

**DRAFT INDIVIDUAL ENVIRONMENTAL REPORT
SUPPLEMENTAL**

LAKE PONTCHARTRAIN AND VICINITY

NEW ORLEANS EAST LAKEFRONT TO MICHOUD CANAL

ORLEANS PARISH, LOUISIANA

IERS #7



**US Army Corps
of Engineers®**

March 2010

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1. INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Mississippi Valley Division, New Orleans District (CEMVN), has prepared this Individual Environmental Report Supplemental #7 (IERS #7) to evaluate the potential impacts associated with the proposed project modifications to the original IER #7. The proposed project modifications are located in Orleans Parish, Louisiana. For the purposes of this IER Supplemental, the proposed project modifications are shown by reaches. Each reach is identified by a project identification number (e.g., LPV 109). Only those reaches associated with the proposed project revisions, referred to as the proposed action throughout this Supplemental, are discussed in this document.

On June 19, 2009, the District Commander signed the Decision Record for IER #7. IER #7 is hereby incorporated by reference into this supplemental document. Copies of the document and other supporting information are available upon request or at www.nolaenvironmental.gov. This supplemental document has been prepared to address proposed changes in the Government's approved plan.

1.1 PRIOR REPORTS

A number of studies and reports on water resources development in the proposed project area have been prepared by the USACE, other Federal, state, and local agencies, research institutes, and individuals. Pertinent studies, reports and projects completed since June 2009 are discussed below:

- On 8 February 2010, the CEMVN Commander signed a Decision Record on IER #9 entitled "Caernarvon Floodwall, St. Bernard Parish, Louisiana." The document was prepared to evaluate the potential impacts associated with realignment of Caernarvon Floodwall to the west of the existing alignment.
- On 8 February 2010, the CEMVN Commander signed a Decision Record on IERS #6 entitled "East Citrus Lakefront Levee, Orleans Parish, Louisiana." The document was prepared to evaluate the potential impacts associated with the addition of a floodwall in lieu of raising the existing levee, which was evaluated in IER #6.
- On 22 January 2010, the CEMVN Commander signed a Decision Record on IER #32 entitled, "Contractor-Furnished Borrow Material #6, Ascension, Plaquemines, and St. Charles Parishes, Louisiana." The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors as a result of excavating borrow areas for use in construction of the HSDRRS.
- On 18 December 2009, the CEMVN Commander signed a Decision Record on IERS #3a entitled, "Jefferson East Bank, Jefferson Parish, Louisiana." The document was prepared to evaluate the impacts associated with construction of wave attenuation berms and

foreshore protection along the Jefferson Parish lakefront and a T-wall, overpass bridge, and traffic detour lane bridge spans at the Causeway Bridge abutment.

- On 10 December 2009, the CEMVN Commander signed a Decision Record on IERS #11 Tier 2 Borgne entitled “Improved Protection on the Inner Harbor Navigation Canal, Orleans and St. Bernard Parishes, Louisiana.: The document was prepared to evaluate the potential impacts associated with construction of a vertical lift gate in lieu of the previously approved sector gate on Bayou Bienvenue within the Lake Borgne Barrier.
- On 5 November 2009, the CEMVN Commander signed a Decision Record on IERS #2 entitled “West Return Floodwall, Jefferson and St. Charles Parishes, Louisiana.” The document was prepared to evaluate the potential impacts associated with replacement of the existing floodwall along the east embankment of the Parish Line Canal with a new T-wall approximately 35 feet west of the current alignment.
- On 28 September 2009, the CEMVN Commander signed a Decision Record on IER #30 entitled “Contractor-Furnished Borrow Material #5, St. Bernard and St. James Parishes, Louisiana, and Hancock County, Mississippi.” The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors as a result of excavating borrow areas for use in construction of the HSDRRS.
- On 20 September 2009, the CEMVN Commander signed a Decision Record on IER #29 entitled “Contractor-Furnished Borrow Material #4, Orleans, St. John the Baptist, and St. Tammany Parishes, Louisiana.” The document was prepared to evaluate the potential impacts associated with the actions taken by commercial contractors as a result of excavating borrow areas for use in construction of the HSDRRS.
- On 31 July 2009, the CEMVN Commander signed a Decision Record on IER # 28, entitled, “Government-Furnished Borrow Material #4, Plaquemines, St. Bernard and Jefferson Parishes, Louisiana.” The document evaluates the potential impacts associated with approving government-furnished borrow areas and an access route for use in construction of the HSDRRS.
- On 30 June 2009, the CEMVN Commander signed a Decision Record on IER # 5 entitled “Lake Pontchartrain and Vicinity, Permanent Protection System for the Outfall Canals Project on 17th Street, Orleans Avenue, and London Avenue Canals, Jefferson and Orleans Parishes, Louisiana.” The document evaluates the potential effects associated with the construction and maintenance of a permanent protection system for the 17th Street, Orleans Avenue, and London Avenue Canals.
- On 29 June 2009, the CEMVN signed a Decision Record on Individual Environmental Report Supplemental (IERS) # 1 entitled “Lake Pontchartrain and Vicinity, La Branche Wetlands Levee, St. Charles Parish, Louisiana.” The supplemental document evaluates the potential effects associated with the proposed project revisions to the original IER #1.

- On 23 June 2009, the CEMVN signed a Decision Record on IER # 8 entitled “Lake Pontchartrain and Vicinity, Bayou Dupre Control Structure, St. Bernard Parish, Louisiana.” The document evaluates the potential effects associated with the proposed improvement or replacement of a flood control structure on Bayou Dupre.
- On 25 June 2009, the CEMVN signed a Decision Record on IER # 6 entitled “Lake Pontchartrain and Vicinity, New Orleans East Citrus Lakefront Levee, Orleans Parish, Louisiana.” The document evaluates the potential effects associated with proposed improvements to three reaches of the East Orleans Hurricane Risk Reduction Levee that were originally constructed as part of the LPV project.
- On 19 June 2009, the CEMVN signed a Decision Record on IER # 7 entitled “Lake Pontchartrain and Vicinity, New Orleans Lakefront to Michoud Canal, Orleans Parish, Louisiana.” The document evaluates the potential effects associated with proposed improvements to three reaches of the East Orleans Hurricane Risk Reduction Levee that were originally constructed as part of the LPV project.

2. ALTERNATIVES

2.1 DESCRIPTION OF THE ALTERNATIVES

At the time of the completion of the original IER #7 report, engineering designs had not been finalized for all of the actions and alternatives. Since that time, engineering details of the action have been further developed and revised. Therefore, the changes to the action that could result in further impact to the natural or human environment are being addressed in this IER Supplemental.

No Action. Under the no action alternative, the Government-approved action as described in IER #7 would be constructed.

Proposed Action. Changes to the Government-approved action include the following:

- a temporary traffic control bridge on Interstate 10 (I-10) across Irish Bayou within the LPV 109 reach
- the expansion of the limits of construction of the LPV 109 levee/highway tie-ins and at the Highway 90 and Interstate 10 crossings
- temporary road closure on Highway 11
- expansion of the LPV 111 limits of work to include the entire existing Right-of-way
- barge access locations along LPV 111
- construction of T-wall along portion of LPV 111 reach
- raising and relocation of U.S. Fish and Wildlife Service (USFWS) pump stations on LPV109 and LPV 111, and provision of temporary pumps during construction

2.2 PROPOSED ACTION

The proposed work would include two reaches within the larger IER #7 project area. LPV 109 runs from the northeast corner of the New Orleans East Lakefront Levee (also known as Southpoint) to the CSX Railroad (denoted as LPV 110 on figure 1). LPV 111 runs from the CSX railroad to the Michoud Canal, along the Gulf Intracoastal Waterway (figure 1).

LPV 109: I-10 Crossing

IER 7 described the authorized I-10 crossing to include the raising of the existing levee structure and highway earthen ramp to the 100-year level of risk reduction, with a minimum net elevation of +19.0 feet NAVD 88. Further analysis determined that an elevation of +16.5 feet NAVD 88 would be necessary to reach the 100-year level of risk reduction. IER 7 also provided limits of work for the I-10 crossing. However, as designs were further developed for this reach, the need for expanded limits of work was revealed and a temporary traffic control bridge across Irish Bayou is now proposed to complete the project. The expanded limits of work are needed to accommodate temporary construction easements during construction and permanent ramp side slopes. The temporary bridge is needed to accommodate the traffic control plan given the geometry of the raised ramp.

The Louisiana Department of Transportation and Development (LADOTD) requires compliance with their design criteria for a 60 mile per hour detour to ensure public safety. Various alternatives that would shift traffic from the detour to the existing traffic lanes before the bridges were considered in order to avoid the need for a temporary bridge detour structure. However, those alternatives could not be designed without violation of one or more of LADOTD's design criteria. The horizontal curvature at which any lane shifts can occur during construction of the I-10 crossing is dictated by DOTD standards, to ensure that the lane shift can be safely driven given the road's slope and speed limit, among other factors. The LADOTD standards require a minimum horizontal curve (thus length) to shift detour lanes which cannot be accommodated between the I-10 crossing and the existing Irish Bayou Bridge. The only alternative that meets the design criteria requires a 1500 foot detour shift using the median as the detour, and a temporary bridge structure. A temporary bridge provides the safest detour route for the travelling public and minimizes the potential for vehicular accidents.

The I-10 is designated as the primary hurricane evacuation route from the New Orleans area to the east. The LADOTD requested that all six lanes of travel remain open during construction to accommodate emergency operations and maintain the highway's current capacity for daily traffic flow. I-10 is a six lane divided highway. Both eastbound and westbound sections consist of three 12-foot lanes and two 10-foot shoulders that are separated by a 40-foot median. The construction of the raise will be divided into 3 phases. The ramp construction includes a temporary traffic control plan to provide a minimum of three traffic lanes in each direction continuously through the life of the construction project.

In phase 1, westbound traffic will be shifted south onto the existing median and the eastbound pavement will be widened to accommodate six lanes of traffic. All six temporary lanes would be reduced in width and separated by a temporary concrete traffic barrier. During construction to the new height, a temporary retaining wall would be constructed to facilitate the construction of the raised profile of the westbound lanes. Three 12-foot lanes and the outside 12-foot shoulder would also be constructed during this phase. In phase 2, westbound traffic would be shifted to the new pavement and the eastbound traffic would move to the temporary pavement constructed in the median during phase 1 (figure 2). Again a temporary retaining wall would be constructed to facilitate the construction of the raised profile of the eastbound lanes, and three 12-foot lanes and the outside 12-foot shoulder would be constructed in phase 2. In phase 3, the eastbound traffic would be moved to their permanent location. The inside median, once used for temporary traffic lanes, would be raised to the elevation of the new driving surface, and the remaining 12-foot inside shoulders would be constructed.

The length required for shifting traffic to the median was inadequate in the original design; a detour could not be constructed under the constraints of complying with Louisiana Department of Transportation and Development (LADOTD) design criteria, and staying within the original IER 7 limits of construction by avoiding the existing bridges. Constructing a temporary bridge structure across Irish Bayou between the existing bridges is necessary because it allows the traffic shifts to extend beyond the existing bridges, and proceed through the construction zone in a safe and acceptable manner.

The temporary bridge across Irish Bayou would be approximately 400 feet long, and consist of four 100 foot spans, supported on 2 bents per span with 4 steel piles each. The bridge would be approximately 43 feet wide and transition to the temporary roadway surface with 2 abutments each supported on 8 steel piles at the bank line (figure 3). The existing riprap along the bank of Irish Bayou and natural ground at the abutments would be cleared of vegetation and approximately 700 cubic yards of fill would be used to bring the natural ground surface up to the required temporary roadway surface. All work would take place within existing LADOTD Right-of-Way (ROW).

It is anticipated that the abutments would be constructed first. The first bents would be constructed from the bank and the first span would be put in place. Other span and supports would be built using the previous spans as a working surface. The temporary bridge would be required for approximately 18 months. The contractor would be required to deconstruct the temporary bridge and return the affected site back to its pre-construction condition at the end of the construction. Equipment used will include but not limited to: bulldozers, compactors, dump trucks, concrete mixers, cranes and pile driving equipment.

