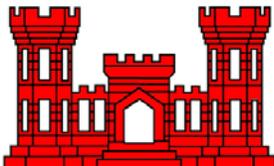


ENVIRONMENTAL ASSESSMENT

**LAROSE TO GOLDEN MEADOW  
HURRICANE PROTECTION PROJECT:**

**Larose Floodwall Repair Phase II (LGM 022B)**  
**EA #509**



**U.S. Army Corps of Engineers  
Mississippi Valley Division  
Regional Planning and Environment Division  
South**

**TABLE OF CONTENTS**

<b>SECTION</b>	<b>PAGE</b>
Introduction.....	1
Purpose & Need for the Proposed Action.....	1
Authority for the Proposed Action.....	1
Prior Reports.....	1
Public Concerns.....	3
Description of the Proposed Action.....	4
Alternatives to the Proposed Action.....	8
Environmental Setting.....	9
General.....	9
Climate.....	10
Hydrology.....	11
Geology/Soils.....	11
Hazardous, Toxic, and Radioactive Waste.....	11
Important Resources.....	11
Wetlands, Bottomland Hardwoods, & Swamp Forests.....	11
Waterbodies and Other Surface Waters.....	14
Upland Resources.....	17
Wildlife and Fisheries.....	18
Endangered or Threatened Species.....	21
Noise and Vibration.....	21
Socioeconomics.....	22
Water Quality.....	23
Cultural Resources.....	28
Environmental Justice.....	32
Recreational Resources.....	33
Aesthetics (Visual Resources).....	33
Air Quality.....	36
Cumulative Impacts.....	36
Coordination.....	38
Mitigation.....	39
Compliance with Environmental Laws & Regulations.....	41
Conclusion.....	41
Preparers.....	42
Literature Cited.....	42
<b>APPENDIXES</b>	
Figures.....	A1
Coordination Letters.....	C1

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## **INTRODUCTION**

The U.S. Army Corps of Engineers (USACE), New Orleans District (MVN), has prepared this Environmental Assessment #509 (EA #509) to evaluate the potential impacts associated with the proposed repair of the Larose Floodwall. This proposed repair would ensure continued integrity of the existing floodwall and resolve the original failure to provide for the level of protection authorized. The proposed action is located in Larose, in Lafourche Parish, Louisiana (See Figure 1 and Figure 2. All figures cited herein are contained in Appendix 1, unless otherwise indicated). EA #509 has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality's Regulations (40 CFR 1500-1508), as reflected in the USACE Engineering Regulation, ER 200-2-2.

## **PURPOSE AND NEED FOR THE PROPOSED ACTION**

The purpose of the proposed action is to correct deficiencies in the existing Gulf Intracoastal Waterway (GIWW)/Larose Floodwall and elevate the wall to authorized elevations, +10.5 feet NAVD88 (2004.65). The GIWW/Larose Floodwall is part of the 48 mile Larose to Golden Meadow Hurricane Protection Project and consists of approximately 5,000 linear feet of floodwall on the GIWW near its crossing with Bayou Lafourche in South Louisiana. The floodwall and floodgate do not prevent seepage, do not meet Corps minimum factor of safety criteria and are not at authorized design elevation. The new proposed floodwall and floodgate would provide the required factor of safety and bring this section to the authorized elevation. To maintain the existing line of protection and limit the disruption to the adjacent properties and utilities, a combo I-wall/levee section was designed for this area.

## **AUTHORITY FOR THE PROPOSED ACTION**

The proposed action was authorized by the Flood Control Act of 27 October 1965, House Document No. 184, 89th Congress (PL-89-298). The authorized project, "Grand Isle and Vicinity", was to provide flood risk reduction in accordance with the recommendation of the Chief of Engineers in his report entitled "Grand Isle and Vicinity, Louisiana" and contained in House Document No. 184, of the 89th Congress, 1st session. The project, generally referred to as the Larose to Golden Meadow Hurricane Protection Project, is to provide hurricane and storm damage risk reduction to the communities located along both banks of Bayou Lafourche between Larose and Golden Meadow.

## **PRIOR REPORTS**

Larose to Golden Meadow, Louisiana, Hurricane Protection (Formerly Grand Isle, Louisiana, and Vicinity Hurricane Protection): Environmental Impact Statement

This Environmental Impact Statement (EIS) describes the actions required to enlarge approximately 38 miles of exterior levees and to construct approximately 5 miles of new levees, together with associated borrow pits, drainage structures, and other appurtenances, to provide risk reduction from hurricane floods along both banks of Bayou Lafourche from Larose to a point 2 miles south of Golden Meadow, Louisiana. The levee system involved is commonly referred to as the LGM levee or LGM ring levee system. The project is located entirely in Lafourche Parish, Louisiana. The Statement of Findings (SOF) for the EIS was signed on April 4, 1974. This EIS and its SOF are incorporated herein by reference (USACE, 1974).

Larose to Golden Meadow, Louisiana, Hurricane Protection Project, Final Supplemental EIS

This Supplemental EIS (SEIS) was prepared to address modifications of the 1974 recommended plan described above. These modifications primarily included: realignment of Section A-East of the LGM levee to exclude 1,500 acres of wetlands from the protected side of the levee; the realignment of Section D and Section E-North of the LGM levee to incorporate two previously excluded agricultural tracts within the protected side of the levee system; the realignment of floodwalls along the GIWW near Larose, and; a minor realignment of Section E-South of the LGM levee. The revised design of the LGM levee system addressed in this SEIS was authorized and the subsequently constructed levee system followed this design, except for comparatively minor changes addressed in subsequent EAs. The Record of Decision (ROD) for the SEIS was signed on May 20, 1985. This SEIS and its ROD are incorporated herein by reference (USACE, 1985).

Environmental Assessment (EA) for the Larose to Golden Meadow, Louisiana, Hurricane Protection Project: Mitigation

This EA was prepared to address environmental impacts associated with the implementation of a mitigation plan designed to compensate for impacts resulting from the LGM Hurricane Protection Project. The EA was accompanied by a Mitigation Report describing the proposed mitigation actions (USACE, 1987). The mitigation plan was developed as a means of mitigating direct and secondary impacts to wetlands and fish and wildlife resources that would result from construction of the LGM Hurricane Protection Project, based on the modified design of this project addressed in the 1985 SEIS discussed above.

The mitigation site for the approved mitigation plan encompasses 4,598 acres within the Pointe-au-Chien Wildlife Management Area, located in Lafourche Parish, and situated about 5 miles west of the LGM levee system. Primary components of the mitigation plan included: (1) construction of a 7-mile long levee along the eastern boundary of the mitigation site, and; (2) construction of 3 low-level weirs (water control structures) along the course of the constructed levee. Anticipated benefits within the mitigation site that would be derived from the mitigation plan included such things as: reduction of salt water intrusion; stabilization of water levels and salinity concentrations; colonization of unvegetated open water areas by desirable wetland plant species; increased submergent and emergent aquatic vegetation; increased utilization of wetlands by fish and wildlife; improved habitat conditions for various wildlife species through maintaining minimum water levels during drought conditions, stabilization of water levels, and by promoting the growth of desirable food plants.

The Finding of No Significant Impact (FONSI) for the EA was signed on September 18, 1986. This EA and its FONSI (USACE, 1986), together with the cited mitigation report (USACE, 1987), are incorporated herein by reference

EA # 81 for the LGM Pumping Stations

This EA was prepared to address the site locations of seven pumping stations that are part of the LGM Hurricane Protection Project and to add additional detailed information on the subsidence-inducing impact of these pumping stations. The FONSI for the EA was signed on December 9, 1988. This EA and its FONSI are incorporated herein by reference (USACE, 1988a).

EA # 86 for the LGM Flotation Access Channel A-East

This EA was prepared to address the proposal of gaining access to an interior borrow area for the second lift of the LGM levee by using an existing canal (Texaco drill slip No.1) located just south of the southern end of the levee system. The FONSI for the EA was signed on April 24, 1989. This EA and its FONSI are incorporated herein by reference (USACE, 1989).

EA #90 for the LGM Access to Flotation Channel, B-South

This EA was prepared to address the proposal of gaining access to a borrow area by using an existing canal near the levee, placing two shell closures, and constructing protection dikes between the closures. The FONSI for the EA was signed on December 12, 1988. This EA and its FONSI are incorporated herein by reference (USACE, 1988b).

EA #137 for the LGM Breton Canal Pumping Station Relocation

This EA was prepared to address the proposal to relocate a previously identified pumping station (Pump Station #6) at Breton Canal approximately 250 feet. The FONSI for EA #137 was signed on July 11, 1991. This EA and its FONSI are incorporated herein by reference (USACE, 1991a).

EA # 157 for the LGM Section D-North Realignment

This EA was prepared to address the proposal of realigning a portion of the D-North segment of the LGM levee, changing an approximately 5-mile long stretch of the original levee alignment (i.e. the alignment design authorized in 1985) along Bayou Raphael Ridge. The revised route incorporated a filled area between Bayou Raphael and Bayou L'Ours Ridge into the protected side of the levee, excluded the LOOP Brine Storage Reservoir from protection, and minimized impacts to forested ridge land. Although overall levee construction impacts were reduced by the modified alignment (compared to the 1985 authorized alignment), mitigation for impacts not addressed in the 1986 Mitigation EA was necessary and was addressed in EA #157. The FONSI for EA#157 was signed on March 8, 1991. This EA and its FONSI are incorporated herein by reference (USACE, 1991b).

EA #360 for the Leon Theriot Floodgate Modification, Lafourche Parish, Louisiana

This EA was prepared as a modification to the 1974 Larose to Golden Meadow Hurricane Protection EIS. The USACE proposed to modify the site of the existing Leon Theriot Floodgate near Golden Meadow, and to construct an additional floodgate along with an earthen lock wall between the two floodgates, a timber pile guide wall, and the adjoining levee. The FONSI for EA #360 was signed on August 23, 2002. This EA and its FONSI are incorporated herein by reference (USACE, 2002).

EA #499 for the LOOP Floodgate Removal, Lafourche Parish, Louisiana

This EA was prepared to evaluate the potential impacts associated with the proposed removal of the existing Louisiana Off-shore Oil Port (LOOP) floodgate in conjunction with construction of a ramped access road segment to replace the floodgate. The FONSI for EA #499 was signed on February 22, 2011. This EA and its FONSI are incorporated herein by reference (USACE, 2011a).

EA #501 Larose to Golden Meadow Hurricane Protection Project: Larose Floodwall Repair

This EA was prepared to correct deficiencies in the existing GIWW/Larose Floodwall and elevate the wall to authorized elevations, +10.5 feet. The FONSI for EA #501 was signed on June 27, 2011. This EA and its FONSI are incorporated herein by reference (USACE, 2011b).

## **PUBLIC CONCERNS**

Reduction of risk from tropical and hurricane storms is of significant concern to residents and businesses in the South Lafourche Levee District (i.e. within the protected side of the LGM ring levee system). The top of the existing floodwall is below the authorized elevation and is lower than the adjacent levees. This condition means there is a higher risk of the floodgate being overtopped by an approaching hurricane storm surge.

## **DESCRIPTION OF THE PROPOSED ACTION**

The purpose of the proposed action is to correct deficiencies in the GIWW/Larose Floodwall and elevate the wall to its authorized elevation, +10.5 feet NAVD88. The GIWW/Larose Floodwall is part of the 48-mile LGM Hurricane Protection Project and consists of approximately 5,000 linear feet of floodwall. This floodwall begins near the confluence of Bayou Lafourche and the GIWW (south of the proposed action), then runs northward along the east side of the GIWW for roughly 4,475 feet. It then turns toward the southeast away from the GIWW and continues for roughly another 940 feet before it merges into the earthen LGM levee system.

The proposed action only involves that segment (reach) of the floodwall beginning at the northern terminus of the floodwall segment bordering the GIWW and extending inland from this point to where it merges with the levee. This reach includes a “gap” in the above-ground portions of the floodwall where it would otherwise cross Louisiana Highway 657. An existing floodgate (vehicle gate) attached to the floodwall at the west side of the highway is closed during potential flood events but otherwise remains open. The existing floodwall west of the highway extends above the ground surface. The majority of the existing floodwall east of the highway is largely buried, although a small stretch immediately adjacent to the highway extends above the ground surface (See Figure 1 and Figure 3)

The segment of the subject reach of floodwall beginning at the floodgate (at west side of Hwy. 657) and continuing west for approximately 150 feet presently does not meet USACE requirements to prevent under-seepage. The same is true for the floodgate. That segment of the subject reach of the floodwall extending east/northeast from Highway 657 does not meet USACE minimum factor of safety criteria and has also settled below the authorized design elevation by as much as 3 feet. The new proposed compacted fill berms, floodwall, and floodgate would provide the required factor of safety and bring the subject floodwall reach to the authorized elevation. To maintain the existing line of protection and to limit the disruption the adjacent properties and utilities, a combination sheet pile wall/levee section was designed for this area.

The proposed action would involve several main construction components, as described in the following subsections. Figure 3 illustrates existing conditions within and near the limits of the proposed action, while Figure 4 depicts key components of the proposed action (proposed conditions).

1. A new floodwall (a steel sheet pile I-wall) would be constructed along the flood side of the existing floodwall, beginning approximately 100 feet east of Highway 657 and continuing eastward approximately 450 feet until merging with the existing levee (levee Section F). The total length of new floodwall would be approximately 450 linear feet. The distance between the new floodwall and the existing floodwall (a sheet pile I-wall) would be approximately 4 feet. The top of the new floodwall would have an elevation of +10.5 feet NAVD88 (the authorized height) and the bottom of the new floodwall would have an elevation of -29.5 feet NAVD88.
2. Compacted fill berms (embankments) would be constructed adjacent to the majority of the new and existing floodwall in the subject reach on both the flood side and protected side of the floodwall. These berms would begin approximately 60 feet east of the northern end of the subject reach and would continue eastward to where the new floodwall would join the existing levee, excluding that area occupied by Highway 657. The total length of these barriers (berms) would be approximately 800 feet, while the width of the barriers would vary (see Figure 4). The top of the compacted fill would have an elevation of +7.0 feet

NAVD88 and would extend as a level surface for 10 feet on either side of the floodwall. The berms would then slope downward using varying side-slopes.

Concrete scour protection would be installed on the surface of the new berms situated along the protected side of the floodwall. Concrete scour protection would also be installed on the flood side of a short segment of the new floodwall where it ties into the levee. The scour protection would consist of a 6-inch thick layer of reinforced concrete. The flood side limits of the scour protection would terminate at approximately elevation +1 feet NAVD88. The protected side limits of the scour protection would terminate at approximately elevation +2 feet NAVD88 west of Highway 657 and elevation -1 foot NAVD88 east of Highway 657. Portions of the new berms not covered by the proposed scour protection would be protected with mulch and Bermuda grass seed.

The new earthen barriers or berms would include a clay cap to control seepage and would act as barge impact barriers and would serve to stabilize the new and existing floodwalls. The new barriers would further serve as erosion control from wave action.

3. Bracing would be installed along the existing floodwall beginning at the northern end of the subject reach (i.e. the point where the floodwall turns southward to run along the GIWW) and continuing southward for approximately 60 feet. This bracing is necessary to minimize impacts by marine traffic to the floodwall and is proposed instead of a compacted fill berm (see #2 above) to avoid interference with a private boat launch adjacent to the flood side of the floodwall. The bracing would consist of H-piles, driven to an elevation of approximately -120.0 feet NAVD88, along with horizontal beams and walers.
4. The Highway 657 floodgate (vehicle gate) would be modified in place. Approximately 50 linear feet of sheet pile would be driven across the roadway to an elevation of -29.5 feet NAVD88 and tied into the remaining sheet pile wall on either side of the roadway to prevent seepage. This new sheet pile floodwall would be incorporated into the gate monolith. Portions of the existing floodgate would need to be demolished to allow for the driving of approximately 1,920 feet of new H-piles required to resist the additional loading from restoring the wall to the authorized elevation. Upon completion of pile driving, the steel reinforcement would be epoxy anchored to the remaining existing slab. The Contractor would place the remaining steel reinforcement and erect temporary forms for the placement of approximately 82 cubic yards of concrete used in the new slab and wall section. The floodgate itself would be retrofitted with approximately 2 feet of steel plate with stiffeners affixed to the top of the floodgate in order to reach the authorized elevation (i.e. +10.5 feet NAVD88).

It is anticipated that construction of the floodgate modifications would require partial closure of Highway 657. During the course of four consecutive weekends, one lane of the highway would be closed and one lane would remain open, alternating the closed and open lanes as construction progresses. The contractor performing the construction would be required to provide appropriate traffic barriers, signs, and flagmen as required by the Louisiana Department of Transportation and Development (LaDOTD) in their traffic control devices plan (TCDP). The TCDP is developed by the Contractor and submitted to LaDOTD for review and approval at least 45 days prior to commencing construction activities. A few residences and businesses are located along the highway north of the floodgate. These residences, businesses (landowners), police and fire departments as well as LaDOTD would be notified at least 48 hours prior to initiation of construction activities that would restrict their highway access.

It may be necessary to temporarily close both lanes of the highway during the course of pile driving, steel reinforcement placement, concrete placement and roadway modifications. If

total road closure is required, this would be restricted to 7 PM to 6 AM each day, commencing Friday evening through Monday morning. Prior to total road closure, the residences, businesses (landowners), police and fire departments as well as LaDOTD would be notified at least 1 week prior to initiation of construction activities that would restrict their highway access. The Contractor would be required to maintain equipment and material adjacent to the ongoing construction activity to restore access to allow for emergency vehicles.

Other significant components of the proposed action would include the following items.

- (A). A temporary jobsite offices and equipment storage area would be established on the flood side of the existing LGM levee, just north of the Highway 657 floodgate adjacent to the east side of the highway. This office/storage area would encompass approximately 0.2 acre within the existing LGM right-of-way and would be surrounded by a temporary chain-link fence. A gravel parking area may be constructed within this area; however it is possible that the entire office/storage area could be covered with gravel for ease of construction. During project construction, this area would be used to house temporary jobsite office structures (ex. small mobile homes or similar portable buildings) and for temporary storage of equipment and materials. The construction contractor would be required to return the area to its existing conditions when construction is complete, except as noted herein.

In addition to the temporary office/storage area discussed above, construction equipment and materials may be temporarily stored within the limits of construction west of the highway on the flood side of the floodwall. Part of this area falls within new right-of-way that would be acquired for the project while the remainder would fall within a temporary construction easement acquired for the project. This area presently encompasses a private paved parking area and a private boat launch. It is estimated that the private boat launch and parking area would need to be closed for approximately 2 months during project construction. Following construction of the impact barrier adjacent to the boat launch, the affected landowner would be granted permission to access the boat launch and parking area through using Mercer Rd. Any damages to the parking area, boat launch and public roads would be repaired by the Contractor to its original condition.

- (B). Presently, sheetflow runoff from certain lands situated on the flood side of the existing floodwall flows into existing drainage ditches D1, D2, and D3 (see Figure 3) which route the flow southward. An existing underground 24-inch diameter steel pipe extends from the south end of ditch D3 to the north end of existing drainage ditch D4, and passes through the existing floodwall. The pipe is equipped with a manhole riser and gate valve situated on the protected side of the floodwall. When the valve is open, the pipe carries flow from ditch D3 into ditch D4, then ditch D4 carries the flow into an existing borrow pit canal (borrow pit B1). The valve is manually closed when a potential flood event is anticipated.

Existing drainage ditches D2, D3, and D4 would be eliminated in their present state by the proposed action, as would be the existing steel pipe. To mitigate for this, new drainage ditches A and B would be constructed (see Figure 4). Ditch A would have a bottom width of approximately 2 feet and 1:2 (vertical:horizontal) side slopes. Ditch B would have a bottom width of approximately 8 feet with variable side slopes (typically 1:5 on north side and 1:1 on south side). In addition, a new underground 24-inch diameter steel pipe, coated with coal tar epoxy paint, would be installed through the new floodwall. This pipe would extend from the south end of Ditch A to the north end of Ditch B. It would be equipped with a manhole riser and manual gate valve located on the protected side of the floodwall, similar to the existing pipe.

- (C). Various existing utilities would need to be relocated as part of the proposed action. These utilities include; One below-ground fiber optic line (no less than a day interruption to make connections during relocation), Two above-ground telephone lines, two electric power poles, and three above-ground electric power distribution lines (no anticipated interruption of service while power poles moved ). Additional utilities include one below-ground 4” waterline (few hours of interruption – unless Water District elects to bypass), gas lines (no interruption), and crude oil lines (no interruptions).
- (D). A few miscellaneous private structures (ex. storage buildings) are currently present on the flood side of the existing floodwall, and fall within the “footprint” of the proposed project. Prior to construction of the proposed action, the South Lafourche Levee District (SLLD) would notify the owners of these structures and give them an opportunity to remove these structures. If these structures were not removed by the parties responsible for their installation/construction prior to project construction, then the structures would be demolished and removed as part of the proposed action.

