ranged from \$105,300 in Jefferson Parish to \$110,100 in Plaquemines Parish. The "Proposed Action" paragraph below indicates the latest and most detailed census (U.S. 2000 Census) information available in regards to the value of residential property in related census block groups, although all of the sites proposed are on currently vacant property.

#### Discussion of Impacts

##### No Action

With implementation of this alternative, Federal GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified. No incremental effects of population and housing, business and industry, property values, or public facilities and services, relative to the proposed action, are expected.

### Proposed Action

Planning for the proposed action has attempted to balance the cost and need for storm surge risk reduction with consideration of property values, public facilities and services, and potential impacts to the local tax base. The borrow material would be used to enhance authorized storm surge risk reduction systems, thus adding value for various purposes ranging from industrial, commercial, residential, institutional, and public. While the Brad Buras area is maintained pasture land, and all sites contain prime and unique farmland, the sites are not otherwise used for residential or commercial purposes.

- The Brad Buras area in Plaquemines Parish covers 9 acres, within the New Orleans to Venice (NOV) Hurricane Project. The site is currently uninhabited, but has been maintained as pasture land. While there are several structures on the Brad Buras site, they will be avoided during excavation. The site is located in census block group 507.04, with a specified median value for owner-occupied housing units of \$56,400.
- The Tabony area in Plaquemines Parish covers 121.3 acres within the New Orleans to Venice Hurricane Project. The site is currently uninhabited; however, there is a cellphone tower on the site. There is also an existing borrow pit on the site, excavated during Task Force Guardian. The site is located in census block group 501.03, with a specified median value for owner-occupied housing units of \$95,200.
- The Westbank F, I, and N sites in Jefferson Parish cover 60.8, 33, and 76 acres, respectively, within the West Bank and Vicinity Hurricane Project. All three sites are uninhabited. They are located in census block groups 276.01.04, 274.02, and 503.03, respectively, with specified median value for owner-occupied housing units of \$75,000, \$47,900, and \$117,900.

Jefferson Parish residents and the Jefferson Parish Council are concerned that using the proposed borrow areas within Jefferson Parish (Westbank F, I and N) would negatively impact property values in the area. Indeed, property values for the sites themselves may tend to decrease as their potential uses for alternative purposes are diminished in the future. For adjacent properties, the market response with respect to property values is undetermined, though there would appear to be no likelihood that property value could be enhanced on this account alone.

The impact for future growth opportunities for business in industry in the area is problematic. An open borrow area has fewer opportunities for future development than one that is backfilled. Also, an open borrow area does nothing to enhance the relative attractiveness of adjacent real estate as opportunities for commercial investment. However, from a market perspective, the competitive disadvantage that the borrow area, and adjacent properties, may be placed when compared to alternative real estate investment opportunities in other markets is measured simply by the cost to backfill. From a practical standpoint, private owners of adjacent properties cannot compel owners of open borrow areas to backfill for the purpose of enhancing property values within the market area in general. For Government Furnished borrow, the future owners of open borrow areas may be the parishes themselves, serving as local sponsors for the project; therefore, the future disposition of open borrow areas may emerge as a higher priority public issue within the context of a comprehensive economic development master plan. As a result, an impediment, to an undefined degree, may be introduced to further prospective commercial development.

### **3.3.2 Health and Safety and Flood Control & Hurricane Protection**

#### Existing Conditions

The proposed project sites fall within existing flood and hurricane protection areas of Plaquemines and Jefferson parishes. All parishes in the vicinity have been highly sensitive to flood damage, requiring an extensive network of structures, pumping systems, and evacuation routes. The erosion rate in some areas appears to have declined since the 1960's, but the loss of barrier islands, erosion, and subsidence of wetlands have continued in many areas in close proximity to the project sites. Storm surges from Hurricanes Katrina and Rita, which occurred in August and September of 2005, respectively, created heavy damages that requires an immediate effort to restore existing conditions and reestablish protected areas of the community, whenever possible.

The immediate project sites do not include health and safety facilities providing related services.

#### Discussion of Impacts

##### No Action

With implementation of this alternative, Federal GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified. Under this alternative there would be no impact to health and safety at the sites discussed in this report.

##### Proposed Action

With implementation of the proposed action suitable material would be excavated from the proposed borrow areas. This is the process that was historically used to create most of the storm surge reduction infrastructure for the New Orleans Metropolitan area. Implementation of the sites would be subject to Federal, state, and local safety and health regulations. There would be temporary, construction-related risks to health and safety, but no permanent impacts are expected. However, if borrow sites are not fenced in, then there would be increased adverse effects to health and safety in the vicinity, especially that of young children.

Increased vehicular traffic near the borrow sites during the excavation period may raise the likelihood of accidents. Routine measures related to traffic management at construction sites are expected to reduce this risk and ensure safety.

With implementation of this alternative, there would be minimal impacts to air and water quality, due to construction. Heavy equipment and excavation of borrow material would cause dust particles to be suspended in the air. In addition, there might be temporary adverse impacts to water quality, but CEMVN will take action to minimize these impacts. Changes in water and air quality would last only through the period of excavation.

One potential adverse health impact due to the excavation of borrow material would be an increased problem with mosquitoes. Should water collect in portions of the areas excavated for borrow material, the available area for potential mosquito breeding would be increased. However, mosquito control is part of the responsibilities of local parishes, not CEMVN.

No long-term impacts to health and safety facilities are expected as a result of this alternative.

Local residents, especially those in Jefferson Parish, are concerned that borrow pits would have an impact on local health and safety. To the extent that borrow pits are left empty, and are not backfilled, even after all parish ordinances have been complied with, Jefferson Parish residents and the Jefferson Parish Council feel that there would continue to be a safety hazard posed to the local community.

### **3.3.3 Employment, Income and Local Tax Base**

#### Existing Conditions

Except for sites used as pasture or farmland, the proposed sites are not currently used for business purposes or to generate employment. The project sites total approximately 300 acres within close proximity to urban developments of the New Orleans MSA.

#### Discussion of Impacts

##### No Action

With implementation of this alternative, Federal GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified. The future conditions with this alternative would require alternative methods for improving hurricane and flood protection using borrow material from other locations. The collection of alternative material may be an added cost to the project that would be reflected in construction costs. However, no incremental impacts on employment, income, and local tax base relative to the proposed action are expected.

##### Proposed Action

Some of the proposed sites were previously or currently used as pasture or farmland. However, if borrow material is excavated from these areas with no backfill, then this land will no longer be available for other uses, including farmland. There are no anticipated disruptions to commercial activities in the areas near the borrow sites. Therefore, no disruptions to income and public tax collections are expected. The exception to this is the possibility that tax collections based on the values of the sites themselves may decline if the values of the properties decline.

To the extent that the execution of the contract to provide borrow material provides taxable income to the property owner, Federal, state, and local tax collections may increase. In a broader sense, the construction activities themselves invariably require the hiring of labor resources that result in higher incomes, personal spending, and potential governmental tax revenues.

### **3.3.4 Community Growth**

#### Existing Conditions

Desirable community and regional growth is considered growth that provides a net increase in benefits to a local or regional economy, social conditions, and the human environment, including water resource development. Similarly to other references to social and economic conditions, community and regional growth has been heavily dependent on the unique flood and hurricane protection systems created by borrow areas. The proposed project sites are planned to improve flood and hurricane protection.

#### Discussion of Impacts

##### No Action

With implementation of this alternative, Federal GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas

described in IERs # 18 and # 19, or other sources as yet to be identified. The no action alternative would require finding alternative borrow sites in different areas. No incremental impacts with respect to the proposed action are expected.

#### Proposed Action

The proposed project would advance community growth by advancing the storm surge risk reduction system. Without strong storm and flood protection, a community's growth may be limited. By advancing the storm surge risk reduction system, confidence and investment in the community will increase.

Additionally, construction activities will advance community growth by increasing traffic to the areas around the borrow sites. This increased activity will likely benefit area businesses.

However, using land for borrow purposes would make that same land unavailable for other uses. This may place the communities around the borrow sites at a competitive disadvantage for increased development and growth. Adjacent property may also be less likely to be developed if land is used for borrow purposes.

Residents in Jefferson Parish worry that the excavation of borrow material from the Westbank I site will place the parish at a competitive disadvantage for future development. They feel that taking material from this site will lessen the benefits to economic growth that the future expansion of the Huey P. Long Bridge may provide. This consideration has been addressed as a potential impact to businesses and industry in the preceding section.

### **3.3.5 Community Cohesion**

#### Existing Conditions

Community cohesion refers to the common vision and sense of belonging within a community that is created and sustained by the extensive development of individual relationships that are social, economic, cultural, and historical in nature. The degree to which these relationships are facilitated and made effective is contingent upon the spatial configuration of the community itself: the functionality of the community owes much to the physical landscape within which it is set. The viability of community cohesion is compromised to the extent to which these physical features are exposed to interference from outside sources.

#### Discussion of Impacts

##### No Action

With implementation of this alternative, Federal GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified. The no action alternative would require finding alternative borrow sites in different areas. No incremental impacts with respect to the proposed action are expected.

##### Proposed Action

The impacts of construction are typically adverse, such as noise and traffic congestion. Some effects, though, have both negative and positive impacts. Yet it is difficult to foresee any construction-related impact that enhances community cohesion; such impacts are expected to be either adverse or, at a minimum, neutral.

Impacts on community cohesion are contingent upon the degree to which project construction is expected to encroach upon the physical landscape that directly or indirectly affects the patterns of social interrelationships. In the current analysis, the borrow sites are sufficiently distant from areas of development such that no spatial element of the community is impinged upon and the shared identity of the community materially threatened. This does not mean that adverse impacts, such as degraded aesthetic qualities or foregone economic opportunities, do not occur. Rather, the adverse impacts in other resource areas are not sufficiently large to affect community cohesion. The impact on community cohesion is first demonstrated by identifying a change in the pattern of social interaction, such as diminished contact due to physical separation, impediments to contact, interference in communication, dislocation, or voluntary migration. None of these conditions are present with the current alternative.

Construction-related impacts can be distinguished from project-related outputs, that is, the economic and social consequences that are specifically intended from the project design and that make it worthwhile to pursue. An increase in community cohesion can be seen as a specifically intended output from the project, as represented by the storm surge risk reduction system. This occurs since storm surge protection measure are designed to protect the community from the catastrophic effects of flooding, preserving the physical integrity of the developed landscape that promotes patterns of social interchange. The alternative presented here increases the level of community cohesion in this instance.

Under the contractor furnished borrow program, material will only be acquired from willing sellers. Those who do not wish to have Pre-Approved Contractor Furnished borrow material removed from their properties do not have to enroll in the program. As such, there should be no adverse impact to the extent that these decisions do not create a significant and long-lasting divisiveness within community affairs that risk the patterns of existing social interaction.

While the proposed borrow areas are located on unpopulated tracts of land, there may be nearby residents or business operators who disapprove of proximate sites being used as sources of borrow materials. This would be seen as a threat to the cohesion of the local community through the adverse visual impact that would result from the activity. Within this understanding of community cohesion, however, such cohesion is linked to a direct impact on a social resource area, aesthetics, which is addressed separately and cannot be otherwise determined to materially affect the patterns of social interaction that the physical landscape and supporting human infrastructure facilitates.

### **3.4 Environmental Justice**

#### Existing Conditions

##### Brad Buras

The proposed Brad Buras borrow area is located on the south side of Highway 23, within the unincorporated community of Triumph, on the west bank of Plaquemines Parish, between Buras and Boothville, Louisiana. Based on satellite imagery, the community of Triumph appears to be a sparsely populated, agricultural community.

The standard unit of analysis for environmental justice is the Census-designated Block Group area. Due to the rural character of the area, the Census-designated Block Group is

larger than the unincorporated area of Triumph. Census Tract 507, Block Group 4, extends from Gulf Drive, on the south side of Buras to Live Oak Lane on the north side of Boothville along Highway 23.

The U.S. Census reports that this area was a predominantly white, low-income community as of 2000. The poverty rate was 25.5%, compared to 18.0% and 19.6% for the parish and State, respectively. The percentage of minority persons was 24.7%, compared to 31.2% and 37.5% for the parish and State, respectively.

The 2007 figures, produced by ESRI Inc. (Environmental Systems Research Institute), estimate that this Block Group has nominally decreased its minority population and become a slightly wealthier area since 2000. However, households with the lowest income in 2000 have not substantially increased their earnings. Therefore, it is probable the area can still be considered a low-income, non-minority population.

#### Tabony

The proposed Tabony borrow area is located near Bohemia on the east bank of Plaquemines, south the unincorporated area of Pointe a la Hache, and between Highway 15 and Highway 39. Using satellite imagery, the community surrounding the site appears to be rural and is very sparsely populated.

The U.S. Census reports that this area, defined as Census Tract 501, Block Group 3, was a predominantly African-American/Black, low-income community as of the year 2000. The boundaries of this Block Group are along Highway 39, from Beshel to Bohemia. The poverty rate was 47.1%, compared to 19.6% and 18.0% for the state and parish, respectively. In terms of minority populations, the percentage of minority persons was 84.3%, compared to 37.5% and 31.2% for the State and Plaquemines Parish, respectively.

The 2007 figures, produced by ESRI Inc., estimate that this Block Group's socio-economic and demographic background has changed very little since 2000. Therefore, it is most likely this Block Group is currently a low-income, minority area.

Because the proposed borrow area is within a sparsely populated area, the Block Group extends far beyond the vicinity of direct impact. If a smaller unit of analysis, the Census Block, is examined, then the data from the 2000 Census reports that Block 43, with a population of 131, was 96.2% minority. This Block includes Tabony Lane and Bethlehem Lane. Poverty statistics and 2007 estimates are not available at the Block level to provide further information.

Based on available aerial photography, this borrow site appears to have no permanent inhabitants.

#### Westbank Site F

The proposed Westbank Site F borrow area is located south of Highway 90 between the Avondale South subdivision and a small residential development off Homeplace Drive. From satellite imagery, it appears the area is a densely populated, suburban community. The proposed borrow site covers 60.8 acres. The site is in close proximity to the adjacent residential areas.

The U.S. Census reports that the community located adjacent to the western side of the proposed excavation site, defined as Census Tract 276.01, Block Group 4, was a minority, predominantly Black/African-American community (77%), with no one living below the poverty line as of 2000. The 2007 estimates, produced by ESRI Inc., indicate

that this Block Group increased its minority percentage to 88% while the income levels remained relatively similar to 2000 data.

The Census reports that the community located east of the proposed excavation site, which is the portion of the Avondale Subdivision located south of Highway 90, and defined as Census Tract 276.01, Block Group 2, is not a minority or low-income community. The minority population is 41.8%, compared to 34.6% and 37.5% for the parish and State, respectively. The percentage of persons living below the poverty line is 14.4%, compared to 13.7% and 19.6% for the parish and the State, respectively. The 2007 figures, produced by ESRI Inc., estimate that this Block Group increased in African-American/Black and Asian residents from 2000 to 2007, which means this area of Avondale is likely now a minority community. Income estimates show the Block Group to have become wealthier since the 2000 Census. Therefore, the area is most likely now a minority, middle-income community.

#### Westbank Site I

The proposed Westbank I borrow area is a 33.7-acre area located just north of Highway 18, between Bridge City Avenue and Highway 90, on the West Bank of Jefferson Parish. Based on satellite imagery, the area is located between heavy industrial activity to the west and industrial and governmental land uses to the east, and is south of a residential area, which is buffered by Bridge City Avenue.

The U.S. Census reports that this community, defined as Census Tract 274, Block Group 2, was a predominantly white, middle-income neighborhood as of 2000. The poverty rate was 14.1%, compared to 19.6% and 13.7% for the State and parish, respectively. In terms of minority populations, the percentage of minority persons was 12.5%, compared to 37.5% and 34.6% for the State and parish, respectively.

The 2007 figures, produced by ESRI Inc., show that this Block Group's socioeconomic and demographic background has changed very little since 2000. Therefore, it is probable this Block Group is currently a white, middle-income community.

It is unlikely the area surrounding the proposed Westbank Site I borrow area can be defined as an area of concern for environmental justice because it is not a low-income or minority community.

#### Westbank Site N

The proposed Westbank N borrow area is a 76-acre site located along Walker Road, between Bayou Road and Landfill Road, south of Belle Chasse in Plaquemines Parish. Based on satellite imagery, it appears that the subject area is not adjacent to any residential communities. The borrow area area is not adjacent to any residential communities and the area surrounding the site is uninhabited.

The U.S. Census reports that the Block in which the proposed site is located, Block 34 of Census Tract 503, Block Group 3, had no population as of 2000. Unfortunately, 2007 estimates for Block level data are not available, but it is highly unlikely that the area now has a population based on satellite imagery.

The larger area of Block Group 3, which includes the residential areas from Concord Road to Walker Road, is likely a white, moderate-income area based on data from the 2000 Census and 2007 ESRI Inc. estimates. According to the Census, the Block Group had a 4.3% minority percentage as of 2000, compared to 37.5% and 31.2% for the State and Plaquemines Parish, respectively. The percentage of persons living below the poverty line was 21.1%, compared to 19.6% and 18% for the State and parish,

respectively. The 2007 estimates, produced by ESRI Inc., show very little change to the 2000 Census demographic and socioeconomic data, implying that the area remains a white, moderate-income community.

Based on the definition of an environmental justice community, it is unlikely that the area surrounding the proposed Westbank N borrow area can be defined as an area of concern for environmental justice because it is not a low-income or minority community.

#### Discussion of Impacts

The proposed actions and alternatives were evaluated for potential disproportionately high, environmental effects on minority or low-income populations. Aerial photos were utilized to confirm the presence of habitation in the various project areas, and are commonly utilized in environmental justice analysis. Further environmental justice analysis will be included in the CED.

#### No Action

Under the No Action alternative, Government contractors would not use material from the five proposed borrow areas. The five subject borrow areas may still be excavated by the individual landowners, but the borrow material would not be used for Federal GNOHSDRRS projects. GNOHSDRRS projects would be built to authorized levels using Government and Contractor Furnished borrow areas described in IERs # 18 and # 19, or other sources as yet to be identified.

No disproportionate impacts borne by any minority or low-income population would be made by not using the five proposed borrow areas. Therefore, no environmental justice issues are anticipated for this alternative.

#### Proposed Action

The proposed action would benefit all residents of the New Orleans Metropolitan Area equally by providing the material necessary to construct the GNOHSDRRS. Further, Pre-Approved Contractor Furnished borrow material would only be acquired from willing sellers. Those who do not wish to have borrow material removed from their properties do not have to enroll in the program. As such, there should be no adverse impacts to community growth and cohesion under the proposed action.

#### Brad Buras

Because this area is rural and sparsely populated, there would not be direct impacts of high human health or environmental nature on minority or low-income populations. No potential impacts to low-income or minority communities have been identified.

#### Tabony

The immediate area of the Tabony site in the lower, east bank of Plaquemines Parish appears to be uninhabited. The proposed borrow area is located near a likely predominantly low-income, African-American/Black community. There is the potential for indirect environmental justice impacts associated with the use of this potential borrow area. Temporary construction related environmental pollution problems, such as noise, truck traffic, and air quality, could impact the minority and low-income population in the vicinity that may pose indirect impacts.

No disproportional impacts to low-income or minority communities have been identified.

#### Westbank Site F

The proposed Westbank Site F borrow area is located adjacent to minority, moderate to middle-income communities that are predominantly Black/African-American. The areas surrounding the borrow area would be potentially impacted by temporary noise and air pollution, traffic congestion, and negative socio-economic issues. Included among those socioeconomic issues are depreciated property values, poor quality of life due to temporary noise and excavation, and limited commercial potential of the excavated sites and adjacent areas. The excavation would have impact to the community to the west of the site, with what appears to be less than 200 feet between the site and private residences. Therefore, use of this borrow area may have potential impacts on this minority community, although they are not disproportionate.

#### West Bank I

The proposed Westbank Site I borrow area is located between areas of heavy industrial land uses. The nearest residential area to the north is a predominantly white, middle-income neighborhood. Since the nearby community is not a low-income or minority community, use of this proposed borrow site is not anticipated to exert direct impacts to low-income or minority communities.

#### Westbank Site N

Because the Westbank N borrow area is far removed from any inhabited areas, it is unlikely that residential areas would experience any long-term negative impact. Therefore, this proposed action would not exert any direct impacts to low-income or minority communities

### **3.5 Hazardous, Toxic, and Radioactive Waste**

The USACE is obligated under Engineer Regulation 1165-2-132 to assume responsibility for the reasonable identification and evaluation of all HTRW contamination within the vicinity of the proposed action. ER 1165-2-132 identifies CEMVN HTRW policy to avoid the use of project funds for HTRW removal and remediation activities. Costs for necessary special handling or remediation of wastes (e.g., Resource Conservation and Recovery Act [RCRA] regulated), pollutants and other contaminants, which are not regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), will be treated as project costs if the requirement is the result of a validly promulgated Federal, State or local regulation.

An ASTM E 1527-05 Phase I Environmental Site Assessment (ESA) was completed for the proposed borrow areas. The Phase I ESA documented the Recognized Environmental Conditions (REC) for the proposed project areas. If a REC cannot be avoided, due to the necessity of construction requirements, the CEMVN may further investigate the REC to confirm presence or absence of contaminants, actions to avoid possible contaminants. Federal, State, or local coordination may be required. Because CEMVN plans to avoid RECs the probability of encountering HTRW in the project area is low.

