



**US Army Corps  
of Engineers**

# Project Information Report

Rehabilitation Hurricane or Shore Protection  
Projects Damaged by  
Hurricane Katrina

**Lake Pontchartrain, Louisiana and Vicinity,  
Hurricane Protection Project**

**Orleans Parish, Louisiana**

**ORLEANS EAST BANK**

**Revision #02**

Revised 17 May 2006

Prepared by U.S. Army Corps of Engineers  
New Orleans District

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## **EXECUTIVE SUMMARY**

The purpose of this revision is to update the original Project Information Report (PIR), dated 18 October 2005, and Revision #01, dated 20 January 2006, to include actual costs for awarded contracts and additional contracts related to increasing the temporary pumping capacity at the interim closure structures on the 17<sup>th</sup> Street and London Avenue Outfall Canals. This revision follows the outline of the original PIR. However, to expedite the development and review of this revision, only the sections that have changed will be included. The sections that have not changed will be identified and a reference to the original PIR will be included.

Hurricane Katrina weakened portions of the Orleans East Bank (OEB) outfall canal levee foundations causing catastrophic breaches at the 17<sup>th</sup> Street and London Avenue Outfall Canals. Hurricane Katrina also caused flooding near the pumping station at the Orleans Avenue Outfall Canal (the aforementioned three outfall canals). Combined with several breaches from overtopping of flood walls at the Inner Harbor Navigational Canal, flood waters covered 75 to 80 percent of the City of New Orleans. Due to the extensive amount of damage caused by Hurricane Katrina, permanent repairs to the protection along the outfall canals will take a minimum of 3 years to complete. In order to restore hurricane protection to the three outfall canals (17<sup>th</sup> Street, London Avenue and Orleans Avenue), insure the integrity of the Parallel Protection levees and floodwalls, and provide for access and maintenance, this PIR recommends increasing the temporary pumping capacity at the 17<sup>th</sup> Street and London Avenue Canals.

The capacity of the temporary pumps at the closure structures on the 17<sup>th</sup> Street and London Avenue Canals is significantly less than the capacity of the existing pumps that discharge into these canals. During a storm event when the gates are closed, the existing pumps will be limited to the capacity of the temporary pumps. Adding additional temporary pumps at the closure structures on 17<sup>th</sup> Street and London Avenue Canals would increase the pumping capacity, insure the integrity of the Parallel Protection levees and floodwalls, and provide for access and maintenance.

The capacity of the temporary pumps approved in Revision #1 was limited to what could be physically put in place by 1 Jun 2006 and is less than the capacity of the existing pumps discharging into two of the outfall canals. Revision #1 states that the need for increasing the capacity of the temporary pumps will be addressed in further investigations. A discussion of the need for increasing the capacity of the temporary pumps at the closure structures on 17<sup>th</sup> Street and London Avenue Canals is provided in Section 12. The additional temporary pumps are an interim measure that would be operated and maintained and removed by the USACE when the authorized level of protection has been restored to the outfall canals. Further, the interim gated closure structures and initial temporary pumping capacity approved via the 20 Jan 06 Revision #01 to the OEB PIR may not be fully in place at the 17<sup>th</sup> Street and/or London Avenue Outfall Canals by 1 June 06. Thus, an interim sheet pile closure with portable temporary pumps of 1,000 cfs capacity located at the 17<sup>th</sup> Street and/or London Avenue Outfall Canals is required.

The recommended alternative also includes increasing temporary pumping capacity at the 17<sup>th</sup> Street and London Avenue Canals. This alternative consists of adding additional pumps at the

interim gated closure structures at 17<sup>th</sup> Street and London Avenue Canals near Lake Pontchartrain. The updated total cost for repairs covered in the original PIR, PIR Revision #01, and in this PIR Revision #02 is approximately [REDACTED]

## 1. NAME AND LOCATION

The **Lake Pontchartrain, LA. and Vicinity Hurricane Protection Project** is located in St. Bernard, Orleans, Jefferson and St. Charles Parishes in southeast Louisiana, generally in the vicinity of the city of New Orleans, and between the Mississippi River and Lake Pontchartrain. The Orleans East Bank portion of the project includes the east bank of the Mississippi River between the 17<sup>th</sup> Street Canal and Inner Harbor Navigational Canal (IHNC). See Figure 1 below.



**Figure 1.** Map of Lake Pontchartrain, LA., and Vicinity Hurricane Protection. Shaded areas in red sustained major damage from Hurricane Katrina.

## **Features**

### **17<sup>th</sup> Street Outfall Canal (Metairie Relief)**

The 17<sup>th</sup> Street Outfall Canal lies in Jefferson Parish, immediately west of the Orleans Parish boundary line. The canal receives discharge from Pump Station No. 6, the I-10 Pump Station, and Canal Street Pump Station. The total maximum discharge capacity of the canal is 10,500 cubic feet per second (cfs). The canal extends approximately 3 miles from Pump Station No. 6 near Interstate 10 to its confluence with Lake Pontchartrain. The parallel protection running the entire length of the canal varies in elevation from +13 to +15 feet National Geodetic Vertical Datum (NGVD).

### **London Avenue Outfall Canal**

The London Avenue Outfall Canal is located on the south side of Lake Pontchartrain in Orleans Parish. The London Avenue Outfall Canal lies to the east of 17<sup>th</sup> Street Canal and Orleans Avenue Canal. The canal receives discharge from Pump Stations No. 3 and 4. The total maximum discharge capacity of the canal is 7,980 cfs. The canal extends approximately 2.5 miles from Pump Station No. 3 to its confluence with Lake Pontchartrain. The parallel protection running the entire length of the canal varies in elevation from +13 to +15 feet NGVD.

### **Orleans Avenue Canal**

The Orleans Avenue Outfall Canal is located on the south side of Lake Pontchartrain in Orleans Parish and runs along the western boundary of City Park. The canal receives discharge from Pump Station No. 7. The total maximum discharge capacity of the canal is 2,690 cfs. The Orleans Avenue Canal extends about 2.4 miles from Pumping Station No. 7 in the vicinity of I-610 to its mouth at Lake Pontchartrain. The parallel protection running the entire length of the canal varies in elevation from +13 to +15 feet NGVD.

## **2. PUBLIC SPONSORS**

The Lake Pontchartrain and Vicinity Hurricane Protection Project consists of areas within St. Bernard, Orleans, Jefferson, and St. Charles Parishes. The additional requirements for the outfall canals require that work be performed in Jefferson and Orleans Parishes. The public sponsors for the Cooperation Agreements (CA) for the interim closures of the outfall canals are the Orleans Levee District (OLD) and the Sewerage and Water Board of New Orleans (S&WB) for the interim closure of all three of the outfall canals; and, for the interim closure of the 17<sup>th</sup> Street Canal, the additional co-sponsors are the East Jefferson Levee District (EJLD), the Fourth Jefferson Drainage District, and the Sub-District A of the Fourth Jefferson Drainage District.

On 15 September 2005, the New Orleans District Commander, Colonel Richard P. Wagenaar issued a Notice to Public Sponsors notifying them that the application period to request Rehabilitation Assistance for Flood Damaged Flood Control Projects expired on 15 Oct 2005. Requests for assistance were received from the Orleans Levee District, the East Jefferson Levee

District, the Sewerage and Water Board of New Orleans, and Jefferson Parish prior to the deadline.

The proposed public sponsors for any additional temporary pumping are the Orleans Levee District (OLD) and the Sewerage and Water Board of New Orleans (S&WB) for the effort at the London Avenue Canal and 17<sup>th</sup> Street Canal. For the additional temporary pumping at the 17<sup>th</sup> Street Canal, the additional co-sponsors are the East Jefferson Levee District (EJLD), the Fourth Jefferson Drainage District, and the Sub-District A of the Fourth Jefferson Drainage District.

Multiple inspections for damage survey reports were conducted from 8 September 2005 through 8 October 2005 to inspect damages to the levee and control structures resulting from the 2005 hurricane event. The following is the team that conducted the inspections:

Project Manager	Frederick Young
Project Manager	Mark Alvey
Project Manager (IHNC)	Stuart Waits
Geotechnical Engineer	Frank Vojkovich
Geotechnical Engineer	Rich Varuso
Structural Engineer	Darryl Bonura
Structural Engineer	Rob Dauenhauer
Civil Engineer	Danny Thurmond
Cost Estimating Engineer	Darrell Normand
Real Estate Specialist	Dawn Lambert

Investigations on each of the three outfall canals have determined the safe water elevation of approximately 5 feet each at the 17<sup>th</sup> Street and London Avenue Canals and approximately 9 feet at the Orleans Avenue Canal. As a result of the extensive damage caused by Hurricane Katrina, the floodwalls along the outfall canals no longer provide the authorized level of protection. The maximum allowable stage in each of the outfall canals will be used to determine the stage at which the gates must be closed. An Operating Manual is being coordinated with the S&WB, OLD, EJLD, and Jefferson Parish concerning the safe water elevation levels of water that may be discharged into the outfall canals.

### **3. PROJECT AUTHORITY**

#### **Public Law:**

- The Flood Control Act of 27 October 1965 (PL 89-298 “Lake Pontchartrain, Louisiana and Vicinity Hurricane Protection Project,” accordance with the recommendations of the Chief of Engineers in House Congress, 1<sup>st</sup> Session.
- Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act, 2006 (Public Law 109-148).

#### **House Document:**

- Report of the Chief of Engineers dated 4 March 89<sup>th</sup> Congress, 1<sup>st</sup> Session, submitted for transmission to Congress the Engineers for Rivers and Harbors, accompanied by the

reports of the Engineers and the concurring report of the Mississippi River Commission its jurisdiction.

**Water Resources Act**

- Water Resources Acts of 1974, 1986, 1990, 1992, 1996 and 2000.

**4. PROJECT CLASSIFICATION**

No changes to this section. Refer to the 18 Oct 2005 PIR.

**5. DESIGN DATA OF PROJECT**

a. This portion of the project that protects the city of New Orleans was designed to protect 28,300 acres of urban and industrial lands. The levee portion is constructed with a 10-foot crown width and side slopes of 1 on 3. Along the Lake Pontchartrain Lakefront, the top elevation of the earthen levees range between elevation +13 and +18 feet NGVD. Floodwalls were designed to provide lines of protection along the outfall canals. Floodwalls consist of reinforced concrete T-wall floodwalls and reinforced concrete I-wall floodwalls constructed on the top of sheet-pile, and sheet piling without a concrete section. Top elevations of the floodwalls vary between elevation +13 and +15 feet NGVD. The level of protection was derived from providing protection from the Design Hurricane (“DH”) that used the combination of the following characteristics:

<b><u>Central Pressure</u></b>	<b><u>Max Winds Radius</u></b>	<b><u>Wind Speed</u></b>	<b><u>Max Forward Speed</u></b>
27.6	30	110 mph	5 – 11 knots

b. The Levee District is classified as urban Flood Control Works (FCW). The primary project features per last inspection in May 2005 are as follows:

			<u>PL84-99</u>		
			<u>Eligible</u>	<u>Active</u>	
Levee	FCW	FLU	Yes	Yes	Acceptable
Floodwall	FCW	FLU	Yes	Yes	Acceptable
Closure Structures	FCW	FLU	Yes	Yes	Acceptable
Orleans Ave. Canal	FCW	FLU	Yes	Yes	Acceptable

Primary Use codes: FCW= Flood Control Works  
NFC= Non-Federal Control Works



<u>Category Codes:</u>		
<u>1<sup>st</sup> Letter</u>	<u>2<sup>nd</sup> Letter</u>	<u>3<sup>rd</sup> Letter</u>
F= Federally Constructed	F=Federally Maintained/Not Eligible	U=Urban
L= Locally Constructed	L=Locally Maintained, Eligible	A=Agricultural
	P=Locally Maintained/Not Eligible	

## **6. MAINTENANCE**

Utilization of the interim canal closures and integrated pumps will be by the USACE. These features will be removed by the USACE as follows: (a) the interim sheet pile closures and portable temporary pumps upon completion of the respective interim gated closure structures and initial temporary pumping capacity and (b) the initial and additional temporary pumping capacity at the interim gated closure structures at each outfall canal upon completion of permanent repair and rehabilitation to the hurricane protection system.