Construction of the new floodwall and compacted fill berms (embankments) would take place within the limits of construction depicted in Figure 4. High-voltage electrical transmission lines run along the protected side of the existing floodwall west of Highway 657 and along a small extent of the protected side of the existing floodwall situated east of the highway. Due to the close proximity of these transmission lines, cranes used to pile-drive the proposed floodwall would likely be positioned on the flood side of the existing floodwall. The construction contractor would be required to level the ground prior to using their crane to provide a stable foundation. The new sheet pile floodwall would be driven into place using a vibratory pile hammer suspended from a crane and the H-piles used to brace the existing floodwall would be driven using an impact hammer/cradle suspended from a crane. The compacted fill berms would be constructed using equipment such as bulldozers, dump trucks, and vibratory rollers.

Vibrations associated with pile driving (sheet pile floodwall installation) would be carefully monitored by the contractor. Vibrations would be limited to a peak particle velocity of 0.25 inches per second at the nearest residential structures (nearest residence is approximately 140 feet from project), 1.00 inch per second at the nearest pile-founded structure (i.e. the electric transmission line tower), and 2.00 inches per second at the existing utility crossings. Should vibrations exceed these specified limits, the operations causing the excessive vibrations would immediately be halted and actions would be taken to reduce the vibrations to acceptable limits.

The gravel access and parking area within the proposed office/storage area would be constructed using equipment such as bulldozers, dump trucks, and vibratory rollers.

Silt fences would be installed along the limits of construction or closer to the limits of areas to be filled and excavated to minimize the transport of sediments from the job site. Where the proposed compacted fill berm and proposed drainage ditch B extends into the existing borrow pit, anchored floating turbidity curtains would be installed along or near the limits of construction to minimize turbidity and the transport of sediments.

Construction of the proposed action would require approximately 14,000 cubic yards of compacted fill and approximately 4,000 cubic yards of un-compacted fill. Fill would be obtained from contractor-furnished commercially approved sources located outside the LGM levee system. The fill would be transported to the project site by various existing roadways including Highway 657 and East Main Street in Larose. The fill source (borrow site) utilized by the construction contractor would have to demonstrate compliance with the National Environmental Policy Act (NEPA) prior to the contractor’s use of the borrow site.

Construction of the proposed action would require approximately 650 cubic yards of concrete, and approximately 72 cubic yards of gravel (aggregate). The gravel and concrete aggregate would be obtained from duly licensed quarries and processing facilities. Construction would also involve excavating approximately 900 cubic yards of soil/earth at the project site. Excavated material would be re-used as un-compacted fill or structural backfill if the materials meet the requirements of the specifications. All unsuitable material would become the property of the Contractor and would be hauled to an appropriate offsite disposal facility.

It is estimated that the total duration of project construction activities would be approximately 8 months. Near the close of the project, the temporary buildings used in the office/staging area parcel would be removed as would be the fencing surrounding this area. The gravel road, gravel parking area, and geotextile fabric installed beneath these areas would be removed and the areas disturbed by these features would also be restored to preconstruction conditions.

The total area encompassed within the proposed project limits of construction would be approximately 8 acres. The composition of this total area would be as follows (all acreages are approximate):

- Existing LGM right-of-way = 6.10 acres.
- New additional LGM right-of-way to be acquired = 0.95 acres.
- Temporary construction easements (areas outside existing and new additional LGM right-of-way) = 0.95 acres

### **ALTERNATIVES TO THE PROPOSED ACTION**

Three alternatives to the proposed actions were considered. These alternatives were: No-action alternative; Utilization of In-Situ Soil Mixing to reduce sheet pile length similar to the preferred alternative; and construction of a Combination-Wall.

#### Alternative 1: No Action

Congress directed the Corps to evaluate the structures in the LGM Hurricane Protection Project and determine which ones needed to be repaired or replaced. The Corps identified four structures (Crawfish Farms Pumping Station I-Wall, Golden Meadow Pumping Station I-Wall, Louisiana Offshore Port (LOOP) Flood Gate, and the GIWW/Larose Floodwall) that needed to be replaced or modified. These walls were identified based on the fact that they did not meet the Corps guidelines for factor of safety or the structures were not at the Authorized Elevation. The modifications are not permanent solutions, these are remedial measure projects that are being constructed to provide the authorized level of risk reduction until the Corps can finalize a Post Authorization Change Report (future decision documents) so the Corps can make a final determination of appropriate system elevation utilizing current Hurricane Storm Damage Risk Reduction Design Criteria. A Draft Report is scheduled to be completed in 2015. All of the current efforts would be incorporated into the final designs. The Crawfish Farms Pumping Station I-Wall was replaced in June 2010 and Golden Meadow Pumping Station Floodwall and the LOOP Access Ramp were completed in September 2011. The GIWW/Larose Floodwall is part of the 48 mile LGM Hurricane Protection Project and consists of approximately 5,000 linear feet of floodwall on the GIWW near its crossing with Bayou Lafourche in South Louisiana. The southwestern 1,400 linear feet of the project has a top elevation ranging from 7.5 feet NGVD88 (2004.65) to 8.1 feet NGVD88 (2004.65) with the first 500 feet of sheet pile wall having a tip elevation at -5.5 feet NGVD88 (2004.65) and the next 900 feet at -13.5 feet NGVD88 (2004.65). The entire GIWW/Larose Floodwall is below authorized grade. The southwestern 1,400 linear feet of the 5,000 foot floodwall does not meet the current Corps' Factor of Safety. Therefore, the

no action alternative is not acceptable because the Corps, non-Federal sponsors, and Congress would not accept the no action alternative as viable as long as these conditions exist. The permanent solution would be addressed in the Post Authorization Change Report.

#### Alternative 2: In-Situ Soil Mixing

Under this alternative, in-situ soil mixing would offer the project the opportunity to replace expensive subsurface steel sheet pile with an approximate 3-foot-thick soil/cement mix wall with equivalent seepage cutoff properties. Under this alternative, a soil-mix cutoff wall would be constructed to an elevation of about -29.5 feet to provide seepage cutoff below-ground surface and the embedded steel sheet pile would stick up above ground. The steel sheet pile would be embedded into the top of the soil mix wall during construction and prior to the mix setting up shown in Figure 6. Because the proposed construction is located along a navigable waterway (Gulf Intracoastal Waterway), protection from impact for the wall is required for all new construction. Therefore, a berm constructed of compacted fill would be included in the project. The soil mix method creates spoil material (when the reagent binder is injected in slurry form) consisting of a mix of soil and slurry binder. The spoil material byproduct would need to be disposed of by the Contractor in an appropriate landfill. The contractor would need to mix the soil, place sheet pile prior to the soil cement mix setting up, support sheet pile while soil cement cures and remove supports after desired strength is gained making this a very hard job to construct in this area. This alternative is considered an interim repair and could not be utilized in the final project design. This alternative would involve mobilizing a temporary cement batch plant and a soil mixing rig to the construction site. Figure 7 shows the typical soil mixing rig and a cement batch plant. For the limited area requiring coverage this would be a very expensive solution, because the equipment and manpower are not readily available in state. Due to difficulties in construction and the expense of the alternative combined with the interim nature of the repair, this alternative was not considered further.

#### Alternative 3: Driving a New Sheet Pile I-Wall

Under this alternative, a new sheet pile I-Wall would be constructed 4 feet to the flood side of the existing wall. Under this alternative, the sheet I-Wall would be constructed of a minimum PZ-27 sheet pile driven to the appropriate depth for seepage and stability with a flood side impact berm. A geotechnical analysis was performed and the results of this analysis determined that a minimum tip penetration to - 29.0 feet is needed for seepage and stability. These requirements match what is currently in place with the exception of the impact berm for the majority of the project. In the areas not meeting requirements, a traditional sheet pile I-wall would be required. In the areas not requiring new sheet pile, a wall extension would be used to restore elevation. This alternative was chosen for part of the wall; but not selected for the portion of the wall where it was unknown if it had been cold formed or the depth of the sheet pile.

## **ENVIRONMENTAL SETTING**

### **GENERAL**

The project area is situated in southern Lafourche Parish, in Larose along the Larose to Golden Meadow Hurricane Protection Levee (the LGM levee). The project area is located within the Mississippi River Deltaic Plain of the Lower Mississippi River Ecosystem. Higher elevations occur on the natural levees of Bayou Lafourche and its distributaries. Developed lands are primarily associated with natural levees, but extensive wetlands have been leveed and drained to accommodate agricultural, residential, and commercial development. Bayou Lafourche is a prominent landscape feature west of the project area while extensive oil and gas industry access channels and pipeline canals are prominent landscape features crossing the

extensive wetlands and shallow open waters east of the project area. The specific project area would begin approximately 4,400 feet north of where the GIWW intersects Bayou Lafourche and would end about 500 feet north of the vehicle gate that crosses LA HWY 657. Resources in the immediate project vicinity include previously cleared and disturbed uplands, fringe wetland marshes, a small disturbed wetland area, residential housing, local streets and the GIWW. The fringe intermediate marsh is composed primarily of *Phragmites australis*, *Rubus spp.*, *Galium spp.*, *Spartina spp.*, *Sagittaria spp.* and *Bidens alba*. The small wetland area consists primarily of a *Salix nigra* (Black Willow) and *Sapium sebiferum* (Chinese Tallow) over story. The upland area consists primarily of manicured lawn with a *Quercus virginiana* and *Pinus sp.* over story.

## CLIMATE

The climate along the Louisiana coast is subtropical, with long, hot summers and brief, mild winters. Winds during the summer are generally from the south, bringing warm, moist air from the Gulf of Mexico, which can produce periods of intense rainfall associated with thunderstorms. The typical growing season lasts 317 days and average rainfall at Houma is approximately 62 inches per year (Muller and Fielding, 1987; Sevier, 1990). During the winter, the area experiences alternating cold and warm air as continental fronts pass through from the northwest. Snow is very infrequent. Hurricanes and tropical storms can occur in Louisiana from June through November, but are most likely to occur in July and September (Muller and Fielding 1987). These storms can bring periods of intense rainfall and wind accompanied by storm surges from the Gulf of Mexico.

Although it is assumed that storms with higher wind speeds produce more damage, Hurricane Juan (1985), which was only a Category 1 storm, produced significant damage from tidal flooding. These storms can also produce large amounts of rain in a given location, with 10 inches to 12 inches not unusual. From 1870 to 1989, 43 hurricanes and 56 tropical storms have struck Louisiana (Roth, 1998). Tropical storms occur with a frequency of approximately one storm every 1.6 years and hurricanes occur once every 4.1 years within a 75 mile radius of New Orleans (U.S. National Hurricane Center, 1995). Louisiana has seen 25 hurricanes from 1899-1992 (Neumann et al., 1993). The most recent storms of note within the study area were Hurricanes Katrina and Rita, which struck in late 2005, and Hurricane Gustav in September 2008. Two weeks later, Hurricane Ike made landfall in Texas over 300 miles away, but locally the storm surge caused almost as much damage as Gustav 10 days prior.

## HYDROLOGY

The surface hydrology of the general region is dominated by Bayou Lafourche, which bisects the overall LGM ring levee system, as well as man-made drainage systems on both sides of the Bayou and the wetland complexes of the Barataria and Terrebonne Basins. The GIWW is the other significant waterway in the area which is immediately adjacent to and included within the limits of construction. Flows are sluggish due to the low elevations, small drainage basin, and surface alterations. Runoff generally flows in a north-to-south direction. A number of straight man-made waterways have facilitated the drainage of fresh water from the surrounding wetlands, resulting in removal of detritus material which forms the base for marsh growth. In addition, these waterways facilitate the intrusion of salt water from the Gulf of Mexico.

## **GEOLOGY/SOILS**

The upper limit of the water table is typically at or within a foot or two of the ground surface. Ground water in the area is saline as a result of salt water recharge in areas offshore where the aquifers outcrop; and because sufficient fresh water recharge is not available to flush the salt water. The area soils are typically river-deposited clays, silts, and sands near the bayous which once functioned as distributaries to Bayou Lafourche. These riverine soils transition to soft, highly organic soils in the adjacent wetlands. The dominant soil underlying the immediate project site area is the Lafitte-Clovelly Association. This association of two soil types has a profile comprised by surface layers of very poorly drained, semifluid, organic soils (muck) with underlying layers of moderately alkaline, semifluid clay (USDA Soil Conservation Service, 1984).

## **HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE**

A Phase I Environmental Site Assessment (ESA) for the Southeast Louisiana Urban Flood Control project entitled “Larose to Golden Meadow, Reach 022B, Gulf Intracoastal Water Way Floodwall, Larose, Lafourche Parish, Louisiana” was prepared by USACE-MVN personnel on 24 April 2012. The Assessment Team performed a Phase I Environmental Site Assessment of the subject site, in Lafourche Parish, Louisiana, in conformance with the scope and limitations of ASTM E 1527. This assessment revealed that petroleum pipelines were crossing either beneath or within very close proximity to the proposed Larose to Golden Meadow, Reach 022B project site. The pipelines are considered to be potential recognized environmental conditions (RECs) that could affect the proposed project on or near the project site; therefore, extreme caution shall be taken to prevent damage to or breakage of the pipelines during construction of the project.

On 29 June 2012 personnel from USACE-MVN made an additional inspection of the project area and a new database search to update the findings of the original Environmental Site Assessment. No information was revealed that would change the conclusion of the April 2012 report.

## **IMPORTANT RESOURCES**

This section contains a description of important resources and the impacts of the proposed action on these resources. The important resources described in this section are those recognized by: laws, executive orders, regulations, and other standards of national, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public

## **WETLANDS, BOTTOMLAND HARDWOODS, AND SWAMP FORESTS**

### Existing Conditions

Wetlands are institutionally important because of: the Clean Water Act of 1977, as amended; Executive Order 11990 of 1977, Protection of Wetlands; Coastal Zone Management Act of 1972, as amended; and the Estuary Protection Act of 1968. Wetlands are technically important because: they provide necessary habitat for various species of plants, fish, and wildlife; they serve as ground water recharge areas; they provide storage areas for storm and flood waters; they serve as natural water filtration areas; they provide protection from wave action, erosion, and storm damage; and they provide various consumptive and nonconsumptive recreational opportunities. Wetlands are publicly important because of the high value the public places on the functions and values that wetlands provide.

Within the general vicinity of the project area, extensive wetlands occur on the flood side of the LGM levee system. The greatest wetland acreage primarily consists of marshes classified as fresh or intermediate marshes. These marshes are primarily dominated by an array of herbaceous species, and some marshes of the “flotant” type where plants and their associated root mass rest on highly fluid muck or other highly organic sediments. Other wetland habitats include forested swamps (cypress-tupelo association) and wet bottomland hardwood (BLH-wet) forests. Several man-made open water features are present within the natural wetlands (ex. canals, borrow pits, GIWW, etc.) and a few natural, shallow open water areas also occur. A large open water feature known as Delta Farms occurs north of the project site. This feature was formed via subsidence of former agricultural fields that were once enclosed by levees and drained via pumps. The man-made open water features allow movement of water from the interdistributary basin into the surrounding marshes. These features also function as conduits of saltwater intrusion during storm events.

Some scattered, isolated wetland habitats presently remain on the protected side of the LGM levee system in the general vicinity of the proposed project. Functional values of these wetlands have been reduced due to isolation, modifications resulting from ditching, forced drainage (pumping), and other disturbances such as grazing, agricultural conversion, other development activities, and subsidence. Very few marshes remain and those that do remain have all been altered by man-made modifications to the landscape. A few of the wetter areas are still dominated by herbaceous species relatively typical of fresh and intermediate marshes present on the flood side of the LGM levee. However, as the isolated marshes have become dryer over time, many have been colonized by woody species and transitional herbaceous species. Some have been cleared or drained and have been colonized by various graminoids and forbs, including domesticated grasses. The habitats present in several of the remnant protected side “marsh” habitats can now be considered as scrub-shrub wetlands or wet pasture/wet prairie wetlands. Some fringe marsh habitats have developed along the shorelines of excavated borrow pits and canals (e.g. vegetated areas within the littoral zones and shorelines of these open water features, with array of herbaceous species and few small woody species). Few, if any, swamp habitats remain in the general vicinity of the proposed project. There are scattered areas of BLH-Wet habitats remaining. Many of the former BLH-Wet habitats no longer classify as wetlands due to the effects of forced drainage and hydraulic isolation (e.g. are now BLH-Dry habitats). Those that do still retain wetland hydrology have been adversely affected by factors such as hydroperiod degradation, hydraulic isolation, colonization by invasive (exotic) plants, grazing, vegetation clearing/thinning, and other anthropogenic alterations.

There is one jurisdictional wetland located within the limits of construction (i.e. the “footprint”) of the proposed action. This wetland (see wetland W1 in Figure 3) encompasses approximately 0.35 acre on the protected side of the existing floodwall/levee system. It has been heavily disturbed by past clearing and topographic alterations, along with hydrologic disturbances resulting from the effects of an adjacent drainage ditch (ditch D4), isolation from historic wetlands, and pumping. Overall, this wetland can be classified as BLH-Wet habitat. Dominant canopy species include black willow (*Salix nigra*) and Chinese tallow (*Sapium sebiferum*, or *Triadica sebifera*). Insubstantial portions of the wetland lean toward classification as scrub-shrub, but these areas compose a small percentage of the 0.35 acre wetland area.

#### Future Conditions with No Action

The 1985 LGM SEIS (USACE, 1985), the 1986 LGM Mitigation EA (USACE, 1986), and EA #157 (USACE, 1991b) provide detailed discussions of anticipated future conditions in the general project study area as regards to wetland and forest resources. Key conclusions presented in these documents are addressed below.

On the flood side of the LGM levee, the existing wetlands areas are eroding at a significant rate primarily as a result of saltwater intrusion and subsidence. As salinity levels gradually increase, the freshwater plant species die and the wetlands gradually convert to open water areas as tidal action and storm surges wash away the underlying organic soils. Rising sea levels further accelerate this process. It is anticipated that the existing fresh/intermediate wetlands would become more saline over time and may disappear altogether with the affected areas converting to open water. Wet bottomland hardwood forests are anticipated to be lost at a rate of approximately 1.5% per year while swamp forests are anticipated to be lost at a rate of approximately 3.9% per year.

On the protected side of the LGM levee, marshes and forested wetlands (swamp and BLH-Wet wetlands) have been adversely impacted by the direct and indirect effects of construction of the levee itself. The indirect impacts result from the enclosure of these habitats within the levee system and subsequent elimination of these habitats by pump drainage and land use conversion. By the approximate year 2100, it is anticipated that all the enclosed natural marshes and the vast majority of forested wetlands not directly eliminated by levee construction would be completely lost. This would result from the combined effects of disruption of historic hydrologic flow patterns, forced drainage, and conversion to pasture, residential, and/or commercial land uses (USACE, 1985). Those few areas of BLH-Wet and swamp habitats remaining would retain substantially lower functional values compared to those present prior to construction of the LGM levee system.

Without implementation of the proposed action, impacts to waters of the U.S. would be avoided. Other wetlands located outside of the limits of construction would likely remain much as they are today or degrade due to factors referenced above but not attributed to the proposed action.

Without implementation of the proposed action, there would be no direct project impacts to the wetland area identified as W1 in the immediate future. It is likely, however, that the wetland's functions and values would continue to degrade over time due to the factors discussed above as well as other factors such as further infestations of Chinese tallow and other invasive plants, and periodic vegetation trimming/clearing beneath existing electric distribution lines that pass over the southern portion of the wetland.

A Post-Authorization Change (PAC) study is presently underway for the entire LGM levee system. This study, including an associated Supplemental EIS, is investigating various alternatives for making improvements to the system. Although a Tentatively Selected Plan (TSP; preferred alternative) has not yet been identified, the TSP is likely to propose activities that would eliminate some or all of wetland W1. Assuming this is the case, and the TSP is eventually authorized and funded, then some if not all of wetland W1 could be destroyed in the relatively near future as a result of these future levee system improvements.

#### Future Conditions with the Proposed Action

All of wetland W1 would be eliminated (filled) as a result of the proposed action, resulting in the loss of 0.35 acre of degraded BLH-Wet habitat. Implementation of the proposed action would not result in any secondary or indirect impacts to other nearby wetlands or forests.

Average Annual Habitat Units (AAHUs) are employed as the means of quantifying a proposed project's impacts to fish and wildlife resources, including wetlands, and as the means of quantifying the mitigation required to compensate for these impacts. The change (increase or decrease) in AAHUs for the "future with project" scenario, as compared to the "future without project" conditions, provides a measure of anticipated impacts. A net loss of AAHUs indicates the proposed project would adversely impact fish and wildlife resources, thus requiring

mitigation to compensate for this loss. The mitigation must provide an increase in AAHUs at the mitigation site that is at least equal to the AAHUs that would be lost through implementation of the proposed action.

The computation of AAHUs is fairly complex. Wetland Value Assessment (WVA) models are first used to calculate a Habitat Suitability Index (HSI) that represents the overall functional value of the affected habitat at a given time, with 0 indicating no value and 1 indicating the top or highest value. Multiplying the HSI value by the number of acres analyzed produces Habitat Units (HUs); the basic units for measuring project effects on fish and wildlife habitat. The HUs are then annualized over the period of analysis (50 years for the proposed action) to yield AAHUs.

The bottomland hardwoods WVA model was run for the proposed impact to wetland W1. This model predicted that the impact would result in the net loss of 0.13 AAHUs.