A copy of the Phase I ESA referenced below will be maintained on file at CEMVN and are incorporated herein by reference. Copies of these reports are available by requesting them from CEMVN, or accessing them at [www.nolaenvironmental.gov](http://www.nolaenvironmental.gov).

HTRW Land Use Histories and Phase I HTRW ESAs have been completed for all of the proposed borrow areas:

- The Phase I ESA for Brad Buras was completed on 11 September 2007. Off-site concerns were noted from the former drilling operations of a documented well

approximately 0.08 miles southwest of the site (Longitude 089.4726696075043, Latitude 29.3327678689304). No RECs were identified on-site. The possible REC is outside of the proposed construction footprint, and would not be impacted by excavation.

- The Phase I ESA for Tabony was completed on 29 January 2008. On-site concerns were noted from the former drilling operations of a documented well located in the south-central portion of the subject site (Longitude - 089.7496255736339 W and Latitude 29.5453071831184 N). It should be noted that the property owner stated that this well was drilled "200 to 300 feet south" of his property; however, the database records indicate otherwise. The location of the well was mapped and would be avoided during excavation.
- On-site concerns were noted from two 55-gallon drums and three five-gallon containers observed stored in the southwestern portion of the site (Longitude - 089.7549903412 W and Latitude 29.5443055117 N), south of the former home site. No ground contamination was noted; contamination should not be a concern. Additionally, drums and containers are outside of the proposed construction footprint, and would not be impacted by excavation.

On-site concerns were noted from a metal pipe of unknown use observed extending from the ground outside the northwest corner of the fenced cell tower (former radio tower) site (Longitude -089.37549627326 W and Latitude 29.5471977303 N). The location of the pipe was mapped and would be avoided during excavation.

Off-site concerns were noted from a former drilling operation of a documented well located approximately 0.13 miles north of the subject site (Longitude - 089.7528782011006W and Latitude 29.5524584248821N). The possible REC is outside of the proposed construction footprint, and would not be impacted by excavation.

- The Phase I ESA for Westbank F was completed on 29 January 2007. Two RECs were noted at the site:
  1. Eight discarded automobile fuel tanks; all tanks appeared empty. The locations of the tanks were mapped and are outside of the proposed construction footprint.
  2. Three rusty metal drums containing unknown materials. These RECs were associated with illegal dumping along the gravel, road at the east side of the property. The RECs were physically very close to each other and could be easily removed for safe disposal. The contractor recommends that the soil in these areas should be sampled and analyzed to ensure that there is no contamination present. The locations of the drums were mapped and are outside of the proposed construction footprint.
- The Phase I ESA for Westbank I was completed on 11 September 2007. On-site concerns were noted on the west-central portion of the site from use of lead shot at the adjoining skeet and trap shooting range. The location of the REC was mapped and would be avoided during excavation.

On-site concerns were noted from the former drilling operations at three documented wells in the southern portion of the subject site. The wells are located at Longitude 090.1732376627, Latitude 29.919524416; Longitude 090.17831299342, Latitude 29.9208253594; and Longitude 090.1760064061,

Latitude 29.9198291996. The locations of the RECs were mapped and would be avoided during excavation.

Off-site concerns were noted from the former drilling operations of a documented well located approximately 0.1 miles east of the subject site (Longitude 090.1717935268, Latitude 29.9197451087. The possible REC is outside of the proposed construction footprint, and would not be impacted by excavation.

The Phase I ESA for Westbank N was completed on 29 January 2008. On-site concerns were noted from the former drilling operations of a documented well located in the central portion of the subject site (Longitude -090.0601910472111 W and Latitude 29.8016435003984 N. The locations of the RECs were mapped and would be avoided during excavation.

On-site concerns were noted from the reported application of herbicide weed killer for at least 10 years over the entire site by the current occupant (Longitude -090.061642931 W and Latitude 29.8024802661 N). Pesticides are believed to have degraded by the present time, and should not be a concern. Further, about three feet of topsoil would be removed by bulldozers during excavation, so any present pesticides would not be found in borrow material.

On-site concerns were noted from stained soils observed underneath a backhoe located in the northeastern portion of the site (Longitude -090.0515274538 W and Latitude 29.7997631896 N). The location of the REC was mapped and would be avoided during excavation.

On-site concerns were noted from a downed pole-mounted transformer located in the northeastern portion of the site (Longitude -090.05178351 W and Latitude 29.7997025275 N). The location of the transformer was mapped and would be avoided during excavation.

On-site concerns were noted from debris piles in the north-central portion of the site, near the mobile home (Longitude -090.0572183278 W and Latitude 29.801686846 N). The debris piles would be removed before excavation.

On-site concerns were noted from several 55-gallon drums and five-gallon containers observed scattered across the north-central portion of the site; however, no stains, odors, or dead vegetation were observed around these containers. The locations of the drums and containers were mapped and would be avoided during excavation.

On-site concerns were noted from an approximately 100-gallon diesel above-ground storage tank (AST) observed in the north-central portion of the site (Longitude -090.0572431222 W and Latitude 29.8020194714 N). The location of the REC was mapped and would be avoided.

Off-site concerns were noted from the reported disposal of incinerator ash on the eastern adjoining property (Longitude -090.049718851 W and Latitude 29.7977218006 N). The possible REC is outside of the proposed construction footprint, and would not be impacted by excavation.

Off-site concerns were noted from the former Belle Chasse Landfill facility located approximately 0.25 miles east of the site (Longitude -090.045135127 W and Latitude 29.7992075535 N). The possible REC is outside of the proposed construction footprint, and would not be impacted by excavation.

#### **4. Cumulative Impacts**

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

Borrow material has been obtained in the past by CEMVN for GNOHSDRRS and other projects in southeast Louisiana. Appendix E shows borrow areas investigated, utilized, approved, and declined by CEMVN since Hurricanes Katrina and Rita to rehabilitate the GNOHSDRRS. CEMVN has been working at an accelerated schedule to complete the GNOHSDRRS system after Hurricanes Katrina and Rita, and to build the system to authorized levels of protection by June 2011. Over 100,000,000 cubic yards of borrow material is estimated to be needed to complete the authorized level of protection. Borrow material will also be needed to perform levee lifts and maintenance for at least 50 years after construction is completed. CEMVN is in the process of implementing construction projects to raise the hurricane and storm risk reduction levees associated with the Federal LPV, WBV, and NOV Hurricane Protection projects to authorized elevations. This includes modifications to flood protection projects not covered by this IER. Levee improvements throughout the LPV and WBV projects would require substantial amounts of borrow material, and some of the borrow areas needed have been identified in this document to provide adequate material in proximity to proposed flood protection projects. In addition to modifying and raising existing structures, three new outfall canal closure structures are proposed at the 17th Street, Orleans Avenue, and London Avenue Outfall Canals in the Orleans East Bank Basin, and a new closure structure is proposed for within the IHNC area. All of these flood protection projects are currently in the planning and design stages and impacts from these component projects will be addressed in separate IERs.

Other CEMVN projects such as Morganza to the Gulf, Donaldsonville to the Gulf, Larose to Golden Meadows, Grand Isle non-Federal levees, Plaquemines West Bank non-Federal levees, maintenance of the Mississippi River levees and other ongoing civil works investigations will require suitable borrow material. State and Local levee and floodwall construction efforts will require borrow material as well. Pre-Approved Contractor Furnished borrow areas are also being investigated and utilized to supply large quantities of material for levee and floodwall projects.

The construction of the proposed borrow areas would have short-term cumulative effects on transportation. It is anticipated that over 100,000,000 cubic yards of material would be needed to raise levee elevations regionally to meet the needs of the GNOHSDRRS . The total number of truck trips required or haul routes for the movement of this quantity of material is currently unknown, but cumulative short-term impacts to transportation are expected to occur. Additional information related to transportation impacts is being collected and will be discussed in future IERs.

Details on cumulative environmental justice impacts, if any, will be analyzed when further project planning data become available at the conclusion of the environmental justice small-group meetings, and will be included in the CED.

The excavation of past, future, and these proposed and other current borrow areas may negatively impact visual characteristics of historic properties and landscapes. Several

borrow areas are located in the vicinity of Avalon; however, there are no recorded historic structures or historic properties that would be impacted within this area. Development tends to be either industrial, such as along the river in Bridge City, or recent residential subdivisions.

Even though minimal in size when compared to the extent of forested and pasture areas directly and indirectly affected by previous development activities, the excavation and use of the proposed borrow material for GNOHSDRRS construction would contribute cumulatively to land alteration and loss within the New Orleans Metropolitan Area. An area of 244.69 acres of BLH forests would be cleared due to implementation of the proposed action. Total BLH impacts covered in IER # 18 and IER #19 (excluding those of the Westbank G area, which was declined- See Section 2.5) equal 391.1 acres. These impacts will be mitigated for, as described in Section 7.

After borrow area excavation, the land may be converted to ponds and small lakes, making it unsuitable for farming, forestry, or urban development in the reasonably foreseeable future. Habitat would be changed to favor aquatic and semi-aquatic species over the terrestrial ones that now occupy the areas. Borrow areas that do not retain water would be colonized by vegetation and woody plants, which would favor terrestrial species. This would attract the same species that are currently found in the areas.

Based on historical human activities and land use trends in this region, it is reasonable to anticipate that future activities would further contribute to cumulative degradation of land resources. It is anticipated that through efforts taken to avoid and minimize adverse effects of this Federal action and the mandatory implementation of a mitigation plan that functionally compensates unavoidable remaining impacts the proposed borrow areas would not result in substantial direct, secondary or cumulative adverse impact on the environment. The mitigation plan is discussed in Section 7.

## **5. Selection Rationale**

The proposed action consists of excavating Government Furnished borrow areas in the New Orleans Metropolitan Area. This report investigated the potential impacts of this action on jurisdictional wetlands, non-jurisdictional BLH, non-wetland/upland resources, prime and unique farmland, fisheries, wildlife, T&E species, cultural resources, recreational resources, noise quality, air quality, water quality, aesthetics, environmental justice, and socioeconomics. There is an identified need for over 100,000,000 cubic yards of borrow material to complete the GNOHSDRRS, and the proposed action meets approximately 6% of this demand. The estimated amount of borrow material are projected quantities, and subject to change based on geotechnical analysis. Because of this need for borrow material, CEMVN will need to investigate acquiring all potentially viable areas for the next few years. Contractor Furnished borrow is an option that was explored in IER # 19 and IER # 23. Other Government Furnished borrow areas were investigated in IER # 18, and more potential sites may be discussed in future IERs. Supply Contract borrow options may also be discussed in future IERs. All of this borrow material would be used to complete the GNOHSDRRS, which would lower the risk of harm to citizens and damage to infrastructure during a storm event.

## **6. Coordination and Consultation**

### **6.1 Public Involvement**

Extensive public involvement has been sought in preparing this IER. The GNOHSDRRS projects, including the proposed borrow areas analyzed in this IER were publicly disclosed and described in the Federal Register on 13 March 2007 and on the website

www.nolaenvironmental.gov. Scoping for GNOHSDRRS projects was initiated on 12 March 2007, through placing advertisements and public notices in *USA Today* and *The New Orleans Times-Picayune*. Nine public scoping meetings were held throughout the New Orleans Metropolitan Area to explain the scope and process of the Alternative Arrangements for implementing NEPA between 27 March and 12 April 2007, after which a 30 day scoping period was open for public comment submission. Additionally, CEMVN is hosting monthly public meetings to keep the stakeholders advised of project status. The public is able to provide verbal comments during the meetings and written comments after each meeting in person, by mail, and via [www.nolaenvironmental.gov](http://www.nolaenvironmental.gov) (Appendix B).

In addition to being discussed at various public meetings starting in July 2007, borrow related-issues were specifically addressed at a public meeting on 12 February 2008. The public meeting was held at the Holy Guardian Angels Catholic Church Youth Center in Bridge City to discuss the proposed Westbank I site. Additional borrow IERs will be discussed at future public meetings.

## **6.2 Agency Coordination**

Preparation of this IER has been coordinated with appropriate Congressional, Federal, State, and Local interests, as well as environmental groups and other interested parties. An interagency environmental team was established for this project in which Federal and State agency staff played an integral part in the project planning and alternative analysis phases of the project. Members of this team are listed in Appendix C, and correspondence between governmental agencies and CEMVN will be found in Appendix D. This interagency environmental team was integrated with the CEMVN PDT to assist in the planning of this project and to complete a mitigation determination of the potential direct and indirect impacts of the proposed action. Monthly meetings with resource agencies were also held concerning this and other CEMVN IER projects. The following agencies, as well as other interested parties, are receiving copies of this draft IER:

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

LDNR reviewed the proposed action for consistency with the Louisiana Coastal Resource Program (LCRP). All proposed borrow activities discussed in this document were found by LDNR to be consistent with the LCRP (Table 6).

**Table 6: LDNR Coastal Zone Consistency Determination Concurrence**

<b>Proposed Borrow Area</b>	<b>LDNR LCRP Consistency Determination</b>
Brad Buras	3 September 2007
Tabony	11 October 2007
Westbank F	25 September 2007
Westbank I	3 September 2007
Westbank N	30 November 2007

CEMVN received a draft programmatic Coordination Act Report from the USFWS on 26 November 2007 (Appendix D). The USFWS's programmatic recommendations applicable to this project would be incorporated into project design studies to the extent practicable, consistent with engineering and public safety requirements. The USFWS's programmatic recommendations, and 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: Not applicable.

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 proposed project area.

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

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

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

CEMVN Response 5: Corps 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 OMRR&R (Operation, Maintenance, Repair, Replacement and Rehabilitation) 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](mailto:david_luchsinger@nps.gov)), or Chief of Resource Management David Muth (504) 589-3882, extension 128 ([david\\_muth@nps.gov](mailto: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: Not applicable.

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

CEMVN Response 8: Concur.

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

CEMVN Response 9: Concur.

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

CEMVN Response 10: Concur.

Recommendation 11: “In general, larger and more numerous openings in a protection levee better maintain estuarine-dependent fishery migration. Therefore, as many

openings as practicable, in number, size, and diversity of locations should be incorporated into project levees.”

CEMVN Response 11: Not applicable.

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

CEMVN Response 12: Not applicable.

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

CEMVN Response 13: Not applicable.

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

CEMVN Response 14: Not applicable.

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

CEMVN Response 15: Not applicable.

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

CEMVN Response 16: Not applicable.

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

CEMVN Response 17: Not applicable.

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

CEMVN Response 18: Not applicable.

Recommendation 19: “Culverts should be installed in construction access roads unless otherwise recommended by the natural resource agencies. At a minimum,

there should be one 24-inch culvert placed every 500 ft and one at natural stream crossings. If the depth of water crossings allow, larger-sized culverts should be used. Culvert spacing should be optimized on a case-by-case basis. A culvert may be necessary if the road is less than 500 ft long and an area would hydrologically be isolated without that culvert.”

CEMVN Response 19: Not applicable.

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

CEMVN Response 20: Not applicable.

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

CEMVN Response 21: Not applicable.

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

CEMVN Response 22: Not applicable.

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

CEMVN Response 23: Concur.

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

CEMVN Response 24: This project is 100% Federally funded; therefore, acquisition of lands and habitat development for mitigation is the responsibility of the Government. However, costs for maintenance and management would be the responsibility of the local 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 would 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.

CEMVN received a draft Coordination Act Report from the USFWS on 03 March 2008 (Appendix D). Recommendations of the USFWS, in accordance with the Fish and Wildlife Coordination Act, include:

Recommendation 1: “[CEMVN] and local sponsor shall provide 118.54 AAHUs to compensate for the unavoidable, project-related loss of forested lands. The Service, National Marine Fisheries Service, Louisiana Department of Wildlife and Fisheries, and Louisiana Department of Natural Resources should be consulted regarding the adequacy of any proposed alternative mitigation sites.”

CEMVN Response 1: CEMVN will work with USFWS, NMFS, LDWF, and LDNR to address mitigation issues.

Recommendation 2: “The protocol to identify and prioritize borrow sources provided in our August 7, 2006 Planning-aid letter [Appendix D]... should continue to be utilized as a guide in locating future borrow-sites.”

CEMVN Response 2: Concur.

Recommendation 3: “Any proposed change in borrow site features, locations, or plans shall be coordinated in advance with the Service, NMFS, LDWF, and LDNR.”

CEMVN Response 3: CEMVN will work with USFWS NMFS, LDWF, and LDNR if there are any proposed changes.

Recommendation 4: “The project’s first Project Cooperation Agreement (or similar document) shall include language that includes the responsibility of the local-cost sharer to provide operational monitoring, and maintenance funds for mitigation features.”

CEMVN Response 4: 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 OMRR&R of all project features in accordance with the OMRR&R manual that the Corps provides upon completion of the project.

Recommendation 5: “Forest clearing associated with borrow site preparation should be conducted during the fall or winter to minimize impacts to nesting migratory birds, when practicable.”

CEMVN Response 5: Concur.

Recommendation 6: “If a proposed borrow site is changed significantly or excavation is not implemented within 1 year, we recommend that the Corps reinstate coordination with David Castellanos (337/291-3112) at this office to ensure that the

proposed project would not adversely affect any Federally listed threatened or endangered species or their habitat.”

CEMVN Response 6: Concur.

## 7. Mitigation

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

All non-jurisdictional BLH forest impacts were assessed by the USFWS and CEMVN under the NEPA, Fish and Wildlife Coordination Act, and under Section 906 (b) WRDA 1986 requirements and mitigation for those impacts would be completed. Field data were collected by CEMVN and USFWS Biologists at the following proposed forested borrow areas: Tabony, Westbank Site I, and existing data from adjacent land was used for the Westbank Site F. 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. A Habitat Assessment Model (HAM) was run for each area identified as having unavoidable impacts. The model provides the AAHUs needed to mitigate for the proposed impacts (Table 7).

Under the NEPA Alternative Arrangements process, mitigation planning and implementation for unavoidable impacts will be completed under a separate investigation and discussed in future IERs currently being written.

**Table 7: BLH AAHUs of Mitigation Needed**

<b>Proposed Borrow Sites</b>	<b>Parish</b>	<b>Non-Wet BLH impacted (acres)</b>	<b>AAHUs needed</b>
Brad Buras	Plaquemines	(9, non-BLH)	0
Tabony	Plaquemines	86.93	28.9
Westbank F	Jefferson	148	85
Westbank I	Jefferson	9.76	4.64
Westbank N	Jefferson	0	0
<b>Total</b>		<b>244.69</b>	<b>118.54</b>

Note: Mitigation values may decrease because of further geotechnical evaluation of proposed borrow areas (i.e., acreage with unsuitable soils will not be impacted).

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

A draft CED will be prepared once the IERs are completed documenting and compiling these unavoidable impacts and those for all other proposed actions within the LPV and WBV which 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. The mitigation IER and draft CED will be made available for public review and comment.

## **8. Compliance with Environmental Laws and Regulations**

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

Environmental compliance for the proposed action 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 T&E species, or completion of Endangered Species Act Section 7 consultation (Table 4); LDNR concurrence with the determination that the proposed action is consistent, to the maximum extent practicable, with the LCRP (Table 6); coordination with the SHPO (Table 5); receipt and acceptance or resolution of all Fish and Wildlife Coordination Act recommendations; and receipt and acceptance or resolution of all Louisiana Department of Environmental Quality comments on the air quality impact analysis documented in the IER.

## **9. Conclusions**

### **9.1 Interim Decision**

The proposed action consists of excavating five borrow areas that are located in non-jurisdictional wetland areas. This report investigated the potential impacts of this action on jurisdictional wetlands, non-jurisdictional BLH, non-wetland/upland resources, prime and unique farmland, fisheries, wildlife, T&E species, cultural resources, recreational resources, noise quality, air quality, water quality, aesthetics, environmental justice, and socioeconomics. CEMVN has assessed the environmental impacts of the proposed action and has determined that the proposed action would have unavoidable impacts to a total of 244.69 acres and 118.54 AAHUs of non-jurisdictional BLH. Mitigation values may decrease because of further geotechnical evaluation of the proposed borrow areas. Mitigation for unavoidable impacts to non-jurisdictional BLH will be described under a separate IER(s).

### **9.2 Prepared By**

IER # 22 was prepared by the following individuals. The address of the preparers is: U.S. Army Corps of Engineers, New Orleans District; Planning, Programs, and Project Management Division, CEMVN-PM; P.O. Box 60267; New Orleans, Louisiana 70160-0267.

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Danielle Tommaso	Environmental Resources Specialist	Document preparation
Ph.D.: Doctor of Philosophy		

In addition to the above list of preparers, the Borrow PDT consists of the following individuals:

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**Appendices**

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## **Appendix A: List of Acronyms and Definitions of Common Terms**

AAHUs: Average Annualized Habitat Units. Habitat Units represent a numerical combination of habitat quality [Habitat Suitability Index] and habitat quantity [acres] within a given area at a given point in time. Average Annual Habitat Units represent the average number of Habitat Units within any given year over the project life for a given area.