## **7. PERIODIC NOURISHMENT**

No changes to this section. Refer to the 18 Oct 2005 PIR.

## **8. PREVIOUS REPAIR AND REHABILITATION ASSISTANCE**

No changes to this section. Refer to the 18 Oct 2005 PIR.

## **9. DISASTER INCIDENT**

No changes to this section. Refer to the 18 Oct 2005 PIR.

## **10. DAMAGE DESCRIPTION**

Refer to the 18 Oct 2005 PIR and the 20 Jan 2006 PIR Revision #01. Sections 10.a. and 10.b. were modified to reflect current information.

### **10.a. Advertised/Awarded Contracts covered in the 18 October 2005 PIR and the 20 January 2006 PIR Revision #01**

- 1 OEB01 – Sheet Pile Repair 17<sup>th</sup> Street Canal Floodwall Breach (Phase I)
- 2 OEB02 – Sheet Pile Repair 17<sup>th</sup> Street Canal Floodwall Breach (Phase II)
- 3 OEB03 – London Ave. Canal Floodwall Breach, Mirabeau Ave. (Phase I)
- 4 OEB04 – London Ave. Canal Floodwall Breach, Mirabeau Ave. (Phase II)
- 5 OEB05 – London Ave. Canal Floodwall Breach, Robert E. Lee Blvd. (Phase I)
- 6 OEB06 – London Ave. Canal Floodwall Breach, Robert E. Lee Blvd (Phase II)
- 7 OEB07 – Lake Pontchartrain Scour Repair and Slope Paving at the Orleans Pump Station
- 8 OEB09 – Interim Closure Structure at 17<sup>th</sup> Street Outfall Canal

- 9 OEB10 – Interim Closure Structure at London Avenue Outfall Canal
- 10 OEB11 – Interim Closure Structure at Orleans Avenue Outfall Canal
- 11 OEB12 – Orleans Avenue Outfall Canal Levee Tie-in
- 12 OEB13 – London Avenue Outfall Canal Levee Tie-in
- 13 IHNC02 – West Side, South of France Rd. Ramp to N. of Benefit St.
- 14 IHNC04 – West Side, Hayne Blvd. to Hwy. 90
- 15 IHNC05 – West Side, Vicinity of France Rd. Ramp to IHNC
- 16 IHNC08 – West Side, North of Benefit St. to Almonaster Blvd.
- 17 IHNC09 – West Side, Lock to Florida Avenue

#### **10.b. Revised Damages**

The surge from Hurricane Katrina affected the integrity of the parallel protection levee system in the three Outfall Canals in the Orleans East Bank basin. Hydrographic and overbank surveys at and near the breaches indicated that the surge caused degradation between and along the canal bank and channel bottoms. Geotechnical analyses of the flood protection along the canals were performed using USACE criteria and current survey data. The geotechnical conditions deteriorated from the effects of Hurricane Katrina thereby reducing the water elevation that the canals could safely handle post-Katrina. The integrity of the flood protection has been compromised along each canal.

### **11. NEED FOR REPAIR AND REHABILITATION**

Hurricane or Shore Protection Project (HSPP) Rehabilitation Assistance is necessary to return the system to adequate functioning of the project and reduce the immediate threat to life and improved property. Planned rehabilitation will return the system to the previously authorized height (returning the project to its previous lift height plus overbuild). Temporary closure structures in the three outfall canals will keep storm surge from exceeding a safe operating stage until rehabilitation of the protection has been completed. As a result of Hurricane Katrina, data indicates that the parallel protection along the outfall canals is weakened, such that the maximum safe water elevation in each of the canals is less than that which existed prior to Hurricane Katrina. Investigations have determined the approximate maximum safe water elevation in each canal. These elevations are approximately 5 feet each at the 17<sup>th</sup> Street and London Avenue Canals and approximately 9 feet at the Orleans Avenue Canal. The capacity of the temporary pumps at the closure structures on the 17<sup>th</sup> Street and London Ave Canals is significantly less than the capacity of the Public Sponsors' existing pumps that discharge into these canals. During a storm event when the gates are closed, the Public Sponsors' existing pumps will be limited to the capacity of the temporary pumps.

HSPP Rehabilitation Assistance allows for the rehabilitation of the Lake Pontchartrain and vicinity Hurricane Protection system to pre-Katrina levels. Accordingly, since the Congress has deemed the outfall canals a feature of the hurricane protection project, the outfall canals are eligible for rehabilitation under HSPP Rehabilitation Assistance.

## **12. PROPOSED WORK**

### **Project Repair Alternatives Considered**

#### **a. Description**

(1) No Action. This alternative consists of providing no additional temporary pumping capacity at the closure structures on 17<sup>th</sup> Street and London Avenue Canals.

(2) Non-Structural Flood Recovery / Floodplain Management. This alternative consists of non-structural strategies generally involving change in land use offered by other Federal and state programs. Such strategies would include: (1) Acquisition, relocation, elevation, and flood proofing existing structures; (2) acquisition of fee interest and/or conservation or other types of easements; and (3) restoration of wetland. The sponsors have not indicated any interest in this alternative. Additionally, this alternative would not insure the integrity of the Parallel Protection levees and floodwalls or provide for access and maintenance.

(3) Increase temporary pumping capacity at the 17<sup>th</sup> Street and London Avenue Canals. This alternative consists of adding additional pumps at the interim gated closure structures at 17<sup>th</sup> Street and London Avenue Canals near Lake Pontchartrain. Further, the interim gated closure structures and initial temporary pumping capacity approved via the 20 Jan 06 Revision #01 to the OEB PIR may not be fully in place at the 17<sup>th</sup> Street and/or London Avenue Outfall Canals by 1 Jun 06. Thus, an interim sheet pile closure with portable temporary pumps of 1,000 cfs capacity is required at the 17<sup>th</sup> Street and/or London Avenue Outfall Canals.

#### **b. Discussion**

(1) No Action alternative is not acceptable to the sponsors. The No Action alternative would not insure the integrity of the parallel protection levees and floodwalls or provide for access and maintenance.

(2) Non-Structural Flood Recovery / Floodplain Management alternative is not acceptable due to the numerous industrial uses for the lands within the protected area. In addition, there will be residents, businesses, and industries that will want to and will be allowed to rebuild their homes and businesses. The sponsor has not requested a non-structural alternative. Additionally, this alternative would not insure the integrity of the Parallel Protection levees and floodwalls or provide for access and maintenance.

(3) In order to restore hurricane protection to the three outfall canals, insure the integrity of the Parallel Protection levees and floodwalls, and provide for access and maintenance, the interim gated closure structures and temporary pumps were approved as part of Revision #1, dated 20 Jan 2006. The capacity of the temporary pumps approved in Revision #1 was limited to what could physically put in place by 1 Jun 2006 and is less than the capacity of the existing pumps discharging into two of the outfall canals. A discussion of the need for increasing the capacity of the temporary pumps at the closure structures on 17<sup>th</sup> Street and

London Avenue Canals beyond what is currently approved is provided below.

**Introduction.**

The three outfall canals (17<sup>th</sup> Street, Orleans Avenue, and London Avenue) convey rainfall runoff from a total of six pump stations to Lake Pontchartrain. On the 17<sup>th</sup> Street Canal, three pump stations discharge rainfall runoff into the canal. The three stations are Pump Station No. 6, the I-10 Pump Station, and the Canal Street Pump Station. Pump Station No. 6 and the I-10 Pump Station are operated by the New Orleans Sewerage and Water Board and the Canal Street Pump Station is operated by Jefferson Parish Drainage Department. On Orleans Avenue Canal, only Pump Station No. 7 discharges into the canal. Finally, on London Avenue, two stations, Pump Station No. 3 and Pump Station No. 4, discharge into the canal. The pump stations discharging into London and Orleans Avenue Canals are all operated by the New Orleans Sewerage & Water Board. The nominal discharges of the stations are shown in Table 1. With the exception of the Canal Street Pump Station, all of the existing pump stations that discharge into the outfall canals were damaged by Hurricane Katrina. Repairs to the damaged pump stations have been addressed in the Federal and Non-Federal Pump Station, Orleans Parish, Louisiana PIR. The PIR was approved on 1 May 06 and contracts for the repairs are scheduled for award by 15 May 06. Interim repairs to the existing stations have been ongoing through the SWB and FEMA. The schedule for the interim repairs has the stations returning to nominal capacity by the beginning of the 2006 hurricane season.

**Table 1  
Nominal (rated) Capacities**

Pump Station	Nominal Capacity (cfs)
<b>17 Street</b>	
PS 6	9,480
I-10	860
Canal Street	160
Total 17th Street	10,500
<b>London Ave</b>	
PS 3	4,260
PS 4	3,720
Total London Ave	7,980
<b>Orleans Ave</b>	
PS 7	2,690
Total Orleans Ave	2,690

The interim closure structures and temporary pumps for all three outfall canals were approved in the Orleans East Bank PIR, Revision #01, dated 20 January 2006. The currently approved

capacity of the temporary pumps at each of the closure structures are provided in Table 2.

**Table 2  
Currently Approved Temporary Pump Capacity**

	Minimum (cfs)	Operating (cfs)	Maximum (cfs)
Single pump	200	220	230
17th Street	2,400	2,640	2,760
Orleans Ave	2,000	2,200	2,300
London Ave	2,400	2,640	2,760
Operating Point is suction at 4.0 and Lake at 8.0			
Minimum Point is suction at 4.0 and Lake at 11.5			
Maximum Point is suction at 4.0 and Lake at 5.0			

**Analysis of Needed Capacity.**

In order to maintain the adequate function of the hurricane protection project and the structural integrity of the outfall canal floodwalls, the water elevation in the canal must be maintained at or below a certain level. This “safe water level” has been determined to be approximately 5 feet each at the 17<sup>th</sup> Street and London Avenue Canals and approximately 9 feet at the Orleans Avenue Canal, and this evaluation of the floodwall stability still continues.

When a tropical system threatens the region and the predicted lake stages are expected to reach or exceed the safe water levels in the canals, the interim gated structures will be closed. Closure of the gated structure will be by the use of cranes until such time that mechanical systems can be installed. Therefore, at least for the beginning of the 2006 hurricane season cranes will be used. The criteria for gate closure are based on the predicted lake stage and on the limitation on the cranes to operate during high winds. We anticipate that the gates will need to be closed prior to winds exceeding 30 mph. It is also anticipated that it will take no more that six hours to close all of the gates at each canal.

While the floodwalls will no longer be threatened by the storm surge when the gates are closed, water levels in the canals can easily reach beyond the safe water level from rainfall runoff being discharged in the canal by existing pump stations. In order to control the water levels in the canal, temporary pumps are being installed at the interim closure structures. The currently approved temporary pumping capacity at the 17<sup>th</sup> Street and London Avenue Canals, is significantly less than the capacity of the existing stations. Therefore, the discharge of the existing stations must be regulated. Under the existing Cooperation Agreements, the sponsors have agreed to limit the discharge into these canals to not exceed the safe water level. However, without this constraint, the discharge into the canal can exceed the discharge out of the canal provided by the temporary pumps. The relevant provision in the Cooperation Agreement is found at Article VI B. It states: “[t]he Public Sponsors and the Government shall coordinate efforts such that the maximum safe water levels maintained in or operating through the outfall canal do not interfere with the integrity of the weakened outfall canals and HSPP and do not

interfere with the expedient construction of the Rehabilitation Effort. When the Government utilizes the interim gated closure structure and integrated pumps or otherwise informs the S&WB, Fourth District, and Sub District A, respectively, of the maximum safe water levels of the outfall canal, the S&WB, Fourth District, and Sub District A, shall operate their respective drainage systems in a manner that conforms to the maximum safe water levels identified by the Government and in a manner that does not interfere with the integrity of the outfall canal and the HSPP features in the vicinity of the outfall canal.” Limiting the allowable discharge into the outfall canals could adversely impact the ability to access and perform maintenance on the outfall canal levees and floodwalls, as well as other features of the Lake Pontchartrain, Louisiana and Vicinity Hurricane Protection Project. Increasing the capacity of the temporary pumps will insure the integrity of the Parallel Protection levees and floodwalls and provide access for maintenance.