## **WATERBODIES AND OTHER SURFACE WATERS**

### Existing Conditions

Waterbodies and other surface waters (OSWs) are institutionally important because of the Clean Water Act of 1977, as amended, and the Coastal Zone Management Act of 1972, as amended. Waterbodies are technically important because: they provide necessary habitat for various species of fish and wildlife; they provide storage areas for storm and flood waters; and they provide various consumptive and nonconsumptive recreational opportunities. These resources are publicly important because of the high value the public places on the functions and values that waterbodies provide as well as the recognized need for water quality protection.

As mentioned, several man-made waterbodies and OSWs (ex. canals, ditches, etc.) and a few natural waterbodies occur in the general vicinity of the project site on the flood side of the LGM levee system. Salinity concentrations in these features are highly variable depending on the location, although many can be viewed as intermediate. Salinity levels are rising due to the effects of salt water intrusion and sea level rise. Many of the open-water areas found in the general project area support a variety of recreationally and commercially important wildlife and fishery species.

There are currently six features that classify as jurisdictional other surface waters of the United States present within or partially within the limits of construction associated with the proposed project. These include five man-made drainage ditches and one man-made borrow pit. General information concerning these features is provided in the table below (see Figure 3 for illustration).

<b>Feature ID Code</b>	<b>Type of Feature</b>	<b>Acres within Limits of Construction (LOC)</b>	<b>Comments</b>
D1*	Drainage ditch	< 0.01	Ditch continues northward beyond the LOC. Flow is to south. Connects to D2 via culvert.
D2*	Drainage ditch	0.03	Flow is to south. Connects to D3 via culvert.

*Larose to Golden Meadow Hurricane Protection Project:  
Larose Floodwall Repair Phase II*

<b>Feature ID Code</b>	<b>Type of Feature</b>	<b>Acres within Limits of Construction (LOC)</b>	<b>Comments</b>
D3*	Drainage ditch	0.02	Flow is to south. Connects to D4 via culvert. Culverts beneath Hwy 657 carry runoff flow from limited areas on west side of highway into D3.
D4	Drainage ditch	0.11	Flow is to east/northeast with outfall into B1. Culvert beneath Hwy 657 carries runoff flow from limited area on west side of highway into D4.
D5	Drainage ditch	<0.01	Ditch continues southward beyond the LOC. Flow is to north. Connects to D4 via culvert beneath Hwy 657.
B1	Borrow pit (waterbody)	0.69	Pit excavated for construction of levee system. Continues north beyond the LOC.

\* Indicates feature is on flood side of LGM levee system. All other features are on protected side.

All of the drainage ditches are shallow, dominated by an array of graminoids and forbs, and the majority can be dry for extended periods of time. Unlike the other ditches, ditch D4 tends to retain some standing water given its bottom elevation and direct hydraulic connection to borrow pit B1. As previously discussed, the underground culvert (a 24-inch diameter steel pipe) connecting ditches D3 and D4 passes through the existing floodwall and is equipped with a manhole riser and manual gate valve situated on the protected side of the levee. The gate valve is closed when there is a potential for storm events that may induce flooding, but is left open otherwise.

Borrow pit B1, which resembles a large canal immediately adjacent to the protected side of the LGM levee, encompasses a total of approximately 63 acres. Of this total area, only 0.69 acres at the southern end of the borrow pit are situated within the limits of construction (LOC) associated with the proposed project. The limits of this waterbody include patches of emergent fresh marsh vegetation that have developed in various locations within the borrow pit's littoral zone (i.e. along shoreline and littoral shelf of pit). Examples of plant species present in these "fringe marsh" areas include common reed (*Phragmites australis*), blackberry and dewberry (*Rubus* spp.), *Galium* spp., cordgrass (*Spartina* spp.), *Sagittaria* spp., and Spanish needles (*Bidens alba*). The borrow pit is up to 20 feet deep in places. Lands bordering this feature tend to drain directly into the borrow pit waterbody; hence it provides some storage capacity for this drainage. One of the LGM pump stations, pump station #7, is situated on the banks of the pit and pumps water from in the pit into waterbodies and wetlands situated on the flood side of the LGM levee when necessary to reduce flooding risks.

Another man-made waterbody, in addition to those mentioned above, is located within the LOC of the proposed project. This is a small pond (pond P1; see Figure 3) situated on the flood side of the existing floodwall. The pond encompasses approximately 0.09 acre and does not classify as jurisdictional Waters of the United States since it was excavated from uplands and does not have a direct hydraulic connection to any jurisdictional wetlands or OSWs. Pond P1 is relatively shallow and can be completely dry at times. Very little vegetation occurs within the pond, although some emergent herbaceous species can be found along the pond's shoreline. Presently the pond contributes to seepage problems beneath the existing Larose floodwall.

### Future Conditions with No Action

Under the no action alternative, there might not be any direct or indirect impacts to drainage ditches D1 through D5 or to borrow pit B1 since the proposed action would not be constructed. The aforementioned LGM PAC study could recommend a TSP that may include direct impacts to one or more of the ditches and/or borrow pit B1. Such impacts could include filling or reconfiguration of the drainage ditches as well as filling and/or expansion (excavation) of portions of the borrow pit. It is emphasized, however, that a TSP has not been selected and it is not known at this stage whether the ultimate TSP would be authorized and funded.

Most of drainage ditch D1 and ditch D5 are located on private lands situated outside the existing right-of-way for the LGM levee system. Given this, it is difficult to anticipate what future actions may affect the portions of these ditches located on private lands. They could remain much as they are now, could be reconfigured, could be expanded, or could be partially or completely eliminated. All of pond P1 is presently located on private land. In the future, the land owner could elect to leave the pond in its current state, could fill the pond completely, or could alter the existing pond through actions such as excavation.

It is anticipated that the extent of open-water areas (waterbodies, OSWs) in undeveloped areas situated on the flood side of the LGM levee system would increase significantly over time as the existing marshes are converted to open water areas due to the combined effects of land subsidence, erosion, saltwater intrusion, and sea level rise. In addition, salinity levels in the open-water areas would continue to increase.

### Future Conditions with the Proposed Action

Construction of the proposed action would not affect ditches D1 and D5, but would eliminate ditches D2, D3, and D4 as they exist today. These direct impacts would total approximately 0.16 acre. These impacts would be mitigated through the proposed construction of replacement drainage ditches "A" and "B" (see Figure 3). Ditch A would have a bottom width of approximately 2 feet, 1:2 (vertical:horizontal) side slopes, and would encompass approximately 0.06 acre. Ditch B would have a bottom width of approximately 8 feet with variable side slopes (typically 1:5 on north side and 1:1 on south side) and would encompass approximately 0.15 acre. In addition, a new underground 24-inch diameter steel pipe, coated with coal tar epoxy paint, would be installed through the new floodwall. This pipe would extend from the south end of Ditch A to the north end of Ditch B. It would be equipped with a manhole riser and manual gate valve located on the protected side of the floodwall, similar to the existing pipe that connects existing ditches D3 and D4.

The proposed action would directly impact approximately 0.69 acres within borrow pit B1, as illustrated in Figure 3. This impact would include: filling 0.67 acres of the pit through placement of the new embankment along the flood side of the proposed floodwall, and excavating less than 0.02 acres of the pit during construction of proposed drainage ditch B. The affected area primarily consists of open water habitat, although limited patches of emergent vegetation (wetland grasses, sedges, rushes) also occur along the shoreline of the portion of the borrow pit that would be directly impacted.

Elevated turbidity levels in borrow pit B1 would result from the proposed construction within and immediately adjacent to the pit, thereby causing temporary water quality impacts on the aquatic environment through reduced light penetration and the resulting decrease in photosynthetic capabilities, and reductions in dissolved oxygen concentrations. Since this waterbody is relatively quiescent, turbidity impacts would be expected to be spatially limited. Turbidity would return to background conditions following completion of project construction. Suspended particulate and turbidity increases in the borrow pit would be minimized through the

installation of anchored turbidity curtains in the pit and through installation silt fences along portions of the pit's shoreline.

One should note that the limits of the proposed floodwall embankment that would encroach into the borrow pit as shown in Figure 3 (e.g. the portion of the pit to be filled) include areas that would remain inundated by standing water upon project completion. It is anticipated that herbaceous marsh species would colonize areas along the modified littoral zone created by fill deposition within roughly 1 to 4 years of construction completion, thereby minimizing the loss of existing "fringe marsh" habitats within the affected portion of the pit. Given the limited area directly impacted by fill, the proposed action would not significantly affect the existing stormwater storage capacity of borrow pit B1.

All of pond P1 (0.09 acre) would be eliminated by the proposed action via placement of fill for the proposed new floodwall embankment along the flood side of the floodwall (see Figure 3). Filling of the entire pond is necessary to help curtail existing seepage problems. This pond provides practically no habitat functions and values, thus the loss of this pond would result in no significant impacts to the local ecosystem.

## **UPLAND RESOURCES**

### Existing Conditions

Upland areas within the limits of construction associated with the proposed project encompass a total of approximately 6.7 acres. The upland areas exclude existing drainage ditches, pond P1, borrow pit B1, and wetland W1 (see Figure 3). All of the uplands have been previously cleared and disturbed, and are actively maintained. Existing land uses in these upland areas include: portions existing LGM floodwall and levee system; residential (portions of residential lots); agricultural pasture; electrical transmission and distribution power line easements; commercial facilities (portions of private boat launch and parking lot, storage buildings, open space, etc.); portion of Highway 657. Vegetation remaining in this upland area mainly consists of domesticated and native grass species, although a few scattered trees and brush (shrubs, other woody species) are also present.

Practically no unaltered native upland habitats remain in the immediate vicinity of the proposed project. The lands in this area are largely developed and given to a wide array of uses including agricultural, residential, commercial, and residential uses. A few isolated bands and patches of dry bottomland hardwoods (BLH-Dry), and even fewer isolated clusters of BLH-Wet habitats remain within parcels situated south and east of the project site.

### Future Conditions with No Action

Under the no action scenario, it is likely most of the upland areas within the existing LGM right-of-way would remain similar to their current state barring failure of the floodwall/levee system. It is difficult to anticipate future conditions in uplands presently located outside the existing LGM right-of-way but within the project limits of construction. Uplands in these areas that are situated south of the existing floodwall and west of Highway 657 would likely remain as they are today since these uplands are located within a major electrical transmission line easement. Uplands in these areas situated north of the existing floodwall and west of the highway could remain similar to existing conditions or could be significantly altered by the current or future landowner, although it is likely the land use would remain commercial.

Uplands in the immediate vicinity would likely be subject to more intense development with the passage of time. For example, existing agricultural fields could be converted to residential or commercial development. However, such potential changes in land use are highly speculative and would be dependent on array of factors, particularly economic factors.

#### Future Conditions with the Proposed Action

Construction of the proposed action would disturb the majority of the 6.7 acres of uplands located within the project's limits of construction (see Figure 5). Areas where additional embankment (compacted fill) is proposed would be permanently altered. Most of the affected area is presently covered by maintained grasses and this would be the case following completion of the proposed action except in locations where concrete scour protection is proposed on top of the embankment. A limited portion of the area that would be impacted by new embankment is presently paved, thus this area would change to be maintained grass cover. Uplands in the proposed office/storage area would only be temporarily impacted, and would be restored to existing conditions (maintained grass cover) following completion of construction. Uplands in the area north of the existing floodwall, west of Highway 657, and north of the proposed future LGM right-of-way would also be subject to temporary impacts. Minor disturbances would occur in this area from its temporary use by project construction equipment. This affected area would also be restored to existing conditions (largely paved parking area and roadway) following completion of project construction.

Future conditions in uplands in the immediate vicinity of the proposed action would not be affected by the proposed action.

## **WILDLIFE AND FISHERIES**

### Existing Conditions

These resources are institutionally important because of the Fish and Wildlife Coordination Act of 1958, as amended, and the Migratory Bird Treaty Act of 1918. Wildlife resources are technically important because: they are a critical element of many valuable aquatic and terrestrial habitats; they are an indicator of the health of various aquatic and terrestrial habitats; and many species are important commercial resources. Fisheries resources are technically important because: they are a crucial element of many valuable freshwater and marine habitats; they are an indicator of the health of various freshwater and marine habitats; and many species are important commercial resources. Wildlife and fisheries resources are publicly important because of the high priority that the public places on their aesthetic, recreational, and commercial value.

In the general study area, the fresh/intermediate marshes may be utilized by various migratory waterfowl (mallards, blue-winged teal, gadwalls, pintails, common moorhen, etc.) and other water birds such as egrets, herons, ibis, bitterns, and snipes. Animal species include white-tailed deer, swamp rabbit, nutria, otter, raccoon, mink, alligators, crawfish, snails, turtles, snakes, and amphibians. Small fish species such as mosquitofish and killifishes may be present when the marshes are inundated. Deeper open water areas can harbor small fishes as well as species like largemouth bass, channel catfish, longnose gar, and threadfin shad.

Forested communities in the general area provide habitat for an array of both resident and migrating birds such as thrushes, warblers, vireos, tanagers, woodpeckers, owls, hawks, and wading birds. Relatively common animal species include deer, raccoons, armadillos, squirrels,

foxes, opossums, bobcats, mice, rabbits, turtles, snakes, and tree frogs. When inundated for prolonged periods, the swamp forests can be utilized by small fish species typically found in adjacent marshes.

Agricultural pasture lands and transitional marsh areas are utilized by a variety of seed-eating and insectivorous birds (mourning dove, eastern meadowlark, cattle egret, eastern bluebird, etc.) as well as by other birds such as red-tailed hawk, barn owl, and American kestrel. Examples of animal species occasionally utilizing these habitats include deer, armadillo, opossum, and small rodents.

Existing conditions within the limits of construction (LOC) associated with the proposed project are such that wildlife utilization of the habitats present is limited. Species such as deer, bobcat, raccoon, and armadillo may occasionally frequent the area. Wading birds such as egrets and herons may forage along the shorelines of the borrow pit and in ditch D4. Various common songbirds may frequent wetland W1 and the shoreline of the borrow pit, hawks and owls may forage in open grassy areas, and ospreys may hunt prey in portions of the borrow pit. Various reptiles and amphibians may utilize upland, wetland, and open water habitats. Fishes such as bass and catfish reside in the borrow pit, while smaller fish species such as mosquitofish may utilize ditch D4 when it is inundated.

With the possible exception of a few rodents and snakes, it is doubtful that any wildlife reside in the upland habitats within the proposed LOC. A few amphibians and reptiles may reside within wetland W1, while various fish, amphibians, and turtles likely reside within the borrow pit. It is noted that no bird nests were observed within the LOC.

#### Future Conditions with No Action

Under the no action alternative, there would be no direct or indirect impacts to wildlife and fisheries since the proposed action would not be constructed. Wildlife utilization of upland and wetland habitats within the LOC of the proposed action would remain low. Utilization of the borrow pit open water habitat by birds, mammals, fish, amphibians, and reptiles would likely remain similar to existing conditions.

As previously discussed, it is anticipated that marsh habitats in the general vicinity of the proposed action and situated on the flood side of the levee system would gradually become more saline over time and extensive areas would eventually be converted to open water. The extent of swamp and BLH-Wet habitats in such areas would also gradually decrease over time, with swamp habitats transitioning to marsh habitats and BLH-Wet habitats transitioning to swamp habitats. These long-term changes would have significant effects on wildlife and fisheries.

Upland and remnant wetland habitats in the general vicinity of the proposed action situated on the protected side of the LGM levee system would likely be subject to further development in the future. This, combined with the gradual loss of wetland habitats through the effects of forced drainage, would result in direct loss of habitats and degraded habitat functions and values, thereby adversely affecting wildlife and fisheries resources.

#### Future Conditions with the Proposed Action

Implementation of the proposed action would result in the elimination of a total of approximately 0.16 acre of existing man-made drainage ditches (ditches D2, D3, and D5) that provide minimal habitat value. However, the loss of this habitat would be completely offset by

the proposed construction of two new drainage ditches, ditch A and ditch B, which would encompass a total of approximately 0.21 acre.

The proposed action would require filling approximately 0.67 acre of existing borrow pit B1 and excavating approximately 0.02 acre within this borrow pit. The excavation would temporarily impact the open water habitat formed by the borrow pit. The proposed fill would permanently convert roughly 0.40 acre of the pit from open water habitat to upland habitat (e.g. would become part of the non-inundated side slope of the adjacent floodwall embankment). The remaining 0.27 acre of the pit affected by fill deposition would be temporarily impacted, but would remain inundated and thus remain as open water habitat following completion of project construction. The net loss of open water habitat would represent less than 1 percent of the total open water habitat formed by entire borrow pit. Patches of existing littoral zone marsh vegetation would be permanently destroyed during the process of fill placement. However, such marsh vegetation would likely re-colonize the altered shoreline/littoral zone formed by the fill alterations within a few years. Given the limited extent of the proposed impacts and the nature of these impacts, the proposed project's effects on wildlife and fish utilizing the borrow pit would be minimal.

The proposed action would permanently eliminate existing man-made pond P1 (approximately 0.09 acre). This pond provides essentially no habitat value; hence this impact would be *de minimis* as regards wildlife and fisheries.

The proposed action would permanently eliminate existing wetland W1 (approximately 0.35 acre). This wetland provides extremely limited habitat functions and values, hence the proposed impact would have minimal effects on wildlife and fisheries. Regardless, the loss of these functions and values would be fully mitigated under the proposed action (refer to "Mitigation" section).

Construction of the proposed action would directly impact a total of approximately 6.7 acres of existing upland habitats. The proposed temporary office/staging area/storage area (see Figure 4) would result in only temporary impacts since this area would be restored to existing conditions following completion of construction. Although the areas where new earthen embankment is proposed would be permanently impacted as regards topography, existing grassed upland habitats affected by the embankment would still be grassed upland habitats following project construction with the exception of areas where concrete scour protection would be provided on top of the earthen embankment. Similar grassed upland habitats would be created by the proposed action via conversion of pond P1 and wetland W1 to such habitats. It is not anticipated that the combined effects of these impacts would significantly influence wildlife resources other than on a short-term basis.

Indirect effects to wildlife species due to construction activities (e.g. noise, vibration) within the area would be short term and temporary. The area affected by this disturbance would be a relatively small part of the local habitat and mobile species could find refuge in other areas until the construction disturbance is over. During project construction, turbidity could increase in nearby aquatic habitats thereby adversely affecting the ability of certain predatory fish species to find and capture prey. However, this impact would be temporary and would largely only affect fish in borrow pit B1.

Following completion of construction, the long-term local trends in fish and wildlife abundance and diversity would remain substantially unchanged compared to the trends anticipated under the no action alternative.

## **ENDANGERED OR THREATENED SPECIES**

### Existing Conditions

This resource is institutionally important because of: the Endangered Species Act of 1973, as amended; the Marine Mammal Protection Act of 1972; and the Bald Eagle Protection Act of 1940. Endangered (E) or threatened (T) species are technically important because the status of such species provides an indication of the overall health of an ecosystem. These species are publicly important because of the desire of the public to protect them and their habitats.

Of the 21 listed Endangered (E) or Threatened (T) plant or animal species listed in Louisiana, 8 animal species potentially occur in Lafourche Parish. These animal species are; piping plover (T), West Indian manatee (E); Gulf sturgeon (T); green sea turtle (T), loggerhead sea turtle (T), leatherback sea turtle (E), hawksbill sea turtle (E), and Kemp's Ridley sea turtle (E). As piping plovers prefer muddy flats or non-vegetated shorelines, they are expected to only be rare migratory visitors in the general project area. Suitable nesting and foraging habitats are absent within the LOC of the proposed project; thus, it is highly improbable that piping plovers frequent the proposed project site. The five species of sea turtle cannot occur within the LOC since it lacks marine habitats, and it very unlikely that sea turtles frequent the GIWW near the site of the proposed project. Manatees cannot occur within the LOC since it lacks marine habitats and direct open water connections to such habitats. It is possible, however, that a few manatees may be found in the GIWW adjacent to the proposed project on rare occasions.

### Future Conditions with No Action

Any use of the general project area by threatened and/or endangered species would be expected to remain similar to existing conditions.

### Future Conditions with the Proposed Action

The USACE determined the proposed project would have "no effect" on endangered or threatened species and USFWS concurred in a letter dated December 12, 2012.

## **NOISE AND VIBRATION**

### Existing Conditions

This resource is institutionally important because the Noise Control Act of 1972 (P.L. 92-574) directs federal agencies to comply with applicable federal, state, interstate, and local noise control regulations. In 1974, the U.S. Environmental Protection Agency (USEPA) provided information suggesting that continuous and long-term noise levels in excess of DNL 65 dBA are normally unacceptable for noise-sensitive land uses such as residences, schools, churches, and hospitals. Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies depending on the type and characteristics of the noise, distance between the noise source and the receptor, receptor sensitivity, and time of day. Noise is often generated by activities part of everyday life, such as construction or vehicular traffic.

Sound varies by both intensity and frequency. Sound pressure level, described in decibels (dB), is used to quantify sound intensity. The dB is a logarithmic unit that expresses the ratio of a sound pressure level to a standard reference level. Hertz (Hz) are used to quantify sound

frequency. The human ear responds differently to different frequencies. *A-weighting*, described in a-weighted decibels (dBA), approximates this frequency response to express accurately the perception of sound by humans. Sounds encountered in daily life and their approximate level in dBA is provided in table 1.