APE: Areas of Potential Effect

AST: Above-ground Storage Tank

ASTM: American Society of Testing and Materials

BMP: Best Management Practices

BLH: Bottomland Hardwood

CED: Comprehensive Environmental Document

CEQ: Council on Environmental Quality

Clay Classifications:

CH: Fat clay

CL: lean clay

ML: Silt

CO: Carbon monoxide

CZM: Coastal Zone Management

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act

EA: Environmental Assessment

EIS: Environmental Impact Statement

ESA: Environmental Site Assessment

ESRI Inc.: Environmental Systems Research Institute

FONSI: Finding of No Significant Impact

HAM: Habitat Assessment Model

GNOHSDRRS: Greater New Orleans Hurricane and Storm Damage Risk Reduction System (aka, Hurricane Protection System [HPS])

HAM: Habitat Assessment Model

HTRW: Hazardous, Toxic, and Radioactive Waste

IER: Individual Environmental Report

IHNC: Inner Harbor Navigation Canal

IPET: Interagency Performance Evaluation Team

LCRP: Louisiana Coastal Resource Program

LDEQ: Louisiana Department of Environmental Quality

LDNR: Louisiana Department of Natural Resources

LDWF: Louisiana Department of Wildlife and Fisheries

LOS: Level of service

LPV: Lake Pontchartrain and Vicinity Hurricane Protection Project

MSA: Metropolitan Statistical Area

NAAQS: National Ambient Air Quality Standards

NEPA: National Environmental Policy Act

NPDES: National Pollutant Discharge Elimination System

NOV: New Orleans to Venice Hurricane Protection Project

NO<sub>x</sub>: Nitrogen oxides

NWR: National Wildlife Refuge

O<sub>3</sub>: Ozone

OMRR&R: Operation, Maintenance, Repair, Replacement and Rehabilitation

P&S: Plans and Specifications

PDT: Project Delivery Team

P.L.: Public Law

PM: Particulate matter

PPA: Project Partnering Agreement  
PI: Plasticity index  
RCRA: Resource Conservation and Recovery Act  
REC: Recognized Environmental Condition  
ROD: Record of Decision  
SHPO: State Historic Preservation Officer  
SIR: Supplemental Information Report  
SO<sub>x</sub>: Sulfur oxides  
SPH: Standard Project Hurricane  
T&E: Threatened or Endangered Species  
UNOP: Unified New Orleans Plan  
USACE: U.S. Army Corps of Engineers  
CEMVN: Mississippi Valley Division, New Orleans District  
USDA: U.S. Department of Agriculture  
NRCS: Natural Resources Conservation Service  
USFWS: U.S. Fish and Wildlife Service  
WBV: West Bank and Vicinity Hurricane Protection Project  
WRDA: Water Resources Development Acts (various years)  
VOC: Volatile organic compound

## **Appendix B: Public Comments**

The following are notes from the 12 February 2008, Westbank I public meeting. Notes for other public meetings can be found at [www.nolaenvironmental.gov](http://www.nolaenvironmental.gov), or by request. Further public comments will be released with the Final IER.



**US Army Corps  
of Engineers**  
New Orleans District

# Public Meeting Recap

Westbank I borrow site community meeting  
Tuesday, February 12, 2008

<b>Location</b>	Holy Guardian Angels Catholic Church Youth Center 425 10 <sup>th</sup> St. Bridge City, LA
<b>Time</b>	7:00 p.m.
<b>Attendees</b>	approx 100 and 9 staff
<b>Format</b>	Presentation then Q & A
<b>Handouts</b>	<ul style="list-style-type: none"> <li>• Presentation</li> <li>• Fact sheet</li> <li>• Borrow handout 2.12.08</li> <li>• Corps funding and approval process pamphlet</li> </ul>
<b>Facilitator</b>	Julie Morgan, USACE, Outreach Presentation by Soheila Holley, Senior Project Manager, Borrow Team

Welcome

Julie Morgan

Opening

Monsignor Luminais started with the “Our Father.”

Monsignor Luminais:

We’re delighted to see so many people here and only in Bridge City would a crowd show. John Alario meant to be here but is held up in Baton Rouge. We’ll play like he’s here. Mr. Lagasse is here and so is Rep. Billiot. Mr. Barkley is here from Marrero Land and Mr. Vastolla. Is anyone else with power here?

I’d like to introduce Julie Morgan with whom I’ve been helping to plan this event. Braving the weather is a test.

**Julie Morgan, USACE, Outreach**

Thank you for coming out in this weather.

Thank you to Jerry Spohrer, from the levee district, our non-federal sponsor. The Corps has had 41 public meetings in the past year. We’re going to continue because want to get information to you. We want your comments and to understand your issues. This is your time to let us know what your concerns on Corps projects in your area are. This meeting is about the borrow site called Westbank I.

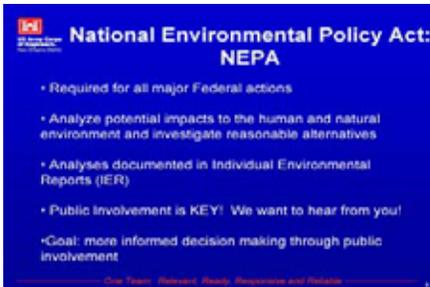
# Public Meeting Recap

Our senior project manager, Soheila Holley, is here to give the presentation. Before we start, here are the ground rules. Please wait until after Ms. Holley is finished to ask any questions. There's a flow to the presentation and by interrupting you stop the flow and she may answer your questions during her presentation. There will be a comment period after the presentation. Please limit comments to 5 minutes. Lots of people will want to make comments. I'll be watching the clock.



Project managers will be here after to talk to you. You can talk to them after the meeting. We also have subject matter experts here and I'll introduce them later. We'll get back to you. E-mail is the best but we'll also snail mail information to you.

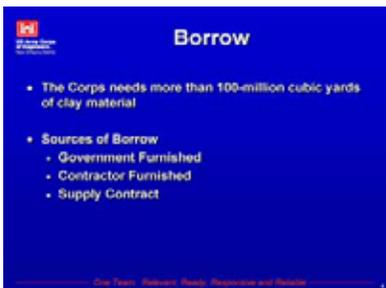
## Soheila Holley, Senior Project Manager



Thanks for coming especially tonight. We have a brief presentation that is about Westbank I, a potential site of borrow in this area.

Here is some background information. NEPA is used anytime we have a federal project. We must comply with NEPA rules. We analyze impacts to human and animal environmental and include all of the analyses in the document which is called an Individual

Environmental Report, or IER. The intention is to make sure you're involved in any project [the Corps takes on] and to make sure you understand impacts of the project.



We estimate we need more than 100 million cubic yards of clay, and that is across 5 parishes. Due to the unprecedented amount of clay we need, we must find material that meets geotechnical and environmental requirements. We're looking at three options to identify borrow right now. The first option is government furnished borrow. First we get right-of-entry then we get on the land to take borings. Material is then analyzed for geotechnical standards and we also do an environmental check as we go through [the examination of the material]. Once a site is deemed suitable it will be put in the IER and

then goes forward so the Corps can begin the real estate acquisition process. Depending on the project, some projects are 100 percent federal. [After using the borrow site] the land easement is returned to land-owner. There is a cost-share, for some phases, for the non-federal sponsor.

[The second way the Corps is identifying borrow material is through the] Contractor furnished method. That is when the landowner does all the geotechnical testing. A technical team determines then if that material is suitable, then that site goes through an IER. The same engineering [and tests] that would be done on a government furnished site is done on a contractor furnished site. As a courtesy that list is available for construction contractors. Compensation is paid between the contractor and the landowner.

[The third way to identify borrow is with a] supply contract. This we've done in some parishes in particular; St. Bernard, Orleans and Plaquemines because, there's not enough material available. This

# Public Meeting Recap

option is to buy material from a clay provider, they have the same testing. The owner or a contractor for the owner does testing and submits it to us then one qualified bidder competes to get a contract award. We're in the second phase of the supply contract. We just did a sources sought, market research, to see who can supply the quantity of clay we need. The second phase is a solicitation. We'll have final solicitation out in couple of months then will [inaudible] award in Oct 08.



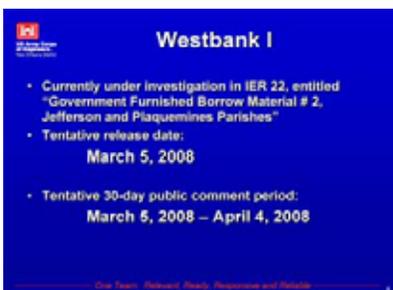
This map shows dots/sites that we've investigated or are under investigation. The bulk of cost from borrow comes from the hauling distance. In order to protect [inaudible], we try to identify alignments close to the sites to be cost effective. We talk about trucks on roads, deterioration of roads, traffic congestion all of that is a factor.



These are the sites on the Westbank we're exploring. [Inaudible] site investigation is almost complete. We're waiting for the IER to be signed. All the sites are under investigation. Site I is here [pointing].

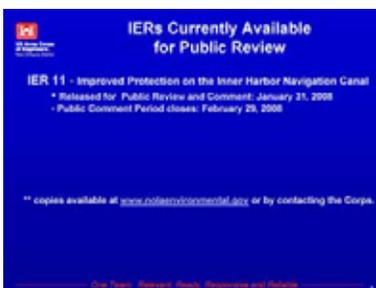


This is Westbank I, the boundary will not be the actual pit. [Pointing] that's the boundary of the area and that we've deemed suitable material therefore borrow. Once we're in the final phase, they'll have a pit design which would be smaller than this map shows. The upper portion of the site is 16 acres, the lower pit is 12.8 acres. The sites would be about 20 ft deep. The middle area is used for stockpile. [Inaudible] another area that's going to be stockpile.



The IER for this site won't be complete until April. Once that's done, this pit will provide material to the Lake Cataouatche project. Once the IER is completed, there will be cost shared by the local sponsor. We'll require the local sponsors to help with the land easement. This IER will be completed in March, then 30 day public review period.

This is an IER that's available for public review. It will close Feb. 29. In order to access this document, go to [nolaenvironmental.gov](http://nolaenvironmental.gov).



If you have input you can go to [nolaenvironmental.gov](http://nolaenvironmental.gov) or contact Gib Owen. His phone number and address is here.

# Public Meeting Recap



This is the Web site that we have for environmental information and NEPA, [www.nolaenvironmental.gov](http://www.nolaenvironmental.gov)

## Question and Answer

**Question 1.** Where is Lake Cataouatche? Why is it connected to us? Why do we have to give them our clay?

**Response 1.** Julie Vignes: This is the lake [pointing]. There's a levee alignment project that protects the Westbank, Waggaman, Westwego and Bridge City. It's under construction now and needs to be further enlarged.

**Woman:** That's not by Avondale?

**Vignes:** It's under consideration for a federal levee. [Inaudible] those are Mississippi River levees.

**Morgan:** This is Julie Vignes, the senior project manager for this area. Also here is Tuta Salaam, from the borrow team, and Todd Klock from our real estate department. I will be watching the clock so please keep your comments to 5 minutes. We want to answer your questions. If we don't, please ask in a different way. We don't want you to leave saying we didn't answer you.

I'll walk around and provide the microphone.

**Comment 2.** Rep. Billiot: You know as much as me. I'm going to learn this project as we go. To the group that's here, if all of this under study is being used for Lake Cataouatche, then there's a lot to be said but if you look at the situation [inaudible]. In Zachary, if you come up to the Huey P. Long Bridge [inaudible] and traffic and alternate routes, this material has to be moved and trucked out. Please take into account the traffic. [The traffic] is unbelievable now and as we move forward [inaudible]. The environment in our area is important. If you have a chance to come here between 5 and 6 in the morning, [you'll see that] it's crowded when Northrop Grumman is coming to work. As things start to happen [inaudible] I'm going to work with you. I need to be able to talk to people in the area. So I don't know a lot, I know Lake Cataouatche and Lake Salvatore. If they are going to use material to make sure areas are safe, then we need to work along with them but we need to make sure the quality of life improves not decreases.

**Question 3.** Man: What about you dig the borrow site and it rains. [There will be] even more water, especially 20 feet behind the school. Water is going to overflow and the drains can't handle it. What will you fill [the borrow site] in with?

## Public Meeting Recap

**Response 3.** Holley: When an area becomes a potential borrow site, when it's excavated, we'll get easement from the owner and then it is returned to owner. The landowner can do what they please [with the site]. As an organization we're still investigating backfilling but the area is returned back to the landowner.

**Man:** Will the Corps replace that [material taken from the borrow site]?

**Holley:** At this time, backfilling is being investigated. We're working that out.

**Question 4.** Timothy Briscal: I've been here for 52 years. You said you take land from there. What about areas that border? There will be dust flying, trucks and everything else. A couple of my friends are here and we work in construction. We know what the problem is. Instead of protection, you don't have protection, that the water doesn't back up. I think I worked Lake Cataouatche on a drainage job. I'm worried about digging and [inaudible] with water coming and we'll have water behind us. We are below sea level and I'm worried about that. A lot of things [are happening] in our area to fight fires [inaudible] we weren't asked then. What about us?

**Response 4.** Holley: Only a landowner will be compensated. You talk about overflow. Once a pit is designed it'll be sloped and it won't overflow to an adjacent area. During construction we'll make sure [inaudible].

**Briscal:** How many years can we count on it not overflowing?

**Holley:** Once the area is excavated, the property is returned to the landowner and they can develop it as they please.

**Question 5.** Larry Walker: Who is the land owner?

**Comment 5.** You may or may not know me. I'm **N. Buckner Barkley** from the **Marrero Land Company**. We own the property. From the standpoint of compensation, you don't know what you'll be offered for your property until they come up with an offer. I've been asking since April that this area not be considered. It's close to the community that it will impact adversely. This is the first time that I've heard that the Corps will take easements and not property. And that they're going to give it back to me. The cost of filling the hole doesn't make sense. This area, with the widening of the Huey P. Long Bridge is going to open up. I would suggest that this is a developable piece of property. It's been divided for an expansion of the residential area. We have plans in place for light industry next to Avondale. It won't happen if this happens (clapping).

**Question 6.** Jeanie Rentz, Bridge City: The concern I have is a pit that big. We have enough problems with flooding and drainage. Before we get help with drainage, Westwego has to fill up first. If we have this borrow pit it's going to take longer for us to drain to Bayou Segnette and there will be problems with mosquito control. We're going to have standing water and breed more mosquitoes. And how is it going to affect the ecosystem? If you have something like this, it'll turn into a marsh. My question is, if the Marrero Land Company is going to get the property back in the condition you're talking about, how is it going to help this community to put it back together?

**Response 6.** Klock: It's our intention to buy an easement which means we can use it for a certain period of time and dig borrow for the levee. Compensation given to Marrero Land will be a fair market value determined by an appraiser. The appraiser will evaluate in the property in its state right now. If it's zoned commercial or residential it'll be appraised by a licensed appraiser and that'll be what's offered.

# Public Meeting Recap

**Question 7.** Judy Folsie: This community is being stretched to its limit with the Huey P. bridge widening and Avondale. I leave at 4:45 a.m. and I have traffic coming home. It's bad enough with Avondale. This community can't afford this. No matter who [inaudible] the environment affects this; we have mosquito spray with trucks once a week. This community can't handle it. You're looking for material from an area that's already losing 16 acres a year in wetlands. The government has to pay to have it shipped in from Mississippi or higher hill country. You're robbing from Peter to pay Paul.

**Response 7.** Holley: As I mentioned, the bulk of the cost comes from hauling. A truck has to come from somewhere. What you're saying is you don't want it to come from your backyard. Where do you want it to come from? We are the guardians of citizens of the US, not just Louisiana. Money is from California and Maine, everywhere. What's most cost effective is material closest to the alignment. These trucks are going to be coming from now until 2011. Other states such as Mississippi are concerned about their roads and deterioration. This material is [inaudible] this is a potential site; this is going to protect your community. This is for entire system. This material is going to provide protection for your community and safety is our number 1 priority. We're trying to minimize impacts but there will be [inaudible].

**Question 8.** Folsie: There's enough dust and traffic already. We don't want the trucks here. I understand we need protection but why should I sacrifice my quality of life for someone in California's taxes? It'll be more cost effective than people for [Inaudible].

**Response 8.** Holley: The most cost effective method is the way we're looking at [inaudible]. [Inaudible] safety and cost effective.

**Question 9.** Carlos Montaforta: There is one pit that's close to the Mississippi River. Why is it so close to the river? Will it compromise the levee holding the river back?

**Response 9.** Holley: No, it should not. When we look at [inaudible] they look to make sure it doesn't fail. There are set backs.

**Montaforta:** But the engineers messed up on the other levees. That river flows every year; if you're digging that close you're going to compromise that levee.

**Holley:** No.

**Montaforta:** How can you be sure that [inaudible] won't compromise the levee that holds back the river?

**Holley:** We'll make sure there will be no borrow sites causing any failures in the vicinity. Including area parks, buildings or the levee system. That analysis will be done. They've dug [inaudible].

Vignes: A lot of borrow sites were done adjacent to the Mississippi River levees. There are borrow sites adjacent to Mississippi River levees.

**Jerry Spohrer, West Jefferson Levee district:** There are two borrow sites close to the Mississippi River levees. The first is between Hwy 541 and LA-18, just a mile east of the bridge circle. The second is in Waggaman, which is adjacent to the Mississippi River; it's about a 20 acre pit. One was done in 1987, the other was done partially in 1988 and we finished using it in 1995.

# Public Meeting Recap

**Question 10.** Lane Hulen, Bridge City: What about the quality of air? You're digging behind a school. We breath the Avondale fumes everyday, what about dust flying in? Coaches bring the [students] there. They'll just be exposed.

**Response 10.** Vignes: We have to get air quality permits from the Louisiana Department of Environmental Quality for air and water. We'll demonstrate that we achieve that standard.

**Comment 11:** Samuel Steins, Mosquito Control, Inc: We deal with borrow sites throughout the parishes. We don't see an increase initially but [the water] becomes stagnant. We would hope that [you will carefully consider what you] fill the site in with. Larva loves debris. We want to go with any process and the refill process. We hope you consider what it's filled with.

**Morgan:** We'll take your comments [back to our superiors].

**Question 12.** Roberta Grace, River Road: Yes, it's going to cost taxes but we're spending money on a war. Who owns the land surrounding borrow the pits?



**Response 12.** Vignes: We don't know who the adjacent land owners are.

**Comment 12:** Barkley: I can't tell from this layout, but this is adjacent to the Jefferson Parish work yard, Department of Transportation and a development yard, which wouldn't be able to expand, and the Bridge City treatment plant. We own all the way to LA 18.



**Comment 13.** Barkley: If you look at this map, this site is off and remote from the other sites that seem to be clustered. Rather than take this little site you can take up other sites and not burden this community by taking this property.

**Comment 14:** Monsignor Luminais: I have a problem with the term borrow. They aren't borrowing it if they aren't giving it back. They're emptying a good piece of property. It borders my church and recreation department and [inaudible] department behind the gym and school. I heard today that a child drowned in the Waggamen borrow pit. That's frightening that a child will drown in a hole for clay. Up river there are empty areas that could give clay. It's not a borrow pit, you should change the name.

**Question 15.** Man in blue: Was any consideration given [to sites] upriver?

**Response 15.** Holley: We're looking at non-wetland areas that could yield suitable areas. We're looking at all areas.

**Question 16.** Man in blue: How many people are opposed to this area please raise your hand? [Whole audience raises hands]. We don't want it around here.

## Public Meeting Recap

**Response 16.** Vignes: We're here to get your comments. He asked about other areas already under investigation. Some have been tested and they're not suitable. Near the lake there is much more organic material and so we won't let us use that material to build the levee.

**Question 17.** Steve Alvarez, Nine Mile Point: I do construction. You were talking about cost effectiveness. You could barge [in material] from Mississippi and [take it] through Lake Cataouatche. You could load material from a barge. The Corps did sampling a lot of times. The left hand and doesn't know what the right hand is doing. Water pressure on top of the hurricane forced water up under the back side of [inaudible]. You're going to put a pit near a levee. [Inaudible] you can hear [inaudible] the spring when the river is at flood stage. You're going to have water pressure of 100 feet. Pressure at the bottom, if it hits an [inaudible] it could cut a dice canal and this will be Nine Mile Point Island. You need to move that pit in an area with population and growth. This area is going to create revenue for Jefferson Parish. You can't say for certain it won't so it shouldn't be put here. Avoid action by not having action (clapping) it shouldn't be put here. Take it upriver and upstate.

**Response 17.** Holley: Concerning green material, there is a third option. A supply contract throughout [inaudible] we'll pursue bidders from out of state. As far as stability, there were borings taken. We're looking at pits and will make sure there are no failing issues with adjacent property. That'll be done during the pit analysis.

**Question 18.** Man: How close are the borings?

**Response 18.** Holley: 500 feet. That's our standard, 500 feet apart. Our geotechnical engineers are comfortable with those borings.

**Question 19.** Carol Adams, Bridge City: What specific clay do you have to have for this project? Red clay, black clay? Georgia is full of clay. Florida and Missouri are full of clay. Others have clay. Railroad tracks don't involve getting on highways. Barges go up and down the Mississippi River. Is there not another source that's not below sea level? We pay taxes too. Half the people don't live here. It wasn't the storm or the levees but the Corps of Engineers. This was a Corps of Engineers thing that caused flooding. We'll try to find you some clay and bring it down. Are you going to put a fence around it? I have nieces and nephews. We don't want kids in a hole. My cat died because of mosquitoes. My family was the first to come here, before there was a street. I don't want Bridge City to die because of clay.