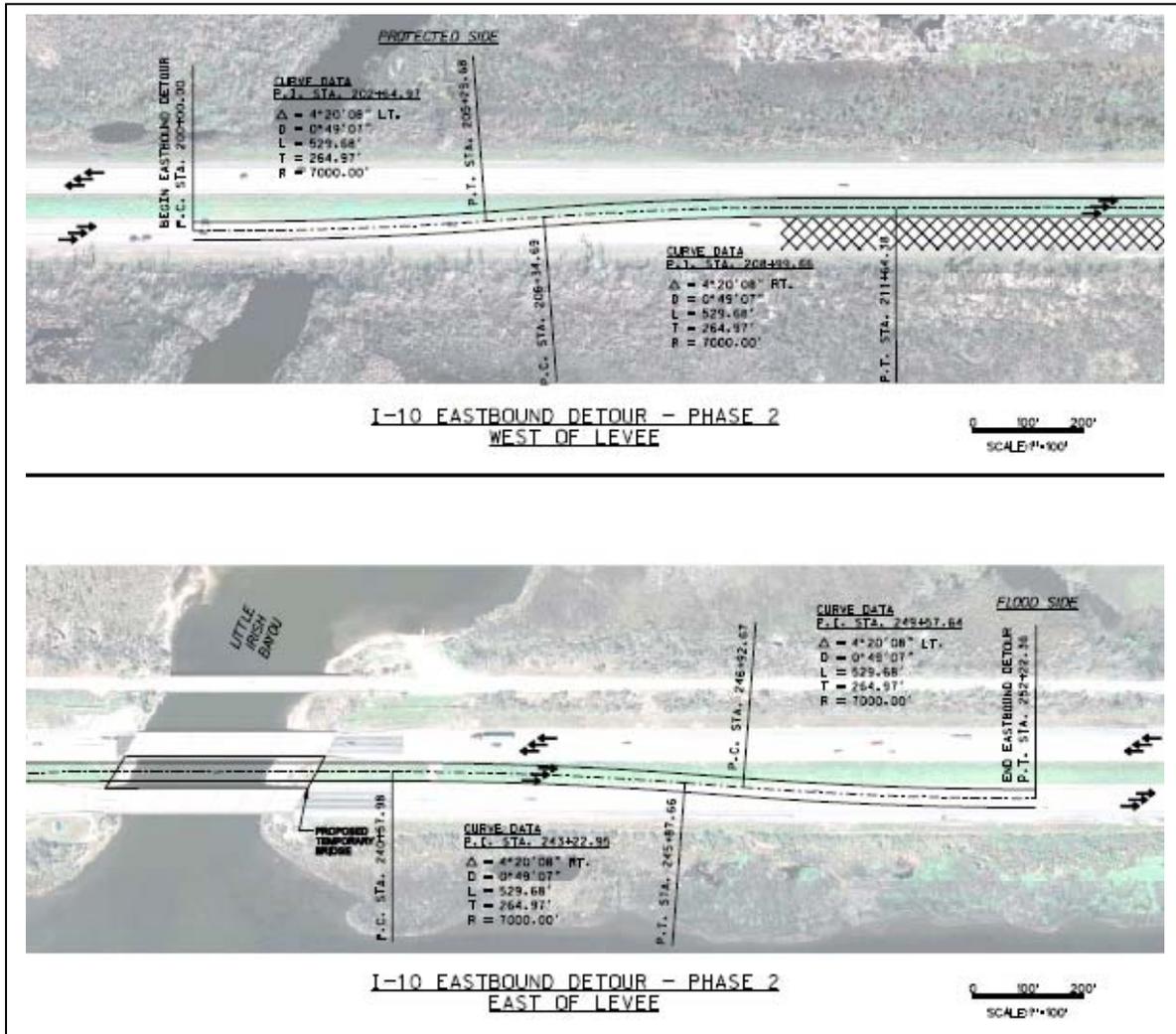


Figure 2: Phase 2 of I-10 ramp construction traffic detour

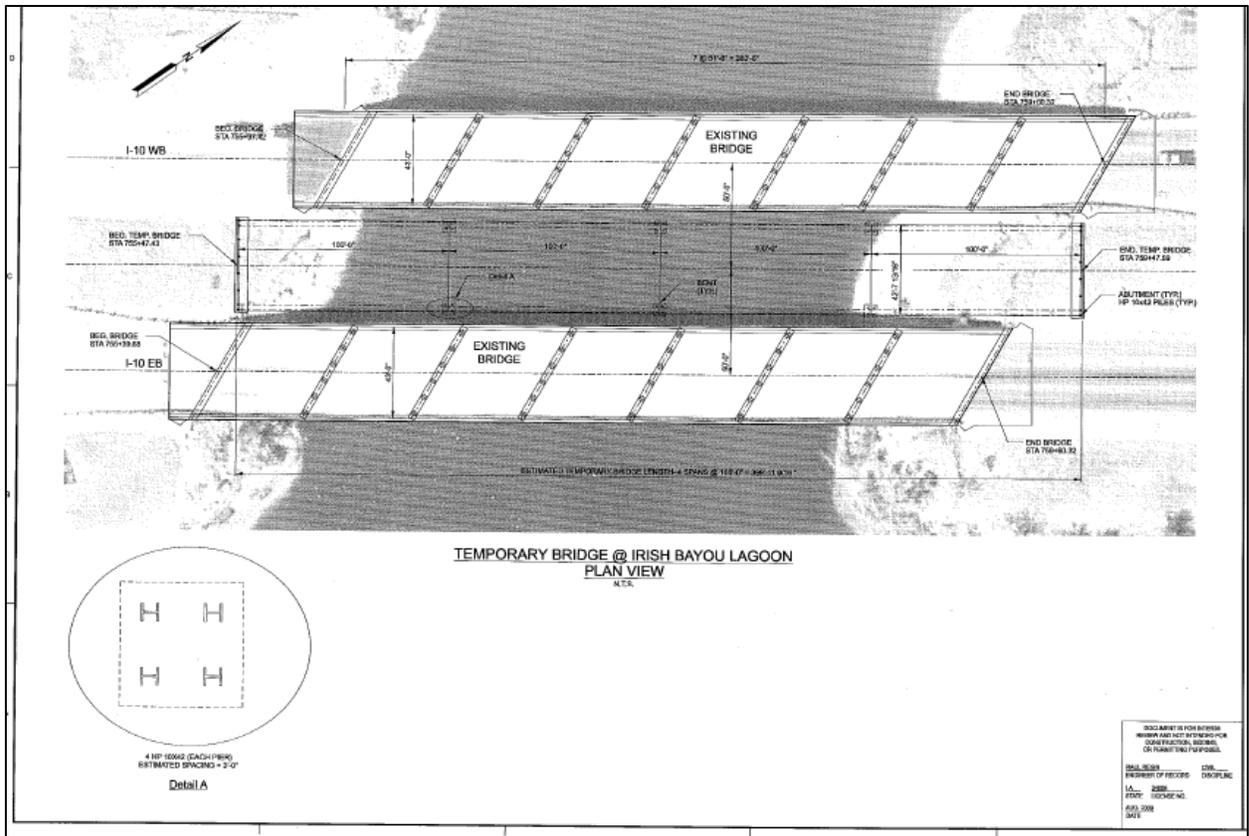


Figure 3. Construction plan view of the temporary traffic control bridge and detail for placement of H-piles.

IER 7 provided limits of work for the I-10 crossing. The proposed action includes expansion of these limits (figure 4). The required footprint for the earthen ramp would be widened by approximately 50-100 feet on each side of the highway, and a temporary construction easement is needed between the new earthen ramp toe and the limits of the LADOTD ROW.

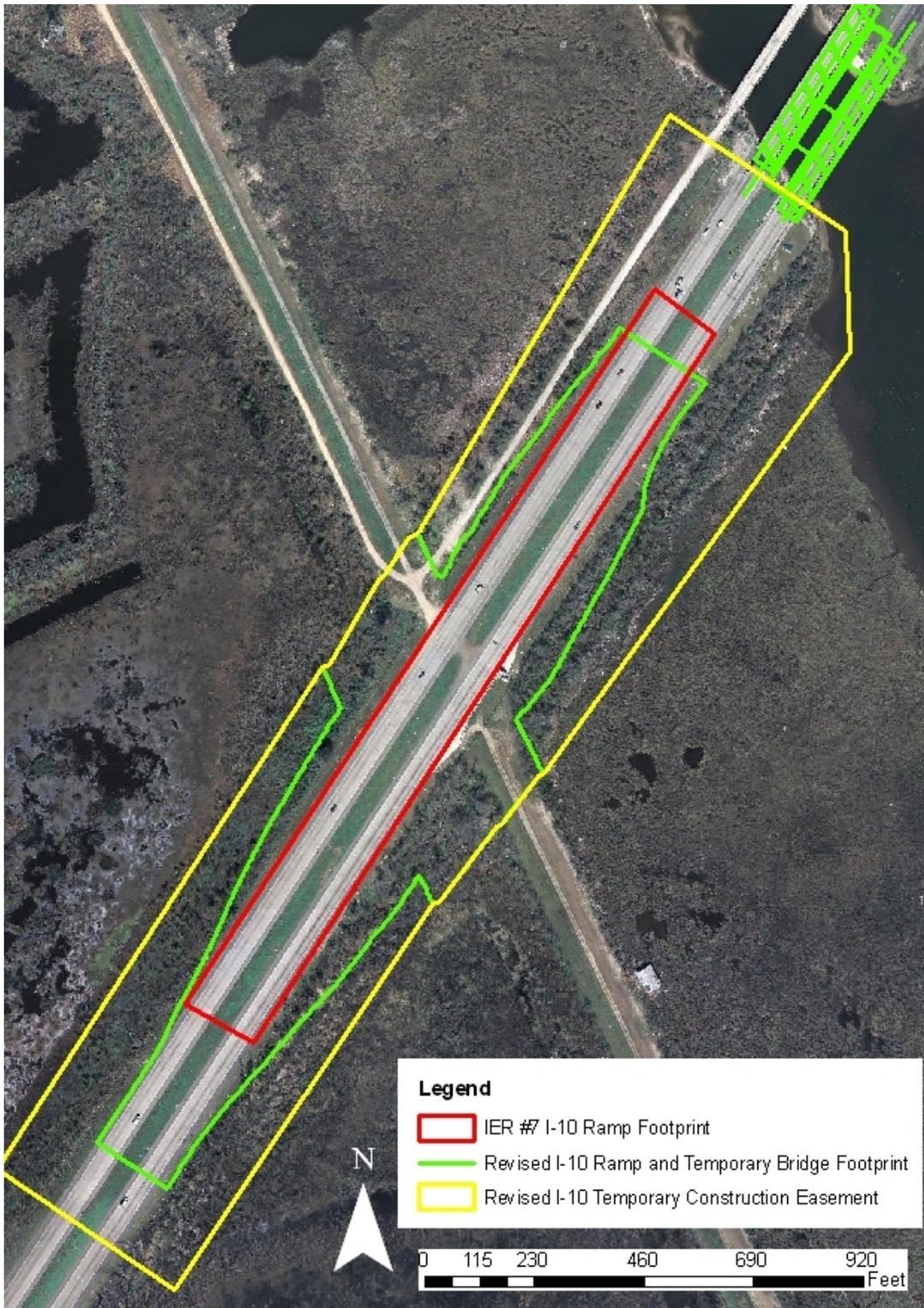


Figure 4: I-10 ramp expanded footprint

US-90 Highway Crossing

IER 7 provided limits of work for reach LPV 109.02c (US-90 Highway Crossing). The proposed action includes slightly expanded limits of work along the highway. For the new gate at US-90, the highway requires widening of approximately 25 feet on either side of the highway near the new gate to accommodate a safe distance buffer around the gate center post (figure 5).

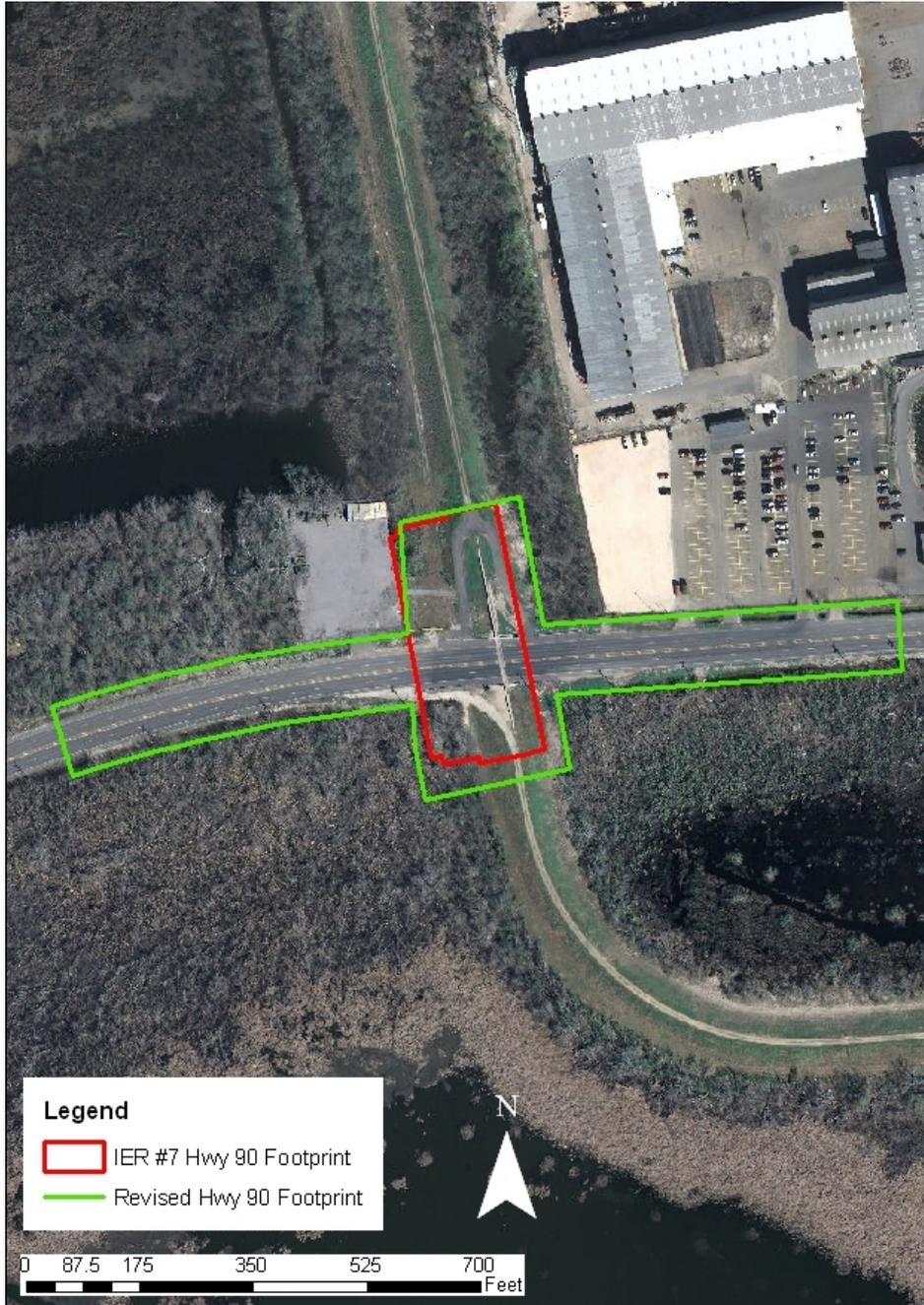


Figure 5: Highway 90 expansion

Levee/Highway Tie-ins

During subsequent design, the tie-ins between the US-90, US-11 and I-10 highway crossings and the LPV 109 levee reach were revised to ensure seamless transitions between these features (figure 6). Although these transitions were shown in IER #7, the acreage of wetlands impacted by the transitions was not incorporated into the Wetland Value Assessment and therefore not captured in the total acres of impact disclosed in IER #7.



Figure 6: Example of refined tie-ins (indicated with yellow arrows) between LPV 109 levee and highway crossing

LPV 109: Highway 11 Temporary Road Closure

For no more than 6 months during construction, the portion of Highway 11 at the site of the gate construction will be closed to traffic. Adequate signage prior to both the north and southbound closures will be provided at an adequate distance to allow traffic detours, and truck turnarounds will be available for any traffic which does not heed these detour signs.

LPV 111

IER 7 provided limits of work for the LPV 111 reach. This footprint did not account for the adjacent construction access necessary to conduct the construction for this reach; it included only the final toe to toe dimensions. This modification would provide an additional 5 to 90 feet on the flood side and protected side of the 28,069 feet of levee (the additional area varies along the reach) for construction access (figure 7). The widened footprint would extend to the limits of the existing levee ROW which was utilized to construct the original LPV 111 levee reach.



Figure 7: Example of expanded footprint for LPV 111

IER 7 anticipated delivery of cement to the LPV 111 reach by barge; however, it was anticipated that the cement delivered by barge would be pumped from barges in the Gulf Intracoastal Waterway (GIWW) across the wetlands so that no wetlands would be disturbed during the delivery. It is now anticipated that borrow material would also be delivered to the LPV 109 reach via barge along the LPV 111 reach. However, because clay material cannot be pumped, barge offload sites must be used. In cooperation with National Marine Fisheries Service, USFWS and Bayou Sauvage National Wildlife Refuge, six eroding access sites were identified for barge offload sites which minimize the impacts to marsh in this area (figure 8).



Figure 8: LPV 111 barge offload sites

The barge offload sites would be designed to minimize impacts to the floodside wetlands along the GIWW. At each site, decking would be supported by approximately 18 piles at a height that allows adequate light to reach the marsh under the decking (figure 9). Flat top deck barges would be temporarily docked just off the marsh, and borrow would be moved via bulldozer, track hoe or similar machinery from delivery barges adjacent to the deck barges or the deck barge itself, across the decking, to trucks within the LPV 111 Levee ROW. These sites would be no larger than 250 feet wide, and would span the area from the levee ROW to the GIWW. After the delivery of all clay material is complete and these offload sites are no longer needed, the contractor will be required to remove the piles, barge and decking.