The dBA noise metric describes steady noise levels. Very few noises are, in fact, constant; therefore, a noise metric, Day-night Sound Level (DNL) has been developed. DNL is defined as the average sound energy in a 24-hour period with a 10-dB penalty added to the nighttime levels (10 P.M. to 7 A.M.). DNL is a useful descriptor for noise because (1) it averages ongoing, yet intermittent noise, and (2) it measures total sound energy over a 24-hour period. In addition, Equivalent Sound Level ( $L_{eq}$ ) is often used to describe the overall noise environment.  $L_{eq}$  is the average sound level in dB.

**Table 1- Common Sounds and Their Levels**

<b>Outdoor</b>	<b>Sound level (dBA)</b>	<b>Indoor</b>
Snowmobile	100	Subway train
Tractor	90	Garbage disposal
Noisy restaurant	85	Blender
Downtown (large city)	80	Ringing telephone
Freeway traffic	70	TV audio
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Source: Harris 1998

Existing sources of noise near the project area include shipping and boating activity in the GIWW, local road traffic, high-altitude aircraft overflights, and natural noises such as water, leaves rustling, and bird vocalizations. The noise environment is a mixture of quiet residential and light commercial. Traffic noise from Highway 657 is the main source of noise near the site. There are individual residences within and adjacent to the project area and a private boat launch.

#### Future Conditions with No Action

Under the no action alternative, additional noise associated with construction activities would not occur. Existing sources of noise as describe above would continue to contribute to the noise environment. Future development may occur and provide additional sources of noise.

#### Future Conditions with the Proposed Action

Short-term increases in noise due to construction activities would occur. Effects would be confined to those areas around the segments of the wall under construction. Equipment would include bulldozers, dump trucks, vibratory rollers, and blade graders. A vibratory hammer would be used for driving sheet pile and an impact hammer would be used for driving H piles.

Normal permissible hours of work would be between 7:00 a.m. and 7:00 p.m. on Monday through Sunday. Prior to 7:00 a.m., the Contractor would not start up any equipment nor have any trucks for delivery, service, hauling or arriving at the jobsite. To facilitate the driving sheet pile across La-657 and modifications to the vehicle gate, the permissible hours of work shall be temporally extended to 24 hours per day. During this phase of work, the Contractor shall be allowed to operate any equipment, receive trucks for delivery, service, hauling, etc. at the jobsite until this phase is complete.

The specific impact of construction activities on the nearby receptors would vary depending on the type, number, and loudness of equipment in use. Individual pieces of heavy equipment typically generate noise levels of 80 dBA to 90 dBA at a distance of 50 feet. With multiple items of equipment operating concurrently, noise levels can be relatively high during daytime periods at locations within several hundred feet of active construction sites. The zone of relatively high noise levels typically extends to distances of 400 feet to 800 feet from the site of major equipment operations. Locations more than 1,000 feet from construction sites seldom experience substantial levels (greater than 62 dBA) of noise. Table 2 presents typical noise levels (dBA at 50 feet) that USEPA has estimated for the main phases of outdoor construction. In addition to noise, vibration will likely be an aggravating factor generated from installation of the sheet pile and general equipment operation. Use of special installation equipment will be employed to mitigate potential for structural or intrusive impacts resulting from the vibrations.

Vibrations associated with pile driving (sheet pile floodwall installation) and all other construction operations likely to cause high vibration levels (ex. hauling and placement of construction materials, movement of heavy equipment) would be carefully monitored daily during the course of project construction. Vibrations would be limited to a peak particle velocity of 0.25 inches per second at the nearest residential structures, 1.00 inch per second at the nearest pile-founded structure, and 2.00 inches per second at the existing 14” water main. Should vibrations exceed these specified limits, the operations causing the excessive vibrations would immediately be halted and actions would be taken to reduce the vibrations to acceptable limits.

**Table 2 - Noise Levels Associated with Outdoor Construction**

<b>Construction Phase</b>	<b>L<sub>eq</sub> (dBA) at 50 feet</b>
Ground Clearing	84
Excavation, Grading	89
Foundations	78
Structural	85
Finishing	89

Source: USEPA 1971

Construction noise would be expected to dominate the soundscape for all on-site personnel. Construction personnel, and particularly equipment operators, would wear adequate personal hearing protection to limit exposure and ensure compliance with federal health and safety regulations.

There would be no permanent or ongoing sources of noise from the proposed action. Construction noise would end when the project is completed (approximately eight months). However, noise due to pile driving is expected to cease within five months of project initiation.

## **SOCIOECONOMIC RESOURCES**

This resource is institutionally significant because of the NEPA of 1969; the Estuary Protection Act; the CWA; the River and Harbors Acts; the Watershed Protection and Flood Protection Act; and the Water Resources Development Acts. Of particular relevance is the degree to which the proposed action affects public health, safety, and economic well-being; and the quality of the human environment. This resource is technically significant because the social and economic welfare of the nation may be positively or adversely impacted by the proposed action. This resource is publicly significant because of the public’s concern for health, welfare, and economic and social well-being from water resources projects.

## Existing Conditions

### Population and Housing

There are four census blocks in Lafourche Parish that would potentially be impacted by the proposed actions. These include Blocks 1022, 1007, 1018, and 1021 in Census Tract 215. This area is bounded to the north by the GIWW, to the west by Louisiana Hwy 308, to the south by undeveloped land south of Louisiana Hwy 657, and to the east by Station No. 7 Rd. According to U.S. Census data, this area had 106 residents and 51 housing units in 2010. Blocks 1022 and 1007 are located outside of the protected area and in 2010 had seven residents and four housing units.

### Employment, Business, and Industrial Activity

The proposed site is located in a residential area along the GIWW to the east of the GIWW/Bayou Lafourche intersection. A privately owned boat launch that is used for commercial purposes is located adjacent to the existing floodwall. There are some businesses proximate to the proposed expanded floodwall.

### Public Facilities and Services

There are no public facilities located near the project area that will be affected during the construction phase.

### Transportation

The transportation infrastructure of the study area includes major roadways and navigable waterways. Major highways include Louisiana Hwy 657 and Louisiana Hwy 308. The portion of Hwy 657 that runs through the study area in a north-south direction along the east side of Bayou Lafourche is also known as E Main St. At the intersection of Bayou Lafourche and the GIWW, Hwy 657 continues along the east side of the GIWW in a northeasterly direction. This section of Hwy 657 is also known as E 2nd St. Hwy 308 intersects Hwy 657 along the eastern boundary of the study area. Hwy 308 crosses over the GIWW in a northern direction and loops around the developed portion of the study area in a southern direction. Secondary roads, such as E 1st St, E Ave A, E Ave B, and E Ave C provide access to Hwy 657 and Hwy 308. E 1st St is directly adjacent to the existing floodwall that runs along the GIWW. The GIWW and Bayou Lafourche are important navigable waterways in the study area.

### Community and Regional Growth

Community and regional growth are generally influenced by national trends, but otherwise depend significantly upon relatively local attributes that allow it to be evaluated apart from the national economy. Growth has also historically been heavily dependent on reliable flood protection. For the purposes of socioeconomic impact analysis, the project area is first described in summary terms with respect to prevailing trends in the growth of population, housing, income, and employment. Against this baseline, the relative effects of the proposed and alternative actions are evaluated.

According to U.S. Census data, between 2000 and the 2005-2009 period, the following trends were observed in Lafourche Parish: population increased from 89,974 to 92,852, per capita personal income increased from \$15,809 to \$22,578 and employment increased from 37,207 to 41,095. One should note that the U.S. Census Bureau is now only providing population and housing characteristics in the decennial censuses. Other social characteristics (e.g., income, employment) will now be provided in the U.S. Census Bureau's American Community Survey (ACS). The ACS provides estimates of social characteristics based on data collected over five years. The 2005-2009 census estimates discussed above represent the average characteristics over the 5-year period of time.

*Tax Revenues and Property Values*

The proposed project is located in Lafourche Parish. The median value for specified owner-occupied housing units in Lafourche Parish was \$115,500 in the 2005-2009 period.

*Community Cohesion*

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 physical and 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. The study area is a settled community with stable complements of community interaction.

Future Conditions with No Action

*Population and Housing*

The No Action Alternative would not provide risk reduction to the residents living within the study area. A catastrophic flood would result in severe negative impacts to residents and cause significant damage to residential structures. Additionally, residents in these communities would not be able to benefit from discounted flood insurance premiums offered by the National Flood Insurance Program (NFIP) should the flood insurance rate maps (FIRMs) be updated to reflect increases in flood risk over time. There would be no direct impact resulting in the displacement of population or housing under this alternative. Indirect impacts under the No Action Alternative include a higher potential for permanent displacement of population and housing as compared to the proposed alternative as residents relocate to areas with higher levels of flood protection. Cumulative impacts include the potential for a steady decline in population as residents move to areas with lower flood risks as well as continued financial and emotional strain placed on residents who remain as they prepare for and recover from flood events.

*Employment, Business, and Industrial Activity*

No direct or indirect impacts to employment, businesses, and industrial activity are expected under the No Action Alternative. However, there may be adverse cumulative impacts on employment, businesses, and industrial activity as the area would be more vulnerable to displacement of population and disruption of economic activity.

*Public Facilities and Services*

No direct or indirect impacts to public facilities and services are expected under the No Action Alternative. However, there may be adverse cumulative impacts on public facilities and services as residents and infrastructure would remain vulnerable to flood events.

*Transportation*

The No Action Alternative would not provide risk reduction for the transportation infrastructure in the study area. There would be no direct impacts to transportation under this alternative. Indirect impacts under the No Action Alternative include a higher potential for flood-related damage to the transportation infrastructure within the study area. Cumulative impacts include the ongoing costs associated with repairing the transportation infrastructure as a result of continued flooding in the area.

*Community and Regional Growth*

Under the No Action Alternative, risk reduction would not be provided for the study area and the storm surge risk reduction system would not allow many properties in these communities to benefit from discounted flood insurance premiums offered by the NFIP (should the FIRMs be

updated to reflect changes in the delineation of Special Flood Hazard Zones showing lower overall flood risk). There would be no direct impacts to community and regional growth under this alternative. Indirect impacts under the No Action Alternative include a higher potential for less community and regional growth compared to the proposed alternative if residents relocate to areas with lower flood risks. Cumulative impacts under this alternative include more socially vulnerable and less resilient communities compared to the proposed action.

#### *Tax Revenues and Property Values*

There would be no direct impacts to tax revenues and property values under this alternative. Indirect impacts under the No Action Alternative include a higher potential for a reduction in tax revenue over time as property values decline due to the high flood risk as well as the potential loss of residents to areas with less risk of flooding. This alternative would potentially have adverse cumulative impacts on tax revenues and property values as residents would be more vulnerable to displacement and disruption of economic activity.

#### *Community Cohesion*

There would be no direct impacts to community cohesion under this alternative. Indirect impacts under the No Action Alternative include a higher potential for a reduction in community cohesion if the civic infrastructure within the study area is damaged as a result of flood events. In addition, community cohesion within the study area may also be reduced if residents relocate to areas with less risk of flooding. This alternative would potentially have adverse cumulative impacts on community cohesion as residents would be more vulnerable to displacement and disruption of economic activity.

### Future Conditions with the Proposed Action

#### *Population and Housing*

Under the proposed action, there may be temporary, construction-related impacts to residents in the immediate vicinity of the project area. These may include increased noise levels, degraded air quality, increased congestion on roadways, and a higher risk of vehicular accidents due to the additional volume of traffic and congestion. Additionally, the construction of the new floodwall and the installation of compacted fill as a barge impact barrier immediately adjacent to the new floodwall on both its flood and protected sides would require a larger right of way (ROW) than the existing ROW. The new ROW would require some land to be acquired from property owners, but would not result in the displacement of residents or require the acquisition of any housing units.

No adverse, indirect impacts to population and housing are anticipated under the proposed action. Cumulative impacts associated with the completion of the LGM levee system in its entirety may occur. The lower flood risk that accrues to the area upon completion of the LGM levee system may enhance the desirability of living within the protected areas. As a result, a shift in the dispersion of population may occur. Also, to the extent that the completion of the LGM levee system encourages regional economic growth, any additional jobs thus created may manifest itself in either in-migration to the area or an increase in commuting activity.

#### *Employment, Business, and Industrial Activity*

Direct impacts under the proposed action include the potential for a temporary, minor increase in employment as a result of construction activity. Additionally, the privately-owned boat launch used for commercial purposes would be closed during construction activity (approximately six months). Also, some of the land adjacent to the boat launch and a small section that includes the boat launch would need to be acquired for the new ROW. After construction is complete, the owner would be allowed to use the area to access the boat launch. There are some businesses along the proposed site that could see a significant decline and

possible closing if the proposed action is implemented. These businesses would be affected by full road closure along St. Hwy 657, prohibiting traffic from reaching these businesses. It is uncertain if these operations could financially survive full road closures for an extended period.

No indirect impacts would be expected to occur as a result of the project. Cumulative impacts associated with the completion of the LGM levee system in its entirety may occur. The lower flood risk that accrues to much of the area upon completion of the LGM levee system may have the effect of spurring more economic growth in the region than would otherwise occur. As a result, an increase in the number of firms and the output of business and industry would likely manifest itself in such growth.

*Public Facilities and Services*

No direct or indirect impacts to public facilities and services are expected as a result of the proposed action. Cumulative impacts associated with the completion of the LGM levee system in its entirety may occur. The lower flood risk that accrues to much of the area upon completion of the LGM levee system may enhance the desirability of living within the protected areas. As a result, a shift in the dispersion of population within the area may occur. Also, to the extent that the completion of the LGM levee system encourages regional economic growth, any additional jobs thus created may manifest itself in either in-migration to the area or an increase in commuting activities. An increase in the demand for public facilities and services would follow the migration patterns of residents and workers in the region.

*Transportation*

Under the proposed action, construction equipment and material may be trucked to the construction site. This may increase congestion on Hwy 308, Hwy 657, Hwy 1, and secondary roads proximate to the construction site such as E 2nd St and Mercer Rd. Congestion impacts around the construction area would likely be moderate, but temporary, lasting only as long as construction activities.

Additionally, the proposed action includes modifying the vehicle gate across Hwy 657. This would be accomplished by closing one lane at a time to allow traffic to pass to allow for driving of sheet pile and the placement of a concrete slab. There is a potential for temporary total road closure during the placement of concrete and roadway modifications. The work would be scheduled over three consecutive weekends. The contractor would be required to provide appropriate barriers, signs and flagmen as required by LADOTD. Beyond the vehicle gate there are a limited number of residences and companies that would require access. The affected landowners and LADOTD would be notified prior to construction activities to restricting their access. Individuals utilizing these affected roads and highways on a regular basis may see increased delays or disruptions in their daily commutes. This would be temporary during the construction phase.

There are some businesses along the proposed site that could see a significant decline and possible closing if the proposed action is implemented. These businesses would be affected by the full road closures prohibiting traffic from reaching these businesses. It is uncertain if these businesses could financially survive full road closures for an extended period.

Indirect impacts include moderate to severe degradation of infrastructure as a result of wear and tear from transporting construction materials. Cumulative impacts associated with the completion of the LGM levee system in its entirety may occur. The lower flood risk that accrues to much of the area upon completion of the LGM levee system may have the effect of spurring more economic growth in the region than would otherwise occur. An increase in the demand for transportation resources usually follows gains in economic activity and would thus be expected given any additional economic growth in the region.

*Desirable Community and Regional Growth*

The proposed action would have no direct or indirect adverse effect on community and regional growth. Increased protection from flooding would preserve and enhance community and regional growth. Cumulative impacts associated with the completion of the LGM levee system in its entirety may occur. The lower flood risk that accrues to much of the area upon completion of the LGM levee system may have the effect of spurring more economic growth in the region than would otherwise occur. In addition, the lower incidence of flooding that the LGM levee system is designed to achieve would reduce the propensity for disruption of community life.

*Tax Revenues and Property Values*

Property values near the construction site itself may decrease temporarily due to the added traffic congestion and construction noise and dust. The impact, however, would be temporary, lasting only as long as the construction. Positive indirect impacts may accrue to tax revenues and property values in the study area as a result of increased flood protection. Cumulative impacts associated with the completion of the LGM levee system in its entirety may occur. The lower flood risk that accrues to much of the area upon completion of the LGM levee system may have the effect of spurring more economic growth in the region than would otherwise occur. It follows that increases in tax revenues would ensue given additional economic growth. In addition, the lower incidence of flooding that the LGM levee system is designed to achieve would have the effect of preserving, if not enhancing, property values within the protected areas.

Tax revenues near the construction site itself may decrease temporarily due to the closure, whether temporary or permanent, or affected businesses. These decreased revenues would be a result of less sales tax revenue which otherwise would be generated.

*Community Cohesion*

The proposed action would have no direct or indirect adverse effect on community cohesion in the study area. Increased protection from flooding would preserve and enhance the potential for community cohesion. Cumulative impacts associated with the completion of the LGM levee system in its entirety may occur. The lower flood risk that accrues to much of the area upon completion of the LGM levee system may have the effect of enhancing community cohesion. The reason for this is that the lower incidence of flooding reduces the likelihood that patterns of social interaction and communication within the community are interrupted or permanently altered.

## **WATER QUALITY**

*Existing Conditions*

Specifically, water quality in the project vicinity is directly affected by the GIWW and other anthropogenic inputs from the city of Larose and the surrounding area. Generally, this resource is institutionally significant because of the passage of the Federal Water Pollution Control Act (FWPCA) in 1948 and its amendments, including the CWA and the Water Quality Act of 1987, as well as the establishment of state and Federal environmental protection agencies, resulted in water pollution control regulations, including:

- The National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution from point sources. In 1997 the USEPA granted NPDES delegation to the LDEQ, which is known as the Louisiana Pollutant Discharge Elimination System (LPDES).
- The LDEQ Nonpoint Source Pollution Program is continuing to implement watershed initiatives to address nonpoint source pollution sources such as agriculture, home sewage treatment, hydromodification, urban runoff, construction activities, and resource extraction.

- The LDNR's Coastal Nonpoint Pollution Program is responsible for identifying Best Management Practices (BMPs) appropriate for all applicable pollutant source categories and carrying out initiatives of public education, technical assistance, and development of enforcement protocols.
- Total Maximum Daily Loads (TMDLs); Section 303(d) of the CWA requires states to identify, list, and rank for development of TMDLs for waters that do not meet applicable water quality standards after implementation of technology-based controls.
- The USEPA-formed Hypoxia Task Force is leading a national task force to address hypoxia in the northern Gulf of Mexico, which is attributed to the excessive nutrients in the Mississippi – Atchafalaya River Basin.

There is little water quality monitoring data available in the immediate vicinity of the proposed project. The US EPA's "2010 Waterbody Report for Intracoastal Waterway – Larose to Bayou Villars" indicates that the overall status of the GIWW waterbody is "impaired" (EPA, 2012). This designation is largely due to fish, shellfish, and wildlife protection and propagation being impaired due to excessively high turbidity in the GIWW. It is estimated that water quality in the only large waterbody present at the proposed project site, borrow pit B1, is relatively good. Factors contributing to any water quality degradation in this waterbody could include nutrient inputs from adjacent agricultural fields, limited pollutant inputs derived from storm water runoff from roadways, residential lots, and commercial lots, and possibly low dissolved oxygen concentrations in deeper portions of this waterbody.

#### Future Conditions with No Action

Under the no action alternative, there would be no direct or indirect impacts to water quality since the proposed action would not be implemented.

Surface water quality in the general vicinity of the proposed project could remain similar to existing conditions, but could also improve over time. Given the laws and programs discussed in the preceding section combined with additional water quality improvement and protection programs that may come to fruition, water quality could be improved in the future. However, activities with the potential for negative effects on water quality would also continue to occur with or without the proposed action. For example, residential, commercial, and residential development would continue in the region, generating point and nonpoint source pollution.

#### Future Conditions with the Proposed Action

Areas cleared and disturbed by construction of the proposed action would be subject to erosion during the construction process. The resulting transport of sediments from the project site would adversely affect water quality in adjacent open water habitats via increased turbidity and suspended sediments. Deposition of fill in borrow pit B1 would obviously increase turbidity and suspended sediments in this waterbody. These impacts would be temporary, however, with turbidity returning to ambient levels once project construction is completed. These impacts would be minimized by employing appropriate best management practices during the construction process. Examples include the installation of silt fences along the boundaries of existing land areas to be disturbed, and installation of a floating turbidity curtain in borrow pit B1 along the limits of construction in this waterbody.

Future water quality conditions in the general vicinity of the project site would not be affected by implementation and completion of the proposed action.

## **CULTURAL RESOURCES**

### Existing Conditions

This resource is institutionally significant because of: the National Historic Preservation Act of 1966, as amended; the Native American graves Protection and Repatriation Act of 1990; and the Archeological Resources Protection Act of 1979; as well as other statutes. Cultural resources are technically significant because of their association or linkage to past events, to historically important persons, and to design and/or construction values, and for their ability to yield important information about prehistory and history. Cultural resources are publicly significant because preservation groups and private individuals support their protection, restoration, enhancement, or recovery.

The prehistory of southeast Louisiana is usually divided into five time periods representing occupation beginning around 500 B.C. to historic times, ca. A.D. 1700. These time periods from earliest to latest are, Tchefuncte, Marksville, Troyville, Coles Creek and Mississippian (Godzinski et. al 2005).

