DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, DC 20314-1000

REPLY TO
ATTENTION OF

CECW-SAD

05 SEP 2009

SUBJECT: Mississippi Coastal Improvements Program, Hancock, Harrison, and Jackson Counties, Mississippi, Comprehensive Plan Report

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my final report on water resources improvements associated with hurricane and storm damage risk reduction and ecosystem restoration in the coastal counties of Hancock, Harrison, and Jackson, Mississippi. It is accompanied by the report of the district and division engineers. These reports are a final response to authorizing legislation contained in the Department of Defense Appropriation Act of 2006 (P.L. 109-148), dated 30 December 2005. The study authorization states, in part, the following:

> *"... the Secretary shall conduct an analysis and design for comprehensive improvements or modifications to existing improvements in the coastal area of Mississippi in the interest of hurricane and storm damage reduction, prevention of saltwater intrusion, preservation of fish and wildlife, prevention of erosion, and other related water resource purposes at full Federal expense; Provided further, that the Secretary shall recommend a cost-effective project, but shall not perform an incremental benefit-cost analysis to identify the recommended project, and shall not make project recommendations based upon maximizing net national economic development benefits; Provided further, that interim recommendations for near term improvements shall be provided within 6 months of enactment of this act with final recommendations within 24 months of this enactment."*

Pre-construction engineering and design and additional studies will be initiated upon Congressional authorization.

2. The Mississippi Coastal Improvements Program Comprehensive Plan, hereinafter referred to as the MsCIP Comprehensive Plan, is a systemwide approach linking structural and nonstructural hurricane and storm damage risk reduction elements with ecosystem restoration elements, all with the goal of providing for a coastal community that is more resilient to hurricanes and storms. The MsCIP Comprehensive Plan for hurricane and storm damage risk reduction in coastal Mississippi was developed using a multiple lines-of-defense approach focusing on reducing hurricane and storm damages through barrier islands restoration, and employing beachfront protection, wetland restoration, and floodplain evacuation concepts of the MsCIP Comprehensive Plan. The reporting officers identify 12 elements to aid recovery of coastal Mississippi that was severely damaged by the hurricanes of 2005. Structural elements include restoring protective beaches and systems, restoring native habitats, and raising an

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existing levee. Non-structural elements include removing structures from floodplains or raising structures that are highly vulnerable to storm damage. The hurricanes of 2005 severely taxed the resources of local governments and institutions, making it unlikely that those resources could be employed to implement these proposed recovery actions without Federal assistance. Thus, this package of 12 elements and the identified further feasibility studies will help the people of coastal Mississippi in their recovery. Implementation of the 12 elements would provide for the restoration of over 3,000 acres of coastal forest and wetlands, approximately 30 miles of beach and dune restoration, and floodproofing or acquisition of approximately 2,000 tracts within the 100-year floodplain.

3. The MsCIP Comprehensive Plan also includes recommendations for additional studies to address the longer term needs over the next 30-40 years. These studies would evaluate the restoration of over 30,000 acres of coastal forest, wetlands, beaches and dunes; sustainable restoration of the barrier islands; structural measures; and floodproofing or acquisition of over 58,000 tracts within the 100-year floodplain.

4. The reporting officers developed the recommended 12 elements for coastal Mississippi consistent with the direction provided in the Department of Defense Appropriations Act of 2006 (P.L. 109-148), dated 30 December 2005. In accordance with P.L. 109-148, the reporting officers found each of the 12 elements to be cost-effective, technically sound, and environmentally and socially acceptable. These 12 elements are described below and include two non-structural hurricane storm risk reduction elements, one structural hurricane and storm damage risk reduction element, seven ecosystem restoration elements, and two coastal ecosystem restoration elements. The additional studies that are part of the MsCIP Comprehensive Plan could provide further improvements in the coastal area of Mississippi if implemented. Discussion of these studies is included in paragraphs 5 and 6.

a. High Hazard Area Risk Reduction Program (HARP). This project element consists of acquisition of approximately 2,000 tracts which are at the highest risk of being damaged by storm surge, demolition of existing structures, and retention of acquired tracts in an open space condition. The number of tracts was based on an estimate of what could be acquired during a five year period following the execution of the Project Partnership Agreement for implementation of this element. To the extent practicable, acquisition would be on a willing seller basis, but eminent domain could be utilized when determined to be warranted. As described in the report, acquisition will be in compliance with the provisions of the Uniform Relocations Assistance and Real Property Acquisition Policies Act (P.L. 91-646), as amended, and the uniform regulations contained in 49 CFR, Part 24 including the provision of payment of relocation assistance benefits to eligible recipients. The tracts would include residential, commercial and unimproved tracts. In addition, buildings owned by the City of Moss Point that are used for municipal purposes will be replaced with buildings out of the Federal Emergency Management Agency (FEMA) designated Velocity Zone. Benefits of the HARP include approximately $22,000,000 – $33,000,000 in average annual hurricane and storm damage risk