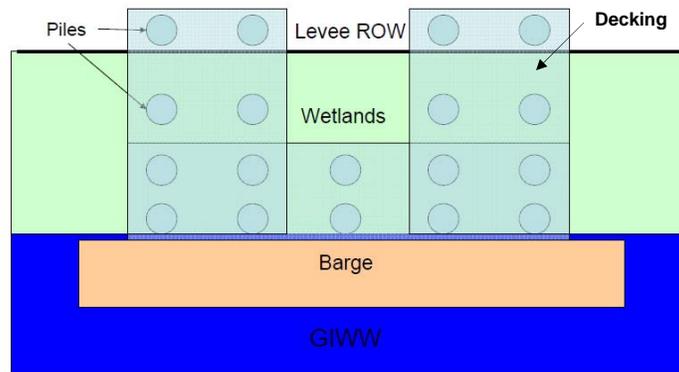


Figure 9: Conceptual barge offload site design

The selected plan for LPV 111 in IER 7 was a deep-soil mixed (DSM) levee. Although DSM has been selected as the preferred alternative for LPV 111, the schedule and budget for this action are largely based on validation of several variables, such as production rates of the specialized DSM machines proposed in the levee design. The validation phase is ongoing, in which these unknowns will be tested and field verified.

In the event that results of the validation phase prove that schedule cannot be met and cost becomes prohibitive, portions of the LPV 111 reach could be constructed as T-wall to accelerate the construction schedule and reduce cost. No more than 25% of the approximately 28,069 linear feet of this reach would be built as T-wall. The footprint for this T-wall would be no wider than the corridor needed for the DSM portions of the reach (figure 10).

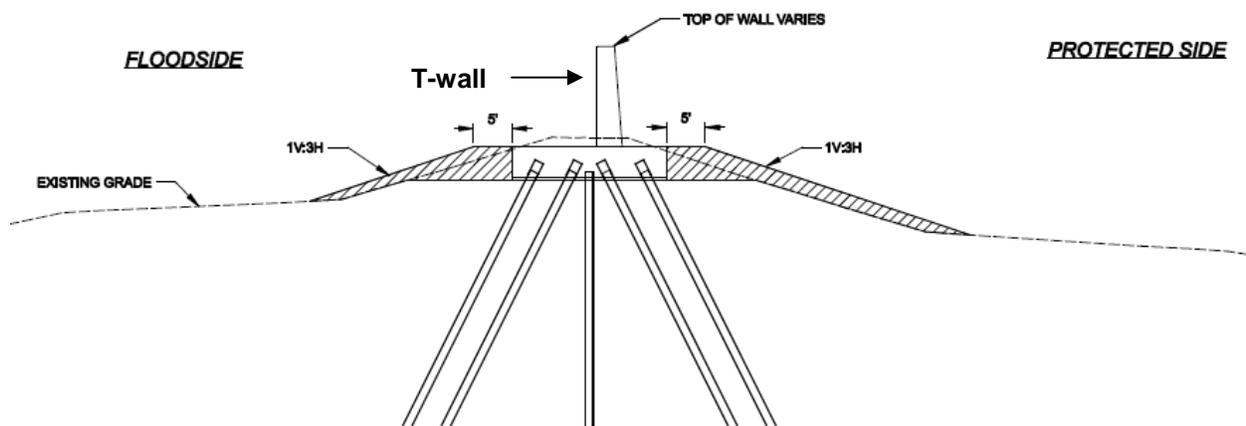


Figure 10: Typical LPV 111 T-wall cross-section

LPV 109 and LPV 111: Fish and Wildlife Pump Stations

IER 7 described that the LPV 109 levee center line would be shifted to the protected side as much as 61 feet. Because of this shift in the centerline and raising the LPV 109 and LPV 111 levee to the 100 year elevation, modifications to the two existing USFWS pump stations located along the LPV 109 and one station located along the LPV 111 levee are necessary to maintain pumping capacity with raising the discharge pipe over new levee elevation. These proposed modifications include the following: raising and relocating the pump stations; replacement of the pump, gear, engine, formed suction intake, control panels, and 36" discharge pipe and appurtenances; installation of temporary cofferdams at the intake and discharge sites; installation of temporary piers, platforms and pumps during construction; and limited excavation within the existing right-of-way. Minor structural modifications may be needed depending upon the loading requirements for the new equipment, relocation of the access bridge, and removal and replacement of the chain link fence.

During the raising and relocation of these pump stations, temporary pumps would be provided to ensure current pump capacity is maintained during construction (figure 11). Two possible layouts are proposed for the temporary pump and discharge. Figure 11 shows one conceptual layout; the second possible layout would be similar to that shown in figure 11 but would be located on the other side of the existing station.

The temporary pump, as proposed, would consist of a diesel-powered, hydraulically driven pump with 30-inch diameter steel discharge pipe. The temporary pump would be located on a small floating barge moored by spud piles. The barge would be positioned adjacent to the existing intake of the pump platform. It is necessary to locate the intake there so that the temporary pump does not scour the existing mud bottom. Access to the pump would either be by ladder or gangway from the pump platform or by boat.

The discharge line would be routed around the section of levee in front of the station which would be temporarily degraded to approximately El. 5.0 to install the soil-cement elements. The discharge would be at the same location as the existing discharge. The temporary discharge pipe would be supported by a small, spud-anchored floating barge.

To install, access, and operate the temporary pumping system, it is necessary to acquire temporary construction easement so that the Contractor can position a crane with sufficient reach to install the floating barge, and pump and drive the barge's spud piles. To support the weight of this crane, it is likely that a working platform with several feet of rock would need to be placed in one of the additional easements, and the crane matted to further spread the load out. These construction easements would be adjacent to the existing pump station and discharge pipe. Once the relocated pump stations are operational, all temporary features will be removed.

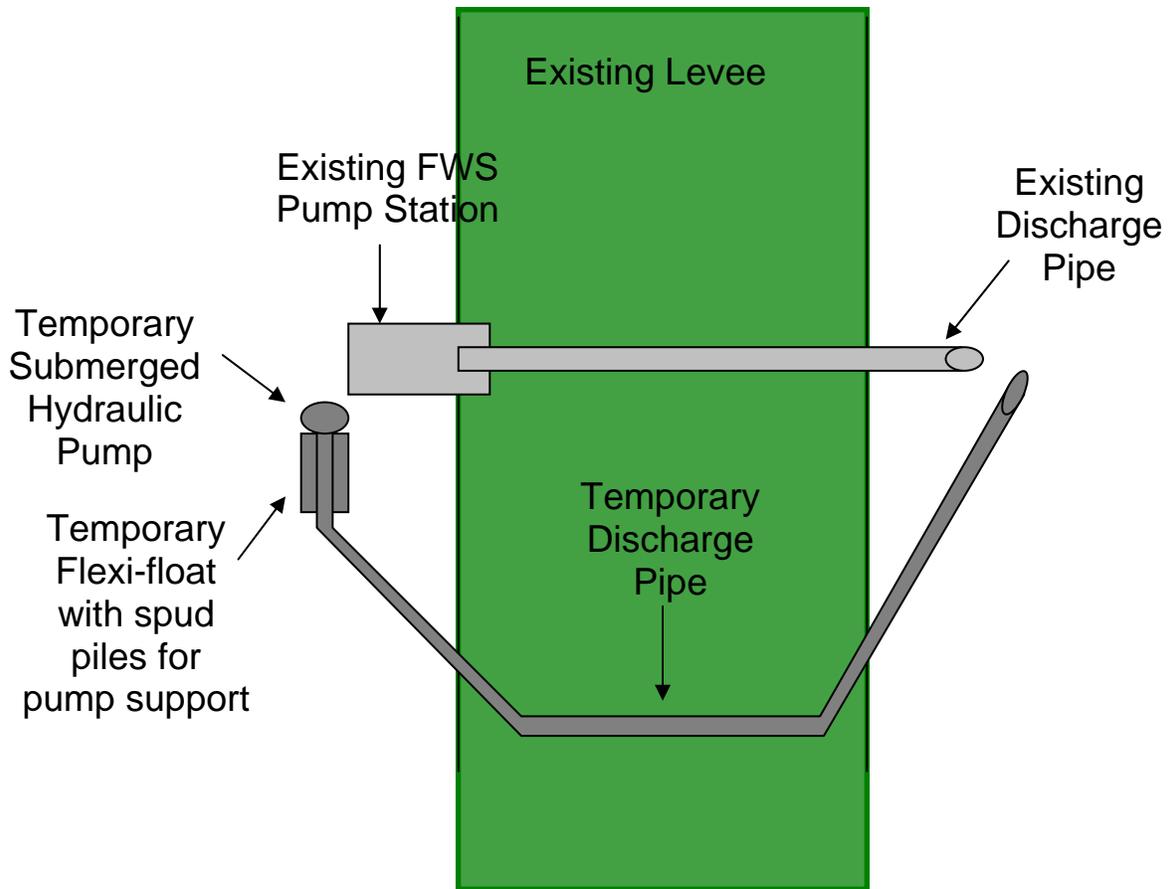


Figure 11: Temporary pumping system for LPV 109 and LPV 111 USFWS Pump Stations

Staging areas: Acreage calculation adjustments

Although all staging areas to be used for reaches LPV 109, LPV 110 and LPV 111 were shown on the maps in IER #7, the temporary wetland impacts were not fully captured in the 15 June 2009 Coordination Act Report. This acreage of impact was revisited by USFWS and adjusted accordingly in this Supplemental IER. The difference in acreage is captured in the following impacts analysis.

2.3 ALTERNATIVES TO THE PROPOSED ACTION

No Action

All construction would be restricted to the limits of work provided in IER #7. Because the proposed increased limits of work at the I-10 and Highway 90 crossings would be required to raise these features to the 100-year level of risk reduction, these features would not be raised under the no action alternative. Under the no action alternative, the temporary bridge at Irish Bayou would not be constructed, which would restrict traffic detours and hinder the proposed traffic control plan. This restriction could require that some of the six lanes be closed during

construction. Along LPV 111, the work limits would be restricted to the toe-to-toe limits of the expanded levee, leaving no space for adjacent construction access. This restriction would limit the contractor's construction method, significantly increasing the time and cost required to increase the level of risk reduction for this reach. No barge access would be provided along this reach. Borrow material would be barged to alternate staging locations and trucked to the project site adding additional cost and time to this project. Temporary pumps would not be provided during construction, which would limit the capacity of USFWS to manage water levels within the Bayou Sauvage Wildlife Refuge.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 ENVIRONMENTAL SETTING

IER #7 contains a complete discussion of the Environmental Setting for the project area and is incorporated by reference into this document. As such, no discussion of environmental setting will be made in this document.

3.2 SIGNIFICANT RESOURCES

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

The resources described in this section are those recognized as significant by laws, executive orders, regulations, and other standards of National, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public. Further detail on the significance of each of these resources can be found by contacting the CEMVN, or on www.nolaenvironmental.gov, which offers information on the ecological and human value of these resources, as well as the laws and regulations governing each resource. Search for "Significant Resources Background Material" in the website's digital library for additional information. Table 1 shows those significant resources found within the project area, and notes whether they would be impacted by any of the alternatives analyzed in this IER.

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

Significant Resource	Impacted	Not Impacted
Water Resources	X	
Wetlands	X	
Non-wetland Resources/Upland Resources		X*
Fisheries	X	
Wildlife	X	
Essential Fish Habitat	X	
Endangered or Threatened Species		X*
Cultural Resources		X*
Recreational Resources	X	
Aesthetics (Visual Resources)	X	
Air Quality		X*
Noise		X*
Transportation	X	
Social and Economic Resources	X	
Hazardous, Toxic, and Radioactive Waste		X*

*= The proposed action poses no additional impacts above those described in IER #7; therefore these significant resources are not discussed in this document.

Existing conditions for the below resources were discussed in IER #7 and are incorporated by reference for each significant resource discussed in this document.

3.2.1 Water Resources and Wetlands

Discussion of Impacts

No Action

Direct, Indirect and Cumulative Impacts

The no action alternative for LPV 109 and LPV 111 would impact 181.7 acres of moderate-quality bottomland hardwood forested wetlands, 100.4 acres of fresh/intermediate marsh, and 70 acres of brackish marsh.

Proposed Action

Direct and Indirect Impacts

The addition of the temporary traffic control bridge on Irish Bayou would not fill any additional forested wetlands, intermediate or brackish marsh, however it would temporarily impact 0.06 acres of waters of the United States which are located within LADOTD ROW.

At the I-10 crossing, an additional 11.66 acres of wetland (6.71 acres of bottomland hardwood, 2.55 acres of fresh/intermediate marsh and 2.4 acres of brackish marsh) would be impacted. Of these impacts, the fresh/intermediate marsh, brackish marsh and 4.95 acres of bottomland hardwood impact are within the temporary construction easement; therefore, these impacts are temporary. The impact to the remaining 1.76 acres of bottomland hardwood would be a permanent impact.

For the new gate at US-90, the required highway widening would impact approximately 0.18 acres of bottomland hardwood. The revised design for the levee tie-ins at I-10, Highway 90 and Highway 11 would impact an additional 1.43 acres of wetland (0.79 acres of bottomland hardwood, 0.64 acres of fresh/intermediate marsh and 0.14 acres of brackish marsh).

The widened footprint along LPV 111 would not extend past the existing levee ROW which was utilized to construct the original LPV 111 levee reach. These expanded limits of work would impact an additional 78.25 acres of wetland (14.6 acres of fresh/intermediate marsh, 49.05 acres of brackish marsh and 14.6 acres of bottomland hardwood) above the impacts disclosed in IER #7. The barge access sites would impact 1.9 acres of brackish marsh and 6.7 acres of waters of the U.S. The proposed construction at the USFWS pump stations along LPV 109 and 111 would impact approximately 1.74 additional acres of wetland (0.69 acres of fresh/intermediate marsh and 1.05 acres of brackish marsh).

An additional 4.83 acres of wetland (1.11 acres of brackish marsh and 3.72 acres of bottomland hardwood) will be temporarily impacted within the staging areas of this project.

These acreages of impact and total acreage by habitat type are provided in Table 2 below.

FEATURE	SUB-FEATURE	FRESH/ INTERMEDIATE MARSH	BRACKISH MARSH	BOTTOMLAND HARDWOOD		WATER	TOTAL
				Flood Side	Protected Side		
		Protected Side	Flood Side	Flood Side	Protected Side	Flood Side	
I-10 crossing	Irish Bayou Bridge					0.06	0.06
	Levee tie-in				0.47		0.47
	Permanent ramp footprint			0.36	1.4		1.76
	Temporary construction easement	2.55	2.4	2.4	2.55		9.9
Highway 90 crossing	Highway widening				0.18		0.18
	Levee-tie-in				0.32		0.32
Highway 11 crossing	Levee tie-in	0.64	0.14				0.78
LPV 111	Expanded limits of construction	14.6	49.05		14.6		78.25
	Barge offload sites		1.9			6.7	8.6
FWS pump station		0.69	1.05				1.74
Staging area	Acreage adjustment		1.11		3.72		4.83
TOTAL PERMANENT		15.93	50.24	0.36	16.97		83.5
TOTAL TEMPORARY		2.55	5.41	2.4	6.27	6.76	23.39
TOTAL		18.48	55.65	2.76	23.24	6.76	106.89

Cumulative Impacts

The proposed modifications would have an additional incremental impact of 100.13 acres of wetland and 6.76 acres of waters of the U.S. This additional acreage would increase the incremental impact of the cumulative impacts described in IER #7. This acreage is in addition to the 352.1 acres of wetland impact disclosed in IER #7 for LPV 109 and LPV 111, for a total incremental impact to 458.09 acres of wetlands and waters of the U.S. for these reaches.

3.2.2 Fisheries

Discussion of Impacts

No Action

Direct, Indirect and Cumulative Impacts

Without implementation of the proposed action, the originally selected plan as discussed in IER #7 would be constructed. Consequently, direct, indirect, and cumulative impacts on fisheries would not differ from those described previously in IER #7.