**Tchefuncte:** The Tchefuncte period generally dates from around 500 B.C. to around A.D. 200. It is during this time period that pottery is first introduced to southeast Louisiana. Sites dating to the Tchefuncte period are generally confined to areas around Lake Pontchartrain and appear to be associated with relatively early river channels and lake margins. Excavations at Big and Little Oak Islands, in eastern New Orleans show that subsistence was directed towards hunting and fishing.

**Marksville:** The early Marksville period is associated with the Hopewellian tradition. The early Marksville period is recognized by diagnostic pottery types and conical mounds. The late Marksville period shows an increase in cultural diversity in the Lower Mississippi valley. The generally recognized dates for the Marksville period are A.D. 200 to A.D. 400.

**Troyville:** This time period, as defined by Phillips (1970) as a collection of widely dispersed sites rather than a coherent archaeological manifestation. During this period the influences are from the gulf coast rather than the upper Mississippi River as distinctive items such as distinctive site plans, site hierarchies, and burial mounds are absent along the coast. Dates for the Troyville period range from A.D. 400 to around A.D. 700.

**Coles Creek:** The Coles Creek period is marked by small ceremonial centers with mounds. These mounds are generally larger than those that characterize the Marksville period and are pyramidal and flat-topped. Weinstein and Kelly (1992) believe that there exists a pattern of major mound sites, satellite villages and seasonal camps or shellfish collecting stations. Coles Creek sites generally date from A.D. 700 to A.D. 1200.

**Mississippian:** The Mississippian period is noted by the appearance of the emergent Mississippian culture in the northern part of the Lower Mississippi Valley. It is characterized by shell tempered pottery and the introduction of maize agriculture. Also characteristic is the presence of multi mound construction.

Discussion of the Historic period comes directly from Godzinski (2005)

**The Colonial Period to 1803:** The area of present-day Lafourche Parish saw very little settlement before 1765. Spain acquired the Louisiana colony via the secret Treaty of Fontainebleau in 1762 although Spain did not establish administrative control until 1796. During the 1780's Acadians, who had been exiled in France, settled in the Lafourche District. For the most part the Acadians maintained their egalitarian outlook and upheld their ideal of small

family homesteads. Their tenacity and refusal to conform to the cultural ideals of the large-planter-dominated Creole culture strained their relations and inevitably increased their isolation.

**The Antebellum Period 1803-1860:** In 1822 Henry Schuyler Thibodaux purchased property that was to become the town of Thibodaux. Originally cotton was grown on the large plantations but by the late 1820's sugar became the dominant crop.

**Civil War 1861-1865:** Lafourche Parish saw little direct effect from military action during the Civil War. Most military activity in the Bayou Lafourche region involved the rail line of the New Orleans, Opelousas and Great Western Railroad which ran from New Orleans to what is now Morgan City. In October of 1862 Union Forces advanced down the east bank of Bayou Lafourche where they eventually defeated the Confederates at Labadieville and occupied Thibodaux.

**Late Nineteenth and Early Twentieth Centuries:** The end of the civil War brought with it a complete upheaval in the labor system of the plantations of south Louisiana. Faced with impending financial disaster, owners turned to wage labor and share cropping. It was not until the twentieth century that a significant number of land claims in marshland surrounding the northwest portion of the Parish. In the early Twentieth Century, the logging of cypress trees became an important part of the Lafourche Parish economy. By 1925 virgin cypress stands were almost depleted. The population of Lafourche Parish continued to grow from 14,719 in 1870 to 42,209 in 1950.

#### Previous Investigations

The proposed project area and the Larose to Golden Meadow Floodwall has been the subject of several cultural resource surveys. The section that is the subject of this Environmental Assessment was surveyed for cultural resources in 1975 (Gagliano et al. 1975), 1981 (McIntire et al. 1981), and 1983 (Stout and Muller, 1983).

No cultural resources were identified in the project area during any of the previous surveys. The Louisiana Division of Archaeology on-line cultural resources map indicates that there is one structure (29-01142) older than 50 years in the project area. A site visit by New Orleans District personnel failed to re-locate structure 29-01142 in the project area.

Letters were mailed on November 9, 2012, to the Louisiana State Historic Preservation Officer and to the Alabama Coushatta Tribe of Texas, the Caddo Nation of Oklahoma, the Chitimacha Tribe of Louisiana, the Choctaw Nation of Oklahoma, the Coushatta Tribe of Louisiana, the Jena Band of Choctaw Indians, the Mississippi Band of Choctaw Indians, the Quapaw Tribe of Oklahoma, the Seminole Nation of Oklahoma, the Seminole Tribe of Florida and the Tunica-Biloxi Tribe of Louisiana requesting a concurrence with a determination of no historic properties affected (36 CFR § 800.4(d)(1)). The Louisiana state Historic Preservation Officer concurred with our finding on no historic properties affected on November 19, 2012. Consultation pursuant to Section 106 of the National Historic Preservation Act has been completed for the proposed project.

#### Future Conditions with No Action

No historic properties would be affected if the proposed project were not implemented.

Future with the Proposed Action

Implementation of the proposed project would have no effect on historic properties.

**ENVIROMENTAL JUSTICE**

Environmental Justice (EJ) is institutionally significant because of Executive Order 12898 of 1994 (E.O. 12898) and the Department of Defense's Strategy on Environmental Justice of 1995, which direct Federal agencies to identify and address any disproportionately high adverse human health or environmental effects of Federal actions to minority and/or low-income populations. Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, and Pacific Islander. A minority population exists where the percentage of minorities in an affected area either exceeds 50 percent or is meaningfully greater than in the general population. Low-income populations as of 2010 are those whose income are \$22,050 for a family of four and are identified using the Census Bureau's statistical poverty threshold. The Census Bureau defines a "poverty area" as a census tract with 20 percent or more of its residents below the poverty threshold and an "extreme poverty area" as one with 40 percent or more below the poverty level. This resource is technically significant because the social and economic welfare of minority and low-income populations may be positively or disproportionately impacted by the proposed actions. This resource is publicly significant because of public concerns about the fair and equitable treatment (fair treatment and meaningful involvement) of all people with respect to environmental and human health consequences of Federal laws, regulations, policies, and actions.

A potential disproportionate impact may occur when the percent minority in the study area exceeds 50 percent and/or percent low-income exceeds 20 percent of the population. In addition, a disproportionate impact may occur when the percent minority and/or percent low-income are meaningfully greater than those in the reference community. For purposes of this analysis, all census tracts within the project footprint are defined as the EJ study area. Lafourche Parish is considered the reference community of comparison.

The methodology, consistent with E.O. 12898, to accomplish this EJ analysis includes identifying low-income and minority populations within the project area using up-to-date economic statistics, aerial photographs, U.S. Census Bureau 2005-2009 American Community Survey (ACS) estimates, as well as conducting community outreach activities such as public meetings. The newly released ACS estimates provide the latest socioeconomic community characteristic data released by the U.S. Census Bureau and are based on data collected between January 2005 and December 2009.

Existing Conditions

The study area is located to the east of the GIWW/Bayou Lafourche intersection in Lafourche Parish, Census Tract 215, Blocks 1022, 1007, 1018, and 1021. According to the 2010 decennial census, the minority population in Lafourche Parish was 22.0 percent of the total population. The 2005-2009 ACS data indicate that Lafourche Parish had a low-income population of 14.4 percent during that period. Data from the 2010 decennial Census indicate that the minority population within proximity to the proposed action was 17.5 percent, and according to the 2005-2009 ACS, the low-income population in the area was 14.5 percent.

Analyses of the above information show that the study area exceeds neither the 50 percent minority threshold nor the 20 percent low-income threshold. Therefore, the study area is not considered a potential EJ area.

Future Conditions with No Action

The No Action Alternative would not result in any disproportionately high or adverse effects on minority and/or low-income populations.

Future Conditions with the Proposed Action

The proposed project is not expected to result in any disproportionately high or adverse effects on minority and/or low-income populations. Therefore, there are no EJ concerns anticipated with the proposed action.

**RECREATIONAL RESOURCES**

Existing Conditions

This resource is institutionally significant because of the Federal Water Project Recreation Act of 1965, as amended, and the Land and Water Conservation Fund Act of 1965, as amended. Recreational resources are technically significant because of the high economic value of recreational activities and their contribution to local, state, and national economies. Recreational resources are publicly significant because of: the high value that the public places on fishing, hunting, and boating, as measured by the large number of fishing and hunting licenses sold in Louisiana; and the large per-capita number of recreational boat registrations in Louisiana.

The following information is provided by the Louisiana Department of Wildlife and Fisheries ([www.wlf.louisiana.gov](http://www.wlf.louisiana.gov)) for the number of fishing licenses sold in 2012 and the number of boating licenses sold in 2011 for Lafourche Parish.

**Table 3 – Fishing and Boating Licenses**

<b>All Resident Fishing Privileges</b>	<b>All Resident Saltwater Privileges</b>	<b>All Non-Resident Fishing Privileges</b>	<b>All Non-Resident Saltwater Privileges</b>	<b>Active Boat Registrations</b>
18,546	17,617	76	146	11,878

The Gulf Intracoastal Waterway (GIWW) is adjacent to the project area. Fishing and boating occur within the GIWW.

The Larose Regional Park and Civic Center is approximately one mile from the project area. The facility was opened in May of 1981 and provides a walking track, tennis courts, basketball courts, baseball diamonds, soccer fields, volleyball courts, football field, swimming pool, playgrounds and pavilions, and parking for campers and motor homes. A wide range of activities and festivals are provided.

There is one boat launch within the project area. It is private and not for public recreational use. There is no recreation occurring with the project area.

### Future Conditions with No Action

Without implementation of the proposed action, the conditions within the recreational environment would continue as they have in the past and would be dictated by the natural land use patterns and processes that have dominated the area in the past. Recreational infrastructure such as parks would remain vulnerable to floods.

### Future Conditions with the Proposed Action

There would be no direct or indirect impact to recreation resources. The proposed action would reduce the risk of floods to recreational infrastructure such as parks and recreation facilities.

## **VISUAL RESOURCES**

### Existing Conditions

The proposed project site currently features a variety of structures ranging from residential use to industrial. Based on the latest aerial photography, the most notable structures in the immediate project area are a tall electrical line tower and a boat launch and parking area.

The Louisiana Scenic Rivers Act of 1988 was established to preserve, protect, and enhance the wilderness qualities, scenic beauties, and ecological regimes of rivers and streams in the state. There are no known, state designated scenic rivers or streams remotely near the project area. Other major water resources include the channel of the Gulf Intracoastal Waterway which runs to the northeast and adjacent to the project site, and Dixie Delta Canal, located just to the northeast. Other water resources include a series of borrow channels to the east and north of the project site and Bayou Lafourche, well to the southeast of the project site.

Public visual access to the project site can be taken from Louisiana State Highway 657, the Gulf Intracoastal Waterway and a small handful of local and neighborhood streets, just to the southwest. The drive along L.A. Highway 657 offers no features that would qualify it as scenic under technical significance. Some viewsheds are obscured by levee and flood wall, while others bring views of open field; pasture land, and high density residential neighborhoods. The only designated Scenic Byway in the area is the Cultural Wetlands Trail which traverses Highways 24 and 1, throughout the region.

The dominant eco-region is Southern Holocene Meander Belts (*ref: State of Louisiana Eco-Regions Map*). The eco-region contains minor species such as live oak, laurel oak, and Spanish moss that are generally not found in the more northerly regions. The bottomland forests have been cleared and the region has been extensively modified for agriculture, flood control, and navigation. The levee system is extensive throughout the region. Soybeans, sugarcane, cotton, corn, and pasture are the major crops, with crawfish aquaculture common. Nearby eco-regions includes the Coastal Marshes.

Land use in the project area appears to be primarily single-family residential, although there is some industrial uses and semi-public uses in the vicinity. Outlying areas, in the vicinity of the project area, feature lands that are more agricultural and open, catering to farming and outdoor recreation uses (*ref: State of Louisiana Existing Land Use Map*).

The habitat around the project area exhibits minute plant species diversity and moderate animal diversity, bringing little to the scenic quality of the area. There are no known specifically identified protected trees or other plant materials in the immediate area.

User activity is relatively low in the region around the project area, even with the local traffic from residents. Average Daily Traffic Counts provided by the Louisiana Department of Transportation and Development show an average daily traffic count in the project area of 392 cars per day along Highway 657 (*ref: LADOTD Estimated Annual Average Daily Traffic Count Sites*).

#### Future Conditions with No Action

With the No Action Alternative, direct impacts would evolve from the natural processes of the area and the associated changes to these geomorphic structures. These changes could also be facilitated by future land use and maintenance practices of the community as well.

As with Direct Impacts, Indirect impacts to visual resources would also most likely evolve from natural processes, or change as dictated by future land use and maintenance practices.

If the present conditions were allowed to continue as they have in this particular flood and storm protection system, and other similar systems across Louisiana and the nation, then there would be a dramatic change to the landscape as a whole due to seepage, flooding and storm damage. This would not be desirable on a neighborhood or national level.

#### Future Conditions with the Proposed Action

With the implementation of Proposed Action, changes to the visual quality and complexity in the area will not be all that different from existing conditions. The primary differences will be the increase in height of flood protection features, the inclusion of concrete aprons, rip rap, sheet piling and other similar man-made objects that will contrast starkly from the present conditions. With much of the natural scenery already lost due to the development of the area, visual impacts will be minimal. There are no new features being added to the area that could qualify as adhering to the basic design principles and presenting a landscape that has scenic value.

In the case of the Reach 22B Study Area there is no state or federally designated sites near the project area that should be identified as protected lands. The nearest related facility is at Pointe Au Chien State Wildlife Management Area, located over five (5) miles to the south of the project site. There is no evidence that the project site itself is located in a historic, visual, cultural or any other designated protected area. There are no known state or federally protected scenic streams in or near the project area.

Indirect impacts to visual resources may include increased traffic volumes along major thoroughfares (including Louisiana State Highways 657 and 308), increased dust and airborne debris, and increased noise during the construction process. It is important to note that these

impacts will be minimal. The Cultural Wetlands Trail will not be visually impacted by the proposed project.

Long term negative impacts to visual resources will be minimal. The measures that will be implemented here will be sufficient to provide storm and flood protection for the community at large.

## **AIR QUALITY**

This resource is considered institutionally important because of the Louisiana Environmental Quality Act of 1983, as amended, and the Clean Air Act of 1963, as amended. Air quality is technically important because of the status of regional ambient air quality in relation to the National Ambient Air Quality Standards (NAAQS). It is publicly important because of the desire for clean air expressed by virtually all citizens.

### Existing Conditions

Lafourche Parish is currently in attainment of all NAAQS. This classification is the result of area-wide air quality modeling studies.

### Future Conditions with No Action

Under the no action alternative, there would be no potential for direct, indirect, or cumulative effects to air quality because construction of the proposed action would not occur.

### Future Conditions with the Proposed Action

Probable direct impacts to air quality would include temporary diesel and gasoline emissions from the operation of construction equipment and temporary creation of fugitive dust during project construction. The indirect effects to air quality of implementing the proposed action would be related to the emissions from transportation of personnel and equipment to and from the job site on a daily basis until the completion of construction. The total volatile organic compound emissions for this project during construction are anticipated to be well below the *de minimis* level of 100 tons per year. Therefore, the proposed action would conform to the Louisiana State Implementation Plan. The cumulative effects to air quality would be the combined emissions from the direct and indirect sources from constructing the proposed action when added to other emissions sources within the region. Because of the relatively short duration of construction, the cumulative impacts of the proposed action on air quality would be minimal and temporary.

## **CUMULATIVE IMPACTS**

Section 1508.8 of Title 40 CFR defines cumulative impacts as:

*...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

The direct, indirect, and cumulative impacts associated with the overall Larose to Golden Meadow Hurricane Protection Project were previously addressed in the 1974 LGM EIS (USACE, 1974), the 1985 LGM SEIS (USACE, 1985), and the 1986 LGM Mitigation EA (USACE, 1986). EA #157 (USACE, 1991b) addressed proposed, and subsequently authorized, changes to the alignment of the LGM levee in the area of the proposed action that deviated from the alignment evaluated in the 1985 LGM SEIS.

MVN is currently undertaking a Post Authorization Change (PAC) Study involving the overall LGM Hurricane Protection Project. The primary purpose of this study is to evaluate various alternative means of improving the hurricane and storm damage risk reduction provided by the existing LGM levee system and its associated components. One or more of the alternative designs considered in the PAC study could involve changes to the height and width of the existing LGM levee. If such design changes were authorized, funded, and constructed, additional impacts would likely occur in the general area containing the proposed action. Important resources affected could include wetlands, bottomland hardwood forests, swamp forests and levee forests, and fish and wildlife. It is likely that the direct impact “footprint” of the proposed action would be contained within the larger direct impact footprint associated with any future LGM levee modifications in the project area. Because of this, it is anticipated that the subject proposed action would not incrementally increase any impacts associated with future LGM levee design modifications.

Lafourche Parish is currently studying the feasibility of constructing a bridge and road adjustment in the vicinity of State Highway 24 over the Dressers Canal. The USACE could potentially construct a T-Wall in association with that effort. The T-wall would go under Highway 1, across Avenue D (which is the road that is being relocated by the Parish), and tie into the earthen levee was completed by MVN in Nov 2009. At this time the parish is studying the road and various types of bridges to cross the canal. Therefore, no firm details of the proposed action exist to evaluate at this time. This action would be an independent project from the proposed Larose Floodwall repair.

Cumulative impacts to socioeconomic considerations under the proposed action alternative are primarily associated with the completion of the LGM levee system in its entirety. The lower flood risk that accrues to the area upon completion of the LGM levee system may enhance the desirability of living within the protected areas. As a result, a shift in the dispersion of population may occur. Also, to the extent that the completion of the LGM levee system encourages regional economic growth, any additional jobs thus created may manifest itself in either in-migration to the area or an increase in commuting activity. The lower flood risk may have the effect of spurring more economic growth in the region than would otherwise occur. As a result, an increase in the number of firms and the output of business and industry would likely manifest itself in such growth. An increase in the demand for transportation resources usually follows gains in economic activity and would thus be expected given any additional economic growth in the region. It follows that increases in tax revenues would ensue given additional economic growth. In addition, the lower incidence of flooding that the LGM levee system is designed to achieve would have the effect of preserving, if not enhancing, property values within the protected areas.

The lower flood risk that accrues to much of the area upon completion of the LGM levee system may have the effect of enhancing community cohesion. The reason for this is that the lower incidence of flooding reduces the likelihood that patterns of social interaction and communication within the community are interrupted or permanently altered. As previously stated, many of these socioeconomic effects would only occur or be fully realized upon completion of the greater PAC study recommendations.

Overall, the proposed action, in comparison to past, present, and reasonably foreseeable future actions, would not incrementally contribute adversely to the general project area.

## COORDINATION

Preparation of this EA and a Finding of No Significant Impact (FONSI) is being coordinated with appropriate Congressional, Federal, state, and local interests, as well as environmental groups and other interested parties. The following agencies, as well as other interested parties, received copies of this EA and the draft FONSI:

- Department of the Interior, Fish and Wildlife Service
- Environmental Protection Agency, Region VI
- Natural Resources Conservation Service
- State Conservationist Advisory Council on Historic Preservation
- Governor's Executive Assistant for Coastal Activities
- Louisiana Department of Wildlife and Fisheries Louisiana Department of Natural Resources
- Coastal Management Division Louisiana Department of Natural Resources
- Coastal Restoration Division Louisiana Department of Environmental Quality (LDEQ)
- Louisiana Department of Environmental Quality
- Louisiana State Historic Preservation Officer

Letters were mailed on November 9, 2012 to the Louisiana State Historic Preservation Officer and to the Alabama Coushatta Tribe of Texas, the Caddo Nation of Oklahoma, the Chitimacha Tribe of Louisiana, the Choctaw Nation of Oklahoma, the Coushatta Tribe of Louisiana, the Jena Band of Choctaw Indians, the Mississippi Band of Choctaw Indians, the Quapaw Tribe of Oklahoma, the Seminole Nation of Oklahoma, the Seminole Tribe of Florida and the Tunica-Biloxi Tribe of Louisiana requesting a concurrence with a determination of not historic properties affected. The Louisiana State Historic Preservation Officer concurred with our finding on no historic properties affected on November 19, 2012.

Comments which have thus far been received from agencies certifying the proposed action are included in the following Compliance Section. Comments received from the above agencies as well as the general public will be considered in preparation of the final EA and FONSI.

In their draft Planning Aid Letter dated January 31, 2013 the U.S. Fish and Wildlife Service (USFWS) made various recommendations concerning the proposed project. The following provides a listing of these recommendations together with the MVN's response to each recommendation.

*Recommendation 1 – To the greatest extent possible, floodwall features should be located such that destruction of wetlands or forested areas are avoided or minimized.*

MVN Response – The proposed action, as set forth and evaluated in this EA, has been designed to avoid and minimize impacts to existing wetlands to the greatest degree practicable.

*Recommendation 2 – Forest clearing associated with project features should be conducted during the fall or winter to minimize impacts to nesting migratory birds, when practicable.*

MVN Response – The MVN agrees with this recommendation

*Recommendation 3 – 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 reinstate coordination with this office to ensure the proposed project would not adversely affect any federally listed threatened or endangered species or their habitat.*

MVN Response – The MVN agrees with this recommendation.

