

**DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS**

**COMPLETE STATEMENT**

**OF**

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**BEFORE THE**

**ENVIRONMENT AND PUBLIC WORKS COMMITTEE**

**UNITED STATES SENATE**

**ON**

**NEW ORLEANS HURRICANE AND FLOOD PROTECTION AND COASTAL  
LOUISIANA RESTORATION: STATUS AND PROGRESS**

**June 16, 2009**

## **Introduction**

Madam Chair and Members of the Committee, I am Brigadier General Michael Walsh, Commander of the Mississippi Valley Division, U.S. Army Corps of Engineers. Thank you for the opportunity to be here today to discuss the Corps of Engineers' ongoing reconstruction, restoration and improvement efforts on the Hurricane and Storm Damage Risk Reduction System (HSDRRS) for the Greater New Orleans area. The Federal Hurricane and Storm Damage Risk Reduction System projects for Greater New Orleans were extensively damaged by Hurricane Katrina in 2005. With quick action from Congress to provide authority and appropriations, the Corps repaired and restored 220 miles of the system to the pre-Katrina level of protection and is now working to provide risk reduction from hurricanes and storm surges that have a 1% chance of occurring in any given year (known as 100-year risk reduction).

We are using the overall resources of the entire Mississippi Valley Division and other Corps expertise across the Nation to keep the program on schedule and deliver on our commitment to provide 100-year risk reduction in 2011. Construction will continue after that date to complete other features in 2013. But even beyond this internal effort, we are leveraging the knowledge and capability of our partners in industry, architect-engineer firms, members of academia and international counterparts to develop and apply state-of-the-practice engineering solutions to the Greater New Orleans Hurricane and Storm Damage Risk Reduction System and across coastal Louisiana.

My testimony today will focus on the Greater New Orleans Hurricane and Storm Damage Risk Reduction System progress to date and provide an overview of the ongoing efforts to restore the coastal ecosystem of Louisiana.

## **Hurricane and Storm Damage Risk Reduction System Status**

The risk reduction systems in the New Orleans area include about 350 miles of levees and floodwalls, navigable floodgates, canal closure structures, seventy-three pump stations and numerous other structures. The threat of 100-year storm surge is being addressed through improvements to the perimeter system composed of the existing Lake Pontchartrain and Vicinity (LPV) and West Bank and Vicinity (WBV) projects that protect major areas of Jefferson, Orleans, Plaquemines, St. Bernard, and St. Charles parishes. There is also an interior drainage system which provides for the removal of rainfall that is being addressed through improvements to the Southeast Louisiana Urban Flood Damage Reduction Project (SELA) project. SELA is designed for a 10-year rainfall event.

Major features of the work we are doing in Louisiana include erecting surge protection barriers to reduce storm surges entering the Inner Harbor Navigation Canal (IHNC), adding scour protection, replacing deficient I-walls with stronger T-walls, making repairs to existing pumping stations, storm proofing pump stations, improving interior drainage and restoring and completing components of the Lake Pontchartrain and Vicinity (LPV) and West Bank and Vicinity (WBV) projects. The authorized and funded work also includes incorporating the Plaquemines Parish non-federal levees into the existing New Orleans to Venice hurricane risk reduction project, and improving levees in Terrebonne Parish. In addition, ecosystem restoration and higher levels of storm risk reduction measures are also being studied for coastal Louisiana as part of the

authorized Louisiana Coastal Area program and the ongoing Louisiana Coastal Protection and Restoration study.

Today we are more than one third through construction of the improved Hurricane Storm Damage and Risk Reduction System. The system is already stronger and more resilient than prior to Katrina and at any time in history. Extensive modeling, lessons learned, and risk informed processes have enhanced our design criteria and on-the-ground construction. The progress continues to occur.

The contracting effort to accomplish this massive construction project in a short time frame is immense. We are proud of our accomplishment in maintaining our aggressive obligation schedule, originally laid out in 2007. We have already awarded over 190 contracts and obligated over \$4.2 billion for the program. The majority of funds are planned for obligation by the end of 2009. Current obligations include over \$1.2 billion to Small and Disadvantaged Businesses, 37% of all contract obligations. We are cognizant of the opportunities to contribute to small and disadvantaged businesses' development.