reduction benefits, depending on the specific tracts acquired. At October 2008 price levels, the estimated first cost of this element is $407,860,000. The cost of this non-structural project element is allocated to hurricane and storm damage risk reduction. In accordance with the provisions of the Water Resources Development Act of 1986 (WRDA 1986), as amended, cost sharing would be 65-percent Federal and 35-percent non-Federal. The Federal share of the estimated first cost of this element would be $265,110,000 and the non-Federal share would be $142,750,000. The estimated annual cost for operation, maintenance, repair, replacement and rehabilitation of this project element is $75,000 and is a 100-percent non-Federal responsibility.

b. Waveland Floodproofing. This project element consists of elevating approximately 25 residential structures in the City of Waveland, Mississippi that are determined to be eligible for floodproofing by elevation out of the 1-percent chance storm event inundation level. Benefits of the Waveland Floodproofing include $224,000 in average annual hurricane and storm damage risk reduction benefits. At October 2008 price levels, the estimated first cost of this element is $4,450,000. The cost of this element is allocated to hurricane and storm damage risk reduction. In accordance with the provisions of WRDA 1986, as amended, cost sharing would be 65-percent Federal and 35-percent non-Federal. The Federal share of the estimated first cost of this project element is $2,890,000 and the non-Federal share is $1,560,000. Due to the non-structural nature of this element, the estimated annual costs for operation, maintenance, repair, replacement and rehabilitation are expected to be nominal. However any operation, maintenance, repair, replacement and rehabilitation that would be needed is a 100-percent non-Federal responsibility.

c. Forrest (Forest) Heights Levee. This project element for the Forrest Heights community in the Turkey Creek watershed of Gulfport, Mississippi consists of raising approximately 6,500 linear feet of an existing non-Federal levee to a levee crest elevation of 21 feet North Atlantic Vertical Datum of 1988 (NAVD-88). An existing publicly owned park with a surface elevation of 12 to 14 feet NAVD-88 would be included in the plan to serve as a water detention area for temporary containment of rainfall during storm events. This recommended project element will require the acquisition of two residential properties within the existing community. Unavoidable adverse environmental impacts have been identified and the cost of acquisition and restoration of approximately 3 acres of mitigation is included in total estimated cost of this element. Hurricane and storm damage risk reduction benefits are estimated at $101,000 to a historically significant minority community. In addition to these benefits, the levee would maintain cohesiveness of the historically significant community, and preserve the culture and heritage of its predominantly minority residential population. At October 2008 price levels, the estimated first cost of this element is $14,070,000. The cost of this element is allocated to hurricane and storm damage risk reduction. In accordance with the provisions of WRDA 1986, as amended, cost sharing would be 65-percent Federal and 35-percent non-Federal. The Federal share of the estimated first cost of this project element is $9,150,000 and the non-Federal share is $4,920,000. The estimated annual cost for operation, maintenance, repair, replacement, and rehabilitation of this project element is $114,000 and is a 100-percent non-Federal responsibility.

d. Turkey Creek Ecosystem Restoration. This project element consists of the restoration of 689 acres of an undeveloped site of degraded wet pine savannah habitat. Restoration of this area would provide an increase of 1,565 average annual functional habitat units. These habitats have been identified by the U.S. Fish and Wildlife Service as habitats of high value for native species and as relatively scarce or becoming scarce on a national basis or in the ecoregion. Measures required to restore hydrology and natural vegetation on the site include filling drainage ditches, road removal, and controlled burning. Rare and threatened and endangered birds that are expected to utilize the areas following burning and regrowth include Henslow's sparrow, Bachman's sparrow, red-cockaded woodpecker, and Mississippi Sandhill Crane. This restored ecosystem also may benefit the Mississippi Gopher frog and, in drier areas along ridges, the black pine snake and the gopher tortoise. At October 2008 price levels, the estimated first cost of this element is $6,840,000. The cost of this project is allocated to ecosystem restoration. In accordance with the provisions of WRDA 1986, as amended, cost sharing would be 65-percent Federal and 35-percent non-Federal. The Federal share of the estimated first cost of this project element is $4,450,000 and the non-Federal share is $2,390,000. The estimated annual cost for operation, maintenance, repair, replacement, and rehabilitation of this project element is $47,000 and is a 100-percent non-Federal responsibility. Post-implementation monitoring of this ecosystem restoration element is projected to be conducted for no more than five years at a cost of less than 1-percent of the total first cost of the ecosystem restoration elements. Adaptive management of ecosystem restoration element is expected to cost no more than 3-percent of the total first cost of the ecosystem restoration element. The cost of monitoring and adaptive management is included in the total estimated first cost of this element.