*Recommendation 4 – If any future proposed project features would result in impacts to wetlands or non-wet bottomland hardwood, the Corps shall reinitiate coordination with this office (i.e. additional Environmental Assessments). At that time, the Service may require appropriate mitigation for the additional impacts and/or recommend measures to avoid or minimize such impacts.*

MVN Response – The MVN agrees with this recommendation.

## **MITIGATION**

As discussed in the 1985 LGM SEIS (USACE, 1985), the 1986 LGM Mitigation EA (USACE, 1986), and the 1987 Mitigation Report (USACE, 1987), the mitigation program previously implemented for the overall LGM Hurricane Protection Project fully compensated for various direct and indirect impacts associated with construction of the LGM levee system. Impacts included those to fresh/intermediate marsh and brackish/saline marsh wetlands, wooded swamp (fresh swamp forests/wetlands), and bottomland hardwoods (bottomland hardwood forests/wetlands). In determining the mitigation necessary, it was assumed that all such habitats present within the existing LGM right-of-way (i.e. the current right-of-way encompassing the floodwall and other features) would be eliminated by the direct impacts associated with project construction. In addition, all such habitats present on the protected side of the LGM levee system were assumed to be completely lost over time as a result of indirect impacts associated with project construction. The authorized and implemented mitigation program compensated for all these direct and indirect impacts.

It is noted that realignment of a portion of the LGM levee was authorized in 1991. This change in levee alignment occurred prior to actual levee construction and deviated from the alignment evaluated in the 1985 LGM SEIS and the 1986 Mitigation EA. This revised alignment substantially reduced the levee project's wetland impacts compared to wetland impacts that would have occurred through construction of the 1985 alignment. Because of this, the implemented 1986 mitigation program generated more mitigation "credits" than were necessary to compensate for the levee project's impacts (mitigation "debits"). According to an Environmental Assessment conducted in 1991, the 1986 mitigation program still has a "credit" of over 300 AAHUs that have not been used to compensate for authorized LGM project impacts (USACE, 1991b). However, although it is highly likely that there may be excess mitigation "credits" remaining via the 1986 mitigation program, the exact number of credits (expressed as AAHUs) has thus far not been satisfactorily quantified or verified.

The Water Resources Development Act (WRDA) of 1986 was enacted following approval of the 1986 LGM mitigation program. Section 906 of this act required that mitigation be provided for impacts to bottomland hardwood forests (wet or dry) to the extent possible. Section 2036(a) of WRDA 2007 required that impacts to other habitat types must be mitigated to not less than in-kind condition to the extent possible.

The 1986 LGM mitigation program included enhancement and restoration of fresh/intermediate marsh, brackish/saline marsh, and shallow open water habitats. However, this program did not include preservation, restoration, or enhancement of any swamp or bottomland hardwood habits. Because of the lack of forested mitigation features in the 1986 LGM mitigation program and the new mitigation requirements established via WRDA 1986 and WRDA 2007, the general approach to mitigating additional wetland and BLH-Dry impacts resulting from LGM Hurricane Protection Project changes subsequent to these laws has been:

- (1) All habitat impacts within the levee system right-of-way established in 1985 have been fully mitigated by the 1986 mitigation program, including impacts to marsh, open water, swamp, and bottomland hardwood habitats;
- (2) Impacts to marsh and open water habitats located outside the 1985 right-of-way but on the protected side of the levee system have been fully mitigated by the 1986 mitigation program (and may have been over-mitigated);
- (3) Proposed new impacts to swamp, BLH-Wet, and BLH-Dry habitats situated outside the 1985 right-of-way, whether on the protected side or the flood side of the levee system, will typically require separate mitigation (e.g. 1986 mitigation program does not compensate for such forested impacts since it did not include “type-for-type” mitigation for such habitats);
- (4) Proposed new impacts to marsh habitats and some, but not necessarily all, open water habitats situated on the flood side of the levee system will typically require mitigation.

The proposed action would impact all of wetland W1, thereby eliminating 0.35 acre of degraded BLH-Wet habitat. This entire habitat is located within the existing LGM levee system right-of-way (e.g. is within the 1985 right-of-way). As discussed above, the 1986 mitigation program has already compensated for any and all habitat impacts located within the existing LGM levee system right-of-way. Thus, no additional mitigation would be required for the proposed action’s impact to the subject BLH-Wet habitat. This is in keeping with past policies applied to the LGM Hurricane Protection Project when alterations/changes to conditions within the 1985 right-of-way have been authorized, including actions that impacted remnant habitats (marsh, open water, BLH, swamp) still present within this right-of-way. It is also noted that the proposed impact to wetland W1 would result in the loss of only 0.13 AAHUs; a minimal loss of BLH-Wet habitat functions/values.

As previously discussed, the proposed action would impact a total of approximately 0.16 acre of existing jurisdictional drainage ditches. This impact would be mitigated through the construction of two replacement drainage ditches totaling approximately 0.21 acre. No mitigation would be provided for the proposed impact to man-made pond P1 (0.09 acre) since this pond does not classify as Waters of the United States and the existing aquatic functions and values provided by this pond are so low that the impact is viewed as *de minimis*.

The proposed action would directly impact approximately 0.69 acre of borrow pit B1, a man-made jurisdictional waterbody that includes small patches of marsh vegetation in the portions of the waterbody’s littoral zone that would be impacted. No mitigation would be provided for this proposed impact for a variety of reasons. A portion of the area directly impacted (roughly 0.29 acre) would remain permanently inundated following project completion and thus would still be open water habitat. Marsh vegetation would re-colonize portions of the affected area (e.g. the littoral shelf formed where proposed fill would remain inundated), thereby helping offset the loss of existing marsh vegetation. Given these considerations, the net loss of habitat functions and values would be *de minimis*. Furthermore, the 1986 LGM mitigation program likely retains excess open water and fresh/intermediate marsh mitigation “credits”, which would more than compensate for this proposed waterbody impact.

## **COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS**

Environmental compliance for the proposed action would be achieved upon coordination of this draft EA and Finding of No Significant Impact (FONSI) with appropriate agencies, organizations, and individuals for their review and comments. The draft FONSI would not be signed until the proposed action achieves environmental compliance with applicable laws and regulations, as described above. A summary of compliance statements and history would be included in the final EA.

A Coastal Zone Consistency Determination has been prepared and was forwarded to LADNR for their concurrence on December 10, 2012. A letter dated January 22, 2013 was received stating that the proposed modification is consistent with the Louisiana Coastal Resources Program.

Coordination with the USFWS under the Fish and Wildlife Coordination Act and Section 7 of the Threatened and Endangered Species Act was initiated on December 10, 2012. The USACE determined the proposed project would have “no effect” on endangered or threatened species and USFWS concurred in a letter dated December 12, 2012. A draft Coordination Act Report (CAR) was received on January 31, 2013. The final CAR would be incorporated into this EA once received. USFW recommendations contained in the CAR would be addressed in the final EA.

Letters were mailed on November 9, 2012, to the Louisiana State Historic Preservation Office (SHPO) and to federally recognized tribes. The Louisiana SHPO concurred with our finding on no historic properties affected on November 19, 2012. Consultation pursuant to Section 106 of the National Historic Preservation Act has been completed for the proposed project.

Water Quality Certification was submitted to the Louisiana Department of Environmental Quality on December 10, 2013. A letter dated January 24, 2013 was received stating that a water quality certificate has been issued for the proposed project.

404b1 Public Notice would occur concurrently with 30-day Public Review of this draft EA.

## **CONCLUSION**

The proposed repair of the Larose Floodwall would insure continued integrity of the existing floodwall and resolve the original failure to provide for the level of protection authorized. This office has assessed the environmental impacts of the proposed action and has determined that the proposed action would have no significant impact upon farmland, cultural resources, threatened and endangered species, environmental justice, and recreation. Minimal impacts are expected to air quality, water quality, noise and vibration, socioeconomics, wildlife and fisheries, aesthetics, wetlands, waterbodies, and uplands. Provided no significant comments or effects are identified during the agency review and public comment period, a FONSI will be prepared for signature. Signature of the FONSI would be dependent upon findings of the final EA.

## **PREPARED BY**

EA # 509 and the associated FONSI were prepared by Debra Wright, Outdoor Recreation Planner, with relevant sections prepared by: Howard Ladner – Biologist; Joseph Musso – HTRW, Eric Williams – Cultural Resources; Debra Wright – Recreational Resources; Kelly McCaffrey – Aesthetics; Joe Mann – Socioeconomics & Environmental Justice; and Maude Johnson – Project Manager, and Joey Wagner – Senior Project Manager. Technical review was conducted by Sandra Stiles, Supervisory Biologist. Agency technical review was conducted by David Gade, Limnologist. All ATR comments have been incorporated and addressed. The address of the preparers is: U.S. Army Corps of Engineers, New Orleans District; Regional Planning and Environment Division, South, CEMVN-PDR-RS; P.O. Box 60267; New Orleans, Louisiana 70160-0267.

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[http://ofmpub.epa.gov/waters10/attains\\_waterbody.control?p\\_au\\_id=LA020801\\_00&p\\_cycle=2010#sources](http://ofmpub.epa.gov/waters10/attains_waterbody.control?p_au_id=LA020801_00&p_cycle=2010#sources)
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# **APPENDIX 1**

## **FIGURES**



Figure 1. Aerial view of project location.

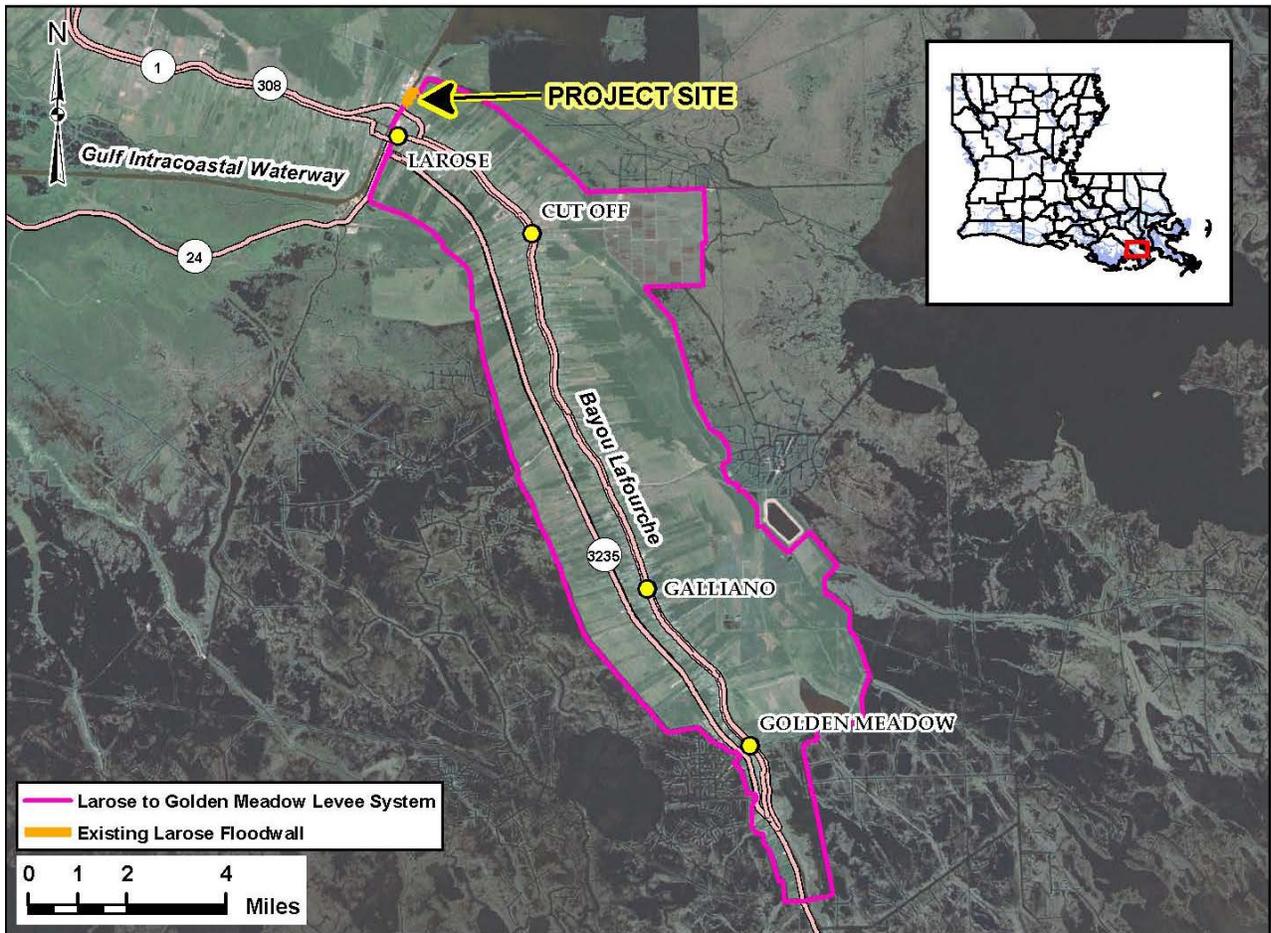


Figure 2. Project location map.

Figure 3. Existing conditions within and near the proposed action, along with proposed new floodwall, proposed new LGM right-of-way, and limits of construction associated with the proposed action.

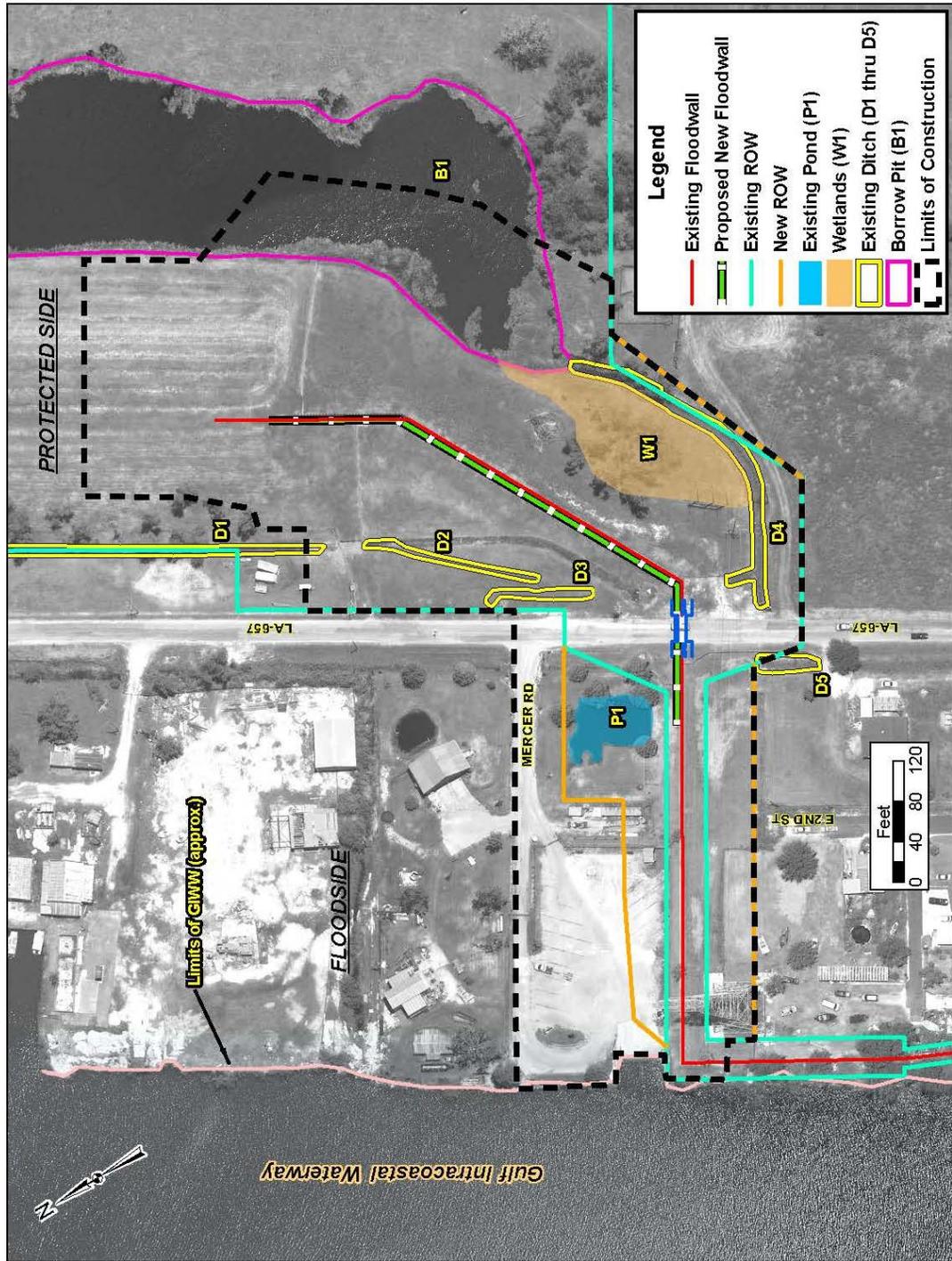
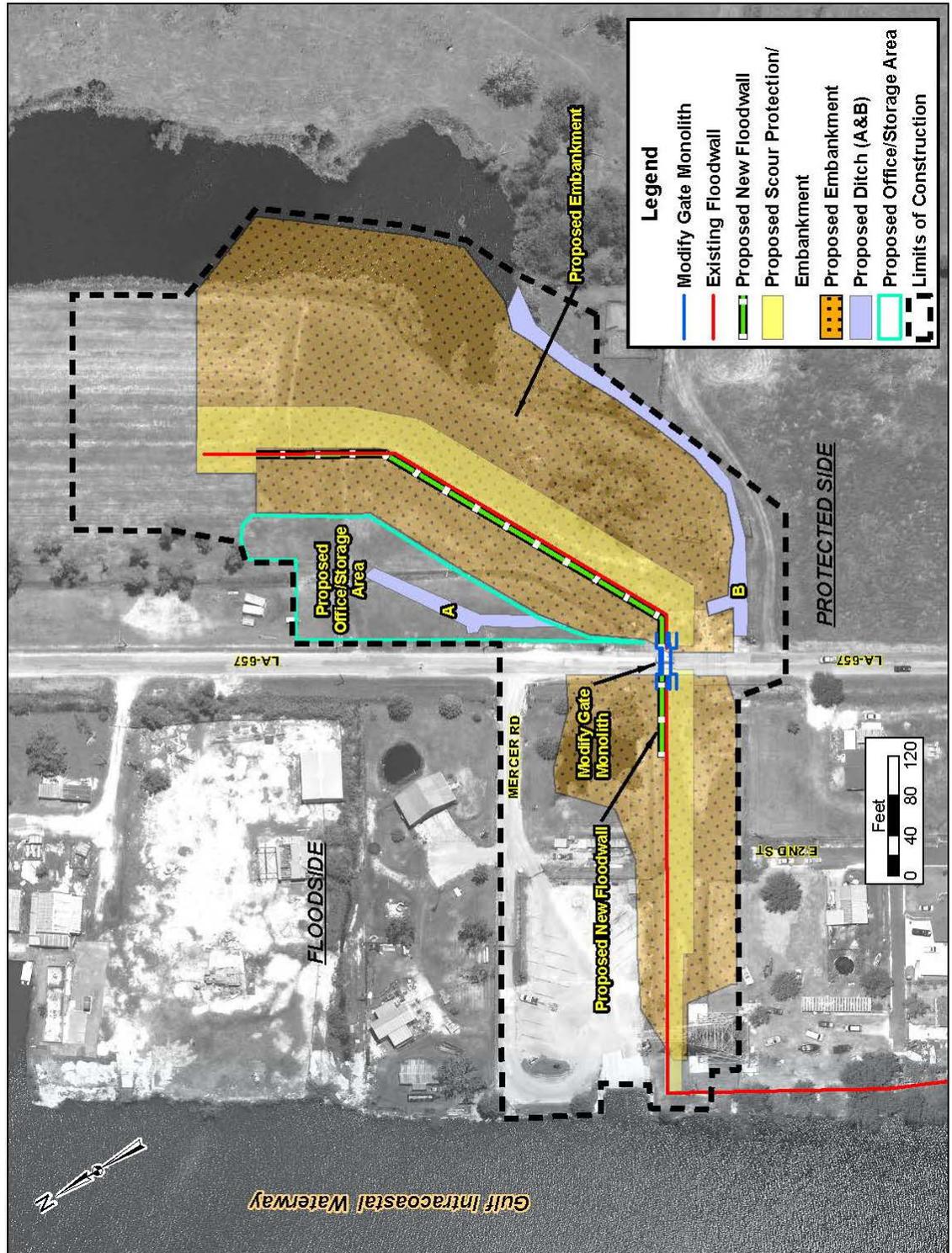


Figure 4. Proposed action (key components).