The capacity of the existing pumping stations along the outfall canals is, to a large extent, dependent on the water elevation in the canals. With normal stages in Lake Pontchartrain, the total pumping capacity into the canals is 10,500 cfs for the 17<sup>th</sup> Street Canal, 2,690 cfs for the Orleans Ave Canal, and 7,980 cfs for the London Ave Canal. When a tropical storm or hurricane is approaching the area, the stage in Lake Pontchartrain and the outfall canals becomes elevated. This increases the head differential across the pumping stations and reduces the efficiency of the pumps. This results in a reduction in the pumping capacity of between 20 to 30 percent. With the interim closure structures in place, the storm surge will be prevented from traveling up the outfall canals significantly reducing the head differential across the pumps. Under the existing Cooperation Agreement, the existing pumping stations will, however, be limited to the capacity of the temporary pumps in order to maintain the safe water level in each of the outfall canals. Limiting the allowable discharge into the outfall canals could adversely impact the ability to access and perform maintenance on the outfall canal levees and floodwalls, as well as other features of the Lake Pontchartrain, Louisiana and Vicinity Hurricane Protection Project. A representation of these conditions is presented in Figure 2.



## 17<sup>th</sup> Street Canal Temporary Pumping

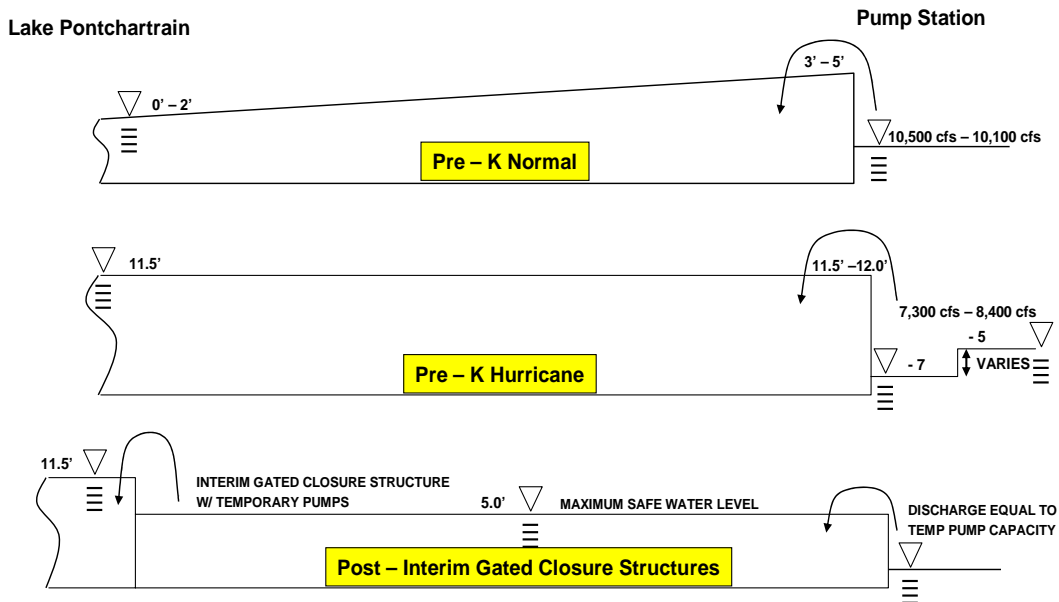


Figure 2

Three variables affect the discharge into the canals; rainfall intensity (suction bay elevation), discharge elevation (canal stage), and mechanical integrity. Table 3 provides the nominal discharge capacity of each pump station based on rainfall intensity and normal lake levels (Pre - K Normal), the capacity of each pump station at a lake stage of 5 feet, and the reduced discharge capacity of the pump stations if they were required to pump against the storm surge produced by the DH (Pre - K Hurricane). The New Orleans Sewerage & Water Board (S&WB) drainage system operates on two power sources, 60 cycle commercial power and 25 cycle S&WB generated power. Emergency back-up power sources are not currently available for the 60 cycle pumps at Pump Stations 3, 4, 6, and 7. Two generators are being installed at Pump Station 6; however, they likely will not be operable during the 2006 hurricane season. Only the 25 cycle power, which is distributed to the station through underground feeders are reliable during a tropical event. Additionally, the constant duty pumps can not operate against high surges. Capacity reductions resulting from a tropical storm or hurricane should be considered in determining the minimum capacities of the temporary pumps. Column 6 in Table 3 shows the discharge capacity of each pump station that would be available during the DH (reduced capacity for increased head differential and excludes pumps reliant on 60 cycle power).

**Table 3  
Capacities Reduced by Storm Surge**

COLUMN #	1	2	3	4	5	6	7
Pump Station	Nominal Capacity (Lake Stage of 0 to 2 feet) (cfs)	Capacity at Lake Stage of 5 feet (cfs)	Reduction From Nominal (%)	Static Head 16.5 (cfs)	Reduction From Nominal (%)	Capacity During DH <sup>1</sup> (cfs)	Reduction From Nominal (%)
<b>London Ave</b>							
PS 3	4,260	4,050	4.9	2,950	31	2,950	31
PS 4	3,720	3,720	0	3,160	15	2,550	31
Total	<b>7,980</b>	<b>7,770</b>	<b>2.6</b>	<b>6,110</b>	<b>23</b>	<b>5,500</b>	<b>31</b>
<b>Orleans Ave</b>							
PS 7 Total	<b>2,690</b>	<b>2,580</b>	<b>4.1</b>	<b>1,900</b>	<b>29</b>	<b>1,050</b>	<b>61</b>
<b>17<sup>th</sup> Street</b>							
PS 6	9,480	9,080	4.2	7,214	24	4,610	51
I-10	860	860	0	860	0	860	0
Canal Street	160	160	0	160	0	160	0
Total	<b>10,500</b>	<b>10,100</b>	<b>3.8</b>	<b>8,234</b>	<b>22</b>	<b>5,630</b>	<b>46</b>
<sup>1</sup> The capacity available during the Design Hurricane assumes that the 60cycle pumps currently without backup generators will not be operable due to loss of power.							

The interim gated closure structures will be left in the open position except when weather conditions exist in Lake Pontchartrain that are capable of producing stages in the canals that would exceed the maximum safe water elevation (the allowable safe operating stage in each of the outfall canals has been significantly reduced as a result of Hurricane Katrina). By leaving the gates in the open position during non-tropical events, the pumping capacity of the existing pumping stations can be utilized during heavy rainfall events, but only to the maximum safe water elevation. The gates will be closed in advance of the storm and will remain closed until the storm has passed and the stages in Lake Pontchartrain have receded to a safe level. During this period of time, the temporary pumps will be the only means to pump out rainfall associated with the storm.

Further, the interim gated closure structures and initial temporary pumping capacity approved via the 20 Jan 06 Revision #01 to the OEB PIR may not be fully in place at the 17<sup>th</sup> Street and/or London Avenue Outfall Canals by 1 Jun 06. Thus, an interim sheet pile closure with portable temporary pumps of 1,000 cfs capacity is required.



**Summary.**

Increasing the temporary pumping capacity at both the 17<sup>th</sup> Street and London Avenue Outfall Canal interim closure structures will help to maintain the adequate functioning of the project and the structural integrity of the existing floodwalls. The increased temporary pumping capacity will significantly reduce the opportunity for exceeding the safe water level in the canals and more closely approximates what would have been available during the design hurricane under pre-Katrina conditions. The maximum and minimum pumping capacities needed at each of the three interim closure structures are shown in Table 4. The temporary pumping capacity at the Orleans Avenue Canal closure structure already meets or exceeds the minimum capacity; thus, no further increases in temporary pumping capacity are required.

**Table 4  
Required Interim Closure Structure Pumping Capacities**

Station	Current Approved	Maximum (cfs)	Add	Minimum (cfs)	Add
London	2,400	7,770	5,370	5,500	3,100
Orleans	2,000	2,580	580	1,050	0
17 <sup>th</sup> Street	2,400	10,100	7,700	5,630	3,230

**c. Sub-Alternatives Considered for Increasing Temporary Pumping Capacity**

Several sub-alternatives have been evaluated for implementing Alternative 3 - increasing the temporary pumping capacity at the 17<sup>th</sup> Street and London Avenue Canal closure structures. Sub-Alternatives 1, 2, and 3 would increase the temporary pumping capacity at the 17<sup>th</sup> Street Canal closure structure. Sub-Alternative 4 would reduce the runoff from Hoey’s Basin by either temporarily storing rainfall (Sub-Alternative 4a) or diverting it away from the 17<sup>th</sup> Street Canal (Sub-Alternative 4b). Sub-Alternative 5 addresses the use of Thruster Pumps at the gated closure structures. Only one sub-alternative was evaluated at the London Avenue closure structure because the minimum capacity can be obtained by adding additional hydraulic pumps.

**17<sup>th</sup> Street Canal**

Sub-Alternative 1. Add Temporary Pumping Capacity at Interim Gated Structure (Line Shaft Pumps).

Within the existing rights-of-way, on the west side of the canal, 12 60-inch vertical pumps with direct drives would be installed in the 17<sup>th</sup> Street Canal in a configuration similar to that adopted for the approved temporary pumping system. Four groups of three 60-inch pumps each discharge into four 9-foot discharge headers. Each pump is driven by drive shafts connected through a right angle reducing gear to an 800 horsepower diesel engine. The nominal capacity of this system is 3,600 cfs for the 12 direct drive pumps. An additional 400 cfs increase can be achieved by the addition of two hydraulically driven 60-inch pumps to the headers currently

under construction on the east side of the canal, increasing the total discharge by an additional 4,000 cfs. Adding capacity beyond the additional 4,000 cfs would require considerable additional rights-of-way. On the east side, sub-alternatives are limited by townhouses. On the west side, a restaurant would be affected by adding any additional pump capacity. The total capacity at the closure structure, including the existing temporary pumps, would increase to 6,400 cfs with this sub-alternative.

The estimated cost for Sub-Alternative 1 is [REDACTED] million or [REDACTED] per cfs. The delivery times for pumps, engines, and right angle reducing gears is between 16 to 20 weeks for this sub-alternative.

Sub-Alternative 2. Add Temporary Pumping Capacity at Interim Gated Structure (Hydraulic Pumps).

Sub-Alternative 2 is similar to Sub-Alternative 1 except that 16 hydraulically driven 60-inch pumps are added to 4 discharge headers along the west side of the canal. This would increase the capacity by 3,200 cfs. The diesel engines would be installed on an exterior platform. Two hydraulic pumps could also be added to the existing system on the east side of the canal, increasing the capacity by an additional 400 cfs. This sub-alternative would increase the capacity at the 17<sup>th</sup> Street Canal by a total of 3,600 cfs. The total capacity, including the existing temporary pumps, would be 6,000 cfs.

The estimated cost for Sub-Alternative 2 is \$64.8 million or \$18,000 cfs. Delivery times for the pumps are 12 to 16 weeks.

Sub-Alternative 3. Add Temporary Pumping Capacity at Interim Gated Structure (Large Vertical Pumps with New Intake and Discharge Channel).

A new pump building would be added east of the 17<sup>th</sup> Street Canal. Four 120-inch vertical pumps would be installed to add 4,000 cfs. Each pump would be driven by a right angle direct drive and 3,000 hp diesel engine. A pump intake basin would be constructed south of the existing temporary pumps with floodwalls to the basin's south and east to replace those removed from the east side of the canal for construction purposes. A new discharge basin would be required north of the basin. This would increase the total capacity at the 17<sup>th</sup> Street closure structure to 6,400 cfs. This sub-alternative could be used in combination with either Sub-Alternative 1 or Sub-Alternative 2. In combination with Sub-Alternative 1 and the existing temporary pumps, the total capacity would be 10,400 cfs. In combination with Sub-Alternative 2 and the existing temporary pumps, the total capacity would be 10,000 cfs.

Acquisition of the engines, gears, and pumps would require at least 9 months. Right-of-way acquisition time and cost would be considerable. The estimated cost for this sub-alternative was not determined because of the long lead time and the additional right of way that would be required.