Proposed Action

Direct and Indirect Impacts

While the proposed action would have no direct impact to fish populations, the loss of an additional 106.89 acres of wetlands and waters of the U.S. would indirectly impact fisheries by further reducing the availability of habitat for fish prey items, potential fish spawning sites and areas for juvenile fish to hide from predators.

Cumulative Impacts

A total of 106.89 acres of wetlands and waters of the U.S. would be lost under the proposed action. This additional acreage would increase the incremental impact of the cumulative impacts described in IER #7. This acreage is in addition to the 351.2 acres of wetland impact disclosed in IER #7 for the LPV 109 and 111 reaches, for a total incremental impact to 458.09 acres of wetlands and waters of the U.S. for these reaches.

3.2.3 Wildlife

Discussion of Impacts

No Action

Direct, Indirect and Cumulative Impacts

Without implementation of the proposed action, the originally selected plan as discussed in IER #7 would be constructed. Consequently, direct, indirect, and cumulative impacts on wildlife would not differ from those described previously in IER #7.

Proposed Action

Direct and Indirect Impacts

The construction of a portion of LPV 111 as T-wall could impact the migration of terrestrial species between the Bayou Sauvage NWR and the GIWW. Although access between these habitats would not be eliminated, as no more than 25% of the reach could be built as floodwall,

wildlife would have to traverse the length of any floodwall portions of this reach to pass between the habitats.

Cumulative Impacts

The additional loss of approximately 100.13 acres of wetlands would increase the incremental impact of the cumulative impacts described in IER #7. This loss would have a greater incremental impact on the availability of nesting and foraging habitat for local birds than the no action alternative.

3.2.4 Essential Fish Habitat

Discussion of Impacts

IER #7 explained that wetlands in Bayou Sauvage National Wildlife Refuge (NWR) on the protected side of the LPV 109 and 111 levees are managed wetland systems separated by levees from the waters of Lakes Pontchartrain and Borgne, and are not Essential Fish Habitat (EFH). However, wetlands on the flood side of these levees are intertidal and considered EFH.

No Action

Direct, Indirect and Cumulative Impacts

Without implementation of the proposed action, the originally selected plan as discussed in IER #7 would be constructed. Consequently, direct, indirect, and cumulative impacts on EFH would not differ from those described previously in IER #7.

Proposed Action

Direct and Indirect Impacts

At the I-10 crossing, US-90 crossing and levee/highway tie-ins, approximately 2.76 acres of floodside bottomland hardwoods, 2.54 acres of floodside brackish marsh and 0.06 acres of lake bottom would be impacted by the proposed action. Thus, a total of 5.36 acres of EFH would be impacted; of this acreage, 2.4 acres of bottomland hardwood and 2.4 acres of brackish marsh would be a temporary impact associated with the I-10 construction easement.

Along LPV 111, approximately 49.05 acres of floodside brackish marsh would be impacted and lost by the expanded footprint of the proposed action. Approximately 1.9 acres of floodside brackish marsh and 6.7 acres of water bottom would be temporarily impacted by the proposed barge access sites along LPV 111.

Approximately 1.05 acres of floodside brackish marsh would be impacted by the proposed work at the pump stations on LPV 109 and 111. An additional 1.11 acres of brackish marsh would be temporarily impacted within the project staging areas.

Cumulative Impacts

Approximately 64.06 acres of EFH would be impacted under the proposed action; however 14.51 acres of this EFH impact would be temporary. This additional acreage would increase the incremental impact of the cumulative impacts described in IER #7. This acreage is in addition to the 106 acres of permanent EFH impact disclosed in IER #7 for the LPV 109 and 111 reaches, for a total incremental impact of 170.06 acres of EFH.

3.2.5 Recreational Resources

Discussion of Impacts

No Action

Direct, Indirect and Cumulative Impacts

Without implementation of the proposed action, the originally selected plan as discussed in IER #7 would be constructed. Consequently, direct, indirect, and cumulative impacts to recreational resources would not differ from those described previously in IER #7.

Proposed Action

Direct, Indirect and Cumulative Impacts

The impacts to recreational resources within the project area would be the same as those described in IER #7 with the exception of impacts to the Highway 11 boat launch in Bayou Sauvage NWR. Although use of the boat launch would not be precluded by the temporary closure of Highway 11, users would not be able to reach the boat launch directly from I-10. The boat launch would only be accessible from Highway 90, requiring some users to drive an additional 15 miles to reach the boat launch.

Cumulative impacts to recreational resources are not anticipated to differ from those described in IER #7.

3.2.6 Aesthetics (Visual Resources)

Discussion of Impacts

No Action

Direct, Indirect and Cumulative Impacts

Without implementation of the proposed action, the originally selected plan as discussed in IER #7 would be constructed. Consequently, direct, indirect, and cumulative impacts to recreational resources would not differ from those described previously in IER #7.

Proposed Action

Direct, Indirect and Cumulative Impacts

The visual quality of the southernmost portion of the Bayou Sauvage NWR would be altered by the construction of T-wall sections along LPV 111. This wall would be visually inconsistent with the natural marsh setting of the majority of this reach, with the exception of the developed area at Pump Station 15 which currently includes floodwall.

Cumulative impacts to recreational resources are not anticipated to differ from those described in IER #7.

3.2.7 Transportation

Discussion of Impacts

No Action

Direct, Indirect and Cumulative Impacts

Without implementation of the proposed action, the originally selected plan as discussed in IER #7 would be constructed. At the I-10 crossing, no detour that maintains all six lanes of traffic that meets LADOTD design standards would be possible within the IER #7 limits of work.

Therefore, increased traffic congestion and disruption of this hurricane evacuation route could occur. The increased construction duration would lead to traffic congestion on local roads and primary arterials for a longer duration than was anticipated in IER #7. This would contribute greater and longer cumulative traffic congestion within the project area.

Proposed Action

Direct, Indirect and Cumulative Impacts

Although construction of the I-10 crossing requires the shifting of traffic lanes, and these shifts may be in place during hurricane season, six lanes of traffic will be in use throughout the majority of the construction period. These lane shifts could cause traffic congestion. There may be minor short lane closures, up to two days in duration, to accommodate incidental construction activities. However, these lane closures would be suspended if hurricane evacuations were pending. Therefore, no impacts to hurricane evacuation traffic are anticipated.

As described in IER #7, construction easements and transport of equipment and materials along haul routes could result in a temporary reduction in level of service on area roads and highways such as I-10. The closure of Highway 11 at the levee crossing will preclude the use of this highway as an alternate route for commuters who wish to avoid the temporary reduction in level of service on I-10. The closure of Highway 11 could also require the use of alternative routes to reach destinations along Highway 11 and Highway 90 for up to 6 months.

Using traffic volume data collected over a 6 day period in the spring of 2010, a traffic evaluation was conducted to estimate the traffic impacts of the temporary closure of Highway 11. The

details of this traffic evaluation can be found in Appendix E. The evaluation estimates the following increases in traffic volume:

- 47% increase in vehicles exiting the I-510 off-ramp onto Highway 90 Eastbound;
- 4% increase in vehicles traveling east of the I-510 Southbound off-ramp;
- 5% increase in vehicles traveling west on Highway 90 in the eastern vicinity of the I-510/Highway 90 interchange;
- 4% increase in vehicles traveling east on Highway 90 in the eastern vicinity of the I-510/Highway 90 interchange;
- 38% increase in vehicles traveling west on Highway 90 in the western vicinity of the Highway 11/Highway 90 intersection
- 19% increase in vehicles traveling east on Highway 90 in the western vicinity of the Highway 11/Highway 90 intersection
- 35% decrease in vehicles traveling west on Highway 90 in the eastern vicinity of the Highway 11/Highway 90 intersection
- 25% increase in vehicles traveling east on Highway 90 in the eastern vicinity of the Highway 11/Highway 90 intersection

Cumulative impacts to transportation are not anticipated to differ significantly from those described in IER #7; the road closure on Highway 11 may further contribute to traffic congestion on area roadways. Any change to the level of service on area roads would be temporary.

The use of barge offload sites along LPV 111 for clay material delivery will reduce the number of trucks delivering clay material on the area roads, leading to less traffic congestion than the no action alternative.

3.2.8 Social and Economic Resources

Discussion of Impacts

No Action

Direct, Indirect and Cumulative Impacts

Without implementation of the proposed action, the originally selected plan as discussed in IER #7 would be constructed. The expanded limits of work at the I-10 and Highway 90 crossings are necessary to complete construction of these reaches; the no action alternative would leave these crossings at their current level of risk reduction, which is below the 100-year level, hindering risk reduction for the entire New Orleans East polder. The staged construction of LPV 111 within the IER #7 limits of construction would lengthen the construction duration for this reach. Such hindrances could delay or prevent Federal Emergency Management Agency (FEMA) certification of the 100-year level of risk reduction for New Orleans East, limiting the area's eligibility for coverage under the National Flood Insurance Program (NFIP).

Proposed Action

Direct, Indirect and Cumulative Impacts

Direct, indirect, and cumulative impacts to social and economic resources would not differ significantly from those described previously in IER #7. Although the closure of Highway 11 will preclude through-traffic along this route, all residences and businesses on Highway 11 are along the northernmost portion of the highway; access to these residences and businesses from I-10 will not be impeded. The only property located south of the road closure is a USFWS boat launch. Access to this property will be precluded directly from I-10; however, it could be reached from I-10 via Michoud Boulevard and Highway 90 which adds an additional 15 miles to reach this property from the intersection of I-10 and Highway 11.

4. CUMULATIVE IMPACTS

Aside from cumulative impacts disclosed in IER #7, the only additional impacts would be those associated with the additional 106.2 acres of wetlands impacted by this project and the closure of Highway 11. This increased wetland acreage adds to the overall cumulative acreage of all of past, present and future projects within the project area. The temporary road closure on Highway 11 may further contribute to traffic congestion on area roadways for up to 6 months.

5. SELECTION RATIONALE

The proposed action includes measures to provide construction easements, permanent easements and design changes to raise the existing risk reduction system to the 100-year level of risk reduction within a reasonable amount of time and within current budget constraints. The no action alternative would leave the New Orleans East polder at its current level of risk for a longer period than the proposed action. The expanded limits of work at the I-10 and Highway 90 crossings are necessary to complete construction of these reaches; the no action alternative would leave these crossings at their current level of risk reduction, which is below the 100-year level, hindering risk reduction for the entire New Orleans East polder. The bridge at Irish Bayou is the most practicable means to maintain six lanes of traffic on I-10, whereas the no action alternative may not allow full operation of this evacuation route. Although the relocation and installation of temporary pumps along LPV 109 and 111 has limited wetland impacts, these impacts are less than the no action alternative which would reduce the capacity of the USFWS to maintain water levels within the Bayou Sauvage National Wildlife Refuge. Such a reduction could have impacts on wetlands throughout the entire refuge, rather than the limited impacts adjacent to the pump stations caused by the proposed action. The expansion of the LPV 111 construction limits, possible construction of limited reaches of T-wall and use of barge access sites add efficiencies to the construction sequence of the LPV 109 and LPV 111, resulting in shorter construction durations. Schedule minimization is critical for the LPV 111 reach, as the construction of the Borgne Barrier (as described in IER #11 Tier 2 Borgne) deflects storm surge from Lake Borgne on to this adjacent levee reach, increasing risk to the New Orleans East polder. Completion of the LPV 109 and LPV 111 reaches are critical to risk reduction for the New Orleans East polder.

6. COORDINATION AND CONSULTATION

6.1 AGENCY COORDINATION

Preparation of this IER Supplemental has been coordinated with appropriate Federal, state, and local interests, as well as environmental groups and other interested parties. An interagency environmental team was established for this project in which Federal and state agency staff played an integral part in the project planning and alternative analysis phases of the project (members of this team are listed in appendix C). This interagency environmental team was integrated with the CEMVN Project Delivery Team to assist in the planning of this project and to complete a mitigation determination of the potential direct and indirect impacts of the proposed action. Monthly meetings with resource agencies were held concerning this and other IER projects.

The USFWS reviewed the proposed action to see if it would affect any Threatened and Endangered species, or their critical habitat. The USFWS concurred with the CEMVN in a letter dated 22 January 2010 that the proposed action would not have adverse impact on T&E species.

In a letter dated 22 December 2009, The CEMVN requested a modification to the Coastal Zone Consistency Determination C20090033 for IER #7. This modification is currently under review by the Louisiana Department of Natural Resources (LaDNR).

A modified Fish and Wildlife Coordination Act Report (CAR) was provided by the USFWS on 1 March 2010. The 1 March 2010 report along with the 15 June 2009 Final Fish and Wildlife Coordination Act (FWCA) Report addresses the study area, significant fish and wildlife species, and project construction to be conducted within the IER #7 project area. The Final and modified CARs concluded that the USWFS does not object to the construction of the proposed project provided that fish and wildlife conservation recommendations are implemented concurrently with project implementation.

The USFWS believes that the project-specific recommendations provided in the 15 June 2009 Final FWCA Report continue to remain valid.

7. MITIGATION

Quantitative analysis utilizing existing methodologies for water resource planning has identified the acreage and habitat type for the direct or indirect impacts of implementing the proposed action. Approximately 100.13 acres of wetland habitat would be impacted by the proposed action. Implementation of the proposed action and the selected plan in IER #7 would impact a total of 447 acres (202 acres of bottomland hardwood, 119 acres of fresh/intermediate marsh and 126 acres of brackish marsh). These 447 acres would be mitigated for in coordination with the Federal and state resource agencies.

The USFWS used the Wetland Value Assessment (WVA) Methodology and Habitat Assessment Methodology (HAM) to assess impacts of proposed action. Their assessment determined that additional bottomland hardwood, fresh/intermediate marsh and brackish marsh would be impacted by the proposed modifications to the selected plan in IER #7. The USFWS' analyses

indicates that the implementation of the proposed action and the selected plan in IER #7 would result in the direct loss of 101.4 AAHUs of bottomland hardwood forested wetlands, 42.9 AAHUs of fresh/intermediate marsh, and 67.4 AAHUs of brackish marsh.

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

Mitigation for unavoidable impacts to the human and natural environment described in this and other IERs will be addressed in separate mitigation IERs. The CEMVN has partnered with Federal and state resource agencies to form an interagency mitigation team that is working to assess and verify these impacts, and to look for potential mitigation sites in the appropriate hydrologic basin.

This effort is occurring concurrently with the IER planning process in an effort to complete mitigation work and construct mitigation projects expeditiously. As with the planning process of all other IERs, the public will have the opportunity to give input about the proposed work. These mitigation IERs will, as described in section 1 of this IER, be available for a 30-day public review and comment period.

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

8. COMPLIANCE WITH ENVIRONMENTAL LAWS AND REGULATIONS

Construction of the proposed action would not commence until the proposed action achieves environmental compliance with all applicable laws and regulations. Environmental compliance for the proposed action will be achieved upon coordination of this IER with appropriate agencies, organizations, and individuals for their review and comments.

9. CONCLUSIONS

9.1 INTERIM DECISION

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

Water Resources and Wetlands

An additional 106.89 acres of wetlands and waters of the U.S. would be impacted by the proposed action.

Fisheries

The loss of an additional 106.89 acres of wetlands and waters of the U.S. would indirectly impact fisheries by further reducing the availability of habitat for fish prey items, potential fish spawning sites and areas for juvenile fish to hide from predators.