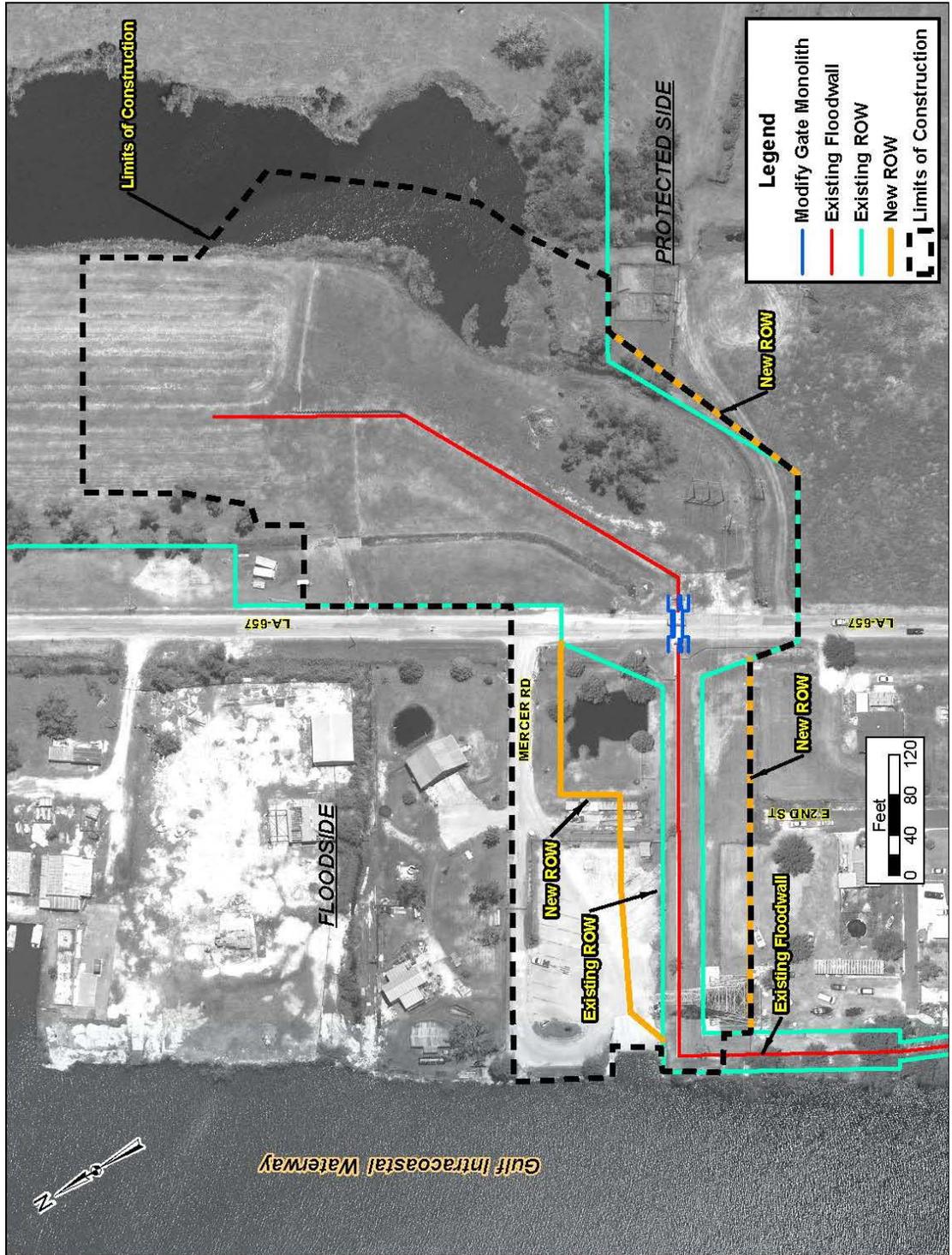
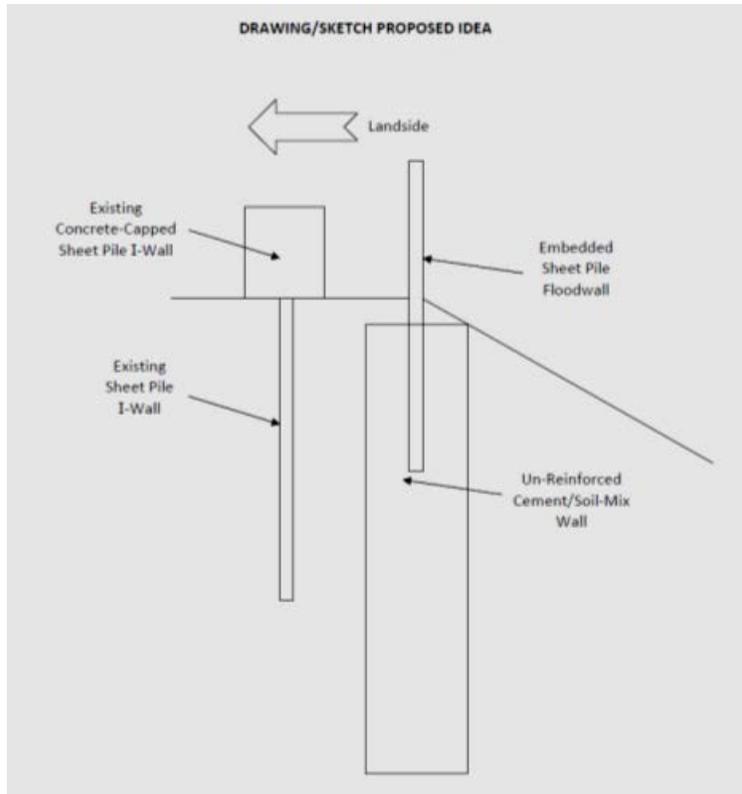


Figure 5. Existing and new rights of way



**Figure 6: In situ soil mix, wall cross section**



## **APPENDIX 2**

### **Coordination Letters**



BOBBY JINDAL  
GOVERNOR



PEGGY M. HATCH  
SECRETARY

State of Louisiana  
DEPARTMENT OF ENVIRONMENTAL QUALITY  
ENVIRONMENTAL SERVICES

JAN 24 2013

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

Attention: Debra Wright

RE: Water Quality Certification (WQC 830414-06/AI 100699/CER 20130001)  
Larose to Golden Meadow Hurricane Protection Project revision  
Lafourche Parish

Dear Ms. Wright:

The Department has reviewed your revised application for the construction of the Larose to Golden Meadow Hurricane Protection Levee. This revision concerns the construction of a new section of floodwall and further repairs and improvements to the project.

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

If you have any questions, please call Jamie Phillippe at 225-219-3225.

Sincerely,



Melvin C. Mitchell, Sr.  
Administrator  
Water Permits Division  
MCM/jjp

This project has been reviewed in accordance with USACE requirements under our jurisdiction and is consistent with the Clean Water Act and Species Act of 1973 (Act). This project is expected to:  
(X) will have no effect on the species.  
( ) is not likely to adversely affect the species.  
This finding fulfills the requirements of Section 7 (c) of the Act.

Memorandum To: USFWS

From: New Orleans District,

Corps of Engineers (Howard Ladner)

Date: December 10, 2012

*D. A. Watts*  
Acting Supervisor  
Louisiana Field Office  
U.S. Fish and Wildlife Service

12 Dec 2012  
Title

Subject: Endangered Species Act, Section 7 Coordination for Larose Floodwall Repair Phase II

This correspondence serves to initiate informal consultation in reference to the proposed repair of the Larose Floodwall which is part of the 48 mile Larose to Golden Meadow Hurricane Protection Project. The purpose of the proposed action is to correct deficiencies in one segment of the existing Gulf Intracoastal Waterway (GIWW)/Larose Floodwall and elevate the wall to its authorized elevation, +10.4 feet NAVD88. The GIWW/Larose Floodwall is part of the 48-mile Larose to Golden Meadow Hurricane Protection Project and consists of approximately 5,000 linear feet of floodwall. This floodwall begins near the confluence of Bayou Lafourche and the GIWW (south of the proposed action), then runs northward along the east side of the GIWW for roughly 4,475 feet. It then turns toward the southeast away from the GIWW and continues for roughly another 940 feet before it merges into the earthen LGM levee system.

The proposed action only involves that segment (reach) of the floodwall beginning at the northern terminus of the floodwall segment bordering the GIWW and extending inland from this point to where it merges with the levee. This reach includes a "gap" in the above-ground portions of the floodwall where it would otherwise cross Louisiana Highway 657. An existing floodgate (vehicle gate) attached to the floodwall at the west side of the highway is closed during potential flood events but otherwise remains open. The existing floodwall west of the highway extends above the ground surface. The majority of the existing floodwall east of the highway is largely buried, although a small stretch immediately adjacent to the highway extends above the ground surface.

The segment of the subject reach of floodwall beginning at the floodgate (at west side of Hwy. 657) and continuing west for approximately 150 feet presently does not meet USACE requirements to prevent under-seepage. The same is true for the floodgate. That segment of the subject reach of the floodwall extending east/northeast from Highway 657 does not meet USACE minimum factor of safety criteria and has also settled below the authorized design elevation by as much as 3 feet. The new proposed compacted fill berms, floodwall, and floodgate would provide the required factor of safety and bring the subject floodwall reach to the authorized elevation. To maintain the existing line of protection and to limit the disruption the adjacent properties and utilities, a combination sheet pile wall/levee section was designed for this area.

The proposed action would involve several main construction components, as described in the following subsections.

1. A new floodwall (a steel sheet pile I-wall) would be constructed along the flood side of the existing floodwall, beginning approximately 50 feet east of Highway 657 and continuing eastward

approximately 450 feet until merging with the existing levee (levee Section F). The total length of new floodwall would be approximately 450 linear feet. The distance between the new floodwall and the existing floodwall (a sheet pile I-wall) would be approximately 4 feet. The top of the new floodwall would have an elevation of +10.4 feet NAVD88 (the authorized height) and the bottom of the new floodwall would have an elevation of -29.5 feet NAVD88.

2. Compacted fill berms (embankments) would be constructed adjacent to the majority of the new and existing floodwall in the subject reach on both the flood side and protected side of the floodwall. These berms would begin approximately 60 feet east of the northern end of the subject reach and would continue eastward to where the new floodwall will join the existing levee, excluding that area occupied by Highway 657. The total length of these barriers (berms) would be approximately 800 feet, while the width of the barriers would vary. The top of the compacted fill would have an elevation of +7.0 feet NAVD88 and would extend as a level surface for 10 feet on either side of the floodwall. The berms would then slope downward using varying side-slopes.

Concrete scour protection would be installed on the surface of the new berms situated along the protected side of the floodwall. Concrete scour protection would also be installed on the flood side of a short segment of the new floodwall where it ties into the levee. The scour protection would consist of a 6-inch thick layer of reinforced concrete. The flood side limits of the scour protection would terminate at approximately elevation +1 feet NAVD88. The protected side limits of the scour protection would terminate at approximately elevation +2 feet NAVD88 west of Highway 657 and elevation -1 foot NAVD88 east of Highway 657. Portions of the new berms not covered by the proposed scour protection would be protected with mulch and Bermuda grass seed.

The new earthen barriers or berms would include a clay cap to control seepage and would act as barge impact barriers and would serve to stabilize the new and existing floodwalls. The new barriers would further serve as erosion control from wave action.

3. Bracing would be installed along the existing floodwall beginning at the northern end of the subject reach (i.e. the point where the floodwall turns southward to run along the GIWW) and continuing southward for approximately 60 feet. This bracing is necessary to minimize impacts by marine traffic to the floodwall and is proposed instead of a compacted fill berm (see #2 above) to avoid interference with a private boat launch adjacent to the flood side of the floodwall. The bracing would consist of H-piles, driven to an elevation of approximately -120.0 feet NAVD88, along with horizontal beams and walers.

4. The Highway 657 floodgate (vehicle gate) would be modified in place. Approximately 50 linear feet of sheet pile would be driven across the roadway to an elevation of -29.5 feet NAVD88 and tied into the remaining sheet pile wall on either side of the roadway to prevent seepage. This new sheet pile floodwall would be incorporated into the gate monolith. Portions of the existing floodgate will need to be demolished to allow for the driving of approximately 1,920 feet of new H-piles required to resist the additional loading from restoring the wall to the authorized elevation. Upon completion of pile driving, the steel reinforcement will be epoxy anchored to the remaining existing slab. The Contractor would

place the remaining steel reinforcement and erect temporary forms for the placement of approximately 82 cubic yards of concrete used in the new slab and wall section. The floodgate itself would be retrofitted with approximate 2 feet of steel plate with stiffeners affixed to the top of the floodgate in order to reach the authorized elevation (i.e. +10.5 feet NAVD88).

5. A temporary jobsite offices and equipment storage area would be established on the flood side of the existing LGM levee, just north of the Highway 657 floodgate adjacent to the east side of the highway. This office/storage area would encompass approximately 0.2 acre within the existing LGM right-of-way and would be surrounded by a temporary chain-link fence. A gravel parking area may be constructed within this area; however it is possible that the entire office/storage area could be covered with gravel for ease of construction. During project construction, this area would be used to house temporary jobsite office structures (ex. small mobile homes or similar portable buildings) and for temporary storage of equipment and materials. The construction contractor would be required to return the area to its existing conditions when construction is complete, except as noted herein.

In addition to the temporary office/storage area discussed above, construction equipment and materials may be temporarily stored within the limits of construction west of the highway on the flood side of the floodwall. Part of this area falls within new right-of-way that would be acquired for the project while the remainder would fall within a temporary construction easement acquired for the project. This area presently encompasses a private paved parking area and a private boat launch

6. Presently, sheet flow runoff from certain lands situated on the flood side of the existing floodwall flows into existing drainage ditches D1, D2, and D3 (see Figure 3) which route the flow southward. An existing underground 24-inch diameter steel pipe extends from the south end of ditch D3 to the north end of existing drainage ditch D4, and passes through the existing floodwall. The pipe is equipped with a manhole riser and gate valve situated on the protected side of the floodwall. When the valve is open, the pipe carries flow from ditch D3 into ditch D4, then ditch D4 carries the flow into an existing borrow pit canal. The valve is manually closed when a potential flood event is anticipated.

Existing drainage ditches D2, D3, and D4 would be eliminated in their present state by the proposed action, as would be the existing steel pipe. To mitigate for this, new drainage ditches A and B would be constructed (see figure 2). Ditch A would have a bottom width of approximately 2 feet and 1:2 (vertical: horizontal) side slopes. Ditch B would have a bottom width of approximately 8 feet with variable side slopes (typically 1:5 on north side and 1:1 on south side). In addition, a new underground 24-inch diameter steel pipe, coated with coal tar epoxy paint, would be installed through the new floodwall. This pipe would extend from the south end of Ditch A to the north end of Ditch B. It would be equipped with a manhole riser and manual gate valve located on the protected side of the floodwall, similar to the existing pipe.

Silt fences would be installed along the limits of construction or closer to the limits of areas to be filled and excavated to minimize the transport of sediments from the job site. Where the proposed compacted fill berm and proposed drainage ditch B extends into the existing borrow pit, anchored

floating turbidity curtains would be installed along or near the limits of construction to minimize turbidity and the transport of sediments.

7. Construction of the proposed action would require approximately 14,000 cubic yards of compacted fill and approximately 4,000 cubic yards of un-compacted fill. Fill would be obtained from contractor-furnished commercially approved sources located outside the LGM levee system. The fill would be transported to the project site various existing roadways including Highway 657 and East Main Street in Larose. The fill source (borrow site) utilized by the construction contractor would have to demonstrate compliance with the National Environmental Policy Act (NEPA) prior to the contractor's use of the borrow site.

Construction of the proposed action would require approximately 650 cubic yards of concrete, and approximately 72 cubic yards of gravel (aggregate). The gravel and concrete aggregate would be obtained from duly licensed quarries and processing facilities. Construction would also involve excavating approximately 900 cubic yards of soil/earth at the project site. Excavated material would be re-used as un-compacted fill or structural backfill if the materials meet the requirements of the specifications. All unsuitable material would become the property of the Contractor and would be hauled to an appropriate offsite disposal facility.

It is estimated that the total duration of project construction activities would be approximately 8 months. Near the close of the project, the temporary buildings used in the office/staging area parcel would be removed as would be the fencing surrounding this area. The gravel road, gravel parking area, and geotextile fabric installed beneath these areas would be removed and the areas disturbed by these features would also be restored.

The total area encompassed within the proposed project limits of construction would be approximately 8 acres. The composition of this total area would be as follows (all acreages are approximate):

- Existing LGM right-of-way = 6.10 acres.
- New additional LGM right-of-way to be acquired = 0.95 acres.
- Temporary construction easements (areas outside existing and new additional LGM right-of-way) = 0.95 acres

The proposed action is located in Larose, in Lafourche Parish, Louisiana (see Figure 1). Of the 21 listed Endangered (E) or Threatened (T) plant or animal species listed in Louisiana, 8 animal species potentially occur in Lafourche Parish. These animal species are; piping plover (T), West Indian manatee (E); Gulf sturgeon (T); green sea turtle (T), loggerhead sea turtle (T), leatherback sea turtle (E), hawksbill sea turtle (E), and Kemp's Ridley sea turtle (E). As piping plovers prefer muddy flats or non-vegetated shorelines, they are expected to only be rare migratory visitors in the general project area. The listed marine species, the manatee and the five sea turtles, are not expected to occur in the immediate project area. Sea turtles are rare in Louisiana's inshore waters and most reported occurrences are in offshore waters (USACE, 1992). The West Indian manatee is not expected to occur in the project area as their

typical range is further east, and their preferred habitats are open waters, bays, and rivers. Although manatees could theoretically utilize the GIWW on a transient basis, the probability of such usage appears low given the location of these canals relative to the typical manatee range and the limited food resources within these canals. In any event, the proposed action will not impact areas below ordinary high water. There is a possibility that construction materials or equipment may be delivered to the project site via waterborne transportation. However, the GIWW is a commercial navigation route used for this purpose.

Based on this information, MVN finds that the proposed activity will have "No Effect" to any listed endangered and/or threatened species or their critical habitats. Under Section 7 coordination of the Endangered Species Act, the MVN requests your concurrence with the MVN determination for the proposed action as shown on the attached diagrams.

Should you require any further assistance, please call Mr. Howard Ladner at (504) 862-2021 or e-mail at [howard.w.ladner@usace.army.mil](mailto:howard.w.ladner@usace.army.mil).

Sincerely,

Howard Ladner  
Biologist, USACE

**BOBBY JINDAL**  
GOVERNOR



**STEPHEN CHUSTZ**  
INTERIM SECRETARY

**State of Louisiana**  
**DEPARTMENT OF NATURAL RESOURCES**  
**OFFICE OF COASTAL MANAGEMENT**

January 22, 2013

JAN 28 2013

Chris Koeppel  
Acting Chief, Environmental Planning Branch  
Corps of Engineers- New Orleans District  
P.O. Box 60267  
New Orleans, LA 70160-0267

RE: **C20100106 Mod 3, Coastal Zone Consistency**  
**New Orleans District, Corps of Engineers**  
Direct Federal Action  
EA #509 Larose floodwall repair Phase II (LGM 022B), **Lafourche Parish, Louisiana**

Dear Mr. Koeppel:

The above referenced modification has been reviewed for consistency with the Louisiana Coastal Resources Program in accordance with Section 307 (c) of the Coastal Zone Management Act of 1972, as amended. The modification, as proposed in this application, is consistent with the LCRP.

If you have any questions concerning this determination please contact Brian Marcks of the Consistency Section at (225) 342-7939 or 1-800-267-4019.

Sincerely,

A handwritten signature in cursive script that reads "Keith Lovell".

Keith Lovell  
Acting Administrator  
Interagency Affairs/Field Services Division

KOL/JDH/bgm

cc: Archie Chaisson, Lafourche Parish  
Debra Wright, COE-NOD  
David Butler, LDWF  
Kirk Kilgen, OCM FC



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

REPLY TO  
 ATTENTION OF

November 9, 2012

Regional Planning and  
 Environment Division, South  
 New Orleans Environmental Branch

Pam Breaux  
 State Historic Preservation Officer  
 Louisiana Office of Cultural Development  
 P.O. Box 44247  
 Baton Rouge, LA 70804-44247

No known historic properties will be affected by this undertaking. This effect determination could change should new information come to our attention.

*Pam Breaux* 11-19-12  
 Pam Breaux Date  
 State Historic Preservation Officer

**RE: Request to Continue Consultation Pursuant to Section 106 of the National Historic Preservation Act for the Proposed Project to Correct Deficiencies in the Existing Gulf Intracoastal Waterway (GIWW)/Larose Floodwall, Lafourche Parish, Louisiana.**

Dear Ms. Breaux:

The U.S. Army Corps of Engineers (USACE), New Orleans District (CEMVN), is proposing to correct deficiencies in the existing Gulf Intracoastal Waterway (GIWW)/Larose Floodwall and elevate the wall to its authorized elevation, +10.4 feet NAVD88. The Area of Potential Effect (APE) is the GIWW/Larose Floodwall located at the intersection of Louisiana Highway 657 and Mercer Road in Larose, Louisiana. The floodwall begins near the confluence of Bayou Lafourche and the GIWW (south of the proposed action), then runs northward along the east side of the GIWW for roughly 4,475 feet. It then turns toward the southeast away from the GIWW and continues for roughly another 940 feet before it merges into the earthen Larose to Golden Meadow levee system. The APE is identified as the "Limits of Construction" on the enclosed drawing.