e. Dantzler Ecosystem Restoration. This project element consists of restoration of 385 acres of severely degraded wet pine savannah owned by the State of Mississippi. Measures required to restore hydrology and natural vegetative habitat to the site include removal of existing hurricane debris and sedimentation, filling drainage ditches, road removal, control of non-native species, and controlled burning. The proposed element would provide an increase of 1,244 average annual functional habitat units and restore the natural hydrologic character of the area. The site's location in proximity to the Pascagoula River delta, a Gulf Ecological Management Site, increases the value of this restoration element by minimizing the fracturing of biodiversity. At October 2008 price levels, the estimated first cost of this element is $2,210,000. The cost of this project is allocated to ecosystem restoration. In accordance with the provisions of WRDA 1986, as amended, cost sharing would be 65-percent Federal and 35-percent non-Federal. The Federal share of the estimated first cost of this project element is $1,440,000 and the non-Federal share is $770,000. The estimated annual cost for operation, maintenance, repair, replacement, and rehabilitation of this project element is $26,000 and is a 100-percent non-Federal responsibility. Post-implementation monitoring of this ecosystem restoration element is projected to be conducted for no more than five years at a cost of less than 1-percent of the total first cost of the ecosystem restoration elements. Adaptive management of ecosystem restoration element is expected to cost no more than 3-percent of the total first cost of the ecosystem restoration element. The cost of monitoring and adaptive management is included in the total estimated first cost of this element.

f. Franklin Creek Ecosystem Restoration. This project element includes restoration of hydrology and native habitats by removing ditches, excavating and removing existing roadbeds, installing culverts under U.S. Highway 90, control of non-native species, and controlled burning to restore 149 acres located north and south of U.S. Highway 90 with critical wet pine savannah habitat. This area routinely floods with only a slight rainfall; thus, this would also provide additional flood storage capacity by restoring the natural habitat. Pine savannah wetlands provide floodwater retention, groundwater recharge, and water purification. This habitat is becoming fragmented and with the increased development, fire maintenance is increasingly harder to perform. The proposed element would provide an increase of 516 average annual functional habitat units and restore the natural hydrology of the area. In addition, restoration of this area would provide for additional flood storage capacity within the Grand Bay area reducing flooding severity within the adjacent communities of Orange Grove and Pecan in Jackson County. The site's location in proximity to the Grand Bay National Wildlife Refuge (NWR) and the Grand Bay National Estuarine Research Reserve (NERR) increases the value of this restoration element by minimizing the fracturing of biodiversity. Incidental hurricane and storm damage risk reduction benefits would be realized from the removal of approximately 30 residential structures from the floodplain. At October 2008 price levels, the estimated first cost of this element is $1,860,000. The cost of this project is allocated to ecosystem restoration. In accordance with the provisions of WRDA 1986, as amended, cost sharing would be 65-percent Federal and 35-percent non Federal. The Federal share of the estimated first cost of this project element is $1,210,000 and the non-Federal share is $650,000. The estimated annual cost for operation, maintenance, repair, replacement, and rehabilitation of this project element is $11,000 and is a 100-percent non-Federal responsibility. Post-implementation monitoring of this ecosystem restoration element is projected to be conducted for no more than five years at a cost of less than 1-percent of the total first cost of the ecosystem restoration elements. Adaptive management of ecosystem restoration element is expected to cost no more than 3-percent of the total first cost of the ecosystem restoration element. The cost of monitoring and adaptive management is included in the total estimated first cost of this element.

g. Bayou Cumbest Ecosystem Restoration. This project element includes the acquisition of approximately 61 tracts, removal of 19 structures, excavation and removal of fill material from former home sites and adjacent lands, filling drainage ditches, control of non-native species, and planting with native emergent wetland species. Following acquisition of these tracts, 148 acres would be restored to emergent wetland (110 acres) and coastal scrub shrub habitat (38 acres). The estuarine wetland habitats provide nursery and foraging habitat that supports various species including economically-important marine fishery species, such as black drum, spotted seatrout, southern flounder, Gulf menhaden, bluefish, croaker, mullet, and blue crab. The proposed element would provide an increase of 637 average annual functional habitat units. The site's proximity to Franklin Creek, Grand Bay NWR and Grand Bay NERR increases the value of this project element by minimizing the fracturing of biodiversity. At October 2008 price levels, the estimated first cost of this element is $25,530,000. The cost of this project is allocated to ecosystem restoration. In accordance with the provisions of WRDA 1986, as amended, cost sharing would be 65-percent Federal and 35-percent non-Federal. The Federal share of the estimated first cost of this project

element is $16,590,000 and the non-Federal share is $8,940,000. The current estimated annual cost for operation, maintenance, repair, replacement, and rehabilitation of this project element is $114,000 and is a 100-percent non-Federal responsibility. Post-implementation monitoring of this ecosystem restoration element is projected to be conducted for no more than five years at a cost of less than 1-percent of the total first cost of the ecosystem restoration elements. Adaptive management of ecosystem restoration element is expected to cost no more than 3-percent of the total first cost of the ecosystem restoration element. The cost of monitoring and adaptive management is included in the total estimated first cost of this element.