Wildlife

The construction of a portion of LPV 111 as T-wall could partially hinder the migration of terrestrial species between the Bayou Sauvage NWR and the GIWW.

Essential Fish Habitat

Approximately 64.06 acres of essential fish habitat would be impacted by the proposed action.

Recreational Resources

Travel time from I-10 to the Highway 11 boat launch in Bayou Sauvage would be increased due to the closure of Highway 11.

Aesthetics (Visual Resources)

The visual quality of the southernmost portion of the Bayou Sauvage NWR would be altered by the construction of T-wall sections along LPV 111.

Transportation

Lane shifting and minor short lane closures on I-10 could cause increased traffic congestion; the temporary lane closures would be suspended if hurricane evacuation was necessary. The closure of Highway 11 could require the use of alternate routes, further increasing traffic congestion in the project area.

Social and Economic Resources

Direct, indirect and cumulative impacts would not differ from those previously described in IER #7.

9.2 PREPARED BY

The point of contact for this IER Supplemental is Ms. Patricia Leroux, USACE, New Orleans District, CEMVN-PM-RS. Table 2 lists the preparers of relevant section of this report. Ms. Leroux can be reached at the U.S. Army Corps of Engineers, New Orleans District; CEMVN-PM-RS, P.O. Box 60267, New Orleans, Louisiana 70118.

Table 3	
IER Preparation Team	
Environmental Coordinator	Laura Lee Wilkinson, USACE
Environmental Project Manager	Lee Walker, Evans-Graves Engineers
Internal Technical Review	Thomas Keevin, USACE
Office of Counsel	Barry Gale and Aven Bruser, USACE

APPENDIX A: LIST OF ACRONYMS AND DEFINITIONS OF COMMON TERMS

CEMVN	U.S. Army Corps of Engineers, New Orleans District
CAR	Coordination Act Report
DSM	Deep Soil Mixing
EFH	Essential Fish Habitat
FEMA	Federal Emergency Management Agency
FWCA	Fish and Wildlife Coordination Act
GIWW	Gulf Intracoastal Waterway
IER	Individual Environmental Report
IERS	Individual Environmental Report Supplemental
LADOTD	Louisiana Department of Transportation and Development
LPV	Lake Pontchartrain and Vicinity
NFIP	National Flood Insurance Program
NWR	National Wildlife Refuge
ROW	Right-of-Way
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

APPENDIX B: PUBLIC COMMENT

All public comments received during the 30-day public comment period will be provided in this appendix of the Final IER

APPENDIX C: MEMBERS OF INTERAGENCY ENVIRONMENTAL TEAM

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

APPENDIX D: INTERAGENCY CORRESPONDENCE



REPLY TO
ATTENTION OF

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

December 23, 2009

Hurricane Protection Office

James Boggs
Field Supervisor
U.S. Fish and Wildlife Service (USFWS)
646 Cajundome Blvd - Suite 400
Lafayette, LA 70506

This project has been reviewed for effects to Federal trust resources under our jurisdiction and currently protected by the Endangered Species Act of 1973 (Act). The project, as proposed,
() Will have no effect on those resources
(x) Is not likely to adversely affect those resources.
This finding fulfills the requirements under Section 7(a)(2) of the Act.

Debra A. Guler Jan 22, 2010
Date
Acting Supervisor
Louisiana Field Office
U.S. Fish and Wildlife Service

Dear Mr. Boggs:

Attn: David Walther and David Castellanos

The U.S. Army Corps of Engineers (USACE), Mississippi Valley Division, New Orleans District (CEMVN), is preparing Individual Environmental Report #7 Supplemental (IER #7 Supplemental) to evaluate the potential impacts associated with a proposed project modification to the original IER 7.

On June 19, 2009, the District Commander signed the Decision Record for IER 7. Copies of the document and other supporting information are available upon request or at www.nolaenvironmental.gov. This supplemental document is being prepared to address proposed changes in the Government's approved plan. IER 7 described work for the Hurricane and Storm Damage Risk Reduction System from Paris Road to Michoud Canal in Orleans Parish. The proposed modification that will be discussed in the IER #7 Supplemental pertains only to a portion of the work described in IER 7. All work not discussed in this proposed modification would move forward as described in IER 7. The project area and subject reaches are shown in the attached map, and the proposed modifications are described in the attached project description.

A summary of the change to the authorized action includes the following:

- a temporary traffic control bridge on Interstate 10 (I-10) across Irish Bayou within the LPV 109 reach
- raising and relocation of U.S. Fish and Wildlife Service (USFWS) pump stations on LPV109 and LPV 111
- the expansion of the limits of construction of the LPV 109 levee/highway tie-ins and at the Highway 90 and Interstate 10 crossings
- barge access points along LPV 111
- expansion of the LPV 111 limits of work to include the entire existing Right-of-way
- possible construction of T-wall along portion of LPV 111 reach

In a letter dated 2 February 2009, your agency reconcurred with the CEMVN that the plan approved in IER #7 would not adversely affect threatened and endangered species under your jurisdiction. We believe that the proposed modifications to the approved plan would not adversely affect any threatened or endangered species, or their critical habitat. Please review this information and inform us whether or not you agree with our determination.

If you have any questions about this project or require any additional information, please contact me at (504) 862-1212 or via email at laura.l.wilkinson@usace.army.mil.

Sincerely,



Laura Lee Wilkinson
Environmental Coordinator
Hurricane Protection Office



United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506
March 1, 2010



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

Dear Colonel Lee,

Please reference the Individual Environmental Report 7 New Orleans East Levee, Maxent Canal to Michoud Slip, Orleans Parish, Louisiana (IER 7). That study was conducted in response to Public Law 109-234, Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (Supplemental 4). That law authorized the Corps of Engineers (Corps) to upgrade some existing hurricane protection projects to provide protection against a 100-year hurricane event. This report contains an analysis of the impacts on fish and wildlife resources that would result from the implementation of 100-year hurricane protection for that area, and provides recommendations to minimize project impacts on those resources.

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

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

This report does not constitute the report of the Secretary of the Interior as required by Section 2(b) of the FWCA. This report has been provided to the Louisiana Department of Wildlife and Fisheries and the National Marine Fisheries Service; their comments will be incorporated into our final report.

DESCRIPTION OF THE STUDY AREA

The work proposed in IER 7 is located entirely within Orleans Parish, Louisiana, and involves the construction of floodwalls and upgrading approximately 20 miles of existing levees and associated structures near and around the Bayou Sauvage National Wildlife Refuge (NWR). The study area is roughly bounded by Paris Road (Interstate-510) to the west, Lake Pontchartrain to the north and east, Chef Menteur Pass to the southeast, and the Gulf Intracoastal Waterway (GIWW) to the south (Figure 1).

Although some construction is occurring in developed areas and on existing levees, project implementation will also directly impact marshes, bottomland hardwoods, and shrub-scrub areas that provide medium to high habitat values for diverse fish and wildlife resources. Project impacts would result primarily from levee rights-of-way (ROW) expansion and construction of levees.

FISH AND WILDLIFE RESOURCES

Description of Habitats

Habitat types in the study area include forested wetlands (i.e., bottomland hardwoods and/or swamps), marsh, wetland scrub-shrub, open water, and developed areas. Factors that will strongly influence future fish and wildlife resource conditions in the area include freshwater input and erosional loss of estuarine marshes outside of the hurricane protection levee. The wetlands within the hurricane protection levee are currently experiencing higher loss rates than the wetlands outside of the levee directly connected to natural hydrologic processes.

Forested wetlands in the study area are predominantly bottomland hardwoods (BLH) with some smaller swamp areas. Where the duration of flooding and/or saturation is sufficient, BLH habitats are defined as intermittently flooded palustrine forested wetlands (Cowardin et al. 1979). BLH habitat in the study area is predominantly vegetated by sugarberry, black willow, Chinese tallow, live oak, waxmyrtle, elderberry, and groundsel bush.

Fresh and intermediate marshes occur on the protected side of levees of the study area. Vegetation common in fresh marshes includes giant cutgrass, cattail, pennywort, maidencane, wax myrtle, alligatorweed, flatsedges, and spikerushes. Plant species commonly found in intermediate marshes include sawgrass, bulltongue, California bulrush, deer pea, and saltmeadow cordgrass.

Open water in the study area consists of marsh ponds on the protected side of the levee and Lake



Figure 1: Project Area for LPV 108, 109, 110, and 111;
New Orleans East Lakefront to Michoud Canal (IER #7)

Figure 1. IER 7 project area, New Orleans, Louisiana.

Pontchartrain on the flood side. These ponds support submerged and floating aquatic vegetation such as coontail, fanwort, pondweeds, water primrose, duckweed, and water hyacinth. Outside of the levee, more brackish tolerant submerged aquatic vegetation (SAV), such as widgeon grass, is found in shallow waters (typically less than 3 feet in depth) of Lake Pontchartrain.

Developed habitats in the study area include commercial areas, as well as roads and existing levees. Those habitats do not support significant wildlife use.

Fishery/Aquatic Resources

Freshwater sport fishes present in the marshes and open water include largemouth bass and smaller sunfishes; other fishes likely to occur are bullhead catfishes, bowfin, and gars. Estuarine-dependent fishes and shellfishes such as Atlantic croaker, red drum, sand seatrout, spotted seatrout, southern flounder, Gulf menhaden, striped mullet, brown shrimp, white shrimp, and blue crab occur in the marshes outside of the protection levee.

Essential Fish Habitat

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; P.L. 104-297) set forth a new mandate for NOAA's National Marine Fisheries Service (NMFS), regional fishery management councils (FMC), and other federal agencies to identify and protect important marine and anadromous fish habitat. The Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Act support one of the nation's overall marine resource management goals- maintaining sustainable fisheries. Essential to achieving this goal is the maintenance of suitable marine fishery habitat quality and quantity. Detailed information on federally managed fisheries and their EFH is provided in the 1999 generic amendment of the Fishery Management Plans (FMP) for the Gulf of Mexico prepared by the Gulf of Mexico Fishery Management Council (GMFMC). The generic FMP subsequently was updated and revised in 2005 and became effective in January 2006 (70 FR 76216). NMFS administers EFH regulations.

EFH includes all waters and substrates within estuarine boundaries, outside of the hurricane protection levee, including the subtidal vegetation (SAVs, seagrasses and algae) and adjacent tidal vegetation (marshes). The forested wetland areas and supra-tidal wetlands (i.e., those located on levee berms) within the project ROW are not likely to be suitable habitat for any of the managed species (e.g., shrimp, red drum).

Wildlife Resources

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

and cuckoos. Wading bird rookeries are known to exist in the southern part of the study area near the LPV 111 reach.

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

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

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

Endangered and Threatened Species

In letters dated December 6, 2007, and on January 30, 2009, the Service concurred with the Corps' determination that the construction of the proposed project features in IER 7 is not likely to adversely affect the pallid sturgeon, brown pelican, bald eagle, and piping plover. Because of manatee protective measures included in the Corps' construction contracts, the Service also concurs that the construction of the proposed project features in IER 7 is not likely to adversely affect the manatee. The Service recommends that the Corps contact NMFS regarding impacts to the Gulf sturgeon and its critical habitat. The Service also recommends that the Corps implement bird surveys as suggested in the referenced concurrence letters, and if necessary, measures to protect colonial nesting birds.

Refuge Land

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

over the use. For example, proposed uses that deal exclusively with air space, navigable waters or overly refuges where another Federal agency has primary jurisdiction over the area, would not be subject to compatibility.

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

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

DESCRIPTION OF SELECTED PLAN

The purpose of the proposed action is to provide the 100-year level of protection for the Greater New Orleans Hurricane and Storm Damage Reduction System (HSDRRS) for New Orleans East. The term “100-year level of protection”, refers to a level of protection which reduces the risk of hurricane surge and wave driven flooding that the New Orleans Metropolitan area has a 1 percent chance of experiencing each year. Elevations of the existing floodwalls and levees within three reaches of the LPV project (reaches 109, 110 and 111), a component of the HSDRRS, are below 100-year design elevations and do not meet Corps design criteria. The proposed action is needed to meet the 100-year design elevations and design criteria in these three reaches. The completed HSDRRS would lower the risk of harm to citizens and damage to infrastructure during a storm event.

Various alternative alignments and structures (*i.e.*, floodwalls and levees) were evaluated for each reach of the Lakefront to Michoud Canal project. Based upon a detailed analysis that included evaluating risk and reliability, construction schedule, cost, ROW requirements, environmental

impacts, and operations and maintenance needs, the following alignments and structures were chosen as the proposed actions for LPV 108, 109, 110 and 111.

The LPV 108 reach is approximately 6.3 miles long (Figures 1 and 2). The authorized level of flood protection ranges from +17.5 feet North American Vertical Datum 1988 (NAVD 88) in the western portion of LPV 108 to +18.5 feet NAVD 88 in the eastern portion. This height provides the 100-year level of flood protection; therefore no further levee work is required to achieve NFIP certification for this reach.

Riprap foreshore protection along Lake Pontchartrain would be raised to reduce erosion and wave impact on the LPV 108 levee. Approximately 121,000 cubic yards of riprap would be required to raise levee foreshore protection to an elevation that would not settle below a net grade of approximately +14 feet NAVD 88 in 10 years. It is anticipated that riprap would be transported to the Lake Pontchartrain shoreline by barge and placed from equipment stationed on barges in the lake and from trucks and equipment accessing the foreshore protection from the shoreline. The placement of foreshore protection would permanently fill approximately 7.2 acres of Lake Pontchartrain. While included as part of the project, this work is actually maintenance of the previously constructed erosion protection. To provide barge access, channels would be dredged in Lake Pontchartrain perpendicular and parallel to the shoreline. It is proposed that five offshore to inshore access channels perpendicular to the Lake Pontchartrain shoreline and four lateral channels parallel to the shoreline would be constructed to allow the tug boat and barge to approach the construction area (Figure 2). Perpendicular and parallel channel dimensions would be approximately 10 feet deep, 100 feet wide at the channel bottom with a 2:1 slope on both sides of the channel. Perpendicular channels would range from 764 to 1,126 feet long and parallel channels would be 2,000 feet long. The dredging operation would excavate approximately 243,000 cubic yards of material. Dredged material (tailings) would be placed within a 178-foot wide area located on one side of and parallel to the dredged channel. The width of the channel and dredged material placement area would create a 400-foot wide footprint, which includes the 140-foot wide channel (top width; 100-foot wide bottom width), the 178-foot wide dredged material stock pile, and the space between the stock pile and channel. Assuming these dimensions, the channel and excavated sediments are expected to directly impact approximately 118.1 acres of lake bed. After construction dredged material for the access channels would be used to backfill the dredged channels.

The LPV 109 reach includes the use of stability berms, high strength geotextile and prefabricated vertical (PV) drains (*i.e.*, wick drains) for levee construction. A stability berm with a width of 120 feet would be constructed on the protected side from South Point to US Highway 90 (US 90), and a stability berm with a width of 175 feet on the protected side would be constructed from US 90 to LPV 110. Two to three layers of high strength geotextile would be used, and the levee fill placed in five lifts between South Point and US 90 and in six lifts between US 90 and LPV 110. PV drains would be used to promote horizontal drainage in subsurface clay soils.