**Response 19.** Holley: We need clay that can be compacted with little organic material and sand to prevent seepage. I understand your concerns. The third option is bringing material in. We were successful with the supply contract. 64 people responded to our market research. The 2<sup>nd</sup> phase is solicitation. If we get bidders and if they have good material [inaudible] and no failure [inaudible] of price but we have a budget. The 3<sup>rd</sup> option is in place. Maybe we'll get a good response [from supply contractors]. Maybe there will be no need for this borrow site, but until then we have to be proactive. I live in Orleans and I flooded, I know the value of protection. Julie [Vignes] is from Chalmette. We all understand. We're trying to minimize impacts and are looking at three options. If the supply is provided at the right time, and if the price is right, then that's the key. Our commander is concerned and our sponsors are trying to address that [price/supply] we have to wait for a response.

## Public Meeting Recap

**Comment 20:** Judy Folsie: This community is not going to be worth saving from a hurricane. Flood water from Lake Cataouatche is a [inaudible] air quality [inaudible] river could suck it down. Move [this site] down the road, we can't afford this. As far as cost-effective we can't afford to lose this land. Someone has common sense. If California and Georgia don't want to pay taxes tell them to send trucks with clay in [inaudible]. If Iraq needed clay they'd send it. Please take it [this site off the table]. We have Avondale, Huey P. Bridge improvements, Bridge City needs repairs, and this is not cost effective to us. We're not worrying about the Corps, we're worried about us.

**Question 21.** Robert Sela [directed at Rep. Billiot]. You heard our concerns. These people don't want this pit. What can you do? We want you to do your best. Move it upriver and get it out of our neighborhood.

**Response 21.** Rep. Billiot: At the beginning, I told you my feelings were this community is overburdened. Now, as this meeting continues, you verified what I said. With Avondale, which creates jobs, we don't have enough room. There is also the Huey P. enlargement. One of my concerns was what the landowner felt. And the landowner said he wanted to see his land become a very quality development, something that needs to happen in this area. I see Avondale traffic. I made all those statements at the beginning. They need to go through procedures but they know how the community feels. They have a job they have to do. When they get to the end I'm hoping it'll fade and that the pit doesn't come here. If the pit will be here there are other avenues the community, state and federal government can try to do to stop it. Right now this is a procedure they are going through. When completed, there's the next step. I'm hoping it's over with. They have a boss and jobs they have to respond to. They can't say it's over and done. Go through the procedure. I'm a state official don't think I can call Bush to say listen. I can call my friend with the parish.

**Question 22.** Sela: If it's not a done deal, can you write a letter expressing our opinion?

**Response 22.** Rep. Billiot: There are things I can do. I wouldn't want them [inaudible] if I have a state project I wouldn't want federal officials to start telling me something. I'd want to go through procedures. We're not going to throw something at them. You understand we're not in favor.

**Question 23.** Linda, Bridge City: The community can't afford this. The first time we found out about this was during our council meeting. We know there were meetings before. We are the community that's going to suffer. When I e-mailed the Corps about meetings, they apologized for not letting Bridge City know. We want to be followed-up with. We've built this church, the community and senior center; we need this community to go up in economic value. The community doesn't want it, we want to stay informed.

**Response 23.** Mike Brown: Through the NEPA process you have the ability to comment. These public meetings are advertised in Times-Picayune.

**Comment 23:** Linda: But we should have known.

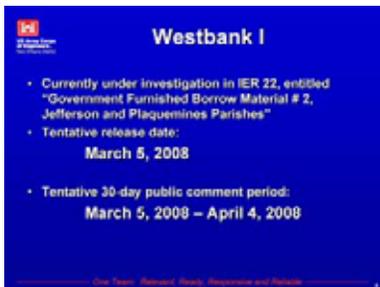
**Morgan:** Now that we have your names and addresses you'll be informed.

**Comment 24:** Wes Kungel, Senator Mary Landrieu's Office: I'd like to tag what Rep. Billiot said. I commend the Corps for going through the process. Senator Landrieu sent a letter to Plaquemines, St. Bernard, Jefferson and even New Orleans East. The letter was sent in December, while the Corps

## Public Meeting Recap

needs materials also [inaudible] because you don't want Southeast Louisiana looking like Swiss cheese. We're in the process of organizing a meeting with Plaquemines, St. Bernard and Jefferson parish officials to figure out ways to move forward. This doesn't sound like the best spot to put a pit. With property rights the property owner has say so. Meetings are a way to get input. I appreciate these efforts. Senator Landrieu asked me to come. Thank you for bringing this to my attention. She's asked me to stay on top of this. As the federal liaison it's easier for Senator Landrieu [inaudible]. Thank you for sharing your opinions. (clapping)

**Question 25.** Jean Rentz: to Rep. Billiot: We know what's going on. We disagree. They have bosses. As a community while we wait for decision can we write petitions or letters to Col. Lee? Can we do this, send petition letters and send them to Col. Lee and our senators? We don't have all our neighbors here but they'd want to write letters too.



**Response 25.** Vignes: This IER is expected to go out for public review on or about this date, we have a Web site where you can access information. You can make direct comments to this. They are available in your packet.

**Comment 26.** Elton Lagasse, Jefferson Parish Councilman: The council will pass a resolution tomorrow opposing this site in Bridge City for several reasons. 1. This is the middle of the [inaudible] area. You see Avondale and everyone mention the Huey P. Long Bridge expansion. This side of the river is the growth area of Jefferson. There is no more growth on the east bank. If you're taking valuable land we're asking [inaudible] we respect the Corps but we know hurricane protection is important. The Westbank was lucky. If we don't raise that levee we'll have a problem. Were asking you to find material for the levee from a different spot.

**Comment 27:** Man with purple sweater: I appreciate our elected officials coming.

**Comment 28:** Man with beard: At the very least we want you to use the word borrow, put dirt back in. [Inaudible] government got cheap and didn't put dirt back.

## Appendix C: Members of Interagency Environmental Team

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

## **Appendix D: Agency Correspondence**

Agency correspondence received during the public review and comment period will be released with the Final IER.



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

646 Cajundome Blvd.

Suite 400

Lafayette, Louisiana 70506

August 7, 2006

Colonel Richard P. Wagenaar  
District Commander  
U.S. Army Corps of Engineers  
Post Office Box 60267  
New Orleans, Louisiana 70160-0267

Dear Colonel Wagenaar:

As you know, the U.S. Fish and Wildlife Service (Service) is assisting the U.S. Army Corps of Engineers (Corps) in assessing impacts of, and mitigation requirements for, borrow sites which are needed to complete authorized improvements, and to construct Federal and non-Federal hurricane/flood protection levees in southern Louisiana. Those improvements to hurricane and flood control projects are authorized by the Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico (Public Laws 109-148, PL 84-99 and PL 109 234 (4<sup>th</sup> supplemental)). This letter is provided in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), Fish and Wildlife Coordination Act (FWCA, 48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), and the Migratory Bird Treaty Act (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.), but it does not constitute the final report of the Secretary of the Interior as required by Section 2(b) of the Fish and Wildlife Coordination Act.

Through the efforts of Task Force Guardian, the Corps has restored Hurricane Katrina-damaged hurricane/flood protection projects to their authorized or previously permitted/constructed protection levels. Identification of borrow areas needed to complete those repairs utilized a protocol that prioritized selection of those sites in the following order: existing commercial pits, upland sources, previously disturbed/manipulated wetlands within a levee system, and low-quality wetlands outside a levee system. The Service supports the use of such protocols to avoid and minimize impacts to wetlands and bottomland hardwoods within project areas. Avoidance and minimization of those impacts helps to provide consistency with restoration strategies and compliments the authorized hurricane protection efforts. Such consistency is also required by Section 303(d)(1) of the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA).

Accordingly, the Service recommends that prior to utilizing borrow sites every effort should be made to reduce impacts by using sheetpile and/or floodwalls to increase levee heights wherever feasible. In addition, the Service recommends that the following protocol be adopted and utilized to identify borrow sources in descending order of priority:

1. Permitted commercial sources, authorized borrow sources for which environmental clearance and mitigation have been completed, or non-functional levees after newly constructed adjacent levees are providing equal protection.
2. Areas under forced drainage that are protected from flooding by levees, and that are:
  - a) non-forested (e.g., pastures, fallow fields, abandoned orchards, former urban areas) and non-wetlands;
  - b) wetland forests dominated by exotic tree species (i.e., Chinese tallow-trees) or non-forested wetlands(e.g., wet pastures), excluding marshes;
  - c) disturbed wetlands (e.g., hydrologically altered, artificially impounded).
3. Sites that are outside a forced drainage system and levees, and that are:
  - a) non-forested (e.g., pastures fallow fields, abandoned orchards, former urban areas) and non-wetlands;
  - b) wetland forests dominated by exotic tree species (i.e., Chinese tallow-trees) or non-forested wetlands(e.g., wet pastures), excluding marshes;
  - c) disturbed wetlands (e.g., hydrologically altered, artificially impounded).

Notwithstanding this protocol, the location, size and configuration of borrow sites within the landscape is also critically important. Coastal ridges, natural levee flanks and other geographic features that provide forested/wetland habitats and/or potential barriers to hurricane surges should not be utilized as borrow sources, especially where such uses would diminish the natural functions and values of those landscape features.

To assist in expediting the identification of borrow sites, the Service recommends that immediately after the initial identification of a new borrow site the Corps should initiate informal consultation with the Service regarding potential impacts to federally listed threatened or endangered species. To aid you in complying with those proactive consultation responsibilities, the Service has enclosed a list of threatened and endangered species and their critical habitats within the coastal parishes of the New Orleans District.

The Service offers the following additional recommendations for reducing borrow site impacts on fish and wildlife resources and, where feasible, enhancing those resources. However, these additional recommendations should not be implemented if they would result in the expansion of existing borrow pits or construction of new borrow pits in wetlands or bottomland hardwoods.

1. A minimum of 30 percent of the borrow pits' edge should slope no greater than 5 horizontal (H):1 vertical (V), starting from the water line down to a depth of approximately 5 feet.

2. Most of the woody vegetation removed during clearing and grubbing should be placed into the deepest parts of the borrow pits and the remaining debris should be placed in the water along the borrow pit shorelines, excluding those areas where the 5H:1V slope, per recommendation 1, have been constructed.

3. Following construction, perimeter levees (if constructed) around each borrow pit should be gapped at 25-foot intervals with an 8-foot-wide breach, the bottom elevation of which should be level with the adjacent natural ground elevation.

When avoidance and minimization of bottomland hardwood and wetland impacts is not practicable, all unavoidable net losses of those habitats should be fully offset via compensatory mitigation. Such compensatory mitigation should be sited within the watershed and/or hydrologic unit where the impact occurred, and should be completed concurrently with borrow operations, or as soon thereafter as possible.

The combined need for borrow necessary to complete authorized improvements to and construction of Federal and non-Federal hurricane/flood protection levees, and the potential construction of levees capable of withstanding a category 5 hurricane, will require substantial amounts of borrow. It is highly likely such amounts would exceed local availability. In the case of ongoing hurricane/flood protection projects (e.g., Morganza to the Gulf) the search for levee-building material has been conducted primarily on project-by-project basis. In the context of such project-by-project searches for borrow material, the least-expensive and easiest sources of borrow material are usually located within wetlands and/or bottomland hardwoods, adjacent to the proposed levee. Such on-site sources, however, often involve adverse impacts to wetlands, thus exacerbating the overall wetland loss problem in all coastal basins, especially those in the deltaic plain of southeast Louisiana. In short, while such on-site sources are relatively inexpensive, they will frequently be inconsistent with coastal restoration efforts and, to the extent that wetlands will be adversely impacted, use of those sites will be counterproductive with respect to minimizing wetland impacts and attaining the goal of increasing non-structural hurricane protection within a sustainable ecosystem.

Large-scale, off-site borrow sources could have the potential to reduce environmental impacts from levees and expedite project-by-project environmental review. Such potential "programmatic" borrow sources could include uplands along the Mississippi River, beneficial use of sediments dredged for navigation purposes (including the mining of disposal sites), the Mississippi River, and offshore deposits (e.g., Ship Shoal). As part of the planning process, we recommend that the Corps begin investigating the practicability of various large-scale, off-site borrow sources and actively involve all resource agencies with the Protection and Restoration Office's Borrow Team efforts.

Programmatic planning would be essential to identify borrow sites of acceptable quantity and quality, while avoiding and/or minimizing adverse environmental impacts. We therefore recommend that a plan be developed that integrates borrow resources, uses, and needs for various programs and activities. Guiding principles should be developed to identify borrow resources, borrow-site designs, and prioritize uses to avoid competing for resources, maximize benefits with those resources, and avoid adverse environmental impacts.

We appreciate the opportunity to provide this planning-aid letter and would be pleased to assist your agency in further identification of potential borrow sources. Should you or your staff have any questions regarding this letter, please contact David Walther (337/291-3122) of this office.

Sincerely,

A handwritten signature in black ink, appearing to read "Russell C. Watson". The signature is fluid and cursive, with a large initial "R" and a long horizontal flourish extending to the right.

Russell C. Watson  
Supervisor  
Louisiana Field Office

Enclosure

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

## Threatened and Endangered Species in Coastal Louisiana – FWS Responsibility

### MAMMALS

Bear, Louisiana\*  
(*Ursus americanus luteolus*)  
Manatee, West Indian  
(*Trichechus manatus*)

### GENERAL DISTRIBUTION IN LOUISIANA

T Entire state  
E Lake Pontchartrain & tributaries on North shore;  
rare along Gulf coast

### BIRDS

Eagle, bald  
(*Haliaeetus leucocephalus*)  
Pelican, brown  
(*Pelecanus occidentalis*)  
Plover, piping\*\*  
(*Charadrius melodus*)

T Entire state  
E Coast  
T Coast

Woodpecker, red-cockaded  
(*Campephilus principalis*)

E Entire state except Delta

### REPTILES

Tortoise, gopher  
(*Gopherus polyphemus*)  
Turtle, ringed map (=sawback)  
(*Graptemys oculifera*)  
Turtle, loggerhead sea  
(*Caretta caretta*)

T Washington, St. Tammany, and Tangipahoa  
Parishes  
T Pearl and Bogue Chitto Rivers  
T Potential Nesting on Chandeleuer Is.

### FISH

Sturgeon, Gulf\*\*  
(*Acipenser oxyrinchus desotoi*)  
Sturgeon, pallid  
(*Scaphirhynchus albus*)

T Pearl River & Lake Pontchartrain tributaries  
E Mississippi River & tributaries

### INVERTEBRATES

Mussel, inflated heelsplitter  
(*Potamilus inflatus*)

T Amite River

### PLANTS

Louisiana quillwort  
(*Isoetes louisianensis*)

E Washington and St. Tammany Parishes

\*Indicates proposed critical habitat

\*\*Indicates designated critical habitat

Enclosure



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

646 Cajundome Blvd.  
Suite 400  
Lafayette, Louisiana 70506

November 26, 2007

Colonel Alvin B. Lee  
District Engineer  
U.S. Army Corps of Engineers  
Post Office Box 60267  
New Orleans, Louisiana 70160-0267

Dear Colonel Lee

Please reference the Individual Environmental Reports (IER) being prepared under the approval of the Council on Environmental Quality (CEQ) that will partially fulfill the U.S. Army Corps of Engineers (Corps) compliance with the National Environmental Policy Act of 1969 (83 Stat. 852, as amended; 42 U.S.C. 4321- 4347). IERs are a CEQ approved alternative arrangement for compliance with NEPA that would allow expedited implementation of improved hurricane protection measures. Work proposed in those IERs would be conducted under the authority of Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4). That law authorized the Corps to upgrade two existing hurricane protection projects (i.e., Westbank and Vicinity of New Orleans and Lake Pontchartrain and Vicinity) in the Greater New Orleans area in southeast Louisiana. This draft report contains a description of resources in the project area and provides planning objectives and recommendations to minimize project impacts on those resources.

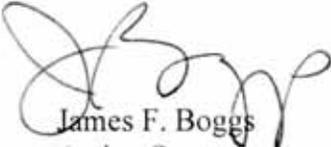
The proposed protection was authorized by Supplemental 4 which directed the Corps to proceed with engineering, design, modification, and construction, where necessary, of the Lake Pontchartrain and Vicinity and the West Bank and Vicinity Hurricane Protection Projects so those projects would provide 100-year hurricane protection. Procedurally, project construction has been authorized in the absence of the report of the Secretary of the Interior that is required by Section 2(b) of the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). In this case, the authorization process has prevented our agencies from following the normal procedures for fully complying with the FWCA. The FWCA requires that our Section 2(b) report be made an integral part of any report supporting further project authorization or administrative approval.

Because of the uncertainties regarding the project design, the project's impacts are undetermined at the current stage of planning, therefore, we cannot complete our evaluation of the IER's effects on fish and wildlife resources and cannot entirely fulfill our 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.). Accordingly, extensive additional Service involvement during subsequent detailed planning, engineering, design, and construction phase of each IER, along with more-definitive

project information that will be available during those planning phases, will be required so that we can fulfill our responsibilities under that Act. Therefore, to fulfill the coordination and reporting requirements of the FWCA, the Service will be providing post-authorization draft and final supplemental 2(b) reports to this programmatic report for each IER. Therefore, this report does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. This report has not been reviewed by the Louisiana Department of Wildlife and Fisheries (LDWF) or the National Marine Fisheries Service (NMFS) but their comments on this report will be provided under separate cover.

Should you or your staff have any questions regarding this letter and our attached report, please contact David Walther (337/291-3122) of this office.

Sincerely,



James F. Boggs  
Acting Supervisor  
Louisiana Field Office

Attachment

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

**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)



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

PREPARED BY  
DAVID WALTHER  
FISH AND WILDLIFE BIOLOGIST

U.S. FISH AND WILDLIFE SERVICE  
ECOLOGICAL SERVICES  
LAFAYETTE, LOUISIANA  
NOVEMBER 2007

U.S. FISH AND WILDLIFE SERVICE – SOUTHEAST REGION

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## EXECUTIVE SUMMARY

The Corps of Engineers New Orleans District (Corps) is preparing Individual Environmental Reports (IER) under the approval of the Council on Environmental Quality (CEQ). Those IERs will partially fulfill the Corps compliance with the National Environmental Policy Act of 1969 (83 Stat. 852, as amended; 42 U.S.C. 4321- 4347). IERs are a CEQ approved alternative arrangement for compliance with NEPA that would allow expedited implementation of improved hurricane protection measures. Work proposed in those IERs would be conducted under the authority of Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4). That law authorized the Corps to upgrade two existing hurricane protection projects (i.e., Westbank and Vicinity of New Orleans and Lake Pontchartrain and Vicinity) in the Greater New Orleans area in southeast Louisiana. This draft report contains a description of resources in the project area and provides planning objectives and recommendations to minimize project impacts on those resources.

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Because of the uncertainties regarding the project design, the project's impacts are undetermined at the current stage of planning, therefore, we cannot complete our evaluation of the IER's effects on fish and wildlife resources and cannot entirely fulfill our 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.). Accordingly, extensive additional Service involvement during subsequent detailed planning, engineering, design, and construction phased of each IER, along with more-definitive project information that will be available during those planning phases, will be required so that we can fulfill our responsibilities under that Act. Therefore, to fulfill the coordination and reporting requirements of the FWCA, the Service will be providing post-authorization draft and final supplemental 2(b) reports to this programmatic report for each IER. Therefore, this report does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. This report has not been reviewed by the Louisiana Department of Wildlife and Fisheries (LDWF) or the National Marine Fisheries Service (NMFS) but their comments on this report will be provided under separate cover.

This report incorporates and supplements our FWCA Reports that addressed impacts and mitigation features for the Westbank and Vicinity of New Orleans (dated November 10, 1986, August 22, 1994, November 15, 1996, and June 20, 2005) and the Lake Pontchartrain and Vicinity Hurricane (dated July 25, 1984, and January 17, 1992) Protection projects. Impacts and

mitigation needs resulting from government and contractor provided borrow areas have been addressed in an October 25, 2007, and a November 1, 2007, FWCA reports, respectively. Therefore, this report will not address those borrow impacts and future impacts will be addressed in FWCA supplements to those FWCA reports. In addition, specific recommendations for mitigation will be addressed in separate FWCA reports because mitigation is still within early planning phases and lacks sufficient details to be adequately addressed.

Construction of the increased flood protection would result in un-quantified habitat losses. The Service does not object to providing improved hurricane protection to the Greater New Orleans area provided the following fish and wildlife conservation recommendations are incorporated into future project planning and implementation:

1. To the greatest extent possible, situate flood protection features so that destruction of wetlands and non-wet bottomland hardwoods are avoided or minimized.
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.
3. Avoid adverse impacts to bald eagle nesting locations and wading bird colonies through careful design project features and timing of construction.
4. Forest clearing associated with project features should be conducted during the fall or winter to minimize impacts to nesting migratory birds, when practicable.
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.
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 Service, NMFS, LDWF, Environmental Protection Agency (EPA) and Louisiana Department of Natural Resources (LDNR). The Service shall be provided an opportunity to review and submit recommendations on the all work addressed in those reports.
7. The Corps should avoid impacts to public lands, if feasible. If not feasible the Corps 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 potentially impacted by project features are: Kenneth Litzenberger, Project Leader for the Service's 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](mailto: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 EPA.