Sub-Alternative 4. Hoey's Basin

The Hoey's Basin plan proposed by Jefferson Parish will store and/or remove rainfall runoff prior to water reaching the outfall canals and the damaged area of the hurricane protection system. The plan has two components: a storage plan and a diversion plan. A third feature of the plan would pump rainfall runoff from Jefferson Parish into Orleans Parish. This third feature does not affect the water levels in the outfall canal that threaten the integrity of the hurricane protection system walls and was not evaluated further. The three pumping stations that currently discharge into the 17<sup>th</sup> Street Canal (P.S. #6, I-10 P.S, and Canal Street P.S) are part of an extensive drainage network. Any alternative that either temporarily stores the water (Alternative 4a) or diverts the water away from the 17<sup>th</sup> Street Canal (Alternative 4b), would reduce the discharge into the canal and lower the temporary pumping capacity needed at the closure structure. The amount of reduction in the peak discharge at P.S. #6 resulting from the implementation of this sub-alternative is currently unknown and will require further modeling to determine.

Sub-Alternative 4a. Storage Plan.

This sub-alternative would create two areas in which approximately 8 inches of rainfall runoff could be detained. Pontiff Playground and the Metairie Country Club Golf Course have been identified as the storage areas. An earthen embankment would be constructed around three sides of the playground and an existing railroad embankment would be used on the 4<sup>th</sup> side. Berm heights will vary from 3.6 to 5.6 feet. Three pumps with a total capacity of 100 cfs will be used to pump water into the detention area. This storage plan will contain approximately 80 acre-feet of rainfall in addition to rainfall directly into the detention area. It would take approximately 10 hrs to fill the storage area to capacity at a rate of 100 cfs. Water would be pumped back out of the storage area and allowed to drain into the 17<sup>th</sup> Street Canal when the lake stages drop to a level where the closure structure gates can be opened.

The second storage area would utilize the Metairie Country Club Golf Course. An embankment would be constructed along the west side of the golf course, a temporary closure would be needed at Airline Drive, and the existing railroad embankment and Orleans/Jefferson levee would create the other sides of the storage area. Two 20 cfs pumps would pump rainfall runoff into the 80 acre storage area. It would take approximately 24 hrs to fill the storage area to capacity at a rate of 40 cfs. A third 20 cfs pump would pump water directly into the 17<sup>th</sup> Street Canal. This third element of the plan would not contribute to reducing the discharge into 17<sup>th</sup> Street Canal and would not reduce the threat on the integrity of the floodwall; therefore, it should not be included in the evaluation. As with the first storage area, the ponded water would be pumped back out of the storage area and allowed to drain into the 17<sup>th</sup> Street Canal when the interim gated structure is opened. NOTE. Metairie Country Club is not currently willing to participate, and this plan would require commandeering by the Governor.

This Storage Plan Alternative, if implementable, may have the effect of reducing discharge from Pumping Station #6 by 140 cfs, but as previously stated, that lowering of PS #6 discharge is uncertain.

Sub-Alternative 4b. Diversion Plan

This sub-alternative, which has two components, would divert the runoff before reaching the 17<sup>th</sup> Street Canal. The first component would be designed to divert 160 cfs out of the Hoey's drainage basin and away from the 17<sup>th</sup> Street Canal by adding pumps to discharge water to the Suburban Pump Station in Jefferson Parish. The second component would divert between 400 and 600 cfs from the Hoey's Basin by pumping the water to the Mississippi River. Two pumps would be placed in the drainage canal prior to entering the 17<sup>th</sup> Street canal. The pumps would discharge water through two 7-foot pipes approximately 7,000 feet to the Mississippi River. The discharge pipes would need to cross Jefferson Highway, River Road and the Mississippi River Levee. Implementation of this sub-alternative would require the acquisition/commandeering of a significant amount of right of way and these costs have not been included.

This Diversion Plan Alternative, may have the effect of reducing discharge from Pumping Station #6 by 560 - 760 cfs, but as previously stated, that lowering of PS #6 discharge is uncertain.

Implementation of sub-alternative 4 can be performed in conjunction with any of the other sub-alternatives. The estimated cost for Sub-Alternative 4 (700 – 900 cfs, if implementable) is [REDACTED] plus right of way costs or [REDACTED] plus per cfs. However, as previously stated, information has not been supplied that would prove that Alternatives 4a and 4b would lower the discharge into the 17<sup>th</sup> Street Outfall Canal.

Sub-Alternative 5. Add Temporary Pumping Capacity at Interim Gated Structure (Thruster Pumps).

Evaluation of using thruster pumps or horizontal pumps was investigated; however, because of the negative affects on the gated closure structures, this sub-alternative was not considered further.

**London Ave Canal.**

Within the space limitation at the London Avenue closure structure, it is feasible to achieve the minimum target discharge with temporary pumps at London Avenue Canal by adding an additional 3,200 cfs in temporary pumping capacity. Implementation of this sub-alternative consists of adding 16 additional sixty-inch hydraulic pumps, 8 on each side of the canal. This would increase the total capacity of the temporary pumps at the London Avenue Canal closure structure from the currently approved 2,400 cfs to 5,600 cfs. Ongoing model studies will be used to determine if the discharge rate into the London Avenue Canal is controlled by the existing delivery system (i.e., the rate at which rainfall arrives at the pumps) or by the capacity of the pumps. The minimum target discharge capacity may need to be adjusted based on the results of these model studies. Any changes will be incorporated into the final designs prior to awarding contracts for the additional pumps. Based on this, no pumps will be ordered and no contracts will be modified until a determination is made as to what is the appropriate additional temporary capacity.

**Recommendation.**

The objective of this sub-alternative analysis is to identify the most cost effective and efficient means to increase the temporary pump capacity at both the 17<sup>th</sup> Street and London Avenue Canal closure structures during the 2006 hurricane season. A summary of the sub-alternatives evaluated is presented in Table 5. Only Sub-Alternatives 1, 2, 4 are considered implementable. The lead times for the engines, gears, and pumps required for Sub-Alternative 3 would result in a construction schedule that would extend well beyond the end of the 2006 hurricane season. Sub-Alternative 5 would adversely impact the gated closure structures and was not considered a viable option. Sub-Alternatives 1 and 2 and combinations of Sub-Alternatives 1 and 4 and Sub-Alternatives 2 and 4 all meet the minimum pumping requirements at the 17<sup>th</sup> Street Canal closure structure. The cost per cfs for Sub-Alternative 4 is over twice the cost per cfs for either Sub-Alternative 1 or Sub-Alternative 2. While Sub-Alternative 1 provides more capacity than Sub-Alternative 2, Sub-Alternative 2 could be implemented quicker, which is critical considering the implementation will occur during the 2006 hurricane season. Sub-Alternative 2 has less lead time on the procurement of the pumps, requires less support structure, and simplifies construction and installation. Without backup generators available during the 2006 hurricane season for many of the Sewerage & Water Board pumps that run off 60 cycle commercial power, the likely total capacity discharging into the 17<sup>th</sup> Street Canal during a tropical storm or hurricane is reduced to 5,630 cfs. Sub-Alternative 2 would increase the available capacity at the 17<sup>th</sup> Street Canal closure structure to 6,000 cfs or 370 cfs more than the capacity of the pumps likely to be operational during the Design Hurricane. Based on the cost per cfs and the shorter lead time required, Sub-Alternative 2 is the recommended sub-alternative for increasing the capacity of the temporary pumps at the 17<sup>th</sup> Street Canal interim closure structure. The minimum capacity for London Avenue Canal can be achieved by adding 16 additional hydraulic pumps similar to the ones currently being installed. This would increase the total capacity of the temporary pumps at the London Avenue Canal closure structure from the currently approved 2,400 cfs to 5,600 cfs. For this reason, the shorter lead times for the hydraulic pumps, and the ease of installation, additional sub-alternatives were not evaluated for increasing the capacity on London Avenue. The results of ongoing model studies will be used to determine if the minimum target discharge needs to be adjusted. Any resulting changes will be incorporated into the final designs prior to awarding contracts for the additional pumps.

This PIR Revision #02 presents information regarding additional temporary pumping. The need for increasing the overall temporary pumping capacity will continue to be addressed in further investigations.

Plans and specifications (P&S) for the addition of temporary pumping capacity at 17<sup>th</sup> Street and London Avenue Canals will be initiated upon approval of the PIR. The additional temporary pumps will be ordered once the required type, size, and quantity are determined. A detailed schedule documenting the completion of P&S, and acquisition and installation of pumps will be developed upon initiation of P&S.

**Table 5  
Summary of Sub-Alternatives**

Sub-Alternative	Additional Pump Capacity (cfs)	Cost (\$)	Cost per cfs (\$/cfs)	Approved and Funded (cfs)	Total Capacity (cfs)
<b>17<sup>th</sup> Street Canal</b>					
1	4,000			2,400	6,400
2	3,600			2,400	6,000
3					
4	800			2,400	3,140
5					
Combination 1 & 4	4,740			2,400	7,140
Combination 2 & 4	4,340			2,400	6,740
<b>London Avenue Canal</b>					
1	3,200			2,400	5,300
<b>17<sup>th</sup> Street Canal &amp; London Avenue Canal</b>					
Contingency Measures	N/A			N/A	N/A
ROW = Right-of-Way					

**Utilization.**

The gated closure structures and pumps are temporary and will only be needed until the permanent protection along the outfall canals has been restored. Likewise, the interim sheet pile closures with portable temporary pumps of 1,000 cfs capacity located at the 17<sup>th</sup> Street and London Avenue Canals will be removed by USACE upon completion of the respective interim gated closure structures and initial temporary pumping capacity. Therefore, utilization costs will be 100 percent Federal until the completion of the permanent repairs and rehabilitation to the hurricane protection system in the outfall canal areas. The gated closure structures and temporary pumps are interim measures that are only needed until the permanent repairs to the outfall canals have been completed and will not be part of the project once the rehabilitation efforts are complete. The costs to construct and utilize the interim sheet pile closures and portable temporary pumps of 1,000 cfs capacity and the gated closure structures and temporary pumps are all part of permanently rehabilitating the hurricane protection system and will be 100 percent Federal. The removal of the interim gated closure structures and temporary pumps will also be by the USACE.

### **13. RECOMMENDED ALTERNATIVE**

(a) The recommendations proposed in the 18 October 2005 PIR and the 20 January 2006 PIR Revision #01 are still valid and currently being implemented. Please refer to that PIR for a list of the previously approved recommendations.

(b) To address the concerns in the three (3) outfall canals, interim closure structures and some temporary pumps near the confluence of each canal with Lake Pontchartrain were approved in PIR Revision #1, dated 20 Jan 06. Each gated structure will consist of a steel structure with operable gates adjacent to existing landside protection. Some temporary pumps will be installed adjacent to the structures for drainage to reduce the area that might otherwise have the potential for flooding. PIR Revision #1 also stated that the need to increase the capacity of the temporary pumps would be evaluated. The currently approved capacity of the temporary pumps at both 17<sup>th</sup> Street Canal and London Avenue Canal closure structures are significantly less than the capacity of the existing pumping stations. This PIR recommends increasing the capacity of the temporary pumps by 3,600 cfs at the 17<sup>th</sup> Street Canal closure structure and by 3,200 cfs at the London Avenue Canal closure structure. This will be accomplished by adding additional hydraulic pumps similar to the ones currently being installed. The USACE will utilize the interim canal closures and integrated pumps until they are removed by the USACE upon completion of permanent repair and rehabilitation to the hurricane protection system. Further, recommended are interim sheet pile closures with portable temporary pumps of 1,000 cfs capacity at the 17<sup>th</sup> Street Canal and London Avenue Outfall Canals. This feature will be removed by USACE upon completion of the respective temporary gated closure structures and initial temporary pumps. The current estimate for utilization of the interim closure structures, previously approved temporary pumps, and additional temporary pumps recommended in this PIR is 3 years at a cost of [REDACTED] per year. These costs were added into the overall costs of project implementation.

### **14. ECONOMICS**

#### **a. Economic Analysis**

(1) General. The revised economic feasibility analysis for the New Orleans East Bank portion of the Lake Pontchartrain Hurricane Protection Project, west of the industrial canal, was conducted in support of the repair and reconstruction of Federally-authorized flood control works.