h. Admiral Island Ecosystem Restoration. This project element consists of restoration of a severely degraded 123-acre tidal wetland area owned by the State of Mississippi. Measures required to restore hydrology and native habitat to the area include excavating fill material, filling ditches, control of non-native species and planting native tidal emergent species. The proposed element would provide an increase of 108 average annual functional habitat units. At October 2008 price levels, the estimated first cost of this element is $21,810,000. The cost of this project is allocated to ecosystem restoration. In accordance with the provisions of WRDA 1986, as amended, cost sharing would be 65-percent Federal and 35-percent non-Federal. The Federal share of the estimated first cost of this project element is $14,180,000 and the non-Federal share is $7,630,000. The current estimated annual cost for operation, maintenance, repair, replacement, and rehabilitation of this project element is $58,000 and is a 100-percent non-Federal responsibility. Post-implementation monitoring of this ecosystem restoration element is projected to be conducted for no more than five years at a cost of less than 1-percent of the total first cost of the ecosystem restoration elements. Adaptive management of ecosystem restoration element is expected to cost no more than 3-percent of the total first cost of the ecosystem restoration element. The cost of monitoring and adaptive management is included in the total estimated first cost of this element.

i. Deer Island Ecosystem Restoration. This project element includes actions that will complement existing Federal restoration projects by minimizing the fracturing of biodiversity. Measures include restoration of a portion of the northern and southern shorelines of the island, and new stone training dikes to prevent future erosion. The proposed element would provide an additional 400 acres of highly productive estuarine wetlands, restore beach and dune habitat, create hard bottom habitat, reduce coastal erosion, and restore the coastal maritime forest. This element would produce an increase of 2,125 average annual functional habitat units. In addition, the restoration of Deer Island provides incidental hurricane and storm damage risk reduction benefits to the developed mainland Biloxi area. At October 2008 price levels, the estimated first cost of this element is $21,520,000. The cost of this project is allocated to ecosystem restoration. In accordance with the provisions of WRDA 1986, as amended, cost sharing would be 65-percent Federal and 35-percent non-Federal. The Federal share of the estimated first cost of this project element is $13,990,000 and the non-Federal share is $7,530,000. All costs for operation, maintenance, repair, replacement and rehabilitation are a 100-percent non-Federal responsibility. Post-implementation monitoring of this ecosystem restoration element is projected to be conducted for no more than five years at a cost of less than 1-percent of the total first cost of the ecosystem

restoration elements. Adaptive management of ecosystem restoration element is expected to cost no more than 3-percent of the total first cost of the ecosystem restoration element. The cost of monitoring and adaptive management is included in the total estimated first cost of this element.

j. Submerged Aquatic Vegetation Element. This element consists of measures designed to evaluate techniques for restoring submerged aquatic vegetation (SAV), an essential component of an estuarine ecosystem. Specifically, five acres of SAVs in the Grand Bay National Estuarine Research Reserve (NERR) area that were destroyed by Hurricane Katrina will be restored using different techniques. The results will be used to guide and develop other SAV restoration projects that would be undertaken as future authorized elements of the overall Comprehensive Plan. At October 2008 price levels, the estimated first cost of this element is $900,000. Cost sharing would be 65-percent Federal and 35-percent non-Federal. The Federal share of the estimated first cost of this measure is $590,000 and the non-Federal share is $310,000.

k. Coast-wide Beach and Dune Ecosystem Restoration. This project element consists of beach and dune improvements to approximately 30 miles of the 60 miles of existing beaches on the mainland coast. These improvements would include construction of 60-foot wide vegetated dune fields approximately 50 feet seaward of the existing seawalls. The element would provide 248 average annual functional habitat units. These beach and dune areas are critical to nesting and resting shorebirds such as the State listed least tern and the threatened piping plover. In addition to the ecological benefits, the dunes would provide incidental hurricane and storm damage risk reduction benefits particularly during smaller storm events, tropical storms, and lower energy hurricanes. At October 2008 price levels, the estimated first cost of this element is $23,320,000. The cost of this project is allocated to ecosystem restoration. In accordance with the provisions of WRDA 1986, as amended, cost sharing would be 65-percent Federal and 35-percent non-Federal. The Federal share of the estimated first cost of this project element is $15,160,000 and the non-Federal share is $8,160,000. All costs for operation, maintenance, repair, replacement and rehabilitation are a 100-percent non-Federal responsibility. Post-implementation monitoring of this ecosystem restoration element is projected to be conducted for no more than five years at a cost of less than 1-percent of the total first cost of the ecosystem restoration elements. Adaptive management of ecosystem restoration element is expected to cost no more than 3-percent of the total first cost of the ecosystem restoration element. The cost of monitoring and adaptive management is included in the total estimated first cost of this element.