8. If applicable, a General Plan should be developed by the Corps, the Service, and the managing natural resource agency in accordance with Section 3(b) of the FWCA for mitigation lands.
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. 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.
10. If a proposed project feature is changed significantly or is not implemented within one year of the date of our Endangered Species Act consultation letter, we recommend that the Corps reinitiate coordination with this office to ensure that the proposed project would not adversely affect any federally listed threatened or endangered species or their habitat.
11. In general, larger and more numerous openings in a protection levee better maintain estuarine dependent fishery migration. Therefore, as much opening as practicable, in number, size, and diversity of locations should be incorporated into project levees.
12. Flood protection water control structures in any watercourse should maintain pre-project cross section in width and depth to the maximum extent practicable, especially structures located in tidal passes.
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 Service, NMFS, LDWF, and LDNR.
14. Any flood protection water control structure sited in canals, bayous, or navigation channels that 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.
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.
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.
17. To the maximum extent practicable, structures should be designed and/or selected and installed such that average flow velocities during peak flood or ebb tides do not exceed 2.6 feet

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

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 should be selected that would maintain sufficient flow to prevent siltation.

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

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.

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.

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.

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

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 Corps should provide the necessary funding to ensure mitigation obligations are met on behalf of the public interest.

25. Any proposed change in mitigation features or plans should be coordinated in advance with the Service, NMFS, LDWF, EPA and LDNR.

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 Corps, the Service, NMFS, EPA, LDNR and LDWF. That report should also describe future management activities, and identify any proposed changes to the existing management plan.

## INTRODUCTION

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## DESCRIPTION OF THE STUDY AREA

The study area is located within the Mississippi River Deltaic Plain of the Lower Mississippi River Ecosystem. Portions of Jefferson, Orleans, St. Charles, St. Bernard and Plaquemines Parishes are included in the study area. Higher elevations occur on the natural levees of the

Mississippi River and its distributaries. Developed lands are primarily associated with natural levees, but extensive wetlands have been leveed and drained to accommodate residential, commercial, and agricultural development. Federal, State, and local levees have been installed for flood protection purposes, often with negative effects on adjacent wetlands. Navigation channels such as the Gulf Intracoastal Waterway and the Mississippi River – Gulf Outlet are also prominent landscape features, as are extensive oil and gas industry access channels and pipeline canals. Extensive wetlands and associated shallow open waters dominate the landscape outside the flood control levees. Major waterbodies include Lake Pontchartrain located north of the project area, the Mississippi River which bisects the project area, and Lake Borgne which is located on the eastern edge of the project area.

## **FISH AND WILDLIFE RESOURCES**

### **Description of Habitats**

Habitat types in the project area include forested wetlands (i.e., bottomland hardwoods and/or swamps), non-wet bottomland hardwoods, marsh, open water, and developed areas. Due to urban development and a forced-drainage system, the hydrology of most of the forested habitat has been altered. The forced-drainage system has been in operation for many years, and subsidence is evident throughout the areas enclosed by levees.

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

Factors that will strongly influence future fish and wildlife resource conditions outside of the protection levees include freshwater input and loss of coastal wetlands. Depending upon the deterioration rate of marshes, the frequency of occasional short-term saltwater events may increase. Under that scenario, tidal action in the project area may increase gradually as the buffering effect of marshes is lost, and use of that area by estuarine-dependent fishes and shellfish tolerant of saltwater conditions would likely increase. Regardless of which of the above factors ultimately has the greatest influence, freshwater wetlands within and adjacent to the project area will probably experience losses due to development, subsidence, and erosion.

The ongoing loss of coastal Louisiana wetlands (approximately 1,149 square miles between 1956 and 2004; average loss rate of 24 square miles per year) was recently exacerbated by Hurricanes Katrina and Rita in 2005. Those hurricanes caused an initial loss of wetlands equivalent to 9 years (approximately 217 square miles) of mean annual losses. Louisiana wetlands provide 26 percent of the seafood landed in the conterminous United States and over 5 million migratory waterfowl utilize those wetlands every year. In addition, those wetlands provide protection to coastal towns, cities and their infrastructure, as well as important infrastructure for the nation's

oil and gas industry.

Non-wet bottomland hardwoods within the project area also provide habitat for wildlife resources. Between 1932 and 1984, the acreage of bottomland hardwoods in Louisiana declined by 45 percent (Rudis and Birdsey 1986). By 1970, Jefferson Parish was classified as entirely urban or nonforested in the U.S. Forest Service's forest inventory with most of this loss resulting from development within non-wet areas inside the hurricane protection levees. A large percentage of the original bottomland hardwoods within the Mississippi River floodplain in the Deltaic Plain are located within levees. However, losses of that habitat type are not regulated or mitigated with the exception of impacts resulting from Corps projects as required by Section 906(b) of the Water Resources Development Act of 1986.

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

#### Forested Habitats

Forested habitats in the study area are divided into two major types; bottomland hardwood forests and cypress-tupelo swamps. Bottomland hardwood forests found in the project area occur primarily on the natural levees of the Mississippi River or former distributary channels. Dominant vegetation may include sugarberry, water oak, live oak, bitter pecan, black willow, American elm, Drummond red maple, Chinese tallow-tree, boxelder, green ash and elderberry. Most bottomland hardwoods that are located within the constructed hurricane protection projects have been degraded by forced drainage and resultant subsidence. Those areas are also often fragmented by development. Conversely, those bottomland hardwoods located outside the protection levees or in areas where structures through the levees maintain a hydrologic connection, still retain many wetland functions and values.

Cypress-tupelo swamps are located along the flanks of larger distributary ridges as a transition zone between bottomland hardwoods and lower-elevation marsh or scrub-shrub habitats. Cypress-tupelo swamps exist where there is little or no salinity, usually minimal daily tidal action and are usually flooded throughout most of the growing season. Bald cypress-tupelogram are the dominant vegetation within this habitat type, however, Drummond red maple, green ash, and black willow are also common. Cypress swamps that are within the levee system and under forced drainage are often dominated by bald cypress, but vegetative species more typical of bottomland hardwoods will dominate the under- and mid-story vegetation. These sites will often have ecological functions closer to those of a bottomland hardwood. Because of their altered hydrology, these areas can potentially convert to sites dominated by bottomland hardwood species.

## Marshes

Marsh types within the project area include fresh, intermediate, brackish, and saline. Fresh marshes occur at the upper ends of interdistributary basins and are often characterized by floating or semi-floating organic soils and minimal daily tidal action. Vegetation may include maidencane, bulltongue, cattail, California bulrush, pennywort, giant cutgrass, American cupscale, spikerushes, bacopa, and alligatorweed. Associated open water habitats may often support extensive beds of floating-leafed and submerged aquatic vegetation including water hyacinth, Salvinia, duckweeds, American lotus, white water lily, water lettuce, coontail, Eurasian milfoil, hydrilla, pondweeds, naiads, fanwort, wild celery, water stargrass, elodea, and others.

Intermediate marshes are a transitional zone between fresh and brackish marshes and are often characterized by organic, semi-floating soils. Typically, intermediate marshes experience low levels of daily tidal action. Salinities are negligible or low throughout much of the year, with salinity peaks occurring during late summer and fall. Vegetation includes saltmeadow cordgrass, deer pea, three-cornered grass, cattail, bulltongue, seashore paspalum, wild millet, fall panicum, and bacopa. Ponds and lakes within the intermediate marsh zone often support extensive submerged aquatic vegetation including southern naiad, Eurasian milfoil, and wigeongrass.

Brackish marshes are characterized by low to moderate daily tidal energy and by soils ranging from firm mineral soils to organic semi-floating soils. Freshwater conditions may prevail for several months during early spring; however, low to moderate salinities occur during much of the year, with peak salinities in the late summer or fall. Vegetation is usually dominated by saltmeadow cordgrass, but also includes saltgrass, three-cornered grass, leafy three-square, and deer pea. Shallow brackish marsh ponds occasionally support abundant beds of wigeongrass.

Saline marshes occur along the fringe of the coastal wetlands. Those marshes usually exhibit fairly firm mineral soils and experience moderate to high daily tidal energy. Vegetation is dominated by saltmarsh cordgrass but may also include saltgrass, saltmeadow cordgrass, black needlerush, and leafy three-square. Submerged aquatic vegetation is rare. Within the study area, intertidal mud flats are most common in saline marshes.

## Scrub-Shrub Habitats

Scrub-shrub habitat is often found along the flanks of distributary ridges and in marshes altered by spoil deposition or drainage projects. Typically it is bordered by marsh at lower elevations and by developed areas, cypress-tupelo swamp, or bottomland hardwoods at higher elevations. Typical scrub-shrub vegetation includes elderberry, wax myrtle, buttonbush, black willow, Drummond red maple, Chinese tallow-tree, and groundselbush. Some scrub-shrub habitat is an early successional stage of bottomland hardwood forests.

## Open-Water Habitats

Open-water habitat within the project area consists of ponds, lakes, canals, bays, and bayous. Natural marsh ponds and lakes are typically shallow, ranging in depth from 6 inches to over 2

feet. Typically, the smaller ponds are shallow and the larger lakes and bays are deeper. In fresh and low-salinity areas, ponds and lakes may support varying amounts of submerged and/or floating-leaved aquatic vegetation. Brackish and, much less frequently, saline marsh ponds and lakes may support wigeongrass beds.

Canals and larger bayous typically range in depth from 4 or 5 feet, to over 15 feet. Strong tidal flows may occur at times through those waterways, especially where they provide hydrologic connections to other large waterbodies. Such canals and bayous may have mud or clay bottoms that range from soft to firm. Dead-end canals and small bayous are typically shallow and their bottoms may be filled in to varying degrees with semi-fluid organic material. Erosion due to wave action and boat wakes, together with shading from overhanging woody vegetation, tends to retard the amount of intertidal marsh vegetation growing along the edges of those waterways.

Drainage canals enclosed within the hurricane protection project are stagnant except when pumps are operating to remove water. Runoff from developed areas has likely reduced the habitat value of that aquatic habitat by introducing various urban pollutants, such as oil, grease, and excessive nutrients. Clearing and development has eliminated much of the riparian habitat that would normally provide shade and structure for many aquatic species.

#### Developed Areas

Developed habitats in the study area include residential and commercial areas, as well as roads and existing levees. Those habitats do not support significant wildlife use. Most of the development is located on higher elevations of the Mississippi River natural levees and former distributary channels; however, vast acreages of swamp and marsh have been placed under forced drainage systems and developed. Limited amounts of agricultural lands occur through out the area; agriculture includes sugarcane farming, cattle production, and haying. Some development in wetlands is also occurring as result of permitted fill activities.

#### **Fishery/Aquatic Resources**

Drainage canals in the study area do not support significant fishery resources because of dense vegetation, poor water quality, and inadequate depth. Freshwater sport fishes present in the project area, but outside of the levees, include largemouth bass, crappie, bluegill, redear sunfish, warmouth, channel catfish, and blue catfish. Other fishes likely to be present include yellow bullhead, freshwater drum, bowfin, carp, buffalo, and gar. Estuarine-dependent fishes and shellfishes such as Atlantic croaker, red drum, spot, sand seatrout, spotted seatrout, southern flounder, Gulf menhaden, striped mullet, brown shrimp, white shrimp, and blue crab are found in the intermediate to saline marshes.

Some of the waterbodies in the project area meet criteria for primary and secondary contact recreation and partially meets criteria for fish and wildlife propagation, while others do not meet the criteria for fish and wildlife propagation. Causes for not fully meeting fish and wildlife propagation criteria include excessive nutrients, organic enrichment, low dissolved oxygen levels, flow and habitat alteration, pathogens and noxious aquatic plants. Indicated sources of

those problems include hydromodification, habitat modification, recreational activities, and unspecified upstream sources. Municipal point sources, urban runoff, storm sewers, and onsite wastewater treatment systems are also known contributors to poor water quality in the area.

Deteriorating water quality in the Barataria Basin, at least partially correlated to wetlands loss and a commensurate reduction in the area's waste assimilation capacity, is a major problem affecting fish and wildlife in that portion of the study area. According to Bahr et al. (1983), factors that currently adversely affect water quality in the Barataria Basin are those generally related to urban development and associated urban pollution, altered land-use patterns, and hydrologic modifications (drainage, etc.) within the watershed. Two major human-related causes of water quality degradation include eutrophication and increased levels of toxic substances.

### Essential Fish Habitat

Estuarine wetlands and associated shallow waters within the project area have been identified as Essential Fish Habitat (EFH) for both postlarval, juvenile and sub-adult stages of brown shrimp, white shrimp, and red drum, as well as the adult stages of those species in the nearshore and offshore reaches. EFH has also been designated for various life stages of Spanish mackerel, bluefish, cobia, and mangrove snapper in the nearshore, marine-portion of the project area and in the lower portions of the estuary. EFH requirements vary depending upon species and life stage.

Categories of EFH in the project area include estuarine emergent wetlands, estuarine water column, submerged aquatic vegetation, and estuarine water bottoms. Detailed information on Federally managed fisheries and their EFH is provided in the 1998 generic amendment of the Fishery Management Plans for the Gulf of Mexico, prepared by the Gulf of Mexico Fishery Management Council (GMFMC). That generic amendment was prepared in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA); (P.L. 104-297). Estuarine-dependent species such as those listed above also serve as prey for other species managed under the MSFCMA by the GMFMC (e.g., red drum, mackerels, snappers, and groupers) and highly migratory species (e.g., billfishes and sharks) managed by the NMFS. Recommendations to minimize and/or avoid impacts to estuarine fishery species were developed by NMFS along with supporting literature and are included in Appendix B.

### **Wildlife Resources**

Mammals known to occur in the project-area bottomland hardwoods and marshes include mink, raccoon, swamp rabbit, nutria, river otter, and muskrat. Those habitats also support a variety of birds including herons, egrets, ibises, least bittern, rails, gallinules, olivaceous cormorant, white pelican, pied-billed grebe, black-necked stilt, sandpipers, gulls, and terns. Forested and scrub-shrub habitats within the study area also provide habitat for many resident passerine birds and essential resting areas for many migratory songbirds including warblers, orioles, thrushes, vireos, tanagers, grosbeaks, buntings, flycatchers, and cuckoos. Many of these and other passerine birds have undergone a decline in population primarily due to habitat loss.

Given the extent of development and drainage, waterfowl use within the hurricane protection system is likely minimal, except in the adjacent wetlands outside the levees. Swamps, fresh and

intermediate marshes usually receive greater waterfowl utilization than brackish and saline marshes because they generally provide more waterfowl food. Migratory species expected to occur in the project area include gadwall, green-winged teal, blue-winged teal, northern shoveler, mallard, pintail, American widgeon, lesser scaup, ring-necked duck, redhead, and canvasback. Resident species expected to occur in that area include mottled duck and wood duck.

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

Amphibians such as the pig frog, bullfrog, leopard frog, cricket frog, and Gulf coast toad are expected to occur in the fresh and low salinity wetlands of the project area. Reptiles such as the American alligator, snapping turtle, softshell turtle, red-eared turtle, and diamond backed terrapin are also expected to occur in the project-area wetlands and waterbodies.

### **Endangered and Threatened Species**

To aid the Corps in complying with their proactive consultation responsibilities under the Endangered Species Act (ESA), the Service provided a list of threatened and endangered species and their critical habitats within the coastal parishes of the New Orleans District in an August 7, 2006, letter to the Corps. The Service recommends that the Corps conduct ESA consultation on each IER as soon as plans are developed and impact locations are identified. If the plans are changed significantly or relocated, or work is not implemented within 1 year following that coordination, we recommend that the Corps reinstate coordination with this office to ensure that the proposed project would not adversely affect any Federally listed threatened or endangered species or their habitat.

### **Protected Species**

The Migratory Bird Treaty Act (MBTA) (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.) and the Bald and Golden Eagle Protection Act (BGEPA) (54 Stat. 250, as amended, 16 U.S.C. 668a-d) offer additional protection to many bird species within the project area including colonial nesting birds and the bald eagle (*Haliaeetus leucocephalus*).

The project area is located where colonial nesting waterbirds may be present. LDWF currently maintains a database of these colonies locations. That database is updated primarily by monitoring the colony sites that were previously surveyed during the 1980s. Until a new, comprehensive coast-wide survey is conducted to determine the location of newly-established nesting colonies, we recommend that a qualified biologist inspect the proposed work sites for the presence of undocumented nesting colonies during the nesting season (e.g. February through September depending on the species). If colonies exist work should not be conducted within 1,000 feet of the colony during the nesting season

Forested habitat in the project-area may provide nesting habitat for the bald eagle, which has officially been removed from the List of Endangered and Threatened Species as of August 8,

2007. Although the bald eagle has been removed from the threatened and endangered species list, it continues to be protected under the MBTA and the BGEPA. The Service developed the National Bald Eagle Management (NBEM) Guidelines to provide landowners, land managers, and others with information and recommendations regarding how to minimize potential project impacts to bald eagles, particularly where such impacts may constitute "disturbance," which is prohibited by the BGEPA. Those guidelines recommend maintaining: (1) a specified distance between the activity and the nest (buffer area); (2) natural areas (preferably forested) between the activity and nest trees (landscape buffers); and (3) avoiding certain activities during the breeding season. The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites. Ideally, buffers would be large enough to protect existing nest trees and provide for alternative or replacement nest trees. On-site personnel should be informed of the possible presence of nesting bald eagles within the project boundary, and should identify, avoid, and immediately report any such nests to this office. A copy of the NBEM Guidelines is available at:

<http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf>. If after consulting those guidelines you need further assistance in determining the appropriate size and configuration of buffers or the timing of activities in the vicinity of a bald eagle nest, the please contact this office.

#### **National Wildlife Refuges, Parks, 404(c) area**

Located within the study area are the Bayou Segnette and the St. Bernard State Parks, which are operated by the Louisiana Department of Culture, Recreation and Tourism, Office of State Parks. Please contact Mr. John Lavin at 1-888-677-1400 regarding work on those areas.

The Barataria Preserve unit of Jean Lafitte National Historical Park and Preserve (JLNHPP) is located on the west bank of the Mississippi River and managed by the National Park Service (NPS). NPS has no authority to enter into agreements with others to allow uses which adversely affect park lands. Therefore, NPS lands cannot be directly utilized or adversely impacted by any flood control project feature unless authorized explicitly by congress. For additional information concerning NPS lands within the area please contact Superintendent David Luchsinger, (504) 589-3882 extension 137 ([david\\_luchsinger@nps.gov](mailto:david_luchsinger@nps.gov)) or Chief of Resource Management David Muth (504) 589-3882 extension 128, ([david\\_muth@nps.gov](mailto:david_muth@nps.gov)).

An area adjacent to the Jean Lafitte National Historic Park and Preserve (JLNHPP) was subject to an Environmental Protection Agency (EPA) Final Determination under the Clean Water Act (CWA) Section 404(c) in 1985. According to the EPA Final Determination, the discharge of any dredged or fill material within the approximately 3200 acre site, referred to as the Bayou aux Carpes 404(c) area, is restricted. The EPA action allowed for three specific exceptions, none of which appears to apply to the Corps' current hurricane protection proposal. Previous requests which have fallen outside those exceptions have been denied by EPA as being contrary to the CWA 404(c) determination. One such categorical denial prohibited the Corps from altering the alignment of the West Bank Hurricane Protection Levee such that it would encroach upon the Bayou aux Carpes 404(c) area.

The EPA 404(c) action was intended as an advance notification to the public and agencies of the government's determination under the CWA Section 404 for the area, in the sense of planning aid coordination. In light of this existing determination, we would expect the NEPA work on the portion of the levee forming the 404(c) boundary to thoroughly evaluate the range of feasible alternatives and their environmental impacts, as well as documenting the Corps' legal and regulatory authority for any alternative that would entail impacts to the Bayou aux Carpes 404(c) area.

The Bayou aux Carpes 404(c) is one of only 11 such actions ever completed by EPA. Approximately 2,800 acres within the site are in Federal ownership and Congress is considering legislation to adjust the boundary of the Barataria Preserve to include the Bayou aux Carpes within the JLNHPP. In the meantime, the National Park Service (NPS) has constructive possession of the area. Therefore, the Corps should contact both the NPS (see contacts above) and EPA (Ms. Barbara Keeler, 214/665-6698) regarding any proposed project feature that may impact that area.

The NPS also has constructive possession of additional Federal lands located adjacent to WBV14c. Congress is considering legislation to adjust the boundary of the Barataria Preserve to also include those lands (i.e., CIT tract) within the JLNHPP.

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

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

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

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. 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.

### **Future Fish and Wildlife Resources**

The combination of subsidence and sea level rise is called submergence or land sinking. As the land sinks the wetlands become inundated with higher water levels, stressing most non-fresh marsh plants, bottomland hardwood plants and even cypress-tupelo swamps leading to plant death and conversion to open water. Other major causes of wetland losses within the study area include altered hydrology, storms, saltwater intrusion (caused by marine processes invading fresher wetlands), shoreline erosion, herbivory, and development activities including the direct and indirect impacts of dredge and fill (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998). The continued conversion of wetlands and forested habitat to open water or developed land represent the most serious fish and wildlife-related problems in the study area. Those losses could be expected to cause significant declines in coastal fish and shellfish production and in the study area's carrying capacity for numerous migratory waterfowl, wading birds, other migratory birds, alligators, furbearers, and game mammals. Wetland losses will also reduce storm surge protection of developed lands, and will likely contribute to water quality degradation associated with excessive nutrient inputs.