With the assistance of the Office of the Federal Coordinator for Gulf Coast Rebuilding and in close partnership with Governor Jindal, we have signed all three major Project Partnership Agreements with the State of Louisiana necessary to proceed with construction, namely those agreements associated with the WBV, LPV, and SELA Projects. We have also signed all deferred payment agreements with the State of Louisiana that extend the State's payments for the cost-shared portion of the work over a 30-year period, supporting the policy announcement between the Federal government and the State of Louisiana in August 2008. The state's estimated cost share is \$1.83 billion, of which \$.33 billion is the real estate acquisitions and \$1.5 billion is the state's required cash contribution. Because of the deferred payment agreement, \$1.5 billion of the \$14.3 billion in Federal funds appropriated for this program is funding the non-Federal cash requirement until the non-Federal funds are received.

We have implemented a robust independent external peer review of the Hurricane Storm Damage Risk Reduction System. This includes the overall design criteria and their application during design and construction, the armoring manual, and the quality management plan. The most complex projects will receive additional peer review during design and construction.

To allow for safe continued operation of the interior drainage system during hurricanes and storm events, we constructed five new safe rooms for pump station operators and added storm proofing in Jefferson Parish for more than \$28 million; completed 47 pump station repairs in Jefferson, Orleans and St. Bernard Parishes for a total of more than \$56 million; and awarded contracts for 16 pump station repairs in Plaquemines Parish for more than \$19 million --- all to be completed in 2009. The safe rooms and pump station repairs were all 100% federally funded. We are very close to finalizing an overarching agreement that would address the remaining portion of the \$340M in storm proofing work in Jefferson and Orleans parishes.

We have awarded all Harvey Canal floodwall contracts (five), totaling about \$340 million. No federal protection previously existed along the east side of Harvey Canal, making this area the most vulnerable on the West Bank. About 3.5 miles of floodwalls and one mile of levee will be constructed along the east side of the Harvey Canal, and we expect to complete this work in the fall of 2010. However, the 100-year level of risk reduction will not be achieved until the Gulf

Intracoastal Waterway - West Closure Complex is constructed, currently scheduled to finish by June 2011.

We completed rebuilding three pump stations in St. Bernard Parish for the Lake Borgne Basin Levee District. The Corps spent more than \$20 million to rebuild the pumps, which were severely damaged during Hurricane Katrina.

Recognizing the need and fundamental responsibility to reach out to stakeholders and to inform our decision making with public input, the Corps has also hosted more than 110 public meetings in Jefferson, Orleans, Plaquemines, St. Bernard, and St. Charles parishes to obtain public comment into the development of the system.

Last year during Hurricanes Gustav and Ike, we coordinated with the Sewerage and Water Board of New Orleans to close gates at the Interim Closure Structures at the outfall canals at Lake Pontchartrain and then pumped storm water out of the canals. The 12-foot surge from Hurricane Gustav tested the system and the Nation watched as waves lapped over the floodwalls along the Inner Harbor Navigation Canal (IHNC). The system performed as designed. No damages to the floodwalls occurred, due to the new T-walls, the armoring, and the splash pads installed for existing I-walls.

### **Inner Harbor Navigation Canal (IHNC) Surge Barrier**

In 2008 we awarded the largest-ever Corps Design-Build contract for the IHNC surge barrier at Lake Borgne. Project features consist of three navigable gated structures and a concrete pile-supported barrier wall stretching across the Gulf Intracoastal Waterway and the Mississippi River Gulf Outlet (MRGO). Once constructed, the surge barrier will be the largest in the world and will provide risk reduction from flooding to the Ninth Ward, Gentilly, New Orleans East, Orleans Metro, and St. Bernard Parishes. Construction is underway on the concrete pile-supported barrier wall and overall project completion to provide 100-year risk reduction is scheduled for June 2011. Extensive efforts in engineering analyses, hydraulic modeling, and simulation exercises with pilots have enhanced navigational safety. With input from the navigation industry and the United States Coast Guard, enhanced features include lengthened and tapered guide walls, dolphins, increased impact resistance and more. We continue to work with industry and stakeholders on the operational scenarios of the project.