l. Barrier Island Restoration. This project element consists of the placement of approximately 22 million cubic yards of sand within the National Park Service's Gulf Islands National Seashore, Mississippi unit. Approximately 13 million cubic yards of sand would be used to close a gap between East Ship Island and West Ship Island, originally opened by Hurricane Camille, through the construction of a low level dune system. The remaining 9 million cubic yards of sand would be placed in the littoral zones at the eastern ends of Ship and Petit Bois Islands. This would result in the restoration of 1,150 acres of critical coastal zone habitats. In accordance with the requests of the National Park Service, the closure of the Ship Island gap and placement of sand into the littoral zones would be undertaken only once, and would not be nourished or otherwise maintained in the

future. The restoration of Ship Island would provide over 400 average annual functional habitat units and help to ensure the sustainability of the Mississippi Sound ecosystem by maintaining salinity inflows from the Gulf of Mexico. The estuarine habitats provide nursery and foraging habitat that supports various species including economically-important marine fishery species, such as black drum, spotted seatrout, southern flounder, Gulf menhaden, bluefish, croaker, mullet, and blue crab. These estuarine-dependent organisms serve as prey for other important fisheries, such as mackerels, snappers, and groupers, and highly migratory species, such as billfishes and sharks. Incidental benefits associated with this element include average annual hurricane and storm damage risk reduction benefits of $20,000,000 to mainland Mississippi, $470,000 in average annual recreation benefits, and $43,000,000 in average annual fishery benefits to Mississippi Sound. The placement of sand would also provide incidental protection to two cultural sites listed on the National Register of Historic Places. At October 2008 price levels, the estimated cost of this element is $479,710,000. The cost of this element is allocated to ecosystem restoration. Cost sharing would be 65-percent Federal and 35-percent non-Federal. The Federal share of the estimated cost of this project element is $311,810,000 and the non-Federal share is $167,900,000.

5. Further Detailed Investigations of Remaining Elements of the Comprehensive Plan. The MsCIP Comprehensive Plan describes a number of additional components that could provide further improvements in the coastal area of Mississippi if implemented. However, these components are not recommended for authorization for construction at this time because further feasibility level analysis under additional study authority would be required to support a recommendation for construction authorization. Consequently, the reporting officers recommended additional feasibility level studies as part of the MsCIP Comprehensive Plan. These follow-on feasibility studies would evaluate the potential for restoration of over 30,000 acres of coastal forest, wetlands, beaches and dunes; restoration of barrier islands; structural measures; and floodproofing of structures on, or acquisition of, over 58,000 tracts within the 100 year floodplain. The reporting officers worked closely with other Federal agencies, the State of Mississippi, environmental groups, stakeholders, and interested parties to ensure that the program recommended for implementation best meets the goals and objectives of the MsCIP Comprehensive Plan consistent with the Congressional authorization. The total study cost of the recommended follow-on feasibility level studies is estimated to be $143,200,000, which would be cost shared on a 50-percent Federal and 50-percent non-Federal basis consistent with cost sharing provisions of Section 105 of WRDA 86, as amended. Follow-on analysis would include:

- 6 additional ecosystem restoration studies to restore the hydrology and native habitat on undeveloped state owned property.
- Long-term High Hazard Area Risk Reduction Program element to evaluate the further acquisition of high risk properties.
- Escatawpa River Freshwater Diversion to evaluate a variety of freshwater diversion scenarios to restore wet pine savannah habitat and reduce salinities in Grand Bay.

- 30 long-term ecosystem restoration and hurricane and storm damage risk reduction studies to restore the hydrology and natural habitat and reduce storm damages in developed residential areas.
- 7 hurricane and storm damage risk reduction studies to evaluate additional hurricane and storm damage risk reduction opportunities in high density land use areas.

6. At October 2008 price levels, the estimated first cost of the 12 elements of the MsCIP Comprehensive Plan recommended for authorization is $1,010,080,000, of which $656,550,000 would be Federal and $353,530,000 would be non-Federal. The estimated first cost of the individual elements recommended for authorization is summarized below in Table 1. The first cost of the recommended feasibility studies is estimated at $143,200,000. The estimated first cost of the individual studies recommended are summarized below in Table 2.