### **ALTERNATIVES UNDER CONSIDERATION**

The proposed plan involves upgrading the existing flood protection levees, floodwalls, and floodgates around the Greater New Orleans area. Most improvements will be constructed partially, sometimes entirely, within the existing right-of-way (ROW). However, some proposed closures, i.e., the Inner Harbor Navigation Canal and the Gulf Intracoastal Waterway, would require new construction ROWs and may impact high quality habitats. Some alternatives that have been examined include expanding ROWs into the lower quality habitat side of a levee, utilizing floodwalls so that minimal expansion of ROWs would occur and incorporating subsoil

mixing that would also reduce the expansion of a levee ROW.

## **PROJECT IMPACTS**

The Corps has not yet selected a recommended plan but is continuing to evaluate plans at several levels of protection for each IER. Although some construction will occur in developed areas and on existing levees, project implementation will also directly impact marshes, bottomland hardwoods, swamps, and shrub-scrub areas that provide low to high habitat values for diverse fish and wildlife resources. Project impacts would result primarily from levee rights-of-way (ROW) expansion and construction of levees, borrow pits, floodwalls, navigable floodgates, and associated features.

Development is ongoing within the hurricane protection levees; therefore, the Service has assumed that, for this specific project, project-induced development within enclosed wetlands will be insignificant. However, project impacts to non-wet bottomland hardwoods as a result of flood protection improvements should be mitigated.

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

## **FISH AND WILDLIFE CONSERVATION MEASURES**

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

(a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (e) compensating for the impact by replacing or providing substitute resources or environments.

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

The Service's Mitigation Policy (Federal Register, Volume 46, No. 15, January 23, 1981) identifies four resource categories that are used to ensure that the level of mitigation recommended by Service biologists will be consistent with the fish and wildlife resource values involved. Considering the high value of forested wetlands and marsh for fish and wildlife and the relative scarcity of that habitat type, those wetlands are usually designated as Resource Category 2 habitats, the mitigation goal for which is no net loss of in-kind habitat value. The degraded (i.e., non-wet) bottomland hardwood forest and any wet pastures that may be impacted, however, are placed in Resource Category 3 due to their reduced value to wildlife, fisheries and lost/degraded wetland functions. The mitigation goal for Resource Category 3 habitats is no net loss of habitat value. Project impacts to wetlands will be minimized to some extent by hauling in material for the levee. Because the project is already, avoiding the project impacts altogether (i.e., the "no action" alternative) is not feasible. Therefore, remaining project impacts should be mitigated via compensatory replacement of the habitat values lost.

Toward that end, the Service recommends that the following planning objectives be adopted to guide future project studies.

1. Conserve important fish and wildlife habitat (i.e., bottomland hardwoods, cypress swamps, fresh and estuarine marsh and associated shallow open water habitats) by minimizing the acreage of those habitats directly affected by flood control features.
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.
3. Operate water control structures in levees to allow for (or maintain) fish and shellfish access into enclosed wetland areas.
4. Avoid adverse impacts to bald eagle nesting locations and wading bird colonies through careful design of levees, other project features and timing of construction.
5. Fully compensate for any unavoidable losses of wetland habitat or non-wet bottomland hardwoods caused by project features.

### **SERVICE POSITION AND RECOMMENDATIONS**

Construction of the increased flood protection would result in un-quantified habitat losses. The Service does not object to providing improved hurricane protection to the Greater new Orleans area provided the following fish and wildlife conservation recommendations are incorporated into future project planning and implementation:

1. To the greatest extent possible, situate flood protection features so that destruction of

wetlands and non-wet bottomland hardwoods are avoided or minimized.

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.
3. Avoid adverse impacts to bald eagle nesting locations and wading bird colonies through careful design project features and timing of construction.
4. Forest clearing associated with project features should be conducted during the fall or winter to minimize impacts to nesting migratory birds, when practicable.
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.
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 Service, NMFS, LDWF, Environmental Protection Agency (EPA) and Louisiana Department of Natural Resources (LDNR). The Service shall be provided an opportunity to review and submit recommendations on the all work addressed in those reports.
7. The Corps should avoid impacts to public lands, if feasible. If not feasible the Corps 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 potentially impacted by project features are: Kenneth Litzenberger, Project Leader for the Service's 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](mailto:david_luchsinger@nps.gov)) or Chief of Resource Management David Muth (504) 589-3882 extension 128, ([david\\_muth@nps.gov](mailto: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 EPA.
8. If applicable, a General Plan should be developed by the Corps, the Service, and the managing natural resource agency in accordance with Section 3(b) of the FWCA for mitigation lands.
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. 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.

10. If a proposed project feature is changed significantly or is not implemented within one year of the date of our Endangered Species Act consultation letter, we recommend that the Corps reinitiate coordination with this office to ensure that the proposed project would not adversely affect any federally listed threatened or endangered species or their habitat.
11. In general, larger and more numerous openings in a protection levee better maintain estuarine dependent fishery migration. Therefore, as much opening as practicable, in number, size, and diversity of locations should be incorporated into project levees.
12. Flood protection water control structures in any watercourse should maintain pre-project cross section in width and depth to the maximum extent practicable, especially structures located in tidal passes.
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 Service, NMFS, LDWF, and LDNR.
14. Any flood protection water control structure sited in canals, bayous, or navigation channels that 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.
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.
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.
17. To the maximum extent practicable, structures should be designed and/or selected and installed such that average flow velocities during peak flood or ebb tides do not exceed 2.6 feet per second. However, this may not necessarily be applicable to tidal passes or other similar major exchange points.
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 should be selected that would maintain sufficient flow to prevent siltation.
19. Culverts should be installed in construction access roads unless otherwise recommended by the natural resource agencies. At a minimum, there should be one, 24-inch culvert placed every 500 feet and one at natural stream crossings. If the depth of water crossings allow, larger sized culverts should be used. Culvert spacing should be optimized on a case-by-case basis. A culvert may be necessary if the road is less than 500-feet long and an area would hydrologically isolated without that culvert.

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.
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.
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.
23. The Corps shall fully compensate for any unavoidable losses of wetland habitat or non-wet bottomland hardwoods caused by project features.
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 Corps should provide the necessary funding to ensure mitigation obligations are met on behalf of the public interest.
25. Any proposed change in mitigation features or plans should be coordinated in advance with the Service, NMFS, LDWF, EPA and LDNR.
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 Corps, the Service, NMFS, EPA, LDNR and LDWF. That report should also describe future management activities, and identify any proposed changes to the existing management plan.

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## APPENDIX A

### Summary of basic mitigation land requirements before land is transferred to the U.S. Fish and Wildlife Service

SUBJECT: Revised Summary of basic mitigation land requirements before land is transferred over to the Service.

The following represents a summary of basic mitigation land requirements before land is transferred over to the Service. This does not necessarily represent a comprehensive list, but does represent our best effort to identify all land requirements within reason.

1. For inclusion into the National Wildlife Refuge (NWR) system the lands must be located within a refuge's acquisition boundary.
2. The Service must be provided copies of any easements/agreements for right-of-way on the property especially as it pertains to maintenance of such right-of-way, frequency of maintenance and costs associated with that maintenance if the maintenance is to be preformed by the landowner.
3. The area must be surveyed prior to acquisition by the United States or transfer to the Fish and Wildlife Service. The survey will be conducted by the Corps of Engineers (Corps) or an approved contractor. Boundaries must be marked and permanent monuments set at all corners. Copies of the surveyor notes, plats, etc. resulting from such survey must be provided to Service.
4. Language must be placed in the deed dedicating the mitigation land to fish and wildlife conservation in perpetuity.
5. When possible any restrictive covenants or liens shall be removed, especially if they could interfere with mitigation implementation, operation and/or maintenance.
6. Completion of a Level 1 survey for hazardous, toxic, and/or radioactive wastes with a copy being provided to the Service. If the Level 1 survey indicates the need for further investigations/surveys, those investigations/surveys must be completed and a copy provided to the Service. Lands having unremediated hazardous, toxic, and/or radioactive wastes present may not be accepted into a NWR. Remediated sites will be assessed for inclusion on a case-by-case basis. Documentation of the level of remediation is to be provided to the Service.
7. Funding mechanism for operation and maintenance of the mitigation lands and mitigation features (e.g., water control structures, timber stand improvements, etc.).
8. Documentation must be provided to the Service describing the mitigation goals and objectives in addition to a description of necessary operation and maintenance activities needed to accomplish the stated goals and objectives.

9. Mineral rights should be purchased. If it is not possible to purchase, then protection of surface rights via the following language:

"The vendors reserve for themselves, their successors and assigns, the right to explore, for, operate, produce, remove and transport, oil and gas from the lands herein described. The vendors reserve unto themselves, their successors and assigns, the right of ingress and egress over the said lands in pursuance of the reservations set forth above.

The land is now subject to oil and gas lease in favor of \_\_\_\_\_, as per lease of record in the records of \_\_\_\_\_, \_\_\_\_\_, pages \_\_\_\_\_ of Book \_\_\_\_\_, and the conveyance is subject to the rights of the lessee in said lease.

The oil and gas reservations made by the vendors herein in favor of themselves, their successors and assigns, shall be subject to the following stipulations, and any lease made by the vendors, their successors or assigns, subsequent to the date of this deed, shall contain the following stipulations for the protection of the vendee.

The vendors, their successors and assigns, agree that prior to entry upon the land for purposes of exploration, development or production of, oil and/or gas, they shall obtain a Special Use Permit from the U.S. Fish and Wildlife Service, which permit is for the purpose of providing for access and protecting the natural resources of the area for which the land was acquired, and whose terms and conditions will not unreasonably restrain the activities of the vendors, and their successors and assigns.

It is mutually understood between the parties that the intention of the Government in acquiring this area is to create a refuge for, and the protection of, wildlife in the area herein acquired, and the vendors will conform to, and be governed by, and the vendors herein bind themselves, their successors and assigns, agents and employees, to conform to, and be governed by, the rules and regulations pertaining to the protection of wildlife and refuge administration prescribed from time to time by the Secretary of the Interior or his/her authorized agent, the Director of Fish and Wildlife Service, except that such regulations shall not unreasonably restrain the exercise and use by the vendors, their successors and assigns, of the reservation set out in this agreement."

10. The Service would need a title commitment and policy in favor of United States of America that is in the American Land Title Association (ALTA) U.S. Policy 9/28/91 format as provided in Title Standards 2001.

If the title remains with the local-sharer or the Corps a General Plan as provided for under Section 3 of the Fish and Wildlife Coordination Act (48 Stat. 401; 16 U.S.C. 661 et seq.) must be written. However, the Service may chose to not manage lands for which it does not have title.

## APPENDIX B

### National Marine Fisheries Service Baton Rouge Field Office

#### Recommendations for Fisheries Friendly Design and Operation of Hurricane and Flood Protection Water Control Structures and Supporting Appendices

##### SUMMARY

The purpose of this document is to: 1) identify design and operational guiding principles that would optimize passage of estuarine dependent marine fisheries species, or at least, minimize adverse impacts to their passage through hurricane and flood protection water control structures planned for the New Orleans District of the U.S. Army Corps of Engineers; and, 2) provide background literature for environmental justification and documentation. Specific projects for which this guidance should be considered include the Mississippi River and Tributaries, Morganza to the Gulf of Mexico Hurricane Protection Project; Donaldsonville to the Gulf Project; Supplemental Appropriations Projects, and the Louisiana Coastal Protection and Restoration Project (LACPR). However, these guiding principles would also pertain to any civil works projects that could include combinations of levees and/or water control structures. Project delivery teams should remain flexible to adapt these design principles on a case-by-case basis as new fishery resource information and project-specific hydraulics data become available.

In general, the ability of estuarine dependent marine fishery organisms to migrate to and from coastal habitats decreases as structural restrictions increase, thereby reducing fishery production. The physical ability (i.e., swimming speed) to navigate through a structure is not the only factor influencing fish passage. Both behavioral and physical responses govern migration and affect passage of fishery organisms through structures. These responses may vary by species and life stage. In addition, most marine fishery species are relatively planktonic in early life stages and are dependent on tidal movement to access coastal marsh nursery areas. For this reason, in general, the greater the flow through a structure into a hydrologically affected wetland area, the greater the marine fishery production functions provided by that area.

Data on marine fishery species migrations in the Gulf of Mexico are too limited to allow the development of definitive design and operational considerations for water control structures that would guarantee the protection of marine fishery production. Anecdotal comparisons can be made with data from water intake and fish passage studies from the west and east coasts. It should not be assumed that structures that have been determined to provide sufficient drainage capacity also optimize or provide adequate fishery passage. More investigation is warranted to refine and adaptively manage water control structure design and operations to minimize adverse impacts to fishery passage. Case specific recommendations for some features under the Mississippi Tributaries, Morganza to the Gulf of Mexico Hurricane Protection Project and LACPR are provided in the appendices. In addition, biological background information is provided in the appendices to assist in preparation of environmental documents required by the National Environmental Policy Act (NEPA).

Summary of guiding principles for designing and operating flood protection water control structures to maintain marine fishery passage:

- Generally, bigger and more numerous openings in hurricane and flood protection levees better maintain estuarine dependent fishery migration. As much opening as practicable, in number, size, and diversity of location should be considered.
- Flood protection water control structures in any watercourse should maintain pre-project cross section in width and depth to the maximum extent practicable, especially structures located in tidal passes.
- Flood protection water control structures should remain completely open except during storm events.
- Any flood protection water control structure sited in canals, bayous, or navigation channels that do 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.
- 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.
- Structures 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.
- To the maximum extent practicable, structures should be designed and/or culverts selected such that average flow velocities during peak flood or ebb tides do not exceed 2.6 feet/second. This may not necessarily be applicable to tidal passes or other similar major exchange points.
- 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 should be selected that would maintain sufficient flow to prevent siltation.
- Culverts should be installed in construction access roads unless otherwise recommended by the natural resource agencies. At a minimum, there should be one, 24-inch culvert placed every 500 feet and 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 isolated without that culvert.
- 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.
- 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.
- Operational plans 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.

## INTRODUCTION

Various flood protection and environmental water control structures in hurricane protection levees are being designed and considered for inclusion with ongoing local and federal civil works projects within the boundaries of the New Orleans District. Design purposes of the structures vary and may include maintaining safe navigation and optimizing drainage and passage of fishery organisms. For the Morganza to the Gulf of Mexico hurricane protection project, an interagency Habitat Evaluation Team (HET) and NOAA's National Marine Fisheries Service (NMFS) identified economically important fishery species that should be considered when assessing structure impacts on estuarine fisheries migration. Both the federal and state governments manage some of these species. Primary species that could be affected by flood protection structures in Louisiana include brown shrimp, white shrimp, blue crab, red drum, black drum, spotted seatrout, sand seatrout, southern flounder, and gulf menhaden. Some information is included herein on forage species, the production of which is important to maintain as they serve as important links of the aquatic food web for many of the managed fishery species.

The Baton Rouge office of NMFS has developed preliminary design principles for hurricane and flood protection water control structures to reduce impacts to living marine resources, especially related to migrations of estuarine dependent species. The basis for the following recommended guiding principles is briefly discussed where supporting literature is available. Case specific examples for some features under the Mississippi River and Tributaries, Morganza to the Gulf of Mexico hurricane protection project and the Louisiana Coastal Protection and Restoration Project are provided in the appendices. Basic behavior and physiology effects on the passage of fishery organisms are discussed in detail in appendices C and D, to aid federal agencies in environmental evaluations and descriptions under NEPA.

This document has been developed in consideration of input from the interagency HET, university faculty, fish passage staff of various agencies, and cursory literature reviews. These design considerations are intended to address potential impacts to living marine resources pursuant to the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act. Impacts to resources managed under other authorities, such as the Endangered Species Act or the Marine Mammal Protection Act, are not addressed in this document.

### GUIDING PRINCIPLES FOR DESIGNING FISHERIES FRIENDLY FLOOD PROTECTION WATER CONTROL STRUCTURES

**1. Generally, bigger and more numerous openings in hurricane and flood protection levees better maintain estuarine dependent fishery migration. As much opening as practicable, in number, size, and diversity of location should be considered.**

Most of Louisiana's commercial and recreational fishery species must have access to estuarine marshes to successfully complete some part of their life cycle (i.e., they are estuarine-dependent). Estuarine-dependent fishery productivity is a measure of standing crop (the number of fishery organisms present at a point in time) and the turnover rate (the rate at which the population is

replaced). All things being equal, fishery production would be lower following levee and water control construction if structures retard turnover rate. This would be the case even while standing crop may appear normal. Restrictions in tidal movement caused by water control structures and levees would result in degraded or substantially changed species composition, which could alter fishery production and/or displace fisheries.

Marine transient species emigrate (i.e., move from coastal marshes towards Gulf waters) towards higher salinity water; therefore, a structure that maintains the greatest degree of opening while allowing the project objectives to be met would be desirable (Rogers et al. 1992).

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

Water control structures should be designed to have a water flow capacity (and similar dimensions where possible) comparable to the waterway before construction. Restricted water exchange in marshes enclosed by levees and water control structures diminishes recruitment and standing stocks of species that must migrate from coastal spawning sites to marsh nurseries (Rogers et al. 1994). As the amount of hydrologic control increases, the effect on migration and production of marine transients and residents increases. Greater restriction decreases turn over rate of estuarine-dependent fishery organisms, which decreases their production (Rogers et al. 1992). Slotted and fixed crest weirs have been found to delay immigration. As the degree of restriction increased from slotted weirs, to low elevation weir, and to fixed crest weirs, greater impacts to different fisheries species and their emigration were observed.

Design considerations for hurricane and flood protection water control structures should include features to accommodate vertical and horizontal fishery distribution patterns within interior marsh tidal pathways and coastal passes. Fishery organisms exhibit preferences by species, life stage, and in some cases tide cycle, for vertical and horizontal distribution within smaller or interior marsh tidal connections (Table 1). Behavioral and physiological responses, such as diel vertical migration, affect these preferred distribution patterns.

Study of Keith Lake Pass in Texas revealed that all portions of the water column, both vertically and horizontally, are used by fishery organisms (Hartman et al. 1987). Most estuarine-dependent fishery species preferred the bottom or shore zones during flood tides, but were much denser near the shores of the pass, in slower moving water, on ebb tide. This lateral movement on slack to ebb tides appears to be a behavioral action to prevent displacement from the pass during ebb tide to accelerate movement to marsh nursery areas. The study identified the response to light cycles with midday densities greatest at bottom and densities greatest at surface during dawn to dusk. Similar within pass distribution patterns were reported by Sabins and Truesdale at Grand Isle, Louisiana (1974).

Table 1. Table on fishery preference within the water column (Marotz et al. 1990; Herke and Rogers 1985; Hartman et al. 1987; Sabins and Truesdale 1974). "a" denotes juveniles; "b" denotes immigrating; "c" denotes emigrating; "e" denotes ebb tide; "f" denotes flood tide.

Species	Vertical Distribution			Horizontal Distribution
	Surface	Mid-depth	Bottom	Shore/Nearshore
brown shrimp <sup>b</sup>	X	X		X <sup>c</sup>
white shrimp <sup>b</sup>	X	X		
white shrimp <sup>c</sup>		X		X <sup>c</sup>
blue crab	X			X <sup>e</sup>
red drum <sup>a</sup>				X <sup>c</sup>
red drum <sup>b</sup>		X	X	
red drum <sup>c</sup>			X	
bay anchovy	X			
striped mullet	X			
Atlantic croaker <sup>a</sup>	X	X		X <sup>c</sup>
Atlantic croaker		X	X	X <sup>c</sup>
spotted seatrout		X	X	
sand seatrout		X	X	X <sup>c</sup>
gulf menhaden	X	X		
southern flounder				X <sup>f</sup>
black drum				X <sup>c</sup>

**3. Flood protection water control structures should remain completely open except during storm events.**

Fish passage should be optimized by the duration that structures remain fully open. Rozas and Minello (1999) reported that even when water-control structures were open, the densities of transient species were low inside areas enclosed by levees and water control structures as compared to natural areas.

Fisheries migration that temporarily may be impacted with storm related closures are listed in Table 2. The degree of impact would be influenced by the timing and duration of a structure closure relative to peak migration.

Table 2. Migration of economically important fisheries in Louisiana that temporarily may be impacted with storm related closures.

Species	Migration Period Overlapping with Hurricane Season
brown shrimp	April - mid July
white shrimp	July - November
blue crab	June - September
spotted seatrout	April - October
sand seatrout	April - October
red drum	August - December
black drum	March - July
southern flounder	September - October

**4. Any flood protection water control structures sited in canals, bayous, or navigation channels that do 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.**

Hartman et al. (1987) recommended structures not be constructed in a tidal pass. If a structure was constructed, they recommended the incorporation of several gates at several vertical and horizontal locations, with baffles near shore. Baffles near shore are to direct shore or near shore fish passage on ebb tides through the available structure opening(s) (e.g., gates in wing walls).

Structures should be designed and operated with multiple openings if the pre-project water depth and widths of a channel are not maintained. Multiple openings are necessary to optimize passage of fishery organisms that prefer to migrate along the sides, bottom, and top of channels. For example, Rogers et al. (1992<sup>a</sup>) recommended opening some vertical slots and top, middle, and bottom gates in a structure with multiple slots and gates.