(2) Benefit Analysis. The total average annual benefits associated with the New Orleans Eastbank reach of the Lake Pontchartrain Hurricane Protection Project are \$136,879,000. The source of this estimate is the “Lake Pontchartrain, La. and Vicinity Hurricane Protection Project Reevaluation Study (July 1984), the latest approved decision document, as updated in June 2005 in support of the FY 2007 Congressional budget submission. Inundation damage reduction benefits include those associated with avoided losses to residential, commercial, and industrial structures, their contents, and vehicles associated with these structures. This figure is estimated using 2006 price levels and an FY 2006 current Federal discount rate of 5.125 percent. These

benefits are based upon an expectation that all damaged or destroyed facilities will be fully restored and is consistent with current planning guidance that requires adjustments if there is specific information that indicates such restoration will not occur. No adjustments thus far were made to account for partial replacement in kind of structures that have been damaged or destroyed by Hurricane Katrina.

(3) Cost Analysis. The total first cost for the rehabilitation work is [REDACTED]. The total average annual cost associated with repair of the damaged portions of the east bank reach of Orleans Parish (west of the industrial canal) is [REDACTED]. This estimate includes [REDACTED] for levee and floodwall repairs and construction of the interim closure structures and initial temporary pumps, [REDACTED] for tree removal, [REDACTED] for pumps at the 17<sup>th</sup> Street Canal, [REDACTED] for pumps at the London Avenue Canal, and [REDACTED] for contingency measures at the 17<sup>th</sup> Street and London Avenue Canals. The total first costs reflect May 2006 price levels and were amortized at the FY 2006 Federal discount rate of 5.125 percent over a 50-year period of analysis. Since the efforts to increase temporary pumping capacity at the 17<sup>th</sup> Street and London Avenue Canals are expected to be completed within one year, no interest during construction accrues. No incremental operations and maintenance costs are expected since the scope of the original project design has not changed.

(4) Summary. The degree to which average annual project benefits exceeds average annual project costs is the measure of positive average annual net project benefits and is consistent with a benefit-to-cost ratio of 1.0 or greater. Net benefits for the rehabilitation project are [REDACTED]. The benefit-to-cost ratio is accordingly [REDACTED] to 1.0.

#### **b. Cost Estimate**

Table 6 summarizes the overall costs for the project. To appropriately reflect the change this additional work represents, costs for previously approved project features have been updated in this report. The estimated costs to utilize the gated closure structures and temporary pumps along with the costs to remove the structures when the permanent protection has been restored are included. Further, costs include construction of interim sheet pile closures with portable temporary pumps of 1,000 cfs capacity at the 17<sup>th</sup> Street Canal and London Avenue Outfall Canals. This includes the use of actual construction contract award amounts on the awarded contracts. Also, given the emergency conditions under which the design and contract documents have been prepared, the short amount of time allowed for construction completion, and high level of competition for construction contractor resources in the area, a [REDACTED] percent contingency is being used for contracts not yet awarded. The need for this is evidenced by bids received on awarded contracts generally exceeding construction estimates and it is anticipated that there will be a higher than normal percentage of contract modifications. The contingency for awarded contracts is [REDACTED] percent.



**Table 6**  
**Summary of Overall Project Costs**

Reach	Total Cost
OEB01 - Phase I Floodwall Repairs - 17 St. Canal	\$
OEB02 - Phase II Floodwall Repairs - 17 St. Canal	\$
OEB03 - Phase I Floodwall Repairs - London Ave Canal at Mirabeau Ave	\$
OEB04 - Phase II Floodwall Repairs - London Ave Canal at Mirabeau Ave	\$
OEB05 - Phase I Floodwall Repairs - London Ave Canal at Robert E. Lee Blvd	\$
OEB06 - Phase II Floodwall Repairs - London Ave Canal at Robert E. Lee Blvd	\$
OEB07 - Lake Pontchartrain-Scour Repair and Slope Paving at Orleans Canal Pump Station; Floodwall Repair; East Bank	\$
OEB09 - Closure Structure at 17th Street Canal	\$
OEB10 - Closure Structure at London Avenue Canal	\$
OEB11 - Closure Structure at Orleans Avenue Canal	\$
OEB12 - Bank Stabilization for 17th Street Canal	\$
OEB13 - Bank Stabilization for London Avenue Canal	\$
IHNC02 - West Side Floodwall Repairs - France Rd to Benefit Rd	\$
IHNC04 - West Side Floodwall Repairs - Hwy 90 To Lake	\$
IHNC05 - West Side Floodwall Repairs - France Rd to IHNC	\$
IHNC08 - West Side Floodwall and Minor Scour Repairs - Benefit Rd. to Almonaster Blvd.	\$
IHNC09 - West Side Floodwall and Minor Scour Repairs - IHNC Lock to Florida Ave.	\$
<b>Subtotal</b>	<b>\$</b>
Contingency (Awarded Contracts = )	\$
Demolition of Interim Gates and Temporary Pumps	\$
Temporary Pumps	\$
<b>Subtotal</b>	<b>\$</b>
Engineering and Design (E&D = )	\$
Supervision and Administration (S&A = )	\$
LERRDs: 17th Street Canal - ;	
London Avenue Canal @ Mirabeau Avenue - ;	
London Avenue Canal @ Robert E. Lee Boulevard - ;	
17th Street Canal Closure Structure	\$
Operation and Maintenance of interim closures and temporary pumps (\$ / year for 3 years)	\$
Additional Temporary Pumps	\$
Tree Removal	\$
Contingency Measures (17th Street and London Avenue Outfall Canals)	\$
<b>TOTAL</b>	<b>\$</b>
<b>TOTAL (ROUNDED)</b>	<b>\$</b>
NOTE: Total Cost = Contract Award + Executed Contract Modifications + Pending Contract Modifications	

**Table 7  
Summary of Overall Project Costs  
Recommended Plan**

Reach	Total Cost
Additional Temporary Pumps - 17th Street Canal	\$
Additional Temporary Pumps - London Avenue Canal	\$
Contingency Measures (17th Street and London Avenue Outfall Canals)	\$
<b>Total</b>	<b>\$</b>
<b>Total (Rounded)</b>	<b>\$</b>

NOTE: Total Cost includes [redacted] contingency; [redacted] % E&D; and [redacted] % S&A

## 15. ENVIRONMENTAL CONCERNS

The New Orleans District Commander has considered the probable environmental consequences of the proposed work under this PIR and does not anticipate that this work will result in significant environmental impacts. No adverse impacts to endangered species, important fish and wildlife resources, waters of the United States subject to Section 404 permitting including wetlands, water quality, floodplains, or other natural and cultural resources are expected.

A portion of the proposed work will occur within the existing footprint for the project and is categorically excluded from additional National Environmental Policy Act (NEPA) documentation as per Engineering Regulation ER 200-2-2, Paragraph 9.a., which provides for NEPA exclusion of “activities at completed Corps projects which carry out the authorized project purposes.” Examples of such activities include “repair, rehabilitation, replacement of existing structures and facilities, such as ... levees.” The requirements of other applicable environmental laws and regulations remain in effect and the proposed work will comply with them.

The balance of the proposed work under this PIR would cause impacts to areas immediately adjacent, but outside the existing project footprint, and so have not been the subject of any prior Federal environmental review. All of the lands required for this work have been previously impacted by human activities and contain no threatened or endangered species or other natural or cultural resources. The required new rights of way are developed residential and commercial properties, roads, road rights of way, and canal waterbottoms. Interested Federal and state agencies have been advised of the proposed work.

The effects of any work within the existing project footprint and work outside of the existing project footprint will be included in an after-the-fact environmental assessment that is under preparation for all of the flood protection repair work being undertaken by the USACE in the Metropolitan New Orleans area. The authority for this approach is per ER 500-1-1, Paragraph 2-3.k(1), and ER 200-2-2, Paragraph 8, and a determination made by the New Orleans District Commander on 5 January 2006, that this work prevents or reduces an imminent risk of life, health, property, or severe economic losses. (See Appendix M).

## **16. PERMITS**

No changes to this section. Refer to the 18 Oct 2005 PIR.

## **17. REAL ESTATE REQUIREMENTS**

### **DESCRIPTION OF LANDS, EASEMENTS, RIGHTS-OF-WAY, RELOCATIONS, AND DISPOSAL AREAS (LERRDS)**

The project recommended in this PIR consists of adding pumping capacity at the 17<sup>th</sup> Street and London Avenue interim outfall canal closure structures.

Increasing the capacity of the temporary pumps may require the acquisition of standard Temporary Work Area Easements. The acquisition of this additional temporary right-of-way for adding pumping capacity may require right-of-entry from OLD, EJLD, State of Louisiana, and/or commandeering, whether by the Mayor of New Orleans or by the Governor of the State of Louisiana through an Executive Order granting use of property.

### **UNIFORM RELOCATION ASSISTANCE (P.L.91-646) AS AMENDED, TITLE II**

If any benefit payments under the provisions of Title II of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended, are applicable, they will be addressed on a case-by-case basis. Title III procedures are applicable.

### **FACILITY/UTILITY RELOCATIONS**

There are no known public facilities or utilities that will be affected by the construction of these projects.

## **18. PROJECT MANAGEMENT**

### **a. Funding Authority**

- (1) Program and Appropriation: FCCE, 96x3125
- (2) Class: 336
- (3) CWIS Number: 009350

### **b. Project Funds.**

(1) Total estimated construction cost, as presented in Table 7, for increasing the temporary pumping capacity at 17<sup>th</sup> Street and London Avenue Canals, including contingencies, Engineering & Design (E&D), and Supervision & Administration (S&A) is [REDACTED].

- (2) Other Non-Federal cost \$0

**c. Project Repair Schedule.** There will be a minimum of two construction contracts used for adding pumping capacity to the interim closure structures at the 17<sup>th</sup> Street and London Avenue Canals. Previous contracts provided for the gated-closure structures constructed at the end of each outfall canal near the lake. The gates will be closed when stages in Lake Pontchartrain are expected to exceed the safe water level in each of the outfall canals. Temporary pumps are needed to insure the integrity of the Parallel Protection levees and floodwalls, and provide access for maintenance. The additional pumping capacity at the 17<sup>th</sup> Street and London Avenue Canal closure structures would be completed during the 2006 Hurricane Season.

Plans and specifications (P&S) for the addition of temporary pumping capacity at 17<sup>th</sup> Street and London Avenue Canals will be initiated upon approval of the PIR. The additional temporary pumps will be ordered once the required type, size, and quantity are determined. A detailed schedule documenting the completion of P&S, and acquisition and installation of pumps will be developed upon initiation of P&S.

Further, efforts to implement the interim sheet pile closures with portable temporary pumps of 1,000 cfs capacity at the 17<sup>th</sup> Street Canal and London Avenue Outfall Canals will take place upon approval of the PIR.

## **19. IMPLEMENTATION GUIDANCE FOR EMERGENCY SUPPLEMENTAL APPROPRIATIONS**

Pursuant to CECW-HS, Memorandum for Commanders, South Atlantic Division and Mississippi Valley Division, SUBJECT: Post Hurricanes Katrina, Wilma, Ophelia Expenditure of Flood Control and Coastal Emergency (FCCE) Funds for Restoration and Rehabilitation, and for Accelerated Work to Complete Authorized Projects, in accordance with the Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act, 2006 (Public Law 109-148), dated February, 14, 2006, signed by Don Riley, Major General, Director of Civil Works (Appendix N), for the purpose of delegating certain approval authority and to provide guidance concerning restoration and rehabilitation of flood damage reduction and hurricane and storm damage reduction project, and the acceleration of work to complete certain Federally authorized projects, in accordance with the funding and authority provided by PL 109-148, as follows:

Public Law 109-148 directs that in using funds appropriated for construction to Hurricane Katrina in the areas covered by the disaster declaration, the Corps of Engineers will restore flood damage reduction and hurricane and storm damage reduction projects and related works to provide the level of protection for which they were designed, at full Federal expense. The Joint Explanatory Statement of the Committee of Conference accompanying Public Law 109-148 further clarifies that the funds are provided to fund repairs to non-Federal levees and pumps and to construct levees and floodwalls to original design levels, rather than to pre-storm condition. Therefore, within the funds provided, for Federally authorized projects with levee and floodwall components, and non-Federal levees and pumps, which were damaged by Hurricane Katrina,

restoration and rehabilitation will be undertaken to the previously constructed design level. The costs for restoration and rehabilitation construction and construction related activities will be at full Federal expense. These costs include Engineering and Design, Supervision and Administration, actual construction acquisition of real estate interests not already owned by or under the control of the non-Federal sponsor, and relocations. HTRW investigations will be performed at Federal expense, if HTRW is discovered, then a mutual decision will be made by the Federal Government and the non-Federal sponsor on whether to proceed with acquisition of the property; and if the parties mutually agree to proceed, then the non-Federal sponsor will be responsible of HTRW clean-up costs. Other non-Federal responsibilities, including operation and maintenance and the requirement to hold and save the Federal Government free from damages, remain. However, as further justified and stated in the following Paragraph 20.g., during the period of construction of the permanent repair and rehabilitation of this portion of the hurricane protection project, USACE will operate, maintain, and repair the interim canal closure and associated temporary pumping capacity.