The proposed action only involves the segment (reach) of floodwall beginning at the northern terminus of the floodwall segment bordering the GIWW and extending inland from this point to where it merges with the levee. This reach includes a "gap" in the above-ground portions of the floodwall where it would otherwise cross Louisiana Highway 657. An existing floodgate (vehicle gate) attached to the floodwall at the west side of the highway is closed during potential flood events but otherwise remains open. The existing floodwall west of the highway extends above the ground surface. The majority of the existing floodwall east of the highway is largely buried, although a small stretch immediately adjacent to the highway extends above the ground surface. The segment of the reach of floodwall beginning at the floodgate (at west side of Hwy. 657) and continuing west for approximately 150 feet does not meet USACE requirements to prevent under-seepage. The same is true for the floodgate. The segment of the reach of the floodwall extending east/northeast from Highway 657 does not meet USACE minimum factor of safety criteria and has also settled below the authorized design elevation by as much as 3 feet.



# Choctaw Nation of Oklahoma

P.O. Box 1210 • Durant, OK 74702-1210 • (580) 924-8280

Gregory E. Pyle  
Chief

Gary Batton  
Assistant Chief

December 28, 2012

John Exnicios  
Chief, Environmental Branch  
Corp of Engineers, New Orleans District  
P.O. Box 60267  
New Orleans, LA 70160-0267

**RE: Corp of Engineers, Mobile District, Proposed Project to correct Deficiencies in the Existing Gulf Intracoastal Waterway Larose Floodwall, Lafouche Parish, LA.**

Dear Mr. Exnicios,

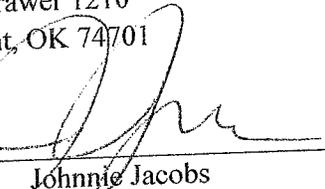
Thank you for your correspondence regarding the above-reference project. Lafouche Parish is outside of the Choctaw Nation of Oklahoma's area of historic interest. We respectfully defer to the other Tribes that have been contacted.

Please feel free to contact me with any questions or concerns.

Sincerely,

Dr. Ian Thompson  
Director, Historic Preservation Department  
Tribal Archaeologist, NAGPRA Specialist  
Choctaw Nation of Oklahoma  
PO Drawer 1210  
Durant, OK 74701

By: \_\_\_\_\_

  
Johnnie Jacobs  
Section 106 Coordinator  
[jjacobs@chocnawnation.com](mailto:jjacobs@chocnawnation.com)

*Choctaws... growing with pride, hope and success!*



## United States Department of the Interior

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



January 31, 2013

Colonel Edward R. Fleming  
District Commander  
U.S. Army Corps of Engineers  
Post Office Box 60267  
New Orleans, Louisiana 70160-0267

Dear Colonel Fleming:

Please reference the Larose to Golden Meadow Hurricane Protection Project (LGM), Lafourche Parish, Louisiana (formerly Grand Isle, Louisiana, and Vicinity Hurricane Protection Project). The proposed action was authorized by the Flood Control Act of 27 October 1965, House Document No. 184, 89<sup>th</sup> Congress (PL-89-298). The authorized project was to provide 100-year level of hurricane and storm damage risk reduction to the communities located on along Bayou Lafourche between Larose and Golden Meadow, in accordance with the recommendation of the Chief of Engineers in his report entitled "Grand Isle and Vicinity, Louisiana." The proposed project consists of replacement of a flood wall and floodgate to improve flood protection along the Gulf Intracoastal Waterway (GIWW). This report provides the Service's assessment of impacts and, if any, recommendations to minimize project impacts to fish and wildlife resources.

The U.S. Fish and Wildlife Service (Service) provided to the United States Army Corps of Engineers (Corps) a May 20, 1985, Fish and Wildlife Coordination Act (FWCA; 48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) report that addressed the hurricane protection improvements that were authorized and have since been constructed. The Service also provided a February 16, 2011, report that addressed the Louisiana Offshore Oil Platform floodgate replacement. This draft report supplements our previous reports, but does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. A copy of this report was provided to the Louisiana Department of Wildlife and Fisheries (LDWF) and the National Marine Fisheries Service (NMFS); their comments, if any, will be incorporated into our final report.

### DESCRIPTION OF THE STUDY AREA

The study area is located in the southern portion of Lafourche Parish within the Mississippi River Deltaic Plain of the Lower Mississippi River Ecosystem. Higher elevations occur on the natural levees of Bayou Lafourche 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 constructed for flood protection purposes, often with negative effects on adjacent wetlands.

Bayou Lafourche and the GIWW are prominent landscape features, as are extensive oil and gas industry access channels and pipeline canals which cross the extensive wetlands and associated shallow open waters outside of the flood control levees. Bayou Lafourche was historically the Mississippi River channel.

## FISH AND WILDLIFE HABITATS AND RESOURCES

Habitat types in the project area include forested wetlands (i.e., bottomland hardwood and swamp in varying successional stages), non-wet bottomland hardwoods, marsh, open water, and developed areas. Due to development and a forced-drainage system, and impoundment due to roads and levees, the hydrology of most of the forested habitat within the levee system has been altered. The forced-drainage system has been in operation for many years, and subsidence is evident throughout the areas enclosed by levees. The invasive Chinese tallow-tree has also supplanted the recruitment of native species in some of the forests. The forested areas to be impacted by this project are found on Schriever clay which is associated with this abandoned river channel.

As previously mentioned, the Service provided a FWCA Report for the authorized hurricane protection project. That report contains a thorough 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 information is provided to supplement the previously mentioned reports and provide specific recommendations regarding the new alternatives and selected plan.

## DESCRIPTION OF SELECTED PLAN

The purpose of the proposed plan is to correct deficiencies in the GIWW/Larose Floodwall (floodwall) and elevate the wall to its authorized elevation, i.e., +10.4 feet North America Vertical Datum (NAVD) 88. The floodwall is part of the 48-mile LGM Hurricane Protection Project and consists of approximately 5,000 linear feet of floodwall (Figure 1). This floodwall begins near the intersection of Bayou Lafourche and the GIWW and parallels the GIWW for roughly 4,475 feet but then turns toward the southeast away from (perpendicular) the GIWW and continues for approximately another 940 feet before it merges into the earthen levee system.

The proposed project only involves that floodwall segment (reach) that is perpendicular to the GIWW. This reach includes where the floodwall crosses Louisiana Highway 657. An existing floodgate attached to the floodwall at the west side of the highway is closed during potential flood events but otherwise remains open. Portions of this segment and the floodgate do not meet either Corps requirements to prevent under-seepage, project authorized elevations or safety factors.

A new floodwall (a steel sheet pile I-wall) would be constructed along the flood side of the existing floodwall, beginning approximately 100 feet east of Highway 657 and continuing eastward approximately 450 feet until merging with the existing levee. The distance between the new floodwall and the existing floodwall (a sheet pile I-wall) would be approximately 4 feet. Compacted fill berms (embankments) would be constructed adjacent to most of the new and existing floodwall on both the sides of the floodwall. The total length of these barriers (berms)

would be approximately 800 feet, while the width of the barriers would vary. Concrete scour protection would be installed on the surface of the new berms along the protected side of the floodwall. The new earthen barriers/berms would include a clay cap to control seepage, act as barge impact barriers, serve to stabilize the new and existing floodwalls and would further serve as erosion control from wave action. Bracing necessary to minimize impacts by marine traffic to the floodwall would be installed along the existing floodwall segment that is perpendicular to the GIWW. The Highway 657 floodgate (vehicle gate) would be modified in place with linear sheet pile being driven below the roadway. The floodgate itself would be retrofitted with approximately 2 feet of steel plate to the top of the floodgate in order to reach the authorized elevation. Silt fences and anchored floating turbidity curtains would be installed along or near the limits of construction to minimize turbidity and the transport of sediments.

Construction of the proposed action would require approximately 14,000 cubic yards of compacted fill and approximately 4,000 cubic yards of un-compacted fill. Fill would be obtained from contractor-furnished commercially approved sources located outside the LGM levee system. The borrow site utilized by the contractor would have to demonstrate compliance with the National Environmental Policy Act (NEPA) prior to the use of the borrow site. It is estimated that the total duration of project construction activities would be approximately 8 months.

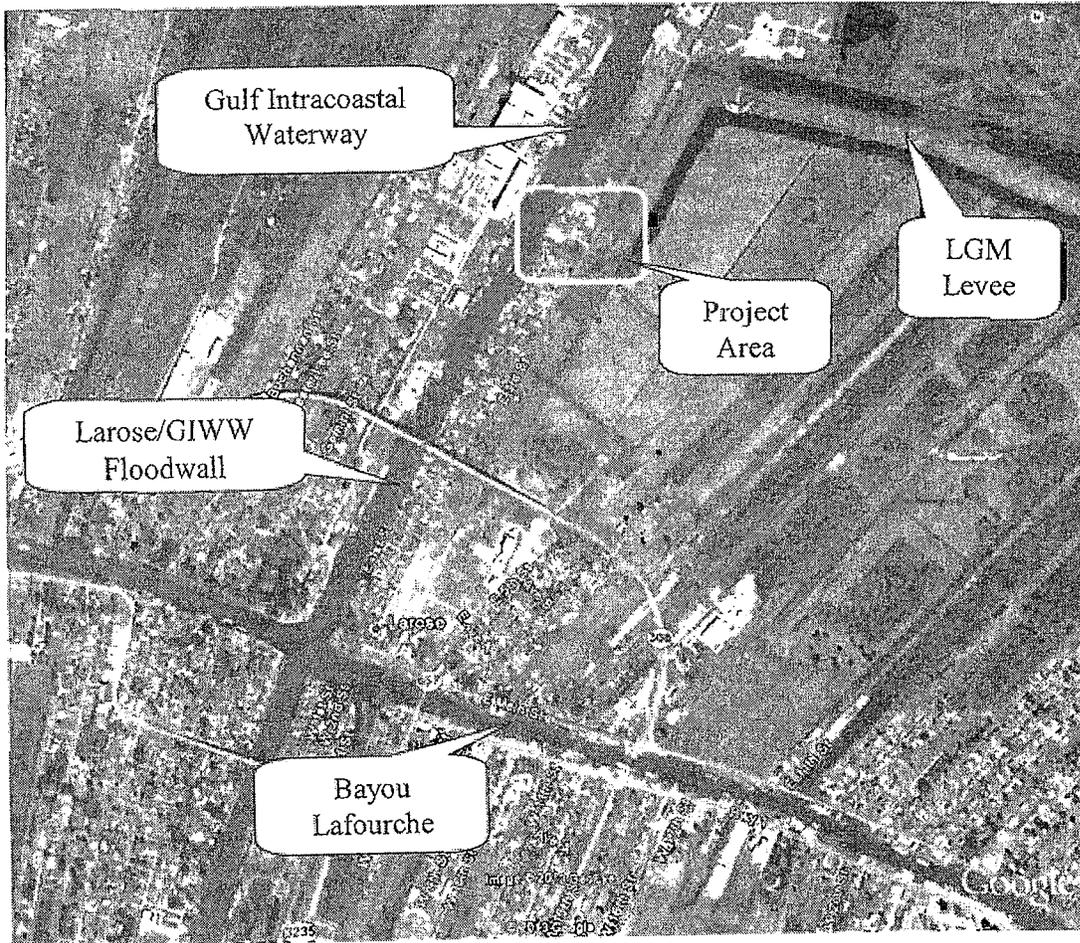


Figure 1. Proposed Project Location (provided by the Corps)

## OTHER ALTERNATIVES CONSIDERED

While the no-action alternative would not result in any additional impacts it would not have provided the Congressionally authorized level of protection; therefore, this alternative was rejected from consideration. The other two alternatives deep-soil mixing and a new sheet pile I-wall were eliminated because of additional costs, difficulties, and interim nature of the deep-soil mixing alternative and no additional benefits from a new sheet pile I-wall over the proposed plan. Because no other alternative offered an environmentally less damaging alternative the Service did not support or recommend another less damaging alternative.

## EVALUATION METHODS FOR THE SELECTED PLAN

The Service used the Habitat Assessment Methodology (HAM) model to quantify the impacts to forested habitat. That habitat assessment model is modified from those developed in the Service's Habitat Evaluation Procedures (HEP), however, a community-level evaluation is utilized instead of the species-based approach used with HEP. For each habitat type, a model defines 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). A Habitat Suitability Index (HSI) is calculated from all of the model variables to represent the overall value of the wetland habitat quality. The product of an HSI value and the acreage of available habitat for a given target year is known as the Habitat Unit (HU), and is the basic unit for measuring project effects on fish and wildlife habitat. HUs are annualized over the project life (i.e., 50 years) to determine the Average Annual Habitat Units (AAHUs) available for each habitat type. The change (increase or decrease) in AAHUs for the future with-project scenario, compared to the future without-project conditions, provides a measure of anticipated impacts. A net gain in AAHUs indicates that the project is beneficial to the fish and wildlife community within that habitat type; a net loss of AAHUs indicates that the project would adversely impact fish and wildlife resources. Further explanation of how impacts/benefits are assessed and an explanation of the assumptions affecting the HSI values for each target year are available for review at the Service's Louisiana Ecological Services Office.

## PROJECT IMPACTS

The proposed project would require clearing much of the existing right-of-way on either side of the existing floodwall and levee. Some disturbed/early successional bottomland hardwood would be cleared along with some fresh marsh fringing the borrow pit. Our analyses indicate that project implementation would directly impact 0.35 acres of disturbed bottomland hardwoods resulting in the loss of 0.13 AAHUs; even less fresh marsh would be impacted.

## MITIGATION 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.

In a 1986 Environmental Assessment, a mitigation project was selected for the LGM Hurricane Protection Project. The mitigation project was designed to compensate for various direct and indirect impacts to fish and wildlife habitat associated with construction of the entire LGM levee system. Impacted habitats included fresh/intermediate marsh, bottomland hardwood and swamp.

In determining the mitigation necessary, it was assumed that all habitats present within the existing LGM right-of-way would be eliminated by the direct impacts associated with project construction. Additionally, all habitats present on the protected side of the LGM right-of-way were assumed to be almost completely lost over the 100-year period-of-analysis as a result of indirect impacts associated with project construction and future development. The authorized and implemented mitigation program would, over time, fully compensate for these direct and indirect impacts.

The Service in our most recent report (February 2011) acknowledged a reported excess of mitigation credits because of a previous levee re-alignment that reduced impacts (see Corps Environmental Assessment #157, 1991). Upon examining aerial photographs and land-loss data that included the mitigation area the Service is no longer certain excess credits have accrued. Restoration of lower salinities and re-vegetation within the mitigation area were the basis for mitigation credit gains; it is uncertain whether such changes have yet to begin occurring and achieving the intended mitigation benefits.

The proposed action would directly impact disturbed/early successional bottomland hardwood and fresh marsh fringing the borrow pit within the protected side of the LGM right-of-way. The 1986 mitigation project previously compensated for impacts to habitats within the LGM right-of-way.

## SERVICE POSITION AND RECOMMENDATIONS

The Service does not object to the construction of the proposed project provided that the following recommendations are incorporated into future project planning and implementation:

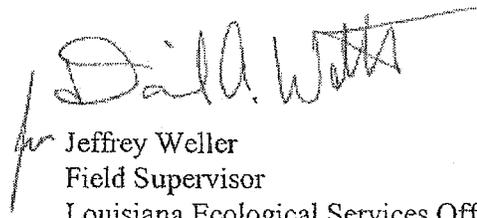
1. To the greatest extent possible, floodwall features should be located such that destruction of wetlands or forested areas be avoided or minimized.
2. Forest clearing associated with project features should be conducted during the fall or winter to minimize impacts to nesting migratory birds, when practicable.
3. 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 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.

4. If any future proposed project features would result in impacts to wetlands or non-wet bottomland hardwood, the Corps shall reinstate coordination with this office. At that time, the Service may recommend measures to avoid or minimize such impacts and/or may recommend appropriate mitigation for the additional impacts.

Should you or your staff have any questions regarding this letter and our attached report, please contact David Castellanos (337/291-3112) of this office.

Sincerely,

  
for Jeffrey Weller  
Field Supervisor  
Louisiana Ecological Services Office

cc: USACE, CEMVN-PDR-RS, New Orleans, LA (Attn: Mr. Clay Carithers)  
National Marine Fisheries Service, Baton Rouge, LA  
EPA, Dallas, TX  
LA Dept. of Wildlife and Fisheries, Baton Rouge, LA  
LADNR, CMD, Baton Rouge, LA  
OCPR, Baton Rouge, LA  
South Lafourche Levee District, Galliano, LA



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

REPLY TO  
ATTENTION OF

Regional Planning and  
Environment Division, South  
New Orleans Environmental Branch

**DRAFT FINDING OF NO SIGNIFICANT IMPACT  
(DFONSI)**

**LAROSE TO GOLDEN MEADOW HURRICANE PROTECTION PROJECT:  
Larose Floodwall Repair Phase II (LGM 022B)**

**Environmental Assessment (EA) #509**

Description of Proposed Action: The U.S. Army Corps of Engineers, New Orleans District (CEMVN), proposes to correct deficiencies in the GIWW/Larose Floodwall and elevate the wall to its authorized elevation, +10.5 feet NAVD88. The GIWW/Larose Floodwall is part of the 48-mile LGM Hurricane Protection Project and consists of approximately 5,000 linear feet of floodwall. This floodwall begins near the confluence of Bayou Lafourche and the GIWW (south of the proposed action), then runs northward along the east side of the GIWW for roughly 4,475 feet. It then turns toward the southeast away from the GIWW and continues for roughly another 940 feet before it merges into the earthen LGM levee system.

Primary work activities associated with the proposed action would include: construction of a new floodwall (a steel sheet pile I-wall) along the flood side of the existing floodwall; construction of compacted fill berms (embankments) adjacent to the new floodwall, installation of concrete scour protection on the surface of the new berms; installation of bracing (H-piles); and modification of the Highway 657 floodgate (vehicle gate).

Eight (8) acres are within the limits of construction. Of this total, 6.7 acres of upland resources and 0.35 wetlands (bottomland hardwood wet) would be impacted. Project construction would directly impact 4.17 acres (proposed embankment and scour protection). Existing right-of-way is 6.10 acres and new required right-of-way is 0.95 acres. Borrow would be obtained from a contractor furnished borrow site.

Factors Considered in Determination: This office is assessing the impacts of the proposed action on important resources, including wetlands, forests, wildlife, fisheries, threatened and endangered species, cultural, environmental justice, recreation, and aesthetics. No significant impacts have been identified for any of the important resources. The risk of encountering HTRW is low.

A mitigation program for the overall LGM Hurricane Protection Project was authorized in 1986 and was subsequently implemented. In a letter dated January 31, 2013 the U.S. Fish and Wildlife Service (USFWS) stated that the proposed action would directly impact disturbed/early successional bottomland hardwood and fresh marsh within the protected side of the LGM right-of-way; however, no additional mitigation was needed. The 1986 mitigation project previously compensated for impacts to habitats within the LGM right-of-way.

In a letter dated December 10, 2012, USFWS concurred that the proposed action is not likely to adversely affect any endangered or threatened species. In a letter dated January 22, 2013, the Louisiana Department of Natural Resources concurred with the determination that the proposed action is consistent, to the maximum extent practicable, with the Louisiana Coastal resources Program. A State Water Quality Certificate, dated January 24, 2013 was received from the Louisiana Department of Environmental Quality. Public review of the Section 404(b)(1) Public Notice will be completed concurrent with Public Review of the EA. The Section 404(b)(1) evaluation will be signed following completion of this public review. Letters were mailed on November 9, 2012 to the Louisiana State Historic Preservation Officer (LSHPO) and to federally recognized tribes. In a letter dated November 19, 2012, the LSHPO concurred with a recommendation of no effect on historic properties. In a letter dated December 28, 2012, the Choctaw Nation of Oklahoma stated that the Lafouche Parish is outside of the Choctaw Nation of Oklahoma's area of historic interest and deferred to other Tribes that have been contacted. This office has concurred with, or resolved, all Fish and Wildlife Coordination Act recommendations contained in a letter from the USFWS, dated January 31, 2013. This office will concur with, or resolve, all comments submitted during the comment period for EA #509.

Environmental Design Commitments. The following commitments are an integral part of the proposed action:

- 1.) If the proposed action is changed significantly or is not implemented within one year, the CEMVN will reinitiate coordination with the USFWS to ensure that the proposed action would not adversely affect any Federally-listed threatened or endangered species, or their habitat. [Coordination Act Report, January 31, 2013]
- 2.) If any unrecorded cultural resources are determined to exist within the proposed project boundaries, then no work will proceed in the area containing these cultural resources until a CEMVN staff archeologist has been notified and final coordination with the LSHPO and Tribal Historic Preservation Officer has been completed.
- 3.) If any future proposed project features would result in impacts to wetlands and/or non-wet bottomland hardwood, the CEMVN shall reinitiate coordination with the USFWS. At that time, the USFWS may recommend measures to avoid or minimize such impacts and/or may recommend appropriate mitigation for the additional impacts [Coordination Act Report, January 31, 2013]
- 4.) Public Involvement. The proposed action has been coordinated with appropriate Federal, state, and local agencies and businesses, organizations, and individuals through distribution of EA #509 for their review and comment. EA #509 is attached hereto and made a part of this FONSI.

Conclusion. This office is assessing the potential environmental impacts of the proposed action. Based on this assessment, which is attached hereto and made a part hereof, a review of the comments made on EA #509, and the implementation of the environmental design commitments listed above, a determination could be made that the proposed action would have no significant impact on the human environment. Therefore, a Supplemental Environmental Impact Statement would not be prepared.

DRAFT

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Date

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Edward R. Fleming  
Colonel, U.S. Army  
District Commander