Table 1
Mississippi Coastal Improvements Program
Cost Sharing (October 2008 Price Level)

Phase I Recommended Plan Element	Total First Cost	Federal Cost	Non-Federal Cost
Phase I High Hazard Area Risk Reduction Plan	$407,860,000	$265,110,000	$142,750,000
Waveland Floodproofing	$4,450,000	$2,890,000	$1,560,000
Forrest Heights Levee	$14,070,000	$9,150,000	$4,920,000
Turkey Creek Ecosystem Restoration	$6,840,000	$4,450,000	$2,390,000
Dantzler Ecosystem Restoration	$2,210,000	$1,440,000	$770,000
Franklin Creek Ecosystem Restoration	$1,860,000	$1,210,000	$650,000
Bayou Cumbest Ecosystem Restoration & Hurricane & Storm Damage Reduction	$25,530,000	$16,590,000	$8,940,000
Admiral Island Ecosystem Restoration	$21,810,000	$14,180,000	$7,630,000
Deer Island Ecosystem Restoration	$21,520,000	$13,990,000	$7,530,000
Submerged Aquatic Vegetation Pilot Program	$900,000	$590,000	$310,000
Coast-wide Beach and Dune Ecosystem Restoration	$23,320,000	$15,160,000	$8,160,000
Comprehensive Barrier Island Restoration	$479,710,000	$311,810,000	$167,900,000
Total MsCIP Authorization Request	$1,010,080,000	$656,550,000	$353,530,000

Table 2
Mississippi Coastal Improvements Program
Cost Sharing (October 2008 Price Level)

Feasibility Studies	Estimated Study Cost	Federal Cost	Non-Federal Cost
Long-term High Hazard Area Risk Reduction	$5,000,000	$2,500,000	$2,500,000
Escatawpa River Freshwater Diversion	$3,000,000	$1,500,000	$1,500,000
Ecosystem Restoration Studies	$1,700,000	$850,000	$850,000
Long-term Ecosystem Restoration and Hurricane and Storm Damage Risk Reduction	$48,500,000	$24,250,000	$24,250,000
Structural Hurricane and Storm Damage Risk Reduction	$85,000,000	$42,500,000	$42,500,000
Total First Cost of MsCIP Recommended Investigations	$143,200,000	$71,600,000	$71,600,000

7. In concert with the Corps Campaign Plan, the MsCIP Comprehensive Plan was developed utilizing a systematic and regional approach in formulating solutions and in evaluating the impacts and benefits of those solutions. All potential impacts, both adverse and beneficial, have been considered without regard to geographic boundaries. The MsCIP and Louisiana Coastal Protection and Restoration (LACPR) study teams collaborated fully their efforts on a systems scale to ensure consistency. A regional salinity and water quality model has been developed covering an area from west of Lake Pontchartrain to east of Mobile Bay and south beyond the Chandeleur Islands in the Gulf. Regional storm surge modeling has been applied to examine regional-scale changes to storm surge levels associated with several of the proposed project alternatives. A multi-disciplinary risk assessment team was assembled by the Corps to characterize the probabilities of different hurricanes that can impact the northern Gulf of Mexico region. The risk assessment team supported both the MsCIP and LACPR work and FEMA's remapping efforts, and developed a unified general coastal flooding methodology that is being applied by U.S. Army Corps of Engineers (Corps) and FEMA.

8. Independent External Peer Review (IEPR) of the MsCIP Comprehensive Plan was managed by Battelle Memorial Institute, a non-profit science and technology organization with experience in establishing and administering peer review panels for the Corps. The IEPR panel consisted of seven individuals selected by Battelle with technical expertise in engineering (civil and geotechnical); geology/geomorphology; hydrology; hydraulics; coastal environmental science, water quality/resource management; floodplain management; meteorology/hurricanes; socioeconomics; real estate; risk assessment; and modeling. The Final Report from the IEPR panel was issued November 7, 2008 and included 14 final comments. Overall, the IEPR panel found the MsCIP Comprehensive Plan is an impressive body of work that is wide-ranging in the scope of research used to inform plan selection and recommendations. However, they felt that the plan could be improved by inclusion of a concise statement of the project's long-term vision for the future coastal landscape and a figure illustrating the project in the Executive Summary. The panel also acknowledged that there has been extensive outreach and community engagement