## **20. REQUIREMENTS OF FEDERAL AND PUBLIC SPONSOR COOPERATION FOR THE REHABILITATION EFFORTS**

For each jurisdiction, a Cooperation Agreement will be entered into between the Government and the respective Public Sponsor(s). Each Public Sponsor, at no cost to the Government, shall provide right of entry to the lands, easement, rights of way and disposal areas or borrow areas (LERD) that were owned, claimed or controlled on the date of the Government's request for right of entry. Likewise, the public sponsor shall use its best efforts to provide right of entry, as requested by the Government, to LERD that were owned, controlled or claimed by other non-Federal Government entities on the date of the Government's request for right of entry (hereinafter "Other Non-Federal Governmental LERD"). If the Public Sponsor, despite diligent efforts, is unable to acquire right of entry to Other Non-Federal Governmental LERD, the Government shall obtain right of entry to the Other Non-Federal Governmental LERD from the non-Federal governmental entity who owns, controls or claims said LERD. Obligations of the Government and the Public Sponsor for the herein described rehabilitation efforts are described in the following sub-paragraphs.

### **a. Lands, Easements, Rights-of-Way, and Disposal or Borrow Areas (LERD)**

(1) LERD Owned, Claimed or Controlled by the Public Sponsor: Upon the Government's request that the Public Sponsor provide right of entry for LERD determined by the Government to be necessary for the construction, operation and maintenance of the permanent rehabilitation efforts herein described, the Public Sponsor shall provide, at no cost to the Government, a right of entry to LERD on lands that were owned, controlled, or claimed by the Public Sponsor on the date of the Government's request for right of entry (hereafter "Public Sponsor LERD"). The Public Sponsor shall secure, at no cost to the Government, the subordination or release of all third party interests within said Public Sponsor LERD, as required by the Government's request for right of entry.

(2) LERD Owned, Claimed or Controlled by Other Non-Federal Governmental Entities: The Public Sponsor, at no cost to the Government, shall use its best efforts to provide right of entry, as requested by the Government, to LERD that were owned, controlled or claimed by other non-Federal Government entities on the date of the Government’s request for right of entry (hereinafter “Other Non-Federal Governmental LERD”). If the Public Sponsor, despite diligent efforts, is unable to acquire right of entry to Other Non-Federal Governmental LERD, the Government shall obtain right of entry to the Other Non-Federal Governmental LERD from the non-Federal governmental entity who owns, controls or claims said LERD.

(3) Owned by Private Interests: For the rehabilitation efforts described herein, the Government shall fund the acquisition of LERD that are not owned, claimed or under the control of the Public Sponsor or any other non-Federal governmental entities on the date of the Government’s request for right of entry (hereinafter “Private LERD”). The Government’s responsibility to fund the acquisition of Private LERD shall be in accordance with the following procedures and requirements.

(a) Exercise of Commandeering Powers: Immediately upon the Government’s request that the Public Sponsor provide Private LERD, the Public Sponsor, without cost to the Government, shall secure or cause to be secured an executive order from the appropriate state official for commandeering the Private LERD (hereinafter “Commandeering Order”), pursuant to his/her powers under La. R.S. 29:721, et seq., for the construction of the permanent rehabilitation efforts herein described. The exercise of such commandeering powers and authorities is subject, under the cited state law, to the requirement that the owners of any commandeered interest that is compensable under the law, be identified and justly compensated under the law. The Public Sponsor shall thereafter provide right of entry for the construction, operation and maintenance of the rehabilitation effort to the Government.

(b) Provision of Right of Entry: At no cost to the Government, the Public Sponsor shall promptly provide right of entry to the Government to the Private LERD for the construction, operation and maintenance of the rehabilitation efforts described herein.

(c) Responsibility for Acquisition of Private LERD: After receipt of the executed Commandeering Order and right of entry from the Public Sponsor, the Government will perform, or cause to be performed, the acquisition of the Private LERD determined by the Government to be necessary for the construction, operation and maintenance of the LERD described herein. The acquisition of LERD by the Government will be subject to the availability and receipt of P. L. 109-148 appropriations and the provision by the Public Sponsor, at no cost to the Government, of the Commandeering Order and right of entry referenced in Paragraph 20.a.(3)(a) and 20.a.(3)(b), respectively.

(d) Acquisition in the Name of the Public Sponsor: The Government shall acquire, as appropriate any Private LERD and Other Non-Federal Governmental LERD and relocations, as well as any subordinations or releases of interest required to be obtained from third parties in the name of the Public Sponsor. Provided however, that if

the Government is required to acquire said interests through the exercise of its Federal powers of eminent domain authority, the Government shall file such proceedings in a Federal district court, such that possession and ownership of the condemned LERD and interests shall be in the name of the United States of America. The Government shall thereafter quitclaim such interest to the Public Sponsor and the Public Sponsor shall agree in the Cooperation Agreement to accept the quitclaim of any LERD and interests so acquired by the Government for the purposes of the Rehabilitation Effort herein described.

**b. Construction.** The Government will expeditiously construct the rehabilitation efforts described herein, subject to the provision of P. L. 109-148 funds by the Congress, and subject to the commandeering of Private LERD by the chief executive officer of the parish or city where the Private LERD are located and to the provision by the Public Sponsor of a right of entry to the LERD determined by the Government to be necessary for the construction, operation and maintenance of the Rehabilitation Effort.

**c. Relocations.** The Government will determine and accomplish or assure accomplishment of all the relocations necessary for the construction, operation and maintenance of the Rehabilitation Effort described herein, including those necessary to enable the removal of borrow materials and the proper disposal of dredged or excavated material; provided however, that the Public Sponsor, without cost to the Government, shall commandeer the privately-owned relocated facilities or utilities in accordance with its powers under La. R.S. 29:721, et seq.; shall diligently exercise its rights and authority to secure a subordination or release of third party interests on Public Sponsor LERD; and shall use its best efforts to secure a subordination or release of third party interests on Other Non-Federal Governmental LERD. If the Public Sponsor, despite diligent efforts, is unable to secure the release or subordination of third party interests in Other Non-Federal Governmental LERD, the Government shall obtain such subordination or release from the owners of such interests.

**d. Hazardous Substances.** The Government shall perform, or cause to be performed, such investigations for hazardous substances as are determined to be necessary by the Government to identify the existence and extent of hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 U.S.C. 9601-9675, on all lands that are determined by the Government to be necessary to the construction, operation, and maintenance of the subject Rehabilitation Effort. In the event that hazardous substances are determined to exist on lands acquired for the Rehabilitation Effort and the Government and the Public Sponsor determine to proceed or continue with the construction after considering liability that may arise under CERCLA, the Public Sponsor shall be responsible, as between the Government and the Public Sponsor, for any and all necessary clean up and response costs, to include the costs of any studies and investigations necessary to determine an appropriate response to the contamination. Such costs shall not be considered a part of the total Rehabilitation Effort.

**e. Indemnification.** The Public Sponsor shall hold and save the Government free from all damages arising from the construction, operation, and maintenance of the subject Rehabilitation

Effort and any related betterments, except for damages due to the fault or negligence of the Government or the Government's contractors.

**f. Betterments.** The Public Sponsor may request the Government to accomplish betterments and shall be solely responsible for any increase in costs resulting from the betterments. All such increased costs will be paid in advance by the non-Federal sponsors.

**g. Utilization.** After the completion of the permanent repair and rehabilitation of the hurricane protection system in the area of the outfall canals, the non-Federal sponsor will be responsible for the OMRR&R of the rehabilitated project. However, during the period of construction of the permanent repair and rehabilitation of this portion of the hurricane protection project, USACE will utilize the interim canal closures and associated temporary pumping capacity. Based on the discussion presented earlier in this report, the proposed structures are temporary and will be removed by USACE.

Utilization of the interim canal closures and integrated pumps will be by the USACE. These features will be removed by the USACE as follows: (a) the interim sheet pile closures and portable temporary pumps upon completion of the respective interim gated closure structures and initial temporary pumping capacity and (b) the initial and additional temporary pumping capacity at the interim gated closure structures at each outfall canal upon completion of permanent repair and rehabilitation to the hurricane protection system.

## **21. PROJECT SUMMARY**

### **a. Conclusions**

(1) The Orleans East Bank Lakefront Area Plan of the Lake Pontchartrain, LA., and Vicinity Hurricane Protection Project was damaged by Hurricane Katrina in August 2005. The damage consisted of extensive breaches, scour and erosion of the levee along the 17<sup>th</sup> Street Canal, London Avenue Canal, and the IHNC, and minor damage to the levees and floodwalls along Lake Pontchartrain. In addition there was extensive damage to the floodwalls that are in these same segments of the hurricane protection system along Orleans Lakefront and Orleans Avenue Canal.

(2) Alternatives consisting of No Action, Non-Structural Recovery, and Structural Repairs were considered. Structural repair of the hurricane protection system was selected as the recommended alternative. Further, recommended actions are to increase temporary pumping capacity at the 17<sup>th</sup> Street and London Avenue Outfall canals that will be utilized and removed by the USACE upon completion of permanent repair and rehabilitation of the hurricane protection system.

(3) Structural repairs to the project would consist of increasing the temporary pumping capacity at the 17<sup>th</sup> Street and London Avenue Canals. This alternative consists of adding additional hydraulic pumps at the interim gated closure structures at 17<sup>th</sup> Street and London Avenue Canals near Lake Pontchartrain. The total capacity of the temporary pumps will be



increased from 2,400 cfs to 6,000 cfs at the 17<sup>th</sup> Street Canal closure structure and from 2,400 cfs to 5,600 cfs at the London Avenue Canal closure structure. Further, interim sheet pile closures with portable temporary pumps of 1,000 cfs capacity will be provided as an interim measure at the 17<sup>th</sup> Street and London Avenue Outfall Canals.

(4) The total estimated construction cost, as presented in Table 7, for increasing the temporary pumping capacity at 17<sup>th</sup> Street and London Avenue Canals, including contingencies, Engineering & Design (E&D), and Supervision & Administration (S&A) is [REDACTED].

#### **b. Recommendations / Project Approval**

(1) It is recommended that structural repair of the hurricane protection system consisting of increasing temporary pumping capacity at the 17<sup>th</sup> Street and London Avenue Outfall canals should be implemented. The utilization and removal of the additional temporary pumps will be the responsibility of the USACE. Structural repairs to the project would consist of increasing the temporary pumping capacity at the 17<sup>th</sup> Street Canal closure by 3,600 cfs and at the London Avenue Canal closure structure by up to 3,200 cfs. The increased capacity will be obtained by adding additional hydraulic pumps (18 pumps at 17<sup>th</sup> Street and 16 pumps at London Avenue) similar to the ones currently being installed. Further, interim sheet pile closures with portable temporary pumps of 1,000 cfs capacity will be provided as an interim measure at the 17<sup>th</sup> Street and London Avenue Outfall Canals.

(2) It is also recommended that this project be approved and that additional Federal funds in the amount of [REDACTED], as presented in Table 7, be provided. The final designs will be completed with contract awards scheduled to ensure the increased pumping capacity has been provided, before the end of the 2006 Atlantic Hurricane Season.