We have recently updated our project cost estimate for the IHNC surge barrier. In addition to the added features for enhanced navigational safety, other cost drivers include a more robust barrier wall to meet design criteria and the nourishment of 705 acres of marsh performed to meet Louisiana Coastal Zone Management standards. The additional IHNC funding requirement was met within the overall HSDRRS program through a reallocation of funds.

Also included as part of the IHNC surge risk reduction is the Lake Pontchartrain (Seabrook) Floodgate, a navigable surge barrier. This project is now going through the preliminary planning needed to meet the National Environmental Policy Act (NEPA) requirements. We plan to construct this project by the 2011 goal.

## **Permanent Protection for Outfall Canals**

Interim Closure Structures at the three outfall canals (17th Street, Orleans Ave. and London Ave.) currently provide the 100-year level of risk reduction. These Interim Closure Structures are temporary facilities until a permanent solution is implemented. The sites under consideration for the Permanent Protection System for the Outfall Canals are currently being evaluated to comply with NEPA.

The Corps submitted a Report to Congress on 26 February 2009 providing a cost analysis of pump station Options 1, 2 and 2a. The Corps is authorized and funded to construct Option 1, which consists of the construction of permanent gated pumping stations at or near the mouths of 17th Street, Orleans and London Avenue Canals. This is the plan that we have been implementing since the Hurricanes in 2005. The operational effectiveness of Option 1 was demonstrated during Hurricanes Gustav and Ike in 2008 when the temporary control structures and pump stations at the outfall canals were successfully operated in concert with the city's pumps at the interior ends of the canals. We anticipate that the New Orleans District commander could sign the Record of Decision for the Individual Environmental Report (IER) document for the permanent pumping stations by the end of June 2009 and we expect to execute an agreement for initiation of this work with the State of Louisiana in early August 2009.

Local stakeholders have sought support for Options 2 and 2a which would expand the scope of work to include significant modifications to the three main outfall canals of the City's interior drainage system in addition to the pumping stations that are being built under Option 1. Since Options 2 and 2a address interior rainwater drainage issues and not storm surge protection, both exceed our current authority and would require additional authorization and funding for construction.

However, the Corps will include reasonable and prudent measures in the design of the permanent pumping stations, such as deepened sills, within the bounds of our current authority and funding, to ensure that no large work element would have to be removed or replaced if Options 2 or 2a are eventually constructed.

In addition, we have initiated a rigorous re-analysis of the floodwalls that line the canals to validate the safe water elevations in each canal. In that reanalysis we will also be looking for ways to improve the floodwalls and increase the safe water elevations. The London Avenue and Orleans Avenue canal assessments will be available by the end of June, and 17th Street Canal assessment will be available by the end of September. In conjunction with this effort, the Corps is reviewing the operating protocol between the Corps and the New Orleans Sewerage and Water Board and will propose modifications and adjust it as necessary to address any risk of exceeding the safe water elevations. The Southeast Louisiana Flood Protection Authority will assist in the establishment of the external peer review process for these studies.

We have also estimated the effort required to study the feasibility of Options 2 or 2a and provide an engineering analysis of any additional flood risk reduction that could be achieved in improving the system that conveys rainfall runoff to the permanent pump stations. The study would identify and evaluate alternatives for providing rainfall runoff evacuation to include assessments of relative flood risk, environmental impacts, technical feasibility and cost. As I mentioned previously, we are currently authorized to perform this study; however, additional

funding is required. We estimate approximately \$15.6 million with a completion schedule of 36 months for this effort.

We remain committed to providing permanent risk reduction at the outfall canals in 2013. As with the entire HSDRRS program, cooperation among the federal, state and local sponsors along with local communities is paramount to achieving this goal.