in the scoping process. The panel encouraged continued Corps collaboration with the public, local and Federal agencies, and the inclusion of universities and research institutions to continue to inform this plan. Support of local communities and states should be fostered as it is also a critical component to project success. Of the 14 IEPR comments identified by the panel, four were classified as high significance by the panel. This first comment recommended including a refined analysis in certain areas before design and build is conducted. In response, additional clarification was added to the report to indicate that a refined analysis would be undertaken in the ensuing project phases. The second comment requested providing additional explanations on the preliminary evaluations of hurricane storm damage risk reduction, erosion control, and ecosystem restoration. In response, with assistance from recommendations in the IEPR report, the Comprehensive Plan was revised to provide further clarification in these areas. The third comment recommended that the redevelopment scenarios should include a range of possible outcomes for the economy. In response, the team provided further explanations on the preliminary analysis and possible outcomes for the redevelopment scenarios. The fourth comment recommended that adaptive management processes should be a more integral part of the Comprehensive Plan and must include a strong monitoring and feedback mechanism. In response, the adaptive management process was further integrated into the Comprehensive Plan, along with recognition that adaptive management will be developed more extensively in collaboration with others in the ensuing project phases. Eight of the IEPR panel comments were classified as medium significance by the panel. They included clarifying the extent of inclusion of public and agency engagement into plan selection; including additional information on future impacts to municipal and industrial waste facilities; including additional detail on human adaptation, as it relates to economic activities; including additional explanations on sea level rise; including a clearer description on how relative sea level rise is incorporated; providing a clearer explanation on the physics-based models; providing further descriptions on the factors in model selection; and providing further explanation on why oysters were used as an indicator species. As a result of these comments, additional discussions were added to the report to clarify these areas, including why decisions were made through the study process respective to these comments. The report was also revised to provide further explanation on the use of oysters as one of several indicator species that assisted in the identification of feasible alternatives. The final two comments from the IEPR panel were classified as low significance. They included reevaluating the goal to reduce loss of life by 100% as it is unrealistic for the project; and to clarify the process for weighting metrics, both of which were addressed with modifications to the report. While the goal to reduce loss of life by 100% remained in the study, additional discussion was added to the report to state that residual risk will remain with any type of plan in place, and to emphasize the roles of all partners in addressing and communicating residual risk, including the need for a well coordinated hurricane evacuation plan.

9. Washington level review indicated that the project is technically sound, environmentally acceptable, and cost effective. The plan conforms with essential elements of the U.S. Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation studies and complies with other administration and

legislative policies and guidelines. Also, the views of interested parties, including Federal, State and local agencies have been considered.

10. One or more of the 12 elements of the MsCIP Comprehensive Plan recommended in this report to be authorized for implementation may be implementable pursuant to statutory language included in Title IV of the Supplemental Appropriations Act, 2009 (Public Law 111-32) under the heading "Flood Control and Coastal Emergencies" that was enacted on June 24, 2009 (*see* 123 Stat. 1875-1876). Analysis as to which element or elements may be implemented pursuant to that language is ongoing.

11. I find that the reporting officers have addressed the provisions of P.L. 109-148, and I generally concur in their findings, conclusions, and recommendations. Accordingly, I recommend that the 12 elements described herein be authorized for implementation in accordance with the reporting officers' plan, with such modifications as in the discretion of the Chief of Engineers may be advisable. I further recommend that the additional studies as described herein be authorized subject to cost sharing, financing, and other applicable requirements of Federal and State laws and policies, including WRDA 1986, as amended. This recommendation of authorization for implementation of the 12 elements is subject to cost sharing, financing, and other applicable requirements of Federal and State laws and policies, including WRDA 1986, as amended, and with the non-Federal sponsor agreeing to comply with applicable Federal law and policies, and with the following requirements:

a. Provide 35 percent of total project costs allocated to hurricane and storm damage risk reduction, as further specified below:

(1) Provide 25 percent of design costs allocated to hurricane and storm damage risk reduction in accordance with the terms of a design agreement entered into prior to commencement of design work for a project element for hurricane and storm damage risk reduction;

(2) Provide, during the first year of construction of a project element for hurricane and storm damage risk reduction, any additional funds necessary to pay the full non-Federal share of design costs allocated to hurricane and storm damage reduction;

(3) Provide all lands, easements, and rights-of-way, including those required for relocations, the borrowing of material, and the disposal of dredged or excavated material; perform or ensure the performance of all relocations; and construct all improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material all as determined by the Government to be required or to be necessary for the construction, operation, and maintenance of a project element for hurricane and storm damage risk reduction;

(4) Provide, during construction of a project element for hurricane and storm damage risk reduction, any additional funds necessary to make its total contribution for hurricane and storm damage risk reduction equal to 35 percent of total project costs allocated to hurricane and storm damage risk reduction;

b. Provide 35 percent of total project costs allocated to ecosystem restoration, as further specified below:

(1) Provide 25 percent of design costs allocated to ecosystem restoration in accordance with the terms of a design agreement entered into prior to commencement of design work for a project element for ecosystem restoration;

(2) Provide, during the first year of construction of a project element for ecosystem restoration, any additional funds necessary to pay the full non-Federal share of design costs allocated to ecosystem restoration;