**DISTRICT PROJECT APPROVAL**  
**Project Information Report**  
**Lake Pontchartrain, LA., and Vicinity Hurricane Protection Project**  
**Orleans East Bank – Revision # 02**

PIR Prepared By: Howard Gonzales Jr. 5/17/06  
Howard Gonzales Jr. Date

Emergency Management Approval By: Michael H. Lowe 5/17/06  
Michael H. Lowe Date  
Chief, Emergency Operations

**CERTIFICATION OF LEGAL REVIEW**

The Project Information Report (PIR) Revision #02 for repair of the Lake Pontchartrain, LA., and Vicinity Hurricane Protection Project, Orleans East Bank has been reviewed by the Office of Counsel, New Orleans District and is approved as a legally sufficient.

Reviewed by: [Signature] 5/17/06  
Assistant District Counsel Date

Certified by: [Signature] 5/17/06  
for District Counsel Date

District-Level Approval By: [Signature] 5/18/06  
Richard P. Wagenaar Date  
Colonel, US Army  
District Commander

**DIVISION PROJECT APPROVAL**  
**Project Information Report**  
**Lake Pontchartrain, LA., and Vicinity Hurricane Protection Project**  
**Orleans East Bank – Revision # 02**

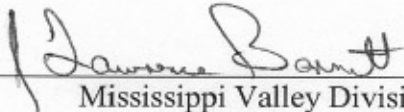
Emergency Management Approval By:

 5/19/06  
Chief, MVD Emergency Operations Date

**CERTIFICATION OF LEGAL REVIEW**

The Project Information Report (PIR), Revision #02 for repair of the Lake Pontchartrain, LA., and Vicinity Hurricane Protection Project, Orleans East Bank has been reviewed by the Office of Counsel, Mississippi Valley Division and is approved as a legally sufficient document for commencement of construction. *P.L. 84-99 provides additional authority.*

Certified by:



Mississippi Valley Division Counsel  
Assistant Chief Counsel

5/19/06  
Date

Division-Level Approval By:



Albert M. Bleakley  
Colonel, Engineer  
Deputy Division Commander

5/19/06  
Date

**APPENDIX A  
PROJECT SPONSOR'S REQUEST FOR ASSISTANCE**

No changes to this appendix. Refer to the 18 Oct 2005 PIR and the 20 Jan 06 PIR Revision #01 .

**APPENDIX B  
Project Map**



**APPENDIX C  
PROJECT OVERVIEWS**

No changes to this appendix refer to the 18 Oct 2005 PIR.

**APPENDIX D  
PROJECT DESIGN DATA**

No changes to this appendix refer to the 18 Oct 2005 PIR.

**APPENDIX E  
PROJECT MAINTENANCE DATA**

Refer to the 18 Oct 2005 PIR for previous Project Maintenance Data and paragraph 6, Part II of the Main Report for the Project Maintenance Data associated with this Revision.

**APPENDIX F  
PERIODIC MAINTENANCE DATA**

No changes to this appendix refer to the 18 Oct 2005 PIR.

**APPENDIX G  
PERIODIC RENOURISHMENT DATA**

No changes to this appendix refer to the 18 Oct 2005 PIR.

**APPENDIX H  
PREVIOUS REPAIR AND REHABILITATION OR OTHER  
FEDERAL AGENCY ASSISTANCE**

No changes to this appendix refer to the 18 Oct 2005 PIR.

**APPENDIX I  
DISASTER INCIDENT**

No changes to this appendix refer to the 18 Oct 2005 PIR.

**APPENDIX J  
DAMAGE DESCRIPTION**

Investigations are continuing on each of the three outfall canals to determine the safe water elevation. As a result of the extensive damage caused by Hurricane Katrina, the floodwalls along the outfall canals no longer provide the authorized level of protection. The ongoing investigations will identify the maximum allowable stage in each of the outfall canals and will be used to determine the stage at which the gates must be closed.

**APPENDIX K  
PROPOSED WORK**

Reference Section 12 of this Revision #02 Main Report

**APPENDIX L  
COST ESTIMATE DATA**

Table 6 found in this Revision #02 Main Report lists a summary of the project costs for the Orleans East Bank project. To appropriately reflect the change this additional work represents, costs for previously approved project features have been updated in this report. The estimated costs to operate and maintain the gated closure structures and temporary pumps along with the costs to remove the structures when the permanent protection has been restored are included. This includes the use of actual construction contract award amounts on the awarded contracts. Also, given the emergency conditions under which the design and contract documents have been prepared, the short amount of time allowed for construction completion, and high level of competition for construction contractor resources in the area, a ■■■ percent contingency is being used for contracts not yet awarded. The need for this is evidenced by bids received on awarded contracts generally exceeding construction estimates and it is anticipated that there will be a higher than normal percentage of contract modifications. The contingency for awarded contracts is ■■■ percent.

### Summary of Overall Project Costs

Reach	Total Cost
OEB01 - Phase I Floodwall Repairs - 17 St. Canal	\$
OEB02 - Phase II Floodwall Repairs - 17 St. Canal	\$
OEB03 - Phase I Floodwall Repairs - London Ave Canal at Mirabeau Ave	\$
OEB04 - Phase II Floodwall Repairs - London Ave Canal at Mirabeau Ave	\$
OEB05 - Phase I Floodwall Repairs - London Ave Canal at Robert E. Lee Blvd	\$
OEB06 - Phase II Floodwall Repairs - London Ave Canal at Robert E. Lee Blvd	\$
OEB07 - Lake Pontchartrain-Scour Repair and Slope Paving at Orleans Canal Pump Station; Floodwall Repair; East Bank	\$
OEB09 - Closure Structure at 17th Street Canal	\$
OEB10 - Closure Structure at London Avenue Canal	\$
OEB11 - Closure Structure at Orleans Avenue Canal	\$
OEB12 - Bank Stabilization for 17th Street Canal	\$
OEB13 - Bank Stabilization for London Avenue Canal	\$
IHNC02 - West Side Floodwall Repairs - France Rd to Benefit Rd	\$
IHNC04 - West Side Floodwall Repairs - Hwy 90 To Lake	\$
IHNC05 - West Side Floodwall Repairs - France Rd to IHNC	\$
IHNC08 - West Side Floodwall and Minor Scour Repairs - Benefit Rd. to Almonaster Blvd.	\$
IHNC09 - West Side Floodwall and Minor Scour Repairs - IHNC Lock to Florida Ave.	\$
<b>Subtotal</b>	<b>\$</b>
Contingency (Awarded Contracts = [REDACTED])	\$
Demolition of Interim Gates and Temporary Pumps	\$
Temporary Pumps	\$
<b>Subtotal</b>	<b>\$</b>
Engineering and Design (E&D = [REDACTED])	\$
Supervision and Administration (S&A = [REDACTED])	\$
LERRDs: 17th Street Canal - [REDACTED];	
London Avenue Canal @ Mirabeau Avenue - [REDACTED]	
London Avenue Canal @ Robert E. Lee Boulevard - [REDACTED]	
17th Street Canal Closure Structure - [REDACTED]	\$
Operation and Maintenance of interim closures and temporary pumps (\$3.00M/ year for 3 years)	\$
Additional Temporary Pumps	\$
Tree Removal	\$
Contingency Measures (17th Street and London Avenue Outfall Canals)	\$
<b>TOTAL</b>	<b>\$</b>
<b>TOTAL (ROUNDED)</b>	<b>\$</b>
NOTE: Total Cost = Contract Award + Executed Contract Modifications + Pending Contract Modifications	



**Summary of Overall Project Costs  
Recommended Plan**

<b>Reach</b>	
Additional Temporary Pumps - 17th Street Canal	\$
Additional Temporary Pumps - London Avenue Canal	\$
Contingency Measures (17th Street and London Avenue Outfall Canals)	\$
<b>Total</b>	<b>\$</b>
<b>Total (Rounded)</b>	<b>\$</b>

NOTE: Total Cost includes [REDACTED] contingency; [REDACTED] E&D; and [REDACTED] S&A

**APPENDIX M  
ENVIRONMENTAL CONSIDERATIONS**

No changes to this appendix. Refer to the 18 Oct 2005 PIR and the 20 Jan 2006 PIR Revision #01 .

**APPENDIX N  
CECW-HS, MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY FOR CIVIL WORKS (ASA(CW)), SUBJECT: RECOMMENDATIONS FOR ONE-TIME DEVIATIONS TO CERTAIN POLICIES REGARDING USE OF P. L. 84-99 (33 U.S.C. 701N) IN NEW ORLEANS AND VICINITY FOLLOWING HURRICANE KATRINA- FOR APPROVAL, DATED OCTOBER 7, 2005**

Authorization for this effort is under P.L. 109-148. Therefore, this Memorandum has no application.

**APPENDIX O  
LETTER FROM OFFICE OF ASSISTANT SECRETARY OF THE ARMY FOR CIVIL WORKS (ASA(CW)) JOHN PAUL WOODLEY, JR. TO DIRECTOR OF OFFICE OF MANAGEMENT AND BUDGET, JOSHUA BOLTEN, DATED OCTOBER 12, 2005**

Authorization for this effort is under P.L. 109-148. Therefore, this Letter has no application.

**APPENDIX P  
PIR POINTS OF CONTACT**

No changes to this appendix refer to the 18 Oct 2005 PIR.

**APPENDIX Q**

**Post Hurricanes Katrina, Wilma, Ophelia Expenditure of Flood Control and Coastal Emergency (FCCE) Funds for Restoration and Rehabilitation, and for Accelerated Work to Complete Authorized Projects, in accordance with the Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act, 2006 (public Law 109-148), dated February, 14, 2006, signed by Don Riley, Major General, Director of Civil Works**

On Following 4 pages

*Project Information Report for Orleans East Bank – Revision #02  
Lake Pontchartrain, LA., and Vicinity Hurricane Project  
May 2006*



DEPARTMENT OF THE ARMY  
U.S. Army Corps of Engineers  
WASHINGTON, D.C. 20314-1000

REPLY TO  
ATTENTION OF:

CECW-HS

FEB 14 2006

MEMORANDUM FOR

COMMANDER, SOUTH ATLANTIC DIVISION  
COMMANDER, MISSISSIPPI VALLEY DIVISION

SUBJECT: Post Hurricanes Katrina, Wilma, and Ophelia Expenditure of Flood Control and Coastal Emergency (FCCE) Funds for Restoration and Rehabilitation, and for Accelerated Work to Complete Authorized Projects, in accordance with the Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act, 2006 ( Public Law 109-148)

1. Reference:

a. Memorandum, HQ USACE, CECW-HS, 25 Oct 04, subject: Post-Hurricane Flood & Coastal Storm Damage Reduction Project Rehabilitation Policy Guidance.

b. Circular 11-2-189, CECW-I, 31 Dec 05, subject: Execution of the Annual Civil Works Program.

2. The purpose of this memorandum is to delegate certain approval authority and to provide guidance concerning restoration and rehabilitation of flood damage reduction and hurricane and storm damage reduction projects, and the acceleration of work to complete certain Federally authorized projects, in accordance with the funding and authority provided in Public Law 109-148.

3. In order to expedite the restoration and rehabilitation of flood damage reduction and hurricane and storm damage reduction projects damaged by Hurricanes Katrina, Ophelia, and Wilma, subject to the further guidance provided in this memorandum, authority is delegated to the Division Commander to:

a. Determine whether a storm qualifies as extraordinary under the criteria provided in ER 500-1-1, section 5-20, paragraphs a & b, for determining eligibility of damaged hurricane and storm damage reduction projects; and

b. Approve Project Information Reports (PIR), such as those prescribed in EP 500-1-1, to document restoration and rehabilitation determined to be eligible for FCCE funding.