### **Gulf Intracoastal Waterway--West Closure Complex (GIWW – WCC)**

In May 2009, another major feature of the 100-year system, the Gulf Intracoastal Waterway--West Closure Complex, part of the West Bank and Vicinity project which reduces risk for Jefferson, Orleans, and Plaquemines parishes, was awarded as an Early Contractor Involvement contract. The Corps has worked very closely with EPA, navigation interests, local government and non-government organizations to develop a plan to reduce risk of storm surge inundation on the West Bank. We've developed a plan to minimize impacts to a 3,200-acre wetland area, Bayou aux Carpes, through collaboration with the EPA and other resource agencies. In 1985, EPA, under the authority granted in Section 404(c) of the Clean Water Act (CWA), restricted the discharge of dredged or fill material in Bayou aux Carpes. EPA's Final Determination restricting the discharge of dredged or fill material was based on findings that discharges would have unacceptable adverse effects on shellfish beds and fishery areas, wildlife, and recreational areas. The Corps recently received approval for a modification of the 1985 EPA Final Determination for the actions proposed as a part of the Gulf Intracoastal Waterway West Closure Complex project. We recognize the importance of Bayou aux Carpes and will use special construction techniques to minimize impacts to the wetlands site. Early Contractor Involvement allows the construction contractors to become familiar with the project during the design phases and before construction starts. This allows them an opportunity to order long-lead-time items in advance. Implementation of the West Closure Complex will significantly reduce the risk to a large area of the West Bank by removing over 25 miles of levees, floodwalls, gates and pumping stations along the Harvey and Algiers Canals from exposure to storm surge. Risk reduction to the 100-year level will be completed by the 2011 hurricane season with interim pumping capacity. All project construction is scheduled to be completed in 2013.

### **St. Bernard Levees and Floodwalls**

Following Hurricane Katrina, about 80% of the levees in St. Bernard Parish were either repaired or constructed to achieve the pre-Katrina authorized elevation. In order to meet the design criteria to provide 100-year level of protection, St. Bernard Parish levees would have to be raised between 10 and 15 feet above the current elevations.

After evaluating several alternatives, the Corps found that T-walls on top of existing levees provided the most timely, cost-effective solution. Construction of more traditional earthen levees would have broadened the cross-section significantly, thus requiring a 900 foot wide footprint and more real estate than is currently available, and would require impacting many acres of wetlands. By building floodwalls instead of levees, the Corps is reducing the amount of borrow material needed by approximately 25 million cubic yards. As part of the National Environmental Policy Act (NEPA), the Corps considered opinions and comments of local residents and stakeholders as part of the decision process. On May 26, 2009, the New Orleans

District commander signed the Decision of Record for Individual Environmental Report (IER) 10 which advances the plan to construct 22.3 miles of floodwalls in St. Bernard Parish.

### **Eastern Tie In**

We are currently working with the Plaquemines Parish government on the Eastern Tie In project which will tie the HSDRRS into the Mississippi River levee just south of the town of Oakville on the eastern side of the system on the west bank. Plaquemines Parish government officials have expressed concerns that the proposed alignment would induce flooding to areas south of the town of Oakville. We've extended the public review period for the Individual Environmental Report 13 to address the pros and cons of potential alternatives that we discussed during a June 1, 2009 meeting with CPRA, Plaquemines Parish government officials and Southeast Louisiana Flood Protection Authority – West (SLFPA-W). We've committed to meet again to review in more detail the Corps' hydrologic analysis and compare to the Parish's own hydrologic analysis of flood risk.

### **Southeast Louisiana Urban Flood Damage Reduction Project (SELA)**

We are continuing construction on eight Southeast Louisiana Urban Flood Damage Reduction Project (SELA) interior drainage projects worth about \$174 million, with seven of those being accelerated to completion under Public Law 109–148, Department Of Defense, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf Of Mexico, and Pandemic Influenza Act, 2006 (3rd Supplemental). Three of these projects are essentially complete (generating benefits).

Of the work authorized, approved and funded under the SELA program, 51 of 74 contracts have been awarded. Scheduled work in Jefferson and Orleans Parishes is approximately 60 percent complete, and the remaining work is scheduled to be completed in 2016. While completion of the SELA projects is not a requirement to provide 100-year protection to the Greater New Orleans area, completion of SELA projects will continue to improve the system's ability to handle interior drainage.