**5. 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.**

The location and number of structures likely affects the abundance and distribution of estuarine fishery species within habitats that would be located on the protected side of levees and water control structures. Rogers et al. (1992<sup>c</sup>) determined that marine transient species were most numerous nearest the structures, partially due to the proximity of the openings with respect to the area enclosed. Similarly, other studies have shown there is a decrease in fishery species abundance and diversity the greater the distance from the access point (Peterson and Turner 1994). This can become more pronounced if an environmental gradient (e.g., salinity) exists between an access point and the interior habitat located on the protected side of structures (Cashner 1994).

**6. Structures 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.**

Study of Keith Lake Pass in Texas revealed vertical and horizontal distribution patterns of fishery organisms in the pass (Hartman et al. 1987). Estuarine-dependent fishery organisms preferred the bottom or near shore zones on flood tides. Most organisms appeared near shores of the pass on ebb tide in slower moving water. Baffles near shore are to direct shore or near shore fish passage through the structure.

Many fish migrate along the water bottom. Water control structures with crests or inverts higher than the lower portion of a channel could impede migration through the deep-water portions of channels. Ramps can provide a means to guide organisms over and through structures and increase access of fisheries organisms to enclosed habitat (Lafleur 1994). Various ramp designs

need to be investigated.

**7. To the maximum extent practicable, structures should be designed and/or culverts selected such that average flow velocities during peak flood or ebb tides do not exceed 2.6 feet/second.**

In this preliminary investigation, no studies were located that evaluated the impacts of swimming speeds for the fishery species and life stages of concern in Louisiana. To avoid preventing or reducing ingress or egress of fishery organisms, preliminary guidance on water velocities through structures in Louisiana could be based on anecdotal comparisons with data available on general swimming speeds from studies on the west and east coasts (Tables 3 and 4).

Swimming speeds of estuarine and marine fish and crustaceans is a function of shape, stage of development, length, ambient temperature, light, and duration required for swimming performance. For most species, absolute speed increases as size increases. Generally, fish swimming speeds range from 2-4 body lengths/second with burst speeds up to 5 body lengths/second (Meyers et al. 1986).

Water intake studies have shown that maintaining water velocities less than 0.5 ft/sec would protect most fish and their life stages from being adversely affected by those flows (USEPA 2004). The species and life stages of fish for that study could not be located at this time and further investigation for Gulf of Mexico species is warranted. They also recommended creating horizontal velocity fields to avoid adverse affects on fish because fish are better able to orient to horizontal verses vertical flow. This could allow selective avoidance of water flows not preferred by fish or minimize disorientation or mortality rates caused by flows.

Eberhardt (personal communication) reported velocities exceeding 0.82 feet/second began to impede fish passage. Fish passage was decreased by 50% for velocities exceeding 2.6 feet/second. Based on evaluation of freshwater species, Gardner (2006) recommends keeping velocities through round culverts less than 1.8 ft/sec during 90% of the fish migration season. To improve fish passage through culverts, installing baffles within culverts should be considered to reduce flow velocity barriers for fish (Pacific Watershed Associates 1994).

Table 3. Water flow velocity thresholds for affecting fish passage or avoiding impingement within flows or on screens.

Source	Water Flow Velocity (ft/sec)	
Alyson Eberhardt, personal communication	0.82	Begin to impede
	2.62	Decreased fish passage by 50%
Gardner 2006	1.8	Critical velocity (freshwater fish)
Meyers et al. 1986	<0.49	To avoid impingement

USEPA 2004	<0.50	Protected 96% of the fish tested from impingement
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Table 4. Sustained fish swimming speeds. Adapted from Meyers et al. (1986). Note that no data was located for the fisheries species and life stages for the Gulf of Mexico.

Fish/life stage	Swimming Speeds (ft/sec)
Atlantic herring	0.19 – 0.3
Mullet	4.19
Horse mackerel	4.46
Sole	0.19 - 0.3
most larvae	0.82 – 0.98

Based on these limited data, larval fish could be adversely impacted by water flow rates exceeding 0.82 feet/second. Post-larval and juvenile stages of flounders could be impacted by flow rates around 1.0 ft/sec. Other species or larger life stages likely would not be adversely impacted until flow rates exceed 2.62 feet/second based on inferences from these data. Water flow velocity monitoring in the Terrebonne Basin by the U.S. Fish and Wildlife Service has found maximum flows through existing open channels exceeding 1.0 feet /second and in larger saline marsh channels and passes exceeding 2.0 feet/second.

If the spatial extent of flow velocity fields exceed the distance that can be traveled with sustained or burst swimming speeds of fishery organisms, those flows could prevent or reduce ingress or egress during the time which those flows exist. However, the degree of mortality from not being able to access nursery and foraging habitat is not known. High flow rates may aid passage of larval fish that primarily depend on passive transport for migratory distribution and access to estuarine habitat on the protected side of levees, if the high flows do not induce mortality from injury or fatigue. Water flow could exceed the fish swimming rates for short periods and still provide passage during low flows or during still water.

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

Design considerations should include installing baffles within culverts to reduce flow velocity barriers (Pacific Watershed Associates 1994). Passage of salmon and herring species has been shown to be impaired by culverts. With baffles or other similar features, still water areas could be created to enhance fish passage.

If water control structures include plunge pools, the invert elevation of the structure could be equal to the depth of the plunge pool if the plunge pool is deeper than the pre-project water depth. This deeper invert would optimize passage of fisheries species, in particular bottom dweller species.

Fish often require visual cues for orientation and exhibit faster swimming speeds at increased

light levels. Herring type fish (e.g., gulf menhaden) are particularly sensitive to light levels. However, although herring exhibited a preference for unshaded portions of treatments during both day and night periods, as little as 1.4% of the ambient light was necessary for their passage through a culvert (Mosser and Terra 1999).

**9. Culverts should be installed in construction access roads unless otherwise recommended by the resource agencies. At a minimum, there should be one, 24-inch culvert placed every 500 feet and at all water 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, even if the road is less than 500 feet long, if an area would be hydrologically isolated without that culvert.**

**10. Water control structures should be designed to allow rapid opening in the absence of an offsite power source after storm passage and return of normal water levels.**

Regardless of structure size, designs and contingency plans should include means to rapidly open the water control structures when flooding risks subside after a storm. Designs and plans should include infrastructure, equipment, and staff necessary to open the structures even if offsite electricity is not available. Design safeguards should be developed to protect the structures from being damaged rendering them inoperable and locked in a closed configuration after passage of a storm.

**11. Levee alignment 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.**

**12. Operational plans 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.**

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## APPENDIX C

### BEHAVIOR

The physical ability (i.e., swimming speed) to navigate a structure is not the only factor influencing fish passage, especially for small structures. Behavioral responses to stimuli individually or interactively affect passage with physiological constraints or responses. Behavior generally can be categorized as schooling and non-schooling behavior.

#### SCHOOLING BEHAVIOR

Schooling behavior consists of strategies that provide hydrodynamic efficiency, reduced predation, increased efficiency in finding food, and increased reproductive success. Water control structures for flood protection impact large numbers of fishery organisms due to this group response. This could be because fish exhibit the tendency to approach and orient to other members of the species (i.e., biotaxis). This orientation confers a hydrodynamic advantage that is more efficient than individuals due primarily to vortices setup by lead fish. Schools function as a living organism where the group reacts to stimuli as an individual. It is this group reaction

that influences greater affect on passage through water control structures.

#### NON-SCHOOLING BEHAVIOR

Agonistic, territorial, and hierarchical behaviors are examples of non-schooling behavior exhibited by fish. Agonistic and territorial behaviors are largely unknown for the listed estuarine and marine fishery species of concern and their life stages. Structures that create physically taxing water flow velocities and some low flow areas may encourage these behaviors as fish compete for resting areas similar to competition seen with fish competing for resting areas within shrimp trawls or behind rocks in river riffle/pool habitat. It is possible these behavioral responses overall may not be that influential on fish passage through a structure, but may come more into play during low flow conditions such as lower tides or slack tide. Hierarchical behavior can often be driven by a combination of physiological responses and will be discussed in that section. Overall, investigation on behavioral responses to water control structures is needed to avoid and minimize adversely impacting fishery passage if not optimizing it.

### APPENDIX D

#### PHYSIOLOGICAL

Fishery species and life stages react differently to a current of water (i.e., rheotaxis). Generally, fish are better able to orient to horizontal versus vertical flow (Meyers et al. 1986).

#### Locomotion

There are two means for migratory transport of estuarine and marine fish and crustaceans: passive and active transport. Passive transport is drift of organisms carried by the tides and currents. Larval and post-larval fish and crustacean life stages are predominately transported passively by tides and currents. Passive transport via tidal forcing can play a strong role in migration of sub-adult and adult brown shrimp, white shrimp, and blue crabs. Active transport is movement by swimming, which is the primary means of locomotion for sub-adults and adult fish.

#### SWIMMING SPEED

Refer to guiding principles number 7 for details on swimming speeds relative to impacts on fish passage.

#### BEHAVIORAL/PHYSIOLOGY INTERACTION

Many fishery organisms exhibit hierarchical behavior. This is a direct response to stimuli, such as astronomical (e.g., tidal rhythm) or meteorological driven flows. For example, brown shrimp mediate transport by circadian or diel vertical migration. Brown shrimp move down in the water column or cease activity as they become negatively buoyant when low salinity and temperature water develop in estuaries with north winds associated with spring fronts. Brown shrimp activity resumes with their movement up in the water column with increasing water temperature, salinity, and hydrostatic pressure associated with the southerly gulf return following after a cold front (Rogers et al. 1993). Similar selective tidal stream transport was reported by Hartman et al. (1987). Fishery organisms identify tide changes by detecting altered velocity, salinity,

temperature, all of which can cue staging for immigration with an incoming tide. Future tidal pass or inlet studies are needed for better information on vertical distribution, depth preferences, and changes in buoyancy or behavior to evaluate active and passive transport of fishery organisms.

## APPENDIX E

### Reference Websites, Fish Passage Agency Representatives, and University Faculty

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USACE Portland District, Fish Passage Team

[http://www.nwp.usace.army.mil/pm/e/en\\_fish.asp](http://www.nwp.usace.army.mil/pm/e/en_fish.asp)

USACE, ERDC, Coastal Hydraulics Lab

<http://chl.erdc.usace.army.mil/CHL.aspx?p=s&a=ResearchAreas;22>

USFWS Fish Passage Decision Support System

<http://fpdss.fws.gov/index.jsp>

NC State's Center for Transportation and the Environment website:

<http://www.itre.ncsu.edu/>

[http://itre.ncsu.edu/CTE/gateway/downloads/Culvert%20Impact%20Study\(December2002\).pdf](http://itre.ncsu.edu/CTE/gateway/downloads/Culvert%20Impact%20Study(December2002).pdf)

<http://itre.ncsu.edu/CTE/gateway/downloads/FishPassage.pdf>

FishXing software and learning systems for fish passage through culverts. This software is intended to assist engineers, hydrologists, and fish biologists in the evaluation and design of culverts for fish passage. It is free and available for download.

<http://stream.fs.fed.us/fishxing/>

- Allows for comparison of multiple culverts designs within a single project.
- Calculates hydraulic conditions within circular, box, pipe-arch, open-bottom arch, and embedded culverts.
- Contains default swimming abilities for numerous North American fish species.
- Contains three different options for defining tailwater elevations.
- Calculates water surface profiles through the culvert using gradually varied flow equations, including hydraulic jumps.

- Outputs tables and graphs summarizing the water velocities, water depths, outlet conditions, and lists the limiting fish passage conditions for each culvert.

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APPENDIX C  
LATIN NAMES FOR SOME SPECIES DISCUSSED IN THE REPORT  
AND/OR FOUND IN THE PROJECT AREA

PLANTS

American sycamore	<i>Platanus occidentalis</i>
Black willow	<i>Salix nigra</i>
Box elder	<i>Acer negundo</i>
Chinese tallow-tree	<i>Triadica sebifera</i>
Cypress	<i>Taxodium distichum</i>
Eastern cottonwood	<i>Populus deltoides</i>
Green ash	<i>Fraxinus pennsylvanica</i>
Overcup oak	<i>Quercus lyrata</i>
Red maple	<i>Acer rubrum</i>
Red mulberry	<i>Morus rubra</i>
Roughleaf dogwood	<i>Cornus drummondii</i>
Sugarberry	<i>Celtis laevigata</i>
Sweet pecan	<i>Carya illinoensis</i>
Water oak	<i>Quercus nigra</i>
Willow oak	<i>Quercus phellos</i>

FISH

Banded pygmy sunfish	<i>Elassoma zonatum</i>
Bigmouth buffalo	<i>Ictiobus cyprinellus</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Blue catfish	<i>Ictalurus furcatus</i>
Bluegill	<i>Lepomis macrochirus</i>
Blue sucker	<i>Cycleptus elongates</i>
Brook silverside	<i>Labidesthes sicculus</i>
Bullhead minnow	<i>Pimephales vigilax</i>
Channel catfish	<i>Ictalurus punctatus</i>
Chub shiner	<i>Notropis potteri</i>
Common carp	<i>Cyprinus carpio</i>
Dollar sunfish	<i>Lepomis marginatus</i>
Dusky darter	<i>Percina sciera</i>
Emerald shiner	<i>Notropis atherinoides</i>
Flathead catfish	<i>Pylodictis olivaris</i>
Freshwater drum	<i>Aplodinotus grunniens</i>
Ghost shiner	<i>Notropis buchanani</i>
Gizzard shad	<i>Dorosoma cepedianum</i>
Golden shiner	<i>Notemigonus crysoleucas</i>
Golden topminnow	<i>Fundulus chrysotus</i>

Goldeye	<i>Hiodon alosoides</i>
Grass carp	<i>Ctenopharyngodon idella</i>
Green sunfish	<i>Lepomis cyanellus</i>
Inland silverside	<i>Menidia beryllina</i>
Largemouth bass	<i>Micropterus salmoides</i>
Logperch	<i>Percina caprodes</i>
Longear	<i>Lepomis megalotis</i>
Longnose gar	<i>Lepisosteus osseus</i>
Mimic shiner	<i>Notropis volucellus</i>
Mississippi silvery minnow	<i>Hybognathus nuchalis</i>
Orangespotted sunfish	<i>Lepomis humilis</i>
Pallid sturgeon	<i>Scaphirhynchus albus</i>
Paddlefish	<i>Polyodon spathula</i>
Pugnose minnow	<i>Opsopoeodus emiliae</i>
Redear	<i>Lepomis microlophus</i>
Red shiner	<i>Cyprinella lutrensis</i>
Redspotted sunfish	<i>Lepomis miniatus</i>
River carpsucker	<i>Carpodes carpio</i>
River darter	<i>Percina shumardi</i>
Shortnose gar	<i>Lepisosteus platostomus</i>
Shovelnose sturgeon	<i>Scaphirhynchus platyrhynchus</i>
Silverband shiner	<i>Notropis shumardi</i>
Silver chub	<i>Macrhybopsis storeriana</i>
Skipjack	<i>Alosa chrysochloris</i>
Slough darter	<i>Etheostoma gracile</i>
Smallmouth buffalo	<i>Ictiobus bubalus</i>
Spotted bass	<i>Micropterus punctulatus</i>
Spotted gar	<i>Lepisosteus oculatus</i>
Striped bass	<i>Morone saxatilis</i>
Threadfin shad	<i>Dorosoma petenense</i>
Warmouth	<i>Lepomis gulosus</i>
Western mosquitofish	<i>Gambusia affinis</i>
White bass	<i>Morone chrysops</i>
White crappie	<i>Pomoxis annularis</i>
White-striped bass hybrid	<i>Morone saxatilis x Morone chrysops</i>
Yellow bass	<i>Morone mississippiensis</i>
Yellow bullhead	<i>Ameiurus natalis</i>

#### AMPHIBIANS

American bullfrog	<i>Rana catesbeiana</i>
Cope's gray treefrog	<i>Hyla chrysoscelis</i>
Dwarf salamander	<i>Eurycea quadridigitata</i>
Eastern narrow-mouthed toad	<i>Gastrophryne carolinensis</i>

Fowler's toad	<i>Bufo fowleri</i>
Green treefrog	<i>Hyla cinerea</i>
Northern cricket frog	<i>Acris crepitans</i>
Pig frog	<i>Rana grylio</i>
Small mouth salamander	<i>Ambystoma texanum</i>
Southern leopard frog	<i>Rana sphenocephala</i>
Spring peeper	<i>Pseudacris crucifer</i>
Western chorus frog	<i>Pseudacris triseriata</i>
Gulf coast toad	<i>Bufo vallicipes</i>

#### REPTILES

American Alligator	<i>Alligator mississippiensis</i>
Cooter	<i>Pseudemys floridana</i>
Copperhead	<i>Agkistrodon contortrix</i>
Cottonmouth	<i>Agkistrodon piscivorus</i>
Diamondback terapin	<i>Malaclemys terepin</i>
Eastern stinkpot turtle	<i>Sternotherus odoratus</i>
False map turtle	<i>Graptemys pseudogeographica</i>
Five-lined skink	<i>Eumeces fasciatus</i>
Racer	<i>Coluber constrictor</i>
Red eared turtle	<i>Pseudemys scripta</i>
Ring-necked snake	<i>Diadophis punctatus</i>
Smooth softshell turtle	<i>Trionyx muticus</i>
Snapping turtle	<i>Chelydra serpentina</i>
Watersnake	<i>Nerodia fasciata</i>

#### BIRDS

American wigeon	<i>Anas americana</i>
Anhinga	<i>Anhinga anhinga</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Barred owl	<i>Strix varia</i>
Belted kingfisher	<i>Ceryle alcyon</i>
Black-necked stilt	<i>Himantopus mexicanus</i>
Blue-winged teal	<i>Anas discors</i>
Carolina chickadee	<i>Poecile carolinensis</i>
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Eastern meadowlark	<i>Sturnella magna</i>
Gadwall	<i>Anas strepera</i>
Great blue heron	<i>Ardea herodias</i>
Great egret	<i>Ardea alba</i>
Greater white-fronted goose	<i>Anser albifrons</i>

Green heron	<i>Butorides virescens</i>
Green-winged teal	<i>Anas crecca</i>
Interior least tern	<i>Sterna antillarum athalassos</i>
Mallard	<i>Anas platyrhynchos</i>
Mourning dove	<i>Zenaida macroura</i>
Northern cardinal	<i>Cardinalis cardinalis</i>
Northern pintail	<i>Anas acuta</i>
Osprey	<i>Pandion haliaetus</i>
Pied-billed grebe	<i>Podilymbus podiceps</i>
Red-bellied woodpecker	<i>Melanerpes carolinus</i>
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>
Red-shouldered hawk	<i>Buteo lineatus</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Snow goose	<i>Chen caerulescens</i>
Solitary sandpiper	<i>Tringa solitaria</i>
Spotted sandpiper	<i>Actitis macularia</i>
White-eyed vireo	<i>Vireo griseus</i>
Wood duck	<i>Aix sponsa</i>

#### MAMMALS

Bobcat	<i>Lynx rufus</i>
Cotton mouse	<i>Peromyscus gossypinus</i>
Coyote	<i>Canis latrans</i>
Eastern cottontail rabbit	<i>Sylvilagus floridanus</i>
Fox	<i>Vulpes vulpes</i>
	<i>Urocyon cinereoargenteus</i>
Fox squirrel	<i>Sciurus niger</i>
Hispid cotton rat	<i>Sigmodon hispidus</i>
Mink	<i>Mustela vison</i>
Nutria	<i>Myocaster coypus</i>
Muskrat	<i>Ondatra zibethicus</i>
Northern raccoon	<i>Procyon lotor</i>
Swamp rabbit	<i>Sylvaligus aquaticus</i>
Virginia opossum	<i>Didelphis virginiana</i>
White-tailed deer	<i>Odocoileus virginianus</i>



# United States Department of the Interior

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

March 3, 2008

Colonel Alvin B. Lee  
District Engineer  
U.S. Army Corps of Engineers  
Post Office Box 60267  
New Orleans, Louisiana 70160-0267

Dear Colonel Lee:

Please reference the Individual Environmental Report (IER) 22, entitled Government Furnished Borrow Material #2 Jefferson and Plaquemines Parishes, Louisiana, that addresses impacts resulting from the excavation of government-furnished borrow sites. Excavated material will be used to increase hurricane protection within the Greater New Orleans area located in southeast Louisiana. Work associated with that IER is being conducted in response to Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4). That law authorized the Corps of Engineers (Corps) to upgrade two existing hurricane protection projects (i.e., Westbank and Vicinity of New Orleans and Lake Pontchartrain and Vicinity) in the Greater New Orleans area to provide protection against a 100-year hurricane event. This draft report contains an analysis of the impacts on fish and wildlife resources that would result from excavation of those borrow sites and provides recommendations to minimize and/or mitigate project impacts on those resources.

The Supplemental 4 authorization of the proposed project directed the Corps to proceed with engineering, design, and modification (and construction where necessary) of the hurricane protection projects. Procedurally, project construction has been authorized in the absence of the report of the Secretary of the Interior that is required by Section 2(b) of the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). In this case, the authorization process has prevented our agencies from following the normal procedures for fully complying with the FWCA. The FWCA requires that our Section 2(b) report be made an integral part of any report supporting further project authorization or administrative approval. Therefore, to fulfill the coordination and reporting requirements of the FWCA, The U.S. Fish and Wildlife Service (The Service) will be providing post-authorization 2(b) reports for individual IERs.