CECW-HS

SUBJECT: Post Hurricanes Katrina, Wilma, and Ophelia Expenditure of Flood Control and Coastal Emergency (FCCE) Funds for Restoration and Rehabilitation, and for Accelerated Work to Complete Authorized Projects, in accordance with the Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act, 2006 ( Public Law 109-148)

4. Public Law 109-148 directs that in using funds appropriated for construction related to Hurricane Katrina in the areas covered by the disaster declaration, the Corps of Engineers will restore flood damage reduction and hurricane and storm damage reduction projects and related works to provide the level of protection for which they were designed, at full Federal expense. The Joint Explanatory Statement of the Committee of Conference accompanying Public Law 109-148 further clarifies that the funds are provided to fund repairs to non-Federal levees and pumps and to construct levees and floodwalls to original design levels, rather than to pre-storm condition. Therefore, within the funds provided, for Federally authorized projects with levee and floodwall components, and non-Federal levees and pumps, which were damaged by Hurricane Katrina, restoration and rehabilitation will be undertaken to the previously constructed design level. The costs for restoration and rehabilitation construction and construction related activities will be at full Federal expense. These costs include Engineering and Design, Supervision and Administration, actual construction, acquisition of real estate interests not already owned by or under the control of the non-Federal sponsor, and relocations. HTRW investigations will be performed at Federal expense; if HTRW is discovered, then a mutual decision will be made by the Federal Government and the non-Federal sponsor on whether to proceed with acquisition of the property; and if the parties mutually agree to proceed, then the non-Federal sponsor will be responsible for HTRW clean-up costs. Other non-Federal responsibilities, including operation and maintenance and the requirement to hold and save the Federal Government free from damages, remain.

5. Projects damaged by Hurricanes Ophelia and Wilma to be restored and rehabilitated to the pre-storm condition using FCCE funds will be implemented in accordance with cost sharing set out in ER 500-1-1, Paragraph 5-11. In some cases it may be appropriate to fully restore sacrificial beach elements of these projects beyond the pre-storm condition, with this work cost shared as periodic renourishment by the Federal Government (using Construction, General (CG) funds) and the non-Federal sponsor in accordance with the Project Cooperation Agreement. In these cases, following the guidance provided in memorandum referenced in paragraph 1, the PIR should document undertaking the CG-funded periodic renourishment at the same time as the FCCE-funded restoration and rehabilitation, except that as provided in paragraph 3. above, approval of the PIR shall be with the Division Commander.

6. Public Law 109-148 also authorizes, at full Federal expense, within the funds provided, acceleration of work to complete unconstructed portions of Federally authorized projects in the State of Mississippi along the Mississippi Gulf Coast and Federally authorized flood damage and hurricane and storm damage reduction projects in the greater New Orleans and South Louisiana area. The costs for new construction and currently ongoing construction and construction related activities to accomplish acceleration of completion of unconstructed portions of Federally

CECW-HS

SUBJECT: Post Hurricanes Katrina, Wilma, and Ophelia Expenditure of Flood Control and Coastal Emergency (FCCE) Funds for Restoration and Rehabilitation, and for Accelerated Work to Complete Authorized Projects, in accordance with the Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act, 2006 ( Public Law 109-148)

authorized projects will be at full Federal expense. These costs include Engineering and Design, Supervision and Administration, actual construction, acquisition of real estate interests not already owned by or under the control of the non-Federal sponsor, and relocations. HTRW investigations will be performed at Federal expense; if HTRW is discovered then a mutual decision will be made by the U.S. and the non-Federal sponsor on whether to proceed with acquisition of the property; and, if the parties mutually agree to proceed, then the non-Federal sponsor will be responsible for HTRW clean-up costs. Other non-Federal responsibilities, including operation and maintenance and the requirement to hold and save the Federal Government free from damages, remain. The non-Federal sponsor's operation and maintenance responsibilities will include operation and maintenance of the new construction under Public Law 109-148. Existing agreements will be amended to make it clear that 1) new construction and associated activities will be at full Federal expense; b) the non-Federal sponsor's operation and maintenance responsibilities will include operation and maintenance of the new construction; and c) HTRW investigations will be performed at Federal expense and if HTRW is discovered and the parties mutually agree to proceed, then the non-Federal sponsor will be responsible for HTRW clean-up costs.

7. For accelerated completion of projects in the South Atlantic Division, Accelerated Project Information Reports (APIRs) will be prepared to document proposed accelerated work for those unconstructed portions of authorized projects that are not covered by existing Project Cooperation Agreements (PCAs). The Accelerated Project Information Report will be approved by the Division Commander. The PCA will be approved by the ASA(CW).

8. For accelerated completion of projects in the Mississippi Valley Division, amendments to the existing agreements and sufficient supporting documentation will be developed in coordination, as appropriate, with the Headquarters and OASA(CW). Authority is delegated to the Division Commander to approve amendments to existing agreements for the accelerated construction to be undertaken in accordance with Public Law 109-148.

9. Construction and operation of the temporary closures in New Orleans, including temporary pumping stations, during the extended construction period of 1-3 years will be performed by the Federal Government in order to ensure optimum and safe construction. Funds provided in Public Law 109-148 will be used to fund operations of necessary temporary closures or temporary pumping at the outfall canals in New Orleans during the extended construction period of 1-3 years; however, FCCE funds other than those provided in Public Law 109-148 will not be available for this purpose.


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CECW-HS

SUBJECT: Post Hurricanes Katrina, Wilma, and Ophelia Expenditure of Flood Control and Coastal Emergency (FCCE) Funds for Restoration and Rehabilitation, and for Accelerated Work to Complete Authorized Projects, in accordance with the Department of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza Act, 2006 ( Public Law 109-148)

10. We will manage Public Law 109-148 funding in the FCCE program as programs, projects, and activities (PPA) IAW reference 1.b above. Work allowance documents will be issued by project for work in these PPAs. Any re-distribution of funds allocated between projects as included in the 9 Dec 06 estimates of project requirements different from the work allowance must be coordinated with the headquarters FCCE program manager prior to re-distribution.

11. Questions concerning this policy should be directed to Jeffrey Jensen, HQUSACE, Civil Emergency Management Branch, [REDACTED]

  
DON F. RILEY  
Major General, USA  
Director of Civil Works

CF:  
COMMANDER, NORTH ATLANTIC DIVISION  
COMMANDER, NORTHWESTERN DIVISION  
COMMANDER, PACIFIC OCEAN DIVISION  
COMMANDER, SOUTH PACIFIC DIVISION  
COMMANDER, SOUTHWESTERN DIVISION  
COMMANDER, GREAT LAKES & OHIO RIVER DIVISION

**APPENDIX R  
NOT USED**

**APPENDIX S  
NOT USED**

**APPENDIX T  
NOT USED**

**APPENDIX U  
NOT USED**

**APPENDIX V  
NOT USED**

**APPENDIX W  
NOT USED**

**APPENDIX X  
NOT USED**

**APPENDIX Y  
NOT USED**

**APPENDIX Z  
PIR REVIEW CHECKLIST (HSPP)**

<b>PIR Review Checklist for HSPP Rehabilitation Assistance</b>				
	<b>YES</b>	<b>NO</b>	<b>N/A</b>	
1.	X			The project is a Federally authorized and constructed hurricane or shore protection project. [ER, 5-20.a.]
2.	X			The project is Active in the RIP. [ER, 5-2.a.] Last inspection date: _May 2005_____
3.	X			The Public Sponsor has requested HSPP Rehabilitation Assistance in writing. [EP, 5-18.b.]
4.	X			The FCCE-funded HSPP Rehabilitation Assistance is necessary (a) to allow for adequate functioning of the project; (b) to reduce the immediate threat to life and improved property; and (c) is to a level no more than the pre-storm condition. [ER, 5-20.a., c., and d.]
5.	X			There is sufficient evidence in the PIR to support a finding that the HSPP was damaged by an extraordinary storm. [ER, 5-20.e.]
6.	X			There are "significant amounts of damage" to the HSPP. [ER, 5-20.e.(2)] The criterion used to make this determination is: _____ the cost of the construction effort to effect repair of the HSPP ( <i>exclusive of dredge mob/demob costs</i> ) (a) exceeds \$1 million and (b) is greater than 2 percent of the original project construction costs (expressed in current day dollars.); or, __X__ the cost of the construction effort to effect repair of the HSPP ( <i>exclusive of dredge mob/demob costs</i> ) exceeds \$6 million; or, _____ more than one-third of the planned or historically placed sand for renourishment was lost. _____ only hard features are involved.
7.	X			The public sponsor has agreed to sign the Cooperation Agreement, which will occur before USACE begins rehabilitation work. [EP, 5-18.l.]
8.	X			The rehabilitation project has a favorable benefit cost ratio of greater than 1.0:1. [ER, 5-20.a.]
9.	X*			The Public Sponsor has access to sufficient funds to meet its required cost contributions. [EP, 5-18 h.] <i>Please note * Based upon the sponsor's request for assistance, it appears that the Public Sponsor will have to seek financial assistance from the State of Louisiana.</i>
10.	X			The cost estimate in the PIR itemizes the work and identifies the Public Sponsor's cost responsibility for items such as deferred and deficient maintenance. [ER, 5-2.g.]
11.			X	The cost estimate in the PIR allocates costs between what may be paid for under PL 84-99 Rehabilitation Assistance, and what is cost shared between the Corps (using CG funds) and the public sponsor under periodic renourishment terms of the project PCA. [EP, 5-18.d.]]
12.			X	Dredge mobilization/demobilization costs are borne proportionally among contributing sources of funds for sand renourishment. [ER, 5-20.i.]
13.		X**		Contingency funds for the FCCE-funded portion of the project are limited to 15 percent for dredging-related costs, and 10 percent for all other costs. [ER, 5-2.v.]
14.	X			The repair option selected is the option that is the least cost to the Federal government. [ER, 5-2 h.]
15.	X			The benefit cost ratio calculation excludes all recreation benefits. [ER, 5-20.a.]
16.			X	Betterments are paid by the Public Sponsor. [ER, 5-2.o.]
17.			X	Costs for any betterments are identified separately in the cost estimate. [ER, 5-2.o.]
18.	X			Based on the projected schedule, project history, anticipated degree of contention of undertaking the project, and similar items, the Rehabilitation Assistance will be finished prior to the onset of the next storm season, or within one year of the date of



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				occurrence of the damage, whichever is less. [ER, 5-20.j.]
19.	X			The proposed work will not modify the HSPP to increase the degree of protection or capacity, or provide protection to a larger area. [ER, 5-2.n.]
20.	X***			An assessment of environmental requirements was completed. [ER, 5-13.e.]
21.	X			The Endangered Species Act was appropriately considered. Dredging will not be adversely impacted. [ER, 5-13.e.]
22.	X			The Archeological and Historical Preservation Act was appropriately considered. [ER, 5-13.h.]
23.			X	EO 11988 was appropriately considered. [ER, 5-13.f.]
24.	X			Other permitting and evaluations were appropriately considered, and result in no impediment to the Rehabilitation Assistance effort. [ER, 5-13.a.]
25.	X			The cover letter forwarding the PIR to the MSC will contain the projected schedule for completing the Rehabilitation Assistance. [EP, 5-18.f.(2)]
26.	X			The completed PIR has been reviewed and the PIR Checklist has been reviewed and signed by the Emergency Management Office. [EP, 5-18.f.(1)]
27.	X			The completed PIR meets all policy, procedural, content, and formatting requirements of ER 500-1-1 and EP 500-1-1. [ER, 2-3.b.]

NOTES:

\* Public Law 109-148 directs that in using funds appropriated for construction related to Hurricane Katrina in the areas covered by the disaster declaration, the Corps of Engineers will restore flood damage reduction and hurricane and storm damage reduction projects and related works to provide the level of protection for which they were designed, at full (100%) Federal expense.

\*\* Rationale for use of the [REDACTED] contingency for the contracts yet to be awarded is based on the emergency conditions under which the design and contract documents have been prepared, the short amount of time allowed for construction completion, and the high level of competition for construction contractor resources in the area. The need for this is evidenced by bids received on awarded contracts generally exceeding construction estimates and it is anticipated that there will be a higher than normal percentage of contract modifications.

\*\*\* An imminent threat declaration has been issued by the Commander of the New Orleans District. Refer to Appendix M of this report for this Declaration.

REVIEWING OFFICIAL'S SIGNATURE



NAME: Michael H. Lowe  
TITLE: Emergency Operations Manager  
TELEPHONE NUMBER: [REDACTED]