The Project Partnership Agreement signed on January 16, 2009 with the State of Louisiana paved the way for construction of \$1.3 billion of SELA features in Orleans and Jefferson Parishes.

### **Other Efforts**

We are also engaged on several other fronts, primarily under the Louisiana Coastal Protection and Restoration (LACPR) authority and the several authorities that support the ongoing effort to restore the coastal ecosystem. The ecosystem restoration activities are conducted under multiple authorities, with funding from varying sources and an array of different cost-sharing formulas. They include: (1) the Coastal Wetlands Planning, Protection and Restoration Act; (2) a Louisiana Coastal Area (LCA) ecosystem restoration program; (3) a related effort to restore wetlands affected by the Mississippi River Gulf Outlet; and (4) the science needed to support all of these related ecosystem restoration efforts.

The Louisiana Coastal Protection and Restoration (LACPR) Final Technical Report is currently undergoing agency and public review and is scheduled to be provided to the Assistant Secretary of the Army for Civil Works in August 2009. The report contains an analysis of Category 5 risk reduction as required by the Department of Defense Appropriations Act of 2006 (Public Law 109-148) signed on December 30, 2005. The report identifies an array of viable comprehensive plans that include structural, non-structural and coastal restoration measures for risk reduction in coastal Louisiana. It also establishes the opportunity to move forward on report components with our state partner, the Coastal Protection and Restoration Authority (CPRA).

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The Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) also referred to as the Breaux Act, was authorized by Public Law 101-646, Title III, Nov 29, 1990. The Act established the authority to produce a list of priority projects and to construct these projects in Louisiana to provide for the long-term conservation of Louisiana's coastal wetlands. Currently, there are 146 active projects of which 76 have been constructed and 18 under construction. Funding is appropriated through the Sport Fish Restoration and Boating Safety Trust Fund (Trust Fund). The program is administered by the Louisiana Coastal Wetlands Conservation and Restoration Task Force, consisting of the Secretary of the Army, Administrator of the Environmental Protection Agency, Secretary of the Interior, Secretary of Agriculture, the Secretary of Commerce and the Governor of Louisiana. The Act designated the Secretary of the Army (Secretary) as the chairman. The Secretary delegated the Task Force chair responsibility to the Army Corps of Engineers, New Orleans District Commander, and similar delegation by the other federal agencies have been made

WRDA 2007 authorized the LCA program. Under the LCA program, the Corps in partnership with the CPRA has initiated feasibility level analysis for 12 of the 15 features. We anticipate initiating the remaining 3 features by FY2010. All 15 features are part of the LCA near term plan. We expect to complete final reports in FY 2010 on 6 of these features in Dec of 2010. In addition we will submit the Barataria Basin Barrier Shoreline Restoration report and the Beneficial Use of Dredge Material Report by the 2<sup>nd</sup> quarter of FY2010. These reports will then be provided to the Assistant Secretary of the Army (Civil Works) for approval or transmittal in accordance with Section 7006 of WRDA 2007. In addition, there are four other components of the program to further restoration and reduce uncertainties and increase effectiveness of restoration measures.

Since Hurricane Katrina, the Corps of Engineers has been involved in leading a number of simultaneous efforts located on or near the MRGO. The comprehensive plan for deauthorization of deep draft navigation was completed in 2008. The MRGO channel was officially closed to all navigation on 22 April 2009. Construction crews are now in the final stages of placing over 300,000 tons of rock to complete the MRGO closure structure in July 2009. We are also in the process of constructing an 18,500-foot long rock dike along part of the bank of the eastern lobe of Lake Borgne to help maintain the lake as a separate ecosystem. A study to identify the best ways to restore wetlands affected by the MRGO is also ongoing. Feasibility scoping meetings for this study were held in April and May 2009 and we plan to release the draft report for public comment and external review in May 2010.

This concludes my testimony. Again, thank you for allowing me to testify on the ongoing efforts of the Corps of Engineers in the New Orleans area. I will be happy to answer any questions you or the other Members may have.