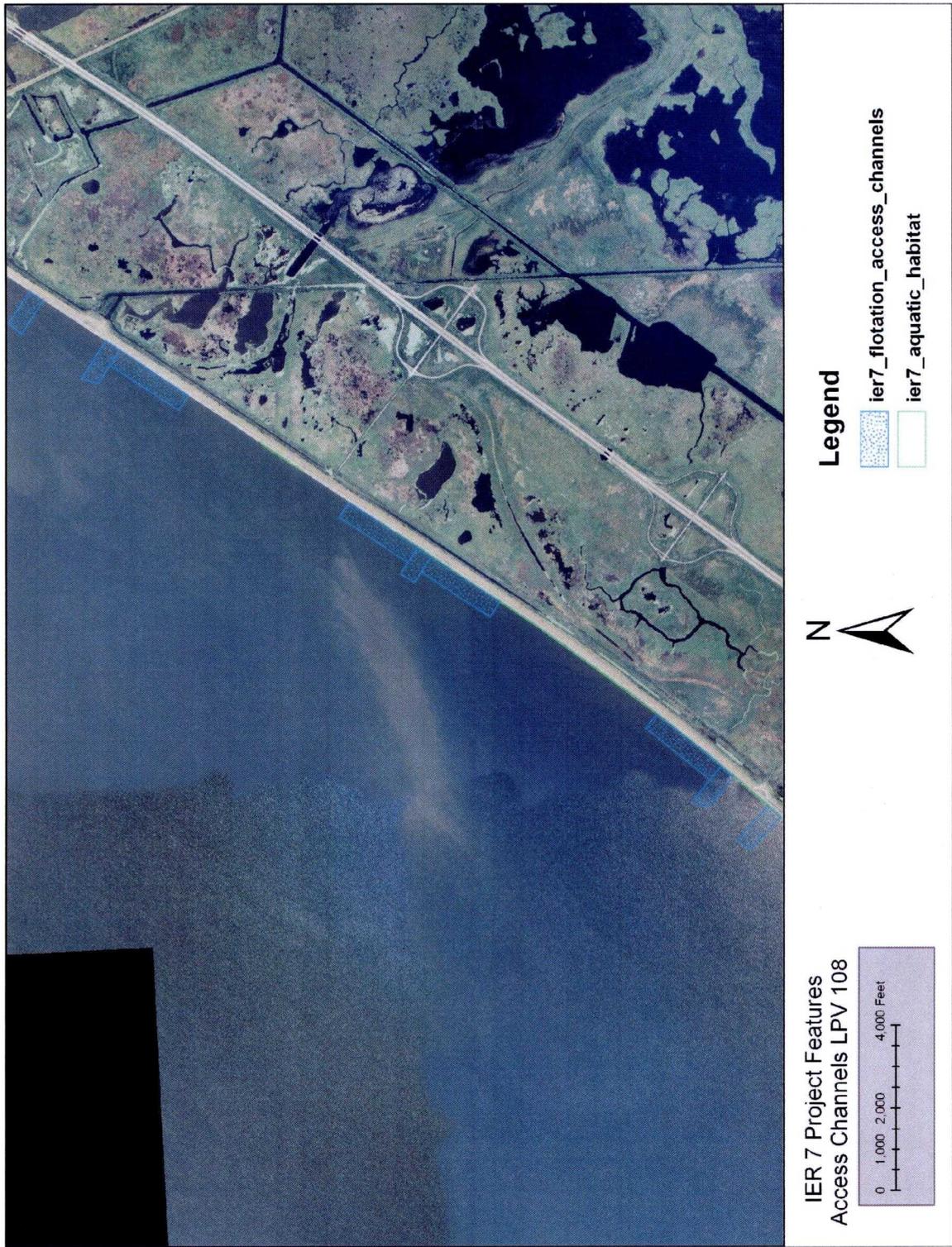


Figure 2. IER 7 – LPV 108 access channels.

Additionally, seepage analysis would be performed during levee design, and if additional seepage control measures are warranted, a cement-bentonite (CB) slurry wall would be constructed beneath the levee. The levee would be raised to an elevation that would vary with distance from Lake Pontchartrain and would not settle below a net grade of between +17.0 feet NAVD 88 (from South Point to US 90) and +22.0 feet NAVD 88 (from US 90 to CSX Railroad) in 10 years. Flood side levee slopes would be 1:4 (vertical:horizontal) from South Point to US 90 and 1:5 (vertical:horizontal) from US 90 to LPV 110. Protected side levee slopes would be 1:4 (vertical:horizontal). The levee would be vegetated along both slopes along its entire length following construction. Levee reconstruction would impact two pump stations and four drainage control structures that provide water level management for Bayou Sauvage NWR. These structures would be redesigned and constructed to accommodate the new levee heights and footprints.

The expanded levee and stability berm footprint would require the acquisition of ROW. The majority of the additional ROW needed for construction is located in Bayou Sauvage NWR. Additionally, a haul route for construction equipment access would be improved along an existing Service-owned road between the LPV 109 levee and US 90.

Flood protection for three highway crossings (Interstate 10 [I-10], US 90 and U.S. Highway 11[US 11]), and the CSX railroad crossing is incorporated into the proposed design for LPV 109.

The existing I-10 roadway that crosses the HSDRRS levee is a six-lane, controlled access, divided interstate highway with shoulders that are supported on an elevated embankment. I-10 passes over the levee via an earthen ramp. The proposed I-10 crossing includes raising the existing levee structure and highway earthen ramp to the 100-year level of risk reduction, with a minimum net elevation of +16.5 feet NAVD 88. There would be sufficient overbuild in the crossing to accommodate natural compaction and subsidence in order to maintain the 100-year level of risk reduction for 10 years. The ramp construction includes a temporary traffic control plan that provides a minimum of three traffic lanes in each direction continuously through the duration of the project construction.

Interstate 10 is designated as the primary hurricane evacuation route from the New Orleans area to the east. Therefore, all six lanes of travel must remain open at all times. I-10 is a six lane divided highway. Both eastbound and westbound sections consist of three 12-foot lanes and two 10-foot shoulders and are separated by a 40-foot median. The construction of the raise will be divided into 3 phases. The ramp construction includes a temporary traffic control plan to provide a minimum of three traffic lanes in each direction continuously through the life of the construction project. The construction of the ramp would occur within existing Louisiana Department of Transportation and Development (DOTD) right -of-way (ROW).

In phase 1, westbound traffic will be shifted south onto the existing median and the eastbound pavement will be widened to accommodate six lanes of traffic. All six temporary lanes would be reduced in width and separated by a temporary concrete traffic barrier. During construction to the new height, a temporary retaining wall would be constructed to facilitate the construction of the raised profile of the westbound lanes. Three 12-foot lanes and the outside 12foot shoulder would

also be constructed during this phase. In phase 2, westbound traffic would be shifted to the new pavement and the eastbound traffic would move to the temporary pavement constructed in the median during phase 1. A temporary retaining wall would be constructed to facilitate the construction of the raised profile of the eastbound lanes, and three 12-foot lanes and the outside 12-foot shoulder would be constructed in phase 2. In phase 3, the eastbound traffic would be moved to their permanent location. The inside median, once used for temporary traffic lanes, would be raised to the elevation of the new driving surface, and the remaining 12-foot inside shoulders would be constructed.

The length required for shifting traffic to the median was inadequate. Therefore, a detour cannot be constructed under the constraints of complying with LADOTD design criteria, and staying within the original IER 7 limits of construction by avoiding the existing bridges. Constructing a temporary bridge structure across Irish Bayou between the existing bridges is necessary, because it allows the traffic shifts to extend beyond the existing bridges and proceed through the construction zone in a safe and acceptable manner.

The temporary bridge would be approximately 400 feet long, and consist of four 100 foot spans, supported on 2 bents per span with 4 steel piles each. The bridge will be approximately 43 feet wide and transition to the temporary roadway surface with 2 abutments each supported on 8 steel piles at the bank line. The existing riprap along the bank of Irish Bayou and natural ground at the abutments would be cleared of vegetation and approximately 700 cubic yards of fill would be used to bring the natural ground surface up to the required temporary roadway surface.

It is anticipated that the abutments would be constructed first. The first bents would be constructed from the bank and the first span would be put in place. Other span and supports would be built using the previous spans as a working surface. The temporary bridge would be required for approximately 18 months. The contractor would be required to return the site back to its original condition at the end of the construction. Equipment used will include but not limited to: bulldozers, compactors, dump trucks, concrete mixers, cranes and pile driving equipment.

The addition of this temporary traffic control bridge on LPV 109 would not fill any additional forested wetlands, intermediate or brackish marsh, however it would temporarily impact 0.06 acres of waters of the United States which is located within LADOTD ROW.

IER 7 provided limits of work for the I-10 crossing. However, as designs were further developed for this reach, the need for slightly expanded limits of work was revealed to accommodate the traffic control plan during construction and ramp slopes. At I-10, the required footprint for the earthen ramp would be widened by approximately 40 feet on each side of the highway, and a temporary construction easement is needed between the new earthen ramp toe and the limits of the LADOTD ROW. The additional 12.5 acres of wetlands that would be impacted are within existing LADOTD ROW.

Risk reduction for the US 90 and US 11 crossings are incorporated into the proposed design for LPV 109. The US 90 (a four-lane undivided highway), and US 11 (a two-lane highway) crossings

would each incorporate the construction of a new floodgate supported on both sides by a T-wall that transitions into the LPV 109 levee. The height of the US 11 floodgate and T-wall would be +18.5 feet NAVD 88 and the height of the US 90 floodgate and T-wall would be +22.0 feet NAVD 88.

IER 7 provided limits of work for the US-90 Highway Crossing. However, as designs were further developed for these reaches, the need for slightly expanded limits of work was revealed. For the new gate at US-90, the highway requires widening of approximately 25 feet on either side of the highway near the new gate to accommodate a safe distance buffer around the gate center post. This widening would impact approximately 0.67 acres of wetlands.

During subsequent design, the tie-ins between the US-90, US-11 and I-10 highway crossings and the LPV 109 levee reach were revised to ensure seamless transitions between these features. This revision would impact approximately 1.0 acre of wetland

The existing CSX Railroad floodgate and associated T-wall at LPV 110 would be raised to an elevation that would not settle below a net grade of approximately +30 feet NAVD 88 in 10 years. The proposed work would include the replacement of the gate monolith and adjacent T-walls and I-walls with T-wall type floodwalls. Because the LPV 110 floodwall would be slightly offset from the centerline of the adjacent levees, the new T-walls would be constructed to tie into the LPV 109 and LPV 111 levees. The CSX Railroad would remain in service during the floodgate and floodwall construction and no additional ROW would be required.

The LPV 111 levee would be raised to an elevation that would not settle below a net grade ranging from +25.0 feet NAVD 88 (closest to the CSX Railroad crossing) to +29.0 feet NAVD 88 (closest to the Michoud Canal floodwall) in 10 years. Ground improvement techniques to strengthen the foundation soils would be needed to raise the 5.3 miles of levee to the design elevation by June 2011. Deep soil mixing, which is a process that modifies the physical and chemical characteristics of the soil without excavating, would be required for the entire length of the levee to improve the foundation soil strength. Deep soil mixing does not require degrading of the levee surface for installation. Shifting of the center of the levee to the protected side as much as 61 feet would be required to allow the wave berm slope to roughly match the flood side slope of the existing levee, thereby reducing the amount of fill added to the flood side slope. After raising the LPV 111 levee to the 100-year elevation, concrete slope protection would be placed from toe-to-toe on both sides of the levee to prevent scouring. Cement for deep soil mixing and slope protection would be delivered to the project area by barge from the GIWW. It is anticipated that the cement would be pumped from barges in the GIWW over the wetlands located at the toe of the LPV 111 levee to the LPV 111 levee construction site. Additional ROW would be required for the expanded LPV 111 levee, and most of that ROW occurs in Bayou Sauvage NWR.

A new reinforced concrete T-wall would be constructed to replace the existing T-wall at Pump Station No. 15. The T-wall contains three 72-inch pipes that discharge into a basin on the flood side of the T-wall. The top of the T-wall fronting Pump Station No. 15 would be +34.0 feet NAVD 88 with the adjacent levee tie-in section raised to +32 feet NAVD 88. The new T-wall would transition into levee on both sides. During T-wall demolition, temporary flood protection would be

constructed in the discharge basin adjacent to the GIWW. The three 72-inch pipes would be extended through the temporary flood protection to discharge into the GIWW. The temporary flood protection in the discharge basin would also be used as a cofferdam to dewater the discharge basin during T-wall construction. A temporary bridge for access during levee and T-wall construction would be placed across Maxent Canal just north of Pump Station No. 15.

IER 7 provided limits of work for the LPV 111 reach. This footprint did not account for the adjacent construction access necessary to conduct the construction for this reach; it included only the final toe to toe dimensions. This modification would provide an additional 5 to 90 feet on the flood side and protected side of the 28,069 feet of levee (the additional area varies along the reach) for construction access. The widened footprint would not extend past the existing levee ROW which was utilized to construct the original LPV 111 levee reach. These expanded limits of work would impact an additional 80.6 acres of wetland.

IER 7 anticipated delivery of cement to the LPV 111 reach by barge; however, it was anticipated that the cement delivered by barge would be pumped from barges in the GIWW across the wetlands so that no wetlands would be disturbed during the delivery. It is now anticipated that borrow material would also be delivered to the LPV 109 reach via barge along the LPV 111 reach. However, because clay material cannot be pumped, barge offload sites must be used. In cooperation with National Marine Fisheries Service, Fish and Wildlife Service and Bayou Sauvage National Wildlife Refuge, six sites were identified for barge offload sites.

The barge offload sites would be designed to minimize impacts to the floodside wetlands along the GIWW. At each site, decking would be supported by approximately 18 piles at a height that allows adequate light to reach the marsh under the decking. Flat top deck barges would be temporarily docked just off the marsh, and borrow would be moved via bulldozer, track hoe or similar machinery from delivery barges adjacent to the deck barges or the deck barge itself, across the decking, to trucks within the LPV 111 Levee ROW. These sites would be no larger than 250 feet wide, and would span the area from the levee ROW to the GIWW. These sites would impact a total of 8.6 acres, of which 3.8 acres is marsh.

IER 7 described that the LPV 109 levee center line would be shifted to the protected side as much as 61 feet. Because of this shift in the centerline and raising the LPV 109 and LPV I II levee to the 100 year elevation, modifications to the existing USFWS pump stations located along the LPV 109 and LPV III levee are necessary to maintain pumping capacity with raising the discharge pipe over new levee elevation. These proposed modifications include the following: raising and relocating the pump stations; replacement of the pump, gear, engine, formed suction intake, control panels, and 36" discharge pipe and appurtenances; installation of temporary cofferdams at the intake and discharge sites; installation of temporary piers, platforms and pumps during construction; and limited excavation within the existing right-of-way. Minor structural modifications may be needed depending upon the loading requirements for the new equipment, relocation of the access bridge, and removal and replacement of the chain link fence. Approximately 2 additional acres of marsh and Waters of the U.S. would be impacted by this modification.

As part of construction, numerous utilities, including electrical services, gas lines, telephone poles and lines, storm drainpipes, and water control structures and pump stations for Bayou Sauvage National NWR, would be avoided or relocated. All staging and laydown areas would be located either within the project construction corridor, or within previously developed areas immediately adjacent to the project corridor (*e.g.*, adjacent to highway rights-of-way). Construction of all three reaches is anticipated to require approximately 2 years.