(3) Provide all lands, easements, and rights-of-way, including those required for relocations, the borrowing of material, and the disposal of dredged or excavated material; perform or ensure the performance of all relocations; and construct all improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material all as determined by the Government to be required or to be necessary for the construction, operation, and maintenance of a project element for ecosystem restoration;

(4) Provide, during construction of a project element for ecosystem restoration, any additional funds necessary to make its total contribution for ecosystem restoration equal to 35 percent of total project costs allocated to ecosystem restoration;

c. Shall not use funds from other Federal programs, including any non-Federal contribution required as a matching share therefore, to meet any of the non-Federal obligations for a project element unless the Federal agency providing the Federal portion of such funds verifies in writing that expenditure of such funds for such purpose is authorized;

d. Shall not use a project element for ecosystem restoration or lands, easements, and rights-of-way required for a project element for ecosystem restoration as a wetlands bank or mitigation credit for any other project or project element;

e. Not less than once each year, inform affected interests of the extent of protection afforded by the project elements for hurricane and storm damage risk reduction;

f. Agree to participate in and comply with applicable Federal floodplain management and flood insurance programs for project elements for hurricane and storm damage risk reduction;

g. Comply with Section 402 of the Water Resources Development Act of 1986, as amended (33 U.S.C. 701b-12), which requires a non-Federal interest to prepare a floodplain management plan within one year after the date of signing a project partnership agreement, and to implement such plan not later than one year after completion of construction of a project element for hurricane and storm damage risk reduction;

h. Publicize floodplain information in the area concerned and provide this information to zoning and other regulatory agencies for their use in adopting regulations, or taking other actions, to prevent unwise future development and to ensure compatibility with protection levels provided by a project element for hurricane and storm damage risk reduction;

i. Prevent obstructions or encroachments on a project element (including prescribing and enforcing regulations to prevent such obstructions or encroachments) such as any new developments on project element lands, easements, and rights-of-way or the addition of facilities which might reduce the level of protection a project element affords, reduce the outputs produced by a project element, hinder operation and maintenance of a project element, or interfere with a project element's proper function;

j. Comply with all applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601-4655), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way required for construction, operation, and maintenance of a project element, including those necessary for relocations, the borrowing of materials, or the disposal of dredged or excavated material; and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act;

k. For so long as a project element remains authorized, operate, maintain, repair, rehabilitate, and replace the project element, or functional portions of the project element, including any mitigation features, at no cost to the Federal Government, in a manner compatible with the project element's authorized purposes and in accordance with applicable Federal and State laws and regulations and any specific directions prescribed by the Federal Government;

l. Give the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor owns or controls for access to a project element for the purpose of completing, inspecting, operating, maintaining, repairing, rehabilitating, or replacing the project element;

m. Hold and save the United States free from all damages arising from the construction, operation, maintenance, repair, rehabilitation, and replacement of a project element and any betterments, except for damages due to the fault or negligence of the United States or its contractors;

n. Keep and maintain books, records, documents, or other evidence pertaining to costs and expenses incurred pursuant to a project element, for a minimum of three years after completion of the accounting for which such books, records, documents, or other evidence are required, to the extent and in such detail as will properly reflect total project costs, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 Code of Federal Regulations (CFR) Section 33.20;

o. Comply with all applicable Federal and State laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable Federal labor standards requirements including, but not limited to, 40 U.S.C. 3141- 3148 and 40 U.S.C. 3701 – 3708 (revising, codifying and enacting without substantial change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq.*), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq.*) and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c *et seq.*);

p. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 96-510, as amended (42 U.S.C. 9601-9675), that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction, operation, and maintenance of a project element. However, for lands that the Federal Government determines to be subject to the navigation servitude, only the Federal Government shall perform such investigations unless the Federal Government provides the non-Federal sponsor with prior specific written direction, in which case the non-Federal sponsor shall perform such investigations in accordance with such written direction;

q. Assume, as between the Federal Government and the non-Federal sponsor, complete financial responsibility for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction, operation, and maintenance of a project element;

r. Agree, as between the Federal Government and the non-Federal sponsor, that the non-Federal sponsor shall be considered the operator of a project element for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, repair, rehabilitate, and replace the project element in a manner that will not cause liability to arise under CERCLA; and

s. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended (42 U.S.C. 1962d-5b), and Section 103(j) of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2213(j)), which provides that the Secretary of the Army shall not commence the construction of any water resources project or separable element thereof, until each non-Federal interest has entered into a written agreement to furnish its required cooperation for the project or separable element.

12. The recommendations contained herein reflect the information available at this time and current Departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are transmitted to the Congress as proposals for authorization and implementation funding. However, prior to transmittal to the Congress, the non-Federal sponsor, the State, interested Federal agencies, and other parties will be advised of any modifications and will be afforded an opportunity to comment further.

R. L. VAN ANTWERP
Lieutenant General, US Army
Chief of Engineers