This draft report incorporates and supplements our FWCA Reports that addressed impacts and mitigation features for the Westbank and Vicinity of New Orleans (dated November 10, 1986, August 22, 1994, November 15, 1996, and June 20, 2005) and the Lake Pontchartrain and Vicinity Hurricane (dated July 25, 1984, and January 17, 1992) Protection projects. However, this report does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. This report has been provided to the Louisiana Department of Wildlife and Fisheries and the National Marine Fisheries Service; their comments will be incorporated into our final report.

## DESCRIPTION OF THE STUDY AREA

The study area is located within the Mississippi River Deltaic Plain of the Lower Mississippi River Ecosystem. Portions or all of Jefferson and Plaquemines Parishes, Louisiana are included in the study area. Higher elevations occur on the natural levees of the Mississippi River and its distributaries. Developed lands are primarily associated with natural levees, but extensive wetlands have been leveed and drained to accommodate residential, commercial, and agricultural development. Federal, State, and local levees have been installed for flood protection purposes, often with negative effects on adjacent wetlands. Navigation channels such as the Gulf Intracoastal Waterway and the Mississippi River – Gulf Outlet are also prominent landscape features, as are extensive oil and gas industry access channels and pipeline canals. Extensive wetlands and associated shallow open waters dominate the landscape outside the flood control levees. Major waterbodies include Lake Pontchartrain located north of the project area, the Mississippi River which bisects the project area, and Lake Borgne which is located on the eastern edge of the project area.

## FISH AND WILDLIFE RESOURCES

### Description of Habitats

Habitat types in the study area include forested wetlands (i.e., bottomland hardwoods and/or swamps), non-wet bottomland hardwoods, marsh, open water, and developed areas. Due to urban development and a forced-drainage system, the hydrology of much of the forested habitat has been altered. The forced-drainage system has been in operation for many years, and subsidence is evident throughout the area. Because no marshes will be impacted by borrow areas addressed in this report, that habitat type will not be described in detail.

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

Factors that will strongly influence future fish and wildlife resource conditions outside of the protection levees include freshwater input and loss of coastal wetlands. Depending upon the deterioration rate of

marshes, the frequency of occasional short-term saltwater events may increase. Under that scenario, tidal action in the project area may increase gradually as the buffering effect of marshes is lost, and use of that area by estuarine-dependent fishes and shellfish tolerant of saltwater conditions would likely increase. Regardless of which of the above factors ultimately has the greatest influence, freshwater wetlands within and adjacent to the project area will probably experience losses due to development, subsidence, and erosion.

Non-wet bottomland hardwoods within the project area also provide habitat for wildlife resources. Between 1932 and 1984, the acreage of bottomland hardwoods in Louisiana declined by 45 percent (Rudis and Birdsey 1986). By 1970, Jefferson Parish was classified as entirely urban or nonforested in the U.S. Forest Service's forest inventory with most of this loss resulting from development within non-wet areas inside the hurricane protection levees. A large percentage of the original bottomland hardwoods within the Mississippi River floodplain acreage in the Deltaic Plain are located within a levee system, especially those at higher elevations. However, losses of that habitat type are not regulated or mitigated with the exception of impacts resulting from Corps projects as required by Section 906(b) of the Water Resources Development Act of 1986.

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

### Forested Habitats

Forested habitats in the study area were divided into two major types; bottomland hardwood forests and cypress-tupelo swamps. Bottomland hardwood forests found in the project area occur primarily on the natural levees of the Mississippi River or former distributary channels. Dominant vegetation may include sugarberry, water oak, live oak, bitter pecan, black willow, American elm, Drummond red maple, Chinese tallow-tree, boxelder, green ash, bald cypress, and elderberry. Most bottomland hardwoods that are located within the constructed hurricane protection projects have been degraded by forced drainage and resultant subsidence. Those areas are also often fragmented by development. Conversely, those bottomland hardwoods located outside the protection levees, or in areas where structures through the levees maintain a hydrologic connection, still retain many wetland functions and values.

Cypress-tupelo swamps are located along the flanks of larger distributary ridges as a transition zone between bottomland hardwoods and lower-elevation marsh or scrub-shrub habitats. Cypress-tupelo swamps exist where there is little or no salinity, usually minimal daily tidal action and are usually flooded throughout most of the growing season. Bald cypress-tupelo gum are the dominant vegetation within this habitat type, however, Drummond red maple, green ash, and black willow are also common. Cypress swamps that are within the levee system and under forced drainage are often dominated by bald cypress, but vegetative species more typical of bottomland hardwoods will dominate the under-

and mid-story vegetation. These sites will often have ecological functions closer to those of a bottomland hardwood. Because of their altered hydrology, these areas can potentially convert to sites dominated by bottomland hardwood species.

### Scrub-Shrub Habitats

Scrub-shrub habitat is often found along the flanks of distributary ridges and in marshes altered by spoil deposition or drainage projects. Typically it is bordered by marsh at lower elevations and by developed areas, cypress-tupelo swamp, or bottomland hardwoods at higher elevations. Typical scrub-shrub vegetation includes elderberry, wax myrtle, buttonbush, black willow, Drummond red maple, Chinese tallow-tree, and groundselbush.

### Open-Water Habitats

Open-water habitat within the project area consists of ponds, lakes, canals, and bayous. Natural marsh ponds and lakes are typically shallow, ranging in depth from 6 inches to over 2 feet. Typically, the smaller ponds are shallow and the larger lakes are deeper. In fresh and low-salinity areas, ponds and lakes may support varying amounts of submerged and/or floating-leaved aquatic vegetation.

Dead-end canals and small bayous are typically shallow and their bottoms may be filled in to varying degrees with semi-fluid organic material. Erosion due to wave action and boat wakes, together with shading from overhanging woody vegetation, tends to retard the amount of intertidal marsh vegetation growing along the edges of those waterways.

Drainage canals enclosed within the hurricane protection project are stagnant except when pumps are operating to remove water. Runoff from developed areas has likely reduced the habitat value of that aquatic habitat by introducing various urban pollutants, such as oil, grease, and excessive nutrients. Clearing and development has eliminated much of the riparian habitat that would normally provide shade and structure for many aquatic species.

### Developed Areas

Developed habitats in the study area include residential and commercial areas, as well as roads and existing levees. Those habitats do not support significant wildlife use. Most of the development is located on higher elevations of the Mississippi River natural levees and former distributary channels; however, vast acreages of swamp and marsh have been placed under forced drainage systems and developed. Limited amounts of agricultural lands occur through out the area; agriculture includes sugarcane farming, cattle production, and haying. Some development is also occurring as wetlands are filled to accommodate growth

### **Fishery/Aquatic Resources**

Drainage canals in the study area do not support significant fishery resources because of dense

vegetation, poor water quality, and inadequate depth. Freshwater sport fishes present in the project area, but outside of the levees, include largemouth bass, crappie, bluegill, redear sunfish, warmouth, channel catfish, and blue catfish. Other fishes likely to be present include yellow bullhead, freshwater drum, bowfin, carp, buffalo, and gar.

Some of the waterbodies in the project area meet criteria for primary and secondary contact recreation and partially meet criteria for fish and wildlife propagation; while others do not meet the latter criteria. Causes for not fully meeting fish and wildlife propagation criteria include excessive nutrients, organic enrichment, low dissolved oxygen levels, flow and habitat alteration, pathogens and noxious aquatic plants. Sources of those problems include hydromodification, habitat modification, recreational activities, and unspecified upstream inputs. Municipal point sources, urban runoff, storm sewers, and onsite wastewater treatment systems are also known contributors to poor water quality in the area.

### **Wildlife Resources**

Mammals known to occur in the project-area bottomland hardwoods and marshes include mink, raccoon, swamp rabbit, nutria, river otter, and muskrat. Those habitats also support a variety of birds including herons, egrets, ibises, least bittern, rails, gallinules, olivaceous cormorant, white pelican, pied-billed grebe, black-necked stilt, sandpipers, gulls, and terns. Forested and scrub-shrub habitats within the study area also provide habitat for many resident passerine birds and essential resting areas for many migratory songbirds including warblers, orioles, thrushes, vireos, tanagers, grosbeaks, buntings, flycatchers, and cuckoos.

Given the extent of development and drainage, waterfowl use within the hurricane protection system is likely minimal, while adjacent wetlands outside the levees provide high quality habitat. Swamps, fresh and intermediate marshes usually receive greater waterfowl utilization than brackish and saline marshes because they generally provide more waterfowl food. Resident species expected to occur in the project area include mottled ducks and wood ducks. The study area also supports resident hawks and owls including the red-shouldered hawk, barn owl, common screech owl, great horned owl, and barred owl. The red-tailed hawk, marsh hawk, and American kestrel are seasonal residents which utilize habitats within the study area.

Amphibians such as the pig frog, bullfrog, leopard frog, cricket frog, and Gulf coast toad are expected to occur in the fresh and low salinity wetlands of the project area. Reptiles such as the American alligator, snapping turtle, softshell turtle, red-eared turtle, and diamond backed terrapin are also expected to occur in the project-area wetlands and waterbodies.

### **Endangered and Threatened Species**

To aid the Corps in complying with their proactive consultation responsibilities under the Endangered Species Act (ESA), the Service provided a list of threatened and endangered species and their critical habitats within the coastal parishes of the New Orleans District. The Corps has conducted ESA consultation on each borrow site as they were identified and no threatened or endangered species or

their critical habitat were located at any borrow site. If a proposed borrow site is changed significantly or relocated, or excavation is not implemented within 1 year, we recommend that the Corps reinstate coordination with this office to ensure that the proposed project would not adversely affect any Federally listed threatened or endangered species or their habitat.

### National Wildlife Refuges and Parks

Public owned lands located within the parishes of the study area include the Bayou Segnette State Park, which is operated by the Louisiana Department of Culture, Recreation and Tourism, Office of State Parks, and the Barataria Unit of Jean Lafitte National Historical Park and Preserve, located on the west bank of the Mississippi River and managed by the National Park Service. Delta National Wildlife Refuge and the Louisiana Department of Wildlife and Fisheries Pass a Loutre WMA are located at the southern end of Plaquemines Parish.

### Future Fish and Wildlife Resources

The combination of subsidence and sea level rise results in higher water levels, stressing most non-fresh marsh plants and forested wetlands leading to plant death and conversion to open water. Other major causes of wetland losses within the study area include altered hydrology, storms, saltwater intrusion (caused by marine processes invading fresher wetlands), shoreline erosion, herbivory, and development activities including the direct and indirect impacts of dredge and fill (Louisiana Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998). The continued conversion of wetlands and forested habitats to open water or developed land represents the most serious fish and wildlife-related problem in the study area. Habitat losses could be expected to cause declines in the study area's carrying capacity for migratory waterfowl, wading birds, other migratory birds, alligators, furbearers, and game mammals.

## **ALTERNATIVES UNDER CONSIDERATION**

The proposed borrow sites have been located in areas that minimize impacts to wetlands and impacts to non-wet bottomland hardwoods have also been avoided to the extent practicable. Use of adjacent borrow, the typical construction method, has been limited because of soil conditions (i.e., insufficient clay content), thus impacts resulting from expansion of borrow sites into wetlands has been avoided in some areas. The Service provided an August 7, 2006, Planning-aid Letter to the Corps proposing a protocol to identify borrow sites thereby minimizing impacts to fish and wildlife resources. The Corps has used that protocol as a guideline in identifying potential government-furnished borrow sites.

## **PROJECT IMPACTS**

Excavation of borrow sites will result in the conversion of terrestrial habitat into open-water areas. Because pasture habitat has a reduced value to fish and wildlife resources and is not a declining or limited habitat type, impacts associated with conversion of pasture to open-water were quantified only by acreage. Impacts to bottomland hardwood were quantified by acreage and habitat quality (i.e.,

average annual habitat unit or AAHUs) and are presented in Table 1.

The Service used the Habitat Assessment Methodology (HAM) to quantify the benefits of anticipated mitigation measures for forested habitats. The habitat assessment models for swamps and bottomland hardwoods within the Louisiana Coastal Zone utilized in this evaluation are modified from those developed in the Service’s Habitat Evaluation Procedures (HEP). For each habitat type, those models define an assemblage of variables considered important to the suitability of an area to support a diversity of fish and wildlife species (Louisiana Department of Natural Resources 1994; U.S. Fish and Wildlife Service 1980). The HAM, however, is a community-level evaluation instead of the species-based approach used with HEP. Further explanation of how impacts/benefits are assessed with HAM and an explanation of the assumptions affecting habitat suitability (i.e., quality) index (HIS) values for each target year are available for review at Service’s Lafayette, Louisiana, field office.

**Table 1: Impacts from Government Furnished Borrow Sites**

<b>Proposed Borrow Sites</b>	<b>Parish</b>	<b>BLH impacted (acres)</b>	<b>AAHUs lost</b>
Brad Buras	Plaquemines	(9, non-BLH)	0
Chauvin	Plaquemines	(28, non-BLH)	0
Tabony	Plaquemines	86.93	28.9
Westbank F	Jefferson	148	85
Westbank I	Jefferson	9.76	4.64
Westbank N	Jefferson	(145, non-BLH)	0
Total		244.69 (182, non-BLH)	118.54

As indicated in Table 1, our HAM analyses indicate that project implementation would result in the conversion of 426.69 acres of terrestrial habitat to deep open water areas. This would also result in the direct loss of 244.69 acres and 118.54 AAHUs of bottomland hardwood forests. The Brad Buras, Chauvin, and Westbank N sites are mostly pasture with only a few hurricane injured trees.

### **FISH AND WILDLIFE CONSERVATION MEASURES**

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

- (a) avoiding the impact altogether by not taking a certain action or parts of an action;
- (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- (e) compensating for the impact by replacing or providing substitute resources or environments.

The Service supports and adopts this definition of mitigation and considers its specific elements to

represent the desirable sequence of steps in the mitigation planning process. Based on current and expected future without-project conditions, the planning goal of the Service is to develop a balanced project, i.e., one that is responsive to demonstrated hurricane protection needs while addressing the co-equal need for fish and wildlife resource conservation.

The Service's Mitigation Policy (Federal Register, Volume 46, No. 15, January 23, 1981) identifies four resource categories that are used to ensure that the level of mitigation recommended by Service biologists will be consistent with the fish and wildlife resource values involved. Considering the high value of forested wetlands and marsh for fish and wildlife and the relative scarcity of that habitat type, those wetlands are usually designated as Resource Category 2 habitats, the mitigation goal for which is no net loss of in-kind habitat value. The degraded (i.e., non-wet) bottomland hardwood forest and any wet pastures that may be impacted, however, are placed in Resource Category 3 due to their reduced value to wildlife, fisheries and lost/degraded wetland functions. The mitigation goal for Resource Category 3 habitats is no net loss of habitat value.

To minimize wetland and bottomland hardwood impacts, the Service recommends that prior to utilizing borrow sites, every effort should be made to reduce impacts by using sheetpile, floodwalls, geotextile, or some combination thereof, to increase levee heights wherever feasible. In addition, the Service recommends that the previous protocol to identify and prioritize borrow sources provided in our August 7, 2006, Planning-aid letter should continue to be utilized as a guide in locating future borrow-sites.

### **SERVICE POSITION AND RECOMMENDATIONS**

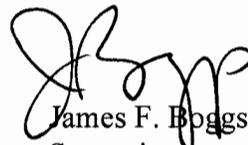
Excavation of borrow sites result in the loss of 244.69 acres of bottomland hardwoods for a total loss of 118.54 AAHUs. The Service does not object to the use of the proposed borrow sites provided the following fish and wildlife recommendations are implemented concurrently with project implementation:

1. The Corps and local sponsor shall provide 118.54 AAHUs to compensate for the unavoidable, project-related loss of forested lands. The Service, National Marine Fisheries Service, Louisiana Department of Wildlife and Fisheries, and Louisiana Department of Natural Resources should be consulted regarding the adequacy of any proposed alternative mitigation sites.
2. The protocol to identify and prioritize borrow sources provided in our August 7, 2006, Planning-aid letter (attached) should continue to be utilized as a guide in locating future borrow-sites.
3. Any proposed change in borrow site features, locations or plans shall be coordinated in advance with the Service, NMFS, LDWF, and LDNR.
4. The project's first Project Cooperation Agreement (or similar document) shall include language that includes the responsibility of the local-cost sharer to provide operational, monitoring, and maintenance funds for mitigation features.

5. Forest clearing associated with borrow site preparation should be conducted during the fall or winter to minimize impacts to nesting migratory birds, when practicable.

6. If a proposed borrow site is changed significantly or excavation is not implemented within 1 year, we recommend that the Corps reinitiate coordination with David Castellanos (337/291-3112) at this office to ensure that the proposed project would not adversely affect any Federally listed threatened or endangered species or their habitat.

Sincerely,



James F. Boggs  
Supervisor  
Louisiana Field Office

Enclosures

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

## LITERATURE CITED

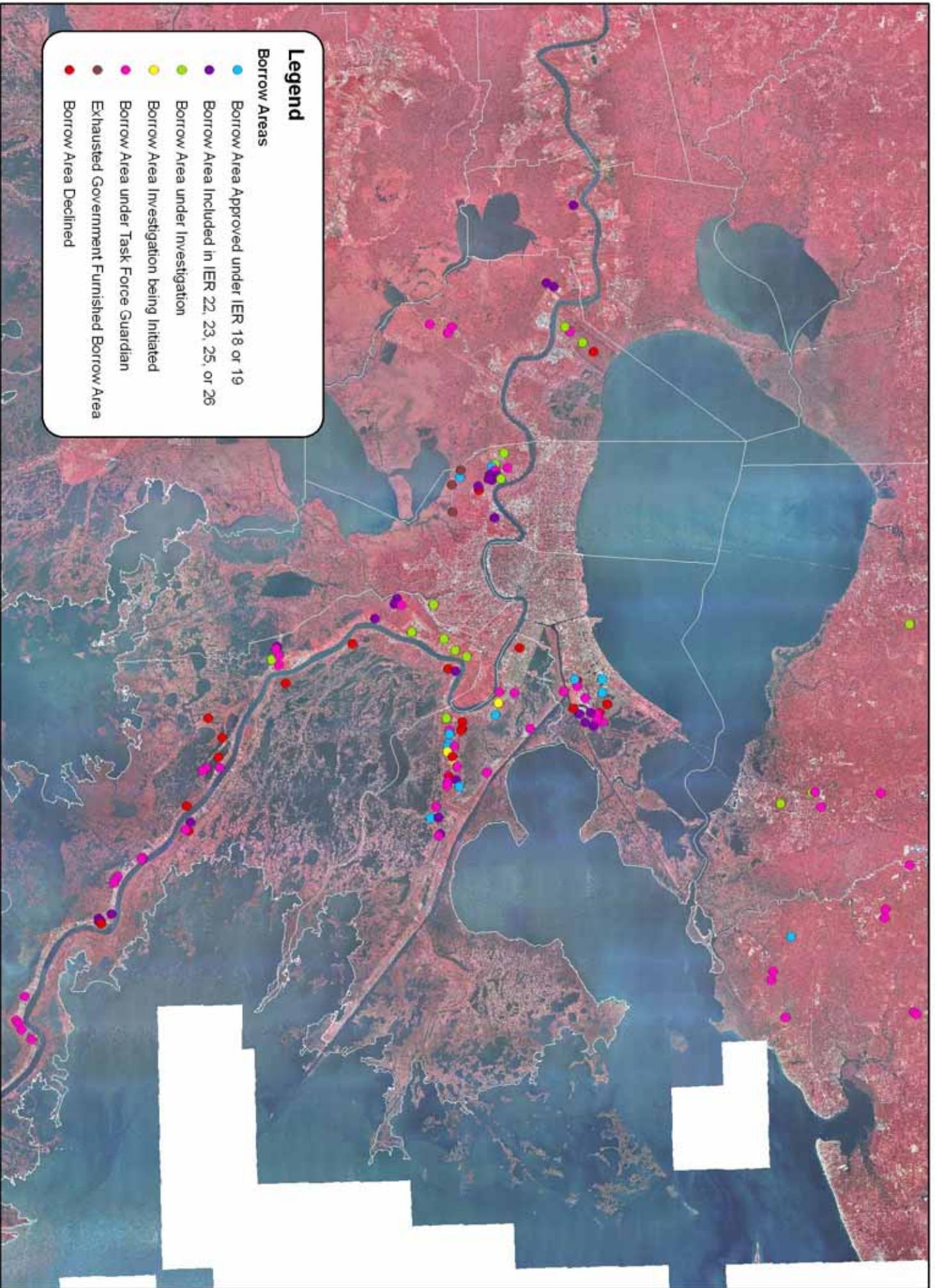
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## **Appendix E: CEMVN Borrow Area Index Map**



**Legend**

**Borrow Areas**

- Borrow Area Approved under IER 18 or 19
- Borrow Area Included in IER 22, 23, 25, or 26
- Borrow Area under Investigation
- Borrow Area Investigation being Initiated
- Borrow Area under Task Force Guardian
- Exhausted Government Furnished Borrow Area
- Borrow Area Declined