All T-walls would be approximately 2-foot wide supported by an approximately 12- to 17-foot wide and 3-foot high concrete slab connected to H-piles (driven to a depth of approximately 85 feet below the ground surface) and a continuous sheet pile cutoff wall (constructed to depths ranging from 50 to 60 feet below the ground surface) for further stabilization and seepage protection. It is anticipated that T-walls would be cast-in-place; however, consideration would be given to using precast concrete for T-wall foundations and wall stems.

Materials (*e.g.*, sheetpile, H-pile, concrete, soil) for the construction of T-walls and earthen levees would be transported from staging areas located adjacent to the project corridor, from borrow pits, and from contractors in the region to the active construction areas. Trucks delivering materials would travel along I-10, US 11, US 90, Intracoastal Drive, Industrial Parkway and the Maxent Canal access road and offload at specific points where construction is occurring. Existing access roads from US 11 to LPV 109 would be used as haul routes. Heavy equipment that would likely be used during demolition and construction activities includes haulers, excavators, pile drivers (vibratory and hammer), dozers, graders, cranes, backhoes, and water trucks. Construction activities could occur 24 hours daily and 7 days a week during the construction period.

ALTERNATIVES UNDER CONSIDERATION

Including the no action alternative, four alternatives were considered in detail for the LPV 109 Levee Section, three alternatives were considered in detail for the LPV 109 I-10 Crossing, and four alternatives were considered in detail for the LPV 109 US 90 and US 11 Crossings. Two alternatives were considered in detail for LPV 110 and four alternatives were considered in detail for LPV 111, including a no action alternative for each reach.

LPV 109 Levee Section

No Action. Under the no action alternative, floodwalls would be replaced and levee heights increased to meet previously authorized elevations. Levee and floodwall improvements would occur within the existing ROW. Maintenance of levees and floodwalls would continue.

Alternative 1: Raise Levee by Placing Stability Berms on Both Sides and Using Pre-fabricated Vertical Drains. Design elevations would be reached by placing levee fill in five stages from South Point to US 90 and in six stages along US 90 to LPV 110. It is anticipated that levee construction would need to be conducted in stages to prevent bearing capacity failure. It is estimated that each stage would need approximately 4 months to substantially complete primary consolidation and associated strength gain in the clay soils. Stability berms would be added to meet slope stability factors of safety requirements. Levee side slopes would be the same as LPV 109 proposed action.

PV drains would be utilized in levee construction to achieve strength gain in the underlying soft clay stratum. A stability berm width would be approximately 160 feet on the protected side between South Point and US 90, and a stability berm width of approximately 225 feet on the protected side and 90 feet on the flood side would be required between US 90 and LPV 110. A seepage analysis would be performed during the design phase, and if additional seepage control measures are recommended, a CB slurry wall underneath the levee would be constructed.

Alternative 2: Raise Levee by Using Geotextile and Prefabricated Vertical Drains. Levee construction with two types of ground improvements, high strength geotextile and the incorporation of PV drains to increase the rate of consolidation, would be used to reach the design elevations by June 2011. Three to four layers of high strength geotextile would be used, with the levee fill being placed in five stages from South Point to US 90 and in six stages from US 90 to LPV 110. It is estimated that each stage would need approximately 4 months to substantially complete primary consolidation and achieve adequate strength gain in clay soils. Flood side levee slopes would be the same as LPV 109 proposed action; however, protected side levee slopes would be 1:3 (vertical:horizontal). A seepage analysis would be performed during the design phase and if additional seepage control measures are recommended, a CB slurry wall underneath the levee would be constructed.

Alternative 3: Raise Levee Using Deep Soil Mixing. Deep-soil mixing (DSM) would be used to provide foundational support for raising the levee to the 100-year level of risk reduction elevation. DSM introduces engineered grout or reagent into the underlying soils to modify their physical and chemical characteristics without excavation. DSM provides soil stabilization and minimizes levee width, and allows for levees to be constructed in fewer lifts (*i.e.*, shorter period of time).

Alternative 4: Raise Levee Using Lightweight Fill. The use of lightweight fill materials such as geofoam, expanded clay and Elastizell to raise the LPV 109 levee to the 100-year level of risk reduction elevation were evaluated. These materials result in small loads being imposed on the levee. The existing levee surface would be partially degraded to create a working platform. Lightweight materials would then be used to raise the levee elevation. Because of the risk of breaches in the levee dislodging lightweight materials, erosion protection would be placed along the slopes of the levee.

LPV 109 I-10 Crossing

No Action. Under the no action alternative, the I-10 crossing of LPV 109 would be replaced to meet previously authorized elevations. Improvements would occur within the existing ROW. I-10 would be raised using an abutment or bridge to allow for a higher elevation T-wall or levee to be constructed at the I-10 crossing to meet the previously authorized elevation. Maintenance of structures would continue. No further action would occur.

Alternative 2. Construct Levee and Raise I-10 with a Bridge. A 3,095-foot long, 40-foot high bridge would be constructed over the LPV 109 levee and would meet DOTD's design criteria. Because of the length of this bridge, the existing I-10 bridges located 1,300 feet east of the LPV 109 crossing would also be reconstructed. The bridge would meet Corps design criteria by providing 15

feet of vertical clearance over the proposed LPV 109 levee. The maximum allowable grade of 3 percent would be used to minimize the length of the bridges and the amount of reconstruction of the existing bridges.

LPV 109 US 90 and US 11 Crossings

No Action. Under the no action alternative, floodgates and floodwalls would be replaced to meet previously authorized elevations. Floodgate improvements would occur within the existing ROW. Maintenance of structures would continue. No further action would occur.

Alternative 1. Raise Highways Using a Ramp. A ramp over the LPV 109 levee would be constructed for the two crossings similar to the method described for I-10. Because of ROW limitations that do not allow for adequate side slopes, retaining walls would be used on both sides of the US 90 and US 11 ramps. Also, ROW limitations would likely require complete closure of these two highways for a period of time during construction.

Alternative 2. Raise Highways Using a Bridge. A bridge over the LPV 109 levee would be constructed for the two highway crossings similar to the method described for I-10. The bridges would be approximately 3,095-feet long and 40 feet high, providing 15 feet of vertical clearance over the LPV 109 levee. ROW limitations would likely require complete closure of these two highways for a portion of the construction period.

Alternative 3. Retrofit Existing Floodgate. The existing floodgate structures would be raised to the design elevation and adjacent I-walls and levee structures raised in elevation, retrofitted to meet design criteria and sloped to meet the flood protection in the adjacent levee section. Additionally, because the centerline of the LPV 109 levee would shift 73 feet to the west, the existing floodgate would be offset and new T-walls would be constructed at angles to connect the existing floodgate to LPV 109 levee reaches.

LPV 110

No Action. Under the no action alternative, the 60 feet of I-wall type floodwall would be improved or replaced to meet previously authorized elevations. Maintenance of T-walls and the floodgates that are currently at the previously authorized elevation would continue. No further construction would occur.

Alternative 1. Retrofit Existing Floodgate. The existing LPV 110 floodgate and floodwalls would be raised 10 feet to meet design elevation. Adjacent I-walls and levees would be raised and retrofitted to meet current design standards. All floodwalls and levee structures would be sloped to meet the flood protection in adjacent reaches.

LPV 111

No Action. Under the no action alternative, levees along the GIWW and the floodwall at Pump Station No. 15 would be maintained at previously authorized elevations. Some additional seepage protection may be required to meet design criteria. No further action would occur.

Alternative 1. Raise Levee with Prefabricated Vertical Drains and Geotextile. Levees would be constructed utilizing two types of ground improvements, high strength geotextile and the incorporation of PV drains to increase the rate of consolidation. Three to four layers of high strength geotextile would be used, with the levee fill being placed in five to seven stages to allow for sufficient consolidation of material. A new T-wall at Pump Station No. 15 would be constructed as described for the LPV 111 proposed action.

Alternative 2. Raise Levee with Lightweight Fill. Using lightweight fill materials such as geofoam, shredded and baled tires, expanded clay and Elastizell were evaluated. These materials result in small loads being imposed on the levee to raise the elevation to the 100-year risk reduction elevation. The existing levee surface would be partially degraded to create a working platform. Lightweight materials would then be used to raise the levee elevation. Because of the risk of breaches in the levee dislodging lightweight materials, erosion protection would be placed along the slopes of the levee. A new T-wall at Pump Station No. 15 would be constructed as described for the LPV 111 proposed action.

Alternative 3. T-wall Cap. The existing levee would be degraded to create a working platform and a T-wall would be constructed on top of the existing levee to an elevation of +31.0 feet NAVD 88. The T-wall would be approximately 27,330 feet long and would require construction precautions to meet vessel loading design criteria, since the LPV 111 T-wall cap would be adjacent to a navigable waterway. A new T-wall at Pump Station No. 15 would be constructed as described for the LPV 111 proposed action.

EVALUATION METHODS FOR SELECTED PLAN AND ALTERNATIVES

The Service used the Habitat Assessment Methodology (HAM) to quantify the impacts to forested habitats. The Fresh-Intermediate, and Brackish Coastal Marsh Models of the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) Wetland Value Assessment (WVA) Methodology was used to quantify the impacts to the marsh habitat. Those habitat assessment models utilized in this evaluation are modified from those developed in the Service's Habitat Evaluation Procedures (HEP). However, both models are community-level evaluations instead of the species-based approach used with HEP. For each habitat type, those models define an assemblage of variables considered important to the suitability of an area to support a diversity of fish and wildlife species (Louisiana Department of Natural Resources 1994; U.S. Fish and Wildlife Service 1980). A Habitat Suitability Index (HIS) is calculated from all of the model variables to represent the overall value of the wetland habitat quality. The product of an HIS 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 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 Service's Lafayette, Louisiana, field office.

IMPACTS OF SELECTED PLAN AND ALTERNATIVES

The no action alternative was not selected because it would not allow completion of 100 year flood protection; the purpose of the Supplemental 4 authorization. Fish and wildlife resources would not be significantly impacted by selection of the no action alternative for reaches 109-111. However, with the no action alternative, maintenance of rock foreshore protection along LPV 108 would still be conducted. Impacts to SAVs resulting from maintenance of the riprap erosion protection (dredging of access channels, stockpiling of dredged material and riprap in Lake Pontchartrain) for LPV 108 has not be quantified, but surveys prior to and post construction will be undertaken to determine the need for restoration activities.

Prior to levee rebuilding, soil borings will be taken along the LPV 109 reach on the protected and flood sides of the levee. Most of the work will be within the Bayou Sauvage NWR. The purpose of the borings is to characterize the subsurface soils which will underlie part the new levee and berm. The 43 boring sites will experience temporary impacts due to compaction from marsh buggy tracks, discharge of soil during the boring process and removal of dirt from the bore hole. Because most borings will be taken near the existing ROW and efforts have been undertaken to minimize the footprint of this activity, it is estimated by the Corps that only 0.18 acres would be impacted. Post boring surveys of the boring sites should be conducted to ensure the accuracy of impact areas and assess any recovery from impacts. The temporal analysis of the boring impacts would extend from when the borings occur till the time of levee construction which is estimated to be approximately 1 year. Borings are anticipated to result in the loss of 0.05 AAHUS of bottomland hardwood forest and 0.05 AAHUS of marsh.

The LPV 109 and LPV 111 levee reaches will be permanently impacted by the expansion of the levee base onto the surrounding marsh and BLH, eliminating linear strips of these habitats. Levee construction, pump station relocation, and upgrading would directly impact approximately 202 acres of moderate-quality bottomland hardwood forested wetlands, 119 acres of fresh/intermediate marsh, and 126 acres of brackish marsh. Our analyses indicate that project implementation would result in the direct loss of 101.4 AAHUs of bottomland hardwood forested wetlands, 42.9 AAHUs of fresh/intermediate marsh, and 67.4 AAHUs of brackish marsh.

Some impacts to fish and wildlife habitat will be temporary. The barge offload sites that would be used for construction of LPV 111 levee segment will temporarily impact approximately 2 acres of flood side brackish marsh outside of the LPV 111 levee footprint impact. Eight staging areas to be used for temporary storage of levee-building material would be located along the LPV 109 alignment. These areas will be degraded for the duration of construction, estimated to be two years. Portions of some of these staging areas would be located within other areas of impact. Only the acreage (3.72 acres BLH [protected side] and 1.11 brackish marsh [flood side]) that is outside of these other impacted areas was analyzed. Other temporary impacts would occur in the temporary construction easement for the I-10 crossing ramp (2.4 acres flood side brackish marsh, 2.55 acres

protected side fresh/intermediate marsh, 2.55 acres protected side BLH, and 2.4 acres flood side BLH). The temporary impact to these habitats for two years was determined to result in a loss of 1.14 AAHUs of BLH on the protected side, 0.14 AAHUs of BLH on the flood side, 0.62 AAHUs of fresh / intermediate marsh on the protected side, and 1.41 AAHUs of brackish marsh on the flood side.

The acreage of impacted habitat may change again depending on design or other constraints that are currently unknown. The Service will continue to coordinate with the Corps to ensure that the proper amount mitigation is implemented for the impacts that are ultimately determined.

The selected plan for LPV 111 is a deep soil mixing process which minimizes the levee base width necessary for upgrade to 100 year protection level. Impact acreage of the selected plan for this levee reach is significantly less than for the selected plan for LPV 109. The deep soil mixing alternative was not selected as the proposed plan for LPV 109 resulting in a much larger levee footprint and subsequent greater impacts to habitat. The Service recommends that the IER should contain at least a summary of the plan selection process and the justifications for elimination of alternatives from consideration.

FISH AND WILDLIFE CONSERVATION MEASURES

Clearing and grubbing should be limited to only what is necessary at the time of construction. If bald eagle nesting locations and wading bird colonies are found in the project area before or during construction, adverse impacts may be avoided by timing of construction and further consultation with the Service. SAVs may be directly impacted by dredging of access channels and indirectly by turbidity increases resulting for erosion of disposed access channel material stockpiled in Lake Pontchartrain. Prior to construction and following backfilling of the access channels the Corp should conduct a survey for SAVs in Lake Pontchartrain from the western end of IER 6 eastward to 6,000 feet west of Paris Road. Surveys should be taken at 1,000 foot intervals along the shoreline out to the 3 foot depth contour with samples taken every 20 feet. SAV should be replanted, if needed, to minimize project impacts. The need to replant would be determined in coordination with the Service, NMFS, and other interested natural resource agencies.

COMPENSATORY 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.

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

To replace the project-related loss of moderate-quality forested wetland habitat, fresh/intermediate marsh, and brackish marsh, on the protected and flood sides of the existing levee system, the Corps and the local sponsor should develop and fund mitigation actions that would produce the equivalent of 212 AAHUs, within the Bayou Sauvage NWR (Table 1). The Service would be involved in evaluating the adequacy of mitigation at any site.

Table 1. Project impact acres and AAHUs lost.

	BLH		Fresh/Int. Marsh		Brackish Marsh		Total
	Acres	AAHUs	Acres	AAHUs	Acres	AAHUs	(Acres/AAHUs)
Flood	32.8	12.2	0	0	126	67.4	159 / 79.6
Protected	169	89.2	119	42.9	0	0	288 / 132.1
Total	202	101.4	119	42.9	126	67.4	447 / 212

SERVICE POSITION AND RECOMMENDATIONS

Construction of the flood protection levee would result in the loss of approximately 202 acres of bottomland hardwood wetlands, 119 acres of fresh/intermediate marsh, and 126 acres of brackish marsh for a loss of 101.4, 42.9, and 67.4 AAHUs respectively. The Service does not object to providing improved hurricane protection to the greater New Orleans area provided the following fish and wildlife conservation recommendations are implemented concurrently with project implementation:

1. The Service, LDWF, NMFS, and other resource agencies shall be provided an opportunity to review and submit recommendations on the draft plans and specifications for all levee work addressed in this report.
2. Access channels should be refilled up to the prior lakebed elevation after project

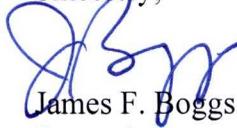
construction, especially the channel sections in water depths of 3 feet or less. Post-construction surveys (e.g., centerline surveys) should be taken to ensure access channels have been adequately backfilled. That information should be provided to the natural resource agencies for review. In areas shallower than 3 feet, where pre-existing elevations have not been successfully restored, the Corps should ensure those elevations are restored by additional measures

3. The Corps should avoid impacts to Bayou Sauvage NWR, when feasible. The Corps should continue to coordination with Refuge personnel during planning and compatibility determination processes. A Special-Use Permit should be obtained prior to any entrance onto the refuge. Coordination should continue until construction is complete and prior to any subsequent maintenance. Points of contacts for that refuge are Kenneth Litzenberger, Project Leader for the Service's Southeast National Wildlife Refuges and Jack Bohannon (985) 822-2000, Refuge Manager for the Bayou Sauvage NWR. The Corps should not sign the Decision Record until a Compatibility Determination is complete.
4. Mitigation for impacts to the Bayou Sauvage NWR should occur on Bayou Sauvage NWR property. Mitigation planning should include refuge staff. The Corps and local sponsor shall obtain 212 AAHUs (as apportioned in Table 1) to compensate for the unavoidable, project-related loss of 447 acres of forested and emergent wetlands.
5. The Service, LDWF, NMFS and other natural resource agencies should be consulted regarding the adequacy of any proposed mitigation.
6. Flood protection and ancillary features such as staging areas and access roads should be designed and positioned so that destruction of wetlands and non-wet bottomland hardwoods are avoided or minimized to the greatest extent possible.
7. Forest clearing associated with project features should be conducted during the fall or winter to minimize impacts to nesting migratory birds, when practicable.
8. If a proposed project feature is changed significantly or is not implemented within one year of the date of our Endangered Species Act consultation letter, we recommend that the Corps reinitiate coordination with this office to ensure that the proposed project would not adversely affect any federally listed threatened or endangered species or their habitat.
9. The Corps should monitor the recovery of the SAV beds in the shallower portions (i.e., less than 3 feet in depth) of Lake Pontchartrain from the western end of IER 6 to 6,000 feet east of Paris Road. If SAV has not re-colonized to pre-project conditions within one year following backfilling, the Corps should plant appropriate species of SAV in the project area. Coordination with the Service, NMFS and other interested

natural resource agencies should be conducted to determine the adequacy of recovery and planting specification, if needed.

10. Areas on the Bayou Suavage NWR where soil borings have been taken should be assessed to ensure the accuracy of the anticipated impact area (0.18 acres) and determine recovery from impacts.

Sincerely,



James F. Boggs
Supervisor
Louisiana Field Office

cc: FWS, Southeast Refuge Complex, Lacombe, LA
EPA, Dallas, TX
NMFS, Baton Rouge, LA
LDWF, Baton Rouge, LA
OCPR, Baton Rouge, LA

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Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service, Division of Biological Services, Washington, D.C. FWS/OBS-79/31. 108 pp.

Louisiana Department of Natural Resources. 1994. Habitat assessment models for fresh swamp and bottomland hardwoods within the Louisiana coastal zone. Louisiana Department of Natural Resources, Baton Rouge, Louisiana. 10 pp.

U.S. Fish and Wildlife Service. 1980. Habitat evaluation procedures. U.S. Fish and Wildlife Service, Division of Ecological Services, Washington, D.C. Ecological Services Manual

**APPENDIX E: US 11 TEMPORARY CLOSURE
TRAFFIC EVALUATION**



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March 10, 2010

Mr. Michael Grzegorzewski
PM Lead
Department of the Army
Hurricane Protection Office, Corps of Engineers
P.O. Box 60267
New Orleans, LA 70160-0267

**Re: US 11 Temporary Closure Traffic Evaluation
Lake Pontchartrain and Vicinity
Orleans Parish
Reach LPV 109.02
US 11 and US 90 Highway Crossings of LPV 109
New Orleans East
Hurricane Protection Office
Our File #: 10-21**

Dear Mr. Grzegorzewski:

This revised report presents the findings of our traffic data collection efforts which were performed in accordance with the requirements of the scope of work dated February 25, 2010.

Traffic volume data was collected by utilizing JAMAR tube counters placed at the following intersections: Chef Menteur Hwy. (Hwy. 90) and Hwy. 11; Chef Menteur Hwy. (Hwy. 90) and I-510; Hwy 11. The counters were deployed at 2:00 PM on Friday, February 26, 2010 and were recovered at 3:00 PM on Wednesday, March 3, 2010. After recovery the obtained data was downloaded from the automatic counters and data reports showing hourly axle counts were generated utilizing JAMAR TRAXPRO software.

Using the above collected data, the Average Daily Traffic (ADT) values were calculated. Graphical illustrations are shown on attached drawing 1, drawing 2 and drawing 3.

Upon closing of Highway 11, northbound and southbound traffic along that road will be diverted to alternate routes. The volumes and movements associated with the diverted traffic are shown in red on the attached drawing 1. Each movement has been identified with an A, B, C or D. Movement A traffic has been separated into two alternate routes. A1 sub movements are assumed to continue through the Hwy 11 intersection. A2 sub movements were assumed to originate between I-510 and Hwy 11, therefore these movements would travel eastbound on Chef Menteur Hwy. to I-510.

Mr. Michael Grzegorzewski
Department of the Army
Hurricane Protection Office, Corps of Engineers
March 10, 2010
Page 2

Movements A were split into A1 and A2 in the same proportion they currently exit the Hwy 11 intersection ($A1=(2,164/3,854)*1,690=949$ ADT) ($A2=(1690/3,854)*1,690=741$ ADT).

Movement B was split into B1 and B2 sub movements. B1 traffic would utilize alternate routes east of the Hwy 11 intersection and B2 would continue through the Hwy 11 intersection in the same proportion that is currently noted ($B2=(775/1,881)*1,106=455$ ADT).

Movement C was assumed to utilize I-510 and Chef Menteur Hwy eastbound as an alternate route.

Movement D was split into D1 and D2 sub movements. D1 traffic would utilize I-510 and Chef Menteur Hwy. eastbound as an alternate route while D2 traffic would utilize alternate routes east of the Hwy 11 intersection. It was assumed that D1 and D2 alternate sub movements would be equal.

Drawing 2 illustrates the impact the above mentioned sub movements will have on the existing traffic conditions. Drawing 3 estimates the percent increase or decrease on existing traffic based on the assumed alternate routes from the net change in traffic as a result of the Hwy 11 closure.

This report and all attachments is being submitted in five copies. A CD with the report, data files and drawing files is also enclosed.

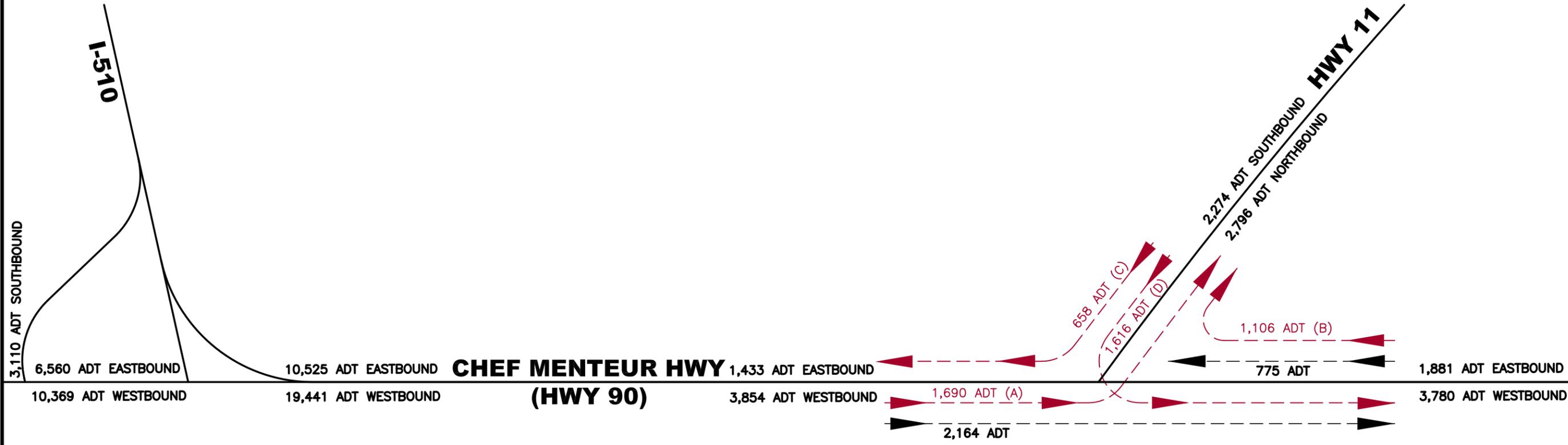
We trust that this submittal satisfies all requirements of the Scope of Work. We appreciate this opportunity to be of continued service to the HPO and please do not hesitate to contact us should you have any questions or require any additional information.

Very truly yours,

for NEW ORLEANS SMALL BUSINESS ENGINEERING, A JOINT VENTURE, L.L.P.

Linfield, Hunter & Junius, Inc.
Managing Partner for NOSBE, L.L.P.
by Charles T. Knight, P.E.

CTK/ctk
Enclosures



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SEAL	
REV. NO.	DATE

**CHEF MENTEUR HWY (HWY 90) & HWY 11
 NEW ORLEANS, LA
 TRAFFIC STUDY**

PROJ. NO. 10-21
DATE 3/4/10
SHEET NO. 1

NOT TO SCALE

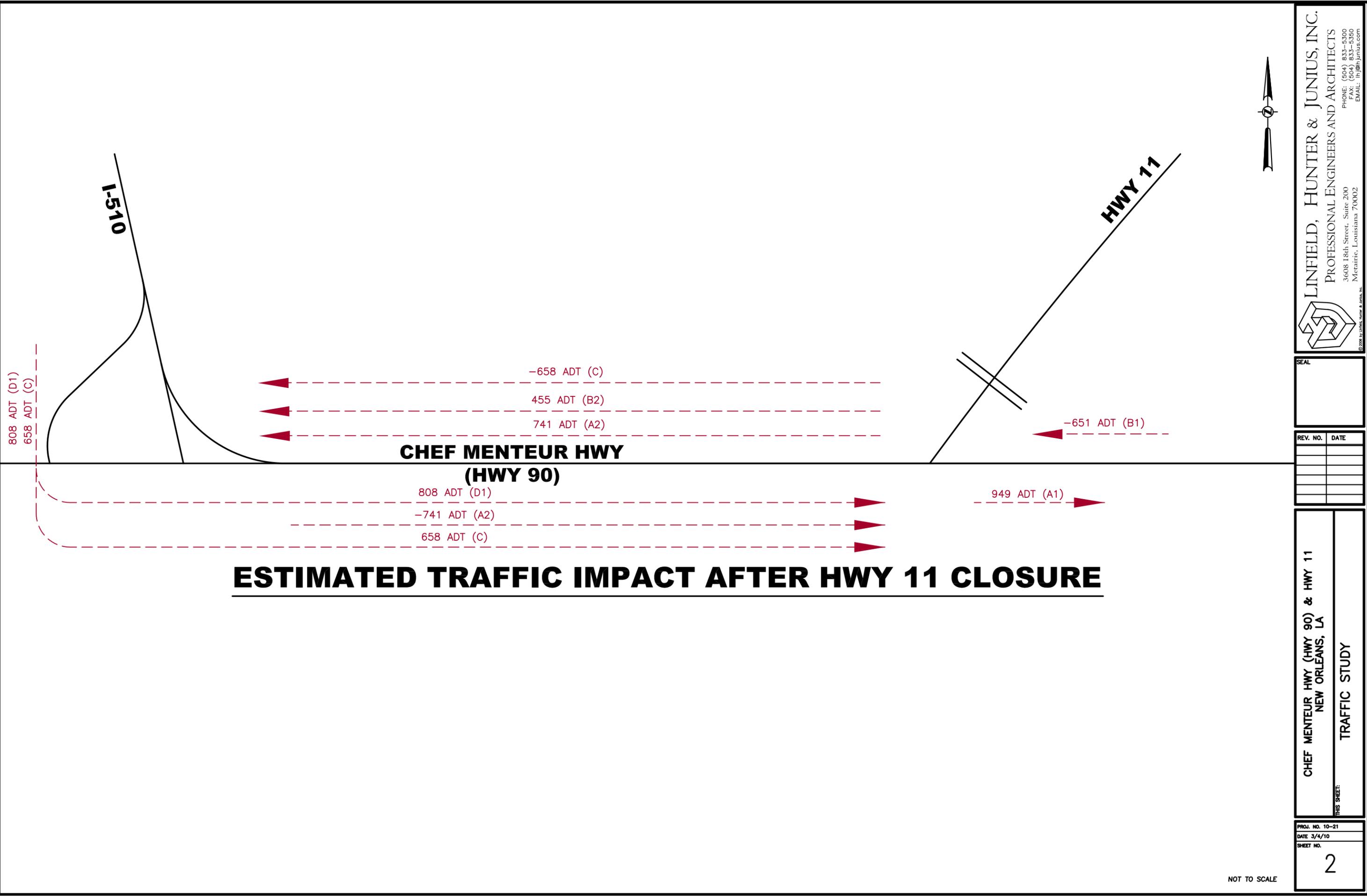
SEAL

REV. NO.	DATE

CHEF MENTEUR HWY (HWY 90) & HWY 11
 NEW ORLEANS, LA
 TRAFFIC STUDY
THIS SHEET:

PROJ. NO. 10-21
 DATE 3/4/10
 SHEET NO.

2



NOT TO SCALE

47% INCREASE (1,466 VEHICLES)

4,576 ADT SOUTHBOUND

I-510

0% INCREASE
6,560 ADT EASTBOUND

11,835 ADT WESTBOUND

5% INCREASE (538 VEHICLES)

11,063 ADT EASTBOUND

20,166 ADT WESTBOUND

**CHEF MENTEUR HWY
(HWY 90)**

38% INCREASE (538 VEHICLES)

1,971 ADT EASTBOUND

4,579 ADT WESTBOUND

HWY 11

35% DECREASE (651 VEHICLES)

1,230 ADT EASTBOUND

4,729 ADT WESTBOUND

4% INCREASE (1,466 VEHICLES)

4% INCREASE (725 VEHICLES)

19% INCREASE (725 VEHICLES)

25% INCREASE (949 VEHICLES)

ESTIMATED TRAFFIC VOLUMES AFTER HWY 11 CLOSURE



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SEAL

REV. NO.	DATE

CHEF MENTEUR HWY (HWY 90) & HWY 11
NEW ORLEANS, LA

TRAFFIC STUDY

PROJ. NO. 10-21
DATE 3/4/10

SHEET NO.

3

NOT TO